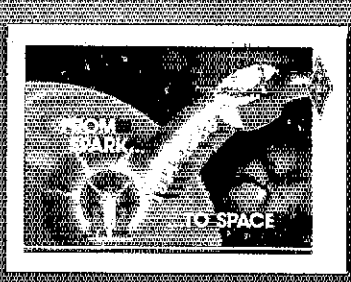
QST

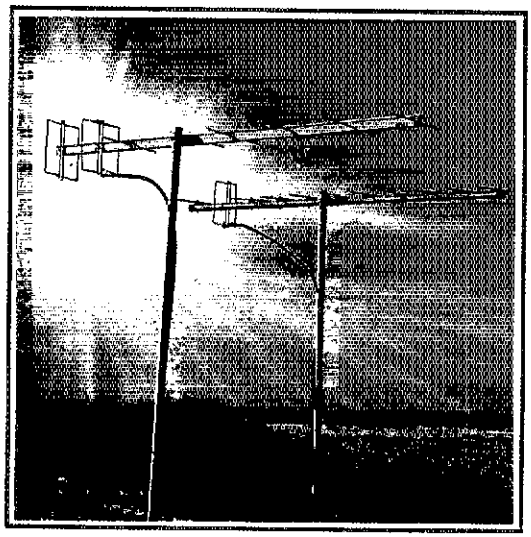
September 1980 $3.00



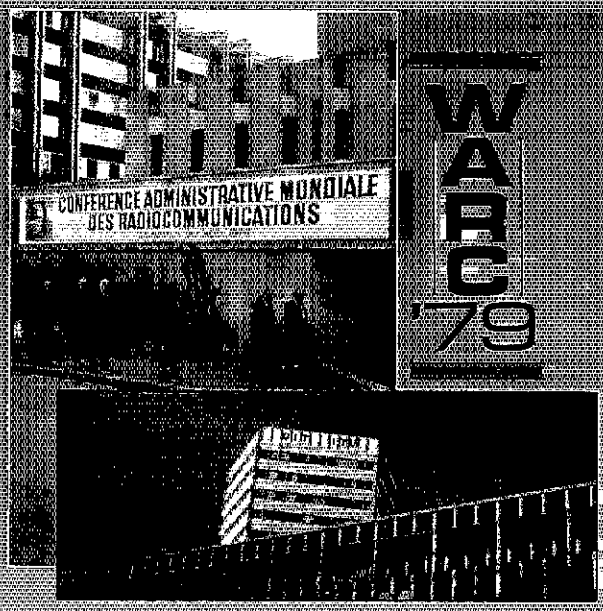
devoted entirely to Amateur Radio

QST

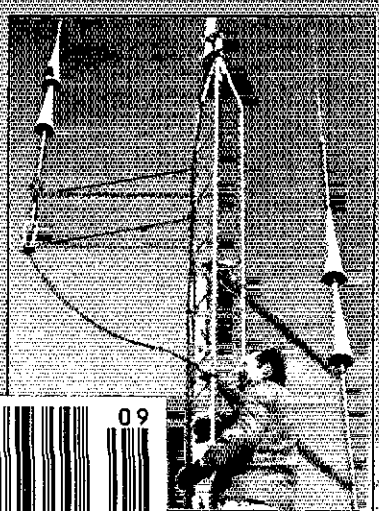
devoted entirely to Amateur Radio November 1977 $1.50

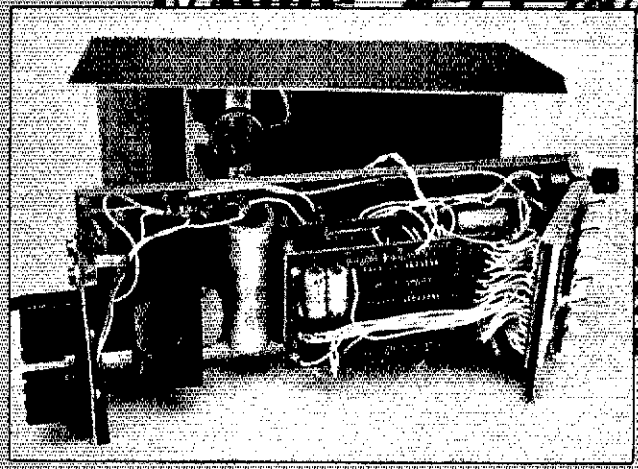


Looking for new horizons?
Try the vhf frontiers!
Page 18



THE '70s





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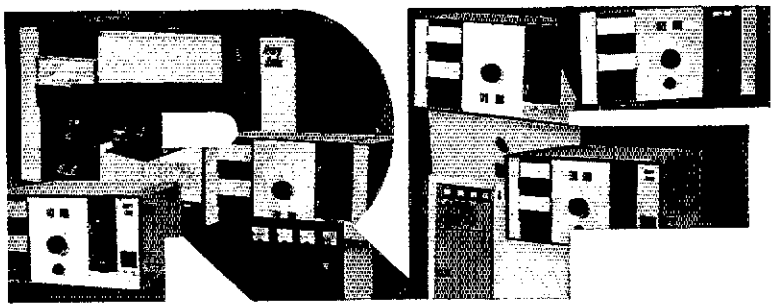
At Henry Radio,



should be our middle name

We're aiming this message at the thousands of amateurs who are also electronics engineers. . . . because we may have just what you are looking for.

We started building amplifiers for amateur use more than 25 years ago. We know that we build the broadest line in the world and we also believe they're the best. A lot of people must agree with us because 40,000 of our amplifiers are in use throughout the world. And because we are so versatile and quality conscious, hundreds of our amplifiers, both stock and custom designed, are being used by commercial, industrial and military users worldwide. They are key components in scores of high tech systems used in a broad range of applications.

Thousands of Henry amplifiers are still used for communications. . .amateur, commercial, MARS, military, short wave broadcast, FM broadcast, VHF link, domestic, foreign. . .Henry amplifiers go everywhere for diverse services. HF point-to-point, VHF, UHF, SSB, AM, FM, RTTY, packet, meteor burst, digital, marine shore station. Are you beginning to get the idea? If you need a special purpose vacuum tube amplifier for a specific frequency from 2 MHz to 500 MHz at power levels up to 10,000 watts, we invite your inquiry.

But communications is only the beginning. Think about plasma generation, sputtering and etching, thin film deposition, laser excitation, nuclear magnetic resonance (NMR), photo-emissions and mass spectrometry, scientific research, industrial production. . .Henry equipment is used in all of these applications. We have always been customer driven and still are.

Recent projects include:

10,000 watt 41 MHz Meteor Burst U.S. Air Force
10,000 watts 70 MHz Cyclotron
2,000 watts 45 MHz numerous customers including SHAPE Headquarters, U.S. Dept. of Interior, The Mitre Company, M-A Com, Etc.
2,000 watts 13.5 MHz Plasma generator for vacuum etching, many customers.
1,000 watts 13.5 MHz Same application as previous listing
5,000 watts 13.5 MHz Same application as previous listing
5,000 watts various Marine HF frequencies Shore stations
10,000 watts 90 MHz Laser Excitation
3,000 watts 110 to 150 MHz United Technology
3,000 watts 300 MHz NMR
4,000 watts 145 MHz VHF Point-to-Point — Indonesia
1,000 watts 300 MHz Cancer Hyperthermia
20,000 watts 100 MHz Pulse for Laser Excitation
2,500 watts 27.12 MHz to ignite Argon Torch Photo-Emissions Spectrometry — Switzerland
2,000 watts 27.12 MHz Mass Spectrometry England
1,000 watts 400-450 MHz NASA
2,000 watts 13.56 MHz Sputtering — Munich, Germany
3,000 watts 6 MHz Shortwave AM — Broadcast
10,000 watts 90 MHz FM Broadcast
5K Classic Amplifiers HF Communications. . .export

If you have a requirement for high power RF, please call Ted Shannon, Meredith Henry or Ted Henry. And don't forget, Henry Radio still produces the world's broadest line of fine Amateur amplifiers.

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KENWOOD

...pacesetter in Amateur Radio

All-mode tri-bander!

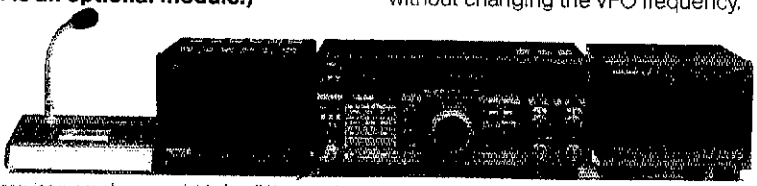
TS-790A

Satellite Transceiver

The new Kenwood TS-790A VHF/UHF all-mode tri-band transceiver is designed for the VHF/UHF and satellite "power user." The new TS-790A is an all-mode 144/450/1200 MHz transceiver with many special enhancements such as automatic uplink/downlink tracking. Other features include dual receive, automatic mode selection, automatic repeater offset selection for FM repeater use, VFO or quick step channel tuning, direct keyboard frequency entry, 59 memory channels (10 channels for separate receive and transmit frequency storage), multiple scanning and multiple scan stop modes. The Automatic Lock Tuning (ALT) on 1200 MHz eliminates frequency drift. Power output is 45 watts on 144 MHz, 40 watts on 450 MHz, and 10 watts on 1200 MHz. (The 1200 MHz section is an optional module.)

- **High stability VFO.** The dual digital VFOs feature rock-stable TCXO (temperature compensated crystal oscillator) circuitry, with frequency stability of ±3 ppm.
- **Operates on 13.8 VDC.** Perfect for mountain-top DXpeditions!
- **The mode switches confirm USB, LSB, CW, or FM selection with Morse Code.**
- **Dual Watch allows reception of two bands at the same time.**
- **Automatic mode and automatic repeater offset selection.**
- **Direct keyboard frequency entry.**
- **59 multi-function memory channels.** Store frequency, mode, tone information, offset, and quick step function. Ten memory channels for "odd split."
- **CTCSS encoder built-in.** Optional TSU-5 enables sub-tone decode.
- **Memory scroll function.** This feature allows you to check memory contents without changing the VFO frequency.
- **Multiple scanning functions.** Memory channel lock-out is also provided.
- **ALT—Automatic Lock Tuning—on 1200 MHz eliminates drift!**
- **500 Hz CW filter built-in.**
- **Packet radio connector.**
- **Interference reduction controls:** 10 dB RF attenuator on 2m, noise blanker, IF shift, selectable AGC, all mode squelch.
- **Other useful controls:** RF power output control, speech processor, dual muting, frequency lock switch, RIT.
- **Voice synthesizer option.**
- **Computer control option.**

Optional Accessories:
• **PS-31** Power supply • **SP-31** External speaker • **UT-10** 1200 MHz module • **VS-2** Voice synthesizer unit • **TSU-5** Programmable CTCSS decoder • **IF-232C** Computer interface • **MC-60A/MC-80/MC-85** Desk mics • **HS-5/HS-6** Headphones • **MC-43S** Hand mic • **PG-2S** Extra DC cable



Complete service manuals are available for all Kenwood transceivers and most accessories. Specifications, features, and prices are subject to change without notice or obligation.

KENWOOD

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COMMUNICATIONS & TEST EQUIPMENT GROUP
P.O. BOX 22745, 2201 E. Dominguez Street
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Mississauga, Ontario, Canada L4T 4C2

ONLY ICOM COULD BUILD THIS MANY FEATURES INTO SUCH A TINY RADIO

ICOM's new "S Series" mini handhelds deliver top performance on the 144, 220 and 440MHz bands with super easy operation and a kaleidoscope of features. Built to fit your needs today, tomorrow, anywhere and anytime.

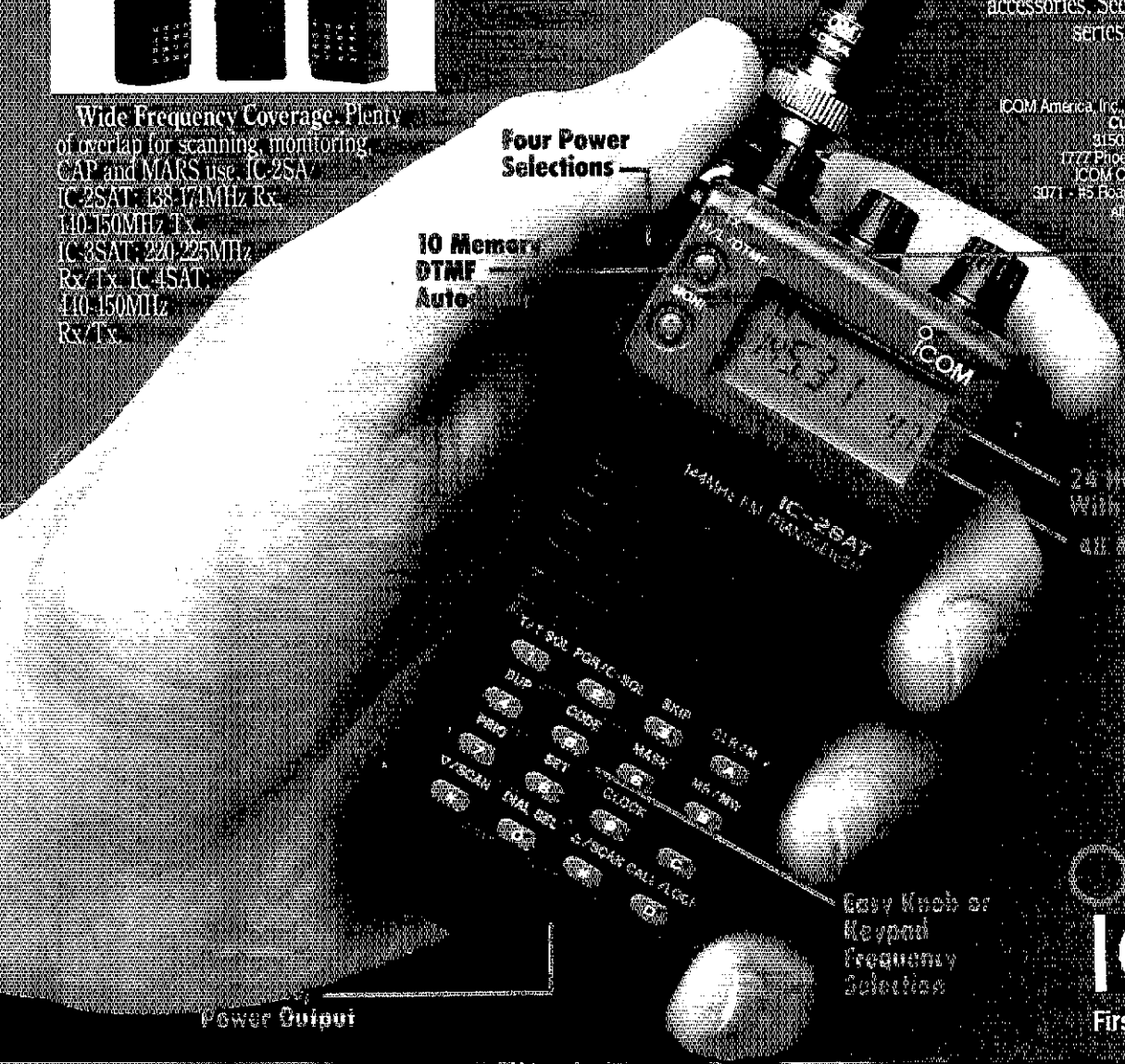
Wide Frequency Coverage. Plenty of overlap for scanning, monitoring, CAP and MARS use. IC-2SAT: 138-174MHz Rx, 140-150MHz Tx. IC-3SAT: 220-225MHz Rx/Tx. IC-4SAT: 440-450MHz Rx/Tx.

Flexible Size And Power. The IC-2SA packs 2.5 watts with supplied BP-82. The IC-2SAT, 3SAT and 4SAT's internal battery packs 2 watts of output on high power. All models deliver five watts when powered via optional BP-85 battery pack or via top-mounted 13.8 volt socket. A small rig with a big punch.

48 Memories. Store your present frequencies and expand your future interests. Offset frequencies are independently programmed in memory channels 0-9. Memories 10-47 use offset frequency contents of the VFO. Also includes soft-sector memory masking. Use only the number of memories you need!

Band and Memory Scanning with programmable limits, memory skip function, plus selectable pause times while scanning. Additional features include: **Automatic Power Shut-off.** Built-in programmable timer automatically switches off transceiver when you forget. **Optional DTMF Paging Function.** Silently monitors any selected frequency for your preprogrammed 3-digit DTMF-keyed calls, then beeps and displays calling station's code.

All ICOM's "S Series" handhelds are supported by an extensive line of optional battery packs, chargers, cases, speaker mics and other accessories. See the exciting new ICOM mini-series handhelds at your authorized ICOM dealer today!



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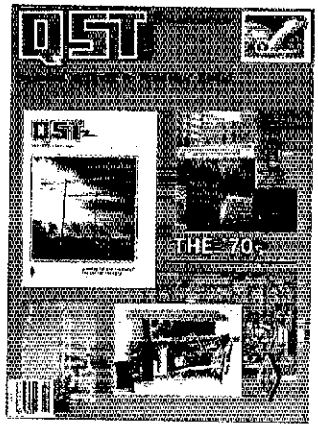


OUR COVER

During the seventies, amateurs gained three new HF bands—thanks to the efforts of the IARU team at the World Administrative Radio Conference in Geneva. *QST* went to a new size, thousands of WB4VVF "Accu-keyers" and "Accu-memories" were built, and the *ARRL Repeater Directory* grew to over 5000 listings by the end of the decade.

CONTENTS

September 1989
Volume LXXIII Number 9

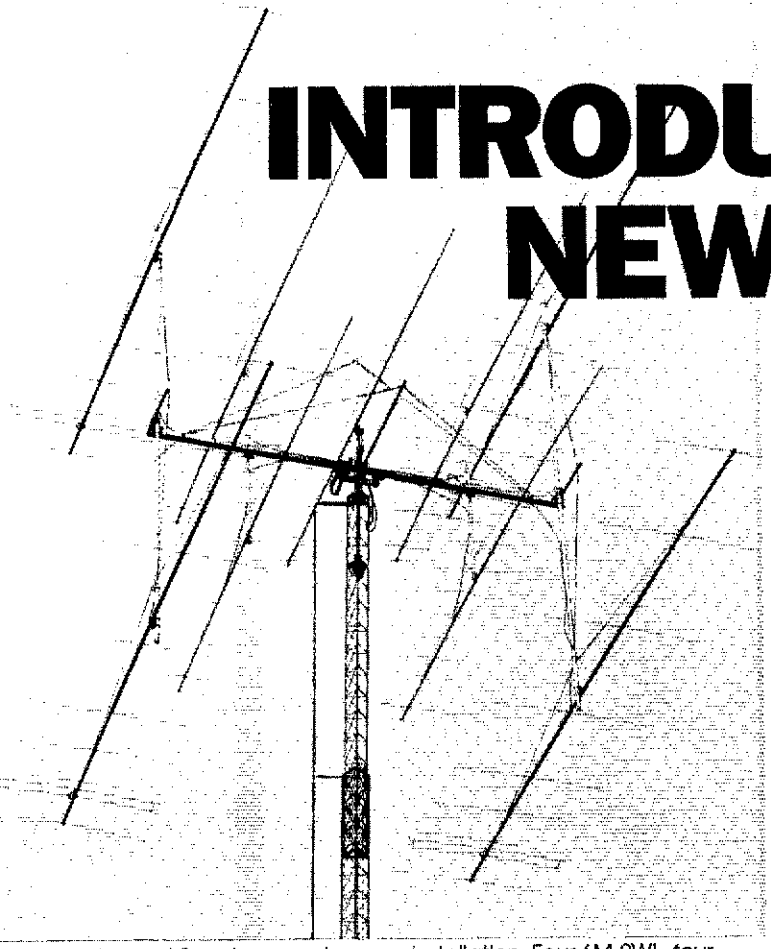
TECHNICAL

NEWS AND FEATURES

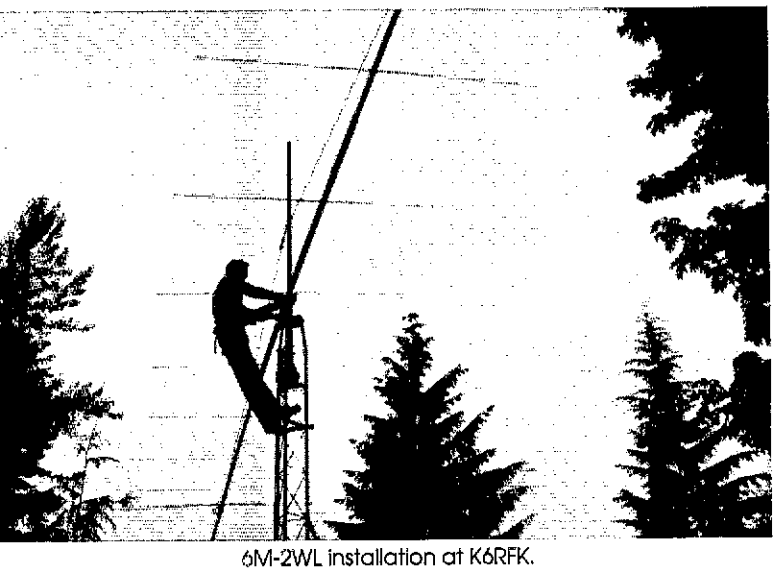
OPERATING

DEPARTMENTS

INTRODUCING AEA's NEW ANTENNAS



6-meter and 2-meter moonbounce installation. Four 6M-2WL, four 2M-5WL and one 432-13WL antennas in array on self-supporting 89-foot US tower at N7ML.



6M-2WL installation at K6RFK.

The superior engineering designs, quality and high performance that AEA built its reputation on are now available in its dynamic new line of antennas. Developed and manufactured by Mike Staal K6MYC, president of M² Enterprises and co-founder of KLM antennas, the product line includes an assortment of 2-meter, 6-meter and 440 MHz antennas and accessories for fixed or portable applications. M²/AEA antennas are already recognized for their superior performance by many moonbouncers.

Features. AEA's new antenna line features computer-optimized antennas with the highest gain for boom-length attainable.

Other features include:
• Machined aluminum driven element housing with built-in "N" connector and O-ring seals including access cover • Silicone dielectric gel in the cavities to withstand inclement weather • Parasitic elements insulated through the boom on most units for long-term performance and reliability • Electronically tuned balun combined with unique driven element design to produce symmetrical patterns • Swaged and tapered boom plus solid rod elements to reduce windload • Low windload overhead dacron boom support • Flexible boom-to-mast mounting for mechanical balance • Ideal for multiple antenna arrays.

Accessories. To compliment the antenna line, AEA also offers various "H" frame support packages. The MT-3000 heavy-duty elevation mechanism and controller for tilting up multiple yagi arrays. Also welded aluminum power dividers for coupling multiple antennas.

For further information, see your local AEA authorized dealer, or call AEA at (206)775-7373.

Model	6M-5	6M-2WL	6M-2.5WL	2M-5WL	2M-18XXX	2M-6WLHD	2M-CP14	2M-CP22	EB-144	430-16	432-13WL	EB-432
Elements	5	9	11	17	18	20	14	22	N/A	16	39	N/A
Boom	15'9"	39'6"	50'4"	33'	36'	41'4"	9'10"	18'	N/A	10'	30'3"	N/A
Weight	11/14	31/40	38/47	13/15	14/16	30/37	6/8	12.5/15	1.5/3	4/5	12/13	1.3/3
Windload	2.0	5.0	5.9	2.7	2.9	6.1	1.1	2.5	N/A	0.82	2.5	N/A
Price	$179.95	$449.95	$539.95	$199.95	$259.95	$469.95	$179.95	$269.95	$129.95	$119.95	$269.95	$119.95

Boom - Length, feet and inches.
Weight - Weight in pounds, antenna weight/shipping weight.
Windload - Windload area in square feet.
Price - Amateur Net. **6M** - Six meters. **2M** - Two meters.
WL - Wavelength. **HD** - Heavy-duty. **CP** - Circularly polarized. **EB** - Eggbeater.

Made in USA

Advanced Electronic Applications, Inc.
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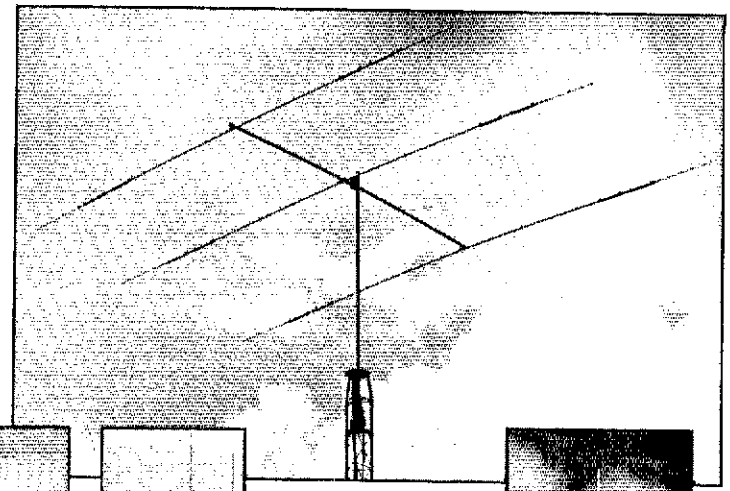
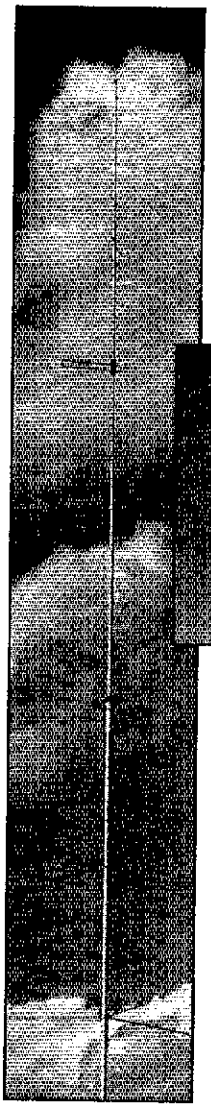
Lynnwood, WA 98036

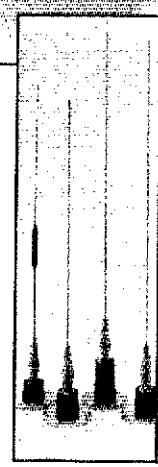
Tuned To The New World Of Amateur Radio

From Novice to Extra Class Cushcraft has the antenna you need.





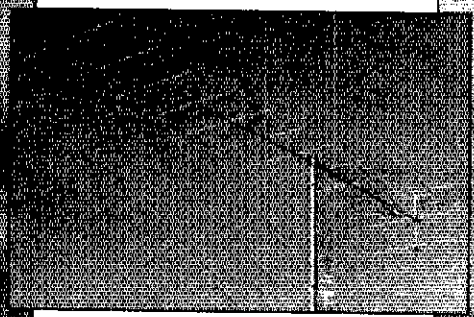
Cushcraft offers high performance antennas to make every phase of your ham radio activity more satisfying. We have been creating innovative and exciting new products for more than 35 years. Call or write for a free copy of our full line antenna and accessory catalog or see your local dealer.

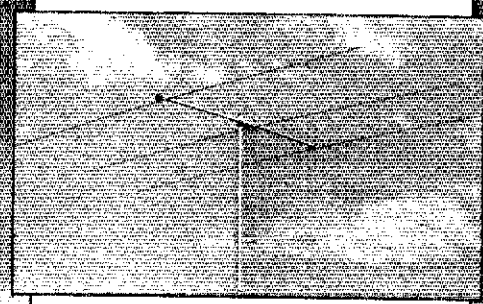


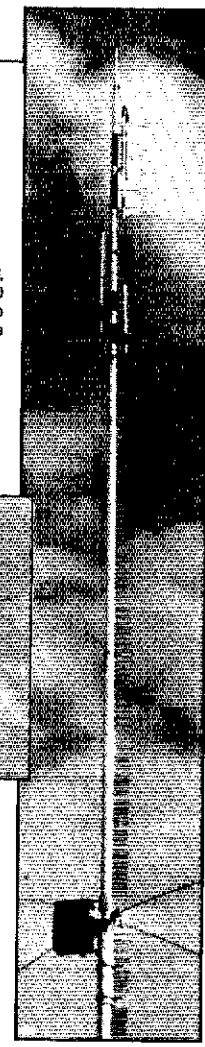
HF TRIBAND BEAM. *A3.* The most popular compact 10,15, 20 meter beam. *A4S.* A high performance 18' long wideband beam with all stainless steel hardware. 40 meter add on kits for each

NEW! ***CUSHCRAFT/SIGNALS.*** magnetic mount mobile for 10 meters. An ideal companion to the new 10 meter multi mode rigs. Model CS28M.

AP8 VERTICAL. Covering 10,12, 15, 17, 20, 30, 40, 80 Meters. Great choice for Novice to Extra class.





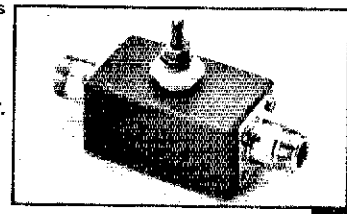


BOOMERS. The contest winners and distance record holders. Computer enhanced design for better gain, pattern and strength. VHF and UHF models for SSB, FM and other activities.

RINGO RANGER II. Still the world's favorite 2 meter, 70 cm or 220 MHz omni antenna, with more gain. A must for your FM or packet station.

FAST ACTION GAS TUBE LIGHTNING ARRESTERS. Protect your valuable radio equipment. High and low power models with SO-239 or N connectors.

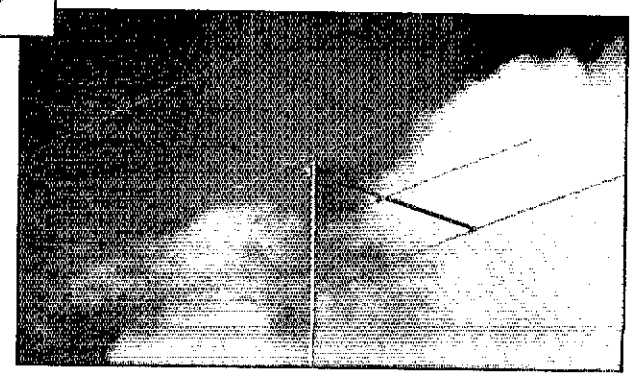
NEW! ***10, 18, 24 MHz ROTATABLE DIPOLE.*** Mounts easily on the same mast as your tribander or other antennas. Bi-directional pattern gives excellent performance. Model D3W.



NEW! ***NEW 10 METER 3 ELEMENT*** for the novice, technician or any ham who wants more gain with a good front to back ratio. Model TEN-3

NEW! ***R5 HALFWAVE 10, 12, 15, 17, 20 METER VERTICAL.*** Amazing DX performance in a small space without ground radials. Includes a solid state broadband impedance matching network. Model R5.

SKYWALKER MONOBAND. 10, 12, 15 and 20 meter Yagis for more contacts, less waiting and a better signal. Preferred by contesters and DX-Peditions.



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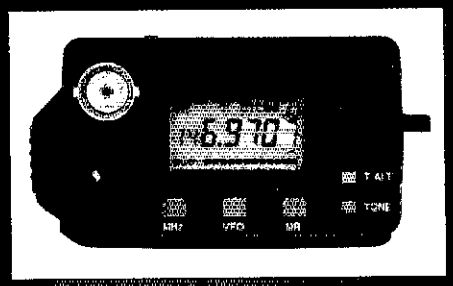
TH-55AT 1200 MHz Here Now!

Compact Breakthrough!

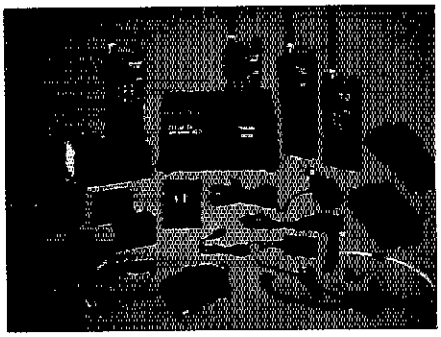


TH-25AT/45AT

New Pocket Portable Transceivers

The all-new TH-25 Series of pocket transceivers is here! Wide-band frequency coverage, LCD display, 5 watt option, plus...

- Frequency coverage: **TH-25AT:** 141-163 MHz (Rx); 144-148 MHz (Tx). (Modifiable for MARS/CAP. Permits required.)
  TH-45AT: 438-450 MHz.
- Automatic Power Control (APC) circuit for reliable RF output and final protection.
- 14 memories; two for **any** "odd split" (5 kHz steps).
- Automatic offset selection (TH-25AT).
- 5 Watts from 12 VDC or PB-8 battery pack.
- Large multi-function LCD display.
- Rotary dial selects memory, frequency, CTCSS and scan direction.
- T-ALERT for quiet monitoring. Tone Alert beeps when squelch is opened.
- Band scan and memory scan.
- Automatic "power off" circuit.
- Water resistant.
- CTCSS encoder /decoder optional (TSU-6).
- **Supplied accessories:** StubbyDuk, PB-6 battery pack for 2.5 watts output, wall charger, belt hook, wrist strap, water resistant dust caps.



Optional accessories:

• **PB-5** 7.2 V, 200 mAh NiCd pack for 2.5 W output • **PB-6** 7.2 V, 600 mAh NiCd pack • **PB-7** 7.2 V, 1100 mAh NiCd pack • **PB-8** 12 V, 600 mAh NiCd for 5 W output • **PB-9** 7.2 V, 600 mAh NiCd with built-in charger • **BC-10** Compact charger • **BC-11** Rapid charger • **BT-6** AAA battery case • **DC-1/PG-2V** DC adapter • **HMC-2** Headset with VOX and PTT • **SC-14, 15, 16** Soft cases • **SMC-30/31** Speaker mics. • **TSU-6** CTCSS decode unit • **WR-1** Water resistant bag

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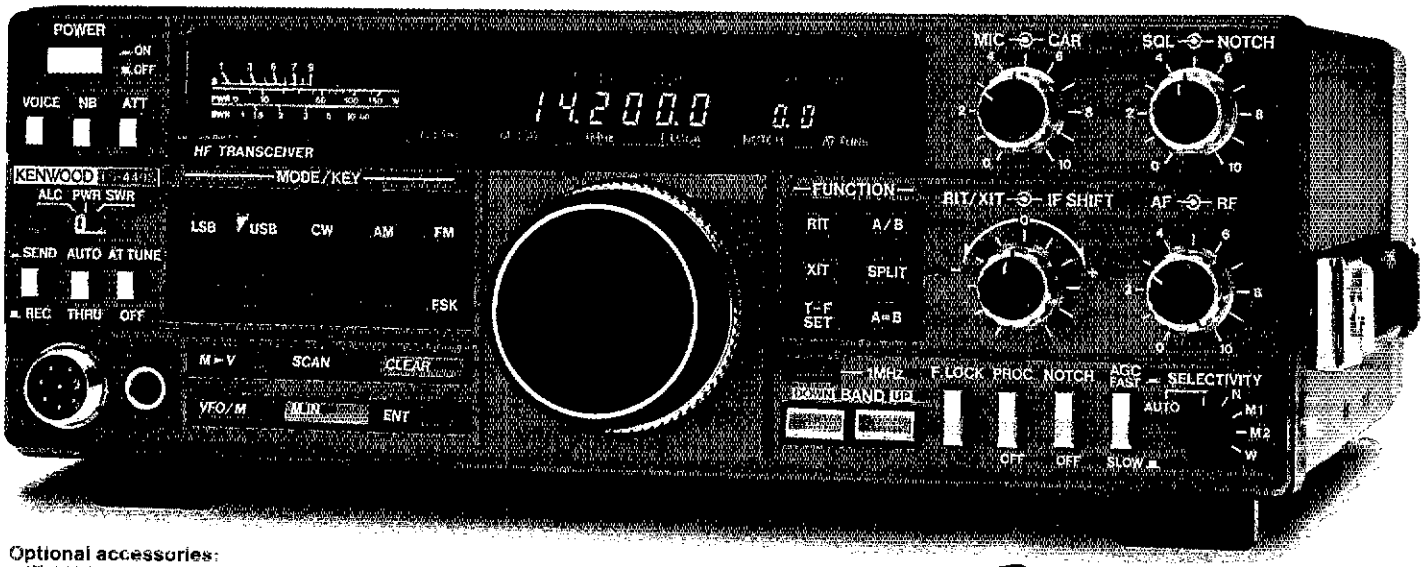
All New Compact HF!

"DX-citing!"

TS-440S Compact high performance HF transceiver with general coverage receiver

Kenwood's advanced digital know-how brings Amateurs world-wide "big-rig" performance in a compact package. We call it "Digital DX-citement"—that special feeling you get every time you turn the power on!

- **Covers All Amateur bands**
  General coverage receiver tunes from 100 kHz—30 MHz. Easily modified for HF MARS operation.
- **Direct keyboard entry of frequency**
- **All modes built-in**
  USB, LSB, CW, AM, FM, and AFSK. Mode selection is verified in Morse Code.
- **VS-1 voice synthesizer (optional)**
- **Superior receiver dynamic range**
  Kenwood DynaMix™ high sensitivity direct mixing system ensures true 102 dB receiver dynamic range. (500 Hz bandwidth on 20 m)
- **100% duty cycle transmitter**
  Super efficient cooling permits continuous key-down for periods exceeding one hour. RF input power is rated at 200 W PEP on SSB, 200 W DC on CW, AFSK, FM, and 110 W DC AM. (The PS-50 power supply is needed for continuous duty.)
- **Built-in automatic antenna tuner (optional).** Covers 80–10 meters.
- **5 IF filter functions**
- **VOX, full or semi break-in CW**
- **Dual SSB IF filtering**
  A built-in SSB filter is standard. When an optional SSB filter (YK-88S or YK-88SN) is installed, **dual** filtering is provided.
- **AMTOR compatible**
- **Adjustable dial torque**
- **100 memory channels**
  Frequency and mode may be stored in 10 groups of 10 channels each. Split frequencies may be stored in 10 channels for repeater operation.
- **TU-8 CTCSS unit (optional)**
- **Superb interference reduction**
  IF shift, tuneable notch filter, noise blanker, all-mode squelch, RF attenuator, RIT/XIT, and optional filters fight QRM.
- **MC-43S UP/DOWN mic. included**
- **Computer interface port**



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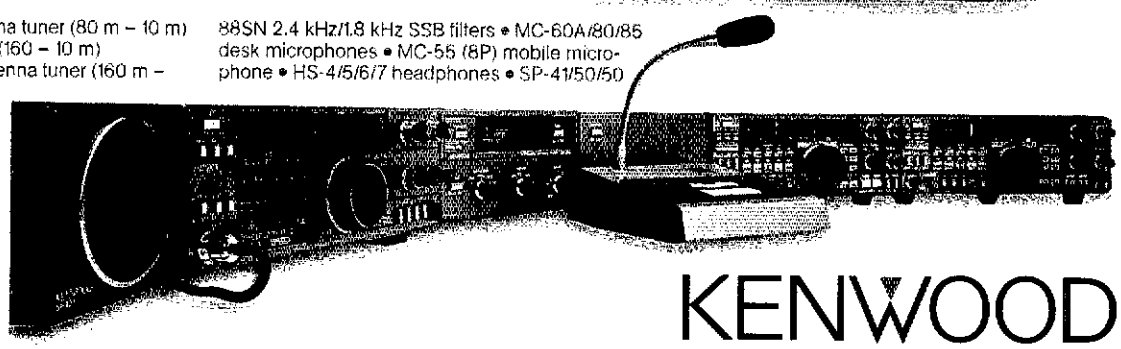
- AT-440 internal auto. antenna tuner (80 m – 10 m)
- AT-250 external auto. tuner (160 – 10 m)
- AT-130 compact mobile antenna tuner (160 m – 10 m)
- IF-232C/IC-10 level translator and modem IC kit
- PS-50 heavy duty power supply
- PS-430/PS-30 DC power supply
- SP-430 external speaker
- MB-430 mobile mounting bracket
- YK-88C/88CN 500 Hz/270 Hz CW filters
- YK-88S-88SN 2.4 kHz/1.8 kHz SSB filters
- MC-60A/80/85 desk microphones
- MC-55 (8P) mobile microphone
- HS-4/5/6/7 headphones
- SP-41/50/50 mobile speakers
- MA-5/VP-1 HF 5 band mobile helical antenna and bumper mount
- TL-922A 2 kw PEP linear amplifier
- SM-220 station monitor (no pan display)
- VS-1 voice synthesizer
- TU-8 CTCSS tone unit
- PG-2C extra DC cable.



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Reports Invited: The ARRL Board of Directors (see list at left) determines the policies of ARRL. The 15 divisions of the League are further arranged into 69 administrative "sections," each headed by an elected Section Manager. Your SM welcomes reports of club and individual activity. ARRL Field Organization appointments are available covering a wide range of Amateur Radio volunteer interests. Whatever your license class, your SM has an appointment available. Check with your SM (below) for further information.

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"It Seems to Us . . ."

A Codeless License: The Time has Come

On July 22, by a vote of nine in favor to six opposed, the ARRL Board of Directors authorized the filing with FCC of a petition for rule making to create a new class of Amateur Radio license. Earning the new license would require passing a written examination somewhat more comprehensive than the present Technician written exam, including some questions relating to Morse code, but without a Morse receiving, sending, or recognition requirement. Accredited Volunteer Examiners would give the exam, and upgrading to Technician similarly would involve taking a 5-WPM code test through the VEC-administered exam system. Privileges would be all amateur frequencies and authorized modes above 220 MHz at a maximum output power of 250 watts. The licensee could not be control operator of a repeater or auxiliary station. Call signs would be assigned from Group D, and thus would be indistinguishable from those now being assigned to new Novice licensees.

Finding the right name for the new license wasn't easy, in part because the names of the present classes of amateur license are not particularly apt. Despite misgivings that it had been tainted by a 1974 FCC proposal to create a sub-Novice license class by that name, the Board settled on "Communicator" as being the most descriptive—though what is now envisioned is entirely different than that earlier FCC concept.

The nine-to-six vote of the Board reflects the controversy that has swirled around this issue for months. Thousands of League members and others let their voices be heard in the debate. The position finally adopted by the Board differs in several respects from that recommended by the special study committee as reported in May *QST*; privileges are somewhat less, but an important step to encourage "mainstreaming" was taken when the Board declined to support distinctive call signs for Communicators.

Why did the Board decide as it did? There is no single answer to that question. There were nine votes in favor of the motion as amended, and there are probably nine different sets of reasons. Neither do all of the six opposing votes reflect unalterable opposition to the concept of a codeless amateur license. And in any case, there are 15 out of 15 Directors who, the decision having been made, support as ARRL policy what has emerged from our representative, democratic process.

If the FCC adopts the ARRL proposal, in the future the point of entry into Amateur Radio for many people will be the Communicator license. But it is not an "entry-level" license in the same sense as the Novice. The written examination will be reflective of the privileges to be earned, requiring a greater commitment than the present Technician written exam. Based on the experiences of dozens of other countries where code-free VHF licenses have been available for some time, there is no reason to believe either that Communicators will not want to upgrade at least to Technician, or that Amateur Radio will become so flooded with codeless licensees that the essence of Amateur Radio as we know and love it will be swept away. In general, the few IARU member-societies who report negative experiences with code-free licenses regard the written exam in their country as too easy, and the license to have been created by the administration (without the support of the amateur community) as a way of appeasing CB-minded individuals. In most of the western European countries, Australia, and New Zealand, the code-free VHF license long ago ceased to be an issue and today is regarded as a natural and integral part of Amateur Radio.

There will be proponents on both sides of the issue who will be disappointed, at least initially, with the League's position as adopted by the Board. To those who might have wanted more in the way of privileges, or an easier exam, we say: Look at the nine-to-six vote. The Board went as far as it could possibly go in accommodating your view, while also accommodating the rest of the Amateur Radio community. To use an analogy from the American political process, the primaries and convention are over; now it's time to unite behind the party's candidate. To those who oppose a codeless amateur license in any form, we say: Your on-the-air operating is not going to be affected in any negative way. Morse code remains a requirement for operating privileges below 220 MHz, and in their studies the new licensees will be exposed to its traditions and advantages in amateur communication.

Addition of a Communicator license further complicates an already-complex licensing structure, a fact the Board took into account by requesting that the League's officers examine the licensing structure as a part of their long-range planning project. But the advantages of adding yet another class of license are seen to far outweigh the disadvantages. At best, adding a Communicator license will bring into our ranks tens of thousands of people who share our interest in radio communication, but who do not immediately recognize the benefits of knowing Morse code. With their entry could come the dawning of a new day for Amateur Radio, a day in which it becomes a part of the social and educational fabric of communities from coast to coast.

The only way a codeless amateur license as envisioned by the ARRL Board, can harm Amateur Radio is if we fail to accept these new licensees as full-fledged hams. That could have happened when the Novice license was introduced in the 1950s, but farsighted amateurs of that time did not permit it—and Amateur Radio is the stronger for their wisdom. Our hope and belief is that we will do at least as well in the 1990s.—*David Sumner, K1ZZ*

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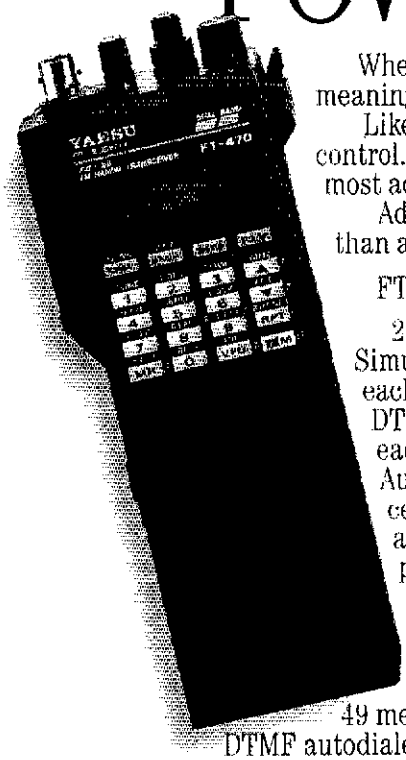

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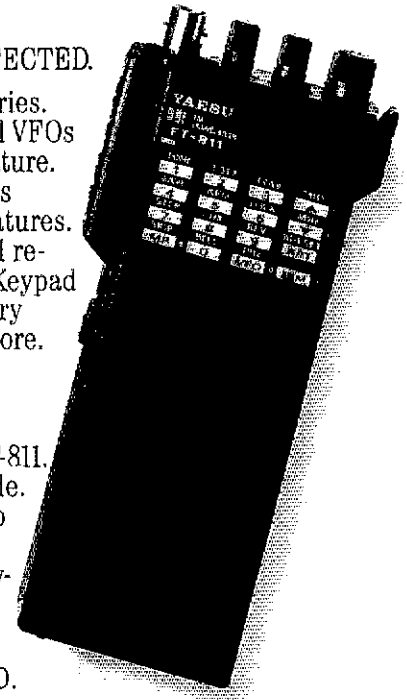

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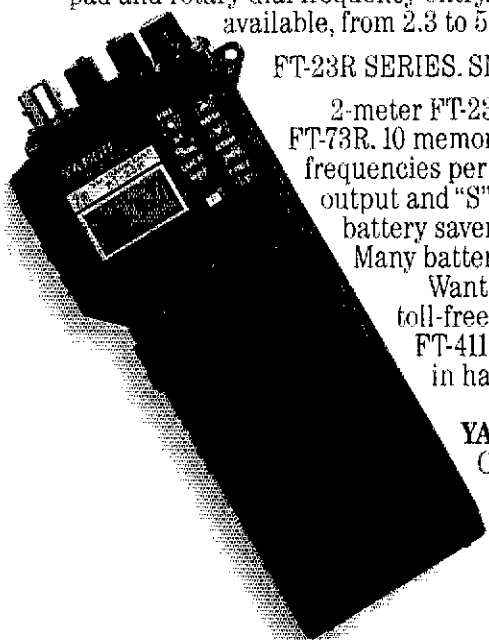

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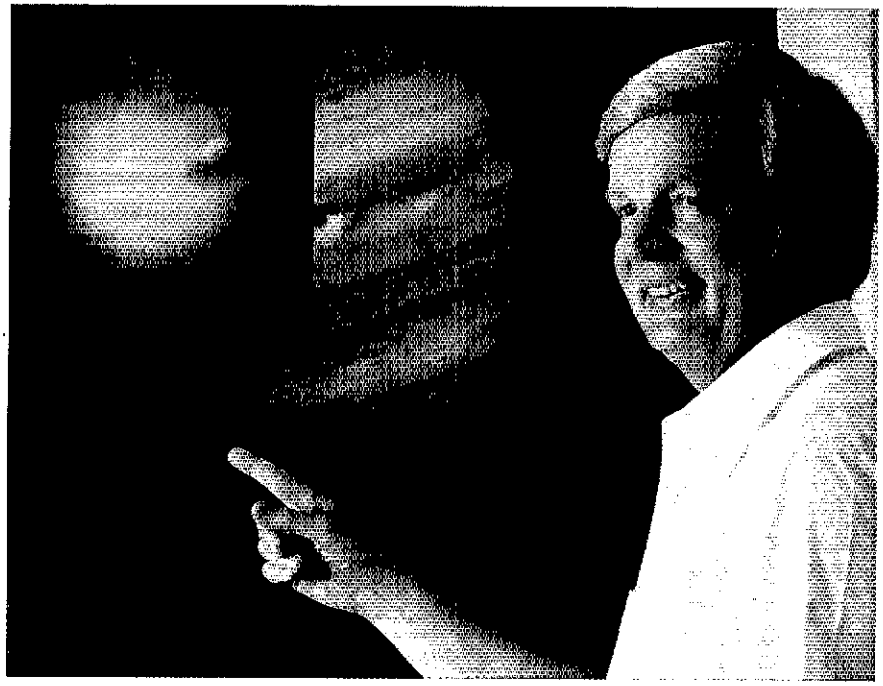
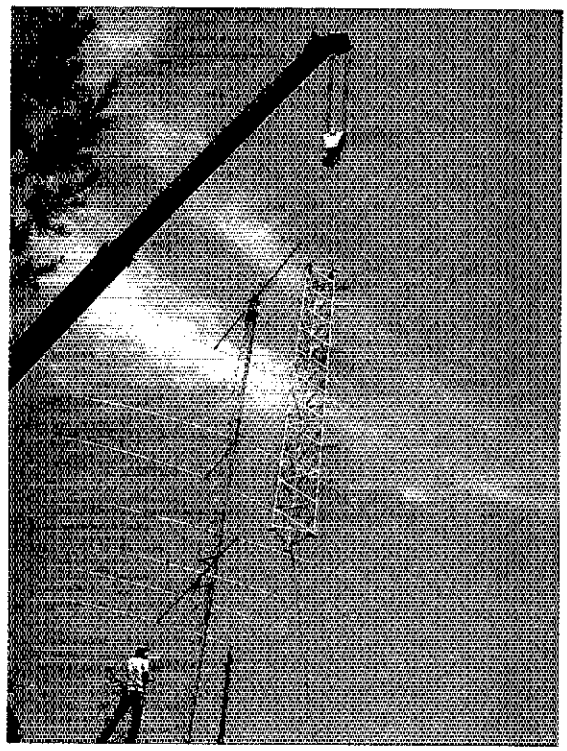


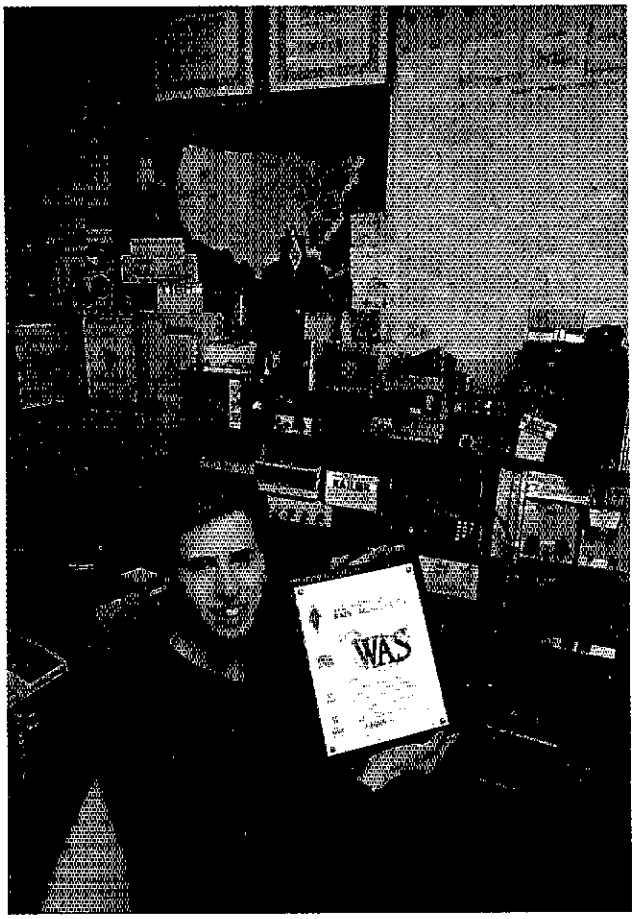
Neptune encounter: The Jet Propulsion Laboratory Amateur Radio Club will operate W6VIO on Aug 19 through Sep 3 to commemorate the *Voyager 2* encounter with Neptune. In the photograph to the left, *Voyager* Neptune Commemorative Chairman George Morris, W6ABW, points to the Great Red Spot on the large image of Jupiter from an earlier flyby. The inset photograph is latest available *Voyager* photograph of Neptune, which shows a dark spot. Motions around this dark spot will be measured as *Voyager* gets closer to see how the dynamics of this feature compare with those of Jupiter's Great Red Spot. George reports the special event will include SSTV transmissions of Neptune as they are received from the spacecraft. For frequencies, modes and best times to contact W6VIO, see the Special Events column in August *QST*, page 82.

Radio rappelling: Dave Ferland, N1GHL, brings his 2-meter hand-held with him on rock-climbing outings. Here, he touches base with other rock-climbing hams just before he heads over the cliff at Pinnacle Rock in Plainville, Connecticut. Dave's interests include CW and restoring antique equipment.

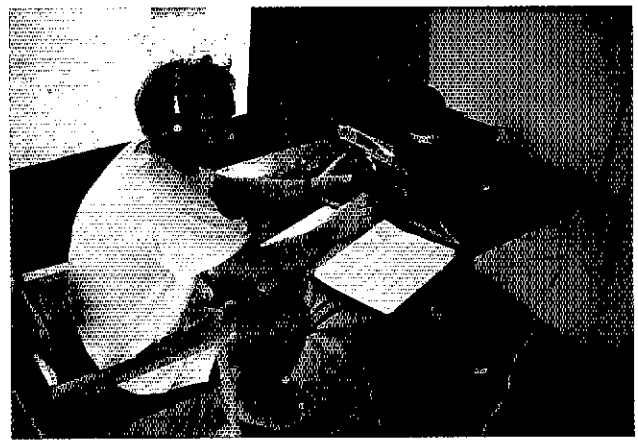


Here it comes: W1AW Station Operator Jeff Bauer, WA1MBK, waits for the crane to place a section of one of three new 60-foot towers installed in June as part of the renovation. See page 17 for the rededication story and photographs of the ceremony, and a future edition of *QST* for a special feature unveiling the new station. *(photo W1XX)*

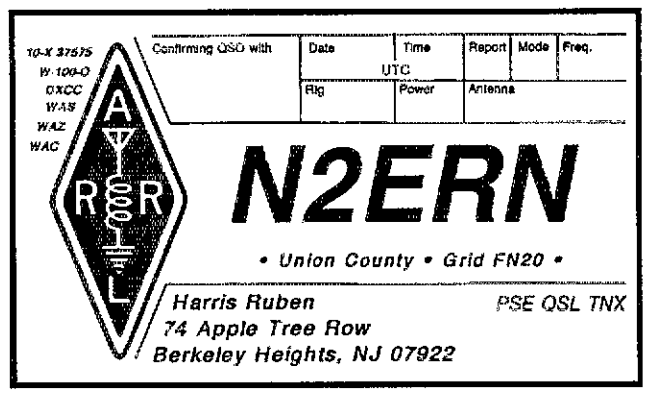
Promises, promises: Hams love to talk. According to John Smetona, K3SLJ (r), of Pottsville, Pennsylvania, sometimes they talk *too* much. He challenged his nephew, Jeff Catchmark, to become an amateur. Never thinking Jeff would take him up on it, John said, "Get a license, and I'll buy you a rig." Jeff, who is an electrical engineering student at Pennsylvania State University, memorized the code and passed the Novice and Technician exams in less than a week. He is now N3HGM, and John followed up on his promise and bought him a 2-meter transceiver. Now Jeff wants to know if his uncle will buy him an HF transceiver when he upgrades to General.



17-meter first: Chris Merchant, KA1LMR, of Concord, New Hampshire, received the first 17-meter Worked All States on March 1. Chris worked all 50 in two days, confirming them in less than three weeks. Chris's other activities include public service, EME, satellites, microwave, VE testing, DXing and contesting.



South Pacific: Joe Adams, VE3CPU (top), operates from Willis Island during a January 1989 DXpedition that also included a stay at Mellish Reef. The group netted over 45,000 contacts and included operators VE3IEO, KD2HE, JR1RCQ, ZF2KN, KJ9I and QSL Manager NM2L. (Bottom) These boobies are quick to let the DX trespassers know what they think, as they parade before the Mellish Reef operating site and antenna farm. *(photos KD2HE)*



Membership QSL: The winner in the ARRL member QSL card contest is Harris Ruben, N2ERN, who came up with this handsome design. The usual variables—call sign, name and address, and awards earned—can be added. The League doesn't print cards or take orders; the specifications and artwork have been made available to QSL printers. Inquiries can be directed to printers in *QST* Ham Ads. Congratulations to N2ERN! His prize? A free supply of QSL cards, of course!

League Lines

The House Energy and Commerce Committee is proposing a budget reconciliation package that includes ***increases in FCC "cost of regulation"*** fees implemented by Congress four years ago; at the time of their implementation, Amateur Radio was exempt. It now appears that the exemption may be in jeopardy. The package was marked up and approved by the Committee on July 13 and proposes an application fee of $30 for each of the following actions involving amateur licenses or permits: new license, modification of license, renewal of license, reciprocal permit, or renewal or modification of a club, RACES or military-recreation license.

The ARRL Board adopted a policy opposing any fees for amateur station and operator licenses that exceed either the actual cost of administration or the fees charged for any other licenses for nonprofit purposes. If enacted, the fees collected will go to the US Treasury, not to the FCC. The League will use all available resources in the fight against any unreasonable fees. See Minute 83 of Moved and Seconded in this issue.

The ARRL Board of Directors endorses a codeless license on 220 MHz and up. After extensive discussion by the ARRL Board of Directors at their second 1989 meeting, it was agreed, by a vote of nine in favor to six opposed, that a proposal recommending a codeless class of amateur license will be presented to the FCC in the form of a petition for rule making. See Minute 39 of Moved and Seconded for more details.

The ARRL Board has enacted measures to ***enhance the public perception of Amateur Radio.*** ARRL President Price will appoint a committee to study the implementation of a nationwide Amateur Radio course in elementary, junior high and high schools and to meet with national leadership organizations of teachers. The League will also be working with the American Association of Retired Persons (AARP) to bring a heightened awareness of Amateur Radio to senior citizens. More information on Board actions can be found starting on page 51 of this issue.

In July, Volunteer Examiner Coordinators (VECs) met at their fifth annual conference. Of major discussion were updates to all of the Amateur Radio public domain question pools. The VEC Question Pool Committee (QPC) has established a schedule for conducting the necessary updates to incorporate the new Part 97 rules and regulations into the question pools. See the Happenings column for more information.

Legislation has been introduced into the US House of Representatives under which ***the government must give back 200 MHz of spectrum for private use*** to encourage new technologies. The Dingell Bill, HR 2965, also precludes the selling of spectrum by auction.

The new ***FCC Rule Book*** will soon be hot off the press! The book not only includes the complete Part 97 rules, but also important interpretations written in the style of the popular Washington Mailbox column. You'll need to keep a copy of these new rules close at hand to keep abreast of the most sweeping changes in the Amateur Radio rules in decades. The cost of the expanded 8th edition is $9 plus postage and handling.

Although it has not yet been confirmed, KH6HME seems to have broken the existing ***world terrestrial distance records for 2 meters, 432 MHz, 220 MHz and 1296 MHz*** on July 13-15. Contacts were made between KH6HME on Mauna Loa, Hawaii (grid square BK29), and XE2GXQ on the Baja Peninsula in El Rosarito, Mexico (grid square DL28 and 29).

ARRL/VEC celebrated its fifth anniversary on July 21, 1989. VEC Department Manager Bart Jahnke, KB9NM, said that the ARRL/VEC has processed 9600 Volunteer Exam (VE) sessions. Averaging between 180 and 220 sessions per month, they expect to hit the 10,000 session mark before the end of October.

The next ***ARRL HQ open house*** will be held Saturday, November 4 from 10 AM to 4 PM. Come and tour HQ and the newly renovated W1AW.

Teaching a class this fall and you want to borrow a videotape such as "The New World of Amateur Radio"? ARRL HQ has an extensive library of ***Amateur Radio videotapes.*** Contact the Educational Activities Branch at ARRL HQ for a list and application form.

Job opening at HQ. Resumes are requested from applicants for the ARRL HQ position of ***Advertising Manager.*** Proven sales ability, knowledge of Amateur Radio industry and products, managerial experience, and ability to travel are required. Base starting salary $26,156 to $31,382. Qualified applicants should apply to Publications Manager Paul Rinaldo, W4RI, at HQ.

Squelch Tails from China's Great Wall

Boeing Employees Amateur Radio Society collaborates in putting China's first repeater on the air.

By C. P. "Pat" West, W7EA
29825 8th Place South
Federal Way, WA 98003

The BEARS communicate with the USA for the first time from China's Great Wall. (l-r) Bob Hudson, K7LAY; Miss Lou, Chinese interpreter; Dick Mehnert, WØKPK; Pat West, W7EA; Zhou Mengqi, CIE; Ning Yun-he, CARA; Mike Norin, NS7O; Bill Showers, KC7CF.

In September 1988, seven radio amateurs from Washington State stood at the Great Wall of China and spoke to friends back home in the US by Amateur Radio. We accomplished this by using China's first VHF/UHF repeater station, in an event witnessed by Chinese citizens, military personnel, newspaper people, magazine photographers, writers and the Chinese National Television cameras.

This was the first known Amateur Radio activity from the Great Wall.

To understand how we, and the Chinese, arrived at this memorable point, we must travel nine years back in time.

In 1980, I joined an Institute of Electrical and Electronic's Engineers (IEEE) Computer Society Technical Exchange to the People's Republic of China. During this visit, I made a pitch for Amateur Radio, resulting in an invitation for four people to travel to China in September 1981 to discuss Amateur Radio.

At first we were told not to bring any radio equipment, but a month before our departure that restriction was lifted. The R. L. Drake Company provided two TR-7 transceivers and Hy-Gain donated two "tape dipoles."

Bob Hudson, K7LAY, was the group's chief radio operator, assigned to training the Chinese in use of the equipment. His students were former hams who had not been on the air for several decades, along with some raw recruits.

Bill Showers, KC7CF, made presentations on Amateur Radio techniques and international regulations, while Henry Oman, K7HO, acquainted government officials and the radio trainees with newer communications techniques for Amateur Radio, such as RTTY and satellite work.

I later described our 1981 visit[1] as a "whirlwind of meetings, presentations, tours, and banquets, mixed in with informal hamfests." For most of the old-time Chinese hams, it was their first contact with the outside world of Amateur Radio since the 1940s.

On-the-air operation was limited to two demonstration contacts, the first, on September 9, 1981, with the late Bill Bennett, W7PHO, of the WWDXC. The second demonstration contact was between CIE (the call sign in Beijing) and K7LAY/BY, operating the other TR-7 and dipole station in Shanghai.

Both these demonstration contacts were tape recorded by the vigilant Chinese authorities.

While two (admittedly) contrived QSOs may at first seem insignificant, it is nearly impossible to overestimate their importance. This was the first Amateur Radio activity from the PRC since the 1950s, and complemented efforts by a number of other people (notably Thomas Wong, VE7BC) to visit China, bringing in books and publications, radio equipment and expertise to assist the Chinese.

It also opened the door in the years that followed for an entire generation of DXers to work BY for a new one.

A Return Engagement

Seven years later we are on the Great Wall of China with VHF hand-held transceivers, engulfed by the military, media representatives, curious onlookers, and TV cameras.

We are about to use the one hour allotted to us to work, by VHF link to Beijing, our friends in the US and Canada.

This milestone in the development of Amateur Radio in the People's Republic of China came about when our 10-member delegation from the Boeing Employees Amateur Radio Society (BEARS) visited China the second week of September 1988. The BEARS, one of the more active special interest clubs at Boeing and an ARRL affiliated club, were guests of the Chinese Institute of Electronics (CIE) and the China Radio Sport Association (CRSA).

The invitation came to the BEARS from Dr Sun Junren, President of the CIE. Other important officials we met during the visit were Zhou Mengqi, Secretary for International Affairs, CIE; Ning Yun-he, Executive Director, China Association for Radio Amateurs; Wang Xun, Deputy Secretary General, CRSA; and Tong Xiao-zong, Director, CRSA, and Station Master of BY1PK.

[1] C.P. West, "For China, Amateur Radio Is On The Way Back," *CQ*, Aug 1982, pp 58-62.

Chinese students use layout boards and schematics to build circuits during an electronics competition (left). Another competition (right) in timed television repair is reminiscent of General Motors' auto repair contests for American high school students. *(K7LAY photos)*

Our mission was to participate in China's first electronic conference and exhibition, called "The Week for the Promotion of Electronic Science and Technology," held in Beijing September 8 to 14. The conference took a year to plan and included radio amateurs, electronics designers and technicians, university professors and students, and government personnel from throughout China.

The BEARS sent information on the Evergreen Intertie (a multistate system of linked repeaters) to see if there was any interest in repeaters in China.

The Chinese authorities requested a presentation on repeater theory and operation, including information on how to link repeaters. The BEARS opted for a live demonstration, an idea embraced by Boeing, ICOM, Telewave, Sinclair, Yaesu, AEA and the Chinese.

BEARS president Dick Mehnert, WØKPK, led the expedition, along with his wife. Other members were Hal Todd, W7ZXM, Bill Showers, KC7CF, Pat West, W7EA, Russ Kroeker, N7HGE, Bob Hudson, K7LAY, and Mike Norin, NS7O. Showers' and Hudsons' wives also made the journey. The BEARS were the only American group to participate in this first all-China electronic conference and exhibition.

First we toured the usual tourist sites—the Forbidden City, the Summer Palace, the Ming Tombs and various zoos for which China is famous. Delegation leader WØKPK served as our spokesman at ceremonies and banquets, and we witnessed several competitions, where champion electronics technical personnel and students competed in constructing electronic circuits and repairing television sets.

Five Beijing Amateur Radio stations were visited: BY1PK, the master CRSA station in China; BY1QH, at Tsinghua University; BY1SK, Xuan Wu Childrens' Science and Technology Hall; BY1BH, Childrens' Palace; and the newest station, BY1BJ, where we participated in the opening celebration.

We were privileged to operate several of the stations. Beijing now has six club stations; BY1CKJ, the newest, was off the air during our visit while its building underwent remodeling. China now has some 28 Amateur Radio stations; 100 were planned by the end of 1989; 500 by the end of 1990.

The Preparations

For more than three months prior to our 1988 visit, a team headed by Russ Kroeker, N7HGE, designed and built a UHF/VHF repeater station. The team included other Boeing engineers and technicians, as well as specialists from other companies in the Seattle area. It is estimated that over 400 man hours were required for construction of the repeater. The air shipment to China weighed 848 pounds.

Three members of the 1981 BEARS delegation to China pose with friends at the new repeater: (l-r) Bill Showers, KC7CF; Ning Yun-he, Executive Director, China Association for Radio Amateurs; Bob Hudson, K7LAY; the author, Pat West, W7EA; and Zhou Mengqi, Secretary for International Activities, China Institute of Electronics. *(W7EA photo)*

During the final installation of the 2-meter antenna on the roof, I got an urge to operate BY1PK on HF. I asked Meng Chao, operator at BY4WNG in Nanjing and a visiting operator trainee at BY1PK, if it was okay to point the beam at the United States and to operate the station.

"No problem," said Meng. (The equipment is connected to the antenna system at the other end of the building).

We rotated the beam, and immediately afterward Meng rushed into the room. "I made a mistake," he shouted. "You just gave Bo a joy ride on the beam!"

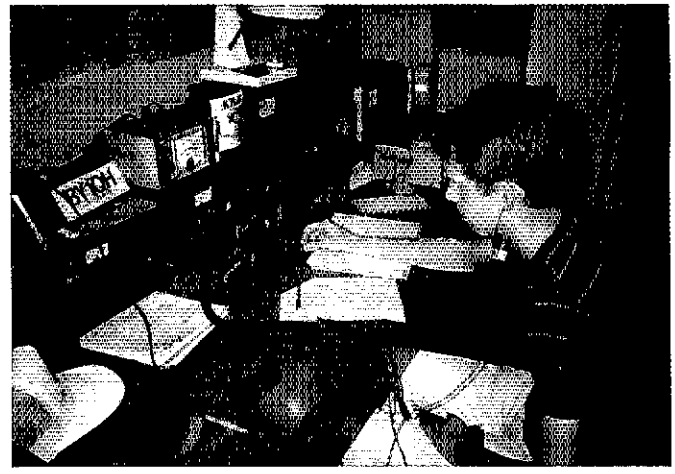
Bo, Chief Operator at BY1QH, was putting the finishing touches on the 2-meter repeater antenna and was sitting on the HF Yagi antenna. Fortunately, he was not injured by this visit from Murphy, who does not recognize international boundaries.

A phone-patch telephone set up by the Chinese completed the connection between the new repeater in Beijing and the Evergreen Intertie in the US. Arrangements were made for the circuit to be activated for one hour, starting at 10 AM China time on Saturday, September 10. In the US, this was 6 PM the previous day.

This is The Great Wall Calling

We were late in getting started to the Great Wall, as the van was half an hour late leaving our hotel, due to the heavy Beijing traffic. Traffic in our home city of Seattle, even during rush hours, pales in comparison to traffic just about any time in Beijing. Enroute to the Great Wall, our driver was halted by the police

Visitors line up for the BT1DZZ Amateur Radio exhibit at "The Week for the Promotion of Electronic Science and Technology" in Beijing. *(K7LAY photo)*



Mike Norin, NS7O, the youngest member of the BEARS delegation and then a high school senior, operates BY1QH at Tsinghua University. *(W7EA photo)*

for driving in the bicycle lane, but we reached the Great Wall in time to meet the one-hour radio window.

We proceeded to make crystal clear voice contacts from the Great Wall, using hand-held radios linked by the new repeater at the BY1PK HF station, with Evergreen Intertie users in British Columbia, Washington State, Idaho and Oregon. Some of the American operators even worked China from their mobile stations. The distance from our spot on the Great Wall to the Beijing repeater was approximately 50 kilometers; full quieting was achieved with 100 mW.

The BEARS and their Chinese friends were successful: We had installed and operated the first Amateur Radio repeater in China!

Chinese national television coverage at this Great Wall event resulted in an all-China broadcast, the first week in October, during a China national holiday.

Postscript

After the Beijing conference Bill Showers, Bob Hudson, and their wives visited Amateur Radio friends in Shanghai, those who had set up the TR-7 station in 1981. The Drake transceiver and associated equipment still is in service at BY4AOM.

Showers and Hudson also operated four other Shanghai amateur stations: BY4AA, BY4AY, BY4AJT, and BY4ALC. The average age at club station BY4ALC (All Little Companions) is 14 years.

The Chinese appear to sincerely appreciate the efforts of those from the West who have helped them reenter Amateur Radio. They recognize the role Amateur Radio can play in making friends for them around the world, and the obvious connection with sorely needed technical development. In that regard, China had planned to begin licensing individual amateurs sometime this year.

The BEARS were very impressed with the rapid progress China has made since 1981 in improving their technology, particularly by the young radio operators and technicians, who were extremely proficient. And, not inconsequently, we made many friends in China.

Editor's note: I shared the BEARS' optimism for China upon first reading this story last May. Now, that optimism is tempered by the events of late May and early June in Tiananmen Square. In consulting with the author, there was never any doubt that the spin of his story would remain the same—the enthusiasm of young Chinese for Amateur Radio. Just how the changing political situation affects Amateur Radio in China remains to be seen. As of mid-July, it still seems to be business as usual, with reports of BY stations on the air and making QSOs.—*James D. Cain, K1TN*

Strays

The Blossomland Amateur Radio Club of southwestern Michigan sure knows how to get the media's attention. First, the club's Field Day Media Chairman, Lee Lull, WR8R, wrote to Michigan Governor James J. Blanchard and asked him to declare the week of June 19-25 as Amateur Radio Week. Once that was in hand, reporters were informed. Next, state and local politicians were invited to the Field Day site. Club members were featured on radio, TV and newspaper, and two radio stations ran Amateur Radio public-service announcements. While the BARC confesses they may not have won Field Day on points, they certainly scored big on Amateur Radio publicity. Here, at the club's phone position, is a WNDU videographer taking shots of (l-r) WB8TSO and KC8IV. *(photo G6JEL)*

W1AW—Rededicated

By John C. Hennessee, KJ4KB
ARRL HQ

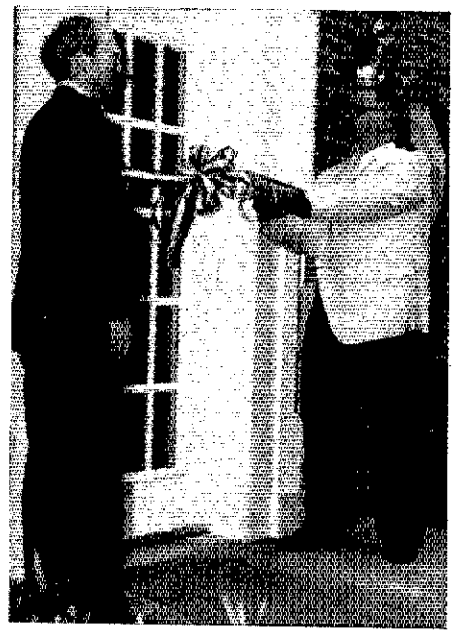
More than 200 people gathered at the corner of Main Street and Starr Avenue in Newington to witness the unveiling of the renovated W1AW on July 20. Under a huge canopy, the crowd listened to Amateur Radio and local dignitaries extol the virtues of the famous little brick building and the services it provides.

1987 ARRL International Humanitarian, the Rev Michael F. Mullen, CM, WB2GQW, gave the invocation. ARRL President Larry E. Price, W4RA, presided over the event and opened with welcoming comments. Steven Bafundo, President of the Newington Chamber of Commerce, said that W1AW was a Newington landmark, and the people of Newington are proud the town is known throughout the Amateur Radio world.

Bobby Baines, American Red Cross External Relations Manager, commended the ARRL for years of service with the American Red Cross (ARC). Former ARRL staffer Michael Riley, KX1B, now employed by the Red Cross, read a letter from ARC Chairman George F. Moody. The letter stated, "ARRL and the American Red Cross have a long, proud tradition of cooperation as noted by our Memorandum of Understanding. Volunteer Amateur Radio operators have repeatedly assisted the Red Cross by providing essential communications."

On behalf of Amateur Radio old timers, ARRL retired Communications Manager George Hart, W1NJM, spoke of the history of the station: "For this dedication, and the one preceding it over 50 years ago, the dedication of individuals who have made it possible is all around us, among you in the audience and in the memories of those who are no longer with us except in spirit. Our new, refurbished, modernized W1AW is presented in the memory of our founder and first president, Hiram Percy Maxim, as was the then modern W1AW in 1938. Mr Maxim was truly the father of organized Amateur Radio—the George Washington of Amateur Radio..." Hart also recognized the contributions of F. E. Handy, W1BDI. Handy was instrumental in the establishment of the first official headquarters station, 1MK (later W1MK), at Brainard Field in Hartford, and later at the Newington station. He added, "Nobody who remembers Ed... will deny that he was perhaps the most loyal, dedicated,

(continued on page 61)



The Rev Michael F. Mullen, CM, WB2GQW (r) gave the invocation. *(photos KC1MP)*

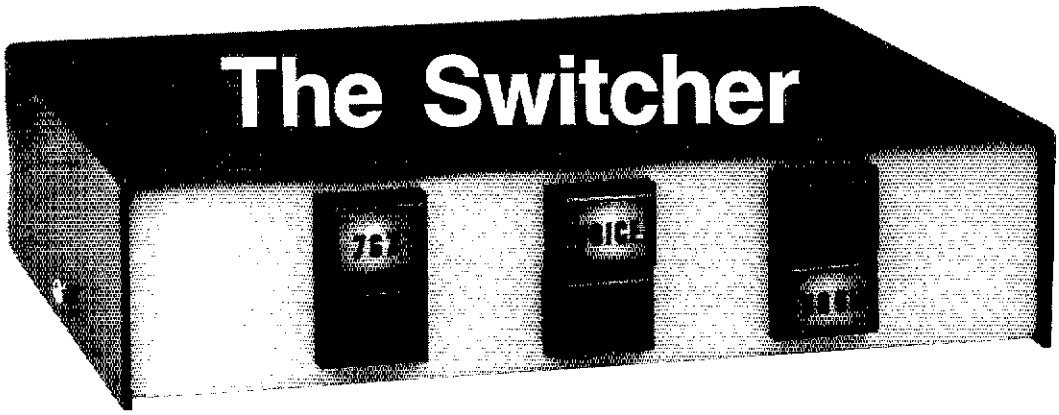
ARRL President Price, W4RA (r), with EVP Sumner, K1ZZ cuts the ribbon, officially opening the station for tours.

American Red Cross External Relations Manager Bobby Baines (r) commended the League's years of service with the Red Cross.

Yes! I Want to Support the W1AW Renovation

The amateur community has been most generous in meeting the W1AW fund drive goal. But it's not too late to help put the finishing touches on this showcase station of which every ARRL member can be proud. If you have not donated as yet, or wish to increase an earlier donation, please consider the **W1AW Renovation Fund**, 225 Main Street, Newington, CT 06111. All gifts will be gratefully acknowledged with a handsome certificate. Thank you!

The Switcher



This versatile station accessory makes switching rigs, mikes and modes as simple as pushing a button!

By Raymond P. Bintliff, K1YDG
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Acton, MA 01720

Getting new ham equipment is fun, but additional gear usually makes for a more complicated shack. If you acquire a boom mike/headset for contesting or DXing, for example, but prefer to use your desk mike for less-intense activities, changing mikes can be a nuisance. *Frequent* mike changes may even wear or damage your transceiver's mike connector! Adding a second MF/HF transceiver adds further complications, such as different mike-connector pinouts, and the need to move your headset from one rig to the other. And then there's digital operation: Adding RTTY or packet radio can *really* increase the complexity of a station!

This article describes the Switcher, an accessory that can centralize and simplify interconnection and selection of a variety of station equipment. Although I designed the Switcher for my particular collection of gear, you can adapt its circuit to your needs.

What the Switcher Switches

As described here, the Switcher allows quick selection between (1) two transceivers (in my station, a Yaesu FT-767GX and a Kenwood TS-940S); (2) voice or digital operation; and (3) a desk microphone and separate headset or a boom mike/headset. Fig 1 shows this switching in simplified form, and the title photo shows the Switcher's front-panel layout.

Illuminated, push-button switches select the Switcher's functions. Pressing 767, for instance, selects the FT-767GX mike and PTT inputs and headphone output; pressing 940 selects the TS-940S. Assuming that the FT-767GX has been selected, pressing the VOICE or DIGI switches connects the '767GX's mike and PTT inputs to the Switcher's mike-selection circuitry (VOICE) or to the station TNC (DIGI). Selecting the Voice mode allows the further selection of desk and boom mikes by means of DESK and BOOM buttons. These buttons also direct the transceiver's headphone output to the appropriate headset—a pair of headphones in the Desk mode, and the boom-mike headset in the Boom mode. As configured for my station, the Switcher's default modes are 767, Voice and Desk.

Relays handle the Switcher's audio and control-line switching; the front-panel push buttons control the relays.[1] Figs 2 and 3 show the complete schematic of the Switcher. Switching between the 767 and 940 modes is accomplished by K1, K2 and K3. The inactive transceiver's mike, ground and PTT lines are disconnected from the Switcher to prevent accidental operation of the inactive transceiver if its mike PTT switch is pressed. K1 and K2 switch the audio-in and PTT lines; K3 switches the audio-out line.

K4 and K5 handle switching between the Voice and Digital modes. Because the TS-940S supports direct frequency-shift keying (FSK), my version of the Switcher does not perform voice/digital switching of the TS-940S mike line. Instead, my TS-940's FSK input is connected directly to the TNC's FSK output. Voice/digital mike-line switching is necessary with the FT-767GX, however, because *audio* frequency-shift-keying (AFSK) must be applied to the '767 for digital operation. For digital operation with the FT-767GX, then, the Switcher (1) disconnects the Switcher's mike line from the '767GX and (2) connects the TNC's audio output to the FT-767GX's mike input. The TNC-audio-output line floats in all other Switcher modes.

To better isolate the Switcher's voice/digital switching, the TNC-Switcher ground connection is opened in the Voice mode. Also in the Voice mode, the TNC-audio input is grounded and the TNC-to-Switcher PTT line is opened. K6 and K7 switch between desk and boom mikes.

In addition to the audio and control-line switching described above, the Switcher lights the push buttons of selected functions and dims or extinguishes those associated with unselected functions. For example, selecting the Switcher's Voice mode fully lights the VOICE lamp and dims the DIGI lamp.[2] In the Digital mode, the DESK and BOOM lamps are turned off.

The Switcher requires 12-V-dc, floating-

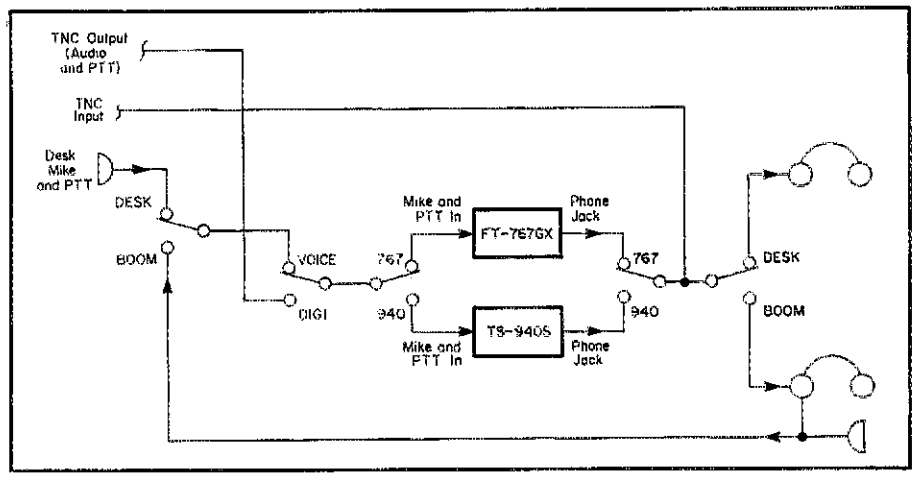


Fig 1—In its basic form, the Switcher allows push-button selection between (1) two transceivers; (2) voice or digital operation and (3) a desk microphone and separate headset or a boom mike/headset. Relays handle the actual switching of audio and control lines; see text.

[1]Notes appear on p 21.

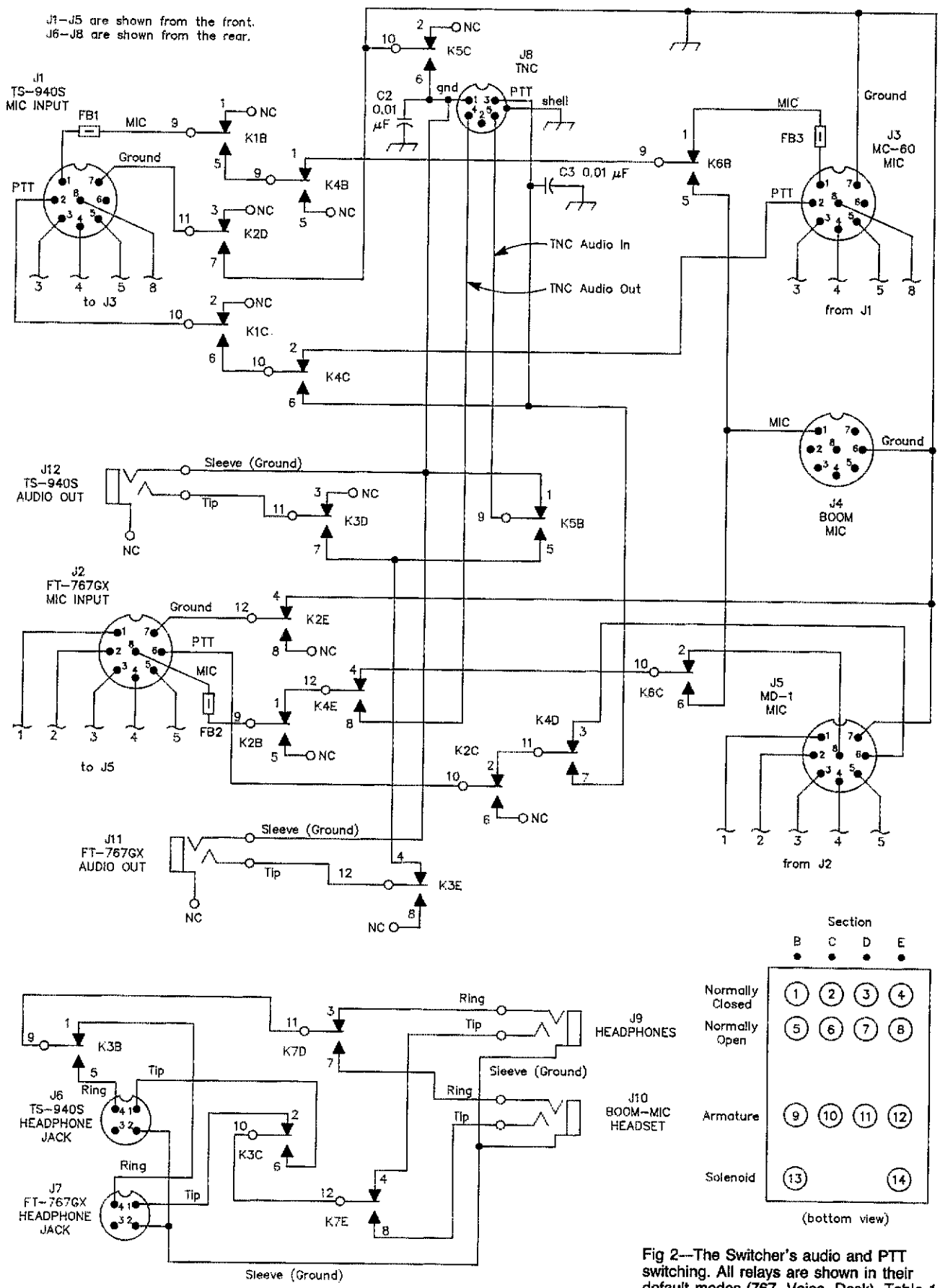


Fig 2—The Switcher's audio and PTT switching. All relays are shown in their default modes (767, Voice, Desk). Table 1 lists the parts used in this circuit.

negative power. (A grounded power supply introduces hum into the switched audio circuits and should not be used.) The maximum current drain, 650 mA, occurs when the Switcher is in the 940, Voice and Boom modes.

Constructing the Switcher

Radio Shack® carries all Switcher components except FB1-3 and the eight-pin, chassis-mount, male mike jacks (J1-J5).[3] I built my Switcher into a Ten-Tec TG 28 aluminum cabinet (approximately 2 × 8.25 × 6 inches [HWD] in size). Figs 4 and 5 show the Switcher's connector layout and internal wiring. I mounted K1 through K7 directly to the cabinet with double-stick foam tape. The sidebar, "Modifying the Push-Button Switches for Momentary Operation," tells how to modify the push-on, push-on switches (S1-S6) for use in the Switcher.

To avoid ground loops,[4] I insulated all connector ground lines (except for those of mike connectors J3, J4 and J5) from the Switcher chassis. I insulated J9 and J10 from the chassis with nonconductive (fiber) shoulder washers, and used four-pin connectors at J6 and J7 to keep the transceiver-headphone-output commons separate from the Switcher chassis. (You can use phone jacks at J6 and J7 if you insulate them from the chassis with nonconductive shoulder washers.)

Ground the bus that connects pin 7 of J3, pin 6 of J4 and pin 7 of J5 to the Switcher chassis at one point only. (J8's ground terminal is a convenient point for this.) Be sure that the positive *and* negative sides of the Switcher's 12-V dc supply float above ground outside the Switcher, and that the supply negative connects to the Switcher chassis *only* at the common ground point described above. Hum or feedback

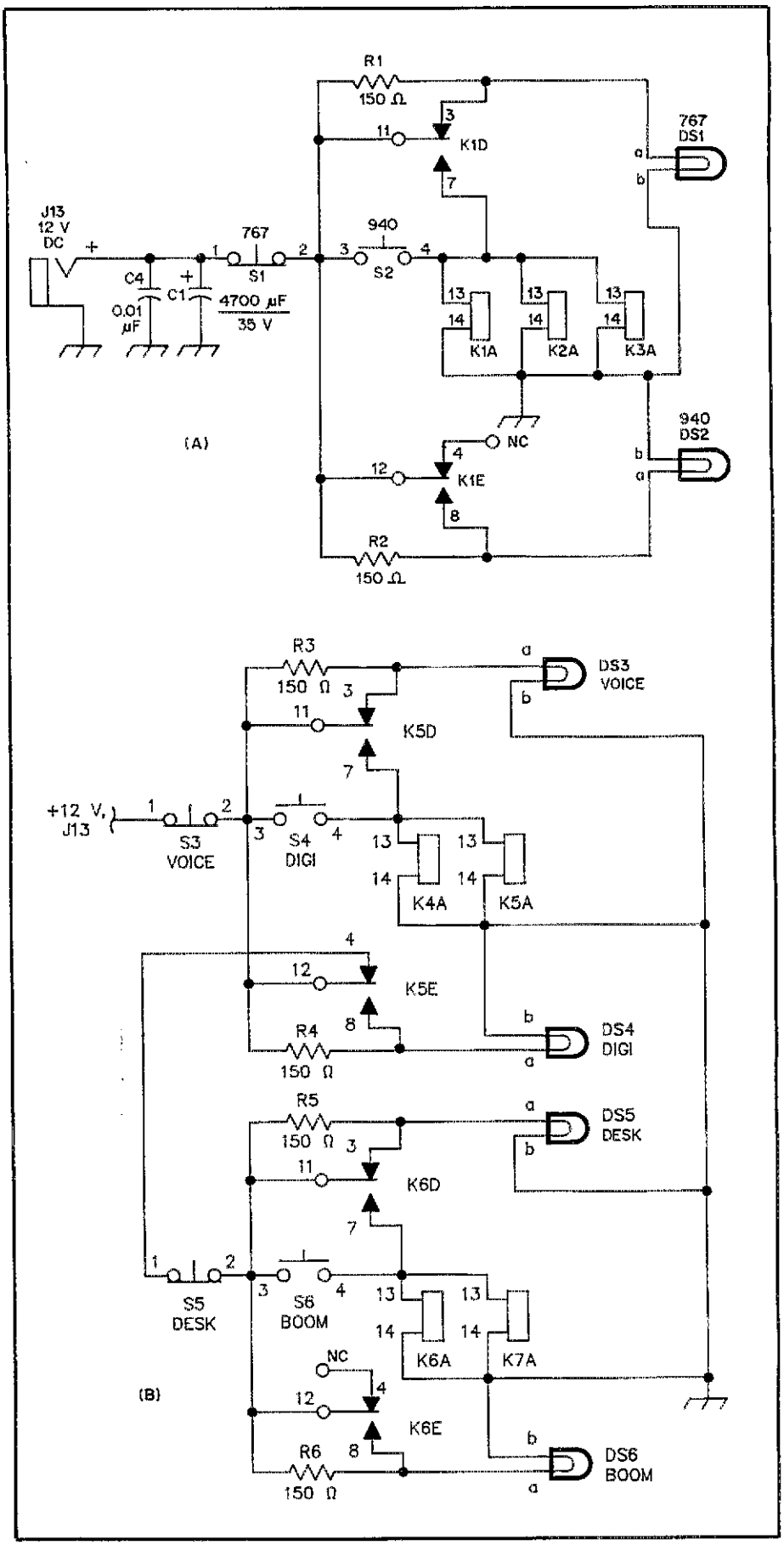


Fig 3—At A, relay and lamp switching for the Switcher's 767 and 940 modes; at B, relay and lamp switching for the Voice, Digital, Desk and Boom modes. Table 1 lists the parts used in these circuits; the inset in the lower right-hand corner of Fig 2 shows the relays' pinout.

Table 1

Switcher Parts List

C1—4700-μF, 35-V electrolytic (RS 272-1022).
C2-C4—0.01-μF, 500-V disc ceramic (RS 272-131).
FB1-3—FB73-101 (Amidon, RADIOKIT) or FB-7-73 (Palomar) ferrite bead.
K1-K7—4PDT, 12-V dc relay (RS 275-214).
J1-J5—Eight-pin male mike jack, chassis mount (see text and Note 3).
J6, J7—Four-pin male mike jack, chassis mount (RS 274-002).
J8—Five-pin female DIN connector, chassis mount (RS 274-005).
J9, J10—Three-conductor, open-circuit, ¼-inch phone jack (RS 274-312).
J11, J12—Three-conductor, open-circuit, 1/8-inch phone jack (RS 274-249).
J13—Dc power connector (RS 274-1565).
S1-S6—Illuminated push-on, push-off SPDT NO/NC switch (RS 275-678), modified for momentary operation as described in the sidebar, "Modifying the Push-Button Switches for Momentary Operation."
R1-R6—150-Ω, ¼-W, carbon-film resistor (RS 271-1312).

Modifying the Push-Button Switches for Momentary Operation

The Switcher uses push-on, push-off switches (S1 through S6) that must be modified for momentary action. The modification procedure is as follows:

1. Set the switch to its "out" position.
2. Remove the switch's red lens and white-plastic light diffuser.
3. Using a small screwdriver, pry out and remove the rectangular, white-plastic lamp holder from the black-plastic shell. (Be careful not to bend the two silver coil springs. These springs provide the electrical connection between the lamp assembly and the base of the switch assembly.)
4. The black-plastic shell contains a detent spring, one end of which is inserted in a small brass eyelet located on the flat side of the shell. Remove and discard the spring.
5. Remove the self-adhesive label from the black-plastic shell. Retain the label so you can replace it later. (The three access holes visible with the label removed will be used to guide the coil springs into place during replacement of the white-plastic lamp holder.)
6. Carefully insert the lamp holder into the black-plastic shell. Note that the flat sides of the shell and the lamp holder must be aligned.
7. Guide the coil springs over the plastic pins in the base of the shell, taking care not to bend the springs. When the coil springs are properly engaged, press the lamp holder until it snaps in place.
8. Test for correct lamp operation by applying 12 V dc to solder lugs a and b. If the lamp tests good, replace the label you removed in Step 5.
9. Replace the switch's white-plastic light diffuser and colored lens. (Two lenses, one red and one green, are furnished with the switch. Use the color of your choice.) When replacing the light diffuser, be sure to correctly position its indexing tab in the lamp holder. Once you've done this, you've successfully converted a push-on, push-off switch to momentary operation.

I elected to use the illuminated switches specified in the parts list because their white-plastic light diffusers can be marked to identify the switches' functions. Dry-transfer lettering works well for this. (I used C-Thru Graphics' "Futura Demi-Bold 24pt" to label the Switcher shown in the photographs.) Many stationery stores carry dry-transfer lettering in various styles.—*K1YDG*

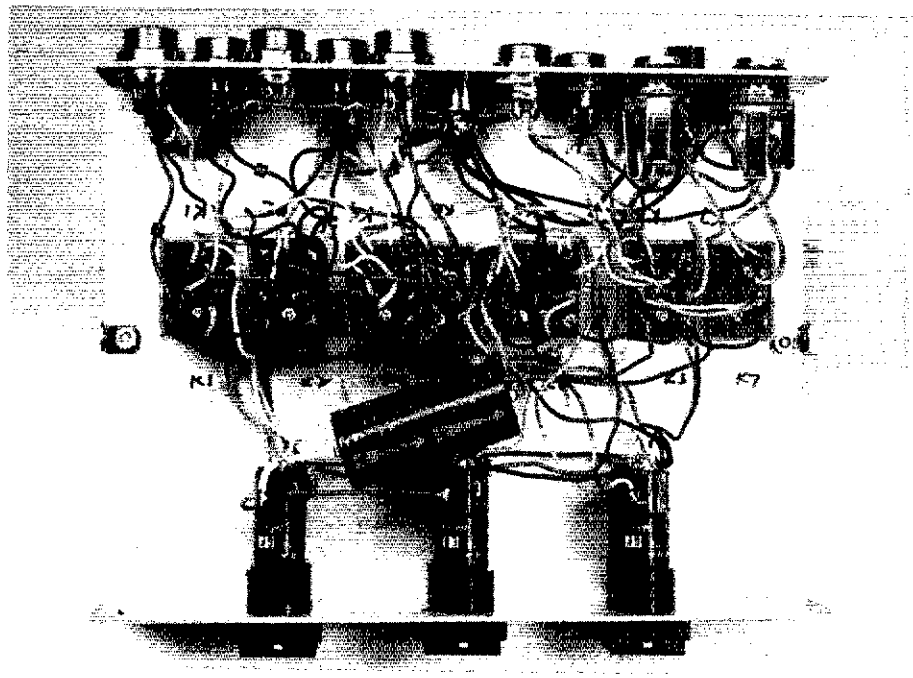


Fig 4—The Switcher's wiring emphasizes short interconnections. From left to right, the relays are K1, K2, K4, K6, K5, K3 and K7. The sidebar, "Modifying the Push-Button Switches for Momentary Operation," tells how to modify and label the Switcher's push buttons.

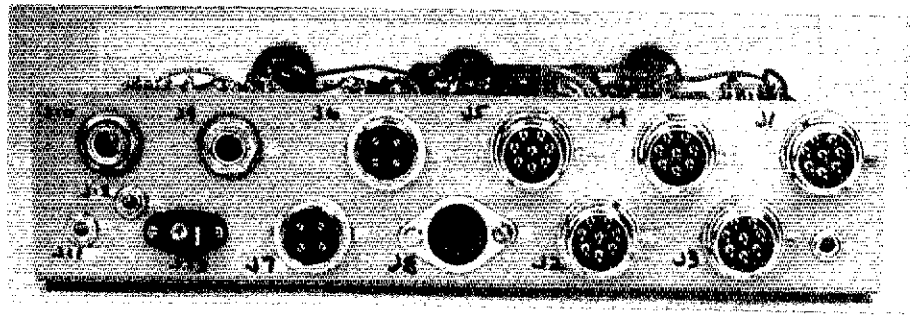


Fig 5—All of the Switcher's connectors mount on the rear cabinet panel. See text for how to wire the connectors to avoid ground loops. The phone jack at lower right is unused.

problems may occur if you don't take these precautions.

Other Design Possibilities

Because I use a separate coaxial switch for RF switching, my version of the Switcher does not switch the transceivers' RF-output lines. Additional relay switching can be incorporated to do this, and to permit the use of one microphone with both transceivers. In my version of the Switcher, however, I chose to simplify the mike switching circuitry, and to retain the up/down tuning capability the MD-1 and MC-60 microphones provide when used with their respective transceivers.

Summary

I've used the Switcher for over a year at my station, and it has proven to be a reliable and easy-to-use accessory. Although it's hardly state-of-the-art, the Switcher is easy to build and uses readily available parts. I encourage you to adapt it to suit your requirements.

Ray Bintliff was first licensed in 1957 as W2HTL, and presently holds an Extra Class license. He held engineering and management positions at RCA until his retirement in 1983. In addition to home-brewing small projects, Ray enjoys chasing DX—and has, on occasion, been known to catch some!

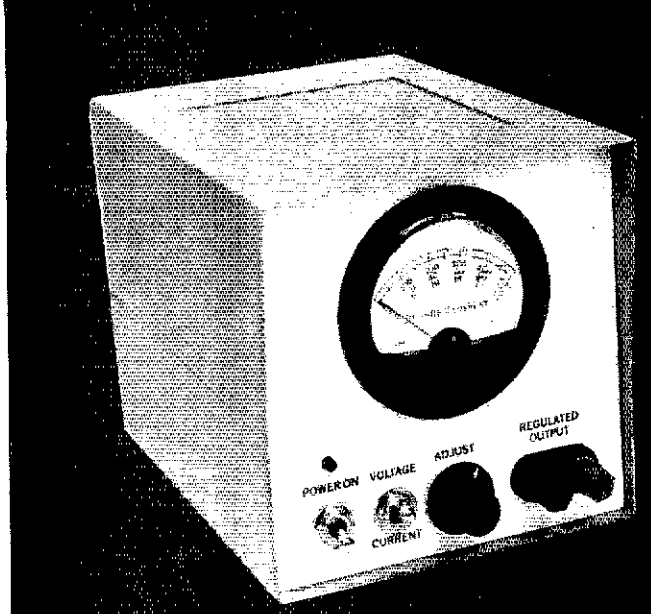
Notes

[1]A mode-by-mode listing of the function of each section of the Switcher's relays is available for a business-size SASE from Switcher Relay Listing, Technical Department Secretary, ARRL, 225 Main St, Newington, CT 06111.

[2]This dimming feature is useful under low-ambient-light conditions, in which the buttons of unselected functions might otherwise be invisible. If this feature doesn't interest you, you can eliminate it and use the lamp-dimming relay contacts for other purposes.

[3]Amateur Electronic Supply lists suitable connectors in its spring 1989 catalog. Other Amateur Radio equipment dealers likely carry such connectors as well.—*Ed.*

[4]A *ground loop* is a common path along which two or more points intended to be at the same ground potential are actually at *different* potentials. Ground loops are undesirable because the unintended inter-circuit coupling they support can cause hum, noise, feedback and data errors.—*Ed.*



A 1.25- to 25-V, 2.5-A Regulated Power Supply

Let's discuss the practical aspects of a test-bench power supply that's easy to build and get working. Most of the parts are available as surplus.

By Doug DeMaw, W1FB
ARRL Contributing Editor
PO Box 250
Luther, MI 49656

I needed a regulated 24-V power supply for development work with power FETs, but my lab supply could not deliver the current required because it provides a maximum of only 1.5 A. My work called for a current range from 2 to 2.5 A. Although I found a number of surplus fixed-voltage power supplies offered at modest prices, they were not variable-voltage units, and they qualified for the "boat anchor" weight class! I chose a typical amateur solution: build the power supply and make it compact.

This article covers the essentials of a simple power supply that you can duplicate in a few evenings. It can be expanded easily to deliver greater output current. The heart of this power supply is contained on a PC board that is available from FAR Circuits.[1] In fact, most components are available from mail-order houses.

Circuit Details

Fig 1 shows the circuit for my supply. The components marked with a double asterisk are external to the PC board. I recommend that you read the *ARRL Handbook* (1989 or other recent editions) for an explanation of how regulated power supplies operate. See pages 27-12 and 27-13 for a design description of a similar power-supply circuit.

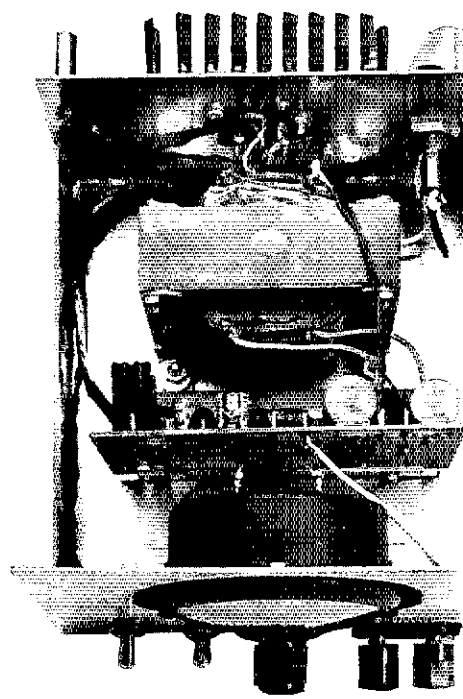
T1 is chosen for the voltage and current you require. You can use a 24-V transformer if you can work with a voltage range of 1.25 to 24. Select a transformer that can deliver 0.5 A or greater current than the maximum direct current you need. Likewise, use rectifier diodes that are rated for substantially more direct current than the supply will deliver. The PIV rating should be at least twice the secondary voltage of T1. U1 is a rectifier module that contains four 6-A, 200-PIV diodes in a full-wave bridge hookup. U1 is mounted on a small heat sink. I used a Thermalloy 6118B that is sold by BCD Electro.[2] The heat sink helps to keep the diodes from overheating when heavy current is flowing.

DS1 is a red LED that serves as the POWER ON indicator. You can replace the LED with a 28-V pilot lamp. If so, eliminate R10. By placing the LED or lamp in this part of the circuit, you will always know if the fuse, T1 and U1 are functional.

R1, R2 and R7 can be wound from no. 28 enamel wire on insulated forms, such as the body of a 10-kΩ, 1-W carbon resistor. You will need an accurate way to measure the wire resistance if you do this. These resistors are available from Mouser Electronics.[3]

U2 is a 1.25 to 30-V, 1.5-A three-terminal positive regulator. This device is also mounted on a small heat sink. I used a Thermalloy no. 6098 that I obtained from All Electronics Corp.[4] You can build your own heat sinks from 16-gauge aluminum or brass. Form U-shaped channels that are approximately 1-1/2 inches square by 5/8 inch high.

Q1 is a PNP (TO-204 case) power transistor. I recommend a Radio Shack® MJ2955 or RCA SK3335 transistor. These have a 150-W rating. The emitter and base pins are bypassed to ground at the pins by means of C7 and C8 in Fig 1. This is a preventive measure against instability, owing to the long leads between Q1 and the PC board. You can parallel two or more pass transistors to increase the output current of the supply. Each pass transistor provides an output-current increase of approximately four times that of U2. The single device at Q1 in Fig 1 ensures an out-



Internal view of the assembled power supply. The chassis and panels are made from single-sided PC board. The circuit board is mounted vertically to conserve space.

[1]Notes appear on page 25.

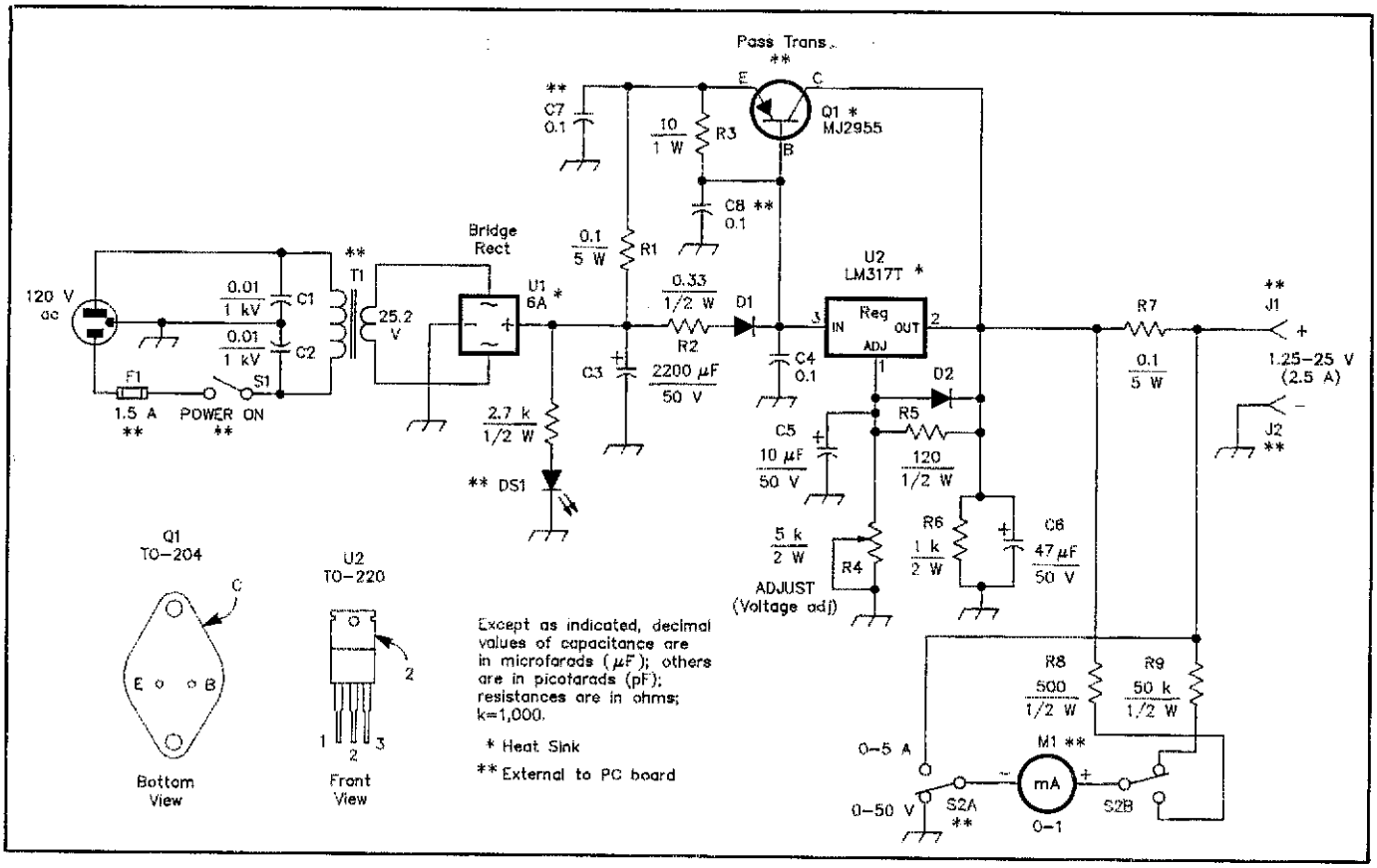


Fig 1—Schematic diagram of the 1.25- to 25-V regulated power supply. Capacitors are disc ceramic except for those with polarity marked, which are electrolytic. See text for data concerning heat sinks for Q1, U2 and U3.

D1, D2—1-A, 100-PIV rectifier diode.
DS1—Red LED.
F1—1.5-A, 3AG fuse in chassis-mount holder.
J1, J2—Standard five-way binding post, one red, one black.
M1—Milliammeter, 0-1 mA dc (see Notes 5 and 9).
Q1—NPN power transistor MJ2955 (Radio Shack) or equiv device with a +70-V, 10-A, 150-W rating in a TO-204 case.
R1, R2, R7—5-W wire-wound resistor. See Notes 3 and 4 for source. Or, use 17 inches of no. 28 enam wire, single-layer wound, on a 10-kΩ, 1-W carbon-composition resistor for R1 and R7. For R2, use 36 inches of no. 30 enam wire on a 10-kΩ, 1-W carbon-composition resistor (scramble wound).
R4—Panel-mount, 5-kΩ, 2-W or 5-W potentiometer, carbon or wire wound (see Note 8).
R8, R9—See text.
S1—SPST toggle switch.
S2—DPDT toggle or rotary wafer switch.
T1—25.2-V, 2.75-A power transformer (see text).
U1—6-A, 200 PIV bridge rectifier with heat sink. See text.
U2—LM317T +1.25- to 30-V, 1.5-A TO-220 regulator. Use an LM317HVK (TO-204 case) for dc output voltage greater than 40. See text.

put current of 5 to 6 A if the transistor has a large enough heat sink to remain at a safe operating temperature. If you use additional pass transistors, you will need to replace T1 with a heftier transformer.

Output voltage and current monitoring is done with a 0-1 mA meter (M1). I used a surplus meter I had available, hence the additional scales on the meter face. A suitable 2¼- × 2-inch meter can be purchased from Dick Smith Electronics.[5] The voltage drop across R7 indicates the current being taken by the load. R8 allows M1 to read 0.5 V full scale, which corresponds to 5 A of current through R7. R9 permits the meter to read 50 V full scale. Try to use 1% resistors for R7, R8 and R9 for best meter accuracy. I used two 1-kΩ, ¼-W resistors (5% tolerance) in parallel for R8 and two 100-kΩ, ¼-W resistors in parallel at R9. R7 in my unit is a 3% resistor. The accuracy of the readings is satisfactory for my work.

You can lift J2 above chassis ground if you want to extract negative voltages from the power supply. A third binding post can be added (common to the chassis) for connection to J1 or J2, depending on the desired polarity. If this is done it will be necessary to bring all of the negative circuit leads to a bus that connects to J2, except for C1, C2, C7 and C8.

Construction Notes

The photograph shows the interior of my power supply. I used an old cabinet that a welder friend had made for me some 25 years ago. The chassis and panels are made from single-sided PC-board material (metal side in). The mating surfaces are soldered together. I used gray automotive primer as the undercoating for the cabinet, then sprayed it with clear lacquer. The panel has gray primer for the undercoating and white spray enamel as the finish coat. Clear lacquer was sprayed over the white panel after the decals were added. The cabinet dimensions are (HWD) 6 × 6 × 8 inches.

You can see in the photograph that the PC board is mounted vertically to save space. It is held in place by an L-shaped aluminum bracket. Q1 and its heat sink are attached to the rear outer wall of the chassis assembly. My heat sink is a surplus extruded type, measuring 3½ × 3¾ × 1 inch. I do not recommend a Q1 heat sink that is smaller than 13 square inches by 1 inch thick. Larger heat sinks will provide added Q1 protection. A hefty heat sink is available from Dick Smith Electronics (no. DS-H3471).[6] The photograph shows a thick heat sink with fingers. It was replaced by a heavier, extruded unit of the type just mentioned, owing to excessive Q1 heat during high-current periods. John Meshna Jr, Inc lists a dual TO-3 (TO-204) heat sink (no. SP-58A-28) that is suitable for one or two pass transistors.[7]

You may find that R4 and R6 are difficult to locate. Wire-wound or high-wattage carbon potentiometers are scarce items on the surplus market. I was able to find a 2-W

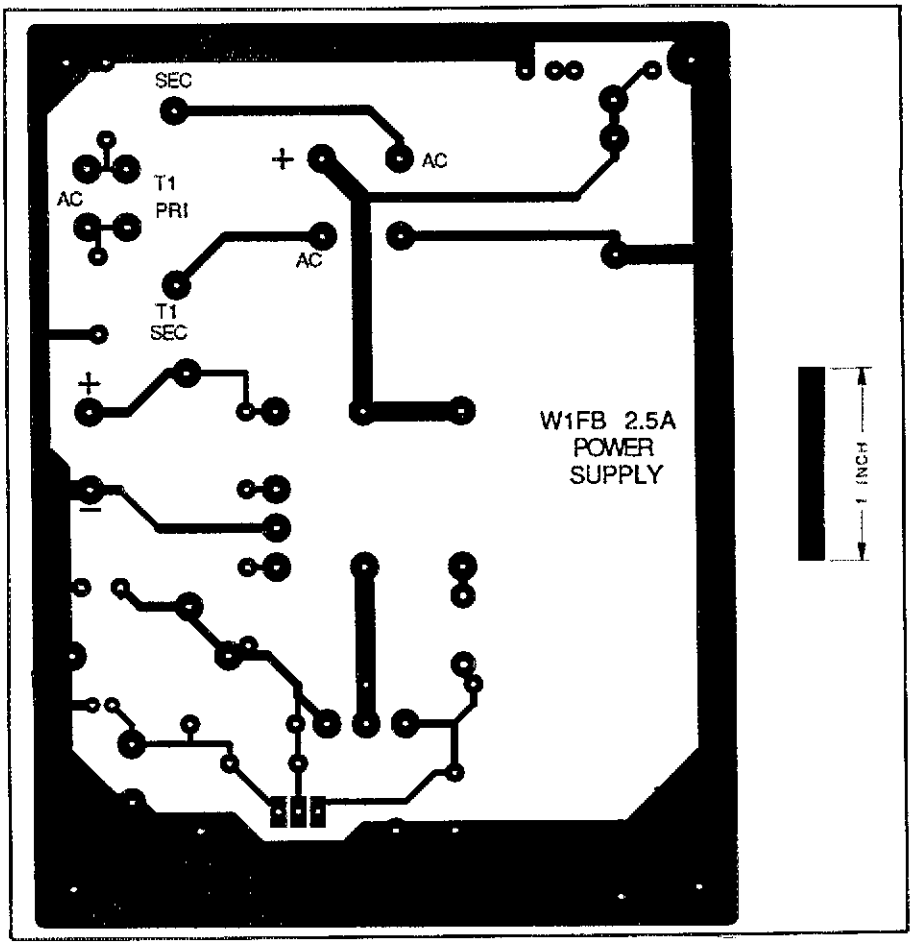


Fig 2—Circuit-board etching pattern for the power supply. The pattern is shown full-size from the foil side of the board. Black areas represent unetched copper.

(5-kΩ) control in the Jameco catalog (no. CMU-5021).[8] It is a chore to locate 2-W carbon resistors. If you can't find the proper unit for R6 of Fig 1, you can parallel two 2.2-kΩ, 1-W resistors.

As mentioned earlier, most of the parts for this project can be purchased by mail. The LM317T, for example, is available from the suppliers listed in Notes 2, 4 and 5. U1 can be purchased from BCD Electro (see Note 2) or from Mouser Electronics (no. 33BR062—see Note 3). C3 can also be obtained from Mouser (no. 20NR905). I purchased T1 from Electronic Surplus, Inc (no. 767B11).[9] If you desire an output voltage greater than 25, you can buy a 32-V, 3.5-A transformer from Fair Radio Sales (no. X5157308).[10] The increased dc voltage (46 V maximum) will require that you replace U2 of Fig 1 with an LM317HVK, which is supplied in a TO-204 case. The use of this IC requires a modification of the PC board in Fig 2.

You can buy a modestly priced 0-1 mA dc meter from Fair Radio Sales, which offers a 3½-inch round unit that has a 0-50 scale (ideal for this project). The cost is $5 at this writing.

Be sure to use a thin layer of heat-sink compound or silicone grease between Q1, U1 and U2 and their respective heat sinks. Affix the three devices firmly (but not excessively tight) to the heat sinks. Too much tension causes stress that can damage the semiconductors.

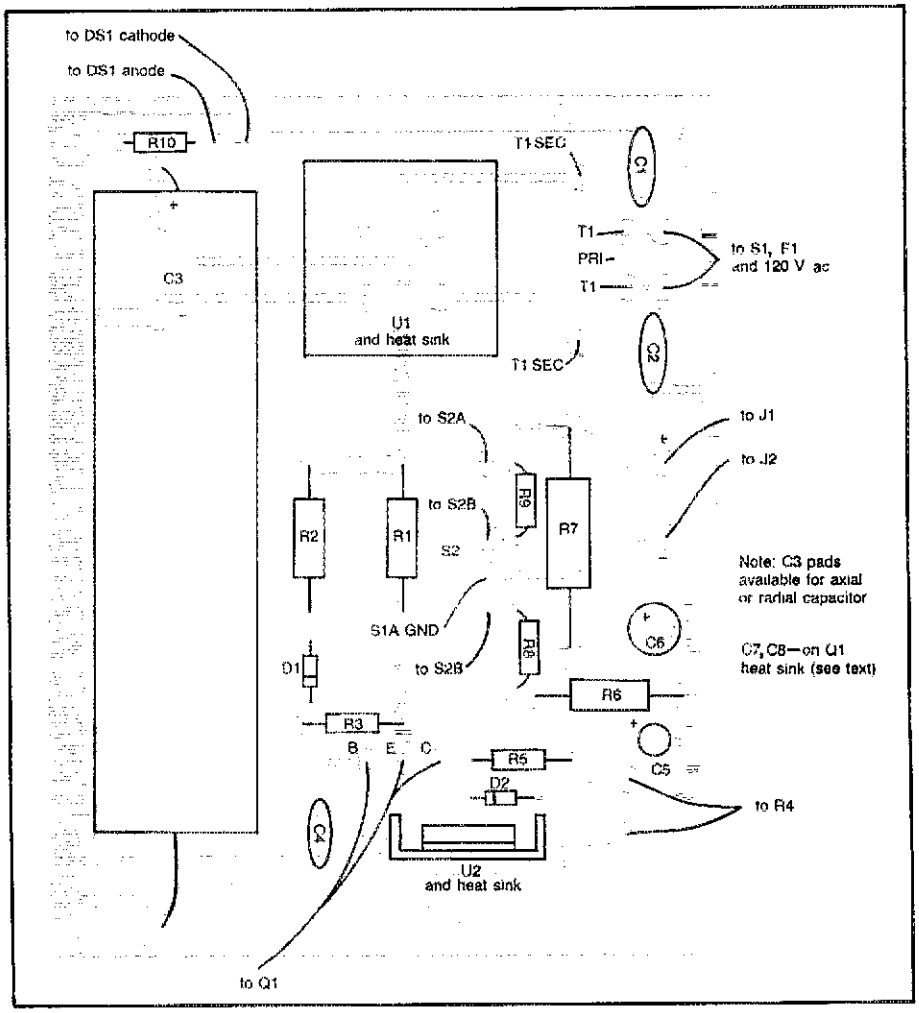
Use 16- or 18-gauge insulated hookup wire between the T1 secondary and the PC board, and likewise between J1 and the PC board. This will minimize unwanted voltage drops through these wires. Also, use insulating hardware to isolate Q1 and U2 from their heat sinks, unless the sinks are "floated" above chassis ground. Radio Shack has insulating kits (no. 276-1371 for Q1 and 276-1373 for U2).

A scale PC-board etching pattern is shown in Fig 2. A parts-placement guide is provided in Fig 3 (see Note 1).

Summary

Many hams have told me they don't build equipment because "It's impossible to find the parts." Perhaps the references

Fig 3—Parts-placement guide for the circuit board, not to scale. Parts are placed on the nonfoil side of the board; the shaded area represents an X-ray view of the copper pattern. Component outlines are not necessarily representative of the shapes of the actual parts used.



in this article will make your job easier—and they should also be useful when searching for parts to use in other projects.

The maximum recommended load current versus output voltage for the circuit in Fig 1 is 500 mA (1.5 V), 750 mA (6 V), 1 A (9 V), 1.5 A (12 V), 1.75 A (18 V), 2 A (20 V) and 2.5 A (25 V). These figures are for steady-state load current. For intermittent loads, such as for CW and SSB transmitters, the current maximums can be increased 25 to 30 percent, assuming a typical duty cycle during transmit.

This power supply is certainly suitable for uses other than a test-bench unit. It can be used to operate a low-power VHF transceiver or homemade QRP gear, or as a battery charger. Good luck and have fun!

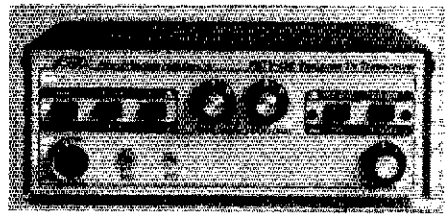
Notes

[1]FAR Circuits, 18N640 Field Ct, Dundee, IL 60118, tel 312-426-2431, evenings. Price: $8.50 (includes shipping to US addresses).
[2]PO Box 830119, Richardson, TX 75083-0119, tel 214-343-1770 (catalog available).
[3]Mouser Electronics, PO Box 699, Mansfield, TX 76063, tel 800-346-6873 (catalog available).
[4]All Electronics Corp, PO Box 567, Van Nuys, CA 91408, tel 800-826-5432 (catalog available).
[5]Dick Smith Electronics, PO Box 468, Greenwood, IN 46142, tel 317-888-7265 (catalog available).
[6]See Note 5.
[7]19 Allerton St, Lynn, MA 01904, tel 617-595-2275 (catalog available).
[8]Jameco® Electronics, 1355 Shoreway Rd, Belmont, CA 94002, tel 415-592-8121 (catalog available).
[9]Electronic Surplus, Inc (formerly R&D Electronics), 1224 Prospect Ave, Cleveland, OH 44115, tel 216-621-1052.
[10]Fair Radio Sales Co, PO Box 1105, 1016 Eureka St, Lima, OH 45802, tel 419-227-6573 (catalog available).

New Products

430-MHz FAST-SCAN-TELEVISION TRANSCEIVER

☐ Advanced Electronic Applications has introduced the FSTV-430, a fast-scan TV transceiver that provides all the necessary FSTV functions, except those provided by a video camera or video-cassette player.



The FSTV-430's transmitter-output power is 1 watt. AEA has also introduced a 16-element 430-MHz Yagi antenna, model 430-16, for use with the FSTV-430.

Price class: FSTV-430, $440; 430-16 Yagi, $120. Manufacturer: AEA, Inc, PO Box C-2160, Lynwood, WA 98036, tel 206-775-7373.—*Rus Healy, NJ2L*

CATS ROTATOR-PRESET CONTROLLER

☐ Craig's Antenna and Tower Service (CATS) has introduced a rotator-preset controller designed for installation in any Hy-Gain rotator manufactured since 1974. The Positioner-1 provides a single preset rotator heading and incorporates CATS' Brak-D-Lay 7-second delayed-brake-actuation controller, which is also available separately. Price: Positioner-1, $75. For more information, contact Craig Henderson, N8DJB, CATS, 7368 SR 105, Pemberville, OH 43450, tel 419-352-4465.—*Rus Healy, NJ2L*

PREAMPLIFIER-DESIGN SOFTWARE

☐ SoftWare Innovations For Technology Enterprises® (SWIFT) has introduced *Amplifier Simulation Program* (ASP) 1.00, a preamplifier-design and -modeling package for IBM® PC and compatible computers. ASP calculates amplifier noise figure and gain, and includes documentation covering the noise-figure equations used by the program, matching techniques and other design hints.

Computer-system requirements include an IBM PC, XT, AT or compatible computer with at least 360 kbytes of RAM and monochrome or CGA-compatible video. A printer and a math coprocessor are optional. Price: $54.95 plus $2.50 shipping and handling (to US addresses). For more information, contact Charles Reichert, KD9JQ, 955 Concord Ln, Hoffman Estates, IL 60195.—*Rus Healy, NJ2L*

Strays

"HOW TO TEACH" VIDEOS

☐ ARRL HQ is looking for videotapes on "how to teach." We'd like to train new instructors or help the experienced ones brush up on new teaching methods. If you know of any public-domain or try-before-you-buy tapes that cover teaching techniques and how to make interesting presentations, please contact the ARRL Educational Activities Branch.

LIFE MEMBERSHIP INFORMATION

☐ The Life Membership is the League is currently $625 in the US and $900 elsewhere. There is a quarterly payment plan, where a Member makes an initial payment of $79 and seven more payments of $78 over a two-year period. Outside the US, the payments are $112.50. Immediate family members of a paid-in-full Life Member can sign up for family Life Membership with a one-time payment of $50. The $50 payment also applies to unsighted individuals. The fee for persons age 65 is $500 in the US. Please contact the Circulation Department for a formal Life Membership application. Write to Rose Cavanaugh, ARRL, 225 Main St, Newington, CT 06111.

QST congratulates...

☐ the following radio amateurs on 60 years as a ARRL member:

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- Walter M. Bolinger, N6UX, Keene, Texas

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- Philip E. Winters, K8THT, Cincinnati, Ohio
- Frank C. Krushina, K4DW, Merritt Island, Florida
- Jettie B. Hill, W6RFF, Roseville, California
- Joseph Santangelo, N1JS, Reading, Massachusetts
- Richard A. Rath, K6ARF, Los Angeles, California
- William M. Smith, W7GHT, Craigmont, Ohio
- Charles E. Gagnon, Jr, W1LQQ, North Conway, New Hampshire
- Harley L. Christ, W9ALU, Lowpoint, Illinois
- Floyd K. Peck, K6SNO, Homeland, California
- Gilman C. Welker, W7LG, Port Angeles, Washington
- Bennett R. Adams, K4EZ, Decatur, Georgia
- Richard M. Stevens, AK4T, Columbus, Georgia
- William F. Stewart, K6HV, Los Angeles, California
- Charles W. Denk, W8LUH, Harbert, Michigan
- George J Apfel, W2GHV, Park Ridge, New Jersey
- C. E. Cottrell, W4GPL, Madeira Beach, Florida
- Robert E. Blair, K5AY, Richardson, Texas
- Lenore K. Jensen, W6NAZ, Sherman Oaks, California

The Care and Feeding of an Amateur's Favorite Antenna Support—the Tree

If your tree-supported antenna fell down, you'd care. Did you ever think about caring for the tree that holds up your antenna?

By Doug Brede, W3AS
116 Ridgewood Dr
Post Falls, ID 83854

For most hams, trees are favorite antenna supports. Many radio amateurs begin their operating careers by hanging the far end of a wire up in the family's shade tree. On Field Day, resourceful hams find a hundred and one ways to get an aerial into the air; many (if not most) of these methods involve using trees as supports or aids.

During my 20 years as a radio amateur, I've used tree-supported wire antennas almost exclusively. Some of those antennas lasted several years; most didn't. Over the years, by trial and error—and because of my trade association with arborists and horticulturists—I've gained an understanding of what can (and can't) be expected of trees as antenna supports.

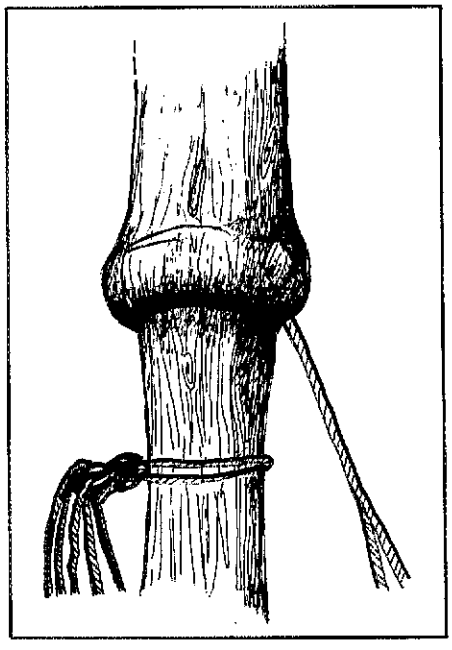


Fig 1—Attaching ropes or wires to trees can sometimes lead to major problems for the tree. Wrapping a rope around a limb or trunk and leaving it unattended will suffocate the tree and cause a distortion of growth or the death of the limb.

There are right and wrong ways to attach and maintain your tree-mounted skyhooks over the long haul. In this article, I'll share with you some pointers from two noted horticulturists who talk about attaching wires to trees. Safety is also discussed—your safety during antenna installation, and the safety of the tree.

Trees Are Alive

Few antenna supports can be classified as life forms. Trees are an exception. Tree experts usually cringe when someone brings up the idea of attaching a wire to a tree—especially when connecting a chunk of wire to its midriff (see Figs 1 and 2). The experts know that trees are made up of three basic layers: the bark, the living sapwood, and the nonliving heartwood. The bark protects the sapwood from injury. The sapwood contains the "skin and blood vessels" of the tree. If the sterile barrier between the bark and the sapwood is broken, infection can set in. Infection, if unchecked, can kill even a mighty oak within a year.

Trees have the same basic problems with infection as we humans do. If a tree gets a cut or gash, infection from bacteria and fungi is bound to set in. But there's one important difference between trees and humans: "Tree wounds don't heal," says noted tree expert Dr Alex L. Shigo. "People heal; when you are wounded, you have forces that fight off the infection. Trees don't have these forces to fight off infection, and *every wound* will become infected."

Shigo, author of the book, *Tree Biology and Tree Care*[1] notes that trees lack an immune system that fights off infection from wounds that occur from the actions of a careless climber or the attachment of an antenna-support eyebolt. Trees treat their wounds by walling off the infected area and isolating it from the living part of the tree. "If you cut open a tree that's 2000 years old, you'll see every injury in that tree that occurred over its lifetime," says Shigo.

Whenever you wound a tree, you weaken the tree in that spot. The walled-off wood around the wound lacks the strength of healthy wood. When attaching an antenna to a tree, it's important to traumatize the tree as little as possible. This will ensure a strong, enduring connection.

Most people believe that tree paint or shellac is the best way to treat a tree wound. "Not so," says Shigo. "Wound dressing paints just protect the microorganisms." Scientific research with tree-wound preparations have failed to show *any* benefit to the tree.

Making the Attachment

Although it's relatively easy to get a wire up into a tree, it's certainly more difficult to keep it there for the long term. Usually,

Fig 2—Over the years, this tree has grown around the cable of a roadside barrier. Dave Newkirk, AK7M, spotted this tree in Glastonbury, Connecticut. *(photo KC1MP)*

[1] A. Shigo, *Tree Biology and Tree Care*, (Shigo and Trees, Assoc, 2nd ed. 1989) 4 Denbow Rd, Durham, NH 03824; $52 plus shipping and handling. A companion to this book, an expanded glossary of 239 tree terms, is priced at $13. The shipping and handling charge for any single book is $3. For any combination of books ordered, the shipping and handling charge is $3 for the first book and $1 for each additional book.

Some Questions and Answers about Tree Antennas

Q: *A CBer in my neighborhood cut the top out of his pine tree and stuck a ground plane antenna up in it. Is this an acceptable way to mount an antenna?*

A: Definitely not. Not only is this a hazardous way to mount an antenna, it essentially ends the useful life of the tree. Topping of trees is strongly discouraged by professional arborists. Because topping removes the growing point of the tree, the tree recovers from the damage by sprouting numerous lateral buds around the top, which soon overrun the antenna.

Q: *I've heard that if you fertilize a tree, your antenna will grow higher each year. True?*

A: False. Although fertilizing is a desirable way to keep your tree healthy, it does not raise the height of your attached antenna one inch. Trees grow by extension of the apex. A wire attached to the trunk at 30 feet will still be at 30 feet 10 years later. By the way, when you fertilize your tree, use regular garden fertilizer distributed around the drip line of the tree. The fancy tree spikes you see advertised are unnecessary because most tree feeder roots are near the surface.

Q: *Is there any way to slow down the growth of a tree, so that it doesn't interfere with my antenna?*

A: Some home-and-garden stores now stock growth regulators for trees. These products can be injected into the tree, dropped on the soil surrounding the tree, or sprayed on the leaves (follow label directions). Tree professionals can also perform this service. These growth regulators are used by some utility companies to reduce the need for tree trimming near power lines.

Q: *Are certain types of trees better wire-antenna supports than others? What about hardwoods versus softwoods?*

A: There's little difference between hard- and softwoods in their ability to hold up antennas. Conifers, because of their shape, are nearly ideal antenna supports. Avoid the use of red oaks and silver maples if possible, because they tend to rot easily if wounded. Avoid using poplars, too. In spite of their height and rapid growth, their branches are brittle and break easily.

Q: *If I damage a tree during antenna installation, what should I do? Is tree replacement expensive?*

A: If the damage is minor, your best bet is to do nothing. If it's a broken limb, saw the limb off cleanly, perpendicular to the axis of the branch. Never saw off a branch flush with the surface of the trunk, as this allows decay to set into the trunk. Using tree paint for injury repair is unnecessary (see text). In case of major tree damage, consult a trained arborist.

The answer to the second question is: Yes, tree replacement is expensive. The International Society of Arboriculture publishes a formula for calculating replacement cost of shade trees of various sizes. This pamphlet can be obtained from many tree services and libraries. Here's one point to ponder: A large, stately shade tree can add several thousand dollars in value to the property on which it sits.

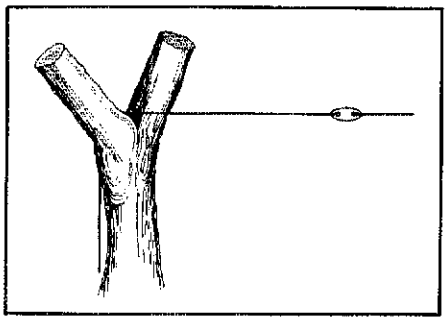


Fig 3—Most hams install tree-mounted antennas by throwing a line over a branch crotch. This should be used only as a temporary installation, because abrasion of the rope and tree results. Over time, girdling may occur leading to the loss of one or more of the branches.

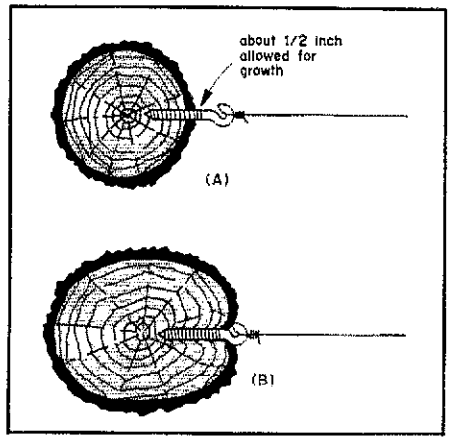


Fig 4—The best way to secure a wire to a tree is with an eyescrew mounted into the wood (A). As the tree grows and expands, however, the eyescrew will become embedded (B) and must be removed and replaced.

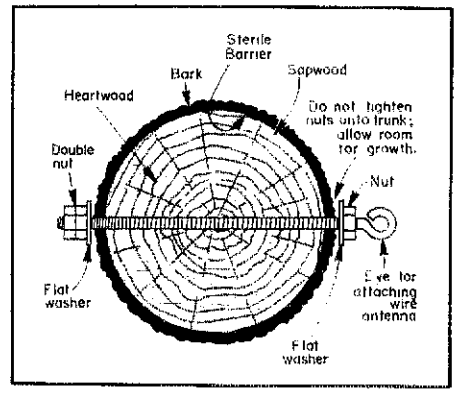


Fig 5—For heavy antenna loads, an eyebolt passed through the trunk or limb will support more weight than an eyescrew. Allow about ½ inch of play between the bolt and trunk or limb. Don't tighten the bolt completely; this allows for tree growth.

annual (sometimes weekly) restringing is needed. It seems that trees "instinctively know" just when to drop a wire to the ground: during midwinter when the snow is high and the skip is long, or in the middle of a heated contest!

The bow-and-arrow method has become a standard of the wire-in-the-tree crew. But many other methods, slingshots, for example—even attaching a string to a golf ball and whacking it with a sand wedge—are common.

One of the easiest and most common ways to connect a wire to a tree is to throw a rope over a branch crotch (see Fig 3) and tie off the loose end. This is the main method used in temporary (such as Field Day) installations.

"Doing this probably won't hurt the tree if it's done as a temporary thing," says Washington State University horticulturist Ray Maleike. But with any of these simple antenna-stringing methods, some problems for the tree (and the antenna) may develop later.

"First of all, you're not stabilizing the antenna very well with this type of setup. The other thing is that people have a tendency to forget the antenna's there. As the tree grows—as it increases in diameter—you can girdle the tree. If you've got this girdling rope or wire up there, you can actually kill that portion of the tree above the wire."

Another no-no when attaching an antenna to a tree is wrapping a wire around the trunk. This strangles the veins in the sapwood the same way a noose around your neck would strangle you. "It's important not to wrap anything around the trunk," says Maleike.

Many commercial nurserymen wrap stabilizing ropes around newly transplanted saplings to keep them from falling over. Recently, however, this practice has been questioned because of the restrictions these ropes place on the growth of the tree. People forget about these ropes; some remain on

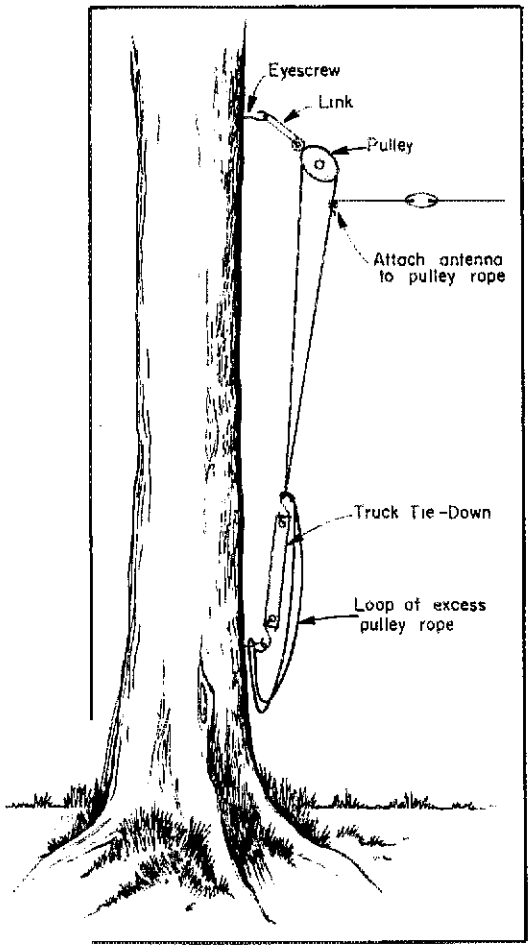


Fig 6—By using a pulley, raising and lowering the antenna for repairs can be done without the need to climb the tree. Flexible truck tie-downs can be used to apply tension to the antenna. (Early editions of *The ARRL Antenna Book* show a weight used to provide the required tension. A weight swinging from a tree can be hazardous.) Loop the excess pulley rope to a second eyescrew, in case the tie-down fails.

Practical Tree Biology Tips

Excerpted from *A New Tree Biology*,† by Alex Shigo, PhD

- Tree wood is not dead. There are more living cells than dead cells in sapwood.
- Tree wounds will become infected. Trees cannot restore, regenerate, or repair injured wood.
- Branches are attached to trunks by a series of collars; branch collars over trunk collars.
- Branch removal that injures or removes the collar will destroy a tree's defense system.
- Trees have five major growth periods during each growing season: (1) onset of growth, (2) leaf formation, (3) wood and inner bark formation, (4) storage, and (5) dormancy.
- Fertilize injured or stressed trees during growth periods (3) and (4).
- Trees get food (sugar) by trapping the energy of the sun.
- Trees get water and elements essential for growth from the soil.
- Substances for tree defense come mostly from stored energy reserves.
- Healthy trees have living cells with high amounts of energy reserves.
- When defense is low, opportunistic diseases attack.
- Because it grows big and fast does not always mean that a tree is healthy.
- If possible, cut tree limbs only when they're dormant or after leaf formation.
- There is no data to show that wound dressings stop rot.
- Tree topping is a crime against nature!
- Read and learn about trees.

†A. Shigo, *A New Tree Biology* (Shigo and Trees, Assoc, 1989), 4 Denbow Rd, Durham, NH 03824; $21 plus $3 shipping and handling (see note 1).

trees for years after transplanting.

Encasing the stabilizing (or antenna) wire in rubber or plastic hose is not the answer either. "Wire wrapped in hose is just as injurious to the tree as the bare wire itself," says Shigo. "If you remember your basic physics, you're applying the same number of pounds of force to the tree with or without the hose." Shigo recommends that if you must wrap something around the trunk of a tree, use a wide fabric strap to do the job.

Two methods have emerged among leading horticulturists as the preferred way to attach a wire to a tree. For light antenna loads (eg, the end of a dipole), a threaded eyescrew (Fig 4) is the method of choice. Simply drill a hole into the tree about 1/16 inch smaller than the screw diameter, then twist in the eyescrew. Be sure to select a cadmium-plated eyescrew threaded for use in wood. A thread length of 2 or 3 inches should secure most antennas. Allow about ½ inch of space between the trunk and the eye; this allows for outward growth of the tree with time.

For stouter antennas, such as multielement wire beams, another method for securing wires to trees is recommended. This procedure involves using an eyebolt longer than the tree diameter, drilling clear through the tree and securing the eyebolt on either side of the tree with round washers and nuts (see Fig 5).

Fig 7—A professional arborist uses a safety belt and rope when climbing trees. Hams should take similar safety precautions. *(A. Douglas Brede, W3AS photo)*

Drilling a hole through a tree causes much less trauma to the tree than wrapping something around it. Much of the core of a tree is dead tissue, used mainly for physical support. Although there will be some wounding of the tree at the site of the bolt or screw, such wounding will be far less than that which occurs from wrapping a wire around the trunk.

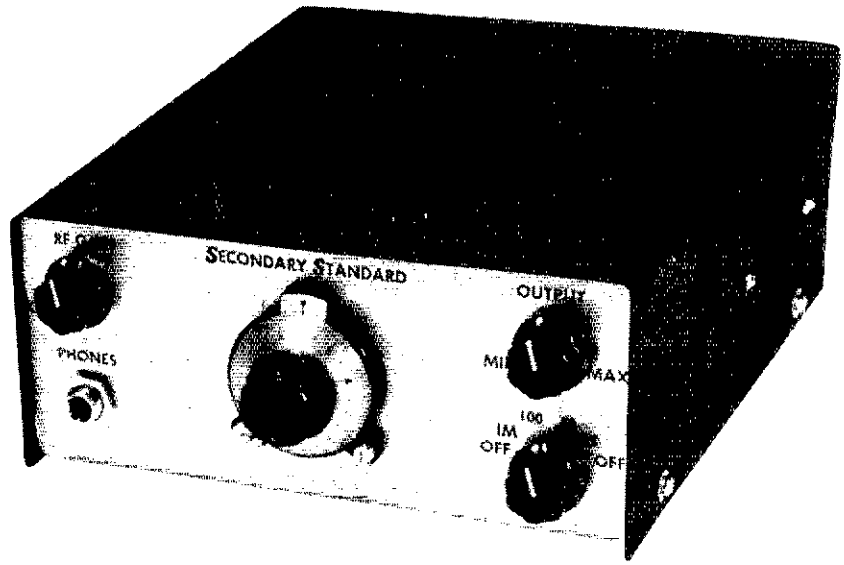
Over time, either type of eyescrew connection will have to be replaced. "If these fasteners are left on the tree for a long time, the fastener will eventually become embedded in the tree," says Maleike. "You're going to have to pull these fasteners out and replace them every now and then." Maleike recommends replacement of tree eyescrews every 5 to 8 years as the tree matures. Commercial arborists use *drive fasteners* for securing wires to trees; drive fasteners are similar to eyescrews. "These fasteners keep the wire away from the tree, allowing the tree to grow out to it," says Maleike. Drive fasteners are used for securing lightning rods and their accompanying wires to trees. The use of drive fasteners is common in the Midwest, where lightning strikes to trees are common. You may have to shop around to find drive fasteners—try calling tree-care services in your area.

It's easier to periodically service a tree-supported antenna if a pulley is used (see Fig 6). Raising and lowering the antenna for repairs can be done without the need to climb

(continued on page 40)

A Simple Secondary Frequency Standard

This simple weekend project nets you an accurate frequency standard and a dedicated WWV receiver.



By James G. Lee, W6VAT
Box 357
Cupertino, CA 95015

One FCC requirement that has not changed in this era of deregulation is your need to observe the frequency limits of each amateur band and the limits of the subbands for your license class. Today's transceivers have built-in calibrators, but these calibrators have limitations: Some are awkward to use, and all need to be checked periodically against an accurate frequency standard, such as WWV.

The US National Institute of Standards and Technology (formerly National Bureau of Standards) stations WWV and WWVH transmit accurate frequency and time signals on 2.5, 5, 10, 15 and 20 MHz. Using an atomic standard as the primary reference, these signals have an accuracy of 1 part in 10^{11}—1 Hz in 100 GHz. We hams don't need this level of accuracy, but we can approach 1 part in 10^7 (1 Hz in 10 MHz) without undue strain on technology or budget. The secondary frequency standard[1] described here provides such accuracy inexpensively and gives you a receiver for WWV time checks and propagation information as well.

The Circuit

My standard uses the Neophyte receiver described by John Dillon, WA3RNC, in February 1988 *QST*,[2] along with some common ICs for marker generation. Fig 1 shows a block diagram of the standard. I recommend that you refer to Dillon's article; it contains a lot of detail about the receiver that won't be repeated here.

The Neophyte, a direct-conversion (D-C) receiver, was originally designed for 80- and 40-meter operation. I've converted it to a 10-MHz WWV receiver by adding a 10-MHz CMOS local oscillator (LO) and retuning its front end. The 10-MHz oscillator is also divided by the TTL string to give 1-MHz, 100-kHz, 50-kHz and 25-kHz markers.

D-C receivers have been popular over the years, and rightly so. Sometimes referred to as "zero-IF" receivers, they use an LO signal at (or, for CW, very close to) the received-signal frequency. Although normally used for CW and SSB reception, D-C receivers can copy AM signals when they are tuned to exact zero beat with the signal carrier.

The standard uses analog and digital circuits, and the two must be interconnected. The 10-MHz LO circuit is the best place to do this. Initially, I tried crystal-controlling the Neophyte LO, but the LO output was insufficient to drive the marker-generator TTL string. I tried several simple LO amplifiers with mixed success. Realizing that the interface circuitry was more complicated than it needed to be, I decided to drive the Neophyte with an external LO.

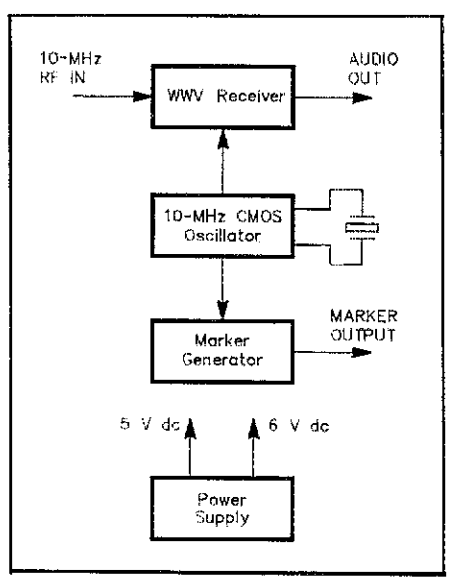


Fig 1—Block diagram of the Simple Secondary Frequency Standard.

The external LO used in this application must meet several requirements. It must be lightly loaded for good stability, consume little power, be capable of providing 200 to 300 mV of drive to the Neophyte, and yet still be able to drive a TTL load. A single CMOS chip—the CD4049A—provides all these requirements with a minimum of parts. The CD4049A, a hex inverter/buffer, makes an excellent oscillator, can drive two standard TTL loads, consumes little power and is inexpensive.

Fig 2 is a schematic of the Neophyte, its new LO and the marker generator. Although standard (74 series) TTL chips (U4, U5 and U6) are used for the marker generator in the unit shown, the 74LS series can be used if desired. U4 and U5 provide two cascaded divide-by-10 ratios to divide the 10-MHz signal to 1 MHz and 100 kHz. U6, a 7474 dual-D flip-flop, divides the 100-kHz signal to 50 and 25 kHz.

The power supply is straightforward, but you might look askance at the use of a bridge rectifier when a simple half-wave rectifier might do. The bridge used is not costly, and it helps reduce power-supply hum, a potential bugaboo in D-C receivers.

Voltage is regulated by U8, a 78M06 3-terminal, 6-V regulator. If you can't find a 78M06 (TO-5 version), you can use a standard 7806 or a TO-220-cased 78M06, or even an adjustable regulator set to 6 V. Check your wiring; pinouts vary among the different devices. Use a heat sink on U8: It gets quite warm when standard TTL chips are used for U4-U6. D2, a 6.8-V Zener diode, is optional. U3 can safely

[1]Notes appear on p 33.

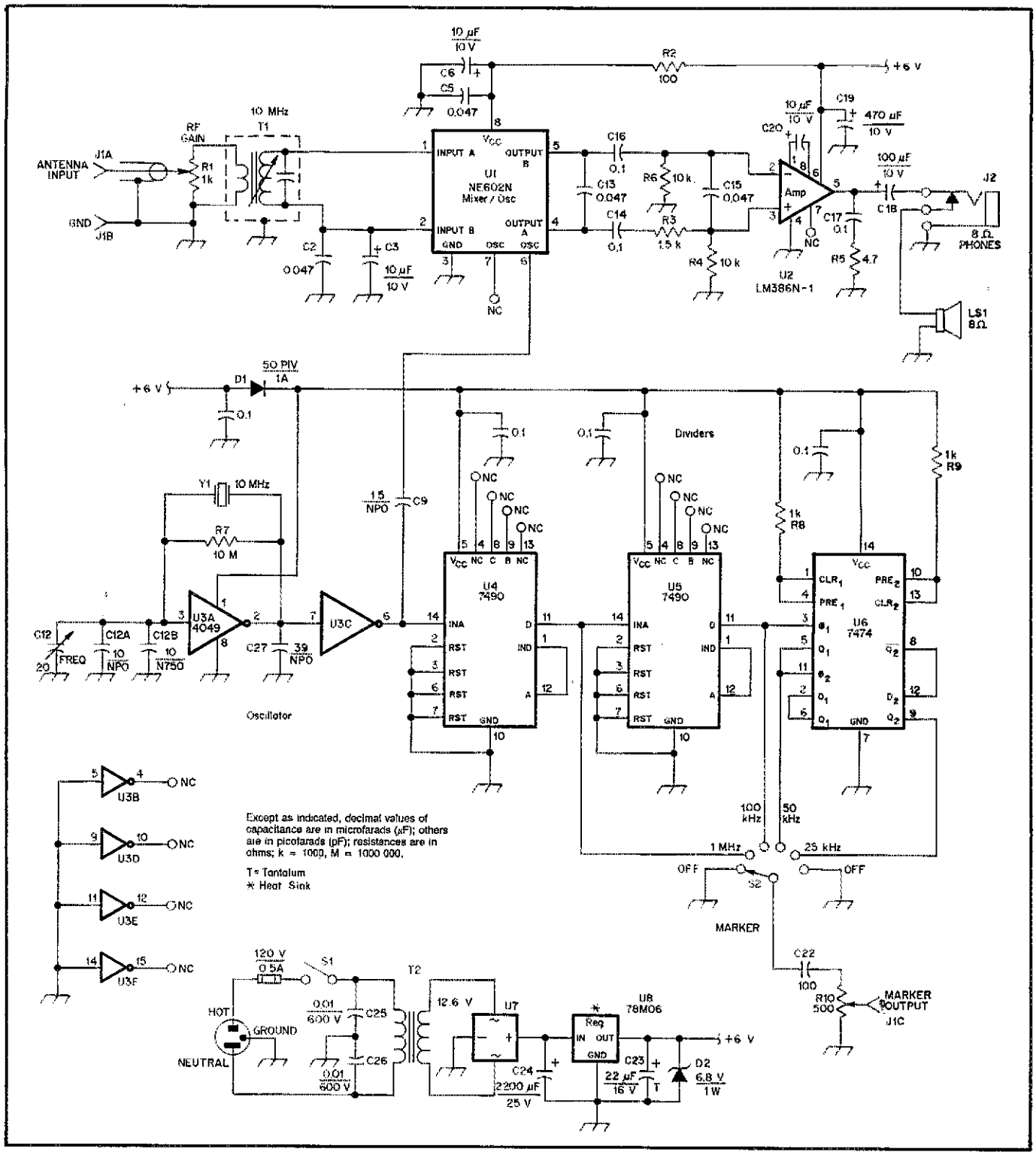


Fig 2—Schematic of the Simple Secondary Frequency Standard. Unless otherwise noted, capacitors are 50-V monolithic or disc-ceramic units. Polarized capacitors are electrolytic. Fixed resistors are ¼-W carbon-film units unless noted.

C2, C5, C13, C15—0.047-µF polyester or ceramic (0.01 µF also suitable for C2 and C5).
C12—20-pF variable capacitor (RADIOKIT 193-0006-001) in parallel with two ceramic capacitors (C12A and C12B). See text.
C14, C16, C17—0.1-µF polyester film or ceramic.
J1—Three-position terminal strip (Radio Shack® 274-620).
J2—Phone jack, ¼-inch, closed-circuit (RS 274-255).
LS1—8-Ω speaker, 2¼-inch diameter (Mouser 25SP024 or equiv).
R1—1-kΩ audio-taper potentiometer with switch.
S1—SPST switch (part of R1).
S2—Single-pole, 6-position rotary switch, nonshorting (one section of RS 275-1386).
T1—10.7-MHz IF transformer, 7:1 turns ratio, green core (Mouser 421F123).
T2—12.6-V, 300-mA power transformer (RS 273-1385 or equivalent).
U1—Signetics SA/NE602N mixer/oscillator IC.
U2—National Semiconductor LM386N-1 audio amplifier.
U3—CD4049A hex inverter/buffer.
U4, U5—7490 or 74LS90 decade counter.
U6—7474 or 74LS74 dual-D flip-flop.
U7—1-A, 50-PIV bridge rectifier.
U8—78M06 6-V, 0.5-A regulator (see text).
Y1—10.0-MHz crystal, 0.001% or better tolerance, HC-18/U holder.

Miscellaneous Parts

Cabinet: Aluminum with steel cover, 2¾ × 6¼ × 7¼ inches (HWD) (Mouser 40UB104, Jameco® B2744 or equiv).
Miniature test points (optional—see text; Mouser ME151-200 series).
Reduction-drive dial, 1½-inch diam (Mouser 45KN100 or equiv).

withstand full power-supply voltage, but U2 and U4-U6 have maximum voltage ratings of 9- and 7-V dc, respectively. D2 is cheap insurance in case of a blown regulator.

Building the Standard

The Neophyte PC board is used as is.[3] I've deleted parts, changed some parts values and made wiring changes. The new parts-placement guide is shown in Fig 3. C1, C4A, C4B, C7, C8, C10, C11 and T2 are deleted. C9 is changed to 1.5 pF and installed where C10 was. W1, a jumper, is installed at C9's former location. D1 is moved to the digital board. Another jumper, W2, is installed where D1 used to be. C12, the Neophyte tuning control, is replaced by a 20-pF variable capacitor in parallel with two temperature-compensating ceramic capacitors (see the sidebar, "Temperature Compensation"). C12, FREQ, is used to shift the crystal frequency to zero beat with WWV.

The Neophyte is powered by 6 V dc. U3-U6 operate at 5 V dc by virtue of the drop across D1. The speaker and headphone audio outputs are retained.

Buy a good-quality crystal for Y1. Avoid cheap microprocessor crystals, no matter how tempting their price might be. Y1 should have a frequency tolerance of 0.001% or better (±100 Hz at 10 MHz). A crystal with a tolerance of 0.0005% is not that much more expensive. The average microprocessor crystal has a tolerance of only 0.01%—1 kHz at 10 MHz—and some I checked were much worse. Crystal manufacturers such as JAN and International will sell single crystals to amateurs (see Table 1).

I recommend Molex® pins or small sockets for mounting the ICs. If you use Molex pins, first cut them to length, leave the bridging strips attached until you are ready to install the chips. Install the rest of the components on the Neophyte board beginning with T1, the resistors, ceramic capacitors and finally the electrolytics. When you are done, carefully inspect the foil side of the board to make sure that there are no shorts or solder bridges between traces.

The power-supply components, CMOS oscillator and marker generator are on a separate board. I used a Radio Shack® no. 276-170 PC prototyping board. You can use perforated board or wire-wrap techniques with equal success. A detailed layout is available from ARRL HQ for those who'd like to duplicate my technique.[4]

After all components are mounted on each board, install the ICs in their sockets. If you used Molex pins for the sockets, use a pair of needle-nose pliers to gently bend the bridging strips back and forth until they break off cleanly. Make sure the pins are in line and then carefully insert the chips, seating them firmly. U3 has protective diodes across each input, so you should not have any problem with static electricity destroying its input gates.

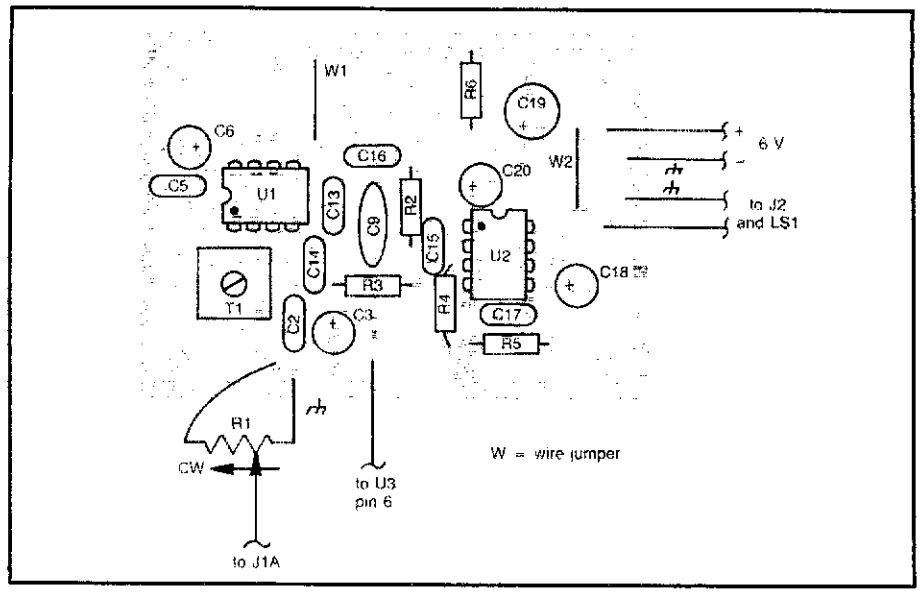


Fig 3—Parts-placement diagram for the modified Neophyte PC board. Parts are placed on the non-foil side of the board. The shaded area represents an X-ray view of the copper pattern. Note that there are no modifications to the etching pattern shown in the original Neophyte article; just components change.

Table 1

Parts Suppliers

All Electronics Corp, PO Box 567, Van Nuys, CA 91408, tel 800-826-5432.

Circuit Specialists, PO Box 3047, Scottsdale, AZ 85257, tel 800-528-1417.

DC Electronics, PO Box 3203, Scottsdale, AZ 85257, tel 800-423-0070.

International Crystal Mfg Co, PO Box 26330, Oklahoma City, OK 73126-0330, tel 405-236-3741.

Jameco® Electronics, 1355 Shoreway Rd, Belmont, CA 94002, tel 415-592-8121.

JAN Crystals, 2341 Crystal Dr, Ft Myers, FL 33906-6017, tel 800-237-3063.

Global Specialties, PO Box 1405, New Haven, CT 06505, tel 800-345-6251.

Mouser Electronics, 2401 Hwy 287 N, Mansfield TX 76063, tel 800-346-6873.

RADIOKIT, PO Box 973, Pelham, NH 03076, tel 603-437-2722.

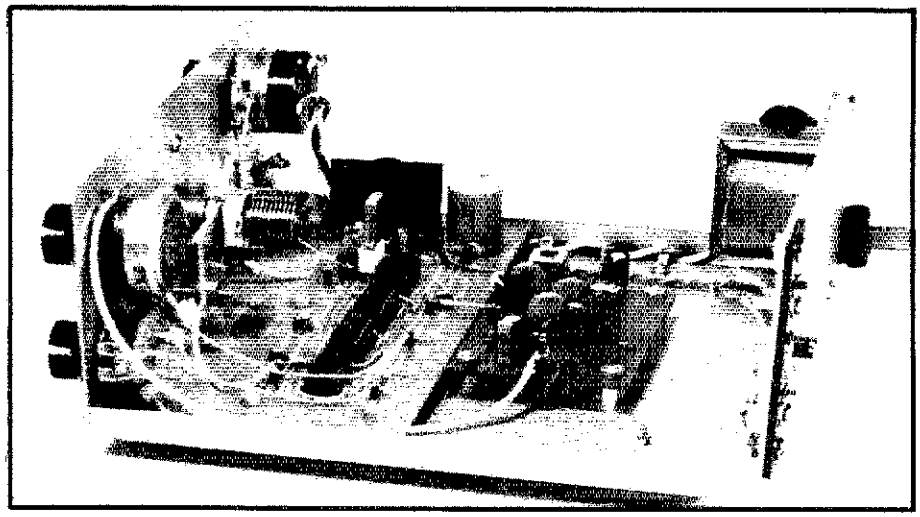


Fig 4—Interior view of the Simple Secondary Frequency Standard.

I mounted both boards to the cabinet with screws and 1/4-inch-long metal spacers. Be sure to ground each board through solder lugs mounted on the underside of the board at each spacer. Fig 4 shows how I mounted the boards so that the lead lengths between the boards, and to C12, are as short as possible. These are

A Bit About CMOS Oscillators

The secondary frequency standard uses a CMOS oscillator to drive a divider chain, and as the Neophyte receiver's local oscillator (LO). A square-wave oscillator like this may not seem like a good candidate for a receiver LO, but balanced mixers (such as the Gilbert-cell mixer used in the NE602N) work quite well with a square-wave LO. Using a square-wave LO can provide 10 to 15 dB more LO rejection than can normally be achieved with a sine-wave oscillator.

CMOS oscillators are usually built around an inverter chip. Oscillators using an even number of cascaded inverters can be tricky to get running properly, but any *odd* number of inverters will always oscillate with a suitable frequency-determining feedback network. Fig A shows a diagram of a basic oscillator circuit.

A crystal makes an ideal feedback network. Fig B shows a typical crystal-oscillator circuit that uses an inverter. R1 and R2 control the feedback and loop attenuation. R2 ensures that the inverter has a dc path from output to input to bias it on. This resistor should be at least 1 megohm; values of 10 to 22 megohms are commonly used to keep the Q of the crystal from being degraded.

Both C1 and C2 affect the oscillator frequency; they are usually made equal in value, with C2 variable to permit fine tuning. Just how much tuning is possible depends on the crystal characteristics and the specific oscillator circuit.

Any odd number of inverters can be used, but propagation delay through the total string affects the highest possible operating frequency. Operating frequency is not the only consideration, however.

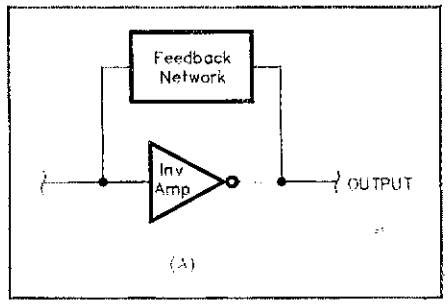


Fig A—Basic oscillator circuit.

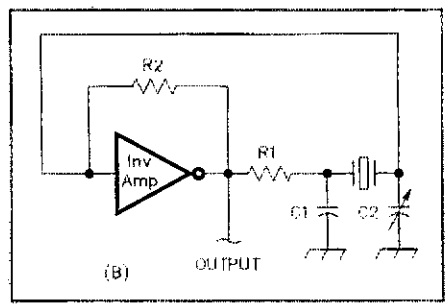


Fig B—Typical crystal oscillator circuit using an inverter.

Many crystals will oscillate readily at their third *overtone*. (An overtone is a complex crystal resonance that occurs at a frequency close, but usually not identical, to an odd-numbered harmonic of the crystal's fundamental frequency.) Usually this is undesirable; a simple solution to this problem is to cascade enough inverters—always using an odd number—so that the propagation delay around the loop is too long for the third overtone to be reinforced at the input. The delay must not be so long that fundamental operation is suppressed, however.

Fig C shows a second way of suppressing unwanted overtone operation. The RC combination in Fig C is a low-pass filter which has a cutoff frequency well below the crystal's third overtone (but *above* the desired oscillator frequency!). This prevents positive feedback at the overtone.—*W6VAT*

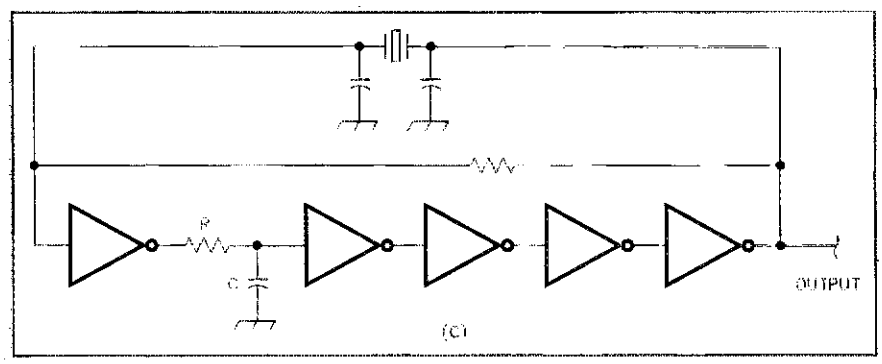


Fig C—One way of suppressing unwanted overtone operation.

the only critical RF leads.

I used 16 miniature test-point terminals for connections to the boards. (Terminals are not necessary, but they make interconnection between the boards and the front-panel controls easier.) Two short pieces of no. 22 tinned wire connect C12 to the digital board.

The power transformer is mounted on the left side of the rear panel, and the ANTENNA INPUT/MARKER OUTPUT terminal strip is on the right side. I installed this particular terminal strip to allow the use of a random-wire antenna; you can use phono or coaxial connectors if you want.

The speaker mounts over louvers on the right rear of the cabinet cover. This keeps the speaker away from the transformer to minimize hum pickup. The PHONES jack is mounted on the front panel for convenience. Shielded wire is used for the leads to T1 and for the audio-output leads from the Neophyte board to the speaker and the headphones. The marker-output lead from the output control is also shielded, but the marker leads from the digital board are short enough so that ordinary hook-up wire can be used.

C12 mounts on a 1 × 1-5/8 × 1/16-inch aluminum plate. The plate mounts on the 1-inch-long screws that hold the dial to the front panel for maximum rigidity. Note the capacitor mounting position shown in Fig 4. I mounted the capacitor this way to minimize lead length to the digital board and to make it easier to attach the temperature-compensating capacitors. The use of a vernier dial may seem unnecessary, but the convenience it provides for zero beating the receiver to WWV or WWVH is worth the cost.

With the exception of U8 (78M06, TO-5 version), all parts are available from the suppliers listed in Table 1. A TO-220 78M06 regulator is available from Mouser. Any small 20- to 25-pF variable capacitor is suitable for C12. Some items, such as the vernier dial and the cabinet, vary in price from supplier to supplier, so check around. Note that mail-order suppliers usually have minimum-order requirements. The frequency standard does not require shielding, so a plastic cabinet works as well as the metal one used on the unit shown. Flea markets, hamfests and your buddy's junkbox are also good places to buy or barter any parts you may need.

Calibration and Operation

Calibration is easy once you are receiving a good signal from WWV. Don't try to calibrate the standard on a weak or fading signal—accuracy will suffer. Calibration is best done when there are no propagation anomalies.[5]

Set the vernier dial to 50, or midrange

Temperature Compensation

You can temperature-compensate the standard to minimize the effects of temperature variation. You may not always be able to receive a usable signal from WWV, and you need confidence that the standard is not very far off frequency during such times. C12 is a 20-pF variable in parallel with a fixed-value NP0 (zero-temperature-coefficient) capacitor (C12A) and a fixed-value N750 negative-temperature-coefficient capacitor (C12B). With C12 set at midrange—10 pF—the fixed capacitors bring the total to 30 pF. To start with, make the two fixed capacitors equal in value (10 pF each). A simple—but somewhat lengthy—procedure is used to adjust the two capacitor values to reduce the frequency drift with temperature to a minimum. This procedure is similar to one described by Irwin Hoff, W6FFC, in November 1968 *QST*.†

To adjust the temperature-compensating capacitors, turn the standard on and let it run for a few days. When the room is as cold as it normally gets, carefully set the frequency close enough to WWV that you can count the beat note (wows) for a period of 30 seconds or so. Write down the number of beats so you won't forget the value. Then, when the room is about as hot as it normally gets, come back and count the beats again. If there has been a change, adjust the vernier dial for a low beat count, and again count the beats over a 30-second period.

Note which way you adjusted C12. If you increased the capacitance of C12, the crystal drifted higher and you need to decrease the value of the N750 capacitor—say, to 5 pF. Then increase the NP0 capacitor to 15 pF so the total capacitance stays at 30 pF with the vernier dial set at midrange. This means you need a small supply of low-value NP0 and N750 capacitors. My unit needed an 8-pF NP0 in parallel with a 12-pF N750 for final compensation.

Repeat this procedure the next day and make any further adjustments to the NP0/N750 capacitor combination to further reduce the drift. If you go too far and drift is reversed, simply back up until the drift is eliminated. It shouldn't take more than a couple of days until the drift is reduced to just a couple of hertz. You can use ceramic capacitors with other negative-coefficient values (N1500, for example), but their effects will be different.

Once these procedures are complete, you will have close control over the standard with only slight adjustments of the vernier dial. As a result, you should have accuracy approaching 1 part in 10^7.—*W6VAT*

†I. Hoff, "The Mainline FS-1 Secondary Frequency Standard," *QST*, Nov 1968, pp 34-38, 152.

on the variable capacitor. Apply power. Assuming all is well, plug in your headphones and advance the RF GAIN control, R1, for a comfortable listening level. You should hear WWV, and the signal can be maximized by tuning T1 to resonance. Use a plastic screwdriver for this adjustment, not a metal one. Once T1 is peaked properly, adjust the vernier dial for zero beat.

Wait for the silent period between 45 and 60 seconds of each minute. Although WWV and WWVH broadcast voice announcements for Geophysical Alert Broadcasts with no accompanying audio tones, the main silent periods extend from 45 to 51 minutes after the hour on WWV, and from 15 to 20 minutes after the hour at WWVH. These are ideal times to calibrate the standard.

Adjust the vernier dial. You will hear one or more beat notes depending on how far off the crystal oscillator frequency is. As you approach zero beat, you will hear a fluttering sound followed by a "wowing" sound very close to actual zero beat. By careful adjustment of the control, you should get the wowing sound to less than one beat per second. It may take several silent periods, so be patient. It is also possible to tune to zero beat on the voice announcements just as you would tune in an SSB signal: Simply tune slowly for maximum voice clarity. Adjustment for zero beat can also be done by using WWV's audio tones.[6] Once the crystal is calibrated, your markers will be quite accurate.

Operation of the standard is the same as with any other marker generator. Couple a small amount of marker output into your receiver or transceiver. Select the marker frequency you want with the MARKER switch, and adjust the marker OUTPUT control for a comfortable level. The RF GAIN control can be used to turn down the audio signal while leaving the markers on. Conversely, you can shut the markers off and leave the Neophyte on.

Stability—Short-Term versus Long-Term

Once you have the crystal zero beat with WWV, your standard's accuracy should be close to 1 Hz in 10 MHz—but what will it be tomorrow? Over the short term—hours to days—the crystal frequency will not hold still. Temperature variations, turning the unit on and off and aging effects cause its frequency to wander about. Crystal aging is a long-term effect that occurs over months and years, and there is little you can do about it. Usually, aging is not severe. It is a function of crystal manufacturing techniques and the crystal drive level. One manufacturer quotes aging rates of 3 to 5 parts per million for the first year, with subsequent aging rates being reduced by 50% to 70% per year.[7]

Short-term stability is of more concern in a standard like this. Temperature variation is the main cause of short-term wandering of the crystal frequency. Anything you can *do* to reduce or eliminate it will help greatly. You can leave the standard on all the time and keep it in a room where temperature variations are limited. Beyond that, proper selection of the temperature-compensating capacitors (see the sidebar, "Temperature Compensation") is the most important factor in reducing short-term drift.

Other Possibilities

Obviously, the standard is quite useful in the workshop for testing and calibrating other equipment. In addition, you don't have to use 10 MHz if the 2.5- or 5-MHz WWV signal is more consistent at your station. (I doubt that the 15- or 20-MHz signals would be of much use as a standard because of the vagaries of HF propagation.) Chapter 6 of the latest edition of *The ARRL Data Book* shows how to wire the 7490s for different division ratios. Remember, you'll have to retune the Neophyte's front end, too.

In the unit shown, the MARKER switch has two OFF positions for the sake of convenience. If you delete one, you could use it to switch the output to a piece of shielded cable to bring out the 10-MHz signal for other uses.

So there you have it—a simple secondary standard that provides very accurate markers and serves as a WWV receiver to boot. It's easy to build and low-cost, considering its accuracy and usefulness.

Jim Lee has been licensed since 1944. He enjoys DXing and public-service operating when he's not designing and building gear for his shack and workshop. Jim is recently retired from GTE-Sylvania, where he worked as a Satellite Systems Engineer.

Notes

[1]A primary frequency standard is reproducible from specifications. A secondary frequency standard is calibrated by comparison with a primary standard.—*Ed.*

[2]J. Dillon, "The Neophyte Receiver," *QST*, Feb 1988, pp 14-18.

[3]Circuit boards and parts kits are available from Penntek Electronics, as described in the Neophyte article (see note 2).

[4]Write to the ARRL Technical Dept Secretary, 225 Main St, Newington, CT 06111. Enclose a self-addressed, stamped envelope. Be sure to include the name of this article with your request.

[5]J. Schaull, "Adjustment of High-Precision Frequency and Time Standards," *Proc IRE*, Jan 1950, pp 6-15.

[6]You can also tune in WWV or WWVH when tone modulation is present and set the standard oscillator by adjusting C12 until the pitches of both tone sidebands are identical—in other words, by zero-beating the tone sidebands with each other.—*Ed.*

[7]CTS Corp, Knights Division catalog, 400 Riemann Ave, Sandwich, IL 60548.

Recommended Reading

J. Janicke, "A Wide-Range Crystal-Controlled Frequency Standard," *QST*, Jul 1976, pp 27-28.

B. Kelley, "Universal Frequency Standard," *ham radio*, Feb 1974, pp 40-47.

D. Blakeslee, "Double Standards," *QST*, Apr 1972, pp 13-17.

G. Collier, "What Price Precision?," Part 1, *QST*, Sep 1952, pp 42-44, 130, 132; Part 2, *QST*, Oct 1952, pp 26-30, 120, 122, 124.

Product Review

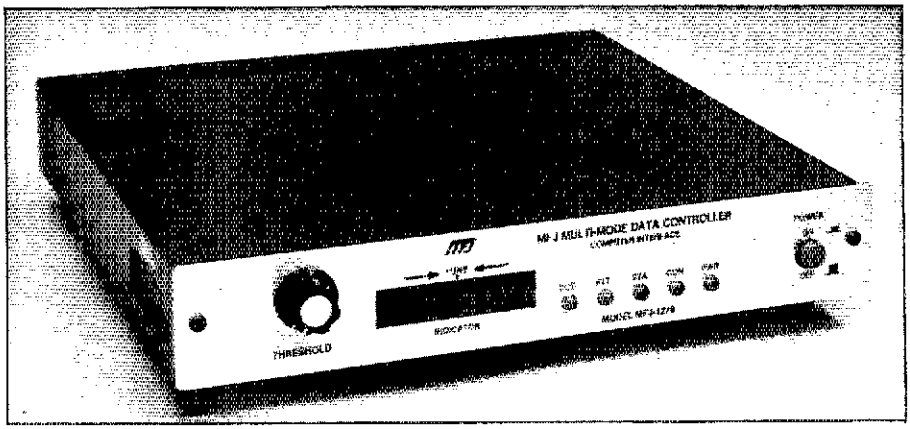
Conducted By James W. Healy, NJ2L
Assistant Technical Editor

MFJ-1278 Multi-Mode Data Controller—Revisited

Editor's Note: We published our review of the MFJ-1278 in July 1989 *QST*. After the purchase of that unit (March 1988), MFJ made substantial changes and improvements to both the hardware and firmware of the '1278.

We received several questions about that review, so we'll take this opportunity to clarify a few things. Because of factors such as *QST*'s lead time, products reviewed sometimes aren't the latest available versions, although we make every effort to ensure that the most recent units are reviewed—and that any late updates are discussed in the review. Comments on the MFJ-1278 reviewed in the July issue were based on the unit that we purchased, which—as received—contained circuit-board revision 6 and firmware version 1.5. (ARRL purchased one subsequent firmware update from MFJ [version 2.1] *based on an advertisement* in *QST*. ARRL received no notification of that or of subsequent updates to the '1278.)

In this issue, we revisit the MFJ-1278. Our intent is to provide the League membership with accurate information on all reviewed equipment. Secondly, our July 1989 '1278 review did not reflect MFJ's recent efforts to improve the '1278. League members should be confident that *QST* reviews are based on the latest available versions of reviewed equipment. Therefore, in this case, we feel that it's in the best interests of ARRL membership, MFJ and ARRL to revisit the MFJ-1278—in its *current* form (June 1989 manufacture)—in this month's Product Review column.



The current-production MFJ-1278 contains circuit-board revision 8 and firmware version 2.3; the unit reviewed here is of the current model. Some comments concerning the next revision, due out this month (September), are included in this review. For background on the previously reviewed MFJ-1278, see "Product Review" in July 1989 *QST*. This month's review mainly covers features that have been added or substantially improved since the release of the version reviewed in July *QST*, and doesn't cover most of the unchanged features of the '1278. Of course, where necessary, I'll discuss features germane to the old and new '1278s.

Setup

Connecting the newer '1278 to a radio is much simpler than doing so with the unit previously reviewed. (The original review unit had an incorrect-value coupling capacitor in the audio-input line, which made it impossible to get enough receive-audio drive from the AFSK OUT jack on my Kenwood TS-440S. This problem has been corrected in the newer units; I had no trouble driving the '1278 with the '440.)

Connecting the '1278 to a computer is simple and straightforward. I used the '1278 with both an Apple® Macintosh® and an IBM® PC. The IBM PC software available from MFJ in the IBM PC Starter Pack is further developed and more refined than MFJ's Macintosh software. Although both software packages work, the Macintosh software crashes too often for serious work. (This may be a compatibility problem with my Macintosh; my computer has the original 64-kbyte ROM. It's possible that the software was developed on a newer Macintosh, and that incompatibility with the ROM routines may account for the problems that I experienced with my Mac.)

Packet-Radio Operation

The unit first reviewed performed well on VHF packet radio, but gave less than optimal results in HF packet-radio operation. I'm glad to report that the new '1278 does very well on VHF *and* HF packet radio. I operated extensively on the HF bands using packet radio, and I'm impressed by the '1278's performance. Even on a crowded channel and/or with fairly weak signals, I was able to carry on QSOs and access packet-radio bulletin-board systems (PBBSs) without difficulty.

I was especially impressed by the new '1278's DCD (data carrier detect) circuit performance. This function, vital to HF packet-radio operation, performs admirably. (The DCD function is what allows reduced packet-collision rates, improving channel throughput.) Refinements such as this go a long way toward improving the viability of HF packet-radio operation with a multimode communications processor!

One of the '1278's new features is the Personal Mailbox, which allows those who connect to your station via VHF packet radio to send and receive messages, list messages, and delete messages left in the Mailbox for them. The '1278's Personal Mailbox feature makes your station into something of a VHF packet-radio-message clearinghouse. Able to store up to about 3 kbytes and a maximum of 30 messages, the Personal Mailbox is an interesting feature.

Yet another of the '1278's added capabilities allows for direct, real-time transfer of pictures (generated by packet radio, SSTV or FAX), to your printer when your station is connected via VHF packet radio to another '1278-equipped station. The IBM PC software provided in the MFJ-1284 Starter Pack allows display of these pictures on your computer screen. Any '1278-received FAX, SSTV or packet-radio pictures that you've stored on disk may be transferred between '1278s in this way.

RTTY and AMTOR

The modem improvements made to the '1278 by MFJ greatly improved not only the 1278's HF packet-radio reception, but also Baudot and ASCII RTTY. I made a lot of RTTY contacts, and even under less-than-optimum conditions, the '1278 provides relatively clean—and entirely usable—copy. Operating RTTY with the '1278 is now a pleasure—it quickly became one of my favorite modes!

Similarly, AMTOR operation shows a

marked improvement in the newer '1278. Although AMTOR is not one of my favorite operating modes, I did a lot of listening and made some contacts, and I'm pleased with the unit's performance.

Incidentally, there has been some confusion with regard to AMTOR operation with the '1278, aroused by the July 1989 '1278 review. The '1278 that ARRL first purchased for review (circuit-board revision 6/firmware version 1.5), which was not capable of AMTOR operation, was photographed for the first review. Before the unit was reviewed, however, it was sent to MFJ for an update to firmware version 2.1, which is AMTOR-capable. Thus, my comments on AMTOR with the earlier '1278.

The latest version of the MFJ-1278, due for release in September, has a revised cabinet, gray-scale capability in FAX and SSTV modes, and side-panel adjustable audio levels for both radio ports. Older versions of the '1278 can be upgraded by MFJ to include the features in this latest version.

CW Operation

CW reception is also considerably improved in the current '1278s. Even with relatively weak signals, the unit provides good copy of machine-sent CW. It also provides good copy of well-timed, hand-sent CW. With poorly sent CW, copy is not always acceptable, but that's attributable to the poor sending—not '1278 performance.

Using the unit as a CW keyboard is still a pleasure, and the buffers provide a convenient way to send standard information (rig, QTH, etc), and are good for contesting. The '1278's automatic serial-number incrementing is also handy in contests. The ability of the '1278 to function as an iambic keyer is an additional bonus.

Facsimile and NAVTEX

The old '1278's facsimile reception was quite disappointing, but in the latest version, FAX reception is so good that it is irresistible to tune around for interesting FAX transmissions. The current '1278 provides good copy of all seven supported FAX formats (1, 1.5, 2, 3, 4, 6 and 8 lines per second). Even though the current '1278 doesn't provide gray-scale capability (FAX pictures are displayed in black and white), I received some excellent pictures. I most enjoyed copying news-photo transmissions. Some of these were outstanding, with crisp, clean reproduction and a surprising amount of detail. MFJ even provides a list of frequencies, by mode and format, where FAX activity is common, to help get you started on FAX. An Epson®-compatible graphics printer is required for making printouts of FAX transmissions. FAX operation with the current '1278 is not the mere curiosity it was in early '1278s, but a mode which can easily become an obsession.

The current MFJ-1278 allows disk storage and printing of received FAX pictures—but only if you have software that has provisions to do so. (The software included in the IBM PC Starter Pack has such provisions.) Also, FAX pictures can be *transmitted* with the '1278. There are two catches, though: (1) Only previously received and disk-stored FAX pictures can be retransmitted, and (2) FAX pictures can be transmitted only at the rate (in lines per second) at which they were received. Even with these conditions, the '1278's FAX-transmission capability is interesting, and doesn't limit the '1278's performance in other areas, because FAX operation doesn't require special connections to the radio or computer, and it doesn't restrict operation on other modes.

NAVTEX-reception capability is also provided by the '1278. NAVTEX, an acronym for Navigational Telex, is a relatively new service in which several stations in North America transmit weather advisories, navigational warnings, ice reports, search-and-rescue information, pilot-service messages, LORAN and other information, including NAVTEX transmission schedules, on 518 kHz. NAVTEX is, in effect, a special case of FEC TOR. The '1278 allows you to select the NAVTEX stations which you want to receive (the default is all), and the information categories that you want to hear. Although I was able to hear the NAVTEX station in Boston, atmospheric conditions kept me from being able to test the NAVTEX capabilities of the '1278. Based on the '1278's performance on other modes, I'm confident that NAVTEX performance is good—under the right atmospheric conditions.

Table 1

MFJ-1278 Multi-Mode Data Controller, Serial no. 3016550

Power requirements: 12 V dc at 500 mA, provided by wall-cube supply (included).

Operating modes: AMTOR, ASCII and Baudot RTTY, CW, facsimile, HF and VHF packet radio, NAVTEX, slow-scan television.

Terminal/computer interface: RS-232-C serial interface with DB25 connector; 8-pin TTL serial port.

Computer/'1278 data rates: 300, 1200, 2400, 4800 and 9600 bauds.

Radio interfaces: 5-pin DIN connectors (two). Each provides connections for audio input and output, PTT, ground and squelch (optional).

SSTV

The MFJ-1278's slow-scan-television operation continues to present some difficulties. According to MFJ Vice President Steven Pan, KF5C, this is caused by synchronization problems related to the current '1278's lack of gray-scale capability (received pictures are displayed in only black and white) in the '1278. In pictures that have gray areas, the '1278 has trouble detecting the synchronization signals. The next update of the '1278 (see "Updates" later in this review) will be capable of displaying received pictures in four shades (black, white and two more in between). This hardware/firmware improvement will also help solve the synchronization problem.

I tested a preliminary version of the '1278 (version 9 hardware/version 3.3 firmware) using some recorded SSTV pictures with gray areas, and the unit performed well. Not only is the synchronization problem solved, but the four-shade pictures from the printer look quite nice. I was not able to test the unit with on-the-air signals, but based on its performance with recorded signals, I'd say it should do well.

MFJ is working on IBM PC software that will allow the display of four-shade SSTV images on screen, as well as that of multishade FAX images. This capability will be worth having, because printing SSTV pictures on a printer is time consuming. You can easily miss several pictures

while waiting for one to finish printing.

The Manuals

Two manuals come with the current MFJ-1278. One primarily covers packet-radio operation; the other also covers some aspects of packet-radio operation, and all of the '1278's other modes. At first glance, the manuals don't appear to be much different than the original documentation, although some errors and typos have been corrected. The indexing is still somewhat difficult to use, but I found most of the information that I looked for by checking the tables of contents, index and/or by looking in the appropriate general section of the documentation. Often, the information presented in the Commands chapter (which lists commands in alphabetical order) is complete enough to answer most questions about a particular operation. There are several (mostly minor) errors in the documentation, but these problems (incorrect page references, typos and such) are not major inconveniences.

Overall Impressions

I was impressed by the current version of the '1278—it offers good performance, on a lot of modes, for a reasonable price. It offers a substantial improvement in performance over earlier versions; in the current '1278, each mode (except SSTV) provides truly usable operating capability. If you are interested in a unit which offers more than just packet-radio operation, the '1278 merits careful consideration. Even if you're only interested in packet radio, you may decide otherwise after experimenting with other modes! When you consider the variety of operating possibilities the '1278 offers, including its ability to serve as an iambic keyer, it definitely deserves a second look when shopping for a multimode communications processor.

Updates

MFJ has sweetened the deal for new MFJ-1278 buyers: When you buy a '1278, you'll receive a coupon for one free firmware upgrade. MFJ won't notify you of the availability of such upgrades, but when you contact MFJ and find that a firmware upgrade is available, or when you see one advertised, you can redeem your free-upgrade coupon.

The newest '1278, circuit-board revision 9/firmware version 3.3, is scheduled to be ready for shipment in September. This unit offers a number of improvements over the circuit-board revision 8/firmware version 2.3 unit, and will be documented in a single, new manual. Among the improvements are the SSTV upgrades and multi-shade FAX displays (with a computer running the appropriate software). Other refinements include independent transmit-audio-level controls (for radio ports 1 and 2) located on the side of the cabinet.

According to MFJ, '1278s with serial nos. above 03010508 (firmware version 2.2 or earlier) may be upgraded by the user for $24.95 plus $2 shipping and handling by sending in the old EPROM. This does not include hardware or firmware support for the multi-gray-level modem. Factory-installed multi-gray-level modem and supporting firmware is $49.95 (plus $5 s&h).

For '1278s with serial nos. below 03010508, the factory-installed firmware upgrade for units with firmware version 1.1 or earlier is $24.95 (plus $5 s&h); for units with firmware version 2.1 or later, the user-installed firmware upgrade is $24.95 (plus $2 s&h). This does not include hardware or firmware support for the multi-gray-level modem. Contact MFJ for details on the multi-gray-level modem and firmware for units with serial nos. below 03010508.

All upgrade prices are based on exchanging the old EPROM; units should be sent postpaid to MFJ for all factory-installed upgrades.

Price class: MFJ-1278 (hardware version 9/firmware version 3.3) with wall-cube ac supply, $280; Starter Packs, $25 each. Manufacturer: MFJ Enterprises, PO Box 494, Mississippi State, MS 39762, tel 601-323-5869.

SOLICITATION FOR PRODUCT REVIEW EQUIPMENT BIDS

[In order to present the most objective reviews, ARRL purchases equipment off the shelf from Amateur Radio dealers. ARRL receives no remuneration for items presented in the Product Review or New Products columns.—*Ed.*]

The ARRL-purchased Product Review equipment listed below is for sale to the highest bidder. Prices quoted are minimum acceptable bids, and are discounted from the purchase price(s).

Sealed bids must be submitted by mail and must be postmarked on or before September 27, 1989. Bids postmarked after the closing date will not be considered. Bids will be opened seven days after the closing postmark date. In the case of equal high bids, the high bid bearing the earliest postmark will be declared the successful bidder.

In your bid, please clearly identify the item you wish to bid on, using the manufacturer's name, model number, or other identification number, if specified. Each item requires a separate bid and envelope. Shipping charges will be paid by the successful bidder, FOB Newington. The successful bidder will be advised by mail. No other notifications will be made, and no information will be given by telephone to anyone regarding final price or identity of the successful bidder.

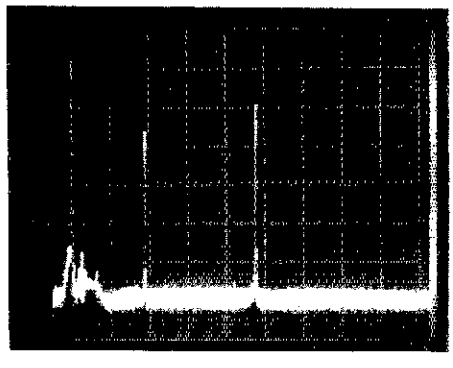
Please send bids to Kathy McGrath, Product Bids, ARRL, 225 Main St, Newington, CT 06111.

Yaesu FT-747GX MF/HF transceiver, s/n 8D040384, including FP-757HD power supply/speaker and *FT-747GX Technical Supplement* (see Product Review, August 1989 *QST*). Sold as a package only. Minimum bid: $680.

New Products

VIDEOSMITH SPECTRUM PROBE

☐ VideOsmith's Spectrum Probe allows you to measure RF signal levels and frequencies on an oscilloscope display, effectively converting the scope into a spectrum analyzer. The Probe provides the amplitude-v-time to amplitude-v-frequency conversion necessary to display the frequency domain on a scope screen. The photo shows a typical Spectrum Probe display with 21.2- and 50.2-MHz input signals.



Spectrum Probe display with 21.2- and 50.2-MHz input signals. The dc pip (generated in the Probe) is visible at the second-from-left vertical graticule line. Only the 21.2- and 50.2-MHz signals were applied to the Spectrum Probe for this test; all other visible signals were generated in the Spectrum Probe.

The 7½-inch-long × 1-inch-diameter, two-ounce Spectrum Probe has a 10-pF input-coupling capacitor, and can be used in 50- and 75-Ω systems. Key manufacturer-claimed specifications are as follows: usable frequency range, 1 to over 100 MHz; dynamic range, >50 dB; vertical logarithmic linearity, ± 3 dB; horizontal linearity, ± 10%, typ; vertical gain, 5 mV per dB typ; spurious responses, −40 dB typ; maximum CW input, +15 dBm, 1 V @ 100 MHz; sweep rate, 6 ms per 100 MHz typ; power requirement, 120 V ac @ 35 mA (wall transformer supplied). With a delayed-sweep scope, improved frequency resolution can be had; minimum usable bandwidth is about 500 kHz.

Price: $380. For more information, contact videOsmith, 1324 Harris Rd, Dresher, PA 19025, tel 215-643-6340.—*Rus Healy, NJ2L*

Hints and Kinks

Conducted By David Newkirk, AK7M
Assistant Technical Editor

HOW CAPACITORS CURE HUM FROM POWER-SUPPLY DIODES: ONE EXPLANATION

AK7M: In an editor's note appended to Michael Dees's "Bypass Capacitors Cure Power-Supply Noise" (Hints and Kinks, *QST*, July 1988, p 44), I described how I'd cured a hum-on-received-signals problem by bypassing the rectifier diodes in a transceiver power supply. Here's one ham's response to my request for an explanation of this phenomenon:

☐ The hum phenomenon described by N3EZD and the editor was well known in medium-wave radios built in the 1930s. The hum occurs when amplitude-modulated RF enters the receiver mixer stage via two paths: (1) Energy from the short antenna enters the mixer via the receiver RF stage; (2) the power line, working as an antenna, also supplies RF to the radio via more or less uncontrollable paths (by means of conduction and stray capacitance). The power-line-conducted RF is amplitude-modulated at the line frequency and its harmonics in the power-supply rectifiers, which act as modulators.

Strong signals cause the receiver automatic gain control to reduce the RF-amplifier gain, reducing the level of signal that reaches the mixer via Path 1, whereas the hum-modulated RF from Path 2 remains nearly unaffected and becomes the dominant input signal at the mixer.

The cheapest way to avoid this effect is to short-circuit the "modulator" diodes for RF with capacitors. Indeed, many 1930s-vintage radios had bypass capacitors in parallel with their rectifier tubes. Such capacitors must be able to withstand considerable high-voltage stress. During WW II, and for a period after the war (when capacitors were in short supply), radio repair personnel cured the problem of a destroyed rectifier-bypass capacitor by just removing it from the radio. The radio owner had to tolerate the resulting hum. (Our radio language adopted a new word in those days: *Blinddarmkondensator* [literally, "appendix-capacitor."])

The better way to solve this hum problem is to RF-filter the power supply input and output leads, and to shield the line(s) between the power supply and receiver. *—Helmut Zurneck, DL4FBI, Ritterstrasse 26, 6110 Dieburg, West Germany*

And K4GXY used power-supply-diode bypass capacitors to solve another RF-related problem:

☐ My Heath® HW-5400 transceiver and Tenna Phase III power supply had bad transmit and receive audio problems (distortion and hum) until I bypassed each of the power supply's diodes with 0.01, 0.1 and 1-μF capacitors. The Tenna Phase III power supply does not include ac-line bypassing; connecting capacitors from hot to neutral, and from hot and neutral to ground, did not solve the problem.

SWR-related RF feedback seems to cause the problem. I speculate that RF is rectified and superimposed as AF on the power supply's dc output; I arrived at this conclusion by observing that the superimposed voltage increases with SWR.

Like the ICOM IC-735 and Kenwood TS-430S, the HW-5400 contains a stepped-tuned PLL VFO.—*John W. Gallagher, PE, K4GXY, 411 S Elm Rd, Lakeland, FL 33801*

MAYBE YOU NEED TO RESET THE MICROPROCESSOR

☐ Most late-model ham equipment is microprocessor-controlled. Occasionally, the microprocessor in such a radio may "lock up" for some reason, rendering the equipment useless. Working part-time at an Amateur Radio store, I've seen many rigs brought in for repair that required no repair other than resetting their microprocessors—a simple task that could have been done by their owners!

Reset procedures vary from radio to radio. In some cases, a panel button must be pressed as the equipment is powered up. Other gear requires that a toothpick or pencil be used to activate a switch through a small hole in the equipment case. Your transceiver's operating manual probably details the procedure necessary to reset the rig's microprocessor.

Certainly, *all* failures in state-of-the-art radios aren't caused by locked-up microprocessors. But it never hurts to give the reset procedure a try—you might save yourself a trip and a service charge. *—Michael A. Czuhajewski, WA8MCQ, Box 232, Jessup, MD 20794*

AK7M: Resetting a rig's microprocessor (also called a *micro* for short, or *CPU* [central processing unit]) may involve one undesirable side-effect: the erasure of frequency, mode, repeater split and other information in memory channels. Be sure to record such information before you try a reset!

In April 1989 Hints and Kinks, Joseph Wavra Jr, WQ5M, described a method of resetting the ICOM IC-02AT that required disassembly of the radio. Our next Hints and Kinks contributor suggests an easier means of resetting the micro in that transceiver:

EASIER RESET FOR THE ICOM IC-02AT CPU

☐ There's a much simpler procedure for resetting the IC-02AT CPU—one that does not require opening the radio. (1) Turn the radio off. (2) Press the FUNCTION button on the side of the radio and hold it on. (3) Turn the radio on. That's it! The '02AT's CPU is now reset, and all of the rig's memories are set to their default value (144.000 MHz).—*Pat Maturo, N1DYI, 233 Harvester Rd, Orange, CT 06477*

AVOIDING STATIC DAMAGE TO THE HEATH μMATIC MEMORY KEYER

☐ Heath suggests that users of the μMatic Memory Keyer ground themselves to protect the μMatic's components from electrostatic discharge (ESD). ESD danger is especially high on winter days when the relative humidity in heated buildings is low. Fig 1 shows my solution to this problem: a grounded metal strip that I touch each time my hand goes to the μMatic paddles. The strip consists of self-adhesive, stainless-steel tape (available in hobby or "home center" stores). The rubber pad also provides an antislip base for the keyer. *—John DeCicco, KB2ARU, 1816 Ave S, Brooklyn, NY 11229*

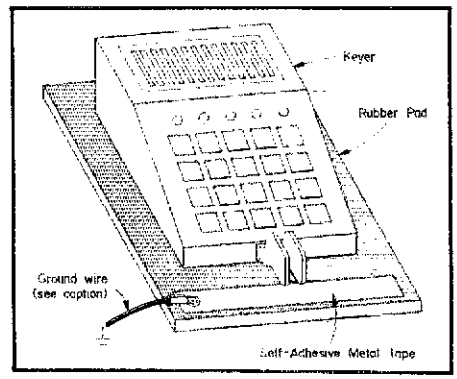


Fig 1—John DeCicco protects his μMatic keyer from static-electricity damage with a grounded length of self-adhesive steel tape. The rubber pad supports the tape and keeps the keyer from sliding on the table. Approaching John's antistatic measures from a commercial angle, computer stores carry "groundable" resistive strips and mats intended to protect computers and keyboards from ESD; such products would also protect the μMatic. Hints and Kinks suggests installing a 1-megohm, 1-watt resistor (or a series-parallel resistor combination of equivalent resistance and power rating) between the metal strip and ground to limit current in the strip ground to an operator-safe level.

PREVENTING MORE SCRATCHES FROM MAGNETIC-MOUNT ANTENNAS

☐ I agree that a surface protection (consisting of polyethylene or another material) can help keep a mag mount from scratching car-finish paint (G. Manning, "Preventing Scratches from Magnetic-Mount Antennas," Hints and Kinks, *QST*, August 1988, p 50). But I've found that the *real* problem is grit and dirt that accumulates between the mount and the auto body. After having tried new protective materials with numerous magnetic mounts, I think the best solution is to start with a new surface protector and

clean the dust off the paint and protective material *daily*.

Plastic bags won't scratch clean paint. New magnetic mounts won't scratch clean paint. Even old, rusty magnetic mounts won't scratch paint very much if there is no dust or dirt between them and the body surface. Keeping your car and the magnetic mount clean is the best insurance against scratches.

One more hint: *Don't ever* place a mag mount across a body joint (such as that between the hood and fender). No matter how well-built your car is, its adjacent surfaces vibrate relative to each other when the engine is running. A mag mount placed across body joints will scratch down to the undercoat in less than a week on an average car!—*Howard M. Lang, KB6NN, 3124 H St, Eureka, CA 95501*

STORE YOUR *QST*s IN THEIR PLASTIC MAILING BAGS

☐ Don't throw away those plastic wrappers *QST* comes in. They're an excellent way to preserve your *QST*s. After each month's *QST* arrives, I carefully trim one end of the bag to remove the magazine. Reinserting *QST* in its bag is easy: Bend the magazine slightly in its middle and slip it back into the bag. Wonder if I can buy these bags by the dozen from ARRL? —*Bill Eppley, W2SDB, 434 Adams Ave, Cape Canaveral, FL 32920*

AK7M: QST Circulation Manager Debra Jahnke tells me that *QST* bags *aren't* available from HQ because they're custom cut and sealed as *QST* rolls off the presses each month at R. R. Donnelley & Sons, Glasgow, KY. Debbie adds that some members use zip-resealable food-storage bags for storing *QST*.

AN AUDIO-TAPE TRANSMITTER KEYER

☐ Need a simple means of transmitting a canned CW message? Use a code-practice or sidetone oscillator to record the message on an "endless" tape cassette (a telephone-answering-machine tape is fine). Play the tape back through the audio-driven keying circuit shown in Fig 2.

I use this circuit to key an experimental 175-kHz beacon—an application that requires Q1 to key only 10 mA. You may need to add a stage of dc amplification between the rectifier and Q1 to key higher currents.—*Arthur C. Erdman, W8VWX, 224 Chaucer Ct, Worthington, OH 43085*

SERIES-RESONANT CIRCUIT ENHANCES DESIRED SIGNAL IN QRP RIG

☐ During cut-and-try construction of a QRP CW rig that uses push-push doubling to produce 14-MHz drive from a 7-MHz VFO, I discovered that the stages following the doubler had output everywhere *except* 14 MHz! I solved this problem by installing a series-resonant tuned circuit between the doubler and its buffer stage (Fig 3). I have also successfully used series-resonant circuits between the antenna and output stages of monoband rigs to minimize TVI. (By the way, I first submitted something for Hints and Kinks in *1932*, but *QST* didn't publish that hint. I have since recovered from my feeling of rejection and decided to try again!)—*Bob Kuehn, WØHKF, 1871 Silver Bell Rd, Apt 313, Eagan, MN 55122*

CURING CORDLESS-PHONE RFI

☐ After disabling two cordless-phone base units—one base unit and its replacement—with my 100-W transmitter, I knew I needed a *real* RFI solution. I solved the problem by adding ferrite-core RF chokes in *all* cords leading into and out of the base unit. I made each choke by winding a single-layer coil of as much cord as possible on a 4-inch-long ferrite rod (material 33, permeability 800).[1] Nylon cable ties hold the windings in place. I formed each choke as close to the body of the phone base unit as possible for maximum interference suppression.—*Jack G. Hollenbeck, W6JIC, 3166 Bryant St, Palo Alto, CA 94306*

[1]Amidon Associates (12033 Otsego St, N Hollywood, CA, 91607) carries such rods as part no. R33-050-400; Palomar Engineers (PO Box 455, 1924-F W. Mission Rd, Escondido, CA 92025, tel 619-747-3343) carries them as part no. RF-4-33; and RADIOKIT (PO Box 973, Pelham, NH 03076, tel 603-437-2722) carries them as part no. R33-50-400.—*AK7M*

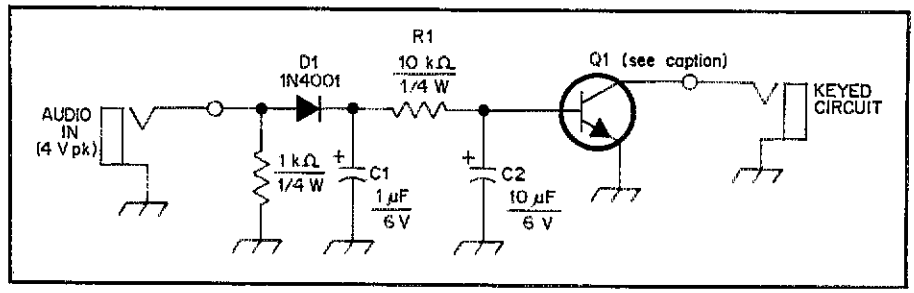


Fig 2—Arthur Erdman uses this audio-driven circuit to key his 1750-meter beacon. D1 rectifies the tape-recorder audio; C1, R1 and C2 filter the rectified audio to drive Q1, and Q1 pulls the keying line low when sufficient drive current flows between its base and emitter. Q1 is any small-signal, silicon NPN transistor capable of withstanding the voltage of the open keying circuit and capable of handling the keyed current. This circuit keys positive (negative-ground) keying lines only.

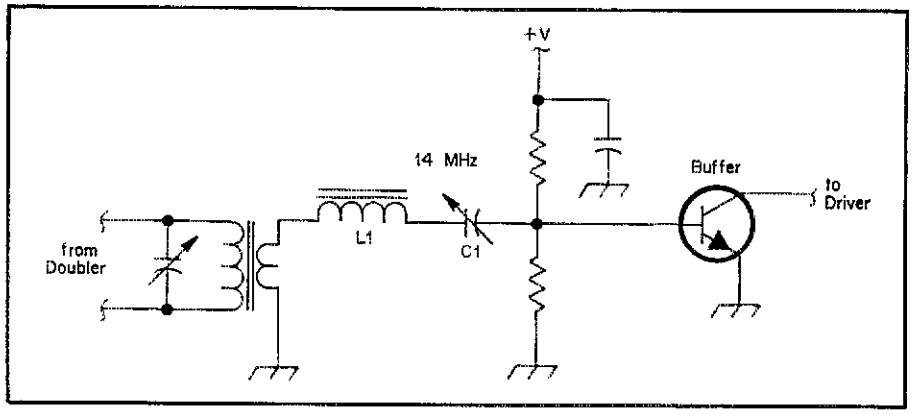


Fig 3—Bob Kuehn added this 14-MHz series-resonant circuit (L1C1) to clean up the output of a push-push doubler in his homemade QRP transmitter. L1 consists of 44 turns of no. 24 enameled wire on a T-68-2 powdered-iron toroidal core. C1 is a small air-dielectric capacitor capable of being set to about 11.5 pF.

How Would You Do It?

Problem: Antenna tuning is a hassle for you because the optimum spot for bringing your random-wire antenna into the house is a hallway and two rooms away from your station. You don't like locking the key with a switch, rock or heavy book and dashing to the window and back before the rig's finals overheat—and the other members of your family are tired of acting as voice-controlled relays ("Key down!...Key up!") at tune-up time. How can you stand at your windowsill-mounted Transmatch and key the transmitter *remotely*—without wires, and without a helper? Send your solutions to Hints and Kinks, ARRL, 225 Main St, Newington, CT 06111.

Technical Correspondence

Conducted By Paul K. Pagel, N1FB
Associate Technical Editor

UPDATES FOR "THE ELECTRONIC PARROT"

☐ I'm pleased by the response to my article, "The Electronic Parrot."[1] I have four enhancements for the project that I think *QST* readers would like to know about. (Unless otherwise noted, all references are to pages, schematics and components identified in the original article.)

Hum can be introduced into the microphone line when the Parrot's chassis is connected to the station ground. The path for introducing the hum is through a ground loop from the microphone ground back through chassis ground via the 12-V DC IN jack, J5 (see Fig 2, p 18). The best way to eliminate this path is to use a two-prong, insulated jack at J5, or feed the dc-carrying cable directly to the POWER switch (S13) and P4 through a grommet-lined hole in the chassis. The 12-V positive and negative leads should be routed through ferrite beads. Bypass the leads to chassis ground with 0.001-μF disc-ceramic capacitors. (Of course, the chassis remains at RF ground potential.)

Replace Q1 (a 2N2222) with an MPSA13 (Darlington), and replace R24 (100 Ω) with a 10-kΩ resistor. This eliminates the possibility of the PLAYM output being current limited when active.

Robert Fabry, N6EK, suggested a simple modification that aborts any message being played back whenever the "foot-to-talk" switch is actuated. This is useful, for example, when you start a message just as a station calls. The modification is performed by bringing out the contacts of an unused message button (such as no. 7) to a pair of spare switch contacts in the foot switch. When the foot switch is actuated, the spare contacts close and cause the ST/SP input of the '6258 to be asserted high. When this happens during playback, the message halts and the Parrot goes immediately into standby mode. Since there is nothing in the unused message (by definition!), this modification does not impede normal foot switch operation when the Parrot is in standby mode. In practice, all seven messages are rarely used, so you can place six message buttons on the front panel and dedicate the seventh to this purpose.

Finally, the Electronic Parrot can be modified easily to pass microphone audio through to the transceiver while recording. This is extremely useful, for example, when you want to record a CQ message while trying to hold a frequency. The modification also allows you to hear the new message (through the transceiver monitor) as it is being recorded, so the recording level can be regulated. As shown here in Fig 1, the modification merely involves the addition of two 1N914 diodes to the base of Q1.

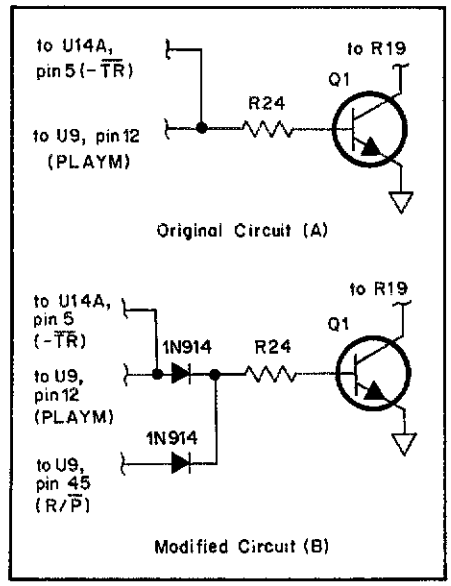


Fig 1—The Electronic Parrot can be modified to pass microphone audio through to the transceiver while recording by adding two 1N914 diodes to the base of Q1.

With the modified circuit, K1 is energized whenever S1 is placed in RECORD and S12 is set to IN. When the Parrot is recording to memory, U9 (see Fig 1B, p 16) passes audio from its input (VIN, pin 16) to its output (DAOUT, pin 30). The output signal is exactly the same as the signal produced when the message is played back; hence, you can tell immediately if you are speaking too softly or loudly, providing a means of setting level controls R2 (MIC GAIN OUT) and R3 (MIC GAIN IN)—see Fig 1A, p 15. When S1 is set to RECORD and S12 is placed in the OUT position, a message can still be recorded without keying the transceiver.—*Kevin D. Balmforth, NC6U, 621 N Ladera Vista, Fullerton, CA 92631*

C64 MEMORY TRANSPLANT

☐ Many amateurs aren't aware that a ready-made ASCII signal is available directly from the C64 USER PORT. The TTL-compatible signal at pin M can be used to modulate an audio subcarrier which, in turn, can be transmitted via AM, FM or SSB. Once the information to be transmitted is in the memory of the initiating C64, a simple one-line command accomplishes this:

```
OPEN 2, 2, 3, CHR$(3 + 32) +
CHR$(32 + 128) : CMD2 : LIST
```

Alternatively, this command may be incorporated into a BASIC program. In this case, data transmission begins when the program is run.

The OPEN portion of the command opens channel 2 to device #2, the modem. The first character-string function (CHR$) sets the data rate and word length. As given, the rate is 110 bauds. For 300- or 1200-baud operation, CHR$(3 + 32) should be changed to CHR$(6 + 32) or CHR$(8 + 32), respectively (see p 350 of the *Commodore Programmers Reference Guide).* The second CHR$ sets various parameters of the transmitted coding, as detailed on p 351 of the *Guide.*

At the other end of the radio circuit, the subcarrier is recovered from the receiver audio, routed through a PLL demodulator, then sent to USER PORT pins B and C (tied together).

To complete the transplant of information directly into the memory of the receiving C64, it's necessary to GET each character in succession from the modem and PRINT the character to the screen. Each time a RETURN is detected in the received data, a RETURN is introduced into the routine via the "dynamic keyboard"[2] (keyboard buffer), thereby implanting it in memory. All of this is accomplished by the BASIC program given in Table 1. (Note: You must ensure that any program you intend to transfer does not already contain program lines numbered 1 through 7. Otherwise, the program presented in Table 1 will not work correctly! If necessary, renumber the statements in the program to be transferred.)

Here's a description of each program statement:

1) The receive modem is OPENed in

[1] K. Balmforth, "The Electronic Parrot," *QST*, Dec 1988, pp 14-23.

[2] J. Butterfield, "Commodore Dynamic Keyboard," *Compute!*, Oct, Nov and Dec 1985. (These issues are out of print; back issues are not available. For more information, contact your local Commodore user's group or local library—*Ed.*) As described by Butterfield: "...dynamic keyboard programming uses a two-step method to let a program give itself direct-mode commands. Step 1 is to print the command at a specific location on the screen. Step 2 is to put a RETURN character in the computer's keyboard buffer, then stop the program with the cursor flashing over the screen command. The RETURN character makes the computer execute the command just as if you'd pressed RETURN."

Table 1

C64 Memory Transplant Program

```
1 OPEN 2, 2, 3, CHR$(3 + 32) + CHR$(32 + 128) : PRINT CHR$(147)
2 GET #2, A$ : IF VAL(A$) = Ø THEN 2
3 PRINT A$;
4 GET #2, A$ : PRINT A$; : A$ = A$ + CHR$(Ø) : IF ASC(A$) < > 13 THEN 3
5 PRINT : PRINT "POKE 152,1 : GOTO 7"
6 POKE 631, 19 : POKE 632, 13 : POKE 633, 13 : POKE 634, 13:
  POKE 635, 13 : POKE 198, 5 : END
7 PRINT CHR$(147) : GOTO 4
```

a manner similar to that of the transmit modem. CHR$(147) removes nonpertinent characters from the screen.

2) GET #2 fetches the first character from memory. If that character is part of the program preamble, its value is zero. Execution of the program is thereby reinitiated immediately.

3) The first valid character is PRINTed to the screen without a carriage return.

4) As program execution is well under way at this point, there is no further need to test for zeros. With the C64, the CHR$(Ø) is a necessary formality when performing this sort of operation. If the character is *not* ASCII code 13 (a carriage return), action loops back to line 3. Each character is PRINTed to the screen as it is received.

5) When a carriage return is detected, POKE 152,1 : GOTO 7, to be executed in line 6, is PRINTed to the screen.

6) The POKE commands place the cursor at the proper screen location, place four carriage returns in the keyboard buffer, then indicate that information is being held in the buffer as a total of five keystrokes (POKE 198, 5). It is the END statement that implements the POKE 152,1 : GOTO 7 statement that was printed to the screen earlier (in line 5). In this instance, END does not constitute the end of the program. The latter part of line 5 directs final action to line 7.

7) The screen is once again cleared and the program returns to line 4 to begin processing the next line.

The beauty of this approach lies in its simplicity. There is no need for ancillary programs, intermediate transformations, storage to disk, buffers, etc. Yet the program as received is wholly in memory and can be manipulated in customary fashion. All the other techniques I've seen substitute cumbersome hard-, firm- and software for something the C64 is inherently equipped to do.

Although I worked this out on 2-meter FM, the same procedure can be followed on HF. (However, I highly recommend the use of an audio band-pass filter on HF.) My modem is about as simple as one can get—I designed and built it myself. The modem plugs directly into the C64 USER PORT and requires no external power source. Details of the modem are available from me; please provide a business-size SASE.

Initial inspiration for this project was provided by Virgil Yarbrough, W5YGX (not Virgil Yarbrough, K4IEK[3]). The technique might never have been mastered had it not been for continuing encouragement and invaluable suggestions by Kenneth Bates, KF5WD. After a search of more than two years for a method of getting received data into memory, I am indebted to my son, Bill, for having discovered the final missing link—the POKE instructions in lines 5 and 6 of the receive program.—*Don Goshay, W6MMU, Emerald Beach Village, Golden, MO 65658*

[3]C. Pratt and V. Yarbrough, "Pictures by Packet," *QST*, May 1988, pp 15-17.

Note: All correspondence addressed to this column should bear the name, call sign and complete address of the sender. Please include a daytime telephone number at which you may be reached if necessary.

Feedback

☐ A couple of errors crept into Howard Lester's July 1989 *QST* article, "Interference Standards Revisited." In both photo captions, the US National Institute of Standards and Technology is incorrectly identified as the National Institute of Science and Technology. Also, both photographs were provided courtesy of M. L. "Mike" Crawford of the National Institute of Standards and Technology.

☐ A crystal-frequency typo found its way into "A Four-Stage 75-Meter SSB Superhet," May 1989 *QST*. On page 25, the sentence in the middle of the second paragraph of the third column should read: I found that I could shift a surplus 9.500-MHz HC-6/U crystal to 9.50013 MHz with C14 in place of W1, as shown. *(tnx Charles M. Schwab, Jr)*

The Care and Feeding of Trees

(continued from page 28)

the tree each time. I use a flexible truck tiedown to provide tension to the antenna.

Your Safety in Trees

A fall from a 40-foot tree is just as dangerous as a fall from a 40-foot tower. Yet, many times you see hams scaling trees with no safety equipment! Wear a tower-climbing safety belt for all tree climbs (see Fig 7). Commercial arborists take the matter of safety one step further: They lob a rope over a tree crotch just above the height at which they'll be working. Then they tie the rope to their safety belt. The loose end of the rope can be held by a helper on the ground.

Be sure to use a good quality rope that is heavy enough to support your weight. Before use, inspect the rope for wear. Arborists prefer to use hemp rope rather than nylon, because hemp rope stretches less.

When you're climbing a tree to attach a wire, always have a buddy on the ground available to fetch tools or summon help in an emergency. Be sure your buddy wears a hard hat; tools or branches dropped from even a moderate height can be dangerous.

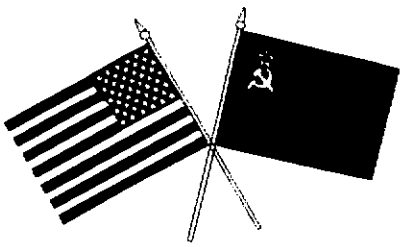
As an alternative to doing it yourself, consider procuring the assistance of a professional to install your tree antenna. A professional can clear away interfering branches and secure an eyescrew in short order. Professional tree trimmers generally work in pairs. They use a ladder or bucket truck to get up into the tree, and then they free-climb throughout the tree. A safety rope, saddle, and safety belt are worn. "A figure that I heard about how much this runs is about $50 an hour," says Maleike. Most antenna tasks can be done by professionals in about an hour.

Summary

Keeping your station in good operating condition is—or should be—a fundamental practice of every radio amateur. Part of that practice includes annual inspection of your antenna system. If trees are a part of your antenna system, take a good look at them. Are you keeping them healthy?

Doug Brede is a former Associate Professor of Horticulture at Oklahoma State University and is now research director for a major west-coast seed company. In addition to having written for QST before ("The Electronic Voice-Saver," QST, Jun 1980, pp 18-20), Doug has written over 100 technical articles on landscape topics for magazines in the landscaping industry.

Doug holds an Extra Class license, and operates mostly HF CW. For an antenna, he uses a dipole suspended between two 90-foot-tall Ponderosa pines.



Tune in to Glasnost

Part 1—Explore the labyrinthine structure of Soviet Amateur Radio in this first of a series.

By James D. Cain, K1TN
ARRL Contributing Editor
PO Box 42
Andover, CT 06232

All Soviet jamming of radio broadcasts was suspended in December 1988. Here's what one Yuri Makarov had to say in a Moscow newspaper:

"How hard it was to say good-bye even to the idea that it was necessary to spend millions on hissing and buzzing on the airwaves, to save our ears from untrue information from lying radio voices. Wouldn't it be cheaper for 'Mayak' [a major Soviet broadcaster] to begin to speak with an honest and informed voice? We did say good-bye to jamming—and lo and behold—all's well with Soviet ears."[1]

This striking example of change in the communist world gladdened the hearts of hams and SWLs everywhere. We think in international terms more than most people, East or West. Soviet amateurs probably dislike the Woodpecker (over-the-horizon radar intruding on our bands) just as much as their Western counterparts.

Len Traubman, W6HJK, who recently compiled *Russian Phrases for Amateur Radio*[2] sums up these feelings:

"After more than 40 years of confrontation during which life itself has been at risk, the relationship between the United States and the Soviet Union has begun a momentous change. Individual citizens are participating in that change.

"Amateur Radio operators in both countries are playing a unique role in building bridges of understanding and cooperation, based on dialogue and direct personal communication."

Freer access to information is the rallying cry in the Soviet Union today, and information is radio amateurs' stock-in-trade. (It is no coincidence that freedom of speech tops our Bill of Rights.)

Look back to the 1950s—the Soviets had a monopoly on internal information about both themselves and the rest of the world. The USSR was virtually unknown to the outside world, and Soviet citizens lived in the sterility of a closed society. There was no human rights movement, no emigration and no vocal dissident movement. Until 1958, only a handful of Americans had any direct knowledge of the Soviet Union. Official government cultural exchanges since 1958 have helped break the Soviets' monopoly on information, explaining why they were so apprehensive about these exchanges in the first place, and still are.[3]

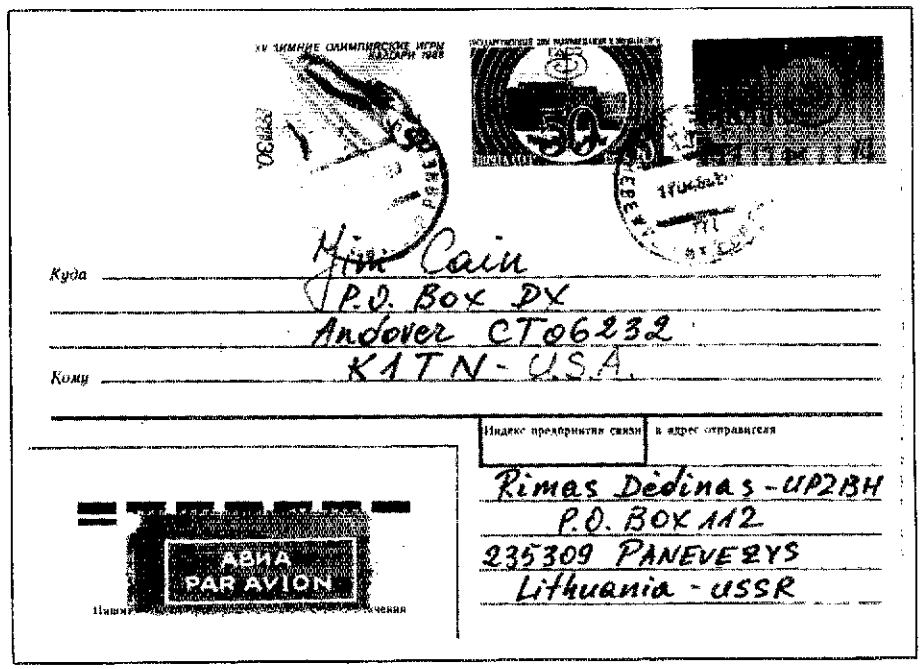
What is a Radio Amateur?

Depending on how the term "radio amateur" is defined, there are from tens of thousands—to millions—of them in the USSR. In everyday usage, the Russian term ("Radiolyubitel") also covers those who engage in speed telegraphy, shortwave listening on the amateur bands and the design and construction of a wide variety of radio and electronics items. These activities not usually considered part of Amateur Radio in the West.

Over the years, visitors have attempted, with little success, to take a census of Soviet amateur licensees.[4-9] The Soviet magazine *Radio* claims 52,000 amateur stations as of January 1988, including 5370 collective (club) stations. The same article noted that there were hundreds of thousands of "radioamateur-constructors" in the country.

A longtime Soviet watcher puts it this way: If we count transmitting radio amateurs only, we start with roughly 47,000 holders of individual calls (not SWL calls). Add to this figure operators not holding individual calls but authorized to transmit at collective stations. Arbitrarily assuming an average of 10 such operators at each of the 5370 collective stations, we would add 53,700 to the 47,000 holders of individual calls, suggesting somewhat over 100,000 "transmitting" radio amateurs.

This would place the USSR about 25th worldwide in the number of amateur stations licensed (not number of amateurs) per capita. As in most countries, a large percentage of licensees are inactive and without stations. Informed sources estimate



A dream come true: direct QSLing between US and Soviet amateurs. In sending cards to the Soviet Union, both IRCs and US currency (dollar bills) are acceptable.

[1]Notes appear on page 46.

Moscow, Box 88

Today more than 50,000 amateur shortwave stations are active on the air. In the USSR this hobby is a passion for different sorts of people, including teachers, artists, economists, students, and even a Cosmonaut and Hero of the Soviet Union—M. Manarov, U2MIR.

Soviet citizens can obtain transmitting licenses beginning at age 14. There are four classes of license:

- Class 4: CW, AM and SSB, 1.83-1.93 MHz, maximum 5 watts.
- Class 3: CW on 1.8, 3.5 and 28 MHz; SSB and AM on 1.8 and 28 MHz, with 5 watts on 1.8 MHz, 10 watts on the other two bands.
- Class 2: All HF bands (except 10.1 MHz); 50 watts.
- Class 1: All HF bands, 200 watts (except 10 watts on 1.8 MHz).

Classes 1, 2, and 3 are permitted all VHF and UHF bands, maximum 5 watts.

As is well known, Soviet amateurs are active in all international contests. In addition, each year some 150 internal contests and "Activity Days" bring out some 90,000 licensed amateurs and observers (shortwave listeners).

The international "CQ M" Contest sponsored each May by the Krenkel Central Radio Club is a major event; in 1988 some 3000 amateurs from 83 countries took part. In addition, every three years the Yuri Gagarin Cup contest is held in honor of the first cosmonaut in the world. This event will be held next in 1990.

Also sponsored by the KCRC are a number of certificates and awards, of which over 4000 are issued to radio amateurs around the world every year.

On-the-air work is not the only activity popular among Soviet radio enthusiasts. Other radiosport activities include high-speed telegraphy competitions and radio direction finding (fox hunting). More than 300,000 people take part in such events, united in more than 5000 public sections and [local] radio clubs.

Current USSR and European CW champion S. Zelenov, from Vladimir, receives by hand 280 marks per minute [about 56 words per minute—*Ed.*]; Sending champion V. Mashunin transmits by hand key at the rate of 250 marks/minute.

The KCRC organized the first European CW championships, held in Moscow in 1983.

"Fox hunting" has been a popular Soviet sport for some 30 years, with 50,000 participating today. Soviet hunters have had great success in both European and world fox-hunting activities.

Radiosport in the USSR has all the civic rights as other kinds of sport, such as football, hockey, boxing, and other athletics. As part of the Common All-Union classification system, radiosportsmen may earn the titles of "Honorable Master of Sport of the USSR" and "Master of Sport of the USSR of International Class."

Radiosport contests are held at such major events as Spartakiada of Peoples of the USSR and the All-Union Youth Games.—*V. Bondarenko, UV3BW, Chief of the Krenkel Central Radio Club of the USSR*

perhaps 5000 to 7000 Soviet stations are active on the air.

What Has Glasnost Done?

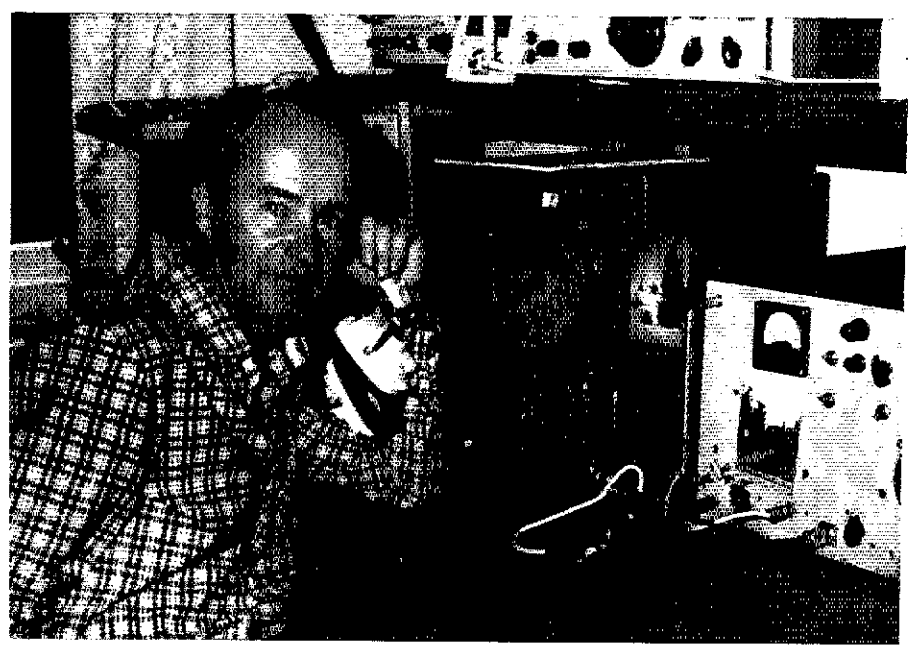
The most commonly used translation of glasnost is "openness"—in the sense of being willing to bring hitherto taboo subjects out into the open and to grapple with them. This is reflected in the pages of *Radio* and *Sovetskiy Patriot*—our two windows on the Soviet amateur world.

Radio magazine, said to be read by as many as 2,000,000 Soviets, is akin to *Popular Electronics* in the US. Published by the Radiosports Federation, it covers topics ranging from computers to hi-fi repair. Most hams read it, and radio construction articles are a mainstay of the magazine. Boris Stepanov, UW3AX, is Deputy Editor in Chief of *Radio*.

Sovetskiy Patriot is a twice-weekly newspaper published by DOSAAF [see the sidebar, "How Soviet Amateurs are Regulated"]. A regular Amateur Radio column by UW3AX, "On the Amateur Bands," is the most up-to-date source of information available to Soviet amateurs. A direct line to DOSAAF, *Sovetskiy Patriot* is the most popular vehicle for the airing of complaints, and for news about licensing, the availability of electronics components, and red tape.

Soviet amateurs have a long way to go before they enjoy anything like the range of amateur activities available to their counterparts in the noncommunist world. Much of glasnost thus far (in the past four years or so) has merely confirmed restrictions that have existed for years and still are in effect. Some changes that *have* occurred are:

- Most dramatically, the right to work hams in any country in the world—without first obtaining special permission to do so—has been granted. The famous (or infamous) "Instruction on the Procedure for Shortwavers and Ultrashortwavers Working Radio Amateurs in All Countries of the World" required such permission. This unpublished "instruction" was simply abolished.[10]
- At the same time, it was announced that the right to receive foreign QSL cards at home addresses or to receive them at personal post office boxes was granted. UA6HZ argued in the September 1988 issue of *Radio* that it still was not legal to give out personal address information over the air, even though he heard it being done all the time. [This practice was legalized in October 1988—*Ed.*]
- Finally, it was announced that radio amateurs would henceforth be permitted to include their photographs on QSL cards. This "unwritten instruction" had long been readily apparent to Western amateurs who received Soviet QSLs. (Conversely, for many years Western amateurs found that Box 88, the Soviet central QSL bureau,



Viktor N. Pisanov, UA9OS, is a machinist in Novosibirsk and has a potent signal on all bands. His long-time QSL manager Joe Arcure, W3HNK, recently has supplied Viktor with QSLs which can now be obtained direct from Box 22, Novosibirsk-91, 630091 USSR. *(photo courtesy W6HJK)*

How Soviet Amateurs are Regulated

The Federation of Radio Sport of the USSR (FRS USSR) heads up the radio amateur movement. The FRS USSR, in turn, works under the direction of the Central Committee of DOSAAF USSR. (DOSAAF, the Voluntary Society for Assistance to the Army, Air Force, and Navy, is principally devoted to training young people for military service and for employment in the national economy. DOSAAF sponsors "technical- and military-application forms of sport" such as motorcycle racing, parachuting—and Amateur Radio).

The highest-level body (organ) of the FRS USSR is a Council (a "Soviet") whose members serve for four years. They represent lower-level FRSs, as well as sports and trade union organizations, the Komsomol (the Communist Party youth organization), and other organizations interested in the development of "radiosport." The Council of the FRS USSR elects a "Radio Amateur movement."

Committees and commissions dealing with particular Radioamateur and Radiosport matters are attached to the Presidium, a committee empowered to act for the FRS. There has been talk recently of changing the name of the FRS to more accurately reflect its area of competence. One title suggested in *Radio* has been Radioamateur-Radiosport Federation.

The FRS USSR relies upon the Central Radio Club Named After E.T. Krenkel (the KCRC) to carry out its work. Following his death in 1971, the CRC was named after Ernst Teodorovich Krenkel, who had chaired the FRS for years and was awarded the call sign RAEM for his feats as an Arctic explorer and communicator.

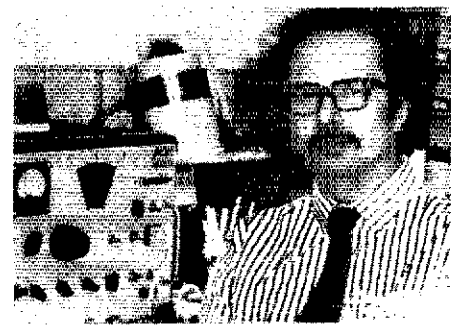
At the two levels below the national ("Union") level, local FRSs operate through local "sport-technical radio clubs."

Federations are not Clubs

The federations, while operating under the direction of DOSAAF, are governed by bodies, many of whose members are from (and presumably owe primary allegiance to) other organizations. (Some of these organizations, such as the Komsomol, may be competitive to some degree with DOSAAF). The federations appear to be mostly deliberative in nature, bringing together people with authority over resources so as to ensure material backing for the Amateur Radio movement—in particular premises and equipment.

The Krenkel Central Radio Club, on the other hand, though seldom labeled as such, is itself a DOSAAF institution. Officials and paid employees of the KCRC and the lower-level clubs are presumably DOSAAF employees, owing full allegiance to the organization. The KCRC is more operational in nature (as opposed to federations), containing within its organizational structure the national QSL bureau and a laboratory.

Areas of overlap, however, include dealings with foreign Amateur Radio organizations, and sponsorship of contests ("competitions")—functions which the federations and clubs share.—*Dexter Anderson, W4KM*



Husband and wife team Lyudmila, UA3WFM, and Nick Federova, UA3WFN, operate this neat station out of Kursk, south of Moscow. Mila, a guitarist, and daughter Elena, a college music major, make this a most musical as well as ham family. *(photo courtesy W6HJK)*

would reject QSLs with photos depicting the elaborate commercial gear in their stations).

Cutting Red Tape

Complaints to the government in the Soviet press about various matters are not new. They precede the Gorbachev era, but the number and magnitude of such complaints has increased. The following interview, from the March 1989 issue of *Radio*, with V. Y. Khoroshchanskiy, Chief, GIE [State Telecommunications Inspectorate of the USSR Ministry of Communication], is revealing.[11]

Q: *There are lots of complaints about the GIE. Memory keys are prohibited, delays occur in the issuance of licenses.*

A: To my knowledge, no one has ever prohibited a memory key.[12] As to delays in issuing call signs, this does occur, but we're not the only ones to blame. Take the case of special call signs for veterans of the Great Patriotic War. The documents are held up a long time in DOSAAF organizations, causing the delay. The same often occurs with the issuance of regular call signs.

Q: *One reader writes that he asked for a previously issued call sign and was refused.*

A: We've often had the situation in which individual comrades have used their official positions to get desirable call signs, resulting in justified complaints. So we decided to issue call signs in strict order, without exception. We shall severely punish offenders. Yes, sometimes it would be convenient to use an old call sign. But we're speaking here of social equity, and we must preserve it at all times and with everyone.

Q: *The rules prescribe locating a station only at the place of [police] registration. But what if circumstances don't permit this? One of our readers wanted to set up his station at his parents' place, but was refused.*

A: This matter relates to the constitutional rights of citizens. If the station is situated other than at the place of residence [of the amateur], even at the residence of close relatives, access by GIE personnel would not be assured, and in this case could the amateur be fully responsible for his station? One citizen would be recorded as the licensee of the station and other persons would have access to it—there's no guarantee that they wouldn't operate on the air.

I don't want to offend this specific reader or cast aspersions on his parents, but why artificially create such situations? In practice, by the way, a fair number of examples exist of people operating with someone else's call sign or from someone else's station.

Q: *Here's a quote from one letter: "The GIE workers' 'prohibition syndrome' has long since become a disease and prospects for its elimination are not yet evident. A hundredfold more things are prohibited than are permitted. Starting with new modes of communication, bands, power, and so on to infinity. . . "*

A: I think this is an exaggeration. Moreover, by no means everything that the

Proposals for Change

The editors of Radio *recently discussed, in a new editorial column, some proposals for radical change in how Amateur Radio is regulated:*

What is required to make up for [the harm done to Amateur Radio in previous years]? This question also is of concern to officials of the Central Committee of DOSAAF, who are called upon to manage the Soviet radio amateur movement.

We think it would be useful to consider transferring organizational and managerial functions relating to Amateur Radio to the KCRC of the USSR, leaving responsibility for radiosport with the UTVPS [Administration of Technical and Military-Application Forms of Sport of the Central Committee of DOSAAF USSR]. This matter is particularly urgent because the UTVPS has nothing to do with technical creativity (which is not properly within its purview), yet technical creativity has always been the basis for radiosport.

We shouldn't forget either that whereas something like 100,000 people engage in radiosport, hundreds of thousands, perhaps 2 to 3 million people engage in "Amateur Radio" [in its broadest sense—*Ed.*]. In addition, today the UTVPS and the CRC USSR often duplicate each other's functions.

The UMT [Teaching Methodology Center] of the Central Committee tries to engage in some aspects of organizing technical creativity, but it must be stated frankly that it doesn't have the necessary competence. Such an attempt to "divide" Amateur Radio between the UTVPS and the UMT is ill advised. So there are [arguments] for the CRS USSR to become the center of Amateur Radio (including radiosport) in this country, as in Czechoslovakia.

The foregoing in no way diminishes responsibility of the amateur community or local federations [of radio sport] for the current state of affairs. Unfortunately, many are waking up too slowly from an overly dependent mood, failing to take advantage of the broad possibilities offered by "perestroika."

DOSAAF Speaks Out

Even DOSAAF itself has entered the fray, as this statement from them following a plenum of federations last December indicates:

It was noted at the plenum that, despite the decision of the all-Union Amateur Radio conference [Moscow, April 8-10, 1988] the work of reducing the number of regulatory documents and of redrafting them is proceeding too slowly. Many of these are so far out of date that they in no way correspond to the present day.

Bureaucratic habits still make themselves felt in the work of Union and local federations of radio sport. For the umpteenth time, mention was made of the neglected state of radiotechnical construction in the organizations of the Defense Society [DOSAAF].

The all-Union Amateur Radio conference considered the structure and titles of the federations and increasing the rights of the committees ("Soviets").

But participants in the plenum didn't have the texts of the conference available because preparation of these texts has been delayed. Yes, we're getting moving [too] slowly, we're in no hurry for perestroika.

By decision of the plenum, the organizational structure of Amateur Radio was opened for public discussion. But alternatives were not presented, and this can hardly be considered democratic.

Perestroika hasn't yet reached the management level of the radio amateur movement, and this deserves serious thought. Why has the radio amateur movement been spinning its wheels, or even moving backward, for years? Are organizational principles at fault?

The KCRC is in a position to become the organizational and instructional center of Amateur Radio in our country [and should have] the appropriate rights, obligations, and structure.

The plenum again discussed the delay in the ability of Soviet shortwavers to use packet communication, slow-scan television, and so on. But in October 1988 a positive decision on packet was finally made. Now it's up to us to suggest an appendix [protocol] on packet to the "instruction on operating amateur stations."

But days, weeks, and months have gone by . . . To be honest, it was awkward to hear V. Khoroshchanskiy, Chief of the GIE [State Telecommunication Inspectorate of the USSR Ministry of Communication] speak of the very slow pace at which the Federation of Radio Sport of the USSR is drafting the [protocol]. And yet people made such a lot of noise beforehand; they should quickly have prepared a draft of the [protocol].

To speed up the positive development we are all counting on, we need to introduce perestroika for ourselves. This was perhaps the leitmotif of the December plenum.

Viktor Dm. Soloviev, UAØIDX, lives in Magadan with his wife Lida and son Gleb. Soloviev, 32, is a radio engineer for a television satellite earth station and is working to improve his already impressive command of English. He was one of the principal organizers of the recent joint US-USSR USØSU operation. *(photo courtesy W6HJK)*

WA6WXD speaks to the Leningrad Radio Club, with translation by UA1DJ, in September 1986. More on his trip in Part 2 of this series.

A Peek at Perestroika

A letter to Sovetskiy Patriot, *18 January 1989, from V. Levchenko:*

Chairman, DOSAAF Committee, Khar'kov Tractor Plant:

Recently, the long-awaited "List of Callsigns of Amateur Radio Stations of the USSR" (Part I) of the Printing House of DOSAAF USSR arrived at the Khar'kovskaya Oblast DOSAAF warehouse. The overall printing run wasn't indicated, but 1500 copies were received for the Oblast, against a demand for about 200 to 300 copies.

So about a thousand copies aren't of any use to anyone, and they'll be [declared surplus]. In the final analysis they'll be destroyed. Yet paper, which is in short supply, was used to print them, and they will become scrap paper!

I'm not sure that all oblasts are supplied with these books. It's possible that somewhere they're waiting for them, as we waited 25 years. Another possibility is plausible: By mistake we were sent the first part of the "list" intended for another oblast, and other editions (there are supposed to be two or three) were sent in the same quantity to other oblasts.

In any case, it's time to end such nonsense. The printing run should be for the number of copies for which there's a demand, not the number that's in the interest of the publisher.

The editors of Sovetskiy Patriot *reply:*

First we had to find out what the printing run of the book was, who determined it, and by whose ill will Khar'kov was inundated with guides in quantities greatly exceeding demand.

The Radiosport Department of the Central Committee of DOSAAF USSR sent us to the Krenkel Central Radio Club.

The Chief of the Club, V. Bondarenko [UV3BW] sent us to the central trading-supply depot. Next we were sent to the Administration of Capital Construction, Production, and Material-Technical Supply.

"Give me a break!" department chief M. Bolekhovskiy implored. "We have nothing to do with distribution."

We'd come full circle and a new "loop" lay ahead. But at that point a knowledgeable person turned up, in the form of Sergey Aleksandrovich Savetskiy, Bondarenko's deputy.

"The guide was published in 50 thousand copies, which approximately corresponds to the number of collective and individual stations," Savetskiy reported. "In fact we also prepared reports on the number of stations per kray and oblast, based on which the books were to be distributed locally to the oblast and kray DOSAAF committees."

"OK, and how many guides were the Khar'kovites scheduled to receive?"

"In the order of 1300. They have 1189 registered radio stations."

So there shouldn't be any extra. But what do they think about this in the Khar'kovskaya Oblast DOSAAF Committee? The Department of Technical and Military-Applied Sport had nothing to say; maybe V. F. Drobin, the chief of the oblast's sport-technical radio club, was informed about it.

Vladimir Fedorovich was indeed informed.

"I received 300 copies from the warehouse. A portion of them has been sold. We aren't forcing books on anyone. All of them [presumably the 300 his club received] I think will go."

And what's the opinion of B. Stepanov (UW3AX), who heads up the column (in *Sovetskiy Patriot*) "On the Amateur Bands" (and is deputy editor of *Radio*)?

As it turned out, Stepanov learned of publication of Part I, and of the distribution procedure, from us. In connection with the latter, he expressed a fear that the book would not get to those who really wanted it. Radio amateurs wouldn't even know it was in stock at the oblast committee or in the sport technical club.

"As is known, Amateur Radio is now stepping out of the cities and towns and into the village," said Stepanov. "So at least a portion of the printing run should have been set aside for rural radio amateurs.

"But for the time being, radio amateurs from remote areas, who cannot travel tens, sometimes hundreds, of kilometers to the oblast center, will wind up with nothing. And in general in distributing specialized literature there should be a reserve in the center."

So the letter didn't receive a clear answer, probably for the simple reason that in publishing the long awaited "List of Callsigns of Amateur Radio Stations of the USSR" a plan for selling it wasn't thought through. Let's say, some oblasts were sent significantly fewer copies than there was demand for. Thus, in all only 108 copies were sent to the Dnejpropetrovskaya Oblast Committee, although a thousand were planned to have been sent.

The Sales Department of the Printing House of DOSAAF USSR told us that the second volume of the guide would soon come out (not in 50 but in 60 thousand copies). We hope the books will be distributed fairly and will reach those who have been waiting for the guide all these years. And won't be turned—for lack of use—into scrap paper.

GIE authorizes at the request of some amateurs is pleasing to others. For example, we introduced short call signs [1 × 2 call signs] for war veterans. And what happens? We get a complaint from Byelorussian radio amateur veterans that the symbol indicating the Union Republic has been left out. So you can't please everybody.

Regarding packet communication, action was in fact delayed but now it's up to DOSAAF to draft an exchange [protocol] which is to become an appendix to the current Instruction. [Sources say packet radio is being delayed because government monitoring stations do not have computers with which to monitor Amateur Radio packet stations—*Ed.*].

US-Soviet Cultural Exchanges

Since the end of World War II, through 40 years of up-and-down relations, the United States and the Soviet Union have attempted to keep some doors of communication open. It is important to examine cultural exchanges, which began in 1958, because of the increasing role that radio amateurs can play in them.

At the governmental level, the Soviets' rationale for exchanges always has been to accelerate their lagging science and technology sector. A browse through the latest issue of *Radio* will convince any Westerner that the Soviets are indeed "behind."

The stated US goal of cultural exchanges—from the 1950s to today—always has been to induce changes in the Soviet system.

And on the individual—personal—level, both sides have sought over the years simply to reduce levels of tension—better the devil you know than the devil you don't.

Cultural agreements have been a new idea for the United States, which had never seen the need for such formalization. The agreements cover areas primarily of interest to the private sector. But the Soviets like to have things—everything—on paper, signed by high government officials. Also, such bilateral agreements add legitimacy to the Soviet regime and "cover" Soviet officials who eventually make the arrangements.

The Soviets' objectives were clear: It is easier to procure new technology by exchanges and commercial purchases than by developing it at home. Further, the exchanges would aid the Soviets in gaining recognition for their advances from a backward agricultural to a modern industrial state.

The US objective—to increase the Soviet bloc's knowledge of the outside world ("the truth")—included such goals as: Freer exchange of information and ideas; distribution of publications; exchanges of films and exhibitions; an end to radio jamming; an end to censorship of outgoing news reports to the West; access of journalists to normal sources of informa-

Arctic explorer and pioneer radio amateur E.T. Krenkel, RAEM, who died in 1971, and for whom the Krenkel Central Radio Club is named. *(photo courtesy UV3BW)*

tion; and encouraging tourism and exchange of athletes, students, and others.

Then Soviet Premier Nikita Krushchev summarized US objectives in his memoirs:

"The Americans wanted a much broader exchange of tourists, scientists and students ... Many of their suggestions were clearly intended to make us open our borders, to increase the flow of people back and forth."[14]

It goes without saying that you don't need a cultural agreement or a visa to conduct a person-to-person exchange on 20 meters.

Our Place in the Picture

At the Reagan-Gorbachev Summit in November 1985, several cultural exchange agreements that had not been renewed after the Soviet invasion of Afghanistan in December 1979 were reinstated. There were no significant differences between the 1985 agreement and that signed by Nixon and Brezhnev in 1973. The main difference did not show up on paper: The US government continues to play less and less a role in the exchanges, and private interests play more of a role.

Reagan's main thrust was for people-to-people exchanges by private parties and institutions. "...once the two governments have opened the doors to this kind of exchange, the [US] Administration will look to the people to take the lead."

Unfortunately for radio amateurs, our chances to participate in these cultural exchanges over the years have been very few. A notable exception was Lawrence DeMilner, W8NRB, a member of the team manning the United States Information Agency's "Communications USA" exhibit

It goes without saying that you don't need a cultural agreement or a visa to conduct a person-to-person exchange on 20 meters.

on a six-month tour of the Soviet Union in 1964.[15] If there is, say, one US ham for every 550 population, and we can expect only a few thousand US visitors to the Soviet Union each year, radio amateurs' chances for in-person contact are not good.

Nor do student swaps offer many opportunities for hams, either. Only a few hundred such exchanges take place every year (as compared to, say, China, which currently has over 25,000 people studying in the United States). Most US graduate students in the USSR are studying Soviet culture and history; most Soviets studying in North America are doctoral and post-doctoral scientists in their middle 30s or older. They are "closed groups."

All of these factors limit who gets to go, from both sides. Thus, for the foreseeable future, while a few radio amateurs from the two countries may cross-visit in person, it is in on-the-air contact where our greatest opportunities lay.

This in no way devalues the importance of those amateurs who have visited the other country or organized a joint operation; in fact, the value of such ventures is enhanced by their rarity.

I am grateful to many people who helped with this story, including K1KI, KB1BE, N1EOL, W6HJK, WA6WXD, UV3BW, W4KM, K1FO, N4IA, WA2LQQ, K7ZR, K6ZSJ, RAØFC, NT2X, UL7PAE, and others whose input will appear in later installments.

Notes

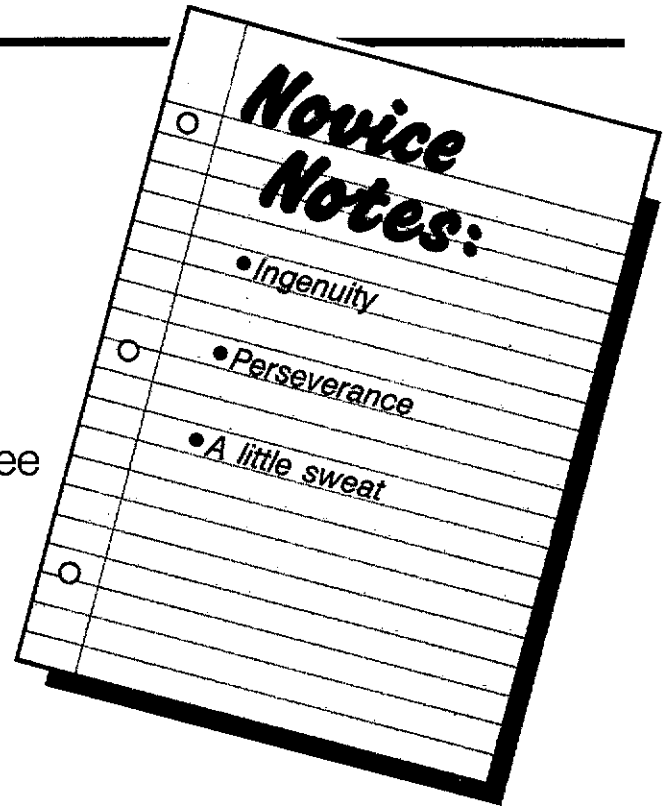
[1]*Sovetskiy Patriot*, January 1, 1989.
[2]Available from Len Traubman, DDS, W6HJK, 1448 Cedarwood Dr, San Mateo, CA 94403. See Jun 1989 *QST*, p 49, and Aug 1989 *QST*, p 77, for details.
[3]Y. Richmond, *US-Soviet Cultural Exchanges, 1958-1986*, (Boulder, CO: Westview Press, 1987).
[4]D. Atchley, "A Glimpse of Russian Amateurs," *QST*, Nov 1959, p 50.
[5]T. Hannah, "Russian Amateur Radio—1962 Style," *QST*, Aug 1962, pp 80-81.
[6]L. DeMilner, "W8NRB in the Soviet Union," *QST*, May 1965, pp 28-32.
[7]T. George, "A Visit With Soviet Hams," *QST*, Feb 1967, pp 54-55.
[8]B. Johnson, "Want to Operate in the USSR?", International News, *QST*, Feb 1977, p 75.
[9]B. Stepanov, UW3AX, "More About Soviet Hams," International News, *QST*, Jul 1982, p 55.
[10]One obvious result of this "instruction" has been that Soviet DXers were unable to achieve high DXCC Honor Roll status because of the "banned countries."
[11]These complaints have the uneasy ring of familiarity to them—Soviet radio amateurs are beginning to call for fundamental changes in how they are regulated. Parallels to the current situation in the United States can be drawn.—*Ed.*]
[12]Owing to the Soviets' need to "have things under control," it is entirely possible that memory keyers and other automatic transmitting devices have been subject to a de facto prohibition, through an "unwritten instruction."
[13]"Agreement between the United States of America and the Union of Soviet Socialist Republics on Exchanges in the Cultural, Technical and Educational Fields."
[14]S. Talbot, "Kruschev Remembers: The Last Testament," 1974.
[15]See note 6.

Strays

GLASNOST BOWL

☐ The University of Southern California and the University of Illinois will be playing football in Moscow. Not to be outdone, the ham radio clubs of both schools are hard at work. Led by W9YH, the University of Illinois club, special-event station UZ3AZO has been established and will be on the air from Moscow from 0000 UTC September 2 through 0000 UTC September 3. Joining UZ3AZO will be club stations W9YH (Illinois) and WB6JHC (USC). If you are a ham alumnus of either school and would like to participate, contact Cliff Cheng, KI6CM, tel 213-935-1396 (USC), or W9YH at the *Callbook* address (Illinois).

Tales of Triumph



Buying a rig, that first contact, taking tests—all part of getting started in ham radio. Here are the stories of three Novices who endured and are now having fun.

Zero to QSO

This is the tale of a 41-year old maintenance electrician at the Tennessee School for the Deaf in Knoxville, an average guy who got caught up in the magic of Amateur Radio. Look, I'm no rocket scientist, and I'm not rich. Yet starting from scratch, I studied for and passed my Novice exam and put a station on the air in just a few short months. Perhaps my approach was unconventional by today's standards, and I sure encountered my share of glitches along the way, but to become a part of the world's greatest hobby, it was worth every minute.

It all began innocently enough. I was kicking back in the recliner on a lazy Saturday evening, minding my own business, absently eyeballing some kind of country music awards show on the tube.

Suddenly, Ronnie Milsap, WB4KCG, started doing a spiel about the American Radio Relay League. He was telling me I could talk to people all over the world if I'd just become a ham radio operator. Who me? You got to be kidding! Wait a minute—I remembered something about ham radio from my Boy Scout days 30 years ago. Yeah, I had even learned how to send my name in Morse code. Although I didn't realize it at the time, the madness had begun. When Ronnie's words flashed through my mind again a few days later, I took the encyclopedia down from the shelf and started to read about Samuel Finley Breese Morse himself. And there, listed alongside the letters of the alphabet, was the code character for each.

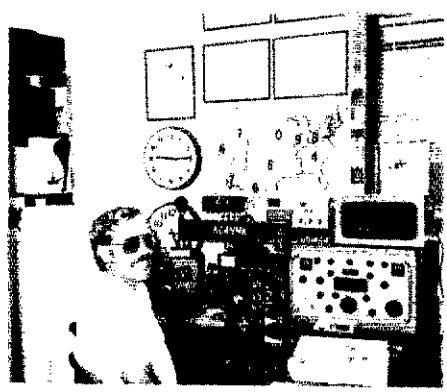
"Looks simple enough to me," I said to myself confidently. I began to toy with the code, and in a short time, I had S-A-M down pat. "Maybe I can really learn this!"

No Pain, No Gain

I began to devote every spare minute to the code. I relinquished my hard-earned seat in the maintenance crew's lunchtime card game. Instead, I sat alone in a corner, reciting dits and dahs. My coworkers didn't say anything, but I noticed they were exchanging grave looks. I guess they figured I had finally gone off the deep end.

One day the foreman eased over to me in the shop. "Are you all right? The guys tell me they're a little bit concerned about you," he said gently.

"No sweat, chief," I assured him. "I'm dah-dah-dah—dah-di-dah!" He stared at me for a moment and then backed away, shaking his head sadly.



David Cope, KC4HMK, in his shack that took a little persistence and planning to put together.

I was too preoccupied with other things to worry about what people thought. I was engrossed in my very first *QST* magazine that I had found in a local electronics store. Finally I was able to learn first-hand what this ham stuff was really all about. *QST* was full of weird things like DXing, monobanders, toroids, rhombics; it looked pretty serious to me. Searching the issue carefully, I noticed an ad for a Novice course. I ordered it immediately.

When the course arrived, I took the cassettes to work with me. Now the guys in the shop could *hear* the dits and dahs, thanks to the powerful speakers in my boom box. They thought I was certifiable for sure. I played the tapes until the crew was about ready for a visit to the rubber room. When the code would get to me (and it did from time to time), I'd switch gears and study the manual and the Novice exam practice questions on theory and regulations.

But what I really needed was a radio, so that I could listen to W1AW code practice and other live ham transmissions; Memorex® was no longer good enough. As luck would have it, a friend who was aware of my predicament told me where I could get a rig—and the price was right.

"At my dad's farm," he said. "It's an old Navy receiver; it came off a World War II destroyer. You can have it, if you'll just go get it."

A Day in the Country

Early the next morning, I left for the

farm, eager to get my hands on this treasure.

"It's down there in the shed," the old man said when I arrived, pointing toward a small building at the bottom of a steep pasture. I could hardly contain my excitement as I opened the shed door a few minutes later.

There it was, a huge black cube about 2½-feet square. On top of it, a metal plate riveted to the case stated the following: MODEL RBC-2, RADIO RECEIVING EQUIPMENT, NAVY DEPARTMENT, BUREAU OF SHIPS, CONTRACTOR—RADIO CORPORATION OF AMERICA. The case appeared to be made of a ¼-inch boiler plate, and when I tried to lift it, I knew I was right.

I knew now what they meant by boat anchor. The rig had to weigh 100 pounds. Somehow (maybe it was the adrenalin), I managed to lift the radio. My car was a tiny speck at the top of the hill. I began to stagger awkwardly, feeling like a character out of an old Laurel and Hardy comedy.

It was agony. I needed desperately to rest, but if I put the receiver down, even for a minute, I'd never be able to pick it up again. Why didn't anyone warn me that ham radios were as heavy as refrigerators?

"Hang on," I told myself. "You can make it. Besides, old Sam F. B. Morse would be mighty proud of you if he could see you now." Finally, I was at the top of the hill beside my car. My lungs were in overdrive. I almost dropped the RCA behind the car and then collapsed in a heap. Sweat poured off my aching body, and my heart was banging like a jackhammer.

Minutes, or was it hours later, when I regained consciousness, I sensed a presence. I slowly opened my eyes as the old man, standing over me, came into focus.

"...er supply," he said.

"What?" I wheezed.

"You'll need the power supply," he deadpanned. "It's back in the shed. 'Bout as big as the radio."

I began to sob quietly.

Home at Last

Somehow I made it home without a stopover at the emergency ward. I installed the receiver on the workbench in my garage. My own radio—12 knobs, three meters, two switches and a big tuning dial that went from 4 to 28 megacycles. It was awesome, not to mention the power supply, which came with an armored cable about two inches thick. No question, I had myself one heavy-duty radio.

I hooked up a random wire and an old intercom speaker, and powered-up the beast. In about five minutes, the radio was warmed and ready. Sure enough, I found W1AW right where it was supposed to be, so I sat back and listened proudly to my first official ham on-the-air transmission. I copied most of the slow stuff, too (okay, okay, so what if I mixed up a few Fs and Ls).

I became one of W1AW's most avid listeners, glued to the radio night after night. A couple of weeks of this and I was as ready as I'd ever be for the Novice test.

After locating a couple of willing hams, I found myself driving down the interstate to the appointed test site. To boost my self-confidence, I started translating license plates into CW as cars passed. But then those difficult characters started rolling around my brain, those Fs, Ls, Ps and Ys. Suddenly di-di-dah-dit flashed in my mind. Di-di-dah-dit? Di-di-dah-dit? What in blue blazes was di-di-dah-dit? Help!

I was a basket case by the time I arrived. Luckily, I couldn't have asked for friendlier examiners. Jack, W4MHA, gave me a tour of his shack, and he and the other examiner, Joe, WB4TJQ, managed to calm me down a little.

About 30 minutes later, the verdict was in—I was a bona fide Novice. All I needed was for the FCC to issue my license.

The Finishing Touches

There was still plenty of work to do, though, while I awaited the arrival of my ticket. After a couple of weeks of wheeling and dealing on a tight budget, I had assembled a station. I was a proud owner of a near-mint R-390 receiver. Like that Navy receiver, it too, was a gorilla of a radio, with 17 knobs, two meters and a mechanical digital readout. A Johnson Viking Ranger I transmitter, circa 1958, came next. After a few repairs, it was fully operational. I put up my very own rendition of a 40-meter, half-wave dipole, suspended between two poplar trees in the backyard, carefully following the instructions in my recently purchased *ARRL Handbook*. Then my license came.

"This is it," I thought. "Now or never, do or die, damn the torpedoes, look out 40, here I come!"

A Star is Born

After a lot of knob twisting, I had the grid peaked and the plate dipped on the old Viking. I was dead-on 7.142 MHz. Everything was ready.

I took a deep breath and threw the transmitter/operate switch to CW. The antenna relay chunked. My trembling hand sent CQ CQ CQ DE KC4HMK K on the straight key.

Absolutely nothing. All was quiet on the R-390. I repeated my CQ at five-minute intervals for about a half hour. Dead silence. I was crushed. All those dits and dahs, not to mention Ohm's Law, crammed into my head for two months for this?

Suddenly I saw the problem. Operator error. After sending CQ, I forgot to turn the CW switch on the transmitter back to standby. No wonder I couldn't hear anything.

Sheepishly, I sent another CQ, making sure to switch back to standby afterward. My heart almost stopped as I copied my call sign being sent back to me. It was Russ, KA4WQO, about 500 miles away. Russ showed a lot of patience as he helped me through my first QSO.

A few hours later, I called Russ on the telephone. I just had to confirm the fact that two people who had no prior knowledge of each other could converse in dits and dahs. He assured me that I was not hallucinating. It really happened. The realization dawned on me that I really was a ham, and through Russ, I had been officially welcomed into the world of ham radio.

The following Monday morning, I told the guys at work about my accomplishment. "Well, was it worth all the trouble you went through to get your license?" one of the fellows asked skeptically. "Piece of cake," I replied.—*David Sam Cope, KC4HMK, Knoxville, Tennessee*

First Contact

Here I sit again. I've been attempting to copy QSOs for a few weeks, but not with much success. How will I ever get my copy speed up to what I've been hearing others send? I'll tune up the dial—maybe I can find someone who is sending slower. Ah, there is someone calling CQ CQ CQ. I recognize the rhythm. If I can just copy his call sign, I'll know it will be the right speed. ...DE KC4EJT... I double check as the call is repeated. Yep, that's right. The UTC clock says 0250.

Do I dare answer? I have almost answered other CQs before, but I've let someone else answer, or I decided I wasn't quite ready, or...(hundreds of other excuses). Why am I trembling? I am an elementary school principal and a musician. I am used to meeting the public and staying calm. I'll put my fingers on the key. Maybe someone else will answer and grant

me a reprieve. No other responses. The chasm of blank time seems endless. Gosh, now my hands are sweating.

The CQ is repeated. I check the call again—same one. Boy, the room is getting hot. Oh, well. Let's go for it. I'll have to do it sooner or later anyway. KC4EJT DE KC4GYD... I can't believe I'm doing this. Maybe he won't hear me. Maybe I'm not sending out a signal.

I hear my call sign repeated. Oh, no! He heard me. I start to copy IA SH M ESN. What language is this? Am I reversing the code characters? What's going on? I hear my call. I hear his. What did he send? How am I supposed to respond? My stomach has been turned inside out and shoved up my throat. My arm is shaking. I can't do anything!

Uh, oh. There is more code. Maybe he is telling me to get lost. R U STILL THERE KC4GYD?? HAS SOMETHING HAPPENED? Hey, I copied it (I think).

I reply with PSE QRS. MY GUTS ARE GOING WILD. Did I really say that?

NAME IS MIKE. IS SPEED OK? DONT BE NERVOUS. Thank you for slowing a bit. I just needed a little more space between characters. I still can't believe I'm having a real QSO in CW. SOBKTOU... What? Oh, I understand.

This isn't so bad. I better tell him I am new at this so he doesn't think I'm a lid.

IM PROUD TO BE UR FIRST CONTACT. I KNOW HOW IT FEELS ON UR FIRST QSO.

Wow! Okay let's have some conversation (RST, etc).

RRR STEVE SOLID COPY ON ALL. You mean he can really understand me? I must be doing it right.

I HOPE U HAVE CALMED DOWN BY NOW. Yeah, I have steadied a bit, thanks to you. (Exchange QSL information, more pleasantries).

I HOPE U REALLY ENJOY HAM RADIO, ESPECIALLY CW. GOD BLESS 73 DE KC4EJT.

The clock says 0350. I didn't think we had chewed for an hour! But, I'm glad it's over. I am still sweating, still trembling a little, but I did survive.

Could a new ham have had a better first contact than this? I think not. From the beginning of our QSO where he sought me out of a mire of panic, through his reassuring and encouraging words, I was guided less painfully through my first CW experience. His patience and understanding were first class.

I hope all CWers who stumble across a newcomer will try to accommodate them as much as possible. All some want to do is give name, RST, QTH and then go. Remember, there was a time when you had to first do it on your own. A bad initial on-the-air experience might be very discouraging to that Novice. Who knows? You may be the very one that gives a positive, gentle nudge to that potential Extra Class operator. My thanks go to my first contact, James M. "Mike" Monger, KC4EJT, of Hampton, Tennessee.—*Steve A. Davidson, N4VAN, ex-KC4GYD, Newport, Tennessee*

Novice Reflections

It's 3:00 AM, and I've just finished speaking with Craig, NT5K, in Louisiana, said good night to Gordon, KA3CNN, and Gump, N3GZE, and closed down the station.

My family remembers last week when I used to cook, cut the grass and make the beds. I haven't seen my husband in two days. He's around here somewhere, I'm sure. His clothes are still here. The dogs come in and look at me longingly, so I know they're still here. I'm caught up somewhere in the twilight of the sporadic E skip.

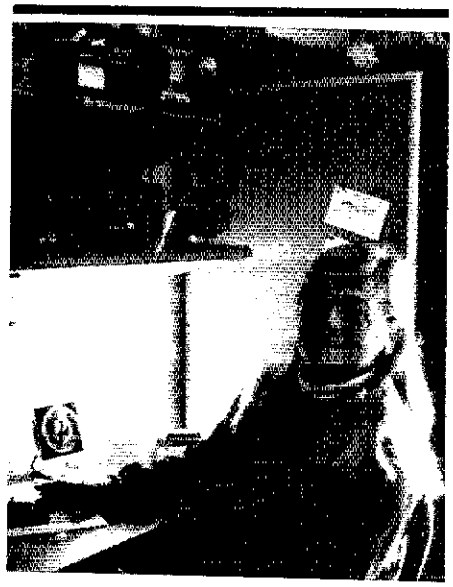
How did this happen to me? I blame it on Citizens Band Radio and genes.

I have always enjoyed communicating with others. CB filled that bill for years. I was first licensed as a CBer in 1976. Back in those days, CBers were like a family. They cared for each other, laughed and cried together. I belonged to a local CB organization that spent hours working to help others. When CB, as I loved it, died, the club died also.

I say my genes, because my grandfather was a telegrapher. He was instrumental in maintaining contact with the fire department and mayor during the great Baltimore fire of 1904 and relayed the message to outlying cities that Baltimore needed help.

So, one can see how CB is responsible for my love of reaching out over the airwaves, and the love of the Morse code is in my genes.

I joined a Novice class run by the Baltimore Amateur Radio and Television Society. We met weekly for theory and code practice and used *Tune in the World with Ham Radio*. I was the only YL. A few weeks later, I went to a hamfest at Timonium, Maryland, to look at all the goodies. I had a great time wandering from display to display. The loudspeaker squawked, "Last call for sign up for testing." I mulled it over, got extremely nervous and said to myself, "Go for it." I walked to the sign-up location and was I scared. I waited through all the other license tests, then it was time for the Novice code test. I could hardly get off the chair to enter the room where code was being given. The test began. Letter by letter I copied endlessly. When it was over, a flood of relief swept over me.



Jan Harding, KA3SZR, using a straight key in her shack.

When I finished, I looked at my copy. I had filled two pages with one-inch letters, numbers and prosigns. It looked like it was written by a kindergartner. I handed my paper in with fear and trepidation. I watched the pass-or-fail board to see the results. A score was placed next to my #58. I was afraid to look. I forced myself. Hallelujah! There was a pretty green P for pass. I got so excited I jumped up and hugged the nearest Volunteer Examiner. I was halfway home.

The written portion was a snap. I had been into *Tune in the World with Ham Radio* and knew most of the answers to the questions. I answered the questions with confidence. Another pretty green P was placed next to my #58.

I was filled with joy, pride, happiness and a lot of self-worth. I had done it. I was a ham. I will readily admit that I cried.

I walked into class with my Certificate of Successful Completion of Examination from the Laurel Amateur Radio Club. I was greeted with congratulations from my fellow students and teachers. Not wanting to be outdone by a women, the six guys in the class put their noses a little deeper in the book and their fingers a little firmer on the key.

Several weeks later, I took the test for Technician. My Novice license came the next day. Everyone in the class is on the air now, and five of us are Technicians.

My first contact was with Drew, ZP5XFA, in Asunción, Paraguay, and his QSL card has a special place in my shack. I can be found on 10 meters enjoying worldwide communications. My grandfather would be proud of me, as I've been part of a CW contest and our group (Ft McHenry) won first place.

Novice Enhancement induced me to become a ham. I've made wonderful friends around the world. I'm looking forward going for my General license now. I'm typing this story on a computer—look out packet radio. I've just begun to explore 2 meters. I'm taking my time and enjoying it all along the way. No matter what grade license I wind up with, I will always be KA3SZR. That call means a lot to me. My family is glad I've normalized my ham radio hours, but I sure am looking forward to what Amateur Radio has for me further down the log.—*Janice Harding, KA3SZR, Baltimore, Maryland* QST

• *At the Foundation*

Increasing Electronics Awareness in Your Community

Read about an excellent project for introducing students to Amateur Radio and electronic communications and think about how you might organize such a project in your locale.

By Mary E. Schetgen, N7IAL
Secretary
The ARRL Foundation, Inc

Earlier this year, the Victor C. Clark Youth Incentive Program awarded Oklahoma State University's Department of Electronics and Computer Technology IEEE-B Group and the university Amateur Radio station, W5YJ, a grant to sponsor an electronics communication awareness workshop for 6th- and 7th-grade students. The one-day workshop, held April 22 at the OSU campus, was attended by 24 specially selected middle school students, ten college students and two faculty members.

Dr Neal Willison, N5MJH, faculty advisor for the project shared his comments on this effort:

"During the workshop the students were to be introduced to electronic communications, specifically Amateur Radio. The students were also to construct their own electronics project. Another phase of the project would be to listen to shortwave broadcasts at a station placed at the Stillwater Middle School.

"The students' names and addresses were provided by the middle school science teachers. Each student was sent a personal invitation to attend the workshop, as well as an informational packet and name tag. The college students gave an overview of the workshop and what was to follow. The university Amateur Radio station operators talked about Amateur Radio and how to obtain an Amateur Radio license. This part of the program was held in the computer laboratory, and a brief computer demonstration was given.

"The second phase of the program divided the middle school students into teams of three, and each team was paired with an OSU student for a trip to the electronics lab. At the lab, each student was given a parts kit, printed circuit board and a schematic and wiring diagram for a code practice oscillator. The IEEE students helped the younger students identify the parts and assisted with the oscillator assemblies. Other students were taken over to the campus Amateur Radio station, W5YJ, where the operators demonstrated the various radio equipment and made several contacts. As an added highlight, several of the middle school students returned to the station at the end of the program, obviously enthused by what they had seen earlier in the day.

James Ergenbright, KB5FBJ, center, explains the station equipment to students in the Oklahoma State University station, W5YJ, during the IEEE/W5YJ Middle School Electronics Communications Awareness Program. *(photo courtesy N5MJH)*

"A continuing phase of this project was to put together a shortwave listening station for the Stillwater Middle School. An ICOM IC-R70 communications receiver was purchased, and an external antenna will be put up in time for fall classes. This station will be a permanent part of the school and will enable the student to listen to shortwave and amateur bands; the aim being to increase geographic and communications knowledge. In addition, several Amateur Radio and SWL publications were purchased for the school's library.

"The middle school students were very excited and enthusiastic about the program and wanted to know what they would build next year. Many parents expressed appreciation for introducing their children to new activities and ideas. The project, we feel, was a successful one, and both middle school students and the IEEE students gained from the experience."

We agree, and hope other groups will be encouraged to sponsor these types of workshops for, not only middle school students, but students of any age. This project was jointly funded by the ARRL Foundation, the IEEE Bendix Award Committee and W5YJ.

Contributor's Corner

We wish to thank the following for their generous contributions to:

The Victor C. Clark Youth Incentive Program Fund

Larry G. Goreham and North Hills Radio Club, Inc, and Robert L. Cloud
(in memory of Mike Caldwell, W6RTK)
Kinston Amateur Radio Society (NC)
(in memory of Burdette "Bud" Dunning, K4DQP)
Ronald C. Barrett, W6PAQ
(in memory of Robert Haller, W4UDB)
Dorothy B. White
(in memory of Joseph Holmes Branson, III, KB4FYR)
Kay County ARC
(in memory of Harry Beattie, WD5DPR)

The General Fund

Bill Fairchild, WO2V
Howland Hayes, N5GPP
Martin H. Brill, K3NVW
William L. Lyon
Homer G. Blumerich, K8AOB
Samuel Schuster, XE1SSG
Cele Deshler
C. Saint Arroman, TR8SA
Alfred R. Benvenuto, KA3HVD
Leman Dolby, W5TUG
Clayton Decosterd
Walter McPherson, W8ZKF
William J. Trignano, NT2M
J. Francisco Fiqueroa, XE1FFZ
Clyde F. Knight, WB0RTA
George S. Blondeck, KA1QFQ
Clyde E. Arntzen, KD4KN
Hans Schroeder, AE9G
John R. Yeager, W8LBY
Stephen Demes, WA3AIR
Dorval H. Keeton, N6KTD
William Stone, WB1FWR
Daniel F. Sullivan, KB2GCL
John J. Antonio, W3UAQ
Harold A. Strick, W1VGE
Albert J. Pelletier, Jr, N4JXU
Pierre T. Rizk, N2FGE
John Troster, W6ISQ
The Estate of Henry R. Pemberton
Erich E. Schleier, N5MHS
Dale D. Scott, KA0QPV
David T. Livingston, K5SFM
Julius Louloff, W2HSJ
Louis F. Frmi, KY7U
Arthur L. Collins, KA3RWP
Chairil Hamid, MD, YC7DF

As received and acknowledged during the month of **June.**

The 1989 Second Meeting of the ARRL Board of Directors

By Bob Schetgen, KU7G
Assistant to the Executive Vice President

The ARRL Board of Directors held its second meeting of 1989 in Windsor Locks, Connecticut on July 21 and 22. The prominent issue of the meeting was that of a possible code-free license for the Amateur Radio Service. The Board faced that issue squarely, adopting a course of action that will position Amateur Radio to enter the next century. You can find more on that topic in "It Seems to Us..." on page 9, and a description of the Board's action appears in a sidebar to this article. Here is a summary of other important issues treated during the meeting.

Washington Doings

In view of the FCC decision to uphold its reallocation of 220-222 MHz from the Amateur to the Land Mobile Service, ARRL President Larry E. Price, W4RA, informed the Board that additional Counsel with special expertise in such matters will aid Counsel Imlay in seeking Court of Appeals review of the FCC action in Docket 87-14. Stipulating that it not delay or impede that proceeding, the Board authorized the filing of a petition for a secondary allocation for amateurs in the 216- to 220-MHz band (Minute 60).

In other Washington matters, the Board went on record in opposition to station or operator license fees that would be counterproductive in our Service (Minute 83). These include fees in excess of actual administrative costs or exceeding fees charged other not-for-profit users of radio; for license upgrading (except for VE reimbursement), modification or reciprocal licenses; and for RACES, military-recreation or school-club stations.

Counsel and the Legal Strategy Committee have been instructed to protect due-process rights of amateurs, with respect to operating restrictions, in RFI cases involving home electronic equipment (Minute 45). In addition, the Legal Strategy Committee is to review the antenna-ordinance-information (PRB-1) package that HQ sends to amateurs (Minute 71) to ensure that it is up-to-date.

Growth

Even though ARRL membership is at an all-time high, and new licenses in the first half of 1989 were issued at a faster rate than during the same period last year, growth of the Amateur Radio Service was an important topic at this meeting. Several actions seek to promote growth of our Service and ARRL. Paramount is the action to establish a code-free license class (Minute 39), but there were many others:

- ARRL joins the Committee for Advancement of Amateur Radio in the New York City School System Amateur Radio Association in sponsoring the "School Amateur Radio Activity" (Minute 16).
- ARRL President Price is to appoint a committee to study how to implement a nationwide course of amateur licensing in elementary, junior-high and high schools (Minute 48), and another committee to develop an interface with the American Association of Retired Persons that will encourage its members to become hams (Minute 68).

From left to right, we see ARRL President Larry Price, W4RA, who ably piloted the Board through another two-day meeting; Executive Vice President David Sumner, K1ZZ; and Washington Area Coordinator Perry Williams, W1UED.

From left to right, Directors Rush Drake, W7RM, (Northwestern); Tom Frenaye, K1KI (New England); and John Kanode, N4MM (Roanoke) hold an impromptu conference during a break.

- The Executive Vice President is to cooperate with NASA and AMSAT in efforts to bring Amateur Radio into the classroom through SAREX (Shuttle Amateur Radio EXperiment; Minute 37) and prepare a detailed plan for professional Public Relations representation of the ARRL (Minute 38).
- Various existing committees will study:

a) distribution of ARRL publications through nationwide school and commercial bookstores (Minute 63),

b) the possibility of providing standardized road signs to affiliated clubs (at cost—bearing the ARRL diamond, club name and meeting information—Minute 69),

c) the marketing of Amateur Radio, in several respects (Minute 72).

International Matters

President Price announced that a World Administrative Radio Conference is scheduled to be held in 1992, in Spain (WARC-92), with the agenda to be set by the ITU Administrative Council. Important early IARU preparation for WARC-92 will take place at the IARU Administrative Council meeting, which follows the IARU Region 2 meeting in Orlando this September.

The Board renominated Southeastern Division Director Frank Butler, W4RH, to continue serving as the Area B Representative to the IARU Region 2 Executive Committee (Minute 82).

ARRL Organizational Action

Awards

At this meeting, the Board recognized several individuals for their contributions to Amateur Radio:

- Fred Cady, KE7X, 1988 Herb S. Brier Instructor of the Year (Minute 51).
- Phyllisan West, KA4FZI, 1988 ARRL Professional Amateur Radio Teacher of the Year (Minute 58).
- Sister Alverna O'Laughlin, WAØSGJ, 1988 Humanitarian of the Year (Minute 62).
- Kevin Biekert, KB5AQV, 1988 Hiram Percy Maxim Award (Minute 67).

Amateur Radio Operations

The "Torrance" band plan was adopted for the 33-cm (902 MHz) band (see Table 2), with the understanding that the Membership Services Committee will continue consideration to assure a flexible approach to band planning and maximum use of the band (Minute 57).

Table 1

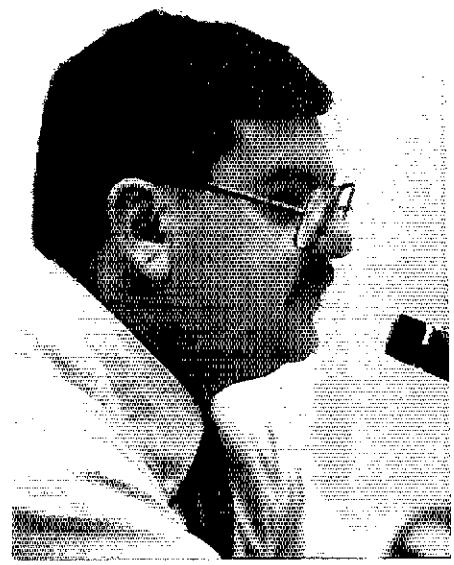
Summary of Board Actions

Minute	Purpose	Disposition
Awards and Acknowledgements:		
51	Fred Cady, KE7X, 1988 Herb S. Brier Instructor of the Year	ADOPTED
52	ANERCOM commended for its report	ADOPTED
58	Phyllisan West, KA4FZI, 1988 ARRL Professional Amateur Radio Teacher of the Year	ADOPTED
62	Sister Alverna O'Laughlin, WAØSGJ, 1988 Humanitarian of the Year	ADOPTED
67	Kevin Biekert, KB5AQV, 1988 Hiram Percy Maxim Award	ADOPTED
ARRL Organizational (Regarding Articles of Association or ByLaws)		
20	Amend ByLaw 2	ADOPTED
77	Amend ByLaw 18, change nomination deadline (effective September 1, 1989)	ADOPTED
ARRL Organizational (Other than Articles of Association or ByLaws)		
21	Revised version of "The Amateur's Code"	ADOPTED
22	Revised ARRL standing orders no. 1 - 135	ADOPTED
26	Revise election rule governing 300-word candidate's statement	ADOPTED
28	Appeal procedure for decisions of the Elections Committee	ADOPTED
29	Procedure for SM-election disputes	ADOPTED
33	ARRL/CRRL Computer Networking Conference	ADOPTED
47	1991 National Convention in Saginaw, Michigan	ADOPTED
50	Board Officers to study license structure	ADOPTED
59	1990 Annual Board Meeting dates	ADOPTED
61	Vice Directors' Board meeting reimbursement	ADOPTED
27 & 76	Directors and Vice Directors election timetable	ADOPTED
49 & 78	Field Organization Local Government Liaison	POSTPONED
Amateur Radio Operations		
16	ARRL joins with NYC group in sponsoring the "School Amateur Radio Activity"	ADOPTED
57	"Torrance" 33-cm bandplan	ADOPTED
64	CAC to recommend a computer-file format for logs	ADOPTED
74	CAC to recommend how to accommodate contesters who use repeater assistance	ADOPTED
81	Use of vestigial sideband filters for ATV from 420 to 450 MHz	REFERRED TO MSC
Publications/Media		
63	Publications Committee to study school and nationwide bookstore distribution for ARRL	ADOPTED
68	Create a committee to interface with AARP	ADOPTED
70	VRAC to study band map for Repeater Directory	LOST
72	Committee to study marketing of Amateur Radio and ARRL	ADOPTED
International Matters		
66	ARRL will propose international planning of disaster drills to IARU Region 2	ADOPTED
82	Dir. Butler renominated as Area B Representative to IARU Region 2 Executive Committee	ADOPTED
Regulatory Matters		
39	ARRL to petition FCC for a code-free license	ADOPTED
45	ARRL to act for due process in RFI cases	ADOPTED
60	ARRL to seek 216 - 220 MHz secondary Amateur allocation	ADOPTED
83	ARRL Board opposes excessive Amateur Radio fees	ADOPTED
Miscellaneous		
37	Encourage SAREX classroom use	ADOPTED
38	Professional public-relations plan	ADOPTED
48	Committee to study nationwide course for licensing in schools	ADOPTED
53	ARRL staff to develop a call-up list for served agencies	ADOPTED
54	EVP to study collecting member-occupational information for use during emergencies	ADOPTED
55	EVP study a HQ "Watch Officer" program	ADOPTED
56	ARRL staff to develop an information packet for served agencies	ADOPTED
65	EVP to study obtaining grants for disaster planning	ADOPTED
69	MSC to study road signs for affiliated clubs	ADOPTED
71	LSC to review the HQ "PRB-1 package"	ADOPTED
73	VRC to explore volunteer leadership training	ADOPTED

Table 2

The "Torrance" Bandplan for the 902-MHz Band

Frequency - MHz	Activity
902.0 - 903.0	Weak Signal [902.1 calling frequency]
903.0 - 906.0	Digital [903.1 alternate calling frequency]
906.0 - 909.0	FM Repeater Inputs
909.0 - 915.0	Amateur TV
915.0 - 918.0	Digital
918.0 - 921.0	FM Repeater Outputs
921.0 - 927.0	Amateur TV
927.0 - 928.0	FM Simplex and Links



ARRL Counsel Christopher Imlay, N3AKD, addresses the assembly.

"THE AMATEUR'S CODE"

The Radio Amateur is:

CONSIDERATE. . . never knowingly operates in such a way as to lessen the pleasure of others.

LOYAL. . . offers loyalty, encouragement and support to other amateurs, local clubs, and the American Radio Relay League, through which Amateur Radio in the United States is represented nationally and internationally.

PROGRESSIVE. . . with knowledge abreast of science, a well-built and efficient station and operation above reproach.

FRIENDLY. . . slow and patient operating when requested; friendly advice and counsel to the beginner; kindly assistance, cooperation and consideration for interests of others. These are the hallmarks of the amateur spirit.

BALANCED. . . radio is an avocation, never interfering with duties owed to family, job, school, or community.

PATRIOTIC. . . station and skill always ready for service to country and community.

—The original Amateur's Code was written by Paul M. Segal, W9EEA, in 1928.

ARRL IS TO PETITION FCC FOR A CODE-FREE AMATEUR LICENSE

After a study by a special committee, whose findings were published in the May 1989 *QST*, and almost three months gathering the views of their constituents on the subject, the ARRL Board of Directors has acted on the subject of a code-free license for the Amateur Radio Service. As adopted at Minute 39, a proposal will be presented to FCC in a form of a Petition for Rule Making incorporating the following elements:

1) a codeless license is recommended.
2) examination elements 2, and 3A plus additional questions including ones relating to Morse code.
3) license examinations be given for the new class of license by the established Volunteer Examiners.
4) there shall be an upgrade path from the new class of license to the present Technician license by way of a 5-WPM Morse code test, administered through the established Volunteer Examining system.
5) call signs shall be assigned from group D.
6) privileges shall be 220 MHz and above.
7) power shall be limited to 250 W PEP output.
8) the licensee shall not be the control operator of a repeater or auxiliary station.
9) the name of the license shall be: Communicator.

Faces to remember: ARRL Treasurer of ten years James McCobb, K1LLU (l), and CRRL President Atkins, VE3CDM.

Southwestern Division Director Fried Heyn, WA6WZO (l) and West Gulf Director Jim Haynie, WB5JBP.

The Contest Advisory Committee is to develop a suggested computer-file format for electronic logs submitted to HQ (Minute 64) and recommend, for 1990 contests, how single-operator contest stations that use repeater assistance can be accommodated (Minute 74).

Membership Services Committee will study the question of formally recommending the use of vestigial sideband filters by amateur television stations in the 420 to 450 MHz band (Minute 81).

Public Service

Several actions provide for growth and improvement of the Amateur Radio public-service role. HQ will develop a call-up list to reach served agencies when necessary (Minute 53), and (with the help of the Public Service Advisory Committee and ANERCOM) work up an information package to help served agencies work more effectively with Amateur Radio (Minute 56). The Volunteer Resources Committee will study volunteer leadership training concerned with motivating members (Minute 73).

The Executive Vice President will study collection of member occupational information for possible use in locating expertise during emergencies (Minute 54), a possible "Watch Officer" program at HQ (Minute 55) and possible financial grants to aid in disaster planning at the national and international levels (Minute 65). Disaster planning will move to the international arena as ARRL proposes to IARU Region 2 the planning of international disaster drills (Minute 66).

Other Issues

The Board also dealt with many miscellaneous topics. At the January 1989 Board meeting, the Executive Committee was directed to review the ARRL standing orders (the standing orders are a summary of operative Board policies that govern day-to-day functions of the League). Its review of the first 135 orders is complete and its recommendations pertaining to those orders were implemented at Minutes 20 (ByLaw 2 revision), 21 (revisions to "The Amateur's Code"—see sidebar) and 22.

Concerning elections, Minute 76 establishes a timetable for Director/Vice Director elections (effective September 1, 1989, to avoid changes during the elections already underway). Minute 26 fine tunes a rule adopted at Minute 44 of the January 1989 meeting. Minute 28 establishes an appeal procedure for decisions of the Election Committee. Minute 29 places disputes about Section Manager elections within Election Committee jurisdiction.

The 1991 ARRL National Convention will be held in Saginaw, Michigan, August 23-25 (Minute 47); and in 1990, the ARRL and CRRL will hold a joint Computer Networking Conference in London, Ontario, on Saturday, September 22 (Minute 33). Our Board of Directors will next meet on January 19 and 20, 1990 (Minute 59).

As part of their long-range-planning efforts, the ARRL Board Officers are to study the license structure in the Amateur Radio Service and report at the July 1990 meeting (Minute 50).

Action on a proposed Field Organization appointment for liaison with local government agencies was postponed indefinitely (Minute 78), and a motion for the Volunteer Resources Committee to study a channelization map for inclusion in the *Repeater Directory* was lost (Minute 70). QST

COMMITTEE REPORTS AVAILABLE

Copies of the reports of the Standing Committees of the Board, Ad Hoc Committees, and Advisory Committees are available to members at the cost of reproduction and mailing. Here is a list of these reports as presented at the 1989 Second Meeting of the Board, with the number of pages and the cost. The absence of a report from this list means that no written report was submitted.

Please order by document number, and include your remittance with your order. Address orders to the Secretary, ARRL.

Committee	*Document #*	*Pages*	*Cost*
Administration & Finance	12	5	$1.00
Membership Services	13	6	1.00
Volunteer Resources	15	4	1.00
Executive Committee	16	2	1.00
Ad Hoc Elections	18	13	2.00
Ad Hoc Reg 2 Planning	19	6	1.00
SAREX Working Group	19-A	2	1.00
RFI Task Group	20	2	1.00
Amateur Radio Digital Comm	22	2	1.00
Legal Strategy Committee	23	3	1.00
ANERCOM	25	23	3.00
VHF Repeater Adv Comm	26	7	1.00
Contest Adv Comm	27	1	1.00
DX Adv Comm	28	43	5.00
VHF/UHF Adv Comm	30	33	4.00

Moved and Seconded ...

MINUTES OF THE 1989 SECOND MEETING OF THE BOARD OF DIRECTORS

July 21-22, 1989

Summary Agenda

1. Roll Call
2. Moment of Silence
3. Consideration of the Agenda for the Meeting
4. Approval of the Minutes of the 1989 Annual Meeting
5. Reports by the Officers
6. Receive Reports and Consider Recommendations of the Committees
7. Preliminary Report of the Host Director, 1990 ARRL National Convention
8. Consideration of the site for the 1991 ARRL National Convention
9. Directors' Motions

1) Pursuant to due notice, the Board of Directors of the American Radio Relay League, Inc., met in Second session at the Sheraton Hotel at Bradley International Airport, in Windsor Locks, CT, on Friday, July 21, 1989. The meeting was called to order at 8:30 AM EDT with President Larry E. Price, W4RA, in the Chair and the following Directors present:

Hugh A. Turnbull, W3ABC, Atlantic Division
Edmond A. Metzger, W9PRN, Central Division
Howard Mark, WØOZC, Dakota Division
Joel M. Harrison, WB5IGF, Delta Division
Leonard M. Nathanson, W8RC, Great Lakes Division
Stephen A. Mendelsohn, WA2DHF, Hudson Division
Paul Grauer, WØFIR, Midwest Division
Tom Frenaye, K1KI, New England Division
Rush S. Drake, W7RM, Northwestern Division
Rodney J. Stafford, KB6ZV, Pacific Division
John C. Kanode, N4MM, Roanoke Division
Marshall Quiat, AGØX, Rocky Mountain Division
Frank M. Butler, Jr., W4RH, Southeastern Division
Fried Heyn, WA6WZO, Southwestern Division
Jim Haynie, WB5JBP, West Gulf Division

Also present as members of the Board without vote were: Jay A. Holladay, W6EJJ, First Vice President; George S. Wilson, III, W4OYI, Vice President; Clyde O. Hurlbert, W5CH, Vice President; Tod Olson, KØTO, International Affairs Vice President; David Sumner, K1ZZ, Executive Vice President; and James E. McCobb, Jr., K1LLU, Treasurer. Also in attendance at the invitation of the Board as observers were the following Vice Directors: James M. Mozley, W2BCH, Atlantic Division; Bruce L. Meyer, WØHZR, Dakota Division; Paul Vydareny, WB2VUK, Hudson Division; L.C. "Chuck" Miller, WAØKUH, Midwest Division; William R. Shrader, W7QMU, Northwestern Division; Charles P. McConnell, W6DPD, Pacific Division; James G. Walker, WD4HLZ, Roanoke Division; William M. Sheffield, KQØJ, Rocky Mountain Division; Evelyn D. Gauzens, W4WYR, Southeastern Division; Wayne Overbeck, N6NB, Southwestern Division; and Sam C. Sitton, KV5X, West Gulf Division. There were also present: Thomas B.J. Atkins, VE3CDM, President, The Canadian Radio Relay League, Inc.; Harry J. Dannals, W2HD, ARRL President Emeritus; William J. Stevens, W6ZM, Past Vice President; Counsel Christopher D. Imlay, N3AKD; Paul Rinaldo, W4RI, Publications Manager; Larry Shima, WØPAN, Controller; John F. Lindholm, W1XX, Membership Communications Services Manager; Robert Schetgen, KU7G, Assistant to the Executive Vice President and Perry Williams, W1UED, Washington Area Coordinator.

2) The assembly observed a moment of silence in recollection of Radio Amateurs who have passed away since the previous Board meeting, especially Michael Colesante, KC8C; Philip R. Ewald, W4EWR; Elizabeth M. Zandonini, W3CDQ; and Dain S. Evans, G3RPE, Past President of RSGB. Good wishes for a speedy recovery were offered to Vice Director Cliff Laverty, W1RWG, who has been seriously ill. Greetings from Past Director Gay Milius, W4UG were conveyed to the Board.

3) On motion of Mr. Mendelsohn, seconded by Mr. Kanode, the agenda was ADOPTED as presented.

4) On motion of Mr. Harrison, seconded by Mr. Butler, the Minutes of the 1989 Annual meeting were ADOPTED as presented.

5) Mr. Price presented an oral report for the office of President, supplementing his regular written reports to the Directors (of which there have been 27 so far this year). On June 15, the FCC upheld its original decision to reallocate 220-222 MHz from the Amateur to the Land Mobile Service. When the Memorandum Opinion and Order finally appears, the League will file a petition for review with the United States Court of Appeals for the DC Circuit. Additional Counsel with special expertise in such matters will be retained to assist Mr. Imlay, Mr. Price said. Legislation is pending in both Houses of Congress to add Radio Amateurs to the list of licensees having to pay FCC license fees.

6) At this point, 9:25 AM, Mr. Price was called away from the meeting; Mr. Holladay took the Chair and presented the report of the First Vice President. The report expressed a need for a class of license with no code requirement on VHF frequencies and above, but also for a marketing approach to the promotion of Amateur Radio. We continue to face other major issues including retention of 220-222 MHz, the Part 15 Rules governing unlicensed devices, and fine tuning of the rewritten Amateur Radio Service rules. Voluntary band planning remains important; a regular cycle of review and update is needed. Mr. Holladay urged a leadership role for the League in counseling prudence, not panic, in responding to concerns about possible biological effects of electromagnetic energy.

7) At 9:30 AM, Mr. Price returned to the Chair, and resumed his report. The President presented a check from the 1989 Central Division Convention in Indianapolis, to be added to the WIAW renovation fund; he noted that contributions had exceeded the fundraising goal, but that additional contributions would be welcome so the full cost of the project would be funded from voluntary contributions. Going on to international matters, there will be a World Administrative Radio Conference in 1992 (WARC-92) in Spain, with its agenda to be set by the Administrative Council of the International Telecommunication Union. WARC-92 is expected to have some allocations authority, and thus to pose some risk to the Amateur Service. The International Amateur Radio Union (IARU) Region II Societies will meet in Orlando September 4-8, with an IARU Administrative Council meeting following. In September, IARU President Richard Baldwin, W1RU, plans to be in Africa at an ITU Broadcasting Conference and teaching a course in Amateur Radio Administration to officials of African Governments. Mr. Price concluded with an interim report on the Long Range Planning process being conducted by the Officers. During the course of the above report, at 9:36 AM, Vice Director Howard S. Huntington, K9KM, of the Central Division joined the meeting. The Board was in recess from 9:46 to 10:29 AM.

8) Vice President Wilson presented a written report on the first half of 1989, during which he was Chairman of the Ad Hoc Elections Committee, the Special Study Committee to examine a possible code-free amateur license, and the ARRL Part 97 Re-Write Committee. He has also served on the Legal Strategy Committee and the Volunteer Resources Committee, and has worked with the officers on long range planning. These activities are more fully detailed in Committee reports to follow.

9) Mr. Olson, as Vice President, International Affairs, presented and summarized a written report covering recent changes to the IARU Constitution. Mr. Olson's report also covered meetings in Mexico and Canada and the results of the ITU Plenipotentiary Conference in Nice, France, in which future international conference activity was scheduled. In his added remarks, Mr. Olson mentioned a need to establish among the public and within the government the cultural relevance of Amateur Radio; we must find better ways of communicating the idea that Amateur Radio is important to the country and deserves support.

10) Mr. Sumner, as Executive Vice President, presented an extensive written report on the affairs of the League. In the area of finances, our financial reserves are good. In 1988, however, we incurred our first loss in operations in 10 years; for every dollar of revenue increase there was a $2 increase in expenses, resulting in a net loss of $483,000. Operations are continuing at a loss for the first six months of 1989, but steps have been taken to raise revenues and contain expenses. Over the past three years, membership has been increasing steadily by several hundred per month. Membership dues have been at present rates since July 1, 1981, during which there has been general inflation of approximately 48% in total. Staff turn-over has increased somewhat compared to the very favorable experience we enjoyed last year. Like other employers, the League has seen the cost of employee benefits increase dramatically in the past couple of years; a staff committee has recommended steps both to reduce the cost of these benefits to the League and employees and to generally improve this program. The Hiram Percy Maxim Memorial Station, W1AW, has been thoroughly renovated, and was rededicated in a memorable ceremony on July 20. All the structural work is complete; some installation of new equipment and antennas remains. The new station should be 100% on line around Labor Day. Materials tested during the Suncoast Seniors Program last year have been made available nationally for use in recruitment efforts aimed at mature adults. Reports of success in recruiting in the classroom arrive at an accelerating rate as well. So far in 1989 there is a 13.4% increase in the issuance of new amateur licenses compared to the same period last year. Promotional activities and a list of new publications rounded out the written report. During the course of above, the Board was recess for lunch from 12:00 noon to 1:00 PM reassembling with all persons hereinbefore mentioned present except Messrs. Overbeck, Lindholm, and Shima.

11) Mr. McCobb, as Treasurer, presented a brief report on investment activities for the first six months of the year. There have been ups and downs in the two portfolios, but results have been generally more positive than negative. Mr. McCobb also indicated that he will have completed ten years as Treasurer in January, 1990, and does not now plan to stand for re-election.

12) Mr. Imlay, as Counsel, presented an extensive report to the Board, on spectrum allocations, legislation and Federal, state, and local regulatory matters. Topics included were the 216 - 225 MHz band, a move against the 50-54 MHz band which had been rejected by FCC, and as-yet-undefined potential threats to other amateur spectrum. Under federal matters, Mr. Imlay discussed the re-write of Part 97 in generally favorable terms; the revision of Part 15 of the FCC rules governing unlicensed transmitting devices, with respect to which we have a pending Petition for Reconsideration in General Docket 87-389; the beacon subband matter, PR Docket 89-65, on which FCC action is expected soon; miscellaneous FCC Rulemaking matters; and the Congressional proposals to levy license fees on amateurs. In local cases involving antennas the trend has been generally favorable, but in the radio frequency interference (RFI) arena, FCC unwillingness to support its licensees when they are accused of interfering with susceptible home entertainment equipment makes the picture less rosy.

13) Mr. Grauer, as President, presented a brief report for the ARRL Foundation. Publicity through *QST* has resulted in greater awareness of the Foundation, a higher number of contributions, and more participation by qualified grant-seekers.

14) Mr. Atkins, as President, brought the greetings of the Canadian Radio Relay League to the assembly, and reported briefly on the new license structure in Canada, scheduled to go into effect around September 1990. The Canadian government has also proposed mode deregulation of the high-frequency bands and CRRL has responded formally in a paper which, among other things, pointed out the importance of voluntary band plans to the international amateur community. The report noted that Mr. Atkins had been named by ARRL President Price to serve as a consultant on the special study committee on a code-less license.

15) Without dissent, the report of the Administration and Finance Committee was deferred until later in the meeting. At this point, 2:15 PM, Mr. Holladay took the Chair for Mr. Price. Mr. Lindholm returned to the meeting.

16) Mr. Quiat, as Chairman, presented the report of the Membership Services Committee. Topics included band plans (some ready for action at this Board Meeting and some under discussion), a standard ARRL QSL card, a proposal for IARU Region 2 to change its policy to permit limited awards activity on the 10 MHz band, DXCC automation, and preparation of summaries and updates of government activity to appear in appropriate League publications. The Committee continues to study recommendations for permanent rules governing automatic HF packet. On motion of Mr. Kanode, seconded by Mr. Butler, it was VOTED that the League join with the Committee for Advancement of Amateur Radio in the New York City School System Amateur Radio Association in cosponsoring the "School Amateur Radio Activity."

17) Mr. Haynie, as Chairman, presented an oral report for the Publications Committee. After study, the Committee had decided it was not feasible to add repeater rules to the *Repeater Directory*. Also, it could find no acceptable solutions to the question of delayed *QST* delivery in outlying areas; air freight to local mailing centers would be too costly. Members could help by filing complaint of late delivery with local postmasters. The impending shift to ZIP+4 mailing addresses should also help. Shipping Department accuracy remains high. The Committee had concurred in changes in shipping charges for publications ordered from Headquarters, which have been implemented.

18) The Board was in recess from 2:58 to 3:30 PM, at which point Mr. Price resumed the Chair.

19) Mr. Stafford, as Chairman, presented the report of the Volunteer Resources Committee, covering possible creation of a new section-level appointment, Local Government Liaison; a review of Section Manager election procedures; Amateur Radio Awareness Day, scheduled this year for September 16; the adopt-a-school program; changes in the Volunteer Examiner Coordinator (VEC) program at Headquarters resulting in greater efficiency; a new Field Organization QSO Party for which staff will develop rules; and continuing studies of the Simulated Emergency Test, Section Emergency Station appointment, Special Service Club plaque program, the Amateur Auxiliary, and the audio-visual program.

20) Mr. Price, as Chairman, presented the report of the Executive Committee. In addition to its regular duties under Article 6 and Bylaw 41, the Executive Committee was given three tasks at the 1989 Annual Meeting: to review Standing Orders (Minute 80), to create action plans for FCC compliance with RFI legislation (Minute 81), and for greater FCC enforcement (Minute 105). The second and third of these were reported on in the Minutes of the June 24 meeting of the Executive Committee. As to the first, a review of the Standing Orders through #135 with recommended actions had been circulated to the Board earlier. Two matters would be subject to separate motions. The Chair recognized Mr. Frenaye, who moved, seconded by Mr. Mendelsohn, that Bylaw 2 be amended by inserting the words "or renewal of membership" after "membership" in the first sentence. A roll-call vote being required, the matter was decided in the affirmative, 15 in favor to 0 opposed; so the Bylaw was AMENDED.

21) On motion of Mr. Heyn, seconded by Mr. Kanode, it was unanimously VOTED to amend Standing Order #55 to adopt the following revised version of "The Amateur's Code":

The Radio Amateur is:

CONSIDERATE...never knowingly operates in such a way as to lessen the pleasure of others.

LOYAL...offers loyalty, encouragement and support to other amateurs, local clubs, and the American Radio Relay League, through which Amateur Radio in the United States is represented nationally and internationally.

PROGRESSIVE...with knowledge abreast of science, a well-built and efficient station and operation above reproach.

FRIENDLY...slow and patient operating when requested; friendly advice and counsel to the beginner; kindly assistance, cooperation and consideration for interests of others. These are the hallmarks of the amateur spirit.

BALANCED...radio is an avocation, never interfering with duties owed to family, job, school, or community.

PATRIOTIC...station and skill always ready for service to country and community.

22) On motion of Mr. Mendelsohn, seconded by Mr. Nathanson, the report of the Executive Committee was ADOPTED, and standing orders 1-135 AMENDED in accordance with the Executive Committee recommendation.

23) Mr. Metzger, as Chairman, presented the report of the Administration and Finance Committee. Concerning specific tasks of the A&F Committee, the group had studied creation of a for-profit subsidiary of the League but had found no immediate advantage in doing so. After extensive review and discussion pertaining to proposals submitted by three finalists, the Committee had unanimously recommended that Peat Marwick Main and Company be retained as auditor for 1989 and it had been so ordered by the Executive Committee at its April 1 meeting. Regarding a switch in the fiscal year to begin on July 1, the Committee had decided to defer a recommendation on this matter. Whereupon, it was moved by Mr. Metzger, seconded by Mr. Harrison, that the Board sit as a committee of the Whole to discuss personnel and financial matters, with only members of the Board and Counsel present. It was moved by Mr. Quiat, seconded by Mr. Kanode, that officers, Directors Vice Directors and Counsel be permitted to be present; but the motion to amend failed. The original motion then being adopted, those in the assembly who were not members of the Board were excused from the meeting at 4:11 PM. The Committee of the Whole arose and reported to the Board at 10:11 PM. On motion of Mr. Turnbull, seconded by Mr. Harrison, the report of the Committee of the Whole was ADOPTED. At this point the assembly recessed for the night. During the course of the above, The Committee of the Whole rested for dinner from 5:47 until 7:52 PM.

24) The Board reassembled at 8:37 with Mr. Price in the Chair and all persons hereinbefore mentioned present, except Mr. McCobb and Mr. Shima.

25) Mr. Wilson, as Chairman, reported for the Ad Hoc Part 97 Rewrite Committee. At its meeting over the weekend of July 15, the Committee had assembled a list of several pages of typographical and other errors of a similar nature found in the Report and Order on PR Docket 88-139. A "Request for Issuance of Errata List" was filed July 19 by Counsel Imlay. The Committee identified a second generation of "things to do," small adjustments the Board has wanted to make to the regulations, but which were not adopted in the Part 97 Rewrite proceeding. The Committee will have a proposal for the Board later in the year.

26) Mr. Wilson, as Chairman, presented the final report of the Ad Hoc Committee on Elections. On his motion, seconded by Mr. Frenaye, it was VOTED that the election rule adopted by Minute 44 of the January 1989 Board Meeting is amended by striking the words "relevant" and (in the last sentence) the word "relevancy." Mr. Heyn requested to be recorded as voting no.

27) It was moved by Mr. Wilson, seconded by Mr. Stafford, that the following time table is adopted for 1990 and subsequent elections of Directors and Vice Directors and ordered to be printed in the material initially mailed to all candidates for such offices. Dates marked with an asterisk may be varied for good cause shown by the Elections Committee.

August 20 — Petition deadline (By-Law 18). Secretary shall have sent each candidate the Qualification questionnaire and election information.

August 23* — The Secretary notifies each candidate of the names and callsigns of each other candidate for the same office.

September 2* — Qualification questionnaire shall be returned by the candidate.

September 9* — The 300-hundred word statement is due along with photo if desired. The Secretary shall mail a copy of the submitted 300 word statement to each other candidate. The Elections Committee is expected to complete its review of candidate qualifications. Each candidate is advised of the Elections Committee decision as to qualifications on his or her own candidacy and that of each opponent.

September 14* — Protests of qualification decisions must be received by the Secretary.

September 20 — Membership cutoff date (By-Law 19). Ballot printing process begins.

October 10 — Ballots must have been mailed (By-Law 19).

November 20 — Ballots counted (By-Law 20). The Secretary notifies each candidate of the ballot count.

November 26 — Any protest from an unsuccessful candidate must be received by the Secretary in writing. WIAW bulletin and general announcement of results. If a protest is filed, this announcement shall abide the decision of the Elections Committee.

On motion of Mr. Mendelsohn, seconded by Mr. Quiat, the motion was AMENDED by deleting the last two sentences. On motion of Mr. Metzger, seconded by Mr. Nathanson, the motion was further AMENDED by changing the dates to read, respectively, August 10, August 13, August 23, August 30, September 4, September 10 and October 1, with November 20 and November 26 unchanged. Mr. Quiat anounced he was drafting a motion for further amendment. On motion of Mr. Nathanson, seconded by Mr. Mark, it was VOTED to postpone consideration of the matter until after lunch.

28) It was moved by Mr. Wilson, seconded by Mr. Frenaye, that the following procedure be adopted should any candidate wish to appeal a less-than-unanimous decision of the Elections Committee:

A. All protests must be in writing or delivered by electronic mail, and must contain the basis of the objection. Unless waived by the Elections Committee for a good cause shown, the protest must be delivered within five days of the Elections Committee decision complained of.

B. The Secretary shall, within one working day, dispatch a copy of the protest and a summary of the Elections Committee action and the reasons therefor to each member of the Board by overnight delivery service or by electronic mail.

C. Directors shall vote on the question, "Shall the decision of the Elections Committee pertaining to Candidate———be sustained?" Votes will be in writing or sent by electronic mail and will be recorded in the Minutes of the next succeeding meeting of the full Board or of the Executive Committee. Unless a majority of all the Directors vote in the negative within five calendar days from the date the Secretary dispatched the material, the Elections Committee decision shall stand. On motion of Mr. Nathanson, seconded by Mr. Quiat, the motion was AMENDED to delete the phrase, "less-than-unanimous". The question then being on the motion as amended the same was ADOPTED.

29) On motion of Mr. Wilson, seconded by Mr. Harrison, it was VOTED that should a dispute arise concerning the qualifications, campaign, balloting or ballot-counting pertaining to a Section Manager election, a summary of the dispute, together with all correspondence specifically relating thereto, shall be promptly forwarded to the Election Committee which shall render a decision thereon. Appeals to the Board from a decision of the Elections Committee shall be processed as provided in disputes pertaining to elections of Directors and Vice Directors. The Board was in recess from 9:27 to 9:42 AM.

30) Mr. Olson, as Chairman, presented the report of the Ad Hoc Committee for Planning the 1989 IARU Region 2 Conference. The schedule of the meeting and the spouses' program were attached to the report.

31) Mr. Turnbull, as Chairman, presented the written report of the RFI Task Group. The report covered an ongoing pacemaker case; the status of

a suggestion by the Baltimore Office of the FCC for a cooperative effort to resolve RFI problems; and the continuing work with the IEEE Standards Committee on Electromagnetic Compatibility (C63), an activity of the Institute of Electrical and Electronics Engineers (IEEE). Mr. Turnbull and Technical Department Manager Charles Hutchinson, K8CH, reviewed documents of the International Special Committee on Radio Interference (CISPR) and attended a cable TV leakage seminar sponsored by the National Cable Television Association in Hartford.

32) Mr. Mozley, as Chairman, reported for the Committee on Biological Effects of Radio Frequency Energy. He had attended the meeting of the Electromagnetic Energy Policy Alliance (EEPA) in Arlington, VA, and had been appointed as a member of its scientific committee; he recommended our continued participation in EEPA. A meeting of the Bio Effects committee was held at the National Convention, at which ARRL's technical plan of education, publication, question pool and syllabi writing, to familiarize amateurs and potential amateurs with the subject, was affirmed. The Committee noted a number of articles on the general subject in the popular press recently. It felt the correct approach toward the handling of the subject of electromagnetic energy was, as noted by Mr. Holladay: prudence, not panic.

33) Mr. Butler, as Liaison, presented the written report of the Committee on Amateur Radio Digital Communication. The Eighth Annual ARRL Computer Networking Conference will be held at the US Air Force Academy, Colorado Springs, CO, on October 7 with a committee meeting the following day. An article outlining an HF packet radio design program was printed in May *QST*; thirty respondents have indicated an interest in participating. The Digital Committee expects to complete a draft of proposed rules for HF packet radio operation under automatic control prior to the October meeting of the Executive Committee. The ARRL publication, *Gateway*, has reported on allegations that a software program, *theNet* infringes on the *Net/ROM* copyright. The Committee felt that no ARRL action, beyond reporting the controversy, is necessary or desirable inasmuch as there are established remedies for protecting intellectual property. The Digital Committee is monitoring development of a protocol for packet-switching satellite operations intended for use on Microsats scheduled for launch in November. Finally, the Committee reported on a relatively new type of modulation called RZ SSB, for "Real Zero single sideband." The new modulation is claimed to be twice as spectrally efficient as FM. After presentation of the report, on Mr. Butler's motion, seconded by Mr. Quiat, it was VOTED that the ARRL accept the invitation of the Canadian Radio Relay League (CRRL) to hold a joint ARRL/CRRL Computer Networking Conference in London, Ontario, on Saturday, September 22, 1990.

34) Mr. Quiat, as Chairman, presented the report of the Legal Strategy Committee, covering the Continuing Legal Education seminar at the National Convention; ongoing studies about ways to handle real estate covenants; and FCC enforcement matters. After presentation of the report, it was moved by Mr. Quiat, seconded by Mr. Mendelsohn, that the League does hereby instruct counsel in coordination with the Legal Strategy Committee to take such steps as may be necessary, through petition, litigation or otherwise, to protect Amateur Radio operators from efforts by the Federal Communications Commission to limit the operating authority of amateurs while denying to amateurs the administrative hearing required by Constitution and statute. Such action would be commenced in connection with a case in which the Commission, or its agents, has arbitrarily limited, or proposes arbitrarily to limit, the operating rights of an amateur as the result of complaints of radio frequency interference to home electronic equipment. But, after discussion, with the permission of his second, Mr. Quiat withdrew the motion.

35) Mr. Frenaye, as Chairman, reported briefly for the Education Task Force. The Task Force has completed its work, with staff now implementing the new Educational Advisor voluntary position along with other Task Force recommendations. There was a successful seminar on Amateur Radio Education at the National Convention in Arlington, TX. Educational activities are now far more visible than in the past. Continuing Education Units (CEUs) will be available for both students and instructors who complete appropriate courses of study. A computer program to check the reading levels of ARRL texts is being used to identify text that should be simplified.

36) Mr. Stafford, as Liaison, presented the report of the ARRL National Emergency Response Committee (ANERCOM). Jerry Boyd, KG6LF resigned as Chairman, and Joel Kandel, KI4T has been appointed to that post. Tom Comstock, N5TC has been added as a member. Consideration of the report was then deferred until after lunch for preparation of a series of motions delineating its work. The Board was in recess from 10:46 to 11:22 AM.

37) Mr. Haynie, as Liaison, presented the report of the Shuttle Amateur Radio Experiment (SAREX) Working Group. The SAREX Working Group, with Roy Neal, K6DUE, as Chairman, has gotten Amateur Radio activities back on the list of acceptable secondary shuttle-payload experiments; SAREX 2 has been approved for shuttle mission STS-35 planned for April 26, 1990 with Ron Parise, WA4SIR, as payload specialist. Another astronaut amateur, Ken Cameron, KB5AWP, is presently scheduled for the June 1990 mission, STS-37. SAREX hardware and software are being developed. John Nickel, WD5EEV, has been designated as ARRL technical representative to the National Aeronautics And Space Administration (NASA) in Houston. After presentation of the report, on Mr. Haynie's motion, seconded by Mr. Harrison, it was VOTED that the Board of Directors endorses the recommendation of the SAREX Working Group that the amateur community take full advantage of SAREX as a means of bringing Amateur Radio into classrooms, and instructs the Executive Vice President to cooperate with NASA and AMSAT in undertaking educational and public-information efforts toward that goal.

38) Mr. Price presented some observations about problems with public relations for Amateur Radio and his difficulty in appointing members to a volunteer Public Relations Committee to do a job which the League should address on a professional basis. After discussion, on motion of Mr.Nathanson, seconded by Mr. Frenaye, it was VOTED that, whereas, an enhanced public perception of the relevance and importance of Amateur Radio is a desirable achievement; therefore, the Executive Vice President is directed to prepare a detailed plan for the selection and utilization of professionals in public relations in order to achieve these goals. The plan is to be submitted to the Executive Committee for review and, upon approval, to the A&F Committee for incorporation into the fiscal year 1990 budget of the League. The President is directed to postpone the appointment of the Public Relations Committee until the report is received.

39) Mr. Wilson, as Chairman, presented the report of the Committee to Examine a Possible Codefree License in the Amateur Radio Service (as printed at page 56, *QST* for May 1989). It was then moved by Mr. Wilson, seconded by Mr. Holladay, that the recommendations of the Committee report be adopted and presented to the FCC in the form of a Petition for Rulemaking with respect to a codefree license. These are: 1) A codeless license be recommended. 2) Examination elements 2 plus a broadened 3A be required for the license. 3) License examinations be given for the new class of license by the established Volunteer Examiners. 4) There shall be an upgrade path from the new license to the present Technician license by way of a 5-WPM Morse-code test, administered through the established Volunteer Examining system. 5) There shall be distinctive callsigns as recommended in the Committee report. 6) The licensee's callsign prefix shall change upon upgrade, as recommended in the Committee report. 7) All privileges above 30 MHz, except in the 144 MHz band. In that band, members of the new class would have privileges limited to digital modes in the 144.9-145.1 MHz subband. 8) The present Technician license would be renamed "Technician Plus," and the new license would be named "Technician." It was moved by Mr. Hurlbert, seconded by Mr. Olson, that the motion be amended by deleting items 2), 7) and 8) and substituting therefor: 2) Examination elements 2 and 3A plus additional questions including ones relating to Morse code. 7) privileges shall be 220 MHz and above. 8) power shall be limited to 250 watts PEP output. 9) The licensee shall not be the control operator of a repeater or auxiliary station. 10) the name of the license shall be Communicator. It was moved by Mr. Heyn, seconded by Mr. Frenaye, to amend the amendment by striking all of the last line in item 2) after 3A, and adding "and an additional element to determine the ability to recognize Morse-code characters, but with no speed requirement". But this motion to amend was LOST. Mr. Frenaye requested to be recorded as voting no. It was moved by Mr. Frenaye that item 7) of the amendment read "50 MHz" instead of "220 MHz", but there was no second, so Mr. Frenaye's amendment was LOST. The question then being on the Hurlbert amendment, a roll-call vote being requested, it was decided in the affirmative, 11 votes in favor to 4 votes opposed. Those voting in favor were Messrs. Turnbull, Metzger, Mark, Mendelsohn, Frenaye, Drake, Stafford, Kanode, Quiat, Butler, and Haynie. Those voting no were Messrs. Harrison, Nathanson, Grauer, and Heyn. So the motion was AMENDED. On motion of Mr. Frenaye, seconded by Mr. Mark, the motion was further AMENDED by striking items 5) and 6), substituting therefor as item 5)"The callsigns shall be assigned from group D" and renumbering items 7) through 10) as items 6) through 9), respectively. Messrs. Nathanson and Harrison requested to be recorded as voting no on this amendment. It was moved by Mr. Mark, seconded by Mr. Haynie, that the motion be further amended to change the permissible output power in item 7) to 45 watts. But this motion to amend was defeated; Mr. Frenaye requested to be recorded as voting no. The Chair then called for a roll-call vote on the final form of the motion: MOVED that a proposal be presented to FCC in a form of a Petition for Rulemaking incorporating the following elements:

1) a codeless license be recommended.

2) examination elements 2, and 3A plus additional questions including ones relating to Morse code.

3) license examinations be given for the new class of license by the established Volunteer Examiners.

4) there shall be an upgrade path from the new class of license to the present Technician license by way of a 5-WPM Morse code test, administered through the established Volunteer Examining system.

5) callsigns shall be assigned from group D.

6) privileges shall be 220 MHz and above.

7) power shall be limited to 250 W PEP output.

8) the licensee shall not be the control operator of a repeater or auxiliary station.

9) the name of the license shall be: Communicator.

The question was decided in the affirmative, 9 votes in favor to 6 votes opposed. Those voting in favor were Messrs. Turnbull, Mark, Mendelsohn, Frenaye, Drake, Kanode, Quiat, Butler, and Haynie. Those voting against the motion were Messrs. Metzger, Harrison, Nathanson, Grauer, Stafford, and Heyn. So the motion was ADOPTED. During the course of the above, the Board was in recess for lunch from 12:02 to 12:48 PM reconvening with all persons hereinbefore mentioned present except Messrs. McCobb, Shima and Overbeck. The Board was again in recess from 1:38 to 1:59 PM and from 2:17 to 2:32 PM.

40) Without dissent, the report of the VHF Repeater Advisory Committee was delayed until later in the meeting.

41) Mr. Drake, as Liaison, presented the report of the Contest Advisory Committee. Issues under consideration by the CAC include the addition of a "single operator, assisted" category in the DX Contest; club participation rules; counting the Canadian maritime provinces as separate DX contest multipliers; and publication of grid squares of VHF contest participants in the results.

42) Mr. Kanode, as Liaison, presented the report of the DX Advisory Committee. The committee, an extremely active one, has under discussion the application of point two of the new DXCC rules in determining what places will be counted as countries. Seven petitions for new-country status are pending: Frederick Reef, Marquesas Islands,

Austral Islands, Conway Reef, Banaba Island, Basilica del Santo, and Walvis Bay. There are also seven internal agenda items under discussion: determining the basis for countries already on the list; point three revision, format for new-country petitions; basis and purpose of DXCC; 5-Band DXCC endorsements for additional bands; and two group stations in enclaves, TP2CE and 4U1VIC.

43) Mr. Vydareny, as Liaison, spoke briefly for the Public Service Advisory Committee, which had no formal report, as there presently is no Chairman.

44) Mr. Holladay, as Liaison, presented the extensive report of the VHF/UHF Advisory Committee. A wealth of material is attached to the VUAC report concerning details of its studies of the various VHF and UHF band plans; beacon frequencies and operations; and the like.

45) The Chair recognized Mr. Quiat to complete the report of the Legal Strategy Committee. It was moved by Mr. Quiat, seconded by Mr. Haynie, that the following resolution be adopted:

WHEREAS, the Board is apprised of repeated incidents of FCC-imposed operating restrictions on Amateur Radio licensees in response to consumer complaints of interference to home electronic equipment, and

WHEREAS, such operating restrictions have been imposed by FCC without regard to technical fault; without the administrative hearings mandated by Sections 303(f) and 316 of the Communications Act of 1934; and without imposition of any obligations on the consumer or the manufacturer of the offended device to assist in resolution of RFI problems;

NOW THEREFORE, in order to protect all amateurs from such arbitrary and unlawful restrictions, Counsel and the Legal Strategy Committee are to pursue necessary administrative and judicial action to insure that due-process rights are afforded amateurs prior to imposition of operating restrictions in RFI cases involving home electronic equipment.

On motion of Mr. Nathanson, seconded by Mr. Heyn, the action clause of the resolution was AMENDED to read "NOW THEREFORE, in order to protect all amateurs from such arbitrary and unlawful restrictions, Counsel is to pursue appropriate action to insure that due process rights are afforded amateurs prior to imposition of operating restrictions in RFI cases involving home electronic equipment." The question then being on the main motion as amended, the same was ADOPTED.

46) Turning now to agenda item 7, Mr. Grauer, as host Director, made a preliminary report on the 1990 ARRL National Convention in Kansas City, MO, June 8-10, 1990. The convention headquarters hotel will be the Allis Plaza.

47) The Chair called for consideration of the site for the 1991 ARRL National Convention. On motion of Mr. Nathanson, seconded by Mr. Wilson, it was VOTED that the 1991 National Convention be held in Saginaw, MI, August 23-25, 1991. At this point, 3:30 PM, Mr. Sitton took the seat for Mr. Haynie.

48) Motions by Directors were the next item on the agenda. On motion of Mr. Nathanson, seconded by Mr. Frenaye the following resolution was ADOPTED:

WHEREAS: The American Radio Relay League is desirous of increasing the infusion of youth into Amateur Radio, and

WHEREAS: the schools of the country do not have curricula leading to amateur licenses, and

WHEREAS: including Amateur Radio programs into elementary, junior high and high school will increase the pool of radio amateurs, which will benefit the nation by increasing the resource; therefore

BE IT RESOLVED that the Board of Directors directs the President to appoint a committee to study the implementation of a nationwide course for amateur licensing in elementary, junior high and high schools and to recommend to the Board action to be taken with respect to meeting with national leadership organizations of teachers to incorporate such programs.

49) It was moved by Mr. Mendelsohn, seconded by Mr. Harrison that the following resolution be ADOPTED:

WHEREAS, a significant portion of the legal/regulatory problems faced by amateurs today come from the area of local government—town and city councils, zoning boards, administrative agencies—which may enact ordinances or regulations detrimental to amateur interests, or may use existing rules to hinder amateur operation; and

WHEREAS, the ARRL has recognized the need for effective representation at the federal level and has addressed this through its efforts in Washington; and at the state level through the creation of the State Government Liaison appointment in the ARRL Field Organization; and

WHEREAS, the State Government Liaison cannot monitor the activities of each and every local board and agency in the state (nor appear before those boards and agencies); therefore

BE IT RESOLVED that this Board of Directors creates the ARRL Field Organization station appointment of "Local Government Liaison" to bring organized Amateur Radio closer to these most basic, grassroots levels of government, and the ARRL closer to any amateur who is trying to deal with local agencies or officials.

BE IT FURTHER RESOLVED that the Field Services Manager will promulgate appropriate certificates of appointment, job descriptions and publish appointee recruitment articles in appropriate publications.

It was moved by Mr. Frenaye, seconded by Mr. Butler, that the motion be amended by striking the last four paragraphs and adding the words, after "and": "It is resolved that all amateurs are urged to participate in local government activities, to monitor actions and work to resolve Amateur Radio issues, and that all amateurs are urged to keep the ARRL informed of such activity". The Chair ruled that the motion is out of order because its purpose was equivalent to rejection of the original motion. Mr. Frenaye disagreed with the Chair and requested an opinion from the Parliamentarian. Mr. Wilson, as Parliamentarian, upheld the Chair. On motion of Mr. Butler, seconded by Mr. Kanode, consideration of the matter was POSTPONED until after dinner. During the course of the above, at 3:49 PM, Mr. Haynie returned to his Chair.

50) On motion of Mr. Frenaye, seconded by Mr. Turnbull, it was VOTED that the Officers, as part of their long-range planning, study the FCC Amateur License structure, and make a recommendation to the Board at the July 1990 meeting. During the course of the above, the Board was in recess from 3:59 to 4:20 PM.

51) On motion of Mr. Drake, seconded by Mr. Stafford, it was VOTED that the ARRL Board of Directors hereby selects Fred Cady, KE7X as the recipient of the 1988 Herb S. Brier Instructor of the Year award.

52) On motion of Mr. Stafford, seconded by Mr. Mendelsohn, it was VOTED that the Board accepts the July 1989 ANERCOM report and commends the committee on its report.

53) On motion of Mr. Stafford, seconded by Mr. Frenaye, it was VOTED that ARRL staff develop a call-up list for national-level officials of served agencies, which will be activated by ARRL HQ when necessary.

54) On motion of Mr. Stafford, seconded by Mr. Heyn, it was VOTED that the Executive Vice President study the feasibility of collecting membership occupational information for possible use during emergencies or disaster. The Executive Vice President is to report on the matter at the January 1990 Board meeting.

55) On motion of Mr. Stafford, seconded by Mr. Butler, it was VOTED that the Executive Vice President study the feasibility of instituting a "watch officer" program, as recommended by ANERCOM, in order to provide early involvement by ARRL HQ in any emergency or disaster response.

56) On motion of Mr. Stafford, seconded by Mr. Kanode, it was VOTED that the ARRL staff proceed with the development of a packet of information for served agencies detailing how served agencies may more effectively interface with Amateur Radio. Staff is to seek input for such a packet of information from ANERCOM and the Public Service Advisory Committee.

57) On motion of Mr. Quiat, seconded by Mr. Butler, it was VOTED that the so-called "Torrance" 33-cm bandplan, as follows, be adopted by ARRL to guide amateur activities on that band while use and activity grows and develops on those frequencies:

FREQUENCY-MHZ	ACTIVITY
902.0-903.0	Weak Signal [902.1 calling frequency]
903.0-906.0	Digital [903.1 alternate calling frequency]
906.0-909.0	FM Repeater Inputs
909.0-915.0	Amateur TV
915.0-918.0	Digital
918.0-921.0	FM Repeater Outputs
921.0-927.0	Amateur TV
927.0-928.0	FM Simplex and Links

The Membership Services Committee, with input from the membership, is directed to continue consideration of 33-cm activity as use of the band develops so that a flexible approach to bandplanning may be maintained to encourage maximum amateur use of the band. Mr. Frenaye requested to be recorded as voting no.

58) On motion of Mr. Butler, seconded by Mr. Quiat, it was VOTED that the ARRL Board of Directors hereby selects Phyllisan West, KA4FZI, as the recipient of the ARRL Professional Amateur Radio Teacher of the Year award.

59) On motion of Mr. Heyn, seconded by Mr. Mendelsohn, it was VOTED that the 1990 Annual Meeting of the Board of Directors begin on Friday, January 19, 1990.

60) On motion of Mr. Haynie, seconded by Mr. Heyn, it was unanimously VOTED that Counsel is requested to initiate, as soon as possible, a rule-making petition seeking secondary allocation to the Amateur Radio Service in the 216-220 MHz band segment. This action should not have the effect of delaying or otherwise impeding the League's ongoing appeal of the Commission's actions in FCC General Docket 87-14.

61) It was moved by Mr. Harrison, seconded by Mr. Mark, that in order to enact cost cutting measures needed at this time, Vice Directors be authorized to attend one Board meeting per term at League expense, with such expenses charged to the appropriate Division account. Attendance at other meetings will be at the expense of the Vice Director for hotel and travel charges. On motion of Mr. Kanode, seconded by Mr. Mendelsohn, the motion was AMENDED to read, "to attend one Board meeting per year". It was moved by Mr. Heyn, seconded by Mr. Mendelsohn, that the motion be further amended to strike the words "and travel charges." But this motion to amend was LOST. The question now being on the motion (with the Kanode amendment), the same was ADOPTED.

62) On motion of Mr. Mark, seconded by Mr. Mendelsohn, it was unanimously VOTED that the ARRL Board of Directors hereby selects Sister Alverna O'Laughlin, WAØSGJ, as the recipient of the 1988 Humanitarian of the Year award (applause).

63) On motion of Mr. Nathanson, seconded by Mr. Butler, the following resolution was ADOPTED:

WHEREAS: The ARRL publishes numerous books which are unavailable on a local basis, and

WHEREAS: College bookstores and other book distributors offer a potential outlet, and

WHEREAS: The distribution of ARRL books helps promote Amateur Radio; it is therefore

RESOLVED that the Publications Committee study methods to increase distribution of ARRL books to college bookstores, high-school bookstores and the major book distributors nationwide.

64) It was moved by Mr. Frenaye, seconded by Mr. Butler, that the Contest Advisory Committee develop a standard computer-file format for contest participants to use when submitting contest log data for ARRL contests. This recommendation is to be submitted to staff with progress on implementation to be monitored by the Membership Services Committee. This optional data would be used to assist in log-checking efforts and would not substitute for a written/printed contest entry. On motion of Mr. Heyn, seconded by Mr. Stafford, the motion was AMENDED by striking the last two sentences and by inserting the word "recommended"

before the word "standard". Mr. Frenaye requested to be recorded as voting no on the amendment. The question then being on the main motion as amended, the same was ADOPTED.

65) On motion of Mr. Stafford, seconded by Mr. Heyn, it was VOTED that the ARRL Executive Vice President shall investigate ways of obtaining private and/or governmental grants to fund national and international disaster communications plans. The Executive Vice President is to report his findings to the Board at the January 1990 Board meeting.

66) On motion of Mr. Stafford, seconded by Mr. Butler, it was VOTED that the ARRL propose to the IARU, Region 2, the planning of disaster drills on an international level. Said disaster drills to initially involve Region 2 countries.

67) On motion of Mr. Haynie, seconded by Mr. Harrison, it was unanimously VOTED that the ARRL Board of Directors hereby selects Kevin Biekert, KB5AQV, as the recipient of the 1988 Hiram Percy Maxim award. (applause)

68) On motion of Mr. Nathanson, seconded by Mr. Heyn, the following resolution was ADOPTED:

WHEREAS: There exists a group of people age 50 and above who are members of the American Association of Retired Persons (AARP), and

WHEREAS: The American Radio Relay League is desirous of expanding the horizons of Amateur Radio, now, therefore

BE IT RESOLVED: that the Board of Directors of the ARRL directs the President of ARRL to appoint a committee to study and propose the development of a program to introduce Amateur Radio to AARP and to meet with the national officers of AARP to explore ways to implement this program, at an expense not to exceed $2500.

69) On motion of Mr. Mendelsohn, seconded by Mr. Heyn, it was VOTED that the Membership Services Committee study the feasibility and desirability of making available, at cost, standard-format road signs with the ARRL diamond, club name and meeting information.

70) It was moved by Mr. Mendelsohn, seconded by Mr. Haynie, that the VHF Repeater Advisory Committee study the desirability of including a shaded map of the United States showing geographical band usage in the ARRL *Repeater Directory*. But the motion was LOST. The Board was in recess from 5:35 to 5:43 PM.

71) On motion of Mr. Stafford, seconded by Mr. Nathanson, it was VOTED that the Legal Strategy Committee do a complete review of the materials sent from HQ to members requesting information dealing with antenna ordinances (the so-called PRB-1 package).

72) On motion of Mr. Nathanson, seconded by Mr. Mendelsohn, the following resolution was ADOPTED:

WHEREAS: The promotion of Amateur Radio is advantageous to the nation and whereas it appears that marketing of Amateur Radio is desirable; now, therefore be it

RESOLVED that the President refer to the appropriate committee a study of the marketing of Amateur Radio and the ARRL which will include, but not be limited to:

a) raising funds for TV advertising;

B) considering the employ of marketing experts;

c) setting goals;

d) determining marketing methods.

73) On motion of Mr. Frenaye, seconded by Mr. Butler, it was VOTED that the Volunteer Resources Committee explore ways to provide training to leadership volunteers at all levels on motivating volunteers and insuring that their participation in ARRL activities is used fully.

74) It was moved by Mr. Frenaye, seconded by Mr. Butler, that the Contest Advisory Committee make every effort possible to resolve with a recommendation how to best accommodate individual contest participants who operate using voice-or packet-repeater assistance before the rules are established for contests to be run in 1990. On motion of Mr. Nathanson, seconded by Mr. Heyn, the motion was AMENDED to strike the first two lines and substitute: "that the Contest Advisory Committee recommend how to best accommodate. . .". The question then being on the motion as amended, the same was ADOPTED.

75) The Board was in recess for dinner from 6:15 to 7:45 PM reconvening with all persons hereinbefore mentioned present except Messrs. McCobb and Shima.

76) The Chair recognized Mr. Wilson, to complete the report of the Ad Hoc Committee on Elections. Mr. Wilson presented the final draft of the time table motion which addressed the concerns expressed by Mr. Quiat. Whereupon, it was VOTED that the motion be amended to read as follows: Moved, that the following time table is adopted for election of Directors and Vice Directors for implementation in 1990 and ordered to be printed in the material initially mailed to all candidates for such offices. Dates marked with an asterisk may be varied for good cause shown by the Elections Committee.

August 10—Petition deadline (By-Law 18). Secretary shall have sent each candidate the qualification questionnaire and election information.

August 13—The Secretary notifies each candidate of the names and callsigns of each other candidate for the same office.

August 23*—Qualification questionnaire shall be returned by the candidate. The 300-word statement is due along with photo if desired. The Secretary shall mail a copy of the submitted 300-word statement to each other candidate.

August 30*—The Elections Committee is expected to complete its review of candidate qualifications. Each Candidate is advised of the Elections Committee decision as to qualifications on his or her own candidacy and that of each opponent.

September 4*—Protests of qualification decisions must be received by the Secretary.

September 10—Membership cutoff date (By-Law 19). Ballot printing process begun.

September 23-October 1—Ballot mailing period (By-Law 19).

November 20—Ballots counted (By-Law 20). The Secretary notifies each candidate of the ballot counts.

November 26*—Any protest from an unsuccessful candidate must be received by the Secretary in writing.

The question being on the motion as amended, the same was ADOPTED.

77) It was moved by Mr. Wilson, seconded by Mr. Heyn, effective 1 September 1989 By-Law 18 is amended by striking the words "20th day of August," and substituting therefor, the words "10th day of August." A roll-call vote being required, the question was decided in the affirmative. All the Directors voted in favor, so the By-Law was amended.

78) The Chair called attention to Mr. Mendelsohn's earlier motion concerning Local Government Liaisons, discussion on which had been postponed until after dinner on motion of Mr. Butler. Mr. Butler yielded to Mr. Nathanson, and on his motion, seconded by Mr. Butler, the matter was again POSTPONED, indefinitely. Mr. Mendelsohn and Mr. Harrison requested to be recorded as voting nay. Mr. Shrader took the seat for Mr. Drake, at 8:00 PM.

79) The Chair recognized Mr. Shrader, as Liaison, to present the report of the VHF Repeater Advisory Committee. The Committee presented a bandplan for 900 MHz [a subject addressed earlier in the meeting] and deferred action on 2.3-GHz and 50-MHz bandplans. Finally, the report suggested two motions for Board consideration.

80) It was moved by Mr. Shrader, seconded by Mr. Haynie, that the Board of Directors of the American Radio Relay League task the VHF Repeater Advisory Committee to recommend changes to the *Repeater Directory* repeater band plan section, and that such changes be presented to the Board at the 1990 Annual Meeting. The Chair ruled that this motion was out of order, the assembly having already addressed and disposed of the topic.

81) It was further moved by Mr. Shrader, seconded by Mr. Butler, that the Board of Directors of the American Radio Relay League formally recommend that the users of Amateur Television in the frequency band of 420 to 450 MHz use vestigial sideband filters to limit their bandwidth to a single sideband only, so that interference to other modes of Amateur Radio operation may be minimized. It was moved by Mr. Heyn, seconded by Mr. Holladay, that the matter be referred to the Membership Services Committee. A tie vote having been found, the Chair voted in favor of referral. Mr. Drake returned to his seat at 8:15 PM.

82) On motion of Mr. Olson, seconded by Mr. Haynie, it was unanimously VOTED that Mr. Butler be nominated as the ARRL candidate for Area B Representative in the September IARU Region 2 Executive Committee election (applause).

83) On motion of Mr. Nathanson, seconded by Mr. Grauer, it was unanimously VOTED that it is the policy of the ARRL Board to oppose Amateur Radio station or operator license fees that are: 1) either in excess of the actual cost of administration, or in excess of those charged licensees of any stations in other services operated for a not-for-profit purpose; 2) for license modifications; 3) for upgrading, other than those to reimburse Volunteer Examiners; 4) for reciprocal operating permits; and 5) for RACES, military-recreation, or school club stations. The President is directed to pursue efforts toward these ends, employing staff, counsel, and other personnel as required.

84) On motion of Mr. Mendelsohn, seconded by the entire Board, it was unanimously VOTED that the Board of Directors of the ARRL, assembled in Windsor Locks, CT, thanks Bob Schetgen for his handling of physical arrangements; Lisa Clark for her assistance with the paper flow; John Lindholm and Paul Rinaldo for their technical expertise at crucial moments; and the Executive Vice President and Perry Williams for faithfully recording one of the most active meetings in memory (applause).

85) There followed an opportunity for all present to make final comments. There being no further business, the Board adjourned *sine die* at 9:20 PM. (total time in session as a Board: 13 hours, 55 minutes; as a Committee of the Whole: 3 hours, 55 minutes; direct authorizations $2,500)

Respectfully submitted,
David Sumner, K1ZZ
Secretary

Strays

MARSHALL H. ENSOR MEMORIAL MUSEUM UPDATE

☐ Thomas Doutt, KEØME, called the League to report that he discovered that the Marshall H. Ensor Museum, featured in August 1989 *QST*, page 45, is closed. A representative of the Johnson County (KS) Museum System, which operates the Ensor Museum, explained that the museum has been closed for preservation planning. Presently, plans are on hold, and the Museum System expects to have more information within the next six months. Inquiries can be directed to the Johnson County Museum System, 6305 Lackman Rd, Shawnee, KS 66217.

Happenings

Conducted By John C. Hennessee, KJ4KB
Regulatory Information Editor

ITU Conference Adopts Schedule for WARC-92

The ITU Plenipotentiary Conference has adopted a schedule of future conferences, at least one of which is of direct interest to Amateur Radio: a World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum. It is scheduled for the first quarter of 1992 in Spain and is tentatively slated to last four weeks and two days. (By contrast, WARC-79 lasted more than ten weeks.)

The precise agenda of the 1992 Conference will not be known until it is established by the ITU Administrative Council. A clue to its likely extent is that the Administrative Council is to take into account "the Resolutions and Recommendations of WARC HF-BC-87, WARC MOB-87 and WARC-ORB-88 [respectively, specialized Worldwide Administrative Radio Conferences dealing with HF broadcasting, UHF mobile and satellite orbit matters] relating to frequency allocations; in addition this Conference may consider defining certain new space services and consider allocations to these services in frequency bands above 20 GHz."

The WARC HF-BC-87 recommendation and WARC MOB-87 resolution were discussed in the August 1987 and January 1988 *QST* editorials. The relevant portions refer to the desirability of a conference to consider "...the possibility of extending the HF frequency spectrum allocated exclusively to the broadcasting service" and "...revising the Table of Frequency Allocations around 1-3 GHz to better accommodate the mobile-satellite and the mobile services." As for WARC-ORB-88, it resolved that the introduction of satellite High Definition Television (HDTV) should be made by a frequency allocation on a worldwide basis and that a future conference should consider the frequency range 12.7 to 23 GHz for the choice of an appropriate band; and further, that a future conference, to be held no later than 1992, should select a band or bands in the range 500 MHz to 3 GHz with a view to a possible allocation for a Sound Satellite Broadcasting Service (SSBS).

The frequency ranges possibly subject to reallocation are:

- HF (3-30 MHz)
- 500 MHz to 3 GHz
- Above 12.7 GHz

However, the ITU Administrative Council may limit these ranges further when it adopts the agenda at a meeting in November for a subsequent meeting scheduled for next spring.

Another future conference on the schedule adopted by the Plenipot is a World Administrative Radio Conference for Dealing with Matters Connected with the Broadcasting Service in the HF Band called for in Geneva in the first quarter of 1993 and tentatively to last four weeks. This may hold some interest to Amateur Radio because of the differences in allocations between regions at 3.95-4.0 MHz and 7.1-7.3 MHz.

CONGRATULATORY MESSAGES RECEIVED FROM IARU SISTER SOCIETIES

US amateurs aren't the only ones who are aware of and are celebrating the 75th anniversary of the ARRL. We have received a number of letters of congratulations from IARU sister societies all around the globe.

From the Deutscher Amateur Radio Club (DARC) in the Federal Republic of Germany: "Congratulations on ARRL's 75th anniversary, and best wishes for prosperous and successful years to come. These wishes are extended to the ARRL community from all German hams. We hope ARRL will continue to play a leading role in Amateur Radio for the benefit of hams around the world.—Guenther Matz, DJ8BN, President, and Hellmut Schmuecker, DK5ML, Vice President, DARC."

From the Japan Amateur Radio League (JARL): "Remembering ARRL members on your very memorable 75th anniversary. We at JARL offer our most sincere congratulations and hope many more anniversaries will follow. Kindest personal regards and best wishes.—Shozo Hara, JA1AN, President, JARL"

From the Canadian Radio Relay League (CRRL): "Sincere congratulations and best wishes on the 75th anniversary of the American Radio Relay League from the Directors, Officers and members of CRRL. Because of the long association of Canadian amateurs as a part of the ARRL family, this occasion is of special significance to us.

"'Since its inception in 1914, the League has been a strong leader, advocate and watchdog for the Amateur Radio Service, not only in North America, but internationally. Its service to the world amateur community has been tireless, impressive and unparalleled. With very best wishes for the future.—Thomas B.J. Atkins, VE3CDM, President, CRRL."

From the Radio Society of Great Britain (RSGB): "We have the pleasure of congratulating all the members of the ARRL on the occasion of your 75th anniversary.

"What would Hiram Percy Maxim have thought of modern day Amateur Radio with all of its intricacies, complexities and legislative framework? Undoubtedly, he would have warmed to the active leadership which the League has contributed to the development and fostering of Amateur Radio throughout its magnificent history. The success of Amateur Radio in terms of technical achievement and international goodwill owes much to the sustained enthusiasm of the League's supporters and the professionalism of its staff. May your next 75 years be as notable and rewarding as the last.

"On behalf of the Council, staff and members of the Radio Society of Great Britain may we offer, in true friendship, our best wishes for your anniversary and for the future.—Julian Gannaway, G3YGF, President, and David Evans, G3OUF, Secretary/Chief Executive, RSGB"

From the Liga De Amadores Brasileiros De Radio Emissao (LABRE) in Brazil: "Greetings on this day when you are celebrating the 75th anniversary of ARRL. It is a real pleasure and thrill to congratulate all administrative officers, volunteers and members for the outstanding efforts you have made in favor of the Amateur Radio Service. The 75th anniversary of ARRL is a source of pride and great encouragement to us all.—Iran Maia Junior, PT2CW, President, LABRE"

NARTE CERTIFICATION AVAILABLE TO HAMS

The National Association of Radio and Telecommunications Engineers (NARTE) is granting its entry-level Class IV certificate to Advanced and Extra Class amateurs. The NARTE program covers broadcasting as well as commercial aspects of satellite, microwave, and land mobile communications, and certification provides a means whereby amateurs may enter the commercial field.

If you are interested in adding yourself to the pool of technical personnel for industry, contact NARTE at PO Box 15029, Salem, OR 97309, or call 503-581-3336.

PRESIDENT BUSH NOMINATES COMMISSIONERS

President George Bush has nominated Alfred Sikes, Sherrie Marshall and Andrew Barrett to be Federal Communications Commissioners. Sikes' appointment was delayed about ten days beyond the others. He was, however, named chairman, as expected.

Sikes has been serving since 1986 as Assistant Secretary of Commerce for Communications and Information and as Administrator of the National Telecommu-

nications and Information Administration (NTIA). He will occupy the seat vacated by Mimi Dawson late in 1987.

Barrett is a member of the Illinois Commerce Commission. He is slated to fill the term of former Chairman Mark Fowler.

Marshall is presently a partner in Wiley, Rein & Fielding. In 1987-88, she was Chief of the Office of Congressional Affairs in the FCC, under Chairman Patrick. She is expected to take his position as a Commissioner.

While the term of Patricia Diaz Dennis expired on June 30, 1989, she may continue to serve until a successor is named. The fifth Commissioner's seat is currently filled by James H. Quello. He was first appointed by President Nixon in 1974.

The three new appointments to the FCC are subject to the advice and consent of the Senate. The naming of the Chairman from among the five Commissioners, however, is the prerogative of the President alone. Hearings on nominations are within the jurisdiction of the Senate Commerce Committee and its Communications Subcommittee. Senators Fritz Hollings and Daniel Inouye are the current chairmen of, respectively, the full and the sub committee. Confirmation hearings were held on July 31, with a Senate vote expected to occur just after presstime for this issue.

FCC-ISSUED CALL SIGNS UPDATE

The following is a list of the FCC's most recently issued call signs as of July 1

District	*Group "A" Extra*	*Group "B" Advanced*	*Group "C" Tech/Gen*	*Group "D" Novice*
0	WU0U	KF0DT	N0KUY	KB0EXN
1	NX1F	KC1PL	N1GSO	KA1UFB
2	WR2F	KE2OE	N2JQR	KB2IEH
3	NV3I	KD3NS	N3HGK	KA3UXS
4	AB4PG	KM4UN	N4WET	KC4LNM
5	AA5MH	KG5VT	N5OTF	KB5KBE
6	AA6OU	KJ6WP	N6VOJ	KC6EQG
7	AA7AY	KF7VB	N7NBM	KB7IGG
8	WT8Z	KF8AE	N8KZQ	KB8HVA
9	WJ9D	KE9QZ	N9IQG	KB9DCM
Guam	KH2K	AH2CE	KH2DW	WH2AMF
Hawaii	**	AH6JU	NH6TV	WH6CEF
Alaska	**	AL7LI	NL7SD	WL7BVI
Virgin Islands	NP2E	KP2BQ	NP2DE	WP2AGY
Puerto Rico	**	KP4QE	WP4VX	WP4IKT

**indicates that all 2 × 1 call signs have been issued in these areas.

QUESTION POOL COMMITTEE ADOPTS EXAM POLICY FOR PART 97 CHANGES

Volunteer Examiner Coordinators (VECs) representing 97% of all Amateur Radio testing met at their fifth annual conference in Gettysburg, Pennsylvania on July 7, 1989. The VEC Question Pool Committee (QPC), a standing committee of the VEC Conference, met to discuss the impact of the new Part 97 rules on the existing question pools. The QPC is charged with the responsibility of maintaining these pools. They decided on the following regarding Part 97 changes that apply to Amateur Radio testing.

Written Elements 2 [Novice] and 3(A) [Technician] released on February 1, 1989, will be implemented unchanged on or before November 1, 1989.

The QPC recommends that all Volunteer Examiners (VEs) use discretion in grading those questions where the question or the published answer differs from the rules to be implemented on September 1. VECs are requested to encourage their VEs to implement these recommendations.

The Committee will publish "discretion lists" of question numbers for each pool that identify those questions affected by the Part 97 rewrite. VEs may wish to substitute these questions from their examinations or, if used, accept an alternate answer which is in accordance with the new Part 97.

Following the publication of a discretion list, the QPC will release a supplement to each existing question pool to bring the pool into conformity with the new rules. The QPC has committed to the production and release of discretionary lists and supplements for all elements by November 1990.

All subsequent question pool revision schedules are suspended until the Sixth Annual VEC Conference on June 15, 1990.

FCC AMENDS EX PARTE RULES

The FCC has amended Sections 1.1200-1.1216 of its rules, in addition to certain other related rules of practice and procedure, which require that all written ex parte presentations filed with the Commission be clearly labeled as "ex parte" filings. Ex parte Commission filings are one-sided arguments representing the views of one group without the presence of those with opposing views in a rule-making matter. The FCC has, in effect, extended the rule-making process by agreeing to accept formal and informal comments filed after the reply comment deadline as "ex parte" comments. These changes appear to codify the practice begun during General Docket 87-14 of accepting as a "written Ex Parte contact" every paper submitted after the deadline for comments and reply comments.

The FCC now requires that two copies of informal comments be filed. The FCC had previously required only one copy for an informal filing to be considered as such. The FCC stated, "Informal comments, as well as other pleadings, filed in non-restricted Rule Making proceedings after the close of the reply comment period . . . will be treated as ex parte presentations if they address the outcome of the proceeding and are not served on all parties [commenting]."

The FCC has lowered the number of copies comments filed for "formal" consideration from six to five. If the participant wants each FCC Commissioner to have a copy, five additional copies must be filed. In the case of all ex parte filings, formal or informal, they must be labeled as "ex parte" comments if filed after the close of the reply comment deadline. The FCC stated, "Because the amendments adopted herein are matters of agency practice and procedure, notice and comment is not required."

SECTION MANAGER ELECTION NOTICE

To all ARRL members in the Alabama, Alaska, Delaware, East Bay, Kansas, Michigan, New Mexico, Santa Barbara, Tennessee and Western Massachusetts sections: You are hereby solicited for nominating petitions pursuant to an election for Section Manager. Incumbents are listed on page eight of this issue.

A petition, to be valid, must contain the signatures of five or more Full ARRL members residing in the Section concerned. Photocopied signatures are not acceptable. No petition is valid without at least five signatures *on that petition*. It is advisable to have a few more than five signatures on each petition.

Petition form (FSD-129) are available on request from ARRL Headquarters but are not required. The following is suggested:

(Place and date)
Field Services Manager, ARRL
225 Main Street, Newington, CT 06111

We, the undersigned Full members of the . . . ARRL Section of the. . . Division, hereby nominate. . . as candidate for Section Manager for this Section for the next two-year term of office.

(Signature. . . Call. . . City. . . ZIP).

Any candidate for the office of Section

Manager must be a resident of the Section, a licensed amateur of Technician class or higher, and a Full Member of the League for a continuous term of at least two years immediately preceding receipt of a petition for nomination.

Petitions must be received at Headquarters on or before 4:00 PM Eastern Daylight Time September 8, 1989. Whenever more than one member is nominated in a single Section, ballots will be mailed from Headquarters on or before October 1, 1989. Returns will be counted November 21, 1989. SMs elected as a result of the above procedure will take office January 1, 1990.

If only one valid petition is received for a Section, that nominee shall be declared elected without opposition for a two-year term beginning January 1, 1990.

If no petitions are received for a Section by the specified closing date, such Section will be resolicited in January 1990 *QST*. An SM elected through the resolicitation will serve a term of 18 months. Vacancies in any SM office between elections are filled by the Field Services Manager. You are urged to take the initiative and file a nomination petition immediately.
Richard K. Palm, K1CE
Field Services Manager

AMATEUR OPERATORS FINED FOR UNAUTHORIZED RADIO ACTIVITY

According to a news release dated June 30, 1989, the FCC New York Field Office reports that two Massapequa, New York ham operators "were fined $750 for pirate radio activity." According to the FCC, "On the evening of June 8, an FCC engineer monitored the radio station on 7415 kHz... The station was in operation at the residence of Herbert Meyers, K2LPK. Neal Newman, KA2CAF, was assisting in the station's operation. The transmissions were first detected by the FCC national monitoring network. Using mobile radio direction-finding equipment, an engineer from the FCC New York office located the illegal station.

The FCC news release stated, "The unauthorized broadcast station was playing popular music and gave "WNPR" as its call letters...Meyers and Newman were fined for unlicensed radio operation which is a violation of Section 301 of the Communications Act. Unlicensed radio operators may be subject of fines of up to $100,000 and/or one year in prison."

W1AW—Rededicated

(continued from page 17)

devoted minion ARRL ever had."

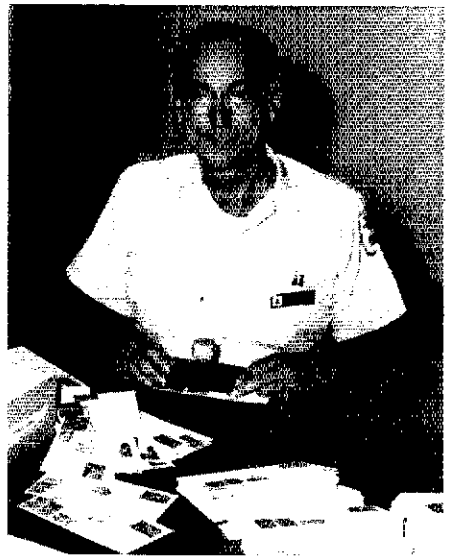
Assistant Treasurer for the Connecticut Bank and Trust Company (CBT) Paul Perakos presented the League with a 75th anniversary crystal globe. Perakos said that CBT was pleased to be associated with ARRL and extended best wishes to W1AW. Fred Hammond, VE3HC, spoke on behalf of the Amateur Radio industry, which donated thousands of dollars of equipment for the state-of-the-art station.

On behalf of ARRL staff, EVP Sumner noted that League HQ exists to serve its members, and the HQ staff was proud to be a part of the 75-year tradition. Sumner said, "W1AW is the best known amateur station in the world...and thanks to the generosity of thousands of members, the station is now equipped to serve a new generation." He added, "W1AW is a monument to one man—Hiram Percy Maxim—without whose vision, ARRL, and probably Amateur Radio itself, would not exist. It is testimony to the love of that man and what he created that is felt by thousands of people in this country and overseas."

President Price then cut the ribbon, and the new W1AW was opened for tours. A number of contacts were made from the refurbished facilities that glistened with new radios and furnishings. Future editions of *QST* will show an extensive look at the station.

Nearly 10,000 individuals and clubs have contributed almost $500,000 to the project fund drive.

(l-r) Former W1AW Trustee George Hart, W1NJM; present Station Trustee John Lindholm, W1XX; and former League Circulation Manager Joe Moskey, W1JMY. George and Joe attended the original dedication ceremony in 1938.



William Bonensant, a philatelic clerk from the Hartford Post Office, hand canceled envelopes bearing 5-cent Amateur Radio and 15-cent Progress in Electronics stamps with a special League 75th anniversary cancellation. This unique memento is available for $3.00 postpaid from HQ; order "Special W1AW postal cancellation."

International Affairs Vice President Tod Olson, KØTO, smiles after making one of the first contacts from a refurbished visitor operating position. Several manufacturers donated equipment to the station. A plaque will recognize these donations, as well as individual Hiram Percy Maxim Club and Kilowatt Club contributors.

Correspondence

Conducted By John Hennessee, KJ4KB
Regulatory Information Editor

HAM RADIO 75 YEARS AGO

☐ Seventy-five years ago, I lived on a farm near Cheney, Washington. For some time, I had been trying to get information on wireless. I noticed an advertisement in Electro Importing magazine. I ordered my first wireless transmitter and receiver. In the early days, we did not have electricity on the ranch, so I purchased a half dozen, big dry cells for power. I first tried to transmit across the table to the cat-whisker Galena receiver. Next, I set up a station and used the willing assistance of the Boy Scouts to receive, while I transmitted from across the ranch a mile away. To my surprise, the signals were as loud as when I was trying to transmit across the table.

Some years later, I heard a ship sailing in the Pacific using CW tell of the death of President Harding. I called the local newspaper, and they held up the printing of the paper until they had received the news. A few days later, my father heard our party-line telephone ring and thought it was our ring. When he picked up the receiver, he heard two women talking and he realized it was not his call. He was about to hang up when he heard the "Lindahl" name mentioned. He listened and heard one woman say: "Since that Lindahl boy got his wireless, this telephone has been so noisy that it is hard to hear."

I am 90 and have enjoyed 75 years of hamming.—*Cmdr Ralph W. Lindahl, W7MP, Wenatchee, Washington*

SWITCH TO SAFETY

☐ I've been a ham for more than 32 years, and in that time, I've performed maintenance tasks to my equipment. Recently, I came frightfully close to making my last maintenance check.

I had recently installed an amplifier in my new shack. As delivered from the dealer, it was tapped for 117 volts ac primary supply. Since I had intended to run it from 234 volts ac, I had switched the taps over for that voltage. I did not have a fuse of the proper rating for the new voltage and put off installing one. I finally got the fuse and planned to put it in and fire up the amplifier.

Changing a fuse is a simple task, one I have done so often that it is something I do not even think about anymore. That carelessness came very close to leading to a disaster. When I unscrewed the tap from the fuse holder, the fuse did not come out with it. I tapped the front panel of the amplifier thinking that might dislodge the stuck fuse. When it didn't, I picked up a pair of long-nosed pliers and proceeded to grasp the protruding end of the fuse. Suddenly, there was a blue-white flash and a loud pop. The edge of the plier points had brushed against the barrel of the fuse holder. For that fleeting moment, I stood there trying to figure out what had gone wrong. It then dawned on me that I had not unplugged the line cord!

As I considered the consequences of my temporary lapse of being watchful, I realized how close I had come to being a Silent Key. There were two pairs of long-nosed pliers on my desk, one with insulated handles and one without, and I hadn't looked to see which pair I picked up. I could have picked up the uninsulated pair. Or, had it not been for the fact that a ground wire, an input cable and an output cable, were all in the way, I would have used my bare hands to extract that fuse. In either case, I probably would not have been here to write this letter.

QST often ran a little graphic that said "Switch to Safety." It was part of a campaign in the 30s which, after a rash of accidental electrocutions, promoted safety consciousness among our fraternity. My close call in my shack serves to remind me that "Switch to Safety" is still good advice.—*Drayton Cooper, N4LBJ, Bowling Green, South Carolina*

29.600—THE 10-METER FM CALLING FREQUENCY

☐ For years and years, the frequency of 29.600 MHz has been used by FM stations as a common calling frequency to establish contact and then move to another simplex frequency for the QSO. This leaves the frequency open for the next pair of stations to establish contact and so on.

The problem is caused by stations on VHF that are linked to the output of 29.600 and who can't QSY. This practice has become more and more common in the last year. The end result is that the calling frequency has become clogged up with QSOs on 29.600 who don't QSY and therefore keep the calling frequency busy with long QSOs. It is impossible for a simplex station to make a call to raise another FM simplex station. Thus, he or she just comes in on top of the QSO in progress to make the call. I would think that new VHF link ops could have picked another frequency in the 10-meter FM simplex region for their use.—*Chuck Albrecht, NØCKW, Aurora, Colorado*

PRESERVE OUR SPECTRUM

☐ I must give my own thoughts on the subject of spectrum allocation and the jeopardies we face. Thank God we have the ARRL to lobby for us in this day when powerful interest groups, especially commercial, are exerting tremendous financial pressures on our legislatures to usurp more and more of the resources which really belong in the public domain. The airwaves, like the highways and the skyways, belong to the people and not to trucking companies (ie UPS) or airlines despite the cries of those pressing the emotional buttons of job creation and public needs. Hang in there, ARRL!—*Charles Camillo, W6TGK, La Grange, Illinois*

HELP...

☐ I was surprised to find so few replies to my April *QST* stray requesting owners of the Kenwood TS-900 to drop me a line so we could get a newsletter or net for TS-900 users. I am sure that Kenwood must have manufactured more than 1000, and to date, I have received only eight replies. I'd still like to hear from owners of the Kenwood TS-900.—*Weston G. Strauch, W5VBX, New Orleans, Louisiana*

SSTV AND THE GENTLEMEN'S AGREEMENT

☐ Slow scan television (SSTV) and facsimile (FAX) operators voluntarily restrict themselves to operating on 3.845, 7.171, 14.230, 14.233, 14.240 and 28.680 MHz nearly 400% of the time. This offers the video enthusiast and experimenter a place where they can be relatively certain they can make a contact, in fact, these frequencies are the calling frequencies. Even so, once an SSTV contact is made, the stations remain on that frequency. Why? Because SSTV is a mode that requires clearance on either side if the images are to remain relatively undamaged. An awareness of these frequencies would certainly be appreciated.—*Pete Gerardi, KE4TP, Pompano Beach, Florida*

[Editors Note: The IARU Region 2 band plan, to which ARRL is a party, calls for SSTV at 3.845, 7.171, and 14.230 MHz ±5 kHz, and 21.340 and 28.680 MHz, ±10 kHz.]

QST PRODUCT REVIEWS

☐ I appreciate *QST* Product Reviews. At times, they have been an influencing factor in purchasing equipment. Also, reviews are of special interest when the gear you own is reviewed. Accurate and unbiased reviewing is absolutely essential if consumers are to benefit. I am sure the ARRL encourages all reviewers to be as straightforward and clear as possible in pointing out the best and worst features of any equipment that is reviewed. Beyond reviews, I think that it would be in the interest of the membership to indicate the level of support various manufacturers and dealers extend to purchasers of their equipment. The support from Ten-Tec has been everything they say about "...fast, efficient and caring service." Although my problems were minor, the Ten-Tec service was super. Again and again, this is echoed on the air. I encourage other hams to relate experiences, good and bad. I am sure the League will continue to be our consumer advocate and help in all possible ways. —*G. Durham Ipock, K4JA, Port Republic, Virginia*

Conducted By Ellen White, W1YL/4
19620 SW 234 St, Homestead, FL 33031

Pitcairn Island's Bicentenary

Be sure to keep tuned for notices of special event stations from Pitcairn commemorating the Bicentennial of the Mutiny on the Bounty, and of the Pitcairn landing. January 23, Bounty Day, is Pitcairn Island's Independence Day. Bounty Day 1990 is of great historical significance to the island. January 23, 1990, will be a landmark VR6 day, representing the 200-year anniversary of the landing of the *Bounty*. Thanks to David F. Miller, NZ9E, in collaboration with Meralda Warren, VR6MW, we're able to reacquaint you with the history and the mystery of this continually hypnotic DX locale—*Ed*

Lying remotely in the mid-Pacific, Pitcairn is probably as close to being a ham's paradise as any spot on earth. No off-the-air TV, so no TVI! No multistoried structures to block signals, just the vast blue Pacific in all directions. No antenna restrictions, no tower height limitations, no zoning laws, very little man-made interference and almost no ignition noise! Toss in the fact that Pitcairn's a rare DX catch, and you come pretty close to a ham's paradise.

On January 23, 1790, Fletcher Christian and eight other fellow *Bounty* mutineers landed on Pitcairn Island. Along with 12 Polynesian women, six men and one infant girl, they set the framework for this modern day dream QTH.

From a ham's perspective, however, the dream was realized in the 1920s when Andrew Young (later VR6AY), carrying the surname of the mutineer Edward Young, set up shop as Pitcairn's first radio amateur. Young was an amateur in the purest sense of the word. Unpaid and having to make do with less than ideal conditions, he pursued Amateur Radio for the love of the activity. Young began operating from Pitcairn with a spark transmitter and a crystal detector receiver which served the island until 1938, when he was provided with a modern telephony and CW rig donated by a group of Americans after a visit to Pitcairn by the ship *Yankee* in 1937. Since then, Pitcairn has been a part of the Amateur Radio scene almost continuously to the present.

Today, Pitcairn hams are able to acquire state-of-the-art equipment, although at a great sacrifice. Despite the distances and difficulties involved, there are more licensed hams on Pitcairn (as a percentage of the population) than in any other country in the world—six licensed hams out of 50 people. Pitcairn hams include Irma Christian, VR6ID; Kay Brown, VR6KB; Kari Young, VR6KY; Meralda Warren, VR6MW; Tom Christian, VR6TC; and Betty Christian, VR6YL—all permanent islanders. At the time of this writing, Carl Lipscombe, VR6CL, is also in residence and will be number seven if he makes the land his permanent home.

Pitcairn Amateur Radio is different than Amateur Radio for the rest of us. Public power is present on the island, but only for a relatively short while twice daily depending on available fuel supplies. The island has two British-made diesel generators that provide 240-V ac. Many of the islanders (particularly the hams) have private diesel generators, but they must also stock private fuel supplies at premium prices. Newer, solid-state transceivers are popular because of their ability to operate efficiently from a 12-V battery (which can be recharged when the public power is functioning). Wind generators haven't proven feasible because they require high maintenance. Solar energy is still quite expensive.

Even though the island is only 1 mile by 2 miles, antenna space isn't a big problem since there are plenty of tall trees. The VR6 population has found that a tribander on a mast is effective. They use wire dipoles for the rest of the bands.

Meralda Warren, VR6MW, (l) with Irma Christian VR6ID.

For Pitcairners, Amateur Radio has proven to be more than simply a hobby. It is a life line to the outside world in times of emergency. A government sponsored "commercial" short-wave station (ZBP) maintains twice-daily communications with New Zealand (some 3000 miles distant).

Like our amateur bands, the frequencies used by ZBP are subject to propagation whims, so a satellite transceiver has been available on Pitcairn for two years. The satellite station uses a "retired" NOAA weather satellite that was transferred back to NASA for experimental and humanitarian needs in the South Pacific. The bird is in a geostationary orbit and is available 24 hours a day for medical and other emergency needs. A series of DTMF tones will bring up a phone patch in the states, allowing the Pitcairn control station to make a stateside phone call to seek emergency medical advice. A Chicago hospital has volunteered its facilities and expertise at any time of day or night, and has been briefed on the special needs of Pitcairn, bringing the island one step closer to modern technology.

Supplies and mail are brought to the island only two or three times each year on average! (You have to do your Christmas shopping early to live on Pitcairn!) Supply ships come from New Zealand and are organized by the Pitcairn Island Administration. A couple of commercial container vessels have also been stopping each year simply as a courtesy to the islanders. These ships often depart from US ports, making it possible to place on board a limited number of parcels from stateside friends.

Under a special agreement with the British Government, ham radio can be and is used to organize procurement of personal items for Pitcairners because of their extreme isolation and extended time between ships. Amateur Radio is thus much more than simply a "hobby" for the people of Pitcairn, although the island hams enjoy that aspect of radio as well. Appreciation by all of us of the island's special needs, and the limited on-air time available to many of the residents, helps to explain why DXing isn't always possible for them.

Pitcairn is a British protectorate, and as such is administered by the British Consulate in New Zealand. In the past, a Pitcairner wanting to become a licensed ham would have to travel to New Zealand to take the exam. Recently, however, it has been possible to take the exam on the island itself, under the watchful eye of the Island Government Officer who also serves as the school teacher. This accommodation is similar to the US VE program. Most of the Pitcairners already have some knowledge of Morse code, as that is the form of signaling used on the island's single-party-line telephone system! Each resident has his own CW designator to alert him (or her) to an incoming phone call. To acquire an Amateur Radio license, the candidate must still pass a code test of 6 WPM (Novice) or 12 WPM (General), plus successfully complete a written examination much like our own. With only two or three mail deliveries per year, however, it may be some time before the license actually arrives from New Zealand!

Many of the ham operators are also employed at the government station that com-

municates with New Zealand and with ships at sea. HF is used for maintaining contact with ships over the horizon, and VHF is used for distances out to 50 miles or so. This government station is located on the largest flat spot on the island, also known as "Taro Ground." It sports a large wire array, along with a variety of meteorological monitoring equipment.

The years 1989 and 1990 are of special import to the Pitcairn people, for it was on April 28, 1789 that Fletcher Christian took command of the *HMS Bounty*, and set Lt William Bligh and the others who chose to stay with Bligh adrift in an open longboat. Bligh himself made history as a result of the mutiny—his was the longest open-boat voyage on record. The voyage covered some 3600 miles in 41 days at sea, with no loss of life. Fletcher Christian, on the other hand, vanished from the eyes of Western civilization by setting fire to the *Bounty* off the shore of Pitcairn, some nine months after their small contingent of Tahitian followers rediscovered Pitcairn (which had been sighted 23 years before, but due to a miscalculation had been incorrectly charted). By erasing all traces of the *Bounty* and by concealing their homes within the lush Pitcairn vegetation, the mutineers managed to avoid discovery which would have meant almost certain death to the members of their colony. The Pitcairners flourished, and still do to this day!

THE IMPOSSIBLE HAS COME TRUE!

The scene in Manila with DU1TVS was jubilant last June 23, 1989, when Seth, XU1SS arrived—a free man. For months now, your editor and numerous caring people around the world have listened and watched as W1RAN and DU1TVS unraveled the snarling skeins of politics and bureaucracy, doing what had to be done to free Seth from a Thai refugee camp. Ultimately, Seth wants to enter the US, resume his education, and someday be able to help his mother country. But, much work remains before Seth can enter the US. Seth still has major monetary needs. Check with W1RAN (E. L. Raub, 12 Deerfield Rd, Waterford, CT 06386) to see how you can assist, and keep an ear tuned for XU1SS/DU!

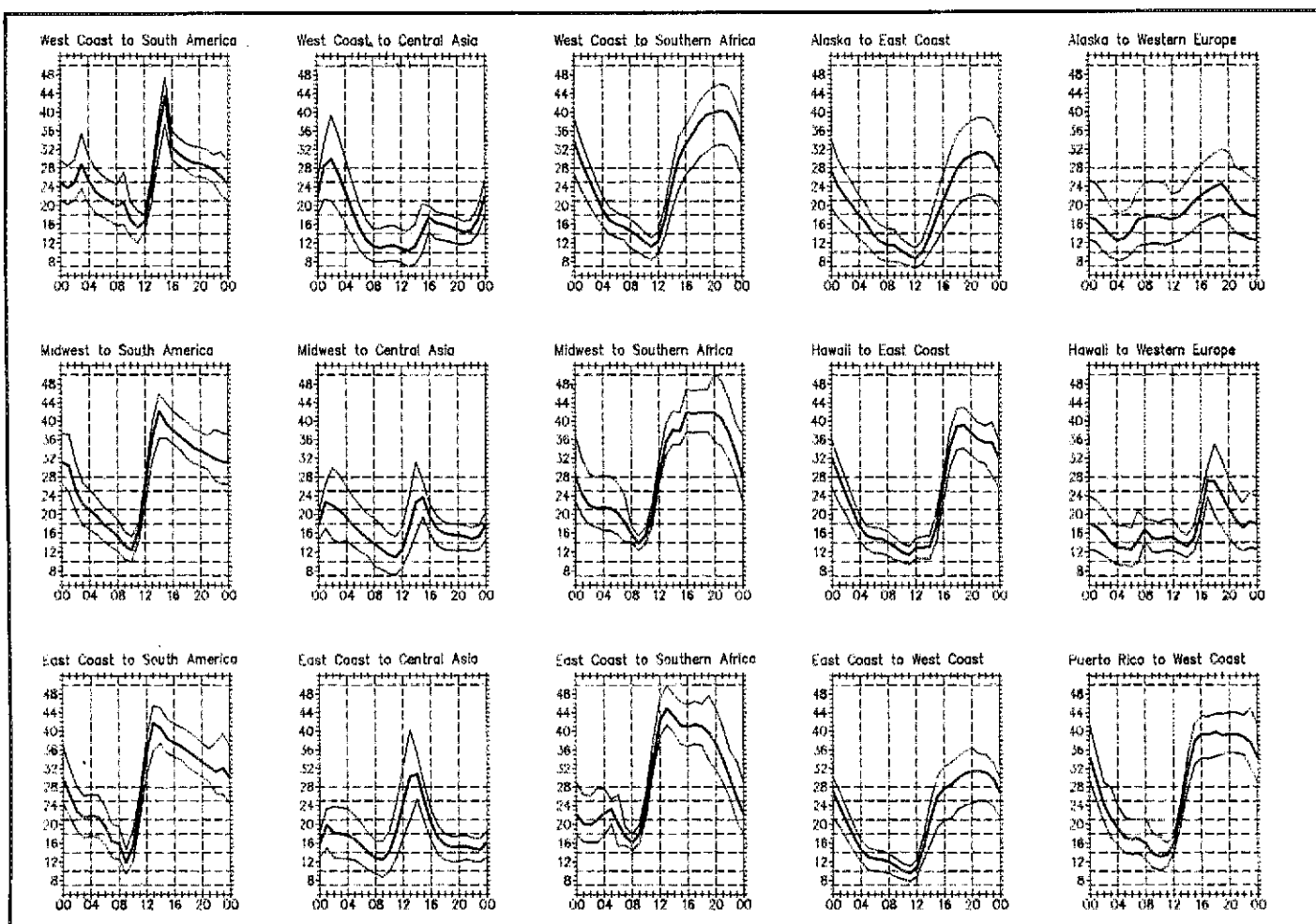
THE CIRCUIT

☐ **Bouvet:** The LA-DX-Group is aiming for a December Bouvet spectacular, according to LA6VM. Details later.

☐ **W9DXCC:** September 9 is the date for this annual Fall event, featuring W5KNE as the banquet speaker. The group meets at the Glen Ellyn Holiday Inn. Further info via NIDXA, Box 519, Elmhurst, IL 60126.

☐ **3V8AZ:** Shocking news via RSGB's *Newsheet*, noting that 3V8AZ ops F2SA and F1HJW were killed in a June 4 plane crash in the Pyrenees.

Correcting a mis-caption on page 63 of July *QST*, meet Molly, Z21JE, with visitor KD4ZU in Zimbabwe. *(photo by Mrs KD4ZU)*



When are the bands open? These charts predict this month's average propagation predictions for high-frequency circuits between the US and various overseas points. One chart showing East Coast to West Coast is also included. On 10 percent of the days of the month, the highest frequency propagated will be at least as high as the uppermost curve (highest possible frequency, or HPF). On 50 percent of the days of the month, it will be at least as high as the middle curve (maximum usable frequency, or MUF). On 90 percent of the days of the month, it will be at least as high as the lowest curve (optimum traffic frequency, or FOT). The horizontal axis shows Coordinated

☐ **UW3DM:** Val will be operating all bands and modes /UAØ from Magadan, Oblast 138 through late this month. QSL via UW3DM, Val Voronin, Box 13, Serpukhov-5, 142205, USSR. *(thanks AA4XU)*

☐ **Lord Howe:** VK9LV (via K1JB) and VK9AE (via KD2EU) will be QRV 160-10 meters Oct 23-28.

QSL Corner: THE ARRL MEMBERSHIP OVERSEAS QSL SERVICE

This is an outgoing service that allows ARRL members to send DX QSL cards to foreign countries at a minimum cost and effort. ARRL members may send an unlimited number of QSL cards for distribution 12 times per year, as outlined below. Recommended QSL card size is 3½ × 5½ inches (90 × 140 mm).

For information on how to receive QSL cards from DX stations, see June 1989 *QST*, pp 72-73 or write the QSL Bureau at HQ. US amateurs may send SWL reports to foreign shortwave listeners. Unlicensed (associate) members may send SWL cards to foreign amateurs. Note that the ARRL QSL Service should not be used to exchange cards within the 48 contiguous states.

Requirements

1) Presort your DX QSLs alphabetically by call-sign prefix (AP, C6, CE, UA, 9Y and so on).

2) Enclose the address label from your current copy of *QST* to show you are a current ARRL member.

3) Enclose payment of $2 per pound of cards (approx 150 cards weigh one pound). A package of 10 cards or less costs $1. Please pay by check or money order, and write your call sign on the check. Send cash at your own risk.

4) Include only the cards, address label and payment in the package. Wrap the package securely and address it to the ARRL Outgoing QSL Service, 225 Main Street, Newington CT 06111.

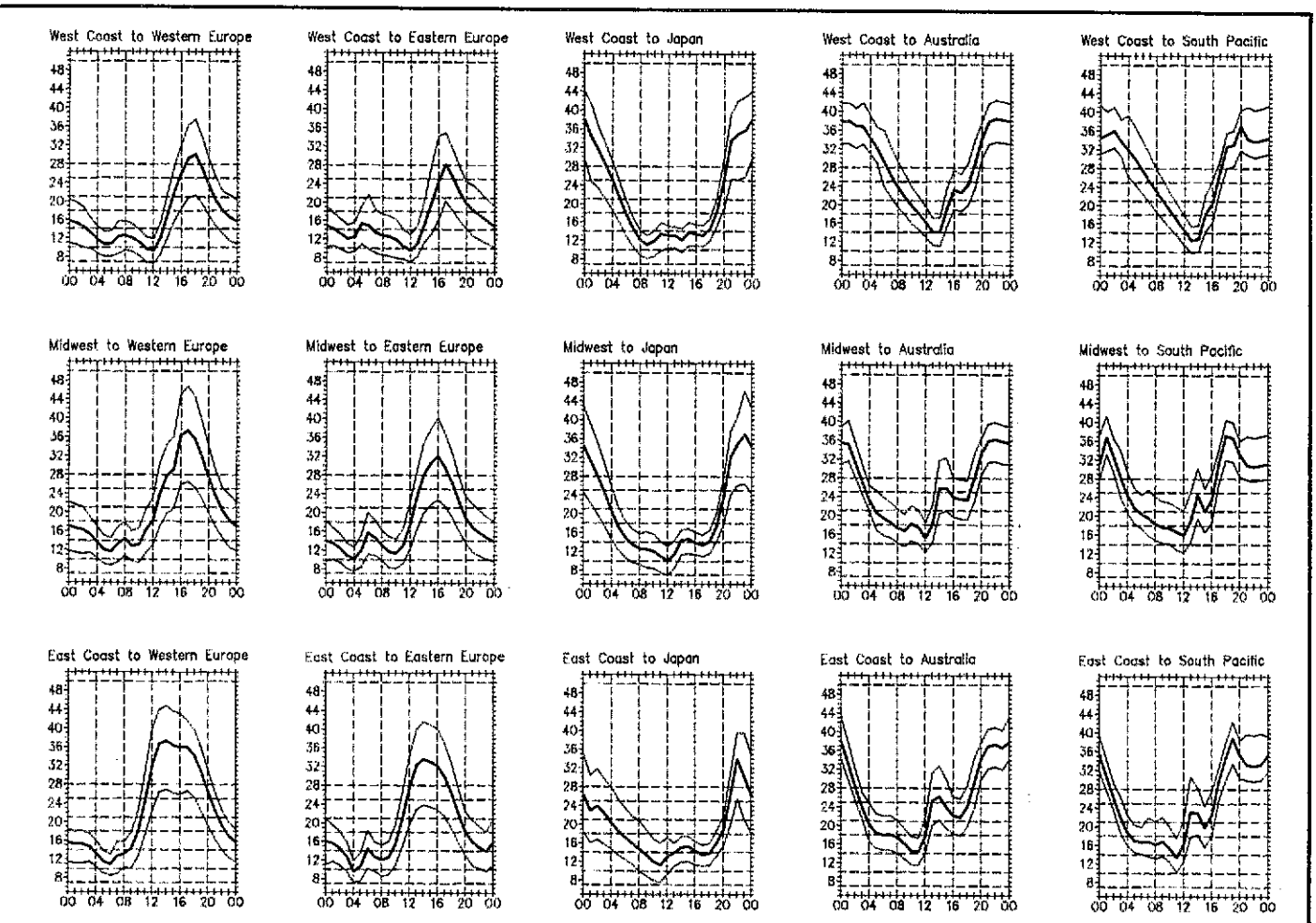
5) Family members may also use the service by enclosing their QSLs with those of the primary member. Include the appropriate fee with each individual's cards and indicate "family membership."

6) Blind members who do not receive *QST* need only include the appropriate fee along with a note indicating the cards are from a blind member.

7) ARRL affiliated-club stations may use the service when submitting club QSLs by indicating the club name. In addition to sending club-station QSLs through this service, affiliated clubs may also "pool" QSL cards from club members who are also ARRL members. Cards should be sorted *en masse* by prefix, and a *QST* label enclosed for each ARRL member sending cards.

Countries Not Served

A5	Bhutan
A6	United Arab Emirates
A7	Qatar
BV	Taiwan
C9	Mozambique
D6	Comoros
ET	Ethiopia
HZ	Saudi Arabia
J5	Guinea-Bissau
KC4	US bases in Antarctica
KC6	Belau
KC6	Micronesia
KH1	Baker & Howland Is
KH3	Johnston Is
KH5	Palmyra & Jarvis Is
KH7	Kure Is
KH9	Wake Is
KP1	Navassa Is
KP5	Desecheo Is
P5	North Korea
SU	Egypt
T2	Tuvalu
T3	Kiribati
T5	Somalia
TJ	Cameroon
TL	Central African Rep
TN	Congo
TT	Chad
TY	Benin
TZ	Mali
V4	St Christopher & Nevis
VP2E	Anguilla
VR6	Pitcairn Is
XT	Burkina Faso
XU	Kampuchea
XW	Laos
XX9	Macao
XZ	Burma
YA	Afghanistan
ZA	Albania
ZD7	St Helena
ZD9	Tristan da Cunha
ZK3	Tokelau
3C	Equatorial Guinea
3V	Tunisia
3W	Vietnam
3X	Guinea
4W	North Yemen
5A	Libya
5H	Tanzania
5R	Madagascar
5U	Niger
5X	Uganda
7O	South Yemen
7Q	Malawi
8Q	Maldives
9G	Ghana
9N	Nepal
9U	Burundi



Universal Time (UTC); the vertical axis, frequency in MHz. See April 1983 *QST*, pp 63-64, for a more-detailed explanation. The 3rd edition of *The ARRL Operating Manual* contains similar charts for a range of sunspot numbers and times of the year. Sunspot data is derived from *Solar Indices Bulletin*, National Geophysical Data Center (E/GC2), Boulder, Colorado. Curves are generated using IONCAP. These predictions, for August 16 to September 15, 1989, assume a sunspot number of 184, which corresponds to a 2800-MHz solar flux of 228.

DX Century Club Awards

Administered By Don Search, W3AZD

The ARRL DXCC is awarded to amateurs who submit written confirmations for contacts with 100 or more countries on the official DXCC Countries List. You may endorse your award in 25-country increments through 250, 10-country increments through 300, and 5-country increments above 300. The Satellite, 160 Meter, and 80 Meter DXCC awards are endorsable in 10-country increments through 200, and 5-country increments above 200. The totals shown below are exact credits given to DXCC members from April 24 to May 29, 1989. An SASE will bring you the rules and applications forms for participation in the DXCC program. Send $1.00 to request the ARRL DXCC Countries List.

New Members

Mixed

CO7PG/110
DA1CM/105
DF4WW/127
DJØWQ/110
DL8EBU/112
DL9MAT/114
FD1MJK/103
G4HK/167
G4SUJ/100
G4WKH/110
HA1XJ/102
HA7KMP/106
HA9RQ/106
HK1KHK/267
IK2GXA/135
IK2IGX/167
I6DQE/203
JF1MGI/107
JG1UZD/121
JA2QPY/272
JA2VPO/302
JJ2LPV/109
JJ2QIT/100
JA4OPW/122
JE6WVV/110
JHØFBH/157
LA8ZAA/110
LZ2FX/245
OE3CBA/253
PA3CNK/PJ2/151
SMØPCA/154
UA9NN/299
UI8IAJ/104
UQ1GXZ/316
XE1L/312
YB3ASQ/161
K1NIT/201
KA1DNB/197
KA1FJ/105
NS1G/110
K2CIB/113
K2OCU/143
KA2FOZ/118
N2GZL/109
WB2GMK/104
KA3RYZ/108
NM3E/110
AB4IE/136
K4ZQX/101
KA4ODV/139
W4IRP/241
WB4QNX/108
WM4D/135
AA5JF/106
WA5IBC/108
K6XL/110
KG6AO/142
KG6ZQ/104
N6RLJ/102
W6AB/117
AD7L/124
W7MN/106
WD8RYV/108
KD9HT/101
W9UVP/131
WB9AJU/117
NØCEE/103
NNØM/107
WMØG/104

Phone

DH7AAC/104
DJØWQ/102
DL6KCW/109
DU1JZ/110
EA3EFF/110
EA6WV/288
EA7AYY/104
EA7DHF/175
EA7DHK/234
EA7EN/106
FD1HVM/109
GW3CDP/314
HA4XX/256
IK1IYU/109
IK2IGX/167
JA2QPY/272
JA2VPO/213
JH3ULY/105
JA6BZA/121
JF6ITM/155
JH6TYD/156
JAØHXV/133
JHØFBH/127
LU8FDZ/106
SMØCCM/277
TK5FF/201
VK5AGM/120
YB3ASQ/150
YCØHET/108
ZS6BRM/104
4X6KJ/114
9J2LG/111
KA1RJG/106
KC1MH/101
N1FVO/102
NW1A/107
K2IUK/297
KA2FOZ/106
KA2TFM/103
N2HFZ/100
K3YL/107
N3GBB/103
W3HDH/132
W3YN/103
KA4EMV/125
KA4ODV/139
WA4JTK/152
WA4WZR/106
WB4EWR/110
WM4D/115
K5EKH/109
KG5ND/130
KG6AO/127
N6HKX/105
N6QKP/101
W6AB/102
W6HCU/104
WB6PFH/124
KD7UH/100
KF7RU/112
K8CH/278
W8IMF/110
WJ8B/207
K8EHJ/105
N9FWM/111
NB9I/103
KAØYFN/102
KIØW/117
WØLY/102
WBØYWO/102

CW

DF2MF/138
G4WKH/100
HA4XX/103
HB9TE/112
I6DQE/130
IK7CJV/100
JA2VPO/104
JA4JDG/104
JA6BZA/119
JAØUMV/117
LA4XFA/104
OK1DQT/103
OZ1CBW/206
PJ9AR/115
PY1AFL/141
SM5PAX/109
SM6HVR/103
SMØCGO/217
SMØPCA/109
NS1G/102
W3KH/106
WA3SLN/100
WA3VFM/106
AB4IE/129
N4DRC/105
WA4CMS/144
KR5X/257
K6XG/110
W6JJS/105
W6UZ/210
AD7L/109
WD9GQV/154
KIØW/102

RTTY

DL3YAW/101
JA4DGG/113

160 Meters

LU8DPM/101
OK1DQT/103
PAØLOU/101
YO3CD/103
YU3AN/102
KQ1F/101

80 Meters

DJ2YA/246
JH1IED/102
SP8CDK/230
K1YR/136
W6ZKM/125
K7OXB/102

10 Meters

DK3EG/166
F1HWB/117
G4WVX/102
HG7JBN/102
I4EAT/269
IK7DBB/121
JAØCVW/125
PA3EDP/109
VE1ACK/120
WP4BDI/123
YB3CN/104
YCØRX/117
N1IR/101
KA2ANF/110
N2BJ/151
N3GJM/107
AA4DO/106
K4AMC/165
KB4VIR/101
WD5KBB/109
KJ6HI/101
N6RJY/104
W8DTV/102
W8RBD/110
KA9BMY/108
NKØS/105

5BDXCC

VK4BJD
VE1JL
WB3BGI
W7KNT
SM6AOU
JH4UYB
W6GVN
G3LNS
KA8MVV
JF2WKE
G3AXI
I4JBJ
JA3DY
JE1VPC
LZ2FX
WP4D
CO2HQ
DJ3GG
N5EPA
G2GM

New Honor Roll Members

Mixed

314
LZ2DF/315

312
DK2XX/319
UP2BR/320
UQ1GXZ/316

311
NJ2C/315
N4AXT/314
N4BLX/314
K5MBE/320
KX8W/315
KØRWL/316

Phone

312
WD9HAW/315

311
CT3BM/313
KZ2P/314
NJ2C/315
N4AXT/313
N4BLX/314

CW

307
W4WJ/311
K8LJG/311

Endorsements

Mixed

CT1GC/199
DF2CD/203
DJ3GG/326
DL1ZN/188
DL3ME/167
DL3YAW/207
DL4MCF/252
DL8MAG/310
EA1BC/355
F1HWB/219
F6HMJ/250
G2TA/292
G3VMW/263
G4IJW/261
GM4GRC/139
HA8UB/265
HB9AUT/260
HB9YP/153
HK1LAQ/239
HK3HFQ/257
HK6HFY/225
I1ZEU/301
IK7CJV/289
JH1QJC/228
JA2ODB/265
JI3AUD/228
JR5RPP/150
JA7AER/197
JA7BJS/323
JA7FS/332
JA7QFU/275
JA9BEK/233
JAØHXV/283
JAØKHD/217
JAØUMV/172
KP4EQF/317
LA1JFA/153
LU8DWN/225
OZ7DX/235
PP5UG/339
PT7AA/304
PY2AN/226
SM5BZQ/184
SM6AGD/317
SMØCGO/255
SMØDJZ/321
SP6CDK/265
UA8JW/336
UB4WZA/316
UP1BZO/319
UR2QD/313
UY5XE/261
VE1HA/143
VE2UI/237
VE3FZW/257
VE3MV/312
VE3OU/178
VE3UR/312
VE3XO/303
XE1CI/310
XE1XF/288
XE2FL/253
YU1AM/330
YU3LF/300
YU3VM/301
YV1TO/271
ZL1BIL/315
ZL2VS/274
Z61OU/333
ZS6AZO/251
ZS6P/216
4X1IL/271
4X1KM/283
4X6UO/252
K1FJ/178
KA1CRP/174
KA1MPA/204
KA1UT/280
KG1V/253
NJ1T/226
W1OPZ/129
W1RLQ/349
W1WLW/339
WA1KUL/296
WA1NSJ/282
WB1GBU/275
K2LQ/325
KA2AOT/261
KB2XL/299
N2BAT/288
NJ2D/298
NQ2Q/204
NR2W/232
W2AX/357
W2AZX/346
W2JB/329
W2VJN/348
WA2CBU/301
WA2IKL/227
WA2OVG/201
WB2BNJ/327
WB2GAI/178
WB2UZR/150
WI2J/267
WK2F/148
K3NW/293
K3PA/261
N3ELN/188
W3BWU/183
W3FGS/200
W3HDH/278
W3NQC/261
WA3CGE/319
WA3DMH/297
WB3FID/303
WB3LQP/150
WB4DU/127
AB4FW/225
K4ADK/288
K4BWU/260
K4ELV/260
K4IR/335
K4PR/308
K4UTE/335
KA4JNB/181
KB4JRS/202
KU4J/315
N4DRC/305
N4HOH/291
N4KTY/259
N4PZF/204
N4ZQ/182
W4DMV/312
W4DR/361
W4JTL/301
WA4WZR/130
WB4CSK/307
WB4ZNH/319
WJ4S/200
K5BLV/321
K5NV/302
K5QY/318
KB5EK/276
KC5CR/283
KG5EG/138
KR5X/299
N5EPA/235
W5AC/280
W5QKR/329
W5TZN/270
WA5LQN/175
WD5ETI/203
WU5X/129
WV5K/253
AA6GM/126
K6DC/362
KA6DXY/284
KB6LOO/175
KE6GM/270
KG6AM/280
K6PG/132
KJ6NZ/206
KM6K/298
N6SYW/125
W6AUG/289
W6GO/326
W6HYG/356
W6JAZ/205
W6SCC/262
W6WKE/209
W6XI/334
WA6EZV/284
WB6PFH/130
WB6WKM/300
WQ6X/186
K7TCL/159
KC7V/300
N7GVV/168
W7ALZ/280
W7AQB/356
W7GUR/320
W7HX/270
K8CMO/320
K8EFS/305
K8LJG/330
K8MW/295
K8QXB/294
A8GBB/175
KE8RO/132
N8ATR/309
N8BEF/263
N8EIH/149
N8MC/316
NG8S/284
NT8O/299
NY8I/276
W8BW/315
W8ILC/340
W8IQ/332
W8JRK/218
W8PR/346
W8XD/260
WA8HFN/316
WB8LFO/304
WB8SFF/232
WB8VKL/292
WB8VPA/312
WD8IXE/300
WD8NVA/259
AI9Y/200
K9CW/301
K9EC/265
K9RN/316
KD9Q/308
NK9X/199
W9POC/225
WB9W/200
WD9IIC/314
ABØX/320
KØIR/251
KØTLM/302
KCØMS/269
KIØW/154
NCØO/211
WØDP/257
WØJIN/310
WBØN/237

Phone

CE3DQR/280
CT1GC/200
CX6BZ/264
DF2CD/203
DJ2YL/325
DK2XX/317
DL4MCF/226
DL5SBA/202
EA5BCX/280
F1HWB/219
G2TA/251
G4IJW/275
G8AHC/201
HB9CZW/201
HK3HFQ/257
HK6BER/267
HK6HFY/224
HK6MKK/151
HK7BEI/135
IV3YRN/316
I4CSP/294
I5BG/252
I6IXJ/255
IK7CJV/288
IK7DBB/262
J73PD/249
JA7AER/187
JA7BJS/320
JA9BEK/232
LU2AH/322
LU3AJW/321
LU4DXU/230
LU8DWN/225
LZ2DF/303
OZ1HPS/152
OZ3WK/322
OZ7DX/224
PP5UG/339
PT7AZ/291
PY2DSC/331
PY4VX/329
SM5BZQ/156
SMØDJZ/312
SP6CDK/264
SV1TN/126
UA6JW/328
UW4NH/325
UY5XE/234
VE3FZW/238
VE3LCZ/152
VE3MV/312
VE3UR/312
VE3XO/302
VK1ZL/280
XE1JIW/263
XE1L/312
XE1XF/266
XE2FL/252
YV1TO/260
ZL1BIL/315
ZP5JCY/298
4X1IL/264
4X1KM/273
4X6UO/244
K1NIT/201
K1PDX/125
K1YDG/253
KA1HBV/253
KB1CD/284
KB1FE/256
KS1S/302
N1IR/225
W1NBE/225
W1WLW/305
WA1KUL/284
WA1NSJ/265
WB1DWO/230
KB2XL/294
KD2NL/181
KE2CG/226
KQ2O/280
N2BAT/266
NN2Q/175
NR2W/206
NX2H/174
NZ2L/201
W2GZA/291
W2RGU/332
WA2OVG/152
WB2BNJ/327
WB2RQX/207
AC3T/175
K3VCZ/126
KA3HXO/300
N3CWP/289
W3IQS/298
WA3CGE/318
WA3NCP/184
K4PR/302
K4SBH/209
KB4JRS/202
KF4GW/200
KK4GT/260
KK4OK/202
KV4F/315
N4DRC/305
N4PZF/204
N4ZQ/178
W4DMV/273
W4DR/357
W4MDX/311
W4NYN/343
WB4CSK/260
WJ4S/175
K5MBE/301
KB5EK/268
KC5CR/280
KE5JE/229
KF5CU/248
N5CFN/178
W5MIG/199
W5TOO/125
WB5HGI/250
WC5Q/251
AH6HY/225
KE6GM/270
KG6FG/264
KI6PG/130
KI6ZH/127
KK6X/226
KM6K/286
N6CGB/280
N6NIG/203
W6AED/327
W6GO/324
W6HYG/352
W6JAZ/205
W6XI/316
W6ZUM/290
WA6EZV/284
K7TCL/156
KB7M/151
KC7V/276
N7GVV/168
NX7W/208
W7ALZ/262
W7HX/225
W7KSK/248
W7SNY/125
K8CMO/317
K8EFS/305
K8LJG/330
K8MDU/254
K8ZZO/314
KC8KE/279
KE8NU/204
N8ATR/307
N8BEF/262
NG8S/262
NT8O/299
W8ILC/335
W8JRK/216
W8PR/335
W8QHG/300
W8QNF/270
W8WRP/314
WA8HFN/311
WB8LFO/303
WB8VKL/289
WB8VPA/312
WD8IXE/295
WD8MQJ/261
WD8NMV/270
WD8NVA/259
WD8SDL/251
WK8M/175
KB9ANR/130
KO9Q/307
N9ELY/200
W9HUW/226
W9WYN/217
W9ZX/306
WA9CDY/262
WA9IVU/300
WA9LLE/163
WD9IIC/284
KØIR/190
KØTLM/296
KCØMS/268
WØHBH/315
WDØAQJ/290
WDØAWL/301
WNØ/225

CW

DK1GF/227	G4IJW/227	JH7DIS/210	SMØDJZ/301	WA1ZIC/148	K4PR/262	WB4CSK/298	KC7V/273	N8MC/299	WA9BXB/150
DK2DE/180	HA8UB/252	JAØKHD/203	UY5XE/151	K2LFL/200	KJ4VH/201	WJ4S/175	WA7HCE/205	NGBS/231	WD9IIC/303
DL1LD/260	HB9BNB/228	LZ2DF/215	VE3FZW/154	KB2FS/228	KU4J/283	KB5EK/200	WR7C/238	W8PR/283	KØGUG/282
DL4MCF/188	I1WNB/201	OH4OJ/260	YBØATB/3/125	WB2GAI/176	N4AVB/202	W5HFN/175	K8MR/179	WD8IXE/260	KØRWL/292
DL6AAP/181	IK1GJT/226	OZ1KWG/141	W1AOQ/231	K3PA/225	N4RUM/159	W5ORM/174	K8MW/278	K9CW/225	KSØM/250
DL9HC/151	IK2ECP/150	PA3BWQ/151	W1ENE/251	W3HDH/257	W4JTL/285	W6AUG/256	KBQXB/261	K9ZXG/175	NCØO/201
F6HMJ/206	JA2ODB/164	PT7AA/271	W1WLW/306	K4BWU/260	W4UG/225	W6GO/310	KB8DB/256	W9NGA/265	NS9B/177
G3VMW/269	JA7FS/286								

RTTY

VE3UR/151	N2BAT/145	W2AYJ/155							

160 Meters

LZ2DF/167	VE3DO/125	W1WAI/140	K4TEA/159	W4DR/223	W4FX/170				

80 Meters

SM6CVX/216	SMØDJZ/177	W1WAI/181	K4KUZ/170	W4DR/307	KC7V/114	W8ZV/260			

10 Meters

CX2AAL/208	SM6CVX/256	ZP5JCY/223	K2EEK/128	W3BWU/177	K4UTE/259	K5OVC/300	N6CGB/157	KA8KDA/125	W9WHM/261
DL3RK/263	SMØDJZ/261	ZS6P/144	N2BAT/172	AA4TV/203	W4DR/321	KE6KT/126	KC7V/175	N8HUR/180	WA8IVU/228
HI8LC/127	VE3JGC/165	W1NG/302	WB2DND/206	AA4UJ/208					

DXCC Notes

Annual Listing Reminder: Those who wish to update their totals for the 1989 DXCC Annual Listing must submit confirmations during the month of September. They must reach HQ on or before September 29, 1989 to be included in the listing. You must comply with DXCC Rule 5, including the once-a-year exception, to update your DXCC standing.

Honor Roll Listing Corrections: Mixed—W4MGN 353/320, G3NSY 329/315, K5NW 326/315, G3RTE 313/312, JA5BLB 318/311, WA4DPU 316/311, N5NW 337/311, W6DU 329/311; Phone—SM5CZY 347/319, KØBUR 340/319, VK5WO 340/314, KK2I 317/313, W4OMQ 340/312, WB4QNP 323/312.

New Books

SHORTWAVE DIRECTORY

By Bob Grove. Published by Grove Enterprises, Brasstown, NC 28902. Fifth edition, 1989. Softcover, 8½ × 11 inches, 212 pages plus front and back matter, $14.95.

Reviewed by David Newkirk, AK7M

Lists of stations by frequency order are one thing, but what about greater informational depth on nonbroadcast, non-Amateur Radio services commonly heard between 1.6 and 30 MHz by North American listeners? If you like listening in on such signals with your general-coverage receiver or transceiver, here's a book that belongs right beside your radio.

The *Shortwave Directory*'s organization of stations—mainly by mission and service—is revealed by the book's main table-of-contents headings: Air Force; Navy; Army; Coast Guard; Federal Government; Aircraft; Space; Maritime; Public Safety; Business, Scientific, Private; Common Carrier; Broadcasting; Longwave; Glossary; Frequency Cross Reference; and Listener's Log Sheet. Subheads under the Navy heading, for example, include: US Navy Frequencies and Call Signs; US Navy Fleet Area Control (with a map of US naval districts); Antarctic Stations (US Navy, Australian, Belgian, French, Japanese, New Zealand, Norwegian, South African, British, USSR); US Navy/Marine Corps MARS; the Canadian, Israeli, Japanese, British, Australian, New Zealand, Italian and Soviet Navies; Inter-American Naval Telecommunications; and CW Beacons.

The *Shortwave Directory* also treats unofficial, unknown, untraced and unidentified radio: "Spy numbers" stations (example: "Charlie India Oscar X-ray Two," audible during New England evenings and late afternoons at about 45 minutes past each hour on 10.125 MHz USB) are covered in the *Directory*'s Federal Government section, and there's a brief section on "freeband," terrorist and smuggler radio toward the end of the book.

Although the *Directory* focuses on nonbroadcast, non-Amateur Radio doings between 1.6 and 30 MHz, it also contains sections on longwave broadcasting; LF/MF nondirectional beacons; international broadcast feeders (example: the Voice of America's 14.526-MHz independent-sideband feeder from Greenville, North Carolina, audible during the afternoon in New England); oft-used shortwave broadcast frequencies by country; and commonly logged stations from 76 Hz to 197.5 kHz. And if you'd rather tune first and ask questions later, the *Shortwave Directory*'s "The Top 100 Shortwave Frequencies" will get you off to a good start.

I recommend this book to radio amateurs interested in getting more out of their general-coverage receivers and transceivers.

Strays

W1AW-4 PACKET BBS REFURBISHED

☐ When the going gets tough, the tough get going—or so the expression goes. A take-charge group recently exemplified this adage when the heart of the W1AW-4 Packet BBS, a Xerox® 820, passed on to digital heaven. Our ever-faithful computer had unexpectedly succumbed to both a long, hard work life and old age.

All looked dark and gloomy. Suddenly a group of amateurs came to the rescue with chips, DIPs and all manner of computer paraphernalia and a new and much improved system came into being. This generous unsolicited donation kept W1AW-4 PBBS down-time to an absolute minimum.

The ARRL wishes to thank the following Amateur Radio operators for their significant time, contributions and efforts in assembling, configuring and testing the new W1AW-4 Packet Bulletin Board System: Bob Peterson, NK8T, and the MIDNET Packet Radio Association—Power supply, case, motherboard, keyboard, I/O boards and cables; Gary Sanders, N8EMR—Seagate ST-225 20-Mbyte hard drive; Joe Stout, KA3MZS, and the Washington PA Amateur Radio Club—RAM chips; Tom Case, K8CLA—360 kbyte floppy disk drive; Joe Schimmel, W2HPM, chief system instructor—interim loaner computer, hardware assembly, integration and on-line system test; Norm Sternberg, W2JUP, project coordinator—Western Digital hard drive controller and RAM chips, software installation and configuration.

The Sysop would like to express special thanks to the spouses of W2JUP and W2HPM for making both "portable 2" journeys so comfortable. The overwhelming hospitality made the two trips to Long Island most pleasant and that high-octane coffee really kept the Sysop going on those wee-hour drives back to Newington.—*Jeff Bauer, WA1MBK, W1AW Station Operator and PBBS Sysop*

Conducted By Luck Hurder, KY1T
Deputy Manager, Field Services Department, ARRL

Hams Are the Key Factor in NDMS Drill

By Sylvia Pentel, KBØDQB

Massive earthquake, registering 8.0 on the Richter Scale, hits Sacramento area of California and causes thousands of deaths and tens of thousands of injured. Power and phone lines down.

What would be *your* reaction to this announcement, had it been the real thing? It was only a test of the National Disaster Medical System (NDMS), but it *could* happen. Would *you* be ready? Could you operate under stress? Who would know that you are available?

The NDMS held an emergency drill on April 22, 1989, to test the capabilities and coordination of the many groups and organizations which would be activated should a real disaster occur.

If a major catastrophic event did take place, the area would be declared a federal disaster by the President of the United States, and the NDMS would become involved, providing assistance such as evacuation of the injured to various hospitals. There are over 100,000 precommitted beds available at any one given time in the US.

From the United States Air Force Reserve Base in Minneapolis, Minnesota, Mr Ed Lord, NDMS area director, coordinated the largest emergency exercise attempted in US history. In cooperation with Chicago and Indianapolis, "patients" were flown in two Hercules C-130s from Minneapolis to Chicago, two C-130s flew to Indianapolis with patients and "next of kin," and two additional planes with patients were flown from Chicago to Minneapolis—a total of six planes involved in the drill.

When the patients arrived in Minneapolis, they were prioritized by degree of injury (triage) and sent by ambulance or medical helicopter to assigned hospitals where they were "treated" by medical personnel. Chicago and Indianapolis followed similar procedures.

A large network of Amateur Radio operators provided communications, linking the Minneapolis/St Paul area, Chicago, Indianapolis, Philadelphia, Des Moines, Sacramento, San Francisco and a dozen cities in Minnesota. Several modes of communication were utilized, including phone, AMTOR, packet radio and amateur TV. In the Twin Cities alone, there were 100 operators. One hundred-two were scheduled, with 100 actually participating —an astounding percentage that proved the dedication of the amateurs. All ages and walks of life were represented in the exercise, including an eleven-year-old General class operator, many senior citizens and several disabled persons, including a blind person and one control operator with cerebral palsy.

Amateurs assisted the American Red Cross with their disaster welfare inquiries and provided packet communications from the communications van at the air base in Minneapolis to the Red Cross in St Paul. AMTOR was utilized to relay data between Indianapolis, St Cloud, and St Paul.

Fast-scan television was used throughout the hangar with monitors in the communications command post, command center command post and the state capitol EOC. Transmission and reception at the air base was excellent and exceeded our expectations. Video reception at the state capitol was very good. ATV will definitely be a part of future drills. Previously, there wasn't a way for the NDMS director, the communications coordinator and others to observe the activities while in the command center. With Amateur Radio communications in the director's command center, requests could be made to the ATV control center to switch to cameras in various areas, allowing those in the van to be kept up-to-date on the activities.

The teamwork among the hams was excellent; they were well-prepared and efficient. There were problem areas, certainly; delays and mix-ups are a part of life, but resolving them proved to us that we could improvise and rectify situations in order to get things running smoothly.

On the humorous side, there was a little comic relief in the morgue area of the hangar when a "dead" patient opened his eyes and said to the nearby ham operator, "Find me a clergyman for my last rites." So the ham looked at the corpse's dog tags and asked, "What kind of a Protestant are you?" "Methodist," said the dead man. The ham then agreed to find a chaplain, at which time the dead man asked, "Could you have him bring me a turkey sandwich while he's at it? I haven't eaten since before dawn." This particular person "died" twice due to an error in the patient-tracking area. We couldn't help but wonder if it was the turkey sandwich that did him in the second time.

A few individuals felt that there should

John Post, KE7AX (r), takes patient information in the medical transportation area at the USAF reserve base in Minneapolis. *(photos KBØDQB)*

ATV cameraman Mike Bingham, WDØFUV, focuses on a ambulance crew transporting a patient. Fast-scan television allowed the NDMS director and the communications coordinator to observe the activities while in the command center.

not be emergency drills like the one described here. Their reason being, in real life, we would not have time to prepare. My answer is, "Where would we be without preparedness?" It's true, we could be taken by surprise with an unexpected disaster, but the more we prepare and coordinate the efforts between various organizations and agencies, the more efficient we will be in handling the problems that would arise in a serious situation. It is unthinkable to refuse to prepare. Complacency is a dangerous thing; we must plan ahead.

I'm sure that the next time we are asked to provide communications, we will do it willingly and enthusiastically. Even as you read this article, the next NDMS exercise is being planned. It's a large-scale effort, with at least 15 states planning to participate. The target date is October, 1990. A lot of preparation will be going into this next drill, and many networks of ham operators will be needed. Perhaps you will be involved.

After the drill, Exercise Assistance Officer, Division of Emergency Management for the state of Minnesota, Bob Dahm, said, "Amateur Radio plays a more important role in emergency communications than most people realize. Amateur Radio can take over when other means of communications are lost and its reliability and ability to communicate important information should be given more attention in the future."

Disaster. It's not a matter of *if*, it's *when* it will happen. Are you prepared? Are you willing? Think about it.

Field Organization Reports July 1989

National Traffic System

Net	Sess	Tfc	Avg	Rate	% Rep	% Rep to Area	
Cycle Two							
Area Nets							
EAN	30	747	24.90	.718	88.9		
CAN	30	568	18.93	.425	100.0		
PAN*	60	409	6.93	.504	96.6		
Region Nets							
1RN	60	305	5.08	.382	83.0	96.7	
2RN	56	217	3.90	.296	85.7	93.3	
3RN	30	157	5.23	.400	85.8	90.0	
4RN	60	383	6.38	.266	95.0	96.7	
RN5	60	358	5.97	.460	87.9	100.0	
RN6	58	102	1.75	.236	95.0		
RN7	59	249	4.22	.390	79.3	98.3	
8RN	60	326	5.43	.295	96.1	93.3	
9RN	60	334	5.56	.345	89.5	100.0	
TEN	60	577	9.61	.414	82.0	100.0	
TWN	60	305	5.08	.448	79.7	89.2	
ECN							
Cycle Three							
Area Net							
EAN	30	165	5.50	.476	72.8		
Region Net							
1RN						93.3	
2RN	29	95	3.27	.263	97.9	76.6	
3RN	26	38	1.46	.213	85.8	100.0	
4RN						40.0	
8RN						66.6	
ECN							
Cycle Four							
Area Nets							
EAN	30	880	29.33	1.029	95.7		
CAN	30	806	26.90	.949	100.0		
PAN*	29	549	19.27	.739	96.5		
Region Nets							
1RN	60	427	7.12	.484	97.6	96.6	
2RN	50	175	3.50	.376	77.0	93.3	
3RN	57	199	3.49	.368	93.6	96.6	
4RN	60	290	4.80	.454	83.6	93.3	
RN5						100.0	
RN6	60	307	5.12	.438	96.7	100.0	
RN7						100.0	
8RN	52	205	3.94	.282	82.0	100.0	
9RN	60	319	5.32	.390	94.6	100.0	
TEN	60	282	4.70	.410	65.8	100.0	
TWN	53	245	4.71	.376	80.7	89.6	
ECN						100.0	
ARN	30	59	1.93	.064	100.0		

*PAN operates both cycles one and two.

Public Service Honor Roll

This listing is available to amateurs whose public-service performance during the month indicated qualifies for 60 or more total points in the following nine categories (as reported to their SM). Please note maximum points for each category: (1) Checking into CW nets, 1 point each, max 30; (2) Checking into phone/RTTY nets, 1 point each, max 30; (3) NCS CW nets, 3 points each, max 12; (4) NCS phone/RTTY nets, 3 points each, max 12; (5) Performing assigned NTS liaison, 3 points each, max 12; (6) Delivering a formal message to a third party, 1 point each, no max; (7) Handling an emergency message, 5 points each, no max; (8) Serving as Emergency Coordinator or net manager for the entire month, 5 points max; (9) Participating in a public service event, 5 points, no max.

This listing is available to Novices and Technicians who achieve a total of 40 or more points. Stations that qualify for the Public Service Honor Roll 12 consecutive months, or 18 months out of a 24-month period, will be awarded a special PSHR certificate from HQ.

405
KC9CJ

169
WD8V

164
W7TVA

149
KA8BBY
K5CXP

147
WB2OWO

139
WTØG

137
WA2SPL

134
WB4DVZ

133
WI2G

132
W2MTA

128
N4GHI
WA1TBY

126
WA4JDH

122
KD7ME
WG9J

121
W9YCV
NM1K

116
KA3DLY

115
W7LNE
WB7WOW

114
KI6ZH

113
N9BDL
KJ4VT

112
W2QNL
KAØRCH

111
WA9W
W4JLS
N1CPX

110
N5MEA
W7VSE

109
WB2ZJF

108
WA2JBO
WF6O

ND2S
K5UPN

107
KT1Q
KF5BL
WB1HIH
K9CNP
WA4PFK

106
WB2VUK
WA9VND

105
KA7AID
K4IWW

104
KA2VZX
WØOYH

103
W4PIM
W2RRX
KA1GEP

102
WG7H
WA4QXT
N2EIA
AG9G
KW1U
KI4YV
K4ZK

101
KC1KI
W9CBE
K4NLK
WB4WII
KC3Y
KD8HB

100
N2XJ
WB4VMX
KA1GWE
N1FLO

99
NR9K
N3EMD
W1PEX
KA1NXT

98
W9DM
KQ3T

97
NØFOO
W4ANK
K5MXO
W7GHT

96
WB2EAG
WT7A
W4CK8
WB8SYA

95
NDØN
KØBXF

94
KA2KJF
WD8KQC
N8HSC
N4EXQ
K8TVG

93
N8NLW

92
KB9LT
WAØHTN
NO3M
KA1S

91
KAØKPY
WB4ZTR
W3FA

90
WD5GKH
KC4BHX

89
K2ZVI
WB4KSG
AA4ZV

88
W4QAT

86
KB1AF
N4KFU

85
W1KX
W5CTZ
KA4HHE

84
N5NZH/T
WA4EIC

83
KØERM
WB4WQL

81
N2HIF
KA9FVX
KA1IFC
K8JDI
W9HBI

80
N1IMP
KC2HJ
WB7WVD
KJ3E
W1KK

79
AC5Z
WDØGUF
WAØTFC
KJ4NK

W5YQZ
W4TZC
K3RXK
WA9VLC
KA4FZI

78
WA1JVV
KA2INE

77
NB2D
NN2H
WA5MWD
K4MTX
WY7U

76
N7BGW
NJ3V
N1FNN

75
WA2FJJ
KG2D
N4MEJ

74
WB5J
NY8W

73
K2TWZ
KA1JXH
K2VX
NS9Q
K1ABO
NC3V

72
NZ5J
N2IYA
WA3UNX
WB8R

71
WA2ERT
N1DHT
WD4LOO
WA3YLO

70
WB1BTJ/T
WX7A
WTØE

69
KB2EPU
W2YGW
N4RHV
N8FWA

68
KA7EEE
N5NAV
KAØPDM
KA2QOO
WB8YPG
N5KCL
WS7U
WA4RUE

67
WA2PAC
KD8KU

66
W6SX
WB2WMP
KC4ESG
N8CEI
W9OBU

65
KJ9J
KAØARP
N3AZW
N8FPN

64
WA2UKM
W2FR
WA4YYQ
KB4WT

63
WA4RNP
KDØYL

N2IKR/T
K8CQF
NW8M
KC4GCK
KA1RVN/T
WD8KBW

62
N7DRP
W9UMH
N7GGJ
K2YAI
K4ZUY
KA8CPS
KM5L
K4BGZ

61
N2HSZ
WBØWNJ
WB2FTX
KA1RSY
N8EFB

60
KDØNH
KA1KML
N2DXP
WT8J
KB4OPR
KA9QXI
WD4KBW

59
KP4DJ

57
KA9CTW/T

55
KB5BNU/T

54
KA2ZNZ/T
N3DRM
N4LST
N4ORZ/T

52
N2EVG/T

51
NØHIA/T

50
KA2JMA/T

49
KA8HJK/T

47
KA1HPO/T

46
WB2ZIE/T
KA9TVU/T

41
KA2UJU/T
KA2UIU/T

40
WB2KID/T

The following stations qualified for PSHR during the month of May, but their call sign did not appear in this column last month: KJ4NK WA4TXT WA4YYQ WB5CPY N7DRP N8EFB.

Brass Pounders League

The BPL is open to all amateurs in the United States, Canada and US possessions who report to their SM a message total of 500 or a sum of originations and delivery points of 100 or more for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt in the standard ARRL form.

Call	Orig	Rcvd	Sent	Dlvd	Total
W3CUL	740	749	1286	71	2846
W1PEX	2	699	1534	15	2250
WB9YPY	0	197	95	802	2094
WA2SPL	21	640	631	36	1328
WBØTAX	0	580	580	0	1160
KB4N	0	559	559	0	1118
WBØWNJ	205	115	690	2	1012
W3VR	357	239	377	28	1001
K1UGM	0	499	499	0	998
KC9CJ	24	478	72	302	878
KA1IFC	12	371	344	15	742
WA4JDH	0	291	327	25	643
K4DOR	49	296	249	2	596
N3AZW	20	271	285	11	587
WA9W	9	314	234	3	560
K5UPN	0	324	213	7	544
W3IWI	0	270	270	0	540
WF6O	8	252	267	12	539
W1FYR	158	146	228	5	537
WA9VND	10	262	240	22	634
N4GHI	12	239	246	22	519
NJ3V	22	235	254	0	511
WG9J	3	287	191	22	503
WB1BTJ/T	0	181	320	1	502
NM1K	40	251	182	27	500

BPL for 100 or more originations plus deliveries

WØFIR	160	
K1TQY	155	

Strays

I would like to get in touch with...

☐ anyone who would be willing to loan me a photo of the Army Signal Corps SCR-270 radar. R. L. Kile, K6CWD, 3315 Como Ln, San Jose, CA 95118.

☐ clubs which sponsor awards for working their members for inclusion in a directory of club awards. Charles E. Martin, AB4Y, 1605 Sinletree Way, Bowling Green, KY 42103-1425.

☐ anyone who worked me as W8ARL in 1931. Teddy Bearden, WD5ADH, 4209 McConnell Ave, El Paso, TX 79904.

☐ anyone with manuals for an Eico model 460 oscilloscope. John M. Ladd, N7HZG, 10869 Forest Ln NE, Bainbridge Island, WA 98110.

Amateur Satellite Communications

Conducted By
Vern "Rip" Riportella, WA2LQQ
PO Box 177, Warwick, NY 10990

Bird Watching—Part 2

Last month, we began a survey of the OSCAR field to assess where we are. This month, we continue the survey bridging where we are to where we will shortly be. We'll look at the major OSCAR of this decade, AMSAT OSCAR 13 (AO-13). Then we'll take a peek at the next major Russian project (RS-12/13), due for launch probably early next year.

AO-13 is clearly the most successful OSCAR project to date. By almost every measure, it stands out as a watershed program. Nevertheless, it, too, has had its disappointments. Let's look at the positive side of the ledger first.

AO-13 was successfully launched aboard a huge Ariane 4 rocket from the European Space Agency facility at Kourou, French Guiana, on June 15, 1988.[1,2] As I wrote in *Amateur Satellite Report* (ASR) at the time:

> In the third and final segment of a flawless trek from jungle launch pad to its orbital residence for the next millennium or so, AMSAT OSCAR 13 has fulfilled a decade-old plan that two prior efforts failed to achieve. It's become history's first OSCAR in a Molniya-type orbit.
>
> The first step to orbit was a flawless launch to GTO (geosynchronous transfer orbit) by the new Ariane-4 launcher of the European Space Agency June 15. All three satellites launched by Ariane mission V-22 have now successfully attained their final orbits. The GTO provided by Ariane mission V-22 had a 36,000 km apogee, 220 km perigee and an inclination of just under 10 degrees.
>
> The second step for AMSAT OSCAR 13 was taken a week after launch when, on June 22, the kick motor was ignited for the first time. The result was an intermediate orbit with perigee at 1081 km and inclination raised to 14.3 degrees. Apogee remained very nearly unchanged.
>
> The stage was thus set for the third and climactic step. It had been decided to raise the target perigee a bit to about 2200 km to add some margin for error and to increase subsequent Southern Hemisphere coverage. The increased margin for error was desired since even a relatively minor "propulsion system hiccup" at the wrong moment could spell disaster. AO-13 could have gone down as a man-made meteorite if the worst had happened.
>
> The 5.5 minute rocket engine "burn" began at 21:05 UTC, July 6. The burn added about 1 mile per second to AO-13's orbital velocity. The plane of the orbit was raised to about 58 degrees and the perigee was raised to about 2500 km. In a word, it was "perfect."
>
> AO-13 reached its near-Molniya orbit where two prior attempts have failed. Phase 3A was lost in 1980 when Ariane mission L-02 failed and was destroyed. In 1983, Phase 3B (which became AO-10) made it to GTO aboard Ariane L-06 and achieved an initial motor burn but was unable to re-ignite the motor later because of a suspected propulsion system leak.
>
> The Phase 3 Program began with early planning in 1976 as a follow-on to AMSAT OSCAR 7, the first OSCAR to use Mode B. AMSAT OSCAR 8 was built as a gap-filler when it appeared the first Phase 3 satellite would not be available until after AO-7 died. Thus, with AO-13 finally reaching the Phase 3 objective orbit first outlined in 1976, it caps a 12 year-plus program costing well over $1 million.

General AO-13 communications operations began at 1500 UTC, July 22, 1988. It was clear from the outset that this would be a fine satellite indeed. It did take some insight to realize this, however, because during the first few days of operation, so many users pressed into the passband that little band space and downlink power were available to individual users. Within a few weeks, things settled down, experience levels increased and users' satisfaction improved.

Several negative aspects appeared within a few weeks as well. Some of these additional negatives would vanish as new insights availed; others would remain in the "profound disappointment" category.

Although Mode B (70 cm up, 2 m down) proved excellent in most regards, Mode L (24 cm up, 70 cm down) users were initially sorely disappointed by the performance they observed. In fact, very few users could even find their downlinks. Part of the problem was traced to incorrectly calibrated frequencies. Published values (including those published in this column) were off by nontrivial amounts. Secondly, the baseline conditions for establishing Mode L transponder performance were specified in inordinately optimistic terms. Consequently, Mode L uplinks had to be increased by about 3 dB (twice the effective radiated power) to yield the expected downlink strength. Added to this was the tight constraint for Mode L satellite antenna pointing relative to the user. In sum, Mode L user grumbling probably peaked 6 on the Richter scale!

But the Mode L (and Mode JL, 2 m and 24 cm up; 70 cm down) grumbling lessened with experience and increased skill levels combined with recognition that "what you see is what you get." A more sinister fault claimed the ambitious RUDAK project, however.

The RUDAK digital transponder was a product of an exceptionally bright group of

Table 1
Transponder details

		RS-12	*RS-13*
Mode "A":	uplink	145.910-145.950	145.960-146.000
	downlink	29.410- 29.450	29.460- 29.500
	beacon	29.4081 (or 29.4543)	29.4582 (or 29.5043)
Mode "K":	uplink	21.210- 21.250	21.260- 21.300
	downlink	29.410- 29.450	29.460-29.500
	beacon	29.4081 (or 29.4543)	29.4582 (or 29.5043)
Mode "T":	uplink	21.210- 21.250	21.260- 21.300
	downlink	145.910-145.950	145.960-146.000
	beacon	145.9125 (or 145.9587)	145.8622 (or 145.9083)
Mode "KA":	uplinks	21.210- 21.250	21.260- 21.300
		145.910-145.950	145.960-146.000
	downlink	29.410- 29.450	29.460- 29.500
	beacon	29.4081 (or 29.4543)	29.4582 (or 29.5043)
Mode "KT":	uplink	21.210- 21.250	21.260- 21.300
	downlinks	29.410- 29.450	29.460- 29.500
		145.910-145.950	145.960-146.000
	beacons	29.4081(or 29.4543)	29.4582 (or 29.5043)
		145.9125 (or 145.9587)	145.8622 (or 145.9083)

Autoanswer "Robot"

modes	A; K; T; KA; KT	A; K; T; KA; KT
uplink	21.1291 and/or 145.8308	21.1385 and/or 145.8403
downlink	29.4543 and/or 145.9587	29.5043 and/or 145.9083

General Technical Data

DC POWER:		
All systems OFF	4.6 W	3.5 W
All systems ON (max. output)	35 W	25 W
RF OUTPUT POWER:		
Beacon and "Robot" (low/high)	0.45/1.2 W	0.45/1.2 W
Transponder TX (29 or 145)	about 8 W	about 8 W

[1]V. Riportella, "Introducing Phase 3C: A New, More Versatile OSCAR," *QST*, Jun 1988, pp 22-30.
[2]See "OSCAR 13 Report Card," *QST*, Oct 1988, p 48.

engineers from AMSAT DL's Munich contingent. A prototype of the RUDAK had been operating on a water tower in Munich for many months, and all the bugs were thought to be vanquished. But when the initial in-orbit tests were performed on the AO-13 RUDAK, the operational software could not be loaded. Attention focused on a "cold PROM device." After months of testing the flight unit and modeling the problem on the water tower-mounted unit, the experiment was reluctantly considered irretrievable. RUDAK was a total loss and several man-years of hard work were lost in the process. No conclusive evidence as to the cause of the failure has been published.

On the positive side, AO-13's Mode S (70 cm up, 13 cm down) transponder built by a Colorado group was first activated on September 17, 1988, and performed more or less as expected. AO-13's Mode S transponder has continued to be used when conditions allow. Because the antenna beamwidths are very tight on Mode S, use of the transponder is sharply constrained by antenna aiming considerations.

AO-13 use continues through seasonal variations of power availability and usage patterns. After 15 months in operation, AO-13 hums merrily along, apparently in good health. The command team is shepherding the resource in a thoroughly professional manner. Moreover, the IHU (Integrated Housekeeping Unit—the on-board computer) should be immune to the level of radiation damage that sharply truncated AO-10's useful life. The radiation-hardened memory chips employed on AO-13 should survive for decades. Even though power available from the solar cells decreases with total solar radiation dosage, the rate of decrease of power yield slows after initial exposure. The prognosis for AO-13 use well into the next decade is good.

Let's turn now to satellites whose launch is imminent. According to reliable sources, the newest Russian entries, RS-12/13, are due for launch this summer. They may already have been launched by the time you read this column. The characteristics of these new Radio Sputniks were published in several places last year, after the builders made their initial announcement. In ASR, I quoted AMSAT-DL:

RS-12 and RS-13 are brothers of RS-10/11. RS-12 and RS-13 were built at the Tsiolkovskiy Museum for the History of Cosmonautics in Kaluga city, an industrial center 180 km southwest of Moscow. The chief architects of the project were Aleksandr Papkov and Victor Samkov. RS-12/13, a single combined unit, is mounted along with the COSMOS primary payload. It's a maritime navigation system for ships as was the primary payload of the RS-10/11 launch. Launch is scheduled for 1989. (Rescheduled for early 1990.—*Ed.*) The circular polar orbit will have a height of 1000 km (621 miles), inclination of 83 degrees and nodal period of 105 minutes. Transponder details are shown in Table 1.

Next month we'll look at the next satellites to be launched this year.

For more information on getting started on OSCAR and information on AMSAT membership and membership benefits, call AMSAT at 301-589-6062 or write: AMSAT, PO Box 27, Washington, DC 20044. Please include a business-size SASE.

New Products

AEA OBTAINS DISTRIBUTION RIGHTS FOR M² ENTERPRISES PRODUCTS

☐ Advanced Electronic Applications has acquired exclusive distribution rights to the line of VHF/UHF antenna products manufactured by M² Enterprises, aka Mike Staal, K6MYC (co-founder of and former antenna designer for KLM). The M² product line now includes computer-optimized antennas for the 50, 144 and 420 to 450-MHz Amateur Radio bands, as well as power dividers and other VHF/UHF antenna hardware. Selected equipment specifications are shown below. For more information, contact AEA, Inc, PO Box C-2160, Lynnwood, WA 98036, tel 206-775-7373.—*Rus Healy, NJ2L*

M² Enterprises Products Available through AEA

Antennas

Model	*Description*	*Price Class*
6M-5	5-element 50-MHz Yagi	$180
6M-2WL	9-element 50-MHz Yagi	$450
6M-2.5WL	11-element 50-MHz Yagi	$540
2M-5WL	17-element 144-MHz Yagi	$200
2M-18XXX	18-element 144-MHz Yagi	$260
2M-6WLHD	6-λ-boom 144-MHz Yagi	$470
2M-CP14	14-element circularly-polarized 144-MHz Yagi	$180
2M-CP22	Like 2M-CP14, but 22 elements	$270
EB-144	Omnidirectional horizontally polarized 144-MHz mobile antenna	$130
430-16	16-element 430-MHz Yagi	$120
432-13WL	39-element 432-MHz Yagi	$270
EB-432	Like EB-144, but for 432 MHz	$120

Accessories

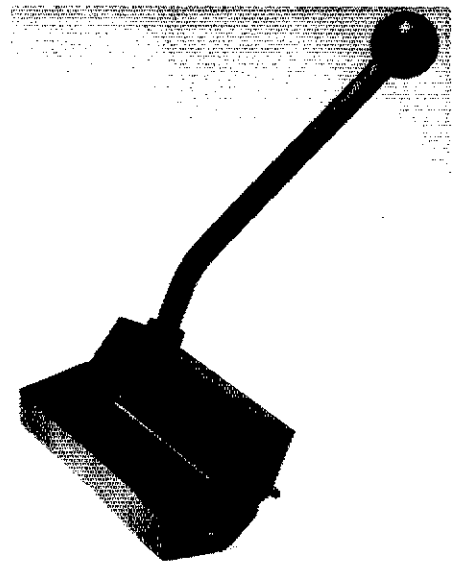
144-MHz H frame for four 2M-18XXX antennas	$590
18XXX upgrade kit (converts KLM 2M-16LBX to 2M-18XXX)	$90
MT-3000 heavy-duty elevation-rotation system	$800

Power Dividers

50 MHz: 4 ports, $220.
144 MHz: 2 ports, $70; 4 ports, $90; 6 ports, $140; 8 ports, $220.

JL MANUFACTURING VISE-BRAKE

☐ Got a small sheet-metal-bending job, but no access to a sheet-metal brake? The Vise-Brake can solve your problem. With it, you can bend thin sheet metal—even stainless steel—and some plastics, such as Lexan®. The Vise-Brake mounts in a vise and can handle materials up to 1/8 inch thick and 6-1/8 inches wide. Product brochure available. For more information, contact JL Manufacturing, 408 Hawk St, Bldg D, PO Box 561203, Rockledge, FL 32956-1203, tel 800-780-3677 or 407-631-3877.—*Rus Healy, NJ2L*



The World Above 50 MHz

Conducted By Bill Tynan, W3XO
Send reports to HCR 5 PO Box 574-334,
Tierra Linda Ranch, Kerrville, TX 78028
or call 512-257-1296 to record late-breaking information.

Let 'em Have VHF/UHF (Continued)

Last month's column lead noted the ever-increasing impression on the part of many hams that the VHF and UHF bands are used for little more than relatively short-range wideband modes of communication, such as FM voice and packet. It made the point that if we are to keep our relatively small slices of spectrum, we must do something to correct this erroneous idea. Giving presentations to local radio clubs and becoming Elmers to those who display an interest in our kind of VHF/UHF hamming were noted as ways to accomplish this goal.

This month's lead continues the subject with other specific suggestions of positive things we can do, especially in the manner in which we use the frequencies we so treasure. The use, or misuse of calling frequencies is one example. Calling frequencies are very useful to catch band openings, but once a large number of operators become aware of enhanced propagation, with everyone clinging tenaciously to 144.2, or 50.110 (50.125 if the proposed DX window is adopted), leaves us wide open to the view that we require very little spectrum for our activities. Why shouldn't other modes, which are already cramped for space, occupy the frequencies we largely ignore? Moral: Spread out. Tune the band. Make skeds at 50.250 or 144.350. Conduct local local nets at 50.3 or 144.4. SMIRK's policy of using 50.2 and SWOT's selection of 144.250 represent excellent initiatives in this direction. Once contact is established on a calling frequency, move off 50 to 75 kHz, not just 5 or 10 or not at all.

Remember, the closer those loud local FM signals get to the part of the band we are using, the higher our noise floors will be, and thus the more limited will be our ability to hear weak signals. All of the low-noise preamps we can muster won't help a bit. I am interested in other ideas that readers have on this subject and will be happy to pass them along.

ON THE BANDS

6 Meters—If the 1989 E season started slow, it certainly has been making up for lost time during the closing days of June and the first week of July. As an example, if the ARRL-sponsored June QSO Party benefited from only so-so conditions, the SMIRK contest one week later, was a different story. Almost continuous coast-to-coast openings swelled many scores. Since the rules for that event stipulated that US/Canadian domestic contacts must be above 50.125, many more became aware of the DX window. The few who didn't get the word, and began operating between 50.100 and 50.125, soon discovered that their QSO rate increased markedly once they QSYed above 125. SMIRK is to be commended for observing the DX window in their contest rules.

That inveterate sporadic E watcher WA5IYX notes that June 1989 represented the poorest June since 1986 in terms of the number of minutes during which he observed E-skip propagation. Nevertheless, outstanding single-and double-hop propagation within the US and Canada was available on many days during the month and the first few days of July. In addition, the availability of DX contacts added considerable excitement for 6-meter enthusiasts. Not surprisingly, the East Coast received the lion's share in terms of transatlantic contacts, but it did not have a monopoly. Word has reached me that EA8/G3JVL worked a number of US stations including West Coaster K7KV. That contact reportedly took place at 1415Z on June 28. The same source says that K2MUB accomplished the trick on the following morning at 1045Z. Shows it pays to get up early! According to G4UPS, QSOs between K7KV, and G3ZYY, G4UPS, G6ION, G7BXS and G8JDX took place between 1400 and 1500Z June 24. That makes K7KV an early riser too. Who says that this sort of DX can only be worked from the East Coast?

W4CKD/8, Greenville, Ohio, (not exactly on the East Coast) shared in the good luck. On July 2, Bob worked EA8/G3JVL 2013Z and CT4KQ a few minutes later. He also heard the ZB2VHF beacon from 2022-2210Z with signals reaching over S9. The CTØWW beacon was also received between 2113-2205Z. W4CKD also reports that VE1YX worked ZB2BL about 2140Z the same day. Nice to hear that Jimmy is back on. He should be popular this fall.

By monitoring 28.885, I have heard of several openings between South America and Europe, including a 20-minute affair July 7, in which CX8HS worked G, F and PA stations.

One East Coast station, N4MM, provides an example of what some in his part of the country have been working. John celebrated the 4th of July by QSOing CT1WW at 2114Z. The following day, Caribbean stations FM5WD, 9Y4VU, WP4G and HI8PM went into the log between 2130 and 0015Z July 6. July 7th was his luckiest day, bringing contacts with CT4KQ 2046Z, 9H1BT 2049Z, EA8/G3JVL 2057Z and another Portuguese station, CR8LN, at 2228Z.

W5OZI, Junction, Texas, lists some of his DX results for June. During the ARRL VHF QSO Party, Pat worked both XE2GFH and CO2KK but found conditions during the contest generally poor. The following week, on the 17th and early hours of the 18th, XE1LL, XE1GE, KP4EKG, HH7PV, KG4SM, XE2UZL, ZF1RC, HI8W and TI2KD went into the log. The last three represented new countries. The next afternoon, W5OZI landed another new country, 8P6LL.

WØKEA near Vail, Colorado, has a similar tale to tell. Phil says that the evening prior to the contest, his group worked some 2-meter stations via aurora and then switched to 6 for a buzz contact with K1LL/Ø, and subsequently VE3JAR EO40, apparently via auroral E. Next, a CQ brought responses from K7IDX/VE6, KL7NO and W6JKV/VE8. Like so many others, WØKEA really cleaned up during the SMIRK Contest, working countries 18 through 22 as a result of contacts with KG4SM, HH7PV, 8P6JW, VP2MO and HI9W. Phil also worked ZF1RC, HC5K and HC2FG just for good measure.

This conductor missed the weekend of the SMIRK affair due to other commitments. However, I found the week following July 1 to be very productive. During the evening of the 3rd and early hours of the 4th UTC, the band seemed to be open in all directions at once, finally settling down for a FB West Coast opening. On the 4th about 1800Z, KH6HI and KH6IAA were the only stations on the band and were worked easily. KH6IAA said it was the best opening for them so far this season. Two hours later, the E clouds were around to the east again, permitting some fine contacts with friends in the Washington, DC, area. Even double-hop was in evidence with VE1APG being worked. July 5th, at 2330 brought V31PC for a new country and a nice QSO with old friend XE1GE. Saturday the 8th brought another one of those openings in all directions, but with a bias to the west. The rest of the story is in the 2-meter section.

The news received from G4UPS also contains the word that 6W1PZ Senegal is on the band and hopes to have a 5-element Yagi up soon. Ted also notes that FC1EAN/7X is active from Algeria, and that SØ1A is scheduled to be on from the Saharan Democratic Republic beginning sometime in July.

The June issue of the *Six Metre and Above DXer*, a monthly newsletter published by the Radio Society of Great Britain (RSGB), says that the Greek authorities have issued 6-meter permits for up to 25 stations in the Athens area. They are allowed 25 W power with no antenna height or gain restrictions. It would be nice if some of the other European governments would take that approach. A beacon, SV1SIX, is operating on 50.040. In earlier action, a number of permits have been issued in Sweden. While on the regulatory kick, the Australian government has come up with rules for the VKs. VK3OT says that what the new regs essentially say is that VKs 1, 2, 3, 4 and 7 will be allowed a maximum transmitter power of 100 W between 50.05 and 50.2, provided they do not cause interference to television transmissions. VKs in call areas 5, 6, 8, 9 and Ø are allowed 400 W between 50.0 and 52 MHz. All VKs may continue to use 52 to 54 MHz as before.

A letter from the Centro Radio Aficionados Montevideo states that there is a new beacon on from Uruguay. It operates from the organization's headquarters under the call CX1CCC with a power of 5 W to a ground plane on 50.020.

Two DXpeditions report their results. KA3B says that his operation as ZF2NV/ZF8 from Little Cayman Island between June 4 and 13 experienced generally poor conditions. Also the 5-element beam didn't show up, plus they had rig failure.

Nevertheless, Harry managed to work a total of 142 stations including 18 W1s, 6 W2s, 7 W3s, 74 W4s, 22 W5s, 5 W9s, 2 WØs, 3 VE3s, plus 1 9Y4, 1 ZF, 2 KP4s and VP2MO. He presents

70-cm Standings

For WAS holders, listings are WAS number, call, state, call areas worked and grids worked. For others, call, state, US states worked, call areas worked and grids worked. Call areas are the 10 US call areas plus KH6 and KL7 plus each VE and XE call area plus DXCC countries not located within the continental limits of the US, Canada or Mexico. (The UN does not count as a call area.) Grids are those Maidenhead designators worked since the VUCC award was instituted January 1, 1983. In order to make the standings a true reflection of current 70-cm activity, those not reporting within the past two years are subject to being dropped. They will be reinstated upon presentation, in writing, of a statement indicating continued activity. It is not necessary to show additional states, call areas or grids worked in order to be relisted. Compiled July 9, 1989. Updates for next listing must be received by January 5, 1990.

1	W0YZS*	MO	—	—	
2	K2UYH*†	NJ	55	—	
3	K5JL*†	OK	48	—	
4	WB5LUA*	TX	41	—	
5	W5FF*†	NM	28	—	
6	W1JR*†	MA	54	178	
7	W0RAP*†	IA	44	205	
8	WB0TEM*	IA	—	—	
9	KA0Y*	IA	—	—	
10	WA4MVI*†	SC	26	—	
11	K5FF*†	NM	29	—	
12	DL9KR*†		55	202	
13	K4QIF*	VA	38	—	
14	K1FO*†	CT	44	206	
15	KL7WE	AK	—	—	
16	N4GJV*	NC	—	—	
17	NC1I*	MA	—	—	
	K1LPS*	VT	22	12	32
	WA1HYN	RI	17	8	45
	W1RIL	MA	15	9	36
	AF1T	NH	14	8	—
	W1EJ	NH	13	8	—
	N1AIS	MA	11	5	—

*Some states worked via EME.
†WAC.
—Information not supplied.

W1FAJ	CT	10	3	12
KA1DHO	MA	9	4	11
W2VC	NJ	27	11	78
WC2K	MJ	25	12	96
K2GK	NY	24	10	77
W2PGC	NY	24	10	45
W2CNS	NY	20	9	—
N2WK	NY	18	9	54
WA2FUZ	NY	18	9	20
N2BJ	NY	16	8	46
K2OVS	NY	16	6	20
KU2A	NY	11	6	28
WB2YZV	NY	10	4	16
KB3PD*	DE	41	13	87
W3RUE	PA	31	11	66
W3IP	MD	28	10	57
WA3FYJ	PA	25	10	44
WB3LJK	MD	24	10	65
AE3T	PA	23	8	—
KB3QM	DE	23	—	54
K3HZO	MD	22	10	51
W3ZZ	MD	22	9	58
W3WFM	MD	21	9	60
WB2DNE/3	MD	17	8	51
KZ3X	PA	14	6	31
AC3T	DE	13	5	18
WA3DMF	MD	10	5	13
WB4NXY	KY	29	8	90
KC4EG	KY	28	8	65

K4QF	AL	25	9	—
W4ISS	GA	25	8	—
WA4CQG*	AL	25	8	—
WS4F	GA	24	9	68
K4CKS	GA	24	8	102
N4MW	TN	24	8	59
WB4SLM	GA	21	8	70
KX4R	GA	21	7	100
WA4SBC	VA	21	7	46
N4VC	TN	21	6	54
KI4CI	FL	16	6	72
WD4DGF	TN	15	6	29
WB4RUA	GA	15	4	31
K4KAE	SC	14	6	—
WA4OFS*	FL	13	11	53
WA4MJD	TN	13	5	27
WA4OWC	FL	11	—	—
WD4FAB	FL	10	4	52
WD4AFY	GA	10	4	37
WD4AHZ	FL	9	2	55
KA4CRT	MS	8	2	16
NA4I	GA	6	2	20
K1FJM/4	FL	4	2	23
W0RRY/5*	OK	48	35	165
WB5AFY*	TX	42	33	158
W5RCI*	MS	41	23	152
K5UR	AR	29	10	144
K5SW	OK	28	9	112
W5HN	TX	26	8	62
WA5VJB	TX	22	7	—

W5DFU	OK	20	8	69
WA5HNK*	TX	19	6	44
KE5EP	TX	19	—	75
W5ASH	TX	18	8	69
W5UGO	OK	18	4	79
W5SXD	TX	17	5	36
K5JRH	TX	17	4	—
N5BBO	TX	12	3	64
W5UWB	TX	11	3	17
W5NZS	OK	6	—	50
W6ABN*†		43	34	—
N6AMG*		9	16	—
K6JYO		9	6	—
K6QXY		4	3	—
WA6HXM		4	2	—
W7FN*	WA	45	34	101
W7HAH*	MT	42	25	87
W4WD/7*	UT	38	33	—
W7JF*†	MT	34	25	—
W7RV	AZ	7	5	47
K7ICW	NV	4	2	20
W8IDU*	MI	41	11	—
W8YIO*	MI	40	31	105
WB8BKC	MI	33	9	133
NI8O	OH	31	10	119
WA8MIL	MI	20	9	55
K8AXU	OH	20	7	—
WB9SNR	IL	34	11	77
WB9OJR	IL	27	8	74

WB9MSV	IL	25	8	92
K9VGE	WI	17	9	70
W0UC/9	WI	14	4	59
W9YCV	WI	13	6	35
W9YCU	WI	12	6	31
K0TLM*†	MO	47	24	91
K0ALL*	ND	41	21	—
W0RT	KS	28	7	79
W0KJY*	CO	22	17	71
WB0DRL	KS	21	6	74
K0US	NE	20	7	51
W0OHU	MN	20	6	46
W0JRP	MO	19	8	63
KC0QR	NE	18	8	80
KC0OG	NE	18	6	56
K0IFL	MO	18	6	54
N0LL	KS	17	6	68
WA0TKJ	KS	15	5	50
K0RZ*	CO	11	7	51
N0BTN	NE	6	3	19
KH6HME		2	2	6
VE3LNX		23	10	67
VE4MA*†		48	48	—
SM0PYP*		32	—	—
G3SEK*		29	46	190

some strong arguments for a DX window, and states his conviction that it should stretch from 50.100 to 50.150 with the calling frequency set at 50.150. He suggests that anyone not believing that we need a full-time DX window should go on a DXpedition and see how the other half lives. Incidentally, he names some very prominent 6-meter operators who he repeatedly heard violating the window. The other jaunt was W6JKV's weekend sojourn to Yellowknife in Canada's Northwest Territory. Jim contacted a total of 130 stations including 16 W1s, 14 W2s, 8 W3s, 19 W7s, 17 W8s, 17 W9s, 19 W0s, 7 VE1s, 8 VE3s, 1 VE4, 2 VE5s, 4 VE6s and 4 KL7s.

2 Meters—Despite the slow start mentioned in the preceding section, 2-meter E skip perked up considerably after mid-June. Apparently, the gods of E skip felt kindly toward fathers, because they and even those who aren't fathers were presented with some fine propagation on Father's Day, June 18. W4FSO, FM14 said he found very strong signals on 6 meters and flipped over to 2 at 1455Z. Right away he heard W8CM/5 DM91 at S9 plus 30 dB. In the next hour, he worked 28 stations in EL09, EL29, EM00, EM10, EM12, EM13, EM22, EM32, DM90 and DM91. Another reporting an extension of the same opening is WD4AFY, Savannah, Georgia. Andy says he worked W5FF DM64, New Mexico, at 1716Z for a new state and new grid. W5FYZ, Minden, Louisiana, experienced the opening from the other end. Ernie notes it was preceded by tropo. He says that the previous evening he worked stations in EM19, EM26, EM46, EM66, EM75 and EM84. The following morning, W5FYZ found the band wide open to the east as early as 6:15 AM CDT. A total of 18 stations in 11 4-land states. Grids included EM85, EM76, EM63, EM84, EM67, EM74, EM75, EM86, EM55, EM64, EM93, FM14 and EM16. Many others, in this part of the country, noted that the 18th produced a mixture of tropo and E skip. Some said that sometimes it was hard to tell which mode was propagating the signals. Even if W3XO/5 wasn't home, W5OZI was busy handing out EM00. Pat reports contacts with K4JQU FM06, W4FSO FM14, KA4NAV grid unknown, KB4QR EM95, WA4VCC and KB4ESE EM94 between 1511-1550Z.

This conductor did manage to catch a couple of 2-meter E skip openings. During the evening of June 26 local, about 0300Z June 27, a number of locals, including W3XO/5, worked W7ID, Boise, Idaho. Altogether four Boise stations were on that night, and W5OZI got all of them. The next evening, about the same time, the same group was in again. This time, I managed a contact with WA7GSK. July 8 was the really big day for me. With 6 meters displaying some very strong signals, I kept checking 144.2. Finally, about 1710Z, I began to hear signals. Stations to the southeast in San Antonio were already working them. At 1714Z, I hooked up with WB6FCS DM14, then, one minute later, N6NJI, also DM14. This was followed quickly by WB7ETR and AA7A DM43, K6PVS and N6LCI DM14, WB6ESQ DM03, WB6CMG DM14, N6CA DM03 and finally K6CH DM13 at 1751Z. This was pretty exciting for an ex-Marylander who had never heard a 6 on 2 meters before—without taking a plane across the country.

The Higher Bands—While the rest of us worry about when the solar cycle will peak and how high, or how good the Perseids meteor shower will be this year, EME enthusiasts go right on working new stations and countries. Although 2 meters has a greater number of countries active, 70 cm has its share also. According to the *432 and Up EME Newsletter* put out by K2UYH, there have been a lot of recent DXpeditions. One such operation, by DF6NA, was responsible for putting both the Irish Free State and Northern Ireland on 70-cm moonbounce during the weekends of May 6-7 and May 13-14. The call used for the first weekend was EI4VFG, GI0/DF6NA serving in the second instance. Four 27-element DL6WU Yagis, a 700-W rig and a hot DL9KR preamp provided about a dozen QSOs from each location. FO4NK in Tahiti was activated by F6ETI who made at least one EME contact during a visit to the island this spring. Since the equipment is owned by FO4NK, it is reasonable to expect that this initial success will lead to regular operation from this rare spot.

K1FO submits a note to the same publication which will be appreciated by the 6-meter people. Steve reported that on May 12 he measured 45 dB of sun noise and couldn't find any cold sky to use as a reference. The same issue notes that WB5LUA is getting things together for 3-cm EME. Al is receiving about 13 dB of sun noise on the band and hopes to have 30 W available before this appears in print.

W2PGC says now that he is retired, he is spending more time with radio projects. Sam has refurbished all of his antennas, including the erection of an array of 12 22-element K1FO-style Yagis for 70 cm and four 45-element W1JR-type loop Yagis for 13 cm. A 7213 amp for 70 cm, along with the 12, 22-element beams should give W2PGC a good EME signal.

WA6EXV sends along a very interesting account of some mountaintopping that he, W6HCC, W6YLI and their families did during the weekend of May 20-21. Chuck's equipment consisted of a 3-cm narrowband rig, a 40-W TWT and a 4-foot dish. Their first attempt was a 190-mile unobstructed path between WA6EXV at 8537 feet on Butler Peak and W6HCC camped at 8000 feet at a spot in the Haulipia Mountains in Arizona. They worked right away, although signals were poorer than expected. The next day, WA6EXV moved to Heaps Peak and worked W6HCC again over an obstructed 195-mile path. Signals were good enough so that W6HCC was able to copy CW from WA6EXV's 160-mW exciter without benefit of the TWT. The next try was from Blue Ridge, a 224-mile path to W6HCC's QTH. Over this path, they had to settle for crossband 3 cm to 2 meters, with Chuck unable to adequately copy W6HCC's lower power 3-cm signal. A similar fate awaited them in their final attempt over a 245-mile path. For this, WA6EXV went to Bird Springs in the Sierra Nevada Mountains near Ridgecrest, California. Although signals were best just after sunrise when the wind died down, it still wasn't enough for a two-way. A good correlation between 3-cm and 2-meter signals was observed, which had been the case during earlier DXpeditions. No matter what the results, it sounds as if they and their families had a fun weekend of camping and microwave hamming.

It seems these fellows are inveterate travelers and campers. Only about a month after all of this activity, on June 23, W6HCC journeyed to DM37 in Utah. From there, he was able to work WA6EXV at Blue Ridge, a distance of 287 miles on 3-cm SSB. That makes four states that these two have worked each other from on 3-cm—California, Nevada, Arizona and Utah.

Conducted By Bob Atkins, KA1GT
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New 10-GHz EME Distance Record

On May 30, 1989, at 1215 UTC, Jim Vogler, WA7CJO (Arizona—grid locator DM33XL), and Al Ward, WB5LUA (Texas—EM13QC), made contact via 10-GHz EME for a new (and probably soon-to-be-broken) band/mode record of 888.5 miles. WA7CJO was running 80 W from a TWT (traveling-wave-tube) amplifier to a 16-foot dish, and WB5LUA used a 9.5-foot dish and a 28-W TWT.

The system noise figure of WB5LUA's home-brew station was 2.25 dB. Using this system on May 29, Al measured 12 dB of sun noise, and cold-sky noise about 5 dB less than that of a 50-ohm resistor. The same night, Al heard WA7CJO's EME signals at "O" copy (easily readable), but the elevation of the moon became too low before the QSO was complete.

The next night, they tried again—but, initially, no signals were heard. Al then realigned his dish to point about 1 degree above the moon. Success! Al heard WA7CJO's signals at "O" copy. Al notes that there was strong evidence of tropospheric bending of UHF TV signals that night, and he wonders if the EME signals were also being refracted. At 1205 UTC, WA7CJO received signals at "M" copy (readable, but not solid copy) which improved to "O" copy by 1210. By that time, the signals were peaking with Al's dish pointing directly at the moon (moon elevation: 50°).

Thanks to Al Ward, WB5LUA, for sending along this information. In his letter, Al raises an interesting question: Who will be the first to get WAS on 10 GHz? Any takers?

SIMPLE S-BAND CAVITY FILTER

The filter shown in Fig 1 is designed for use in the 2- to 2.6-GHz range, but will tune down to around 1.5 GHz. I have used this filter to: (1) suppress the 2160-MHz LO component in the output of a 2304-MHz transmit mixer; (2) reduce the image frequency response (2016 MHz) of a 2304-MHz receiver; and (3) to clean up a 2556-MHz LO chain output before a ×4 multiplier to 10.224 GHz (the LO for a 10-GHz transceiver).

With tight coupling (connectors close to the center conductor), the loss at the tuned frequency is less than 0.5 dB, and the rejection 150 MHz from the tuned frequency is about 15 dB. With loose coupling, the insertion loss is higher (as much as 3 dB), but the rejection 150 MHz off frequency increases to around 30 dB. Whether low loss or high rejection is important depends on the application; a nice feature of this filter is that coupling is adjustable by simply screwing the connectors in and out. This filter should be capable of handling high power, so it should be usable for cleaning up the output of a power amplifier.

The best material for construction of this filter is copper. Brass is also acceptable, although it yields a slight performance reduction. Thick-walled tubing can be used for the cavity or, alternatively, a 7/8-inch hole can be drilled in suitable bar stock. Soldering should be done on the outside of the cavity wherever possible, because solder inside the cavity lowers the cavity's Q. Aluminum could also be used for the cavity, but in this case (because soldering is impractical) the filter must be assembled using mechanical fasteners, risking poor electrical contact.

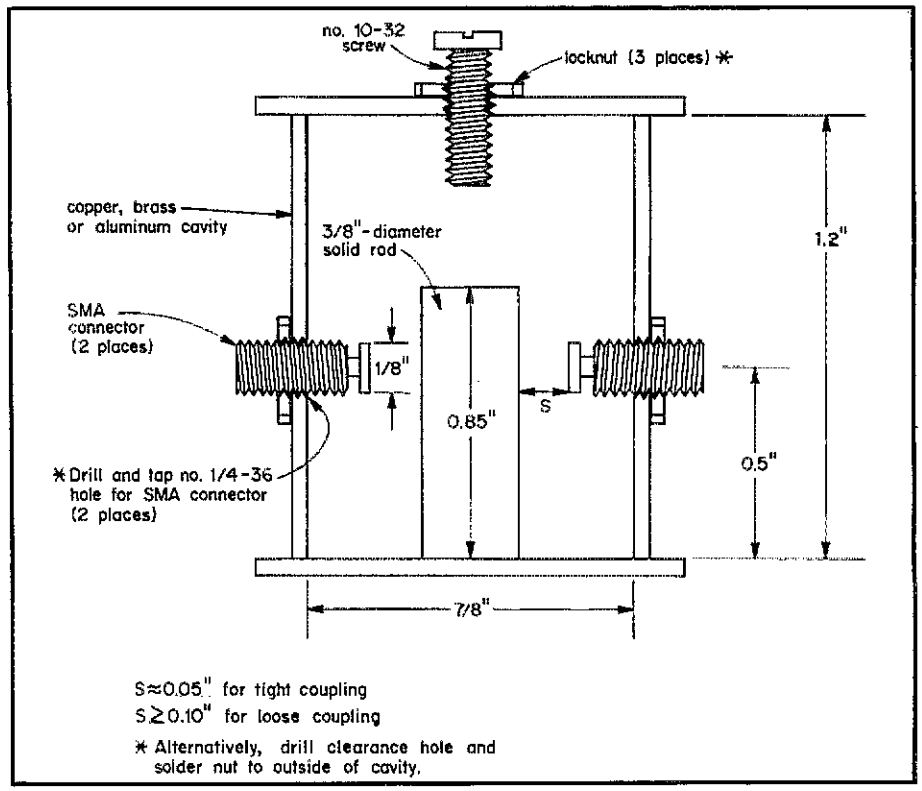

Fig 1—This 2- to 2.6-GHz band-pass cavity filter has several practical applications. The construction material of choice is copper, but brass or aluminum are also usable. See text for details.

From electrical and mechanical standpoints, SMA connectors are preferred, but BNC (or better still, TNC) connectors could also be used. The tuning screw (Fig 1—top) should have a fine pitch to make tuning easier, and its end should be filed flat and smooth. Better still would be a DRO (dielectric-resonance oscillator) tuning piston or cavity-tuning assembly, such as those available from a number of commercial microwave-tuning-component companies. The inside of the filter should be polished to a smooth, mirror-like finish for maximum Q. Silver plating is a good idea if brass is used, but probably would make little difference in the performance of a copper cavity.

FM/RPT

Conducted By Stan Horzepa, WA1LOU
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CompuServe ID no. 70645,247

Simply Say Simplex

Many hams, myself included, were around before the days of Amateur Radio repeaters. At that time, local mobile operation was confined mostly to 75 meters. Higher frequency operation on 10 and 2 meters was not very successful for local contacts due to the limited range provided by ground wave between mobile stations running relatively low power into low-gain, omnidirectional antennas. Repeaters came on the scene to provide increased operational range between local mobile stations. With antennas located at high elevations, it did not take much power to hit the repeater, and hearing a high-powered, high-elevated repeater was easy.

When I first used repeaters, I rarely heard a base station using a repeater. When they did, they would call a mobile station or another base station. Base station operators rarely occupied the repeater for more than a minute or two because they knew that the primary purpose of the repeater was to aid mobile-to-mobile communications. Additionally, base-station operation usually involved higher power and higher-gain antennas, so simplex operation was a viable alternative to repeater operation. Often I heard a base station tell a mobile station or another base station, ". . . .meet you on simplex on xxx frequency" and the other station would answer, "Roger, QSY to xxx, W6AAA this is W6BBB QSY."

QSY to Five-Two: A Rarity

Today, one rarely hears reference to simplex operation or "Let's QSY to xxx" where xxx is a simplex frequency. There is, of course, lots of activity on simplex, but many people forget to consider checking to see if they can hear the other station direct on the repeater's input frequency and suggesting "Let's QSY to xxx because I can hear you on the repeater input."

Some of our repeaters have very good coverage, so there are many occasions when you are in contact with another station that is simply too far out of simplex range. However, on other occasions, simplex operation is quite feasible. Try listening on the repeater input frequency when it occurs to you (many of our latest whiz-bang radios permit us to eavesdrop on the input frequency at the push of a button), and if you can hear the other station clearly, suggest going to a simplex frequency to free up the repeater for other (read: mobile) users.

According to the ARRL band plans, simplex operation on 2 meters is suggested in the 146.415 to 146.595 MHz and 147.42 to 147.585 MHz subbands on 15-kHz-spaced channels (146.415, 146.43, 146.445, 146.45, etc). In some areas, 146.40 to 146.60 MHz and 147.40 to 147.60 MHz are used for repeater inputs and outputs with a 1-MHz split. For example, 147.415 MHz as an input frequency and 146.415 MHz as an output frequency. Avoid those frequencies for simplex operation if repeaters are active there.

Besides the recommended simplex frequencies, there are other frequencies you may try, but you must be ready to move if you find other activity on those frequencies (for example, weak-signal, packet radio, etc).

Try using simplex when possible. Simplex is fun and it allows others to use the repeater as well.—*Jeff Towle, WA4EGT, from* The Propagator, *the newsletter of the South Orange Amateur Radio Association (SOARA) of California. SOARA operates the WA4EGT/R repeaters on 2 meters and 220 MHz from atop Temple Hills in the city of Laguna Beach, California. The 2-meter repeater on 147.045 MHz input/147.645 MHz output is open to all licensed amateurs (PL 110.9 Hz is used to help reduce noise). The 220-MHz autopatch repeater on 223.04 MHz input/224.64 MHz output is also open (PL 79.7 is used at all times).*

New Products

AEA MM-3 MORSE MACHINE KEYER

☐ After a few years of inactivity in the keyer-manufacturing business, Advanced Electronic Applications has introduced the MM-3 Morse Machine. Features include keypad- and potentiometer-adjustable speed; 8000-character storage (expandable to 36,500 characters) in 20 memories; random-group practice at steadily increasing speed; random four-letter-word generator; Dr. QSO™ simulator; automatic serial-number incrementing; serial-number embedding capability (in memories); and RS-232-C serial interface (allows keyer-function programming and monitoring, including memory loading and display of CW practice sessions, via computer).

The MM-3 is available through AEA-authorized dealers. Price class: $190. Manufacturer: AEA, Inc, PO Box C-2160, Lynwood, WA 98036, tel 206-775-7373. —*Rus Healy, NJ2L*

CUSHCRAFT ANTENNAS

☐ Cushcraft recently introduced four new antennas, as follows:

- R5 multiband vertical, successor to the R4, with full coverage of 20, 17, 15, 12 and 10 meters (height: 17 ft; SWR 1.2:1, typ; 1.8-kW-PEP power rating; 1.5-ft² wind load; 9 lb). The Model R45K conversion kit is also available. It allows conversion of an R4 to an R5. Price class: R5, $270; R45K, $45.
- TEN-3 three-element ten-meter beam (8-foot boom, 25 dB F/B ratio, 2-kW PEP power rating, 2-ft² wind load, 10 lb). Price class: $100.
- D3W triband rotatable dipole, with coverage of the 10, 18 and 24-MHz ham bands (less than 2:1 SWR across each band; 2-kW power rating; 0.9-ft² wind load; 11 lb). Price class: $160.
- CS-28M magnetic-mount, 10-meter mobile antenna with 49-inch whip, chrome-plated steel spring and 15 feet of RG-58 coaxial cable. Price class: $50.

For more information, contact Cushcraft, PO Box 4680, 48 Perimeter Rd, Manchester, NH 03108, tel 603-627-7877.—*Rus Healy, NJ2L*

IARU News

Conducted By Richard L. Baldwin, W1RU
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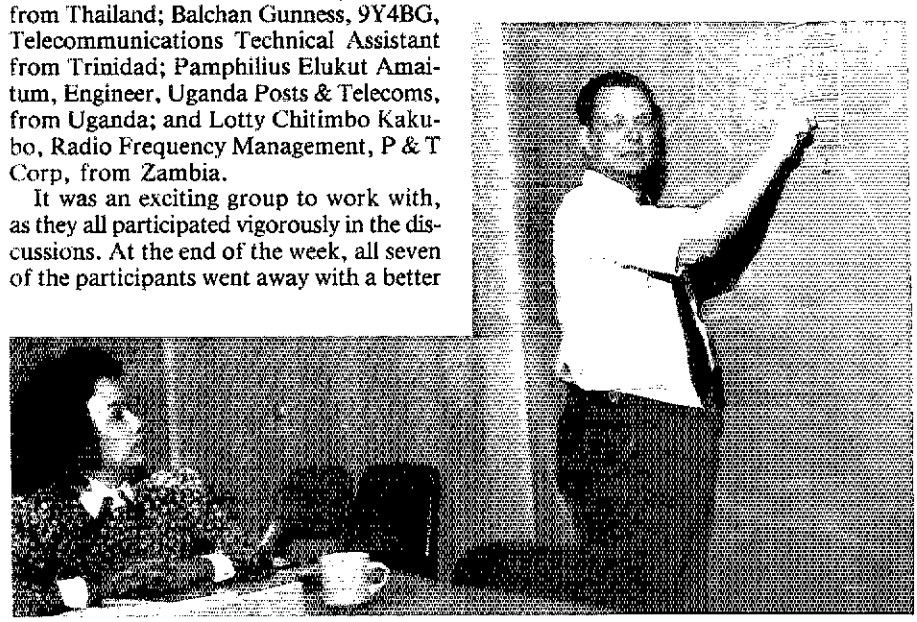
USTTI Sponsors Amateur Radio Administration Course

The United States Telecommunications Training Institute, which receives financial support from the private sector and in-kind support from several US Government agencies, sponsors a multitude of telecommunications operations and management courses. Since 1983, when it began sponsoring tuition-free courses for telecommunications and broadcast professionals from the developing world, USTTI has graduated over 1400 participants from 108 nations. One of those courses is Amateur Radio Administration. In this course, we examine the International Radio Regulations in detail, insofar as they apply to the Amateur Service and the Amateur-Satellite Service. We also explore ways in which domestic regulations can be written, not only to encourage the growth of Amateur Radio, but also to protect the interests of the administrations. Along the way, we point out what a valuable service the Amateur Service is, and why it is beneficial for a country to encourage the growth of Amateur Radio.

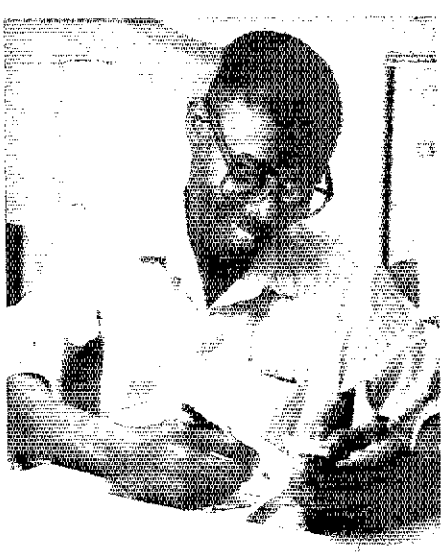
The course in Amateur Radio Administration was presented at ARRL HQ in Newington in June. W1RU acted as the principal (and principle!) instructor, with invaluable assistance from W4RI, K8CH, KE3Z, KA1CV, K1ZZ and N1CIX.

Participants included Vincent N. Cumberbatch, 8P6AG, Telecommunications Assistant from Barbados; Mourad Ben Mehdi Chafiq, Chief, Maritime/Radio Amateur, from Morocco; Col Edgar Usher, ZP5EU, President, Radio Club Paraguayo; Mrs Auraphan Suwanratna, HS1BJ, Director of Public Relations, P & T Department, from Thailand; Balchan Gunness, 9Y4BG, Telecommunications Technical Assistant from Trinidad; Pamphilius Elukut Amaitum, Engineer, Uganda Posts & Telecoms, from Uganda; and Lotty Chitimbo Kakubo, Radio Frequency Management, P & T Corp, from Zambia.

It was an exciting group to work with, as they all participated vigorously in the discussions. At the end of the week, all seven of the participants went away with a better concept of administering the Amateur Service and thus, hopefully, will be in a position to make informed decisions which are favorable to the Amateur Service and the Amateur-Satellite Service. QST



W4RI illustrates a point about Microsat, while HS1BJ looks on. *(photos KC1MP)*



The participants got some hands-on time in the ARRL Laboratory. Here, 8P6AG puts together a code-practice oscillator.

W1RU at the blackboard, with ZP5EU in the center and 9Y4BG ready to ask a question. Incidentally, the course is not designed for radio amateurs, but for administrators of the Amateur Service. It was strictly a coincidence that four of the seven participants were licensed radio amateurs.

Conducted By Joan Gibson, KG1F
RR 1, Box 1465, Waterbury, VT 05676

Scrapbook of Amateur Radio's YLs

Remember the YLs heard from Niue's first all YL DXpedition February 20-26, 1988? Mary Lou Brown, NM7N/ZK2MB (l), takes a dinner break with exotic island snacks. She recently led a YL expedition to Wallis and Fiji. Jan Scheuerman, WB2JCE/ZK2JS (r), handles the pileups and makes a lot of YL-hunting amateurs very happy.

Aekaterini Panagea, SV1VH, is Greece's pride. Kate is an accomplished gymnast, as well as an experienced radio amateur. *(photo courtesy SV1VH)*

Alenka Celik, YT3YL, and Boris Celik, YU3AN, are united in holy matrimony, as well as Amateur Radio.

These YLs were in attendance at a party held in honor of Kari Young, VR6KY. (Front l-r) Keiko Morales, N9EUN; Betty Reich, WD9GQV; Jo Henderson, KA9W. (Rear l-r) VR6KY and Suzanne Miller, KA9UCK. *(photo courtesy K9POX)*

This is my last YL News and Views column. Being contributing editor during the past four years has been a privilege, as well as a memorable and rewarding experience. My thanks to the many amateurs whose interest in the column prompted them to send story ideas and pictures. Often this unsolicited material became the seed for feature stories, and in turn, made my search for story ideas less difficult. New friends were made, old acquaintances renewed. By searching for and writing about the world's YLs, I discovered a new dimension in the contributions YLs make to Amateur Radio. I am proud to be a member of the YL radio community.

If life, as a friend once suggested to me, is ever new and changing relationships, then Amateur Radio is a fascinating slice of life! I am awed by our hobby's vastness and its membership's sense of camaraderie and human kindness. 33 and 88 de KG1F.

Coming Conventions

VIRGINIA STATE CONVENTION

September 16-17, 1989, Virginia Beach

The Virginia State Convention will be sponsored by the Tidewater Radio Conventions Inc. It will be held at the Virginia Beach Pavilion. Doors will be open Saturday 9 AM-5 PM and Sunday 9 AM-4 PM. Admission in advance will be $5, at the door $6 (good for both days). Features will include ARRL and DX forums of all types, major commercial exhibitors for both amateur radio and computers, VE exams on Sunday, indoor flea market, plenty of free parking, ladies' and children's programs. Talk-in will be on 146.37/97. For more information contact Manny Steiner, K4DOR, 3512 Olympia Ln, Virginia Beach, VA 23452, tel 804-340-6105.

KANSAS STATE CONVENTION

September 30-October 1, 1989, Wichita

The Kansas State Convention will be sponsored by the Wichita Amateur Radio Club. It will be held at the Red Coach Inn, 915 E 53rd, North Wichita, KS (I-135 and 53rd North). Doors will be open 9 AM both days. Admission will be $5 in advance and $6 at the door (package price $20, includes registration banquet and breakfast). Features will include flea market, dealers, VE exams, forums, banquet Saturday night, breakfast Sunday morning. Talk-in will be on 146.22/82, 146.34/94. For more information contact Vern Heinsohn, WAØZWW, 950 Backbay Blvd, Wichita, KS 67203.

1989
September 30-October 1
Kentucky Section, Louisville

October 7-8
Mississippi, State, Biloxi

ARRL NATIONAL CONVENTIONS
June 8-10, 1990
Kansas City, Missouri

August 23-25 1991
Saginaw, Michigan

PACIFIC DIVISION CONVENTION

October 6-8, 1989, San Jose, California

The Pacific Division Convention will be sponsored by the Santa Clara County ARA. It will be held at the Lebaron Hotel, 1350 N. First St. Doors will be open Friday from 6 PM-10 PM, Saturday 9 AM-5 PM, Sunday 9 AM-1 PM. Admission will be in advance $12 and $15 at the door. Features will include tech sessions, exhibits, ARRL forum. Talk-in will be on 146.385/985, 442.425/447.425. For more information contact, "Pacificon '89," 481 Fenley Ave, San Jose, CA 95117, tel 408-243-8349.

Attention Hamfest and Convention Sponsors

ARRL HQ maintains a date register of scheduled events that may assist you in picking a suitable date for your event. You are encouraged to register your event with HQ as far in advance as your planning permits. Note that the hamfest and convention approval procedures for ARRL sanction are separate and distinct from the date register: Registering dates with ARRL HQ does not constitute League sanction, nor does it guarantee there will not be a conflict with another established event in the same area.

We at ARRL HQ are not able to approve dates for sanctioned hamfests and conventions. For hamfests, this must be done by your Division Director. For conventions, approval must be made by your Director and, additionally, by the Executive Committee. Application forms can be obtained by writing to or calling the ARRL Convention Program Manager, tel 203-666-1541 ext. 283.

Note: Sponsors of large gatherings should check with League HQ for an advisory on possible date conflicts before contracting for meeting space. Dates may be recorded at ARRL HQ for up to two years in advance. QST

Hamfest Calendar

Administered By Bernice Dunn, KA1KXQ
Convention Program Manager

Attention: The deadline for receipt of items for this column is the 5th of the second month preceding publication date. Hamfest information is accurate as of our deadline; contact sponsor for possible late changes. For those who send in items for Hamfest Calendar and Coming Conventions: Postal regulations prohibit mention in *QST* of prizes of any kind and games of chance such as bingo.

†**California (Oxnard)—September 23.** *Sponsor:* Ventura County ARC. *Time:* 8 AM-2 PM. *Place:* Oxnard Community Ctr. *Features:* refreshments, microwave ATV demos, ARRL video tapes. *Talk-in:* 146.28/88. *Admission:* free. *Contact:* Dick, WA6JOX, 805-485-4462.

California (Santa Rosa)—September 16. *Sponsor:* Sonoma County Radio Amateurs. *Time:* setup 7 AM, public 8 AM-2 PM. *Place:* Sonoma Co Fairgrounds, from US 101 in Santa Rosa, take Hwy 12 east ½ mile. *Features:* flea market, VE exams, radio clinic, exhibits, refreshments, auction at noon. *Talk-in:* 146.13/73. *Admission:* free. *Tables:* vendor spaces advance $5, door $7. *Contact:* Sonoma County Radio Amateurs, Box 116, Santa Rosa, CA 95402.

Colorado (Longmont)—September 24. *Sponsor:* Boulder ARC. *Time:* 8 AM-3 PM. *Place:* Boulder Co Fairgrounds in the exhibit building on Nelson and Hover Rds, near the Twin Peaks Mall. *Features:* ham gear, computers, seminars, VE exams, refreshments. *Admission:* $3. *Tables:* $10, check made out to Boulder ARC with SASE to contact person. *Contact:* Barbara McClune, NØBWS, 5338 Spotted Horse Trail, Boulder, CO 80301. (dealers welcome to make arrangements, tel Barbara at 303-530-1872).

†**Connecticut (Danbury)—September 17.** *Sponsor:* Candlewood ARA. *Time:* setup 8 AM, public 10 AM-4 PM. *Place:* Elks Lodge, 346 Main St, just off exit 5 off I-84. *Features:* flea market, refreshments, dealers. *Talk-in:* 147.72/12. *Admission:* $3. *Tables:* $8. *Contact:* Candlewood ARA, PO Box 143, Bethel, CT 06801 or George, KC2QF, 914-533-6653, after 7 PM, or Norm, N1ASU, 203-438-3875 after 6 PM.

†**Connecticut (Willimantic)—September 24.** *Sponsor:* Natchaug ARC. *Time:* dealers 8 AM, public 9 AM. *Place:* French Club, Club Rd, off Rte 66 (old Rte 6). *Features:* VE exams (9 AM sharp), refreshments, tailgating ($5 and up). *Talk-in:* 147.93/33. *Admission:* no advance, door $2. *Tables:* in advance $6, at door $8. *Contact:* Pat Rogowski, N1GBP, 90 Becker Cir, Windsor, CT 06095.

†**Georgia (Gainesville)—September 24.** *Sponsor:* Lanier ARC. *Time:* 9 AM-4 PM. *Place:* downtown Gainesville. *Features:* VE exams, refreshments. *Talk-in:* 146.07/67. *Admission:* $5. *Contact:* Eddie Keith, KK4IG, 3137 Lake Ranch Cir, Gainesville, GA 30506, tel 404-532-1479.

Illinois (Glen Ellyn)—September 9. *Sponsor:* Northern Illinois DX Assn. *Place:* Glen Ellyn Holiday Inn, 1250 Roosevelt Rd, (near Chicago). *Features:* DX program, evening banquet. *Contact:* Howard Huntington, K9KM, 65 South Burr Oak Dr, Lake Zurich, IL 60047, tel 312-438-3452.

†**Illinois (Grayslake)—September 23-24.** *Sponsor:* Chicago FM Club. *Place:* Lake County Illinois Fairgrounds, near Rtes 45 and 120. *Features:* manufacturers & distributors of radio and computer technologies, VE exams, camping and parking available, overnight security provided. *Talk-in:* 146.16/76. *Admission:* advance $4, door $5. *Tables:* indoor flea market tables and electricity available. *Contact:* Mike Brost, WA9FTS, PO Box 1532, Evanston, IL 60204.

†**Illinois (Joliet)—September 10.** *Sponsor:* Bolingbrook ARS. *Time:* 8 AM-3 PM. *Place:* Inwood Recreation Ctr, 3000 W Jefferson St. *Features:* forums, overnight parking (no hookups), refreshments, VE exams (walk-ins welcome, bring original license and photocopy, ID and photo ID, $4.75 test fee.) *Talk-in:* 147.93/33, 222.94/224.54, 146.22/82. *Admission:* advance $3, door $4. *Tables:* reserved dealer tables indoors $15, reserved flea market tables indoors $10 (any remaining indoor space will be on a first-come, first-served basis at $5 per table on the day of the hamfest.) *Contact:* Ed Weinstein, WD9AYR, 7511 Walnut Ave, Woodridge, IL 60517, tel 312-985-0527, general information tel BARS hotline 312-759-7005.

†**Illinois (Peoria)—September 16-17.** *Sponsor:* Peoria Area ARC. *Time:* Saturday 6 AM-6 PM, Sunday 6 AM-4 PM. *Place:* West Northmoor Rd, off 6300 Block, North University. *Features:* refreshments, full camping facilities on site. *Talk-in:* 146.16/76 (call W9UVI). *Admission:* advance $4 through August 31, door $5. *Contact:* Superfest '89, PO Box 3461, Peoria, IL 61614, tel 309-674-5656.

Illinois (Springfield)—September 24. *Sponsor:* Sangamon Valley RC. *Time:* 6 AM-2 PM. *Place:* Mather Land-O-Sports, 2 miles south of Springfield on Rte 4, just off Rte 36. *Features:* flea market, VE exams, refreshments, overnight camping (no hookups). *Talk-in:* 146.28/88, 222.18/223.78. *Admission:* $3 each, or 2/$5. *Tables:* indoor $2 (advance reservations accepted). *Contact:* Don Pitchford, WD9EBK, PO Box 8252, Springfield, IL 62791, tel 217-789-4519.

Indiana (Bedford)—October 8. *Sponsor:* Hoosier Hills Ham Club. *Time:* Saturday 10 AM for overnight camping and swap shop setup, Sunday hamfest begins at 6 AM. *Place:* Lawrence Co 4-H Fairgrounds, US Hwy 50, 4 miles southwest of Bedford, (½ mile west of the jct of US 50 and IN 37). *Features:* swap shop, refreshments, Saturday night social 6:30 PM. *Talk-in:* 146.73/13. *Admission:* $5. *Tables:* bring your own. *Contact:* Hoosier Hills Ham Club, PO Box 891, Bedford, IN 47421.

Indiana (Hammond)—October 1. *Sponsor:* Lake County ARC. *Time:* setup 6 AM, public 8 AM-2 PM. *Place:* Hammond National Guard Armory, 2530 173rd St. *Features:* VE exams (walk-ins welcome), refreshments, free parking, ARRL and ARES information available. *Talk-in:* 147.60/00, 146.52. *Admission:* $3.50. *Tables:* $5 each (limited amount). *Contact:* Ken Brown, WD9HYF, 918 Chippewa, Crown Point, IN 46307, tel 219-663-5035.

Indiana (Huntington)—October 8. *Sponsor:* Huntington County ARS. *Time:* 8 AM-3 PM. *Place:* Police Athletic League Club, 2099 Riverside Dr. *Features:* free parking, indoor flea market, refreshments, handicapped accessible. *Talk-in:* 146.085/685, 146.52, 443.975/448.975. *Admission:* advance $3.50, door $4. *Tables:* reserved 8-ft tables are $5 in advance. *Contact:* Jim Covey, KC9GX, 1752 Kocher, Huntington, IN 46750, tel 219-356-3269.

†ARRL Hamfest

†**Maryland (Gaithersburg)—September 10.** *Sponsor*: Foundation for Amateur Radio. *Time*: 6:30 AM-3:30 PM. *Place*: Montgomery Co Agriculture Ctr, Fairgrounds. *Admission*: $5. *Contact*: Gaithersburg Foundation for Amateur Radio, PO Box 1068, Laurel, MD 20707, tel 301-776-3571 or 301-725-5137.

†**Massachusetts (Cambridge)—September 24.** *Sponsor*: MIT Electronics Research Society and the MIT Radio Society. *Time*: setup 7 AM, public 9 AM-4 PM. *Place*: Albany and Main St. *Features*: flea market, free offstreet parking, tailgate electronics. *Talk-in*: 146.52, 449.725/444.725, PL 2A W1XM/R. *Admission*: $1.50. *Tables*: sellers space in advance $5, at the gate $6. *Contact*: Richard Brezina, 3 Ames St, Cambridge, MA 02139, tel 617-253-3776 (mail in advance reservations before September 10).

†**Massachusetts (South Dartmouth)—September 10.** *Sponsor*: Southeastern Massachusetts ARA. *Time*: 9 AM. *Place*: Rte 195 to 140 South, at the end of 140 turn left onto Rte 6, ½ mile turn right on Rockdale South and follow signs. *Features*: tailgate sale, working HF, VHF and packet stations, refreshments. *Talk-in*: 147.600/00, 144.89/145.49. *Admission*: advance free, dealers $5; door free, dealers $8. *Contact*: Southeastern Massachusetts ARA Hamfest, PO Box P-105, South Dartmouth, MA 02748.

Michigan (Adrian)—September 24. *Sponsor*: Adrian ARC. *Time*: 8 AM-3 PM. *Place*: Lenawee Fairgrounds. *Features*: trunk sales. *Talk-in*: 144.77/145.37, 444.675/449.675. *Admission*: advance $3, door $4. *Tables*: $6. *Contact*: Adrian ARC, PO Box 26, Adrian, MI 49221.

Michigan (Grand Rapids)—September 16. *Sponsor*: Grand Rapids ARA. *Time*: 8 AM. *Place*: West Catholic High School, from US 131 just north of I-196, exit at Leonard St, go west to Bristol, turn north, the school is located near the corner of Richmond, *Features*: electronic flea market, VE exams, walk-in basis only. *Talk-in*: 147.26/86, 223.04/224.64. *Admission*: $3, sellers $2 additional. *Contact*: Don Hazelswart, KA8BCI, 616-363-0649, or write PO Box 1248, Grand Rapids, MI 49501.

Michigan (Lansing)—October 8. *Sponsor*: Central Michigan ARC and Lansing CD Repeater Assn. *Time*: setup 6 AM, public 8 AM-3 PM. *Place*: Lansing Civic Arena, 2 blocks SW of Capitol Bldg. *Features*: refreshments. *Talk-in*: 146.34/94. *Admission*: $3.50. *Tables*: $1.50/foot. *Contact*: Rowena Elrod, KA8OBS, 111 Lancelot Place, Lansing, MI 48906, tel 517-482-9650.

†**Michigan (Mt Clemens)—September 17.** *Sponsor*: L'Anse Creuse ARC. *Time*: vendors 6 AM, public 8 AM-2 PM. *Place*: L'Anse Creuse High School on Reimold St, NE of the I-94 and Metro Parkway (16 miles) intersection. *Features*: trunk sales, VE exams, refreshments, inside tables. *Talk-in*: 147.68/08, 146.52. *Admission*: advance $2, door $3. *Contact*: Ralph Wilcox, KA8YOJ, 39610 Chart, Mt Clemens, MI 48045-2154.

†**Missouri (Marshall)—September 17.** *Sponsor*: Indian Foothills ARC. *Time*: 8 AM. *Place*: Marshall Senior Citizens Building, one block south of the Marshall Square. *Features*: refreshments, VE exams, free parking. *Talk-in*: 147.765/165. *Admission*: advance $2 each, 4 for $5, door $2 each, 3 for $5. *Contact:* Gordon Gordon Buckner, WØVZK, Box 721, Marshall, MO 65340, tel (D) 816-886-2223, (N) 816-886-3408.

†**Missouri (O'Fallon)—October 1.** *Sponsor*: St Peters ARC. *Time*: 7 AM-3:30 PM. *Place*: Civic Center Park, take I-70 to exit 217, north on Main to Civic Dr, (just across N&W RR tracks) left ½ mile. *Features*: refreshments. *Talk-in*: 144.81/145.41. *Admission*: $1. *Contact*: Walt Franzer, 314-278-1993 (no reservations, first come, first served).

New Hampshire (Davisville)—September 17. *Sponsor*: Contoocook Valley RC. *Time*: setup 7 AM, public 8 AM-3 PM. *Place*: take I-93 to Concord, take I-89 to exit 7, go east on Rte 103 for ½ mile, hamfest will be on the left. *Features*: flea market, refreshments *Talk-in*: 146.295/895, 146.34/94, 146.52. *Admission*: $1 buyers, $7 sellers. *Contact*: Warren Stiles, WA1RLO, RFD 7, Box 353F Deer Meadow Rd, Webster, NH 03303, tel 603-648-2604, packet BBS @ WB1DSW-1.

†**New Jersey (Pennsauken)—September 17.** *Sponsor*: South Jersey Radio Assn. *Time*: 8 AM-3 PM. *Place*: Pennsauken High School Parking Lot. *Features*: swap shop, refreshments, eyeball QSOs, free parking, tailgating ($5 per space, tailgaters must purchase an admission ticket), VE exams (all classes register at 9:30 AM). *Talk-in*: 144.69/145.29. *Admission*: advance $3.50, door $4. *Contact*: Ed Ramming, AB2Y, 4500 Westfield Ave, Pennsauken, NJ 08110, tel 609-663-5539.

New Mexico (Santa Fe)—September 30. *Sponsor*: Northern New Mexico ARC. *Time*: 9 AM-6 PM. *Place*: US Army Reserve Ctr, 2501 Cerrillos Rd. *Features*: tailgating, flea market, new equipment vendors, forums, VE exams. *Talk-in*: 146.22/82. *Admission*: $5, children under 12 $3. *Contact*: send SASE to Tom Hardek, K9IK1/5, PO Box 233, Los Alamos, NM 87544.

New York (Horseheads)—September 30. *Sponsor*: Elmira ARA. *Time*: 6 AM-5 PM. *Place*: Chemung Co Fairgrounds. *Features*: flea market, dealer displays of new equipment, refreshments, free parking, QSL Contest, camping, VE exams. *Talk-in*: 147.96/36. *Admission*: advance $3, door $4, 10 and under free. *Contact*: Dave Lewis, RD #1, Box 191, Van Etten, NY 14889.

†**New York (Old Westbury)—September 17.** *Sponsor*: Long Island Mobile ARC. *Time*: 9 AM-4 PM. *Place*: New York Institute of Technology. *Features*: refreshments, VHF tune-up clinic. *Talk-in*: 146.25/85. *Admission*: no advance, door $3, exhibitors $5. *Contact*: Neil Hartman, WE2V, 516-462-5549 or Mark Nadel, NK2T, 516-796-2366.

†**New York (Yonkers)—October 1.** *Sponsor*: Yonkers ARC. *Time*: 9 AM-3 PM. *Place*: Yonkers Municipal Parking Garage, at the corner of Nepperhan Ave and New Main St. *Features*: refreshments, flea market, new and used equipment, auction at 1 PM. *Talk-in*: 146.265/865. *Admission*: no advance, door $4, children under 12 free. *Tables*: vendors $8 per parking space, bring your own tables. *Contact*: John Costa, WB2AUL, 914-963-1021.

†**North Carolina (Benson)—October 1.** *Sponsor*: Johnston ARS. *Time*: 8 AM-4 PM. *Place*: Rte 301 north 4 blocks north of Rte 50. *Features*: refreshments. *Talk-in*: 147.27/87. *Admission*: advance $4, door $5. *Contact*: David Belcher, KE4EM, 1205 S Crescent Dr, Smithfield, NC 27577, tel 919-934-0486.

†**North Carolina (Maysville)—October 8.** *Sponsor*: Maysville Hamfest Inc. *Time*: 9 AM-3 PM. *Features*: refreshments, QCWA Meeting, VE exams. *Talk-in*: 146.16/76. *Admission*: free. *Contact*: JoAnn Taylor, WD4JYR, 220 Anita Forte Dr, Swansboro, NC 28584, tel 919-393-2120.

†**North Carolina (Spruce Pine)—September 23.** *Sponsor*: Mayland ARC. *Time*: 9 AM-5 PM. *Place*: 2 miles east of Spruce Pine on Hwy 19E. *Features*: refreshments, seminars, tailgating $2 per space, VE exams (walk-ins welcome), bring photocopy of current license, exams start at 10 AM. *Talk-in*: 147.975/375, 144.59/145.19. *Admission*: $4. *Contact*: David McCarty, KK4PW, Rte 2, Box 73A, Greenmountain, NC 28740, tel (D) 704-682-9270, (N) 704-675-5996.

Ohio (Bellefontaine)—September 23. *Sponsor*: Champaign-Logan ARC. *Place*: Logan County Fairgrounds. *Features*: free parking. *Talk-in*: directions on 147.60/00. *Admission*: advance $3, door $3.50. *Tables*: $4. *Contact*: Steven Kidder, N8ETD, Box 265, Russells Point, OH 43348, tel 513-843-6006.

†**Ohio (Berea)—September 23.** *Sponsor:* Cleveland Hamfest Assn. *Time*: 8 AM-4 PM. *Place*: one mile west of I-71 and Bagley Rd, Interchange, ½ mile south on Eastland Rd. *Features*: technical forums, refreshments, VE exams (walk-ins welcome). *Talk-in*: 146.52, 6 AM-12 PM. *Admission*: advance $3.50, door $4. *Contact*: Marion Hill, 216-238-1152.

†**Ohio (Canfield)—September 17.** *Sponsor*: 20/9 ARC. *Time*: setup 6:30 AM, public 9 AM-4 PM. *Place*: Mahoning Co Joint Vocational School, Palmyra Rd, Canfield, OH, (off 224, west of Canfield). *Features*: flea market, handicap and paved parking, inside dealer area ($1 per space). *Talk-in*: mobile check-in until 1 PM on 147.915/315 and 144.67/145.27. *Admission*: door $2. *Tables*: $6 per 8-ft table (tables and space guaranteed with reservation and fee in advance). *Contact*: Paul Resch, 216-793-8352 or Corney Farcas, 216-793-1353.

†**Ohio (Lima)—October 8.** *Sponsor*: Northwest Ohio ARC. *Time*: setup after 3 PM Saturday. *Place*: Allen Co Fairgrounds, Rte 309, E Lima, 1 mile east of I-75; exit 125 A and B. *Features*: camping (electricity for camping $7), all-night security provided, VE exams for all classes, free parking, handicap accessible. *Talk-in*: 146.07/67, 147.63/03, 444.925/449.925. *Admission*: advance $3.50, door $4. *Tables*: $8 full, $4 half (personal checks for tables should be in at least 2 weeks in advance or send money order or cashier's check, tables held until 9:00 day of fest unless prior arrangements made.) *Contact*: for exams; SASE with 610 and copy of your current license and check for $4.75 made to ARRL/VEC to W8TY, 1370 Stevek Rd, Lima, OH 45807 (cutoff date September 1), table reservations; WD8BND, PO Box 211, Lima, OH 45802, tel 419-647-6513.

Ohio (Ross/Venice)—September 17. *Sponsor:* Greater Cincinnati ARA. *Time*: flea market 7 AM, commercial exhibits 8 AM. *Place:* State Rte 128 to Stricker's Grove. *Features:* refreshments, Hurricane Air Show, ARRL Forum, hidden transmitter hunt. *Talk-in:* 146.07/67. *Admission*: advance $6, door $7. *Contact:* John Haungs, WA8STX, 10615 Thornview Dr, Cincinnati, OH 45241, tel 513-563-7373.

Ohio (Springfield)—October 1. *Sponsor*: Springfield Independent RA. *Time*: 8 AM-4 PM. *Place*: Clark Co Fairgrounds, take I-70 to exit 59, go ¼ mile north on Rte 41. *Features*: flea market, vendors, refreshments. *Talk-in*: 144.85/145.45, 222.66/224.26. *Admission*: advance $3, door $4. *Tables*: advance $7, door $8. *Contact*: Steve Klipfel, KA8QCS, 513-882-6521 or Springfield Independent RA, PO Box 523, Springfield, OH 45501.

†**Oregon (Milton-Freewater)—September 23-24.** *Sponsor*: Walla Walla Valley ARC. *Place:* Community Center Bldg. *Time*: 9 AM. *Features*: refreshments. *Talk-in*: 147.28. *Admission*: free. *Contact:* Jack F. Babbit, Sr, WA5ZAY, 1401 Pleasant, Walla Walla, WA 99362, tel 509-525-7003.

†**Pennsylvania (New Kensington)—September 17.** *Sponsor*: Skyview Radio Society. *Time*: 9 AM-3 PM. *Place*: Skyview Club Grounds, Turkey Ridge Rd. *Features*: flea market, free parking, tailgating, refreshments. *Talk-in*: 146.04/64, 443.450/448.450. *Contact*: John Thompson, WB3FYP, 1014 Cable Ave, Pittsburgh, PA 15238, tel 412-828-5966.

†**Pennsylvania (Warrington)—October 7-8.** *Sponsor*: Mount Airy VHF ARC. *Time*: 6 AM rain or shine. *Place*: Warrington Motor Lodge, Rte 611 on Saturday and the Bucks Co Drive-in Theatre Rte 611 on Sunday. *Features*: Mid-Atlantic VHF Conference on Saturday, the Hamarama will be on Sunday, flea market. *Admission*: advance registration for the Conference is only $5, or $6 at door includes admission to the flea market, admission to just the flea market is $4 per person, $7 per carload. *Tables*: bring your own, selling spaces are $6. *Contact*: Pat Cawthorne, WB3DNI, 215-672-5289.

†**Pennsylvania (York)—September 23-24.** *Sponsor*: Keystone, York, Pen Mar, Hilltop Radio Clubs. *Time*: setup 6 AM, public 8 AM-4 PM both days. *Place*: on Rte 74, in northwest part of York, 2 miles south of the Intersection of Rte 74 and US Rte 30. *Features*: refreshments, ladies' programs Sunday. *Talk-in*: 146.37/97, 147.93/33. *Admission*: no advance, door $4 or $6 for both days. *Contact*: York Hamfest, PO Box W, Dover, PA 17315, tel 717-843-1921 or 717-755-3830 from 5-10 PM only.

Quebec (Montreal)—September 9. *Sponsor*: Luc ARA. *Time*: setup 8 AM, public 9 AM-3 PM. *Place*: Richard's Church, 7070 Guelph Rd, Cote St, Luc. *Features*: flea market. *Talk-in*: 147.27/87. *Admission*: no advance, door $2. *Tables*: $10. *Contact*: Joe Ship, VE2JS, 5637 Melling Ave, Cote St, Luc, Quebec, H4W 2C1, tel 514-482-6500.

South Carolina (Rock Hill)—October 1. *Sponsor*: York County ARC. *Time*: 8 AM-4 PM. *Place*: Joslyn Park. *Features*: flea market, QLF CW Contest, refreshments. *Talk-in*: 146.43/147.03. *Contact:* York Co ARS, PO Box 4141 CRS, Rock Hill, SC 29731.

†**Texas (Wichita Falls)—September 16.** *Sponsor*: Wichita ARS. *Time*: setup Friday 3 PM-8 PM, Saturday public 7 AM-6 PM. *Place*: Wichita Falls Activity Ctr, 1001 Indiana. *Features*: ARRL forums, workshops, VE exams (bring original license, a copy, two forms of ID and $4.75), refreshments, free parking, handicapped facilities, QCWA, AMSAT, MARS and net meetings. *Talk-in*: 146.34/94, 147.74/14, 449.3/444.3. *Admission*: advance $6, door $7. *Tables*: reserved 8-ft tables $5 each. *Contact*: Wichita Falls ARS, PO Box 4363, Wichita Falls, TX 76308, tel 817-691-1978.

†**Vermont (Berlin)—September 24.** *Sponsor*: Central Vermont ARC. *Time*: 9 AM-3 PM. *Place*: National Guard Armory, exit 7 off I-89, left at third set of traffic lights. *Features*: flea market, VE exams 1 PM (walk-ins welcome), dealer displays, refreshments, handicap accessible, tailgating $4. *Talk-in*: 146.025/625. *Admission*: $2. *Tables*: advance $6, door $8. *Contact*: Todd Bigelow, KA1KAQ, PO Box 624, Williamstown, VT 05679, tel 802-433-5587.

†**West Virginia (Huntington)—October 7.** *Sponsor*: Tri-State ARA. *Time*: 9 AM-4 PM. *Features*: forums, ladies' activities, VE exams, flea market, parking, handicapped access. *Talk-in*: 146.16/76. *Admission*: $5. *Contact*: Jim Baker, K8KVX, 304-736-6542.

Silent Keys

Administered by Nancy A. Slipski

It is with deep regret that we record the passing of these amateurs:

W1DJ, Harry W. Wills, Hampton, NH
KA1DSR, Arthur J. Swenson, Hampton Falls, NH
W1GGV, Philip R. Grush, Beverly, MA
W1QA, Henry A. Barnicle, North Reading, MA
*K1ZIE, Frank E. Shaug, Walnut Creek, CA
WB2ACX, Frank Parisi, West Coxsackie, NY
WD2AKZ, Joseph B. Cohen, Boca Raton, FL
W2BLD, Reid G. Smythe, Brooklyn, NY
K2CSY, Frank Sabo, Bloomingdale, NJ
KA2CWP, Fred J. Haney, Niagara Falls, NY
W2DGI, Stanley Markhouse, Hawthorne, NJ
W2DJ, Norman P. White, Canisteo, NY
K2GT, William A. Schrader, Rockville Centre, NY
KA2HNQ, Nancy Guddemi, Wyckoff, NJ
W2LMI, Richard Weinberg, Elmira, NY
KC2LU, Richard M. Martell, Wappingers Falls, NY
WB2TDO, Rosario S. Angileri, Toms River, NJ
KA2UGS, Melvin L. Jones, Sr., New York, NY
KA2ZEH, Edwin H. McMahon, Kent, NY
N3CRD, Paul Herman, Williamstown, PA
W3DHM, Howard W. Green, Media, PA
W3KNE, Franklin W. Yarnall, Myerstown, PA
KT3O, Robert J. Montgomery, Broomall, PA
WA3QYS, Grant T. Custer, Palmyra, PA
W3RKJ, Gordon D. Goldstein, Silver Spring, MD
WA3SCC, John W. Thompson, Wyomissing, PA
NC4C, John Lantz, Jr, Falls Church, VA
K4DQP, Burdett R. Dunning, Kinston, NC
K4EON, W. F. Wilkerson, Farmville, VA
K4GPX, Frank E. Kamplain, Belleair Bluffs, FL
W4HTP, Edward C. Westenhaver, Quincy, IL
*W4MLC, George L. Miller, Springfield, VA
KA4NPJ, Arthur B. Hazel, Holiday, FL
W4NY, Robert B. Webb, Lakeland, FL
W4PXA, Charles D. Lawrence, Gloucester, VA
NY4T, Reggie D. Phillips, Humboldt, TN
WA4YCG, Christine E. Helms, Niceville, FL
W5CB, Ralph A. Rusca, New Orleans, LA
N5EWL, William G. Dudley, Houston, TX
WA5IBZ, Frank N. Shumard, Little Rock, AR
KA5NNN, Philip E. Buch, Las Cruces, NM
WA5ORP, L. D. Howell, Baytown, TX
W5QQP, Carey L. Fields, Amory, MS
WQ5T, R. M. Johnson, Arlington, TX
WA5UFT, C. B. Gray, Bastrop, LA
W5VCF, Charles Frederick, Pueblo, CO
W6BVS, Edward Ullman, Pacific Palisades, CA
N6DAZ, Hugo F. Kinner, Balboa Island, CA
WA6DFT, Forrest D. Rehders, Garden Grove, CA
W6ESZ, Joseph A. Palumbo, Sacramento, CA
WA6JAT, Samuel B. Gibson, Palos Verdes Pen, CA
N6KLQ, Robert L. Richman, Sunnyvale, CA
W6KOM, John C. Farquhar, San Diego, CA
W6NIU, Wiot L. Clarke, Chula Vista, CA
KB6NSH, Mercedes Barragan, Richmond, CA
W6OH, Virgil E. Barringer, Vista, CA
N6OVI, Richard H. Beasley, Avery, CA
W6RIU, Philip R. Bonner, Los Angeles, CA
K6RQT, Ronald Q. Terrey, Palos Verdes Peninsula, CA
K6SSG, John M. O'Shaughnessy, Whittier, CA
KB6VMW, George R. Serrano, Hayward, CA
W6YHE, Bob E. Cherney, Redwood City, CA
WL7AIC, Keith A. Fuller, Anchorage, AK
W7EZW, Roy A. Pruitt, Gresham, OR
W7LRX, Andrew Kalnasy, Sr, Las Vegas, NV
W7LWF, Edwin Laventhal, Chiloquin, OR
W7LYE, David E. Wright, Santa Maria, CA
W8AQC, Samuel G. Thomson, Royal Oak, MI
N8BH, Charles Deaton, Martins Ferry, OH
W8EEQ, F. Melvin Wentz, Bryan, OH
WB8FOY, Daniel E. Long, Huntington, WV
WA8GAV, Robert A. Brickel, Sr, Hicksville, OH
K8GIP, Owen H. Burgbacher, New Martinsville, WV
W8HSM, Robert A. Neff, Bradenton, FL
W8LZV, Kurt R. Schmeisser, Detroit, MI
W8MHO, William H. Martin, Berryville, VA
W8RNJ, Virgil A. Wilton, Huntington Woods, MI
WB8RTM, Charles E. White, Berrien Springs, MI
W8YIW, Harry W. Wyche, Wooster, OH
*W9AIF, Robert A. Hanson, Western Spgs, IL
KB9BJD, Aloys Biver, Chicago, IL
*W9BUQ, William C. Johnson, Indianapolis, IN
W9CIL, Harry L. Cole, La Crosse, WI
W9CWM, William M. McCullough, Wisconsin Dells, WI
K9EIP, Herbert E. Horne, Fox Lake, IL
W9EWX, Dallas E. Storm, Mattoon, IL
W9GNV, Earl A. Pinnick, Troy, MI
WB9KVM, Wayne M. Severns, Petersburg, IL
W9MMH, Arne Hansen, Normal, IL
K9PBE, Raymond E. Severson, La Crosse, WI
W9PBP, Leonard J. Skarbek, Lynwood, IL
W9VRK, Reynald E. Thompson, Crystal Lake, IL
KØTII, Otis A. Lindstrom, Funk, NE
KØAVW, Donald L. Murkins, Sioux City, IA
WØAZL, Garnett F. Bryan, Sedalia, MO
WØCXI, Fred M. Walls, Topeka, KS
WDØGCS, Paul L. Mayfield, Florissant, MO
WØHMG, Paul C. Arnold, Nuevo, CA
WØIEY, James A. Middleton, Sr, Odebolt, IA
*KØIUM, H. Paul Brower, Cedar Rapids, IA
KØJKW, Olin C. Stanfield, Papillion, NE
WØKHS, Herbert R. Pearson, Minneapolis, MN
KAØLBE, Gilbert C. Chronister, Cape Girardeau, MO
WBØLGY, James L. Haworth, Poplar Bluff, MO
KØPSC, Estel L. Darland, Hiawatha, IA
WØQAC, Muriel S. Perry, Cahokia, IL
WØTOY, John Jarnefeld, Hibbing, MN
KBØUH, Alan G. Furnish, Kansas City, MO
KBØXQ, Walter P. Dewsbury, Duluth, MN
KØYGP, Charles C. Koons, El Campo, TX
KØYMS, Nuel F. Holman, Sr, Lamar, MO
G3RPE, Dain S. Evans, Hemel Hempstead Herts, Great Britain
OA4F, Alfonso Pereyra Brintoli, Lima, Peru
*ZLØAGO, Robert F. York, Maungatrpere Northland, New Zealand

*Life Member, ARRL

Notes: All Silent Key reports sent to HQ must include the name, address and call sign of the *reporter* as well as the name, address and call of the Silent Key in order to be listed in the column. Please allow several months for the listing to appear in *QST*.

In order to avoid unfortunate errors in the Silent Keys column, reports of Silent Keys are confirmed through acknowledgment only to the family of the deceased. Thus, those who report a Silent Key will not necessarily receive an acknowledgment from HQ. Canadian reports should be sent to the CRRL HQ address on page 9.

Many hams have remembered a Silent Key with a memorial contribution to the ARRL Foundation. Should you wish to make a contribution in a friend or relative's memory, you might designate it for an existing youth scholarship, the Jesse A. Bieberman Meritorious Membership Fund, the Victor C. Clark Youth Incentive Program Fund or for the General Fund. Contributions to the Foundation are tax-deductible to the extent permitted under current tax law. Our address is: The ARRL Foundation, Inc, 225 Main St, Newington, CT 06111.

50 Years Ago

September, 1939

☐ Single-signal reception is still a rather expensive step forward for most amateurs; W1EAO helps us common folk eliminate heterodyne interference by a simple variation of the Wien bridge, a few resistors and condensers in a circuit which phases out the undesired audio frequency.

☐ General Radio's Arthur Peterson describes a high-Q tank circuit for u.h.f. that is really a "tank"—concentric brass cylinders for an oscillator of high stability.

☐ First to cross the line in the California-Hawaii yacht race was the *Contender*, equipped with ham gear by W6AM and granted permission by FCC to work amateurs from its commercial frequency, thus keeping the world in touch with the progress of the race.

☐ Believing that u.h.f. is ready to take huge steps forward, the League is sponsoring a field day and relay competition for 56-Mc. and higher activity; test messages, as in the days of the old "transcons," will play an important part.

☐ Wonder and worry no more about losses in your tuned line or how to remove that last bit of standing wave. By Goodman, W1JPE, reports on results of summer-long experimentation on losses in tuned lines and adjustment of flat lines.

☐ Those curious enough to take W6GVU's "historical quiz for old timers" will later find that "Kilo-Hertz" is a German term meaning the same as Kilocycles/sec., and "Picofarad" was a high brow term for micro-microfarad. *Déjà vu?*

☐ VE5JB believes that audio distortion is as much a source of phone splatter as overmodulation and shows us how we can overcome impedance variations and reduce the problem.

☐ Yes, it could happen to you—broadcast interference, that is. W9AQS outlines six typical "case histories" which are helpful background in case it indeed happens to us.

☐ If you have two receivers, W2JCR suggests simultaneous operation with separately oriented antennas to greatly reduce fading in h.f. reception.

25 Years Ago

September, 1964

☐ Senator Barry Goldwater, K7UGA, K3UIG, has been named the Republican Party's nominee for the nation's president. We can all dream of seeing a beam atop the White House, but meanwhile, *QST* admonishes us to avoid partisan politics on the air.

☐ For specialized types of amateur communication —moonbounce, for example—phase-lock detection methods can produce a very much worthwhile increase in effective sensitivity, as detailed by W8FKC.

☐ Now eight years old, the "Monimatch" is still a very popular and simple device for checking the match between a coax feed line and an antenna. Fond father W1ICP presents his latest versions—Mark III and Mark IV—of this handy reflectometer.

☐ Based on an application by the League, the Post Office Department will later this year issue a commemorative stamp in recognition of the public service contributions of the nation's amateurs. You can get a "first day cover," mailed from the city of original issuance, for only 25 cents; 3 for 70 cents!

☐ Increasing activity on v.h.f. leads naturally to a desire for higher power to break through for DX contacts. W1HDQ says power alone is not the answer and evaluates several approaches to attainment of a stronger signal, particularly as concerns linear amplifiers.

☐ Most antenna analysis is based on standard horizontal or vertical radiators. K4GSX examines the current trend to tilted verticals, with accompanying theoretical field patterns.

☐ Continuing the implementation of the League Board's policy of designating *public service* as our number one objective, W1NJM outlines the "nuts and bolts" of rallying local amateurs and organizing a community emergency corps.

☐ The 50-year commemorative section covers postwar (WW II, that is) readjustment, with the 2½-meter band being made available to amateurs only four days after V-J Day and bands above 28 Mc. following in November of 1945.

☐ If you have space for only 15- or 20-meter antennas, W2PF shows how you can use feed lines as radiators and get output on 40 or 80 meters.

☐ More than 7500 contacts with amateurs were made crossband from WAR, NSS, AIR and NPG during the Armed Forces Day communications tests.

☐ K8OCO uses neon bulbs in a relaxation or sawtooth oscillator as the timing element for his simple and inexpensive electronic key.

☐ The Maxim Memorial Station is undergoing extensive reconstruction, but W1AW is continuing bulletins, code practice and such with makeshift arrangements in the basement.—*W1RW*

Results, First ARRL RTTY Roundup

. . . RTTY is a whole different animal!—WB7Y

By Hal Blegen, WA7EGA and Billy Lunt, KR1R
12910 Broadway Contest Manager
Spokane, WA 99216

On a mid-winter weekend last January, the ARRL kicked off the opener of what may well become the superbowl of keyboard contesting. The RTTY Roundup was so popular that the density of RF colliding over Colorado raised the mean temperature of the state four degrees. The hydroelectric power required for all that key-down contesting is suspected of dropping the level behind the Grand Coulee Dam (WA) by nearly a foot.

The popularity of the Roundup could have been predicted. Where else can you find a fast-paced, worldwide, RTTY contest with a schedule that allows the contestant to take the XYL out to dinner Friday, have a leisurely breakfast the next morning, get six hours of sleep Saturday night and be finished in time to watch *60 Minutes* on Sunday? KL7PG pointed out with a bit of understatement, "...It certainly was well attended as the bands were very crowded."

Who says January isn't contest season? Any time QSOs exceed 700 in a 24-hour contest, it makes a definitive statement about participation. Totals like that the first time out on a 24-hour digital (RTTY) contest make a statement that probably should be printed in rescue-orange headlines!

Although certificates are awarded by section and country, not by overall competition, NG7P's effort from Lake Stevens, WA clearly illustrates the pace of the new contest. Earl's 768 QSOs and 96 multipliers earned him the world top score. In a photo finish, a scant two-multiplier margin separated NG7P from RTTY newcomer K6LL. The next-highest score was submitted by KT1N, who placed third in a field that included over 300 logs from 39 countries and 49 states.

Most experienced RTTY contest operators subscribe to some form of WB7RBJ's one-hunk-of-metal-unison rule: "THE AMPLIFIER IS PART OF THE ANTENNA AND THE ON/OFF SWITCH IS WIRED TO THE COFFEE POT." The Roundup is the first RTTY contest with a place for the folks that do not heat their homes with their final tubes. Barefooters competed in their own group and peanut whistles outnumbered barn-burners by nearly three to one! One of the top-ten DXers, 9Y4DG, expressed amazement at what could be done with 50 watts and a multiband antenna, "Who said contesting is only for the Big Guns?"

"I only operated 10 meters with 50 watts out and a dipole, but I enjoyed it very much. I hope you continue having the RTTY Roundup in the years to come"—

Single Operator Top Ten

W/VE—Low Power		W/VE—High Power		DX—Low Power		DX—High Power	
Call	*Score*	*Call*	*Score*	*Call*	*Score*	*Call*	*Score*
AA5AU	44,616	NG7P	73,728	K2BMI/VP2V	42,772	KP2N	46,200
NTØV	37,000	K6LL	72,447	4M5RY (YV5KAJ,op)	33,768	HK1LDG	42,930
VE6ZX	33,210	KT1N	69,102			KL7XD	29,952
KD6PY	31,692	W3LPL (W3EKT,op)	66,255	HI3ADI	31,875	OK2FD	19,800
WJ7S	29,120			FF1NZH	18,612	XE1VV	15,960
NUØP	24,948	WS7I	52,380	GØATK	17,784	OH2LU	9,840
NO1Y	24,794	WA7EGA	48,720	G4SKA	15,820	SM4CMG	6,600
AA5FR	23,004	AA4TH	47,437	SP3SUN	14,105	LA7AJ	5,733
K1EVU	21,520	WF5E	47,168	CX5BX	11,160	HP1AC	5,546
KD4W	18,864	K2NJ	41,322	9Y4DG	10,860	DK3EA	3,975
		KEØKB	41,308	AL7BK	10,659		

Multioperator High Scorers

W/VE—Low Power		W/VE—High Power		DX—Low Power		DX—Low Power	
Call	*Score*	*Call*	*Score*	*Call*	*Score*	*Call*	*Score*
N2DCP	17,019	WAØVQR	19,584	HA5KAG	15,300	UZ9CWA	27,720
WAØQIT	13,462	WB6WQA	12,168	OE1XJA	5,428	JA1YFG	6,240
KI7T	11,088	W3EAX	3,713	HGØD	308		
NØFMR	10,450			N4TRA/MM	143		
KA3DSX	5,969						

Bob, AA5FR, finished eighth-place W/VE low-power from his NTX QTH.

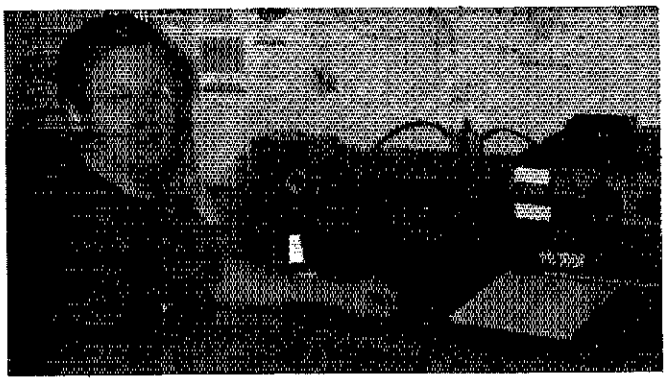
N2FF tunes for another multiplier. Frank finished first-place low power in the NLI Section.

Single-Operator Division Leaders

Division	Low Power Call	Score	High Power Call	Score
Atlantic	WA3ZKZ	13,455	W3LPL (W3EKT,op)	66,255
Canada	VE6ZX	33,210	VE3JAN	2,496
Central	WB9MSM	12,768	W9HLQ	5,130
Dakota	NTØV	37,000	KEØKB	41,308
Delta	AA5AU	44,616	K5KLA	3,552
Great Lakes	W8LNK	10,443	W8MQK	35,061
Hudson	WA2PNI	16,170	K2NJ	41,322
Midwest	NUØP	24,948	K6WZ	33,726
New England	NO1Y	24,794	KT1N	69,102
Northwestern	WJ7S	29,120	NG7P	73,728
Pacific	KD6PY	31,692	N6GG	41,085
Rocky Mountain	NFØB	8,477	NQØI	6,174
Roanoke	KI4MI	15,318	AA4CK	2,262
Southeastern	KD4W	18,864	AA4TH	47,437
Southwestern	WB6SSW	10,545	K6LL	72,447
West Gulf	AA5FR	23,004	WF5E	47,168

Single-Operator Continental Leaders

Continent	Low Power Call	Score	High Power Call	Score
Africa	EA8AKQ	8,910	—	—
Asia	JA1DFQ	6,944	JR1IJV	1,176
Europe	FF1NZH	18,612	OK2FD	19,800
North America	K2BMI/VP2V	42,772	KP2N	46,200
Oceania	WH6I	9,702	KH2D	3,772
South America	4M5RY (YV5KAJ,op)	33,768	HK1LDG	42,930



Charles, WB3DDF, amassed 202 QSOs and 63 multipliers and finished first-place low-power in the MDC Section.

JA1AYC has been a ham for 34 years and one of his favorite modes is RTTY. Masao finished second-place low-power in Japan.

KC7MJ. There seems to be a mystique about the attic. "QRP RTTY really works! I used a 5-watt rig and a dipole in the attic," from NI1L. "I used 100 watts to a random-wire antenna in the attic. I'm looking forward to the next contest"—NJ1H. WA3SDV brags, "I made all my QSOs with 30 watts to an attic-mounted indoor dipole!"

A ground-mounted, 5-band vertical and 100 watts provided AA5AU with all the clout he needed to corner the low-power, world top score with 507 QSOs. More QSOs but fewer multipliers was the story for K2BMI/VP2V, whose 578 QSOs earned him second-best score for barefoot operation. During his 22-hour effort he also boasted the top low-power QSO rate. Third overall and second place in the W/VE low-power went to NTØV with 500 QSOs.

Despite the anticipated information lag in getting word of a new contest to the DX community, logs from outside the US accounted for one out of four. Ron, KP2N, was the number one DX station with 550 QSOs. "The caliber of operation has greatly improved," he said, "I worked only 3 stations who sent a string of RYs!" HK1LDG was second in the DX high-power class, followed by KL7XO.

Out of 52 logs from DX stations in the 150-W class, K2BMI/VP2V gets first bow, followed by 4M5RY (operated by YV5KAJ) in second and HI3ADI third. Of the six logs from Canada, VE6ZX was notable with 405 QSOs, followed by VE3UR and VE6BS.

WAØVQR (plus NØBG) took the honors among the multioperators with 306 QSOs. The team at N2DCP placed second, with WAØQIT finishing third.

The Roundup packed its share of troubles. Bob, 7J6CAS, on Okinawa described the effects of a direct lightning hit on a 3-wavelength rhombic. "Great contest," he wrote, "...you missed a good light show." Lightning also had VE3JAN scrambling, "...had to disconnect all the antennas and gear for several hours." SM5CZD lost a round to weather. "After the storm," he said, "all I had left was 50 watts and a longwire antenna." Mother Nature didn't let veteran RTTY op ND2K off the hook either. "...wet snow and ice formed on all the antennas due to a storm," he said. But at least a Saturday morning thaw brought him a happy ending, "...6 minutes before the end I worked J52US!"

The Roundup was especially tough for the Novices and Techs who had only one band to operate. "It was frustrating hearing all the DX just outside of the Novice portion of 10 meters"—KB5ECK/T. Midwinter propagation also was a factor for some. "There was no propagation on Saturday from G land but it was much better Sunday. I enjoyed it immensely"—GØATK. Although he finished in the high-power top ten, KEØKB also commented on propagation, "Even though the conditions were not the best, it was near nonstop action." ZL2AKI wasn't so lucky, "RTTY was quite active but conditions were against a better score at this end." There was also some grumbling from VK2BQQ, "I think I'm faster with paddles than I am with the keyboard." Multiop entry HGØD said they never did get their RTTY modems to work right.

Although open to all digital modes, nearly all the activity was on Baudot. Packeteer ON6CR remarked, "...not many stations on packet here in Europe." And KA1RJJ suggested, "I noticed very little packet activity during the contest. Maybe an incentive is needed for next year?"

George, KB2VO/4, laments, "I wasted 7 hours at a dull party with the XYL..well, you understand..." Even with multiple power outages, XE1VV captured 5th place in the high-power DX category. AA5FR lost his computer halfway through the contest. Beam trouble forced GI4TSK to a ground-mounted vertical and WAØOUI said he invited Murphy to be second op, "I almost blew up the rig exceeding the

duty cycle!" "Never," said WB6SMX, "try to voltage feed a random wire anywhere near a computer."

The low-power category, in concert with a simplified exchange and scoring system, attracted a lot of folks who were new to RTTY contesting. "...first time on RTTY," said 11-year-old KA1SSU, "and I had lots of fun!" 5Z4BH wrote, "been a ham for 26 years and this is my first contest...extremely interesting mode!" OE3GOU said it was his first. "Thanks for having the RTTY Roundup," said KA2AEY, "This was my first contest ever."

After 34 years, K4IBP finally tossed his hat in the ring saying that he enjoyed "...everything but the paperwork." Second-place world winner K6LL commented, "This was my first experience on RTTY and I really enjoyed it." It was also a first effort for NUØP. "The pileups are different," he said, "You have to be quick on the keyboard to work two a minute. I can't wait for next year!"

After running the first day on low power, WS7I said, "It got a little slow and I got bored so I switched on the amp." Although he finished 5th in high power and earned section-winner wallpaper, he was his own biggest critic. "Boy was that dumb," he said, "I was almost 40,000 before I changed classes." (Top low-power score was 44,616.)

VE3UR set the tone, "Congratulations on your first RTTY Roundup. It was a dandy and I sure enjoyed it." GWØANA praised the ops, "...thanks to all the competitors in the contest for their sportsmanlike attitude." "What a breath of fresh air," from KC7MM. "Great contest! Next year I plan to operate the entire 24 hours"—WA9AKT. VE2OWL remarked, "...I sure enjoyed this one. The pace was different." WDØE described their multiop entry, "My son Tom, NØISE and I had a blast! We will be back next year for sure!"

Long-time RTTY DXer/contest-op K6WZ wrote, "I've been in more than a hundred RTTY contests and this one looks to be one of the best." KB4YBR/T was also full of praise, "What a great first contest. I had a ball and can't wait until next year." From NØFMR, "...great contest. Let's do it again soon," and WA6SDM lamented, "Do we have to wait a whole year...?" W4RQK summed it up, "Let's do it again next year!"—*WA7EGA*

Soapbox

I'm glad to see a new RTTY contest. I hope to see everyone next year. 73 and good DX (EA5FKI). Thanks for a very good contest (G4SKA). A fine contest. I enjoyed the nice opening on 10 meters where I was able to speed up to a 31-QSO/hour rate (YO2IS). Thanks again for providing a weekend of fun. All the best for 1989 and aloha (WH6I). The contest was enjoyable and a long overdue ARRL event. I'm looking forward to it becoming an annual event (K1EVU). It was a pleasure working the contest. Thanks for putting contests like these together (WA2MBQ). RTTY contests are the only contests I enter. I've been active on RTTY since 1965. I sure wish you had a contest like this a long time ago. Keep it up! (N2FF). I had a great time! After a long spell since our last rag chew, I worked my old friend Al, W8PBX. I'm looking forward to next year's contest (KD2XN). I had lots of fun with this contest. Let's do it again next year! (WA3INX). I really enjoyed this contest. I hope it becomes a permanent fixture! (WB4M). I had loads of fun! Please make it a regular contest (WA5VBE). The rig broke down Sunday morning, but I managed a temporary fix that lasted for 3 more QSOs (KG5EG). I learned a lot about RTTY operation and realized quickly that RTTY is a whole different animal! (WB7Y). Thanks for the fastest-paced RTTY contest I have ever experienced, including operating from the Galapagos Islands. I hope all the participants had as much fun as I did and I'm already looking forward to next year! (WA7EGA). I had a great time. I could have made more contacts but took a break to QSO a long-lost friend (K8OSF). Having been off RTTY for about two years, the contest was great motivation to get everything up and running again. I'm looking forward to 1990 (KC8YL). This was my first-ever contest entry and I hope to make RTTY Roundup an annual event (KC8FS). Just wish I could have operated more than just the 2 hours I did, but I had to work both days. Next year! (WB9B). It was great to see such a good turnout (WB9MSM). It was a fun, low pressure contest (WAØVQR).

Scores

Scores are listed by continents, countries and ARRL/CRRL sections. DX stations are listed first then US and Canada. Each line score lists (call, score, number of QSOs, number of multipliers, hours operated and power (A = less than 150 W output; B = more than 150 W output).

DX

Africa

Canary Islands

EA8AKQ 8,910- 162- 55-16-A
EA8RA 6,750- 125- 54-24-A
EA8AZM 437- 23- 19-24-A

Kenya

5Z4BH (KB7NK,op) 4,002- 87- 46-24-A

Zambia

9J2KF 2,480- 62- 40-17-A

Asia

Korea

HL9FN 792- 36- 22-24-A

Japan

JA1DFQ 6,944- 124- 56-24-A
JA1AYC 6,360- 120- 53- 9-A
7J6CAS 4,680- 117- 40-24-A
JR1IJV 1,176- 42- 28- 7-B
JA1YFG (JO1RUR,JP1JFG,ops) 6,240- 120- 52-24-B

Asiatic RSFSR

UA9FBV 2,940- 84- 35-24-A
UZ9CWA (UA9s CGA,CFV,SMW,CR, UV9CAF,ops) 27,720- 315- 88-24-B

Europe

Fed Rep of Germany

DK3EA 3,975- 75- 53-24-B
DF9XI 2,193- 51- 43-24-B
DL9RBV 1,848- 56- 33-24-A
DK7FP/P 1,189- 41 29-24-A
DK4JN 1,131- 39- 29-24-A
DK5KJ 750- 30- 25-24-B
DL2YAK 231- 21- 11- 4-B

Spain

EA5FKI 4,914- 91- 54-24-A

Ireland

EI9CB 7,367- 139- 53-16-A

France

FF1NZH 18,612- 186- 99-24-A

England

G8ATK 17,784- 247- 72-24-A
G4SKA 15,820- 226- 70-24-A
G8ARF 6,201- 117- 53-12-A
G4MKQ 5,310- 118- 45-18-A

Northern Ireland

GI4TSK 1,664- 52- 32-13-A

Wales

GW8ANA 5,661- 111- 51-22-A

Hungary

HA1YA 1,272- 53- 24- 8-A
HA5KAG (HA5s AEX,CE,HA8JP,ops) 15,300- 222- 68-21-A
HG8D (HA8s BW,DR,HA,HG,ops) 308- 22- 14-24-A

Norway

LA7AJ 5,733- 117- 49-15-B
LA8BX 1,736- 56- 31- 9-A

Austria

OE3GOU 2,380- 70- 34-16-A
OE1XJA (OE1s ACB,EOA,ops) 5,428- 118- 46-24-A

Finland

OH2LU 9,840- 164- 60-12-B

Czechoslovakia

OK2FD 19,800- 264- 75-17-B

Belgium

ON6CR 30- 6- 5- 6-A

Denmark

OZ1QI 132- 12- 11-24-A

Sweden

SM4CMG 6,600- 120- 55-15-B
SM5BKA 2,340- 65- 36-12-A
SM7BGE 969- 43- 23- 9-A
SM5CZD 420- 28- 15-10-A
SM5EIT 208- 16- 13-24-B

Poland

SP3SUN 14,105- 155- 91-24-A
SP2UUU 285- 19- 15-24-A
SP3BGD 16- 4- 4-24-B

European Russian RSFSR

UA3TN 920- 46- 20-24-A

Romania

YO2IS 10,150- 175- 58-24-A
YO6JN 2,170- 70- 31-24-A
YO6CFB 1,568- 56- 28-24-A
YO7FT 154- 14- 11-24-A

North America

Dominican Republic

HI3ADI 31,875- 425- 75-17-A

Panama

HP1AC 5,548- 118- 47-24-B

Alaska

KL7XD 29,952- 384- 78-19-B
AL7BK 10,659- 187- 57-14-A
KL7PG 9,050- 181- 50-13-A
KL7CQ 968- 44- 22-24-B

Virgin Islands

KP2N 46,200- 550- 84-22-B

British Virgin Islands

K2BMI/VP2V 42,772- 578- 74-22-A

Mexico

XE1VV 15,960- 285- 56-24-B

Oceania

Guam

KH2D 3,772- 92- 41-24-B

Hawaii

WH6I 9,702- 198- 49-11-A

Australia

VK2BQQ 765- 45- 17-24-A

New Zealand

ZL2AKI 2,627- 71- 37-23-A

South America

Uruguay

CX5BX 11,160- 180- 62-24-A

Colombia

HK1LDG 42,930- 477- 90-24-B

Brazil

PT2BW 8,232- 147- 56-15-A

Venezuela

4M5RY (YV5KAJ,op) 33,768- 252- 134-22-A

Trinidad and Tobago

9Y4DG 10,880- 181- 60-18-A

Maritime Mobile

N4TRA/MM (+N4RHV,N5DST) 143- 13- 11- 8-A

W

1

Connecticut

NO1Y 24,794- 322- 77-24-A
NT1I 5,500- 110- 50-11-A
KH6CP/1 2,496- 78- 32-11-A
KA1RJJ 2,232- 62- 36-12-A
KY1T 1,896- 53- 32- 7-A
NI1L 1,456- 56- 26-10-A
NF1J 720- 30- 24- 4-A
K1ZZ 640- 32- 20- 2-B

Eastern Massachusetts

KT1N 69,102- 698- 99-24-B
W1IHN 13,064- 184- 71-24-B
W1TR 11,592- 184- 63-17-A
N1FIO 10,725- 173- 62-16-A
W1HFN 7,870- 130- 59-13-A
W1AX 3,285- 73- 45- 4-B
WA1TPE 1,749- 53- 33- 9-A

Maine

K1EVU 21,520- 269- 80-13-A
KC1BS 806- 31- 26-10-A

New Hampshire

NU1E 18,000- 225- 80-24-A
KA1LMR 13,333- 199- 67-18-A
NJ1H 5,760- 120- 48-14-A
W1UBG 897- 39- 23-13-A
WB2MBQ 672- 28- 24-24-B

Rhode Island

KB1EM 10,080- 180- 56-10-A
N1DM 1,917- 71- 27-10-A

Western Massachusetts

W1BYH 14,258- 198- 72-24-B
WB1GSO 6,804- 126- 54-15-B
KA1QFU 4,752- 108- 44-18-A
KA1IFE 726- 33- 22- 8-A

2

Eastern New York

WM2U 4,141- 101- 41-15-A
WB2SPN 2,128- 58- 38- 8-A
KE2JJ 1,500- 50- 30-11-A
W1KHQ 646- 34- 19- 4-A
KB2GKY/N 570- 30- 19-17-A

NYC—Long Island

KC2FD 30,030- 385- 78-24-B
N2FF 9,180- 170- 54-22-A
W2JGR 3,900- 100- 39- 6-B
W2AYJ 2,014- 53- 38-10-A
KD2BW 1,736- 56- 31- 9-B
K2RYI 1,326- 51- 26- 6-A

Northern New Jersey

K2NJ 41,322- 426- 97-24-B
WA2IKL 16,215- 235- 69-24-B
WA2PNI 16,170- 245- 66-24-A
ND2K 7,830- 145- 54-11-A
KE2CG 5,700- 100- 57-16-B
KD2L 2,244- 68- 33- 6-B
K2BO 504- 28- 18-24-B

Western New York

WB2ZQP 7,168- 120- 56-22-A
KD2XN 5,760- 120- 48-13-A
W2YRH 5,480- 105- 52-24-B
K2PYM 1,995- 57- 35-18-A
KA2AEY 735- 35- 21- 7-B

3

Delaware

WA3ZKZ 13,455- 195- 69-21-A
N3DLM 798- 42- 19- 9-B

Eastern Pennsylvania

NT3B 12,868- 179- 72-18-A
KW3F 8,032- 118- 52-13-A

N3BOU 5,424- 113- 48-19-A
WB3FIZ 3,854- 82- 47- 8-A
W3GU 3,772- 82- 46-10-B
KC3ST 2,240- 55- 40-11-A
N3FOG/T 1,550- 62- 25-12-A
N3GLE/T 780- 39- 20- 9-A
WA3SDV 432- 27- 16- 6-A
W3GBG 425- 25- 17-11-A
W3KV 272- 17- 16-24-B
N3DIZ/T 90- 6- 5- 3-A
KA3DSX (+KA3HNM) 5,969- 127- 47-18-A

Maryland—DC

W3LPL (W3EKT,op) 66,255- 631- 105-24-B
WB3DDF 12,726- 202- 63-22-A
N3UN 11,948- 181- 66-11-A
WB8WRY/3 10,050- 201- 50-20-A
WA3UXZ 1,560- 60- 26-11-A
W3EAX (KA1GD,KD3FU,ops) 3,713- 79- 47- 8-B

Western Pennsylvania

WA3INX 2,304- 64- 36-15-A

4

Georgia

AA4TH 47,437- 533- 89-24-B
KD4W 18,864- 262- 72-17-A
KB4GID 10,830- 190- 57-18-A
KL7TFI/4 6,370- 130- 49-24-B
NN4K 2,196- 61- 36-10-A
KK4DF 2,100- 60- 35-10-A

Kentucky

KI4QJ 5,040- 112- 45-14-A
WB4LKP 2,145- 55- 39-10-A

North Carolina

KI4MI 15,318- 207- 74-22-A
WB4M 10,354- 167- 62-14-A
K4JYS 8,758- 151- 58-15-A
KD4OM 4,183- 89- 47-16-A
N4RTK 2,940- 70- 42-17-A
WA4DAZ 1,271- 41- 31- 4-A
KC4HIU/T 9- 3- 3- 1-A

Northern Florida

W4HBK 11,524- 172- 67-12-A
KC4CSD 8,095- 115- 53-11-A
N2DCP (+N4TSV) 17,019- 279- 61-17-A

South Carolina

WA4BHK 2,301- 59- 39- 7-A

Southern Florida

KB2VO 28,026- 346- 81-18-B
W4ROK 4,047- 71- 57-17-A
KD4VR 1,864- 52- 32-10-A
W1UDB/4 594- 33- 18- 7-A
KF4WB (+N4UNE) 4,850- 97- 50-23-A

Tennessee

K4IBP 9,858- 159- 62-16-A
KD4MM 7,975- 146- 55-13-A
WA4JJY 3,128- 88- 46-24-A
WA4MCZ 1,590- 53- 30- 8-A
KB4YBR/T 532- 36- 14-13-A

Virginia

KF4FP 2,516- 68- 37-24-A
AA4CK 2,202- 58- 39- 5-B

5

Arkansas

WA5VBE 1,952- 61- 32- 7-A

Louisiana

AA5AU 44,616- 507- 88-24-A
KG5EG 18,800- 300- 62-22-A
K5KLA 3,558- 74- 48-11-B
WB5ASD 2,108- 68- 31-24-A
KB5NR 1,960- 56- 35- 8-A

Mississippi

KB5ECK/T 1,098- 61- 18-14-A
W5VZF (+KB4HB,WA4DDE) 3,078- 114- 27-24-A

North Texas

AA5FR 23,004- 284- 81-21-A
WM6H 9,280- 184- 45-23-A
KF5SH 2,812- 76- 37-15-A
KA5ZBT 1,643- 53- 31-24-A

Oklahoma

K8WM 3,774- 111- 34- 8-B
KD5IT 2,090- 55- 38-24-A

South Texas

K5LTW 4,165- 119- 35- 7-A
K5EJL 204- 17- 12- 3-A

West Texas

WF5E 47,168- 536- 88-24-B

6

Los Angeles

WB6SSW 10,545- 185- 57-20-A
W6CN 4,232- 92- 45-15-A
KE6T 2,300- 50- 46-13-A
WB6SMX 250- 50- 5-24-A
W5QBC 80- 10- 8- 6-A
WB6WQA (+N6QEZ) 12,168- 234- 52-16-B

Orange

W6IWO 3,471- 89- 39- 9-B
KI6X 2,418- 78- 31-11-A

Santa Clara Valley

KD6PY 31,892- 417- 76-24-A
WA6SDM 3,612- 84- 43-13-A
WD6FYJ 1,104- 46- 24-10-A

San Francisco

W6JOX 2,013- 61- 33-13-A

San Joaquin Valley

W6MTJ 8,640- 144- 60-23-B

Sacramento Valley

N6GG 41,085- 495- 83-20-B

7

Arizona

K6LL 72,447- 779- 93-24-B
KC7MJ 3,636- 101- 36-10-A
N7LQS 2,294- 74- 31- 8-A
WB6IBZ 1,947- 59- 33-12-A
W7KB 315- 21- 15- 4-B
ND7A 221- 17- 13- 1-A

Eastern Washington

WS7I 52,380- 582- 90-24-B
WA7EGA 48,720- 609- 80-20-B
K7GS 10,540- 170- 62-12-A
KC7MM 3,996- 108- 37-24-A
W7ZRR 2,100- 75- 28-13-A
K7JRN 1,876- 67- 28-20-A

Idaho

WB7Y 13,624- 262- 52-18-A
WS7U 90- 10- 9- 1-A
KB7FNI/T 88- 11- 8- 8-A

Oregon

WJ7S 29,120- 364- 80-24-A
W7MI 9,900- 150- 66-17-B
W7IMP 4,676- 88- 53-16-B
NJ7H 2,706- 66- 41-11-A
K7SGT 2,360- 59- 40-15-A

Western Washington

NG7P 73,726- 768- 96-24-B
WA7PVE 8,536- 194- 44-12-A
KI7T (+WB7VHL,WL7V) 11,088- 231- 48-22-A

Wyoming

KB7M 4,480- 112- 40-18-A

8

Michigan

WB8QIK 35,061- 403- 87-22-B
N8ABW 14,760- 246- 60-17-B
K8CV 11,457- 201- 57-24-B
K8OSF 4,536- 108- 42-10-A
KA8IZE 3,150- 75- 42-12-A
K8CHN 2,144- 67- 32-17-A

Ohio

AB8K 22,640- 283- 80-18-B
W8PBX 11,830- 182- 65-14-B
W8LNK 10,443- 177- 59-21-A
WB8YJF 10,032- 152- 66-14-A
N8JNB 4,950- 110- 45-23-A
W8EXI 2,808- 72- 39-17-A
WB8WTS 2,142- 63- 34- 3-B
KE8UA 2,072- 56- 37-21-A
KC8YL 2,040- 60- 34-24-A
W8VQI 1,040- 40- 26- 8-A
W8IOM 945- 35- 27- 5-A
N8IRS/T 812- 36- 17-14-A
WA8IMF 240- 20- 12- 7-A

West Virginia

WA8FLF 5,244- 114- 46-19-A
KC8FS 2,133- 79- 27-20-A

9

Illinois

WD9DZV 7,128- 132- 54- 7-A
W9HLQ 5,130- 114- 45-24-B
KR9G 4,108- 79- 52-16-A
N9HZA 3,828- 116- 33-13-B
W9FFQ 3,388- 77- 44-17-A
WA9AKT 2,170- 70- 31-10-A
WA9YII 2,117- 73- 29-14-A
N9GTT 1,475- 59- 25-24-A
WB9B 425- 25- 17- 3-A
KA9MAB/T 3- 3- 1- 2-A

Indiana

K9VQK 2,124- 59- 36- 8-B
W9FXV 1,624- 56- 29-24-B
KD9HT 900- 36- 25- 7-A

Wisconsin

WB9MSM 12,768- 228- 56-24-A
NX9H 4,410- 105- 42-19-A

0

Colorado

NF0B 8,477- 173- 49-12-A
NQ0I 6,174- 147- 42- 8-B
K0BP 5,166- 123- 42-24-A
K3ZMO/T 495- 33- 15-10-A
WD0E 165- 15- 11- 8-A
N0SE 56- 8- 7- 1-A

Iowa

NU0P 24,948- 324- 77-24-A

Kansas

K6WZ 33,726- 462- 73-24-B
N0HYG 3,816- 106- 36-13-A
KA0SIX/N 546- 42- 13-24-A
N0FMR (+NW0F) 10,450- 209- 50-19-A

Minnesota

KE0KB 41,308- 449- 92-24-B
NJ0M 41,124- 447- 92-24-B
KA0ZMY 1,560- 80- 26-12-A
KD0GF 1,430- 65- 22- 7-A
W0TIV 1,242- 54- 23-24-B
WA0QIT (+N0EOB) 13,452- 254- 53-24-A

Missouri

WA0OUI 5,490- 122- 45-19-B
KB0ANP/T 468- 39- 12-13-A
N9BU 378- 27- 14-24-A

North Dakota

NT0V 37,000- 500- 74-24-A
W0LHS 5,547- 129- 43-24-A

Nebraska

KB0IC 19,108- 281- 68-24-B

South Dakota

WA0VQR(+N0BG) 19,584- 306- 64-18-B

VE

Quebec

VE2OWL 3,960- 88- 45-20-A
VE2FFE 2,613- 67- 39-24-A

Ontario

VE3UR 18,504- 257- 72-24-A
VE3JAN 2,496- 64- 39-18-B

Alberta

VE6ZX 33,210- 405- 82-19-A
VE6BS 13,719- 269- 51-23-A

Check Logs

SM6EZI, SP2FN, YO2CMI, KB2CLQ, WB4FY

Rules, ARRL International EME Competition

1) **Object:** Two-way communications via the earth-moon-earth path on any authorized amateur frequency above 50 MHz.

2) **Contest Period:** Two full weekends, Oct 14-15 and Nov 18-19; full 48-hour period UTC each weekend.

3) **Categories**

A) **Single operator:** One person performs all operating and logging functions, equipment adjustment and antenna alignment.

(1) **Multiband.**

(2) **Single-band:** Single-band entries on 50, 144, 220, 432, 902 and 1296-and-up categories will be recognized in awards offered. Contacts may be made on any and all bands without jeopardizing single-band entry status. Such additional contacts are encouraged and should be reported. Also see Rule 8, Awards.

B) **Multioperator:** Two or more persons participate; includes neighboring amateurs within one call area, but with EME facilities for different bands on different team members' premises, as long as no two are more than 50 km (30 miles) apart. Multioperator neighborhood groups cannot use the same call signs at each location; all calls will be listed in the results.

C) **Commercial equipment:** Stations using equipment that is not amateur (such as a dish antenna for lab equipment owned by an institution or government agency) will have their scores listed separately.

4) **Exchange:** For a valid contact to occur, each station must send and receive both call signs and a signal report in any mutually understood format, plus a complete acknowledgment of the calls and report. Partial or incomplete QSOs should be indicated on your log, but not counted for contest credit. Stations may be worked once per band for credit.

5) **Scoring**

A) **QSO Points:** Count 100 points for each complete EME contact.

B) **Multiplier:** Each US and Canadian call area, plus each DXCC country (not US/Canada) worked via EME on each band.

C) **Final Score:** Multiply QSO points by sum of multipliers worked on each band for your final score.

6) **Miscellaneous**

A) Fixed or portable operation is permitted. Stations operating outside traditional call areas must indicate so, identifying the call area of the operating site.

B) Contacts may be on CW or SSB. Only one signal per band is permitted.

C) A transmitter, receiver or antenna used to contact one or more stations under one call sign may not be used subsequently under any other call sign during the contest, except for family stations where more than one call has been issued, and then only if the second call sign is used by a different operator.

D) There is no specified minimum terrestrial distance for contacts, but all communications must be copied over the moon-bounce path, regardless of how strong (or weak) a nearby station's terrestrial signal may be.

7) **Reporting:** Entries must be postmarked no later than 30 days after the contest and must include complete log data. Your summary sheet should show a band-by-band breakdown of QSOs and multipliers, and include details of your station setup and a photo.

8) **Awards:** Certificates will be issued to the top five stations worldwide in each of the entry categories: single operator, multiband; single operator, single band (separate awards for each band); and multioperator. Additional awards will be issued where significant achievement or competition is evident. In addition, each station that successfully completes at least one EME contact during the contest period will receive a certificate commemorating that achievement.

9) **Disqualifications:** See January 1989 *QST*, page 104.

Contest Corral

Conducted By Mark R. Burke, KA1MIS
Contest Assistant

SEPTEMBER

3

LZ-DX Contest, see Aug *QST*, p 81.

6

West Coast Qualifying Run, 10-35 WPM, at 0400Z Sep 7 (9 PM PDT Sep 6). W6OWP prime, W6ZRJ alternate. Frequency is approximately 3.590 MHz. Underline one minute of the highest speed you copied, certify that your copy was made without aid and send to ARRL HQ for grading. Please include your full name, call sign (if any) and complete mailing address. A large SASE will help expedite your award or endorsement.

9

W1AW Qualifying Run, 10-35 WPM at 0200Z Sep 10 (10 PM EDT Sep 9). Transmitted simultaneously on 1.818 3.5815 7.0475 14.0475 21.0775 28.0775 50.08 147.555 MHz. See Sep 6 listing for more details.

9-11

ARRL September VHF QSO Party, see Aug *QST*, p 80.

European DX-Contest, phone, see Jul *QST*, p 94.

10

North American Sprint, CW, see Aug *QST*, p 81.

WARC-FEST, sponsored by the Texas DX Society, 1800Z-2400Z Sep 10. Single operator, CW or single operator mixed categories. Bands: 18 and 24 MHz. Work stations once per band/mode. One-hour time period minimum per band. Exchange name, QTH (ARRL Section/province/country), and single-word antenna type (eg, dipole, sloper, Yagi, etc). Official summary sheets available and requested. Postmark entries no later than Oct 15 and send to Texas DX Society, PO Box 540291, Houston, TX 77254-0291.

16-17

ARRL 10-GHz Cumulative Contest, Jun *QST*, p 102.

Scandinavian Activity Contest, CW sponsored by the Norwegian Radio Amateur League, from 1500Z Sep 16 until 1800Z Sep 17. (Phone contest from 1500Z Sep 23 until 1800Z Sep 24.) Work LA LB-LG-LJ, JW, JX, OF-OG-OH-OI, OHØ/OJ, OHØM, OX, OY, OZ, SJ-SK SL-SM and TF stations on 3.5, 7, 14, 21, and 28 MHz only. Work stations once per band; no cross-mode QSOs. Categories: single op, 1 transmitter; single op, 1 transmitter, QRP (max input 10 watts); Multiop single transmitter; and SWL. Multi-single stations may have only one transmitted signal at any given time and must remain on a band at least 10 minutes after a band change. Exchange signal report and serial number starting with 001. European stations count one point per Scandinavian QSO on any band. Non-European stations count 1 point per Scandinavian QSO on 14, 21, and 28 MHz and 3 points on 3.5 and 7 MHz. Multiply total QSO points by the number of different Scandinavian call areas worked per band (LA1 = LB1 = LJ1 and OY/W1XX = OYØ, etc) for final score. Avoid contest traffic in these subbands: 3.560-3.600, 3.650-3.700, 14.060-14.125 and 14.300-14.350, except when this conflicts with national regulations. In that case, split-operation must be used. Mail entries for both modes with complete summary sheet by Oct 31 to Trondheim DX Club, Box 5357, N-7002 Trondheim, Norway.

17

North American Sprint, SSB, see Aug *QST*, p 81.

23-24

All Mode 10-Meter QSO Party, sponsored by the Calumet Area Radio Enthusiasts from 0000Z Sep 23 until 2400Z Sep 24. Single op only. Work each station once. Exchange call sign, name, state, Ten-Ten number (if any), and Steel City number (if any). Score 1 point per contact without Ten-Ten number, 2 points per contact with Ten-Ten number. Multiply QSO points times total number of Steel City numbers worked. Suggested frequencies: 28.100-28.500. Cover sheet containing name, callsign, Ten-Ten number (if any), expiration date, chapter assignment, total contacts and total points claimed is required. Dupe sheet required if over 300 QSOs. Logs must be postmarked no later than Oct 24 and sent to Glenn Yerby, ND9Y, 11023 Ave D, Chicago, IL 60617.

CQ World-Wide RTTY DX Contest, sponsored by *CQ Magazine*, from 0000Z Sep 23 until 2400Z Sep 24. Single-ops may operate more than 30 hours, but only first 30 count for contest credit. Rest periods must be not less than 3 hours and noted in logs. Multiop stations can operate 48 hours. Classes: single operator, all band; single operator, single band; multioperator, single operator, all band. Modes: Baudot, AMTOR (FEC/ARQ), ASCII, and AX.25 (no digipeated QSOs allowed). Bands: 80, 40, 20, 15, 10 meters. Work stations once per band regardless of mode. Exchange RST, state or VE area (W/VE only), and CQ zone. Count 1 point per QSO with own country, 2 points per QSO with same continent, 3 points per QSO with different continent. Multipliers: 1 per each state (48), VE area (13), DX country (DXCC and WAE lists), CQ zones per band. For final score multiply QSO points times total multipliers. Separate log, a dupe sheet, and a multiplier check list for each band. Awards. Send logs before Dec 1 to CQ RTTY Contest, Roy Gould, KTIN, PO Box DX, Stow, MA 01775.

24-25

Fall Classic and Homebrew Radio Exchange, sponsored by the Classic Radio Newsletter from 2000Z Sep 24 until 0400Z Sep 25. Object is to restore, operate and enjoy home-brew equipment and equipment least 10 years old, but it is not required for entry. Exchange name, RS(T), QTH, receiver and transmitter type (home-brew send final amp tube or transistor). The same station may be worked with different equipment combinations on each band/mode. Suggested frequencies: phone—3.880 7.290 14.280 21.380 28.320; CW—60 kHz up from lower band edges; Novice—3.720 7.120 21.120 28.120 28.320. Add the number of all the different transmitters and receivers worked plus the different states/provinces/countries worked per band. Multiply that number by total number of QSOs. Multiply that total by total years old of all your transmitters and receivers used (minimum three QSOs per unit). For transceivers, multiply years old by 2. For homebrew, count as 25 years old unless older. Awards. Mail logs (include SASE for results) to Jim Hanlon, W8KGI, 5560 Linworth Rd, Columbus, OH 43085.

27

W1AW Qualifying Run, 10-35 WPM, at 1300Z Sep 27 (9 AM EDT Sep 27). See Sep 9 listing for more details.

OCTOBER

3

West Coast Qualifying Run, 10-40 WPM, at 0400Z Oct 4 (9 PM PDT Oct 3). See Sep 6 listing for more details.

7-8

California QSO Party, sponsored by the Northern California Contest Club, from 1600Z Oct 7 until 2200Z Oct 8. Single-ops limited to 24 hours, time off periods at least 15 minutes and noted in log. Work stations once per band and mode. Only one transmitter signal allowed. California stations may be worked again if they change counties. CW QSOs must be in CW subbands, except for 160 meters. No repeater or MCW QSOs. Suggested frequencies: CW—1805 and 40 kHz up from low end; phone—1.850 3.850 7.230 14.250 21.300 28.450; Novice—10 kHz up from band edges. Try CW on the half hour; 147.540 at 2000Z, 0000Z, 0400Z; 160 at 0500Z; 80 at 0300Z and 0700Z. Exchange QSO number, state (county in CA)/province/country. Scoring: phone—2 points, CW—3 points. Multiply QSO points times number of CA counties (max 58). California stations multiply by number of states and provinces. Awards. Entries with more than 200 QSO must submit dupe sheet. Submit entries by Nov 15 to NCCC, c/o Gary Caldwell, WA6VEF, PO Box 8014-56, Blaine, WA 98230.

Columbus Contest, sponsored by the Columbus ARA, from 0000Z Oct 7 until 2400 Oct 8. Phone only. Suggested frequencies: 7.240 14.340 21.375 28.500. Exchange name, QTH, and signal report. Count 1 point per contact. Certificates to stations with at least 10 Columbus stations (working club station W8TO counts as 6 contacts). Plaques. Submit an SASE (4 units) for QSL and certificate, 9- × 12-in SASE for unfolded certificate. Otherwise use no. 10 envelope to Roger Dzwonczyk, WB2EIG, 283 E Longview Ave, Columbus, OH 43202.

VK/ZL/Oceania DX Contest, phone, sponsored by the Wireless Institute of Australia, from 1000Z Oct 7 until 1000Z Oct 8 (CW contest, 1000Z Oct 14 until 1000Z Oct 15). Single-op and SWL classes. Operate only 12 hours in even one-hour blocks (1000Z 1100Z, etc; not 1035Z-1135Z, etc). Work stations once per band. No crossband QSOs. Exchange signal report and serial number starting with 001. Count 2 points per VK/ZL/O QSO. Multiply by total VK/ZL/O prefixes worked on all bands. Use separate log for each band and mode. Mail entries to be received by Feb 15 to Frank Beeck, VK7BC, 37 Nobelius Dr, Legana, Tasmania 7277, Australia.

8

W1AW Qualifying Run, 10-40 WPM at 0200Z Oct 9 (10 PM EDT Oct 8). See Sep 9 listing for more details.

8-9

Illinois QSO Party, sponsored by the Radio Amateur Megacycle Society, from 1800Z Oct 8 until 0200Z Oct 9. Phone and CW. No repeater QSOs. Suggested frequencies: CW—3.550 7.050 14.050; phone—3.890 7.290 14.290; Novice—30 kHz up from bottom for CW, 28.390 for phone. Other bands may also be used (except 30, 17 and 12 meters). IL stations exchange RS(T) and county; others exchange RS(T) and state/province/country. Count 1 point per phone QSO, 2 points per CW QSO. Work stations once per band and mode, and once per band/mode/county for IL mobile stations. IL stations multiply QSO total by sum of states plus VE provinces plus a maximum of five DX countries. Count additional DX for points, but not multipliers. IL portables and mobiles may add 200 to final score for each county from which 10 or more contacts were made. All others multiply QSO points by the number of IL counties worked. All stations may take one bonus multiplier for each eight QSOs with the same IL county. Awards. Stations with over 100 QSOs must submit a dupe sheet. Send logs by Nov 6 to RAMS, c/o Joe LeKostaj, WB9GOJ, 9134 Ewing Ave, Evanston, IL 60203.

14-15

ARRL International EME Competition, this issue p 84.

GARTG-SSTV Contest, part 2.

Pennsylvania QSO Party

VK/ZL Oceania DX Contest, CW, see Oct 7-8 listing.

21

9V QSO Party

21-22

Jamboree-on-the-Air

29

W1AW Qualifying Run

Deadline: The deadline for receipt of items for this column is the 1st of the second month preceding the publication date. For example, your information would have to reach HQ by **Oct 1** to make the **Dec** issue. Please include name of contest, dates, times (Z) and complete rules. Send to Contest Corral, 225 Main St, Newington, CT 06111.

Special Events

Conducted By Mark R. Burke, KA1MIS
Contest Assistant

Chillicothe, Ohio: **WK8N** will operate during local evening and weekend hours during **Sep** to celebrate the annual summertime production of the outdoor drama *Tecumseh!* Suggested frequencies: SSB—lower 25 kHz of the 40, 20 and 15 General bands; 10-meter Novice phone. For commemorative QSL, send QSL and SASE to Ron Cade, WK8N, 747 Jefferson Ave, Chillicothe, OH 45601.

Ann Arbor, Michigan: Domino's Farms will operate **N8GNQ Sep 1-4,** 1400Z-2200Z each day, from the steam launch *Telegraph* and the Antique Wireless Station. Suggested frequencies: 5-10 kHz into the low end of the General phone and CW bands of 80, 40, 20 and 15; Novice bands; packet—145.010. For certificate, send QSL and business-size SASE to Jim Monaghan, N8GNQ, 811 Lowell St, Ypsilanti, MI 48197.

Sierra Vista, Arizona: The Cochise ARA will operate **WA7KYT Sep 2-4** from the ghost town in Paradise, AZ. Suggested frequencies: 3.885 7.285 14.288 21.288 28.385; 6 meters. For special certificate, send business-size SASE to Cochise ARA, PO Box 1855, Sierra Vista, AZ 85636.

Newnan, Georgia: The Bill Gremillion Memorial RC will operate **K4SEX Sep 2-4,** 1400Z-2000Z each day, in conjunction with the 20th annual Powers Crossroads Arts and Craft Festival. Suggested frequencies: 14.325 21.325 28.325. For QSL, send QSL and SASE to BGMRC, PO Box 2327, Newnan, GA 30264.

Schaumburg, Illinois: The Schaumburg ARC will operate **WB9TXO** 1500Z-2100Z **Sep 3** from their demonstration station at the Schaumburg Septemberfest. Suggested frequencies: 7.289 14.289 21.289 28.389. For special certificate, send QSL to SARC, PO Box 68251, Schaumburg, IL 60168-0251.

Billings, Montana: The Yellowstone RC will operate club-member stations **Sep 4-9,** 1400Z-2400Z each day, to coincide with the Great Montana Cattle Drive in commemoration of the Montana Centennial. Suggested frequencies: 7.265 14.265 21.365. For commemorative certificate, send QSL and 9- × 12-in SASE to Verlon Cox, K7AEZ, 1124 Parkhill Dr, Billings, MT 59102.

Prince Georges County, Maryland: The Prince Georges ARES will operate 1600Z-2400Z **Sep 9** at the Price Georges County Fair. Suggested frequencies: 3.950 7.275 14.340 18.150 21.435 24.950 28.350 50.130. For special certificate, send QSL to PG-ARES, PG-OEP, 7911 Anchor St, Landover, MD 20785.

Bethlehem, Connecticut: The Hen House Gang ARC will operate **W1FHP Sep 9-10,** during daylight hours, celebrating the 65th Annual Agicultural Fair. Operation will be 40- and 20-meter SSB, 40-meter Novice CW, and Novice and General 10 meter. Send QSL and regular-size SASE to Hen House Gang, Hard Hill Rd, Bethlehem, CT 06751.

Lost Peninsula, Michigan: The Oliver Hazard Perry Expeditionary Force will operate **WD8LKI Sep 9-10,** starting at 1300Z. Suggested frequencies: 3.965 7.265 14.265 21.365 28.365. For certificate, send QSL and 9- × 12-in SASE to Como Wills, 30372 Bates Rd, Perrysburg, OH 43551.

Missouri: The Kansas City QRP Assn and the St Louis QRP Society will operate **NRØR** and **NØZZ,** respectively, **Sep 9-10,** 1500Z-2300Z each day, to celebrate QRP in the state of Missouri. Work both stations for special certificate, use QRP and receive a bonus QRP endorsement. For certificate, send QSL and large SASE to Mark Campbell, NRØR, 6205 E 140th Pl, Grandview, MO 64030-3834.

St Marys, Pennsylvania: **KA3QEQ** will operate **Sep 9-10,** starting at 1400Z, to celebrate the Eleventh Annual Bavarian Festival. Suggested frequencies: 7.247 14.250 21.375 28.450 28.650. For special QSL, send SASE to KA3QEQ, PO Box 175, St Marys, PA 15857.

Lubbock, Texas: Local hams will operate **KG5BL** from 1200Z **Sep 8** until 2400Z **Sep 9** to celebrate Buddy Holly's birthday. Suggested frequencies: phone—3.875 7.275 14.275 21.375 28.454; CW—3.720 7.120 21.120 28.120. For special QSL, send SASE to Moody Forgey, KG5BL, 7603 Wayne Ave, Lubbock, TX 79424.

Baltimore, Maryland: Area hams will operate **W3USS Sep 10-16** to commemorate the 175th anniversary of the writing of the "Star Spangled Banner" by Francis Scott Key and the bombardment of Baltimore during the War of 1812. Suggested frequencies: SSB—14.275 18.140 21.375 28.475 144.250; CW—7.125 18.090 21.175 28.175; FM—146.550 222.100 446.000. For commemorative certificate, send QSL with contact number and 9- × 12-in SASE to 175th Amateur Radio Committee, Fort McHenry National Monument and Historic Shrine, Baltimore, MD 21230.

Atlantic City, New Jersey: The Southern Counties ARA will operate **K2BR Sep 11-16** from the Miss America Pageant. Suggested frequencies: phone—25 kHz inside lower General band edges; CW—65 kHz inside lower General band edges; Novice 10 meter. For QSL, send QSL and no. 10 SASE to SCARA, PO Box 121, Linwood, NJ 08221.

McMinnville, Tennessee: The Warren County Emergency Services Group will operate **WA4WNT** from 2200Z **Sep 15** until 0200Z **Sep 16** and 1400Z-2400Z **Sep 16** at the Warren County Fairgrounds. Suggested frequencies: 3.980 (except during TN phone net) 14.240 28.400 146.970. For certificate, send QSL and SASE to WCESG, PO Box 126, Morrison, TN 37357.

Adrian, Michigan: The Adrian ARC will operate **W8TQE Sep 15-17** in conjunction with the International Human Powered Speed Championship Races. Operation will be 20 kHz up from the General 20-meter phone band and the Novice bands. For QSL, send QSL to W8TQE, PO Box 26, Adrian, MI 49286.

Clyde, Ohio: The Clyde ARS will operate **NF8E** 1600Z-2400Z **Sep 16** and 1600Z-2200Z **Sep 17** from the Winesburg Fall Fair. Suggested frequencies: phone—3.890 7.250 28.400; CW—3.720 7.125. For certificate, send QSL and business-size SASE to Steve Karr, NF8E, 302 Hamer St, Clyde, OH 43410-1212.

Muskegon, Michigan: The Muskegon Area Amateur Radio Council will operate **W8ZHO** from 1300Z **Sep 16** until 1900Z **Sep 17** from on board the USS *Silversides.* Suggested frequencies: 3.855 7.255 14.255 21.320 28.475. For certificate, send QSL and 9- × 12-in SASE to Robert Wright, KB8APS, 3160 Walker Rd, Muskegon, MI 49444.

Davenport, Iowa: The Palmer College of Chiropractic ARC, in cooperation with the Davenport RAC, will operate 1300Z-0100Z **Sep 17** to commemorate Chiropractic Founders Day and the original site of broadcast station WOC. Operation will be 10 kHz up from the bottom of the General bands. For certificate, send QSL and no. 10 SASE to Dr Wayne Henry Zemelka, KBØCIO, 1000 Brady St, Davenport, IA 52803.

East Greenwich and Providence, Rhode Island: The Providence RA and the New England Museum of Wireless and Steam will operate **W1NTE** 1400Z-2400Z **Sep 17** and 1600Z-2100Z **Sep 22** and **W1OP** 0000Z-0400Z **Sep 20** to celebrate their 70th and 25th anniversaries, respectively. Suggested frequencies: W1NTE—7.030; W1OP—14.290. For commemorative QSL, send SASE to New England Wireless, 697 Tillinghast Rd, E Greenwich, RI 02818.

Delaware, Ohio: The Delaware ARA will operate **W8QLS** from 1300Z **Sep 17** until 0100Z **Sep 18** and from 2300Z **Sep 20** until 0300Z **Sep 22** to commemorate the 44th running of the Little Brown Jug Harness Race. Suggested frequencies: 7.260 28.405. For special QSL, send QSL and SASE to DELARA, 398 N Old State Rd, Delaware, OH 43015.

Long Beach, California: The Aircraft Co ARC will operate **W6RNK** 1600Z-2000Z **Sep 23** to celebrate the first flight of the MD-11. Operation will be on 28.400. For special QSL, send QSL to Douglas Aircraft Co ARC, W6RNK, M/C 12-60 Attn: Dave Williams, 3855 Lakewood Blvd, Long Beach, CA 90846.

Butler County, Pennsylvania: The Butler County Public Service Group will operate **W3MMG Sep 23-24,** 1400Z-2300Z each day, to celebrate the annual Saxonburg Festival of the Arts. Suggested frequencies: SSB—lower 25 kHz of the General bands; Novice 10-meter band. For special QSL, send QSL and SASE to Jim Beir, W3MMG, 329 W Penn St, Butler, PA 16001.

Ocean City, Maryland: **NT3A/3** will operate **Sep 23-24** to commemorate the 15th annual Sunfest. Suggested frequencies: phone—3.903 7.233 14.323 21.413 28.313; CW—3.713 7.113 14.035 21.135 28.135. For special QSL, send QSL and business-size SASE to Sunfest, PO Box 120, Simpsonville, MD 21150-0120.

Illinois: The Lewis & Clark RC will operate **KC9GL** 1500Z-2100Z **Sep 24** during the Pride Inc's "Ride for Pride." Operation will be the lower end of the General phone band on 20 and 15, and Novice phone. For certificate, send QSL and no. 10 SASE to Lewis & Clark RC, PO Box 553, Godfrey, IL 62035.

Reading, Pennsylvania: The Reading RC will operate **W3BN** 1400Z-2000Z **Sep 24** to celebrate the historic Pagoda Skyline Festival atop Mt Penn. Operation will be SSB on 80, 40, 20, 15 and 10 meters. Contact 10 RCC members to qualify for special certificate. For commemorative certificate, send QSL and SASE to Reading RC, PO Box 13777, Reading, PA 19612-3777.

Tuscaloosa, Alabama: The West Alabama ARS along with the University of Alabama ARC will operate 1300Z-2300Z **Sep 30** honoring college football and Coach Paul "Bear" Bryant. Operation will be the bottom 25 kHz of the General bands. For commemorative certificate, send QSL and 9- × 12-in SASE to WAARS, PO Box 1741, Tuscaloosa, AL 35403.

Watertown, South Dakota: The Lake Area Radio Klub will operate **KEØDX** 1400Z-2300Z **Sep 30** in commemoration of South Dakota's centennial observance. Suggested frequencies: phone—3.890 7.265 14.265 21.340 28.340; CW—40 kHz up from the bottom of 80-10 meters. For QSL, send QSL and SASE to Lake Area Radio Klub, PO Box 642, Watertown, SD 57201-0642.

Green Bay, Wisconsin: The Northeast Wisconsin Radio League will operate **WF9H Sep 30** and **Oct 1,** 1500Z-2200Z each day, from the Colonial Militia Muster at Heritage Hill State Park. Suggested frequencies: bottom 25 kHz of General phone of 40, 20 and 15; 28.425. For certificate, send QSL and SASE to NEW Radio League, PO Box 10051, Green Bay, WI 54307.

Deadline: The deadline for receipt of items for this column is the 1st of the second month preceding the publication date. For example, your information would have to reach HQ by **October 1** to make the **December** issue. Please include the name of the sponsoring organization, the call sign of the special-event station, the city location, dates and times (Z), suggested frequencies and QSL information. Requests for donations will not be published.

QSLing Special-Event Stations: To get your QSL or certificate from any of the special-event stations listed here, follow these simple guidelines. (1) After working the station, carefully fill out a QSL card for the QSO. Show the date and time accurately using UTC. (2) Prepare a self-addressed, stamped envelope. If sending for a certificate, use a 9- × 12-in envelope if you want an unfolded certificate, or a no. 10 envelope if folds are acceptable. Include enough postage for return of your envelope. (3) Mail both your QSL and your SASE to the address listed, or to the address given on the air by the station you QSO. Be patient. Special-event stations will often print their cards and/or certificates after the operation is over so they will know how many to order.

Section News

Administered by Steven Ewald, WA4CMS

The ARRL Field Organization Forum

ATLANTIC DIVISION

DELAWARE: SM, Hal Low, WA3WIY—ASM: Walt Dabell, KD3GS. ASM: Bill Ryan, WB3DPJ. Congratulations to Mark Miller (WB3KIS) and the Skyline Middle School ARC. They were just awarded $500.00 from The ARRL Foundation to promote education through amateur radio. Mark has worked long and hard to get SMSARC off the ground and has about 50 signed members. Novice classes are under way and should be a fine source of new hams. Good luck Mark and keep up the good work. If you have questions or need help from the ARRL, there are several volunteers in the state you can turn to. The Section Manager or either of the two Assistant SM's listed above can be a good first source. If they can't answer your question or give help, they know where to look. Other major volunteer positions in the state are: Section Emergency coordinator: Carl Schufak, NS3G District EC/ New Castle County: Jim Lanahan, WA3PHT District EC/ Kent County: Richard Brannen, KA3JCA District EC/ Sussex County: Jim Richardson, N3EZY Section Traffic Manager: Bill Rutherford, KA3GRQ Technical Coordinator: Jim Sevast, AF3R Bulletin Manager: Bill Martin, KD3GB Public Information Officer: Bob Reinhardt, KC3OQ State Government Liaison: Bill Remington, W3XU Affiliated Club Coordinator: Hal Low, WA3WIY Not mentioned are Assistant EC's, Official Observers, Net Managers, Official Bulletin Stations, and Official Relay Stations. These people have volunteered their time to serve the needs of hams in Delaware. If you need them, they are there. If you would like to volunteer your time to help, contact the SM (see page 8) or either of the two ASM's. Net Report for March: DTN stns 343 tfc 33 in 23 sessns, DEPN stns 41 tfc 10 in 4 sessns, SEN stns 62 tfc 10 in 4 sessns. TOTALS: WB3DUG 34, K3YBW 32, WA3WIY 31, KA3GRQ 29, W3FEG 19, W3PVO 15, KQ5G 15, KD3GS 12. Late RPTS: Dec. W3PQ 75, Jan. W3PQ 45, Feb. W3PQ 50.

EASTERN PENNSYLVANIA: SM, Kay Craigie, KC3LM—ASM: WA3PZO, KA3A, KO3B, K3ZFD. SEC: KB3YS. ACC: KC3QB. OOC: W3IS. SGL: WA3IAO. STM, BM: KB3UD. PIO: W3ZXV. TC: W3FAF. Be sure to attend the York Hamfest, EPA's only 2-day fest, September 23-24. Eastern PA's roster of ARRL-affiliated organizations is pushing 70 with the addition of Delaware Valley Council of ARC's; the council represents 14 radio clubs in the Philadelphia area of EPA, SNJ, and DE. The many club newsletter editors in EPA do a lot to keep our clubs strong and growing. We salute Phil-Mont's W3PST, who "retired" earlier this year after 11 years on the job! Endless Mts. ARC's N3FYV is our youngest club paper editor, at age 13, and doing a fine job. On the Field Organization appointment list we now include OO's K3ITH and WA3PNY, and PIA N5IEP. Please note that appointment endorsement stickers are no longer issued. Your Field Organization appointment is valid as long as you maintain appropriate activity, report as required, and keep your ARRL membership current. If your appointment certificate is old and grungy, contact the SM for a nice, fresh one. Section Net schedule:

NET	FREQ	TIME	MGR
EPA	3610 kHz	7:10PM DY	AA3B
EPAEPTN	3917 kHz	6PM DY	WA3EHD
PTTN	3610 kHz	6:30PM DY	WB3EPU

The nets usually have some openings for Net Controls. Please let the Net Managers know if you can serve in even a backup capacity. Be sure to take part in your local ARES and RACES nets, too. It was fun to meet ORS's W3KOD and W3TWV at the Murgas hamfest. Congrats to ORS N3FGC on passing her Extra. We're happy to welcome W3NNL back to the traffic nets. On the down side, a fellow picked a radiogram off a packet BBS and phoned it to the addressee, who turned out to be a traffic handler. In return for his courtesy, the caller received a royal chewing out because the addressee doesn't approve of packet radio. What a warm welcome to NTS! Now, it's a free country, so everyone has a personal right to like or lump any operating mode. However, a healthy National Traffic System needs ALL modes and an open door to volunteers. It does NOT need bad manners. On a happier soapbox, are you ready for the PA QSO Party, October 7-8? The EPA vs. WPA rivalry should be hotter than ever, with several EPA clubs showing impressive growth last year. Okay, WPA, just try to take it away from us! This one's going to be fun. Traffic: N3AZW 587, W3JKX 156, N3CD 136, N3DRM 104, AA3B 96, W3DP 65, KA3DLY 61, W4UQ 44, N3EFW 43, W3NNL 36, KU3R 32, K3TX 26, WB3EVL 25, W3BNR 21, N3COY 20, W3AQN 15, N3FGC 14, W3CL 12, KA3MVM 11, KA3SKT 10, KA3RGF 9, W3ADE 8, W3VA 7, W3ZID 6, W3GJC 6, K3NB 4, W3HK 3. NETS (JUNE QNI/QTC): EPAEPTN 416/126, EPA 375/159, PTTN 180/65, SEPATN 74/12, D6ARES 82/6, D5ESN 82/7. @PBBS: @K3RLI 301, @WA3TSW 198, @WB3JOE 40.

MARYLAND: SM, Ken Cohen, NI3F—I've been in office for only five days; it has been a real eye-opener and lots of fun! Thanks for all those words of encouragement as well as your FD messages. You may contact me via packet at the W3IWI PBBS and Hugh, W3ABC, our Atlantic Director, at WA3ZNW. Thanks to W3FZV and KJ3E for sage advice. Certificates of Merit have been given to W3FZV and "AutoCall"—Congrats! Traffic reports should continue to N3EGF; all other 'standing orders' and appointments will continue. Thanks to WA1QAA for his faithful reports—an inspiration to others. Annual Storm Conference was held during May in Annapolis. Montgomery County RACES/ARES did their bit during power outages caused by severe weather. K2BSA will be on the air during National Scout Jamboree in VA, Aug. 2-8. Ham radio's thousand points of light will shine even brighter since the enactment of a new law limiting civil liability of volunteers working for nonprofit organizations—pop a cork! EC's are needed in the following counties: Caroline, Charles, Dorchester, Garrett, Hartford, Somerset, St. Mary's, Talbot, Wicomico. Any takers? This is an IMPORTANT job, and very rewarding, too! MEPN picnic promises to be fun. CU at Timonium! With the nets: NET/MGR QND/QTC/QNI: MSN/KC3Y 30/28/224, PON/WB3BFK 26/8/27, MDD/W3FA 60/212/433 (TOP BRASS W3FA/97, W3QQ/91, KC3Y/85, K3GHH/80), MEPN/k3RXK 31/154/698, HOCARES/WA1QAA 2/0/10, MAVEN/W3YVQ 0/0/0.
TRAFFIC W3IWI 540 (BPL), NC3V 262, KC3Y 177, K3RXK 134, KJ3E 126, NB3P 112, K3GHH 105, NR3Q 97, W3FA 87, KK3F 84, WA3YLO 62, K1BGT 41, K3ORW 41, N3EGF 40, K3USO 33, W3FZV 32, W3YVQ 30, WB3BFK 26, W3DQ1 23, KD3JK 23, N3GIY 12, WA1QAA 11, KA3DXX 8, N1FJW 8, KDOM 4, WA3GUW 4.
PSHR, KC3Y 101, W3FA 91, KJ3E 80, K3RXK 79, NC3V 73, WA3YLO 71.

SOUTHERN NEW JERSEY: SM, Richard Baier, WA2HEB—SEC: K2QIJ. STM: WB2UVB. ACC: K2IXE. TC: N2BOT. PIO: KA2RAF. SGL: VACANT. BM: WB2UVB. OOC: WA2HEB. ATC's: K2JF, KA2RJA and WB2MNF. VE testing by the DVRA on Sept 23. See May, 1989 QST column, page 109 for details. Testing will also be given in Bellmawr on Sept 21. See Jan, 1989 QST column for full info on this session. Field Day reports received from the following clubs; JSARS, OBARC, GCARC, GE Astro ARC, Burlington County RC and DVRA. Are you even moderately interested in traffic handling and are also working packet radio? Why not check your local PBBS for radiograms? If you use KB1BD-4, then you are checking into our section's PNS (packet nodes station). This is the place where traffic with NTSSNJ or SNJ zip codes in the "TO" field will be dropped. While traffic will be routed to the local PBBS, a lot of traffic gets listed on KB1BD before moving on. If this sounds like your cup of tea, don't be bashful, do an "LT" (list traffic) when you log in. If you would like more detailed information about this relatively new way to handle traffic, leave a message for KB1BD @ KB1BD-4. Also, don't forget to generate some outgoing traffic. What better way of helping test the system and doing a little public service work to boot? Until next month, 73. Traffic: WB2ZJF 191, WA2HEB 5.

WESTERN NEW YORK: SM, William W. Thompson, W2MTA—ACC: N2EH. BM: K2KWK. PIO: WA2PUU. SEC: NN2H. TC: K2QR. STM: N2EIA. SGL: WB3CUF. OOC: W2MTA (acting). ASM: W2GJ, W2GLH. PSHR: KG2D, N2EIA, N2EVG, WA2FJJ, W2FR, NN2H, KC2HJ, N2IKR, N2IYA, W2MTA, WB2OWO, KA2QOO, ND2S, NJ3V, K2YAI, W2YGW, KA2ZNZ. JUNE BPL: NJ3V.

NET	QNI	QSP	QND
NYSEMO	075	008	04
NYSR	009	002	03
NYS/M*	298	240	30
WDN/M*	383	151	30
NYP*	100	081	26
NYPON*	414	297	30
ESS	337	065	30
NYSPTEN	321	054	30
LCARES	020	000	04
OCTEN/E*	556	137	30
QNET	362	000	29
STAR*	251	105	28
WDN/E*	408	136	30
NYS/E*	297	221	30
BLUELINE	100	010	26
JCARCN	305	008	24
OARCN	062	003	04
TIGARDS	047	005	04
VHF THIN	030	000	04
ORTN	024	000	04
CNYTN*	238	039	30
OCTEN/L*	248	057	30
WDN/L*	360	079	30
NYS/L*	328	251	30

*NTS Net. New record for Field Day messages received by Section Manager at 19! KI2A, W2CXV, WA2DCL, K2ECQ, KG2F, W2FMM, KA2FCG, K2IQ, WA2L, W2LZ, K2MP (28th annual) W2OFQ, W2OW, W2PE, W2QYV, W2RUI, W2SB, AI2W, KA2WFT (Lafayette High School). W2OW celebrates its 70th year as a club this year. K2MP thinks the band-dit-dahs have completed 27 (or so) Field Days. Some reported RACES members and not ARES members . . . guess there is no difference, we will accept the count . . . but messages received with no text were not counted. The FD station in WNY sending "QLF" on 40 meters Sunday now knows who you were working . . . hil N6IN operating at W2OW had FB monitor note from keyer but when all kept sending "LID", he found that the rice box could not handle high speed keying hit CLUB OFFICERS: GRAM KC2RF, KA2OQZ, WA2AIV, KA2OVA; Lockport KB2CXM, KE2NC, KA2ZTO, K2BXS; RAWNY KA2NYS, WA2FKV, KA2IWK, WB2OWS. The Southern Tier lost an FB operator when W2UWD became a silent key; Bob was an early member of BARA and an officer of the QCWA Chapter 28 of Central New York. OO report from KA2MOO laments the goings on heard on 20 SSB near 14313. Recently a member's observation was passed along to the SM about support for the League and Amateur Radio in general. He said, "Sell the organization . . . the League needs a Sales Department". What do you think? Let's put the adventure back into HAM RADIO! Traffic: (June) NJ3V 511, W2MTA 462, N2EIA 459, WB2OWO 426, WA2FJJ 307, KC2HJ 225, ND2S 174, W2FR 171, KA2QOO 107, K2YAI 101, NN2H 98, KA2DBD 97, KA2ZNZ 92, KG2D 86, N2DLN 68, N2IYA 63, KA2SJG 61, WB2QIX 55, WB2NLU 52, WB2OEV 49, N2IKR 39, AF2K 31, W2UYE 28, KA2TWY 15, W2PPS 14, KA2DQA 12, N2EVG 10, WA2OEP 8, KA2JXI 3. HAMFESTS: Liverpool (LARC) September 16; Horseheads (EARA) September 30; Syracuse (RAGS) October 14—have a great Fall!

WESTERN PENNSYLVANIA: SM, Otto L. Schuler, K3SMB—SEC: WA3UFN. STM: NO3M. BM: KC3ET. TC: N3EFN. ACC:

NET	QNI	QTC	SESS	kHz	T/D	MAN
WPACW	202	113	30	3585	7:00P/D	WA3UNX
WPAPTN	346	96	30	3983	6:00P/D	WA3HLN
KFN	92	58	22	3983	1:30P	KA3OEM
PFN	167	167	30	3958	5:00P	WA3THT
WPA2MTN	235	38	30	28/88	8:00P/D	KA3BGC
NWPA2MTN	605	41	29	53/45	9:00P/D	KC3NY

I regret to announce a silent key W3SE of McMurray. Our sympathies are extended to his family. The McKean County ARC provided communications for the Debbie Chambers Memorial ride in Olean N.Y. About $9,000 was raised for cancer. Although the race took place in New York a Penna club was involved. Amateurs providing communications were NJ3K, KD3LJ, N3ELT, N3FVM and KA2HJC. Field Day was very active. I received reports from Horseshoe ARC with 14 Operators present, NR3T reporting. McKean County ARC W3VV reports 17 ops present. AC3J reports for the Triple "A" with 45 ops present most of the time, they apparently never ran out of help. KA3QFD reports for the Uniontown ARC 19 members present 9 ARES. W3LIF reports from Buhl Farm with Mercer Cty ARC. No details given. W3VI reports for the Huntington ARC Weaver Heights, 12 ops present 9 ARES members. KA3KDU reports for the Two Rivers ARC at White Oak Park, 30 ops present 15 ARES. The North Hills ARC was located on the property of the North Hills Library. This was a good way to get our message out to the public. We had about 50 people on the site at various times. About 25 were club members. Several candidates for Novice classes to be held soon. Traffic: (June) KQ3T 279, N3FM 245, N3EMD 241, NO3M 155, WA2QXA 102, W3NGO 87, WA3DBW 83, WA3UNX 83, N3AES 76, W3OKN 70, K3SMB 46, W3RUL 30, WA3HJC 29, KC3YE 28, NR3T 10, KA3EGE 6. Traffic: (April) N3FM 212. Traffic (May) KQ3T 317.

CENTRAL DIVISION

ILLINOIS: SM, Dave Carlson, AA9D—SEC: W9QBH. BM: K9EUI. ACC: WB9SFT. STM: K9CNP. SGL: K9IDQ. TC: N9RF. OOC: W9TT. PIO: W9EWA. DEC: WD9EBQ.

NET	FREQ	TIME
ISN	3905	1800 DAILY
ILN	3690	1830, 2200 DAILY
ITN	3705	1900 DAILY
CTN	147.69/09	2100 DAILY
ILARES	3905	1630 1ST, 3RD SUNDAYS
IEN	3940	0900 SUNDAYS
ILPN	3855	1645 M-F; 0830 SUNDAY
NCPN	3915	0700 M-SAT
NCPN	7270	1215 M-SAT

Post Field Day Greetings! I hope that all went well with your FD operation. I received FD messages from more than two dozen groups. There was, however a slight problem. The great majority of the FD messages I received would not qualify for the bonus because they did not include the correct information. Most were not even close, indicating that the originator didn't take the time to read the FD rules. Others were sent either before or after the FD period! For shame, people! You can do better than that! If FD was a contest. . . KB9CIN, N9IIH, N9III, WB9MRL, and N9FWM handled communications for the Naperville Cystic Fibrosis 10K Walk. WV7T, KB2BZY, N9HPZ, WB9OWC, W9NLT, and K9APE helped with crowd control at the Great Lakes Naval Air Station Glenview Air Show. R.A.M.S., the Radio Amateur Megacycle Society is sponsoring the annual Illinois QSO Party. This year's contest runs from 1800Z October 8 to 0200Z October 9, 1989. For more information and/or entry forms, contact Joe LeKostaj, WB9GOJ, 9134 Ewing Ave., Evanston, IL 60203. Traffic: KA9FEZ 399, W9HOT 184, W9HBI 162, W9HLX 133, WA9VLC 97, K9CNP 65, WD9HQW 64, W9OBU 60, KA9CTW/T 46, KA9QXI 46, WB9TVD 45, W9LWH 44, KA9JNE 38, WD9CIR 35, W9KR 34, NC9T 32, WA9SLT 18, KA9TVU/T 14, KA9UEX 14, W9VEY/M 8, WA9AXL 6, WA9RUM 6, K9EHP 4.

INDIANA: SM, Bruce Woodward, W9UMH—SEC: WD9AVQ. STM: WA9OHX. ACC: K9ZBM. TC: WA9JWL. SGL: WA9VQO. BM: W9OCL. PIO: N9IPA. OOC: KJ9G. Net Managers: ITN KA9EIV, QIN KJ9J, ICN KD9ER, VHF W9PMT, IWN KA9ERC. JUNE Net Reports:

NET	FREQ	TIME	DAILY	UTC	QNI	QTC	QTR	SES
ITN	3910	1330	2130	2300	2625	438	2217	90
QIN	3656	1430		0300	341	189	1800	58
ICN	3705	0100			48	17	306	18
IWN	3910	1310			1364		296	30
IWN VHF Bloomington					770		145	30
IWN VHF Kokomo					943		185	30
IWN VHF Ligonier					758		138	30
Hoosier VHF NETS (19)					4861	98	4581	225

D9RN for June 334 QTC 80 ses. IN 95% by WA9OHK, K9ZLS, W9UEM, K9CGS, K9GBR. CAND 568 QTC in 31 ses. D9RN 100% by NR9K, K9ZLS. Early Bird Wet Net Report for JUNE WA9OKK 318 QTC in 1800 minutes and 22 ses. There were not as many Field Day messages sent to the SM this year but the activity was universal and everyone had a good Field Day. W9ZRX reports 341 NTS messages relayed during June out of a total of 5078 personal messages and bulletins. This means 341 messages in and out of Indiana (W9ZRX is our gateway). A Nazarene Church convention in Indianapolis helped the totals along. Congratulations and thanks to the amateurs involved. So few amateurs seem to understand packet traffic handling even with an active packet station. The past month has not been a happy experience for me on packet. Most packet BBS operators did not turn in a report this month. OO reports: KA9QYK, N9GHT, AG9S, N9GSX, KJ9G, WA9VLR, and WF9B. EC reports: N9DUZ, WD9X, K9OIZ, KA9RTD, KA9EIV, W9CNE, W9YDP, N9ENC, N9FMO, KA9DZM, KA9OOH, KD9HB, WD9BKA, W9KGE, KA9VNK, WB9LRR, KD9ZN, N9DTG, WA9OQT, WA9HEE, WB9NCE. Packet BBS

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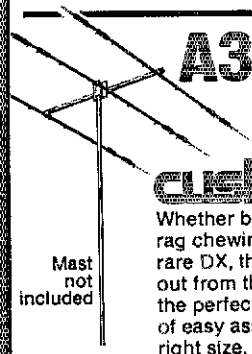

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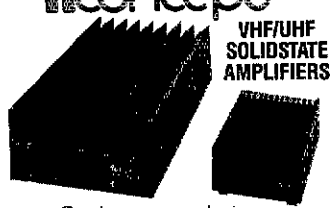

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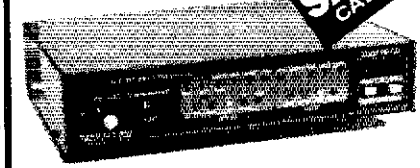

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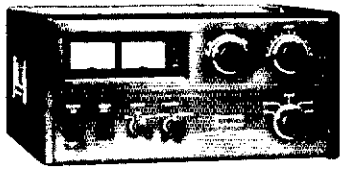

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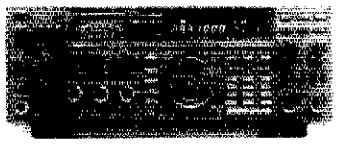

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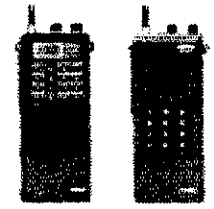

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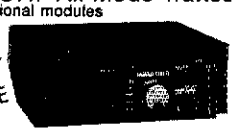

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Reports: W9ZRX 5078, N9BAC APRIL 560, MAY 497, JUNE 474. Public Service Reports: Jefferson County, WB9AHJ Hanover Community Days Parade. Trimble County Fair 5k race. Madison Courier 10 k walk/race. Marion County, Senator Richard Lugar Fitness run/walk. "500" Mini-Marathon N9FOZ 146.10/70 monitor program. 436 hours reporting 5 accidents, 3 traffic signals, 7 road hazards, 3 train crossing lights. Traffic: NR9K 387, KJ9J 143, KB9SU 128, W9UMH 105, W9UEM 100, W9ZGC 92, WA9OHX 91, K9ZLS 62, WD9JAA 54, K9GBR 51, WA9QCF 44, WB9QPA 44, K9FEI 41, N9DWU 32, W9PPO 31, K9ZBM 29, WD9HII 26, N9HZ 28, N9DTG 20, K9ABW 18, W9PMT 15, KB9HH 14, WD9DWD 14, N9BS 14, W9OZJ 14, WB9OZZ 13, WB9NCE 12, KA9RTD 12, WB9JUV 12, WB9IHR 11, KB9GK 11, W9KHK 7, K9DIY 7, W9KMY 6, N9ENC 6, W9BTZ 5, WD9X 5, N9FMO 4, WA9OKK 4, KE9MM 4, WD9CIV 4, NZ9S 3, W9XD 3, K9DUP 3, W9RTH 3, WB9AJY 2, WB9AHJ 2, W9YDP 1, WA9OIZ 1, KA9MUU 1.

WISCONSIN: SM, Richard R. Regent, K9GDF—SEC: W9ZAG. STM: KC9CJ. ACC: KA9FOZ. BM: WB9JSW. OOC: NC9G. PIO: K9ZZ. TC: K9GDF. N9GHZ, now Emergency Coordinator of Taylor County, has also volunteered to be EC for Clark County. N9IKP is new District Emergency Coordinator for Central Wisconsin. N9AW has interesting semi-automatic key collection and is looking for more keys. Milwaukee Radio Amateur's Club has amateur radio classes held August 30th through November 15th on Wednesdays, 7:30 P.M., at Wauwatosa East High School, contact KE9JJ for information. MRAC exams will be on September 6th. Fox Cities ARC held their first Field Day at Clayton School with much success. Green Fox ARC has made progress on their communications trailer. WB9ZRE is very active in hot-air ballooning. W9UGT, at the QCWA Chapter 55 junk-box auction in Wisconsin Rapids, got best bid for a barometer, held it up to his ear and said "It doesn't tick". Listen for new Waupaca repeater on 145.41 MHz. WNA Picnic and Fall Meeting, September 9th at North Wood County Park, west of Wisconsin Rapids; K9FHI of prize committee will have some surprises; everyone is welcome. Net Managers should send monthly net reports to KC9CJ; the traffic offered category is now optional. WIN/L W9NGP has seven regular check-ins and Ed says "That's just enough to fill NCS slots for the entire week." Ed and the gang would enjoy hearing others on the net too. Taylor County ARC donated over $750 worth of Amateur Radio books and materials to libraries and completed their new Directory of area amateurs. W9NJH developed interesting idea for rotary coil antenna coupler. Observation of the month: Asking dumb questions is easier than correcting dumb mistakes. Traffic: WB9YPY 2094, KC9CJ 878, WA9W 560, WG9J 503, W9YCV 278, W9CBE 243, K9GDF 217, W9CXY 193, W9KLN 146, N9BDL 117, KA9BHL 114, KA9KLZ 112, W9UCL 77, AG9G 73, WA9WYS 67, K9AKG 58, W9IEM 53, AD9X 52, W9NGP 44, NS9Q 41, WB9ICH 37, K9FHI 37, KA9FVX 63, KE9LX 30, KG9B 29, W9ODV 25, K9UTQ 24, KA9VIA 20, K9EP 20, K9BED 7.

DAKOTA DIVISION

MINNESOTA: SM, George Frederickson, KCØT—Well, let's see— we've had Field Day, Grandma's Marathon, Bike-a-thons, Hamfests, Parades, Regattas, celebrations—all involving the good services of Ham Radio, namely through the various clubs, throughout Minnesota. SKYWARN, fortunately, has had a relatively easy time of it so far, for the most part. And the beat goes on with NTS and our Minnesota Nets although band conditions haven't always been cooperative. Only one daytime session had to go by the boards—not bad, really. A big welcome back to Si, NØDPF following his recent stint in the hospital. He says he is doing well and we sure hope so. One thing is certain and that is that NTS traffic will pick up now that Si is back at it! Congratulations to George Frederickson, KCØT, SM for being chosen as the Minnesota Amateur of the Month for June. It was decided that it was about time that George got some kind of recognition to let him know from all of us what a great job he does as Section Manager. Not only for the month of June but for twelve months of the year as well. Thanks George and thanks to all MSN participants for the great work. Traffic held up quite well with a total of 2,472 and 17 stations reporting. Until next time, 73 es GL. Jim Swisher, KAØEPY, STM.

NET	FREQ	TIME	QNI	QTC	SESS	NETMGR
MSN/1	3685	6:30P	273	90	30	KAØEPY
MSN/2	3685	10:00P	228	54	30	KDØNH
MSSN**	3710	6:00P	300	30	30	KAØSBY
MSPN/N	3860	12:05P	243	167	29	WBØWNJ
MSPN/E	3860	5:30P	568	212	30	KCØT
PAW	3929	9:00A	No Report for June			

**Additionally MSSN sent 14 training messages. Alt. Freq. MSN/1 and MSN/2—7070; MSPN/N—7232. Traffic: WBØWNJ 1012, WAØTFC 354, KAØEPY 241, WØGRW 192, WØDM 118, NØFOO 100, NRØS 86, NFØG 54, KAØPDM 52, NØJP 49, KAØSBY 45, KAØARP 44, WDØGUF 38, KCØT 34, KDØNH 34, WFØQ 12, KØOGI 7.

NORTH DAKOTA: SM, Bill Kurtti, WCØM—As I write this we are at the Peace Garden Hamfest, just back from the PARTY OF CENTURY at Bismark, after helping out with the Bus dispatching (Sure hope NØIWS is staying home making the hay). More on that next month. Congratulations to WØRRW on receiving his PHD from NDSU, also to KFØDD on his new call. KCØSD has been spearheading the drive to link the repeaters at Barnsville, Fisher and Karlstad with the superlink. That project is now in operation. Now the next addition will be to link the Minneapolis area to the system in operation here. Let me know what you are doing or planning so I can get your work for ham radio into the section report. The Goose River net had been moved back to Sunday morning at 9 a.m. tnx to NTØV for becoming our new Net control.

NET	FREQ	TIME	SESS/QNI/QTC	MGR
GOOSE RIVER	1990 kHz	9AM SU		NTØV
DATA	3941 kHz	6:30 DA	30/419/22	NØIJR
WX NETS	3941 kHz		0/0/0	WOGFE
WINTERS ONLY		9AM 12:30PM	Monday-Friday	
STORM NET	3941kHz	DURING STORMS	ONLY	WCØM

SOUTH DAKOTA: SM, R. L. Cory, WØYMB—ASM: NØABE, WAØFPR. SEC: KAØKPY. STM: KDØYL. On June 17 WØYMB, NYØX KCØLI and WBØYDG set up a station at the West River Wagon Train at the Moreau River south of Isabel and 52 contacts were made during the short time that we were there. My congratulations to the Pierre Amateur radio club on there affiliation with the ARRL. Field Day messages received by SM for extra points were from Huron ARC, Hot Springs ARC, Hub City ARC at Aberdeen and Lake Area ARC at Watertown. As of July 5th the East River Wagon Train has logged 2300 contacts so it is going very well. Mobridge DIGI is back in operation. NYØX installed a new beam and with very high gain and it hits Glad Valley all the time and often gets into Terry Peak. Traffic: KDØYL 33, KAØKPY 30, WØMZI 46, KØAIE 40, KØERM 56, WØYMB 13.

NET	SESS	QNI	QTC	NETMGR
SD MORNING WX NET	25	832	148	WØHOJ
SD NJQ NET	30	597	12	KDØYL
SD CW NET	22	108	39	KØERM
SD NOVICE NET	4	16	0	KDØYL
SD SUN EMG NET	4	44	1	KEØIR
WALWORTH CTY NET	4	18	4	WØYMB
SD QCWA NET	4	27	3	WØHOJ
NE SD 2M NET	4	75	2	KDØYL
TRI-STATE 2M EMG NET	4	47	0	WØHOJ

DELTA DIVISION

LOUISIANA: SM, John "Wondy" Wondergem, K5KR—ASM: KB5CX. SEC: N5ADF. ACC: K5KR. SGL: KD5SL. TC: W5RWF. OOC: WB4ICV. PACKET: WB5ASD. SNM-CW: WB4FDT. The False River Repeater Assoc. newly elected officers are: Pres: Roch, N5CLW. Sec: J.B., N5JDE. Treas: Jay, N5NXI. Their newsletter is much appreciated. A big congratulations are in order for Cyndi Gauthier, N5KLQ of the Central La. ARC for winning the $1000 scholarship awarded annually by the Dayton, Ohio ARC to the amateur operator/student for top academic achievement in world-wide competition. Members of the Rosedale Repeater Assoc. and several Baton Rouge amateurs did an outstanding performance in providing emergency communications for the June 8 Grosse Tete tornado disaster. The first report came from N5NQN on W5OVV/R within minutes KB5HPQ, KG5SG, KB5FZZ and KB5DYV were there. Calls for emergency help and welfare messages went out on autopatch, landlines and the 79 quick-dial patch in Baton Rouge. Relays and phone calls were made by KB5DLS, KB5FZQ, W5OVV, WB5SLK and others. Area traffic was handled in the first few hours by KB5GUJ, KB5HGE, KB5EKL and others. In Baton Rouge, Red Cross stations were activated by KF5NA, KA5JPH, KA5LEB and others. Over 50 amateurs participated for 4 days & 2 nights. Congratulations to the Louisiana Council of ARC officers elected during the Lafayette Hamfest. Chairman: Ed, KB5CX. Vice Chairman: Sam, KB5VC. Sec/Treas: Al, W5OVV. 73 & GL de "Wondy", K5KR.

TENNESSEE: SM, Harry Simpson, W4MI—Eastern Assistant SM and PIO W4TYU, Central Assistant SM WA4GLS, Western Assistant SM and ACC K4CXY, STM: NG4J. SEC: K4UVH. OOC: K4LSP. SGL: N4POY. TC: W4HHK. The TN Phone Net is on 3980 kHz with early sessions at 6:40 AM Eastern. Regular sessions at 7:45 AM Eastern Monday thru Friday, at 9 AM Eastern on Saturdays, Sundays and Holidays. Evening sessions are Monday thru Saturday at 7:30 PM Eastern. CW Net Sessions are on 3635 kHz at 8 PM Eastern, Monday thru Friday. It is with deep regret that we record the passing of Charles West N4HWH of Manchester, Jesse Ballard K4SSX of Nashville, Harry Carroll W4AEE of Madison and Hugh Russell WA4SJV of Newport. They will all be missed by their host of friends. This column is dedicated to traffic nets and traffic handling, but net people go to hamfests, too! We have some good ones—no, great ones!—coming up in October. Memfest '89 will be held at the Memphis Fairgrounds on October 14-15, complete with ARRL forums, VE exams, an Army MARS meeting, etc. Tri-Cities Hamfest will be the next Saturday, then Chattanooga on the following weekend. I will see most of you at one or the other of those events. DRN5 Net Manager WB5YDD reports that net had 60 sessions and handled 478 messages. TN was represented on 70% of the sessions by K4WWQ and NG4J. KA4MNH reports that the West TN WX Net held 28 regular sessions, three emergency sessions and a total of 915 QNI and 462 QTC. Traffic: WA4FMR 135, KA5KDB 47, W4MI 48, W4TYV 46, WB4LAL 43, W4DDK 34, WA4GZZ 34, K4WOP 32, W4PFP 21, K4CXY 12, WA4HKU 9, W4EWR 4.

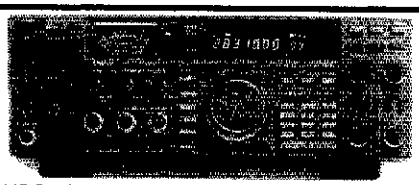
GREAT LAKES DIVISION

KENTUCKY: SM, John Thernes, WM4T—ASM: KC4WN. SEC: WB4NHO. STM: KA4MTX. PIO: WA4SWF. (June) This month the big story was Field Day! Your SM received Field Day messages from the following stations: W4NJA, KI4B, KM4CH, WA4ZVL, KD4SS, AB4Y, KA4VFI, K4CSH. Congrats to NKARC for another very successful Ham-O-Rama. See you at the Louisville Hamfest in late September. I have replaced the KY Section News with a one page newsletter called "Club Corner" which will be mailed to affiliated clubs on a more regular basis. If your club did not receive a copy by the time you read this, send me the club address for the next mailing.

NET	QNI	QTC	SESS	MGR
MKPN	1265	160	30	WD4RWU
KTN	659	86	30	WD4RWU
KYN (BOTH)	258	106	59	K4AVX/KZ8Q
TSTMN	334	27	30	KZ8Q
KNTN	192	65	38	WA4EBN
KRN	533	17	30	K4NLY

Traffic: (June) WD4RWU 287, K4VHF 119, KI4QH 71, WA4EBN 51, KC4WN 49, KB4UJA 42, K4AVX 32, N4LAF 29, KA4MTX 28, WA4HLW 12, W4TPB 12, WB4AUN 12, N4PEK 9, WA4NOG 6, WD4CQF 5, KU4A 4. PSHR: KI4QH 97, KC4WN 75.

MICHIGAN: SM, George E. Race, WB8BGY—@ N8FTY, ASM: WA1LRL @ WA1LRL. STM: WD8KQC @ NT8R. SGL: N8CNY. TC: W8YZ. OOC: WA2AJQ. ACC: N8JVA. PIO: N8KBA. BM: WI8W. How quickly the summer seems to go by. Our fall ARPSC workshops will be held in Gaylord on Sept 9th, and Lansing on Sept 23rd. If you are a DEC, EC, AEC, or NTS Net Manager your attendance is requested. These full day workshops will prepare you for the annual SET being held this year on Oct. 21-22. Please feel free to bring anyone from your group. Don't forget to invite your local served officials. Anyone with an interest in the SET is also invited to attend as well. As always some surprises, training sessions, and lots of handouts will be provided by your Section Staff. My thanks to retiring EC of Gratiot Co. Wells Chapin, W8GI, for a job well done. New EC appointments for the following Counties: Ed, WB8YIG-Alpena, Walt, N8DKI-Bay, Norm, WA8AEG-Gratiot, Joe, K8YZA-Lenawee, Tim, KA8YWV-Alcona, Harvey, WT8J-Arenac. Welcome to the group, I hope you can all make one of the ARPSC workshops. Jackson Co. EC, KA8VLN, reports 15 new certified RACES members have joined the group. September swaps; L'Anse Creuse, Sept 17, Adrian, Sept 24. Field Day reports indicate the event was a big



HF Equipment	Regular	SALE
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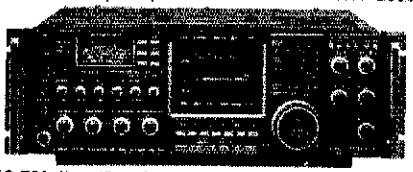
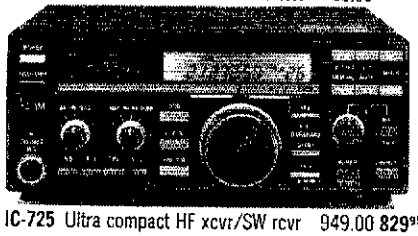


IC-781 Xcvr/Rcvr/ps/tuner/scope	6149.00	5295
IC-761 Xcvr/Rcvr/ps/tuner *(Closeout)*	2699.00	2295
HM-36 Scanning hand microphone	47.00	
SP-20 Ext. speaker w/audio filter	149.00	139.95
FL-101 250 Hz 1st IF CW filter	73.50	
FL-53A 250 Hz 2nd IF CW filter	115.00	109.95
FL-102 6 kHz AM filter	59.00	
EX-310 Voice synthesizer	59.00	
IC-751A 9-band xcvr/.1-30 MHz rcvr	1699.00	1469
PS-35 Internal power supply	219.00	199.95
FL-63A 250 Hz CW filter (1st IF)	59.00	
FL-52A 500 Hz CW filter (2nd IF)	115.00	109.95
FL-53A 250 Hz CW filter (2nd IF)	115.00	109.95
FL-33 AM filter	49.00	
FL-70 2.8 kHz wide SSB filter	59.00	
RC-10 External frequency controller	49.00	
IC-735 HF transceiver/SW rcvr/mic	1149.00	999.95
PS-55 External power supply	219.00	199.95
AT-150 Auto. antenna tuner *(Special)*	445.00	369.95
FL-32A 500 Hz CW filter	69.00	
EX-243 Electronic keyer unit	64.50	
UT-30 Tone encoder	18.50	



IC-725 Ultra compact HF xcvr/SW rcvr	949.00	829.95

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IC-4KL HF 1KW out s/s amp w/ps	6995.00	5999
EX-627 HF auto. ant. selector *(Special)*	315.00	269.95
PS-15 20A external power supply	175.00	159.95
PS-30 Systems p/s w/cord, 6-pin plug	349.00	319.95
MB Mobile mount, 735/751A/761A	25.99	
SP-3 External speaker	65.00	
SP-7 Small external speaker	51.99	
CR-64 High stab. ref. xtal for 751A	79.00	
PP-1 Speaker/patch	179.00	164.95
SM-6 Desk microphone	47.95	
SM-8 Desk mic - two cables, Scan	89.00	
SM-10 Compressor/graph EQ, 8 pin mic	149.00	139.95
AT-100 100W 8-band auto. ant. tuner	445.00	389.95
AT-500 500W 9-band auto. ant. tuner	589.00	519.95
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UT-16/EX-388 Voice synthesizer	34.99	
SP-10 Slim-line external speaker	35.99	
IC-28A 25w 2m FM, TTP mic *(Special)*	469.00	379.95
IC-28H 45w 2m FM, TTP mic	499.00	439.95
IC-38A 25w 220 FM, TTP mic	489.00	349.95
IC-48A 25w 440-450 FM, TTP mic	509.00	449.95
HM-14 Extra TTP microphone	59.00	
UT-28 Digital code squelch	39.50	
UT-29 Tone squelch decoder	46.00	
HM-16 Speaker/microphone	34.00	
IC-228A 25w 2m FM/TTP mic *(Special)*	509.00	429.95
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UT-40 Pocket beep function	45.00	
IC-900A Transceiver controller	639.00	569.95

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UX-59A 6m 10w unit	349.00	319.95
UX-129A 1.2GHz 10W band unit	549.00	499.95
IC-1200A 10w 1.2GHz FM mobile	699.00	599.95
IC-2500A 440/1200MHz FM mobile	999.00	869.95
IC-3210A 25w 2m/440 FM/TTP	739.00	649.95
AH-32 2m/440 Dual Band antenna	39.00	
AHB-32 Trunk-lip mount	35.00	
Larsen PO-K Roof mount	23.00	
Larsen PO-TLM Trunk-lip mount	24.70	
Larsen PO-MM Magnetic mount	24.70	
RP-1510 25w 2m repeater	1849.00	1649
RP-2210 220MHz 25w rptr *(Special)*	1649.00	1399
RP-1210 1.2GHz 10w 99 ch FM rptr	1529.00	1349

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Aircraft band handhelds	Regular	SALE
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BC-16U Wall charger for BP7/BP8	21.25
LC-11 Vinyl case for Dlx using BP-3	20.50
LC-14 Vinyl case for Dlx using BP-7/8	20.50
LC-02AT Leather case for Dlx models w/BP-7/8	54.50

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BP-5 425mah/10.8V Nicad Pak - use BC35	65.00
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DC-1 DC operation pak for standard models	24.50
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HS-10SB PTT unit for HS-10	24.50
SS-32SMP Commspec 32-tone encoder	27.95

For other HT Accessories not listed please CALL

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RC-11 Infrared remote controller	70.99	
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FL-63A 250 Hz CW filter (1st IF)	59.00	
FL-44A SSB filter (2nd IF)	178.00	159.95
EX-257 FM unit	49.00	
EX-310 Voice synthesizer	59.00	
CR-64 High stability oscillator xtal	79.00	
SP-3 External speaker	65.00	
CK-70 (EX-299) 12V DC option	12.99	
MB-12 Mobile mount	25.99	
R-7000 25MHz-2GHz rcvr *(Special)*	1199.00	999.95
RC-12 Infrared remote controller	70.99	
EX-310 Voice synthesizer	59.00	
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success in MI. Sounds like everyone had a great time. I had the opportunity to visit several sites. It looked to me like good food and lots of activity were in order for all who attended. What's this I hear about Marion, WA8MFL, sounds like he acquired a new Field Day title. If you hear him on the bands, don't forget to ask him about it. My congratulations to the Michigan Novice Net on the fine job they continue to do. Your monthly traffic totals and participation show how popular this net has become in the Section. Keep up the great job! A very last minute reminder, don't forget to attend the Five County Swap and MI State Convention being held in Saginaw on Aug. 26-27. Join us for the Wouff Hong Ceremony at the Florentine Inn Convention HQ on Sat. evening. Hope to see you all there.

NET	FREQ	TIME/DAY	QNI	QSP	SESS	MGR
UPN*	3921	5:00PM DY	903	58	34	WA8DHB
MACS*	3953	11:00AMM-SA	276	50	30	K8OCP
MITN	3953	7:00PM DY	506	186	30	WD8EIB
QMN*	3663	6:00PM DY	252	54	59	WB8R
MNN*	3722	5:30PM DY	132	62	58	KA8BBY
SEMTN	145.33	10:15PM DY	394	85	29	N8HSC
GLETN	3932	9:00PM DY	1041	71	30	NW8M
W8SBN	3935	7:00PM DY	382	31	30	W8NDI
VHF NET ACTIVITY						NO8Q

*QMN Fast-6:30PM Dy; QMN Late-10PM Dy; MNN Late-8:00PM Dy; MAC8- 1PM Sun; UPN-12PM Sun. Traffic: KA8CPS 372, KA8BBY 252, KN8JDN 212, N8FTY/BBS 204, WD8KQC 136, N8JAT/BBS 85, WB8YDZ 84,K8GXV 66, NW8M 60, WB8SYA 55, WA8DHB 52, WD8MJB 51, WB8R 47, N8HSC 44, N8IIC 43, N8CNY 42, W7LVB 41, WB8YPG 40, K8UPE 34, WD8EIB 33, KA8BYK 33, N8FPN 31, NY8W 28, W8EOI 28, K8OCP 24, K8CQF 22, K8ZJU 21, WB8BGY 15, K8HAP 13, W8IHX 13, KI8Q 13, WA8MVH 12, N8HWO 12, WT8J 12, KA8LAR 11, W8VIZ 10, WB8WJV 8, N8IQS 6, W8CSO 4, W8URM 2.

OHIO: SM, John Haungs, WA8STX—Ph: (513) 563-7373. ASM: David Kersten, N8AUH, Ph: (216) 221-6740. SEC: WD9MPV. STM: KF8J. ACC: KJ3O. ACT.BM: W8PH. TC: KB8MU. OOC: WB8ZCE. SGL: N8CVK. PIO: K8QOE.

NET	QNI	QTC	SESS	TIME(LOCAL)	FREQ	MGR
BN(E)	196	100	30	1845 DY	3.577	WD8C
BN(L)	184	75	30	2200 DY	3.577	K8TVG
BNR	198	67	30	1800 DY	3.605	W8EK
OSSBN	1517	628	90	1030,1615,18453	3.9725	N8IBS
OSSN	230	107	30	0645 M-F	3.577	KD8HB
OSSN	---	---	---	0800 S-SU	3.577	KD8HB
OSN	232	57	30	1810 DY	3.708	WD8KBW
O6MN	---	---	---	2100 M-W-F	50.16	WD8CTX
OHIO SECTION ARES NET				1700 SUN	3.875	WD8MPV
OHIO SECTION WX NET				A/R	3.875	WD8MPV

The Ohio Area Repeater Council has made changes in the Board of Directors. Clifford E. Bade, W9CJB, of Olmsted Falls was elected by the full OARC membership to a five year term. He replaced Jack Foster, K8DYD of Cincinnati, the first Director to serve the full five year term since reorganization. Jack will continue to serve as area four coordinator (Cincinnati & Dayton area). Bill Creighton, K8TUT, Athens, is the new Chairman of the Board of Directors for OARC. Bill has been a Director for four years and takes the gavel from George Waldie, W8JRL, of Mt. Gilead. Waldie continues to serve as a Director and was recently named National Editor of the Repeater Coordinators Newsletter, published by the ARRL. Field Day reports from 22 participating clubs showed that 396 operators (300 ARES members) were active this year. NOARS, OHIO VALLEY ARA, FINDLAY ARC, OHIO STATE UNIVERSITY, CUYAHOGA FALLS ARC, INDIAN HILLS RC, CRES ARC, QCEN, TOLEDO ARC, MEDINA TWO METER RC, MERCURY MIDWEST RC, PORTAGE ARC, MASSILLION ARC, THE RESERVOIR ARA, SOUTHERN OHIO ARC, WAYNE COUNTY ARTS, ORRVILLE ARS, OH-KY-IN ARS, SCARES, COLUMBUS ARA and EASTERN OHIO AMATEUR WIRELESS ASSN. qualified for the additional 100 points. Just a reminder that actual emergencies are a little different than a simulated emergency test. The Amateurs need to protect themselves and move if they see an impending danger approaching, such as a Chlorine gas cloud. The objective is to provide communication for Civil Defense not for the agency which has caused the disaster. For FCC Exams scheduled in the Section contact your Section Manager or ARRL HQ. Check the Hamfest Calendar Section for events going on, and we hope that everyone has a great summer Hamfest season. Traffic: KD8HB 296, K8TVG 262, W8PMJ 250, KD8KU 234, W8BO 203, W8SKP 176, WD8IKC 162, WA8SSI 147, K8JDI 147, N8IIP 145, WA8STX 141, KF8J 137, N8FWA 136, KE8CV 127, KA1S 109, W8LDU 107, W8ZOL 104, KA8HBN 102, W8QZK 94, W8EK 90, WA8HED 79, WA8EYK 69, KC8TW/BBS 68, WD8KFN 64, KC8NM 64, WB8FSV 60, WD8KBW 56, W8JLW 55, K8ALV 55, NC8Q 54, W8VND 46, K8DHD 42, N8EX 42, KA8BNQ 41, KA8SON 37, KA9ODX 36, N8XX 35, KA8CGF 33, K8ES 33, WB8DPZ 32, N8JSN 32, N8INP 31, N8CEI 29, WB8HHZ 28, N9AUG 28, N8GOB 26, N8EFB 25, WD8RAO 24, K8IOW 23, KB8ABO 23, NS8C 23, WB8VNV 23, NW8D 23, K8WZX 19, WD8CSP 18, KB8AKW 17, KB8ESU 16, W8BDC 14, N8AJU 12, KA8RQF 12, N8FPH 12, N8CB 12, WD8JYE 11, K8JA 11, N8JYV 11, KA8IRX 9, W8GDQ 9, N8JRV 9, K8CKY 9, KA8YIT 8, KD8XL 8, N8CW 8, K8DXZ 8, W8LDQ 7, N8HJB 7, N8KXD 6, N2NS 6, KB8FXG 6, KA8VYT 4, WA8NZE 4, N8INC 4, WB8GDM 4, KA8LMQ 4, N8GIO 3, W8FPA 3, WB8KWC 3, KD8IC 3, KA8OQS 2, W8XT 1, WB8DFR 1. (MAY) WB8VNV 22. (APRIL) KF8J 121.

HUDSON DIVISION

EASTERN NEW YORK: SM, PAUL S. VYDARENY, WB2VUK—ASM: K2ZM. STM: WB2EAG. SEC: WA2ZYM. BM: WB2IXR. SGL: KB2HQ. PIO: KB2TM. OOC: N2DVQ. ATC: WA2VGM. ACC: KV2A. ASM/PACKET: N2FTR. ASM/NWSLTR: WB2NHC. NET REPORTS FOR JUNE(QNI/QSP): AESN 33/3 ESS 337/65 HVN 379/67 NYP 100/81 NYPON 414/ 297 NYS/E 297/221 NYS/L 328/251 NYS/M 298/240 SDN 267/ 128. CLUB NEWS: A number of groups including Albany, Rensselaer, Schenectady, Saratoga RACES and AARA, W2SZ group, Schenectady ARA and TCATS all participated in the Empire State Regatta on the weekend of June 10th with 55 amateurs participating. Also, July 7/8 AARA, Rip Van Winkle and Poughkeepsie ARC assisted in the Multiple Sclerosis 150 mile bike trek with WA2YBM KA2RLH WD2K WE2G KB2GRW W2AWX W2CJO WB2FMB WA2WQZ NY2U N2ENX W2VXI N2HFV involved. Catskill Mtn ARA report upgrades KB2EMV WB2UYR—congrats. CCNR is working on their 450 repeater. Mt Beacon held elections Pres: N2GWK. VP: K2DPL. Rec. Sec: KD2TZ. Treas: K2LYE. Cor Sec: N2JBK. Dir/Eng: N2FZC. OMARC

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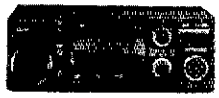

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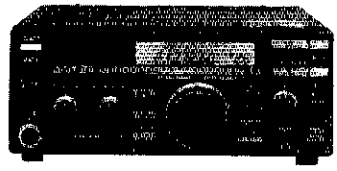

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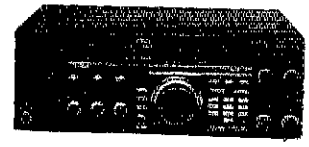
IC 2GAT
- Deluxe
- 2 Meter HT

IC-765
- Competition Grade
- HF Transceiver



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TS 140S/680S
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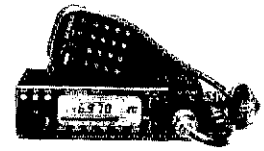

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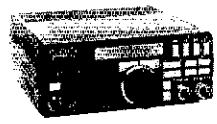

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Is R5 the world's best ham antenna?

June 1, 1989

Bill Carpenter ,WA8HFN
3934 Maidstone Drive
Gahanna, Ohio 43230 USA

President
Cushcraft Corporation
48 Perimeter Road, P.O. Box 4680
Manchester, NH 03108

Dear Sir:

I am compelled to write this letter to tell you how much I appreciate my R5 vertical antenna. Enclosed please find a copy of two pages of my logbook which represent about one month of activity. I have worked "four new ones". These are indicated by the orange marker. Should I get them to QSL my DXCC total will be 320 countries. The "new ones" of course were in "pileups" against hams with big antennas and great height. I don't get "20 over 9" reports but I work everything I go after.

My R5 is eight feet above the ground in my backyard. Beams are not allowed at this QTH. The R5 doesn't take up a lot of room and is not as visible as a beam antenna.

My wife convinced me to buy the R5. I didn't want to buy it as I thought I could not work DX without a beam. I also thought that I would have to bury a lot of ground radials. I had always used a beam at other locations, (A4).

The R5 has exceeded my expectations and I am delighted with the results that I have seen so far. I thought you would like to know how well your antenna is performing here at my location.

Keep up the good work and thanks again for designing and producing a quality product.

Sincerely,

Bill, WA8HFN

Bill, WA8HFN

R5 will open a new ham radio world for you too!

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R5 electrical halfwave, only 16′ 4″ tall design allows the antenna to be mounted virtually anywhere, without compromising performance. It easily handles 1800 watts of power with a solid state matching network giving full band coverage of 10-12-15-17-20 meters.

Easy set-up makes this antenna ideal for portable or fixed installations. It performs without a rotator, or tower. A simple support mast and 50 ohm cable is your connection to ham friends around the world.

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and Ulster RACES have been very busy with public service activities and flooding in Kingston. Those helping included KB2GA WB2POM WA2ZNU N2GQS N2HWV N5MEA WA2KPF WA3AFS W8KRF KB2L WD2V KB2GHW WA2RUW W2XL W2PCV AK2H KD2NE N2JHJ W2ZW WB2OXY KC2IW N2LL W2GJF WA2UBI N2AAK. With great sadness, PEARL reports WA2MPQ as a silent key. Pete was very active in the formation of PEARL and in the technical aspects. Rip Van Winkle is holding monthly breakfasts to get members together informally. Saratoga RACES had a discussion on no-code led by Hudson Division Director WA2DHF. *Thanks to those* submitting F.D. messages. JUNE BPL: WB1BTJ. JUNE PSHR: N5MEA WA2JBO WB2VUK WB2EAG K2ZVI N2HIF WB1BTJ KB2EPU. JUNE TFC: WB1BTJ 502, N2HIF 356, N5MEA 239, WB2VUK 190, WB2EAG 162, K2LYE 111, K2ZVI 111, KB2EPU 86, WA2JBO 81, WB2IIV 70, WA2GYY 51, WD2K 37, N2FTR 22, KA2Q 19, WF2M 14, K2HNW 14, WB2NVR 11.

NORTHERN NEW JERSEY: SM, Rich Moseson, NW2L—(@KD6TH)—ASMs: KA2F/Recruitment, W2VV/Youth, KY2S/SE, KC2ZA/SW. ACC: WA2QYX. BM: K2ULR. OO/ACC: KA2BZS. PIO: NW2L. SEC: WB2HBZ. SGL: W2KB. STM: K2VX. TC: KA9Q. HAM RADIO INFO LINE: 201-680-1585. Tnx to all for the opportunity to serve as your Section Manager. I will do my best to meet your expectations. Tnx to KA2BZS, W2KB, WB2HBZ & K2VX for continuing in their section leadership posts. Welcome to new section cabinet members W2VY, KC2ZA, WA2QYX, K2ULR & KA9Q. And welcome back to KA2F & KY2S. With N2XJ's retirement as ASM/VE, his duties are being incorporated into the new position of ASM/Recruitment. All VE teams: please send your schedules/statistics to John King, KA2F, 26 N. Sunnycrest Dr., Little Silver, NJ 07739 (Ph: 842-3179). John will also coordinate new-ham recruitment efforts in the section, including the new "Helpful Amateur Mentor" (H.A.M.) program. "Mentors" (elmers) will be paired with new and potential hams, while "helpful amateurs" will invite mentors & newcomers to visit their shacks and see ham radio specialties in action. Contact John for more info. Tom Moulton, W2VY, ASM/Youth Program, will be coordinating efforts to bring more young people into Amateur Radio. Tom is putting together an advisory panel of educators, youth group leaders and radio instructors. Please contact him if you're interested (9 Rosalie Ave. #1, Clifton, NJ 07011 or @KD6TH). Endorsements for 9/89: DEC: W2KB/Hudson. EC: KA2OEE/Somerville, W2UH/Chatham. OES: W2KB, KA2OEE, W2UH, N2FOZ, N2XJ, NE2P, NW2L, WB2HVF, WB2VUF. OO: KB2WI. ORS: AG2R, K2VX, KC2YG, N2XJ, NJ2Q, W2CC, WB2QMP. Regret to announce WB2VUF's resignation as DEC/Morris. Tnx to Bob for many years of service to ARES as SEC and DEC. FD messages from Englewood ARA, NJ REACT ARC, Bergen ARA, Metuchen RC, New Providence ARC, Raritan Bay RA, Garden State ARA, Ramapo Mtn. ARC, Edison Twp. OES. Hope all had fun. ALL CLUBS: Please add me to your newsletter mailing list, so I can include your activities here. (address on Pg. 8) Tnx. Congrats to new licensees/upgrades in June: NOVICE: Christine Weaver, Jon Morgan, Mark Stives, P. Mitchell. TECH: KB2HXC, KB2HWQ, KB2HVQ, KB5JFN, KA2STU, KB2BZQ, KB2HOQ, KB2HXK, KB2HXE, KB2OUB, KB2FUN, Christine Weaver, Michael Solomon, Joseph Macor, Jr. GEN'L: N2IPV, N2IVV, KB2HTT, KB2ECQ, N2JMC, KA2QCW, KB2GVR, N2IWS, N2IHY, KA2OWN, KB2ENS, N2GGJ. ADV: N2ILK, KB2FLW, KB2HTT, KB2JJJ. EXTRA: KE2IE, N2JGE, W2NGN, N2IIS. Traffic: N2DXP/305/60, N2XJ/225/100, KA2KJF/220/94, WB2QMP/204/90, W2RRX/150/103, W2QNL/112/112, WB2FTX/84/81, K2VX/71/73, KA2INE/70/78, WA2PAC/43/67, KE2JX/42/-, KB2WI/34/-, W2CC/20/-, W2XD/18/-, WA2CLP/14/-, NZ2T/-/77. If you're active on a traffic net, please send reports to STM K2VX. NMs & NCSs will gladly tell you how. 73

NEW YORK CITY—LONG ISLAND: SM, Walter M. Wenzel, KA2RGI—ASM: N2GQR ACC/PIO: KA2LCC SEC: WA2UJI STM: K2MT OOC: NB2T TC: W2QUV BM: W2JUP. The following are traffic nets in and around the section that handle NLI:

Net	Freq	Time	Day	Mgr
BAVHF	145.350/R	2000	Dly	K2TWZ
NCVHF	146.745/R	1930	M-F	N2IMP
SCVHF	145.370/R	2000	S-F	KA2JMA
NYPON	3913 kHz	1700	Dly	KA2UBD
NYS/M	3677 kHz	1000	Dly	N2EIA
NYS/E	3677 kHz	1900	Dly	KU2N
NYS/L	3677 kHz	2200	Dly	KU2N
NLT	28450 kHz	2100	Wed	N2IMP
ESS*	3590 kHz	1800	Dly	W2WSS
PNS	145.01	24hr	Dly	AI2Q-4
PNS(Alt)	145.03	24hr	Dly	WB2IBO-4

*Independent Net, recognized by NTS, all times are local. VE Listings: LIMARC-second Saturday of each month at 9:30 AM at Salten Hall, NY Institute of Technology, Old Westbury—contact Al Jones, W2ZDB 516-676-5790 Suffolk County VE Team - second Saturday of each month at 9:30 AM at the Suffolk County Community College, Selden - contact George Sintchek, WA2VNV 516-751-0894; GRUMMAN ARC - second Tues of each month, at 5:00 PM at the Grumman Recreation Center, Bldg 800, South Oyster Bay Road, Hicksville - contact Howard Liebman W2QUV 516-354-6861; Great South Bay ARC - fourth Sunday each month at 12 noon at the Babylon Town Hall Office Annex, North Babylon - contact Walter Wenzel, KA2RGI 516-947-5726; MAARC - last Thursday each month at 6:00 except Dec., at the Robert Wagner JHS, Manhattan - contact Rubina Asti, KD2IZ 212-838-5995. If your group holds regularly scheduled license exam sessions and/or classes let me know so they can be added to this listing. Reminder Time: If you can assist with emergency communications for the Long Island Jewish Arts Festival on Labor weekend (Sunday and Monday Sept 3-4) please contact me ASAP so we can get you the proper information and clearance. Also do not forget to volunteer for the New York City Marathon which will be held on November 5, there are still positions that have to be covered for the event and one of them might be just right for you. If you can assist or want more information contact Steve WA2DHF or Emergency Test is next month (Oct. 21-22). Lets see more participation this year than last. For more information on how you can become part of ARES or the NTS please contact me. HAMFEST INFO: Sept. 17 LIMARC Outdoor Hamfest at NYIT in Greenvale, NY; Oct. 8 Suffolk County Hamfest at the Bingo Hall in Centereach, NY; Nov 12 Ham Expo '89 (NYC-LI Section Hamfest for 1989) at

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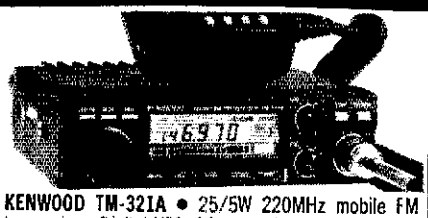
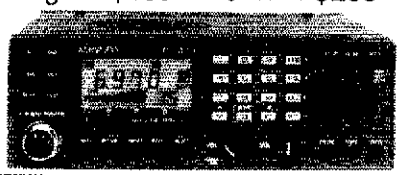


KENWOOD TM-321A • 25/5W 220MHz mobile FM transceiver. Digital VFO, 14 memories with shift, scan and lockout. Prog. band scan, 38-tone encoder, 16-key up/down DTMF mic. 12V DC @ 6.5A, 1½"h × 5½"w × 7"d.

Regular $469.95 • ***Closeout* $299.95**

KENWOOD TM-421A • 35/5W, 440MHz FM transceiver. Looks like and features same as TM-321A above.

Regular $469.95 • ***Closeout* $299.95**



KENWOOD TM-3530A • 25/5W, 220MHz base/mobile FM transceiver. Keyboard entry, 16-key DTMF, DCL capability. 23 multi-function memories; linked to 15 telephone number memories. Frequency up/down control from microphone. 12V DC @ 6.5A, 2 ½"h × 7"w × 9⅜"d.

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KENWOOD TM-621A • 2m/220MHz, **dual band** FM mobile transceiver. Extended 2m receive 138 to 173.9MHz, transmits user modifiable for MARS/CAP. 45W (2m), 25W (220MHz). Dual Watch simultaneous 2m/220 receive, selectable full duplex operation. 30 memories, programmable memory and band scan, lockout, priority watch. CTCSS encoder, With modification can be used as a cross band repeater. 16-key DTMF mic. included. 12V DC @ 9.5A, 2"h × 6"w × 8"d.

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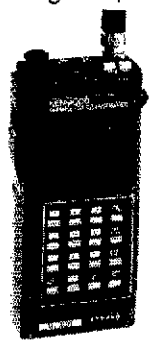

KENWOOD TH-31BT
220MHz FM Pocket Handheld

1.5/0.15W, 3-digit thumb-wheel and 5kHz upshift switch. DTMF keypad, programmable CTCSS encoder built-in, std. repeater offsets. Flexible antenna, 1.5W Ni-Cd battery (PB-2), wall charger, 4¾"h × 2¼"w × 1⅛"d, 0.6 lbs.

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plus • with **TH-31BT** purchase:
Extra **PB-21** std. battery - **$5.00**
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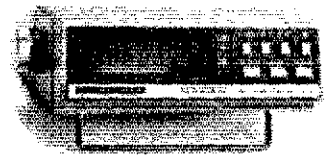

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Suffolk County Community College in Selden. SPECIAL REQUEST DEPARTMENT: Looking for people that are interested in becoming liaisons between NTS packet radio. We also need people that are involved with packet radio to become active with ARES/RACES. ARES/RACES is also looking for people that are available during the daytime to assist with emergency communications and be on call when the need arises. If you need more information please contact myself or Dom, WA2UJI. Traffic: WI2G 288, N2IMP 175, KA2VZX 164, WA2UKM 85, K2TWZ 54, NB2D 50, N2HLZ 39, N2JGW 30, K2MT 20, KA2SMA 18, WB2KID 16, KA2UIU 14, KA2RGI 11, WB2ZIE 8. (May) KA2UIU 19.

MIDWEST DIVISION

IOWA SECTION: SM, Wade Walstrom, WØEJ—SEC: KDØBG. STM: WBØAVW. ACC: NUØP. OOC: WAØQMU. BM: KØIIR. TC: KØDAS. SGL: WRØG. After a long search, the State Government Liaison appointment has been filled by WRØG. Perry is a practicing attorney in Des Moines and is active in many of the subsets of amateur radio including DXing and packet. Perry fills an appointment which has been vacant for over three years. Regretfully, WØBDZ, WØOTP and WØHDX have become silent keys. 1989 Field Day found many groups active. Calls of groups and clubs reporting to the SM include KVØN, WØGN, NØSM, WØPDT, KØPBR, KØKWO, WØJV, WØGQ, WEØM, KØGP, NWØX. The Fort Madison ARC administered the Novice exam to an applicant over Field Day and gained a new Novice, a new club member, and a new ARRL member. Earlier Fort Madison VE exams yielded 3 Technicians and 1 General. Benton County VE exams produced the following upgrades: 2 Extras, 3 Advanced, 1 General, 4 Technician, and 1 Novice. VE exams will be given in Ames on September 23. Contact KCØRX at (515) 292-4504. WBØVYG has completed the EC Training Certification course. KØZQ has stepped down as Cass County EC after 10 years. WBØUBL and XYL are the proud parents of a new baby boy! Congratulations! The Iowa 75 Meter Noon has shifted operation to 40 meters until conditions improve. Traffic: WØSS 152, WØYLS 92, KØIPT 62, KØGP 52, KAØADF 42, WBØAVW 29, KØCNM 20, KAØVBA 13, KEØWO 6.

KANSAS: SM, Robert M. Summers, KØBXF—SEC: NØBLD. STM: WØOYH. ACC: KØBXF. TC: KAØHEP. BM: KØJDD. SGL: NØBLD. Net Mgr's CW: WBØZNY. Voice: WØFRC. RTTY: open. Slow Speed CW-WØMYM; WX Net: WBØYWZ. PIO: WBØWSG. DEC's: WØOAG, WØEB, WBØYJT, WØFRC, NKØV, WBØMDF & WAØCVR. NXØR has asked to be replaced as Packet coordinator for Kansas due to other pressing activities and WAØZBL, at Wichita will assume the responsibilities. If you have anything of value for the ham fraternity reference PACKET, contact Hayes. We were all glad that Bob, WAØHOZ only had a short stay in the hospital after his motorcycle accident. Hope to see you all at the STATE CONVENTION in Wichita Sept 30 and Oct 1. There will be a SECTION meeting held covering all the nets operation and other activities incl ARES. Bring your concerns and share them with us. May net activity:

NET	SESSIONS	QNI	QTC	MANAGER
KSBN	31	1343	160	WØFRC
KPN	24	408	24	WØFRC
KMWM	31	689	595	WBØYWZ
KWN	31	958	651	WBØYWZ
CSTN	31	1972	44	WØDE
QKS	51	185	60	WBØZNY
QKS-SS	13	29	11	WØMYM

Traffic: (MAY) WØFIR 330, KAØRCH 202, NZØM 179, KØBXF 143, WØFRC 138, WØOYH 103, WAØTJU 76, WØFDJ 66, WBØZNY 65, WØQMT 55, WTØE 54, NBØZ 29, WØMYM 22, WAØOZP 12, WAØYXK 8.

MISSOURI: SM, Bill McGrannahan, KØORB—Your new SM has been able to hit the deck running thanks to the fine help of Ben Smith, the retiring SM. Fortunately several of Ben's staff are staying on: NOØN-STM, WBØBZP-OOC, KDØUD-SGL, and K4CHS-TC. Newly appointed are Jim Schroeder, KFØBM-SEC and Charles Konop, WØOLG-BM. Roger Volk, KØGOB, of St. Louis has agreed to be Asst. Section Mgr. and will be "watching the store" on the east side of the state. The Columbia Hamfest was bigger and better than ever this year. We're looking forward to the Washington Hamfest and now don't forget Springfield Aug. 12 and St. Charles Aug. 27. The St. Charles ARC newsletter carries a fine article by Eric Koch, NFØQ, concerning ARRL membership. Other clubs please reprint. Eighteen clubs sent us their field day reports. Kimberling ARC "Squelchtale" tells of raising money to buy a communications trailer and the folks around St. Joe have been enjoying Jack Randall's (KØKBO) great smoked turkey! MO Rptr Council elected: KCØWX, Pres.; KAØLZN, Vice-pres; KØGOB, sec/tr. and K4CHS, State Technical Coordinator. Communication was provided for the Shawnee Mission Health Center Triathlon by: KØUAA, WØAIB, KØTCB, NWØF, KAØREN, KAØYJE, WAØP, WA5DYC, WBØIZY and KØORB. MY PACKET PBBS IS KØORB-1 V KCMO.

NET	SES	QNI	QTC
MOSSB	30	577	130
MON	60	187	91
MEOW	30	529	78
HBN	23	367	31
SLARES	4	246	3
CMEN	7	133	1
LOZBC	22	387	0
PREVERE	4	272	0
LOZFM	5	111	0
QCWA	4	58	0
MEXARES	5	55	3
ZAEN	4	46	0
CARL	3	30	0
RRBN	20	255	1

Traffic: NØFBW 1132, NQØG 487, WAØYJX 162, KØORB 158, NDØN 133, AIØO 105, WAØHTN 77, WBØUCI 48, KFØBM 43, WØOUD 38, WBØTEG 27, WØBMA 26, KEØAH 14, WØRL 8, WRØR 7. NDØN MO STM FOR KØORB MO SM.

NEBRASKA: SM, Vern J. Wirka, WBØGQM—A new Official Observer has been named, in the Nebraska Section. Tim S. Hopkins, KAØQDX, of Lincoln joins the list of OOs that serve the Nebraska Section. It has been a busy summer, of public service events, for many clubs in the Nebraska Section. Scottsbluff area amateurs provided public service communications for the "Super Valley Antique Car Race", June 10th. The race lasted all day and covered over 100 miles. The Lincoln Amateur Radio Club has provided public service communications for: March of Dimes Walk America, Lincoln Marathon, ACS Bike Tour, YMCA Triathalon, and Cornhusker State Games. The Ak-Sar-Ben Amateur Radio Club of Omaha provided public service communications for the Nebraska State Track Meet, Drums Across the Midlands, and the annual Offutt Air Force Base open house. Ak-Sar-Ben members will help with the annual River City Round-up Parade in September. These clubs reported their public service activities. All clubs are invited to send reports of all their activities and their newsletters to your Section Manager. Many clubs also provided spotters during severe weather. It has been a busy severe weather season from the Nebraska Panhandle to the metropolitan Omaha area. The Central Nebraska Amateur Radio Club sponsored another successful hamfest at the Victoria Springs State Recreation Area near Anselmo, Nebraska. The 147.21 - .81 MHz Bellevue repeater now has a much larger coverage. The repeater is now located at the home QTH of Tom Huber, WDØBFO, in northwest Bellevue. The new 146.16 - .76 MHz Lincoln repeater system continues to function well. Handheld transceivers can access the repeater from Lincoln. Contributions toward the Lincoln repeater can be sent to Jim Garner, KAØVKJ, C/O, Lincoln Amateur Radio Club, P.O. Box 5006, Lincoln, Nebraska 68505. Traffic: KØDKM 218, WBØGQM 13, WAØBOK 8, WCØO 4.

NEW ENGLAND DIVISION

CONNECTICUT: SM, Caesar Rondina, N1DCS—Well, Fall is just around the corner, and it is time to get all that last minute antenna work done. Remember safety first. I hope everyone is enjoying the summer, and I see from many newsletters that many clubs have been having their picnics. The packet networking system is coming along fine. Yes, it is a bit behind, but should be completed soon. A note of thanks to the traffic handlers that have been keeping the packet boards clean of undelivered messages. That is a great help when a path goes bad and the traffic sits undelivered until the system is back up and running. Tnx to WA6ILT for his VT DX-Pedition. And scrams ran their annual flat hammock DX-Pedition on July 16th. The WHARA is working out a nice reciprocating agreement with the ARC. This will serve to be very beneficial to both groups as well as a great boost to Public Service. Connecticut had 100% Rep in 1RN Cycle 3, and 95% Rep on 1RN Cycle 4 in June. Congrats to Lou, K1YR, for his 5 Band DXCC Award. Also Congrats to NM1K, he finally received his certificate from CQ Magazine for coming in 1st in the USA in the FM only class for the CQ worldwide VHF WPX Contest in 1987. Rusty also came in 1st in the world in the same contest with a score of 6, 760. CARA will be holding its annual flea market on Sept. 17 at the Elks Lodge on Main St. in Danbury. For info contact George, KC2QF or Norm, N1ASU. Soon we will be losing our good friend Jerry, WA1IUF, back to the land of Oranges. It was a pleasure to have you back for the summer and we all wish you and yours a great trip back. 73 for now.

Net	Sess	QNI	QTC	NM
NVTN	30	589	219	NM1K
CN	60	341	197	W1WCG
CSN	22	79	35	N1FNN
WESCONN	30	417	101	KA1GWE
RTN	30	247	72	WA1FCA
TMRCN	4	85	1	NM1K

BBS Reports: KY1T 104, NM1K 146, N1API 32, N1DCS 666. Traffic: NM1K 500, W1WCG 268, KA1JAN 151, KA1GWE 121, N1FNN 78, KY1F 73, WA1YUA 49, W1KYD 48, WA1NLD 31, N1GPB 30, KB1ZC 30, W1BDN 18, W1CUH 18, KA1ROL 15, KA1TBM 13, W1YOL 8, W1QV, KC1OL 6, N1API 3.

MAINE: SM, Ted Bonesteel, WA2ERT. 35 Maine hams provided communications for the American Lung Association 3-day Bike Trek which spanned the State. Starting in Bethel, 420 bikers ended their journey in Rockland. KQ1L, NR1W, N1RP, ND1A, NS1Q, K1UNQ, KB1YA, KB1QN, W1's CUW, RUZ, SIN, PXE, HTG, TGY, JTH, WA1JZP, WN1TXD, N1's CBA, EBC, All, KA1's FKS, FXH, FXI, MWG, GPO, JGF, SQH, RFB, NKA, RFD, GZR, SIZ, LPW, MLF and CNG were the communicators. They used 2-mtr rptrs 145.39, 146.97/73/76/82. We thank the repeater owners for their support. The Oxford Hills Triathalon was supported by KA1REB, KA1ADK, WB1HBJ, N1APN, WA1PCU, KA1RUC, KA1BRY, KA1LUN, KA1NAZ, and N1BHM. Exams: Windsor Hamfest, Sep 9, WA2CJO; S Paris, Sep 21, 6:30 PM, KA1REB. Net Acty: PTN/30/117/232/W1KX; SGN/26/128/683/K1GUP; AEN/4/9/65/WA1YNZ; Kennebec/5/12/74/KA1LPW; CMEN/9/11/169/N1DZI; Hancock/4/0/36/WA2ERT. STn Acty: W1KX 223, W1JTH 89, NR1F 85, WA1ODT 65, KA1REB 60, K1UNQ 54, WA2ERT 45, W1BMX 41, W1VEH 34, WA1YNZ 34, N1BCF 26, KA2ZKM 17.

NEW HAMPSHIRE: SM, Bill Burden, WB1BRE—ASM's: W1NH. DX and contest, KX1L: Youth Coord, WB1HBB: NHARA Liaison. June—Action! Adventure! Excitement—well anyway, a lot of good stuff went on this month highlighted by two events! We began with the Deerfield Hamfest and ended with Field Day! Deerfield was later than usual and the good weather brought out over 5000 eager folks. We ran the ARRL pubs booth with much appreciated help from K1CII, WB1HBB and KA1RWZ, NW1U, WA1UXA, and KA1LDS. Many of the section staff members visited the booth and I had a chance to chat with many folks Friday evening and Saturday. Nice to see Barry KB1PA SM-EMa there on Sat. Another successful effort by the Hosstraders with a good sum going to the Boston Shriners Burn Center Hospital thanks to your generosity. See you there on Oct 7. Our second big event included Field Day week and the FD weekend. On Monday, June 19, We were at the Governor's Office of Emerg Management in Concord for the reading of the Governor's proclamation of "Amateur Radio week in NH" with opening remarks by Dick Strome, Dir. This was relayed over local 2M and 220 machines and recorded for later relay as a bulletin on other machines throughout the state. In attendance were TC: W1JY, NHARA treas: WB1GXN, PIO: WA2MBQ. OEM staffer: WA1WOK. NHARA pres: WB1HBB, W1HSB, KA1LDS, WB1AOB, and KA1RWZ. Copies of the proclamation can be obtained from WB1HBB. There will be a new director at OEM by this printing and we will be working hard to insure that Amateur Radio continues to play a key role in the state emergency planning operation. Then—on to Field Day weekend! Warren, Donna, Dot and I traveled to a total of 8 FD sites this year, beginning on the Seacoast and working East. (last year, we started in the West) With so many sites active this year, we knew we couldn't cover all in the two day period, so we are alternating each year. First was the PCARC site in Stratham with Dave WA1YFZ doing his act as one support for a wire dipole! Pres WA1TOL was on hand as setup and operations proceeded.

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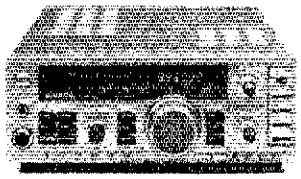

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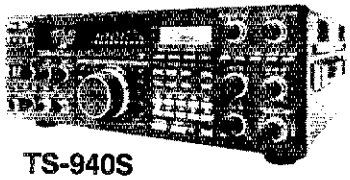

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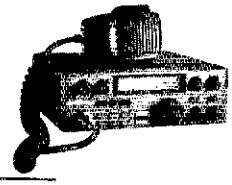

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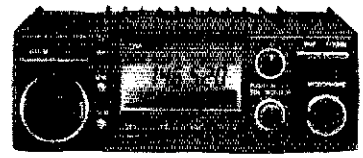
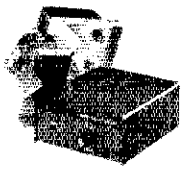


IC-228A



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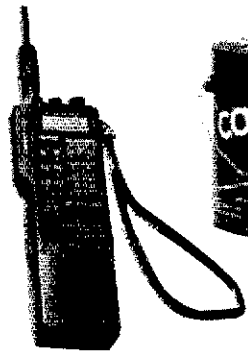

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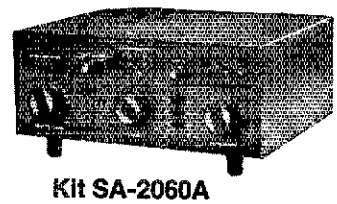
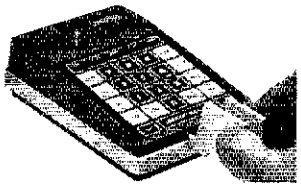


Kit SA-2060A



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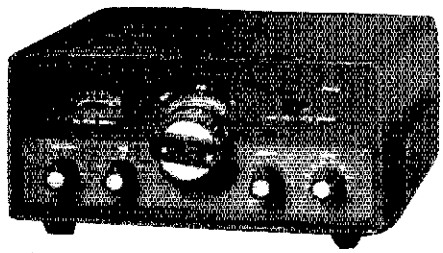

Heathkit deluxe QRP CW transceiver **Kit HW-9**

Kit SB-1000

Then to GBRA in Farmington and greetings by Pres KC1KA and EC WA1PEL. Their Novice station was hard at work on 10M struggling with poor band conditions, but making contacts. Then to the CNHARC at the Gordon Kendall homestead in Belmont. Ray WA1WVD demo'd his lo-band packet station and PC running off a set of two 50 W solar panels! Johnny W1JY, relayed a message to me from K3MD operating 1B on Bridgewater Mtn! (there was also a 1D station in Nashua—new Ham—but that's another story!) We wrapped up Sat at the NARC site—known as "aluminum city" with four towers, 15 stations and the added challenge of working QRP-battery! Club Pres AK1K said the "search and pounce" mode was most effective for QRP. FD Coord K2TE said the mosquito/Ham ratio had already exceeded 1000/1! NARC had also integrated the operation with the local Red Cross which had set up a van on site with two stations resident. We also had FEMA participation this year with four test messages submitted by FEMA rep Don Connors. Sunday AM we were off to the IRS site in Goffstown and were greeted by KA1OU, FD chairman. Their first try at a satellite station had netted them over 120 contacts on AO13 the previous night and they were running a 9 station operation this year. At the GSARA site in Francestown, Ralph K1RD showed us around the 3A operation including the 40M SSB operation and the Novice station. We then moved on to the AF1T site in Mason where Dale had "grown" a field full of phased verticals overnight just for the Field Day harvest!(sorry about that!) They were running out of log sheets when we arrived—a great problem. They had also made over 130 sat contacts—portable moonbounce next year, Dale? And then on to the SVARC site where pres W1FJH and FD coord N1ACH were real happy with the results and the new site next to a ball field. But no more excited than the new Wilborg-Cotter team of KA1FUI and KA1NPS who had their first go at contesting on the lowbands and were hooked! There were other activities during June with NARC hosting another VE session in Nashua. 22 of 32 applicants upgraded including 3 new Novices and 12 Tech upgrades. Thanks to Don N1AKS and the committee! GBRA instructor W1HJT has 18 in his Novice class—two have passed their exams and the rest should be Hams by this reading. Last month CNHARC reported their Novice class in full swing as a result of a significant promotional and information blitz. Look for more new calls in the Lakes region this summer! And in Contoocook, Ken K1BGI and Bob W1IN are running code classes on Thursday evenings. SVARC reports that Scott KB1NW is the new Newsletter editor for the club. Our thanks to Craig N1ACH who was editor from the beginning of the club and provided the valuable monthly communications to members and interested parties. I was invited to the GSARA meeting to update the club on 220, Part 97, etc and to do my satellite program. Thanks to Pres N1FIL who handled the videotape operation flawlessly (well, almost)! One last note—the new Part 97 is on the streets—please read it carefully! Traffic: Nets: GSPN 188, VTNH 125, GSFM 71. Stations: W1PEX 2250, KB4N 1118, W1FYR 537, K1TQY 488, N1CPX 465, KA1NXT 58, W1ALE 53, KK1E 37, N1ALM 31, KA1SXM 19, NE1J 16, KA1ROH 14, KA1HPO 11, KI1M 4, KA1LMR 3, KA1KFX 1. BPL: W1PEX, KB4N, W1FYR, K1TQY. PSHR: N1CPX, KA1NXT, W1PEX, KA1HPO/T.

RHODE ISLAND: SM, William M. Foss, KA1JXH—Providence County South ARES Net meets every other Wednesday at 9 PM on 146.55, 28.405, 224.92, 223.82, 447.525, 449.225, 441.2. Viking Amateur Radio Service (VARS) is forming a club to support its 146.88 repeater. Contact N1BED or N1DWS. EBAWA Pres N1DVM, VP/Tres WB1DE, SEC N1BVY. NCRC business meeting is the 2nd Monday at the Middletown Fire and Police Station. The 5.17 & 4.56 Trivia Net starts up Sept. 20th at 7:30 PM. The following clubs participated in FD. ARASNE at Hunts Mills with 15 ops. BVARC at Buckhill with 18 ops. EBAWA at Columbian Fathers Monastery with 22 ops. NCRC at Glen Park with 15 ops. NRIRC at Gorton Jr High with 15 ops. Traffic: W1EOF 212, KA1KML 155, PSHR: 60, KA1JXH 108, PSHR 73.

WESTERN MASSACHUSETTS: SM, Bill Voedisch, W1UD—OO/RFI: N1CM. PIO/ACC: K1BE. SEC/SGL: WB1HIH. TC: KA1JJM. STM: W1KK. Roger Boilard, NQ1N, has installed a radio station in his classroom. Roger is a fourth grade teacher at Quabbin Regional School. His efforts have produced one new member to our ranks and with a little effort on the part of other students nobody knows how many more will join our ranks. Start 'em young Roger. They may forget the teacher that introduced them to calculus but they will never forget the Elmer that started them hamming.—Post 73, sponsored by CMARA, demonstrated ham radio at the recent Mohegan Council Boy Scout Show. They were active on 220,144,50 Mc. using AM, ATV, and FM. HF SSB produced a scheduled QSO with the U. of Arizona Club station. All that participated had fun.—NoBARC's annual picnic held at the Grafton, NY State Forest was a great success. Everyone enjoyed the day. The illustration in "Squench Tail" of the technology of a water closet in "computer language" was outstanding.—The W1NY BBS is constantly being modified and expanded. Access to it through various nodes is possible throughout Western Mass. Try it!—W1TM is back in the area again. We're putting him to good use subbing on our nets while the regulars are away on vacation. Welcome back Bill and thanks for the help! Traffic: KA1IFC 742, KA1EXJ 115, KA1RVN 115, W1KK 76, W1SJV 55, KB1XK 42, W1TM 25, WB1HIH 30, W1ZPB 10, NM1U 8, W1UD 138, WA1OPN 6, W1GQP 6, KA1NWZ 4.

NET	QNI	QTC	SESSIONS
WNEN	380	174	65/65
WMTN	214	187	21/21
WMFN	198	156	31/31
WMN	182	199	31/31

NORTHWESTERN DIVISION

IDAHO: SM, Don Clower, KA7T—SEC: N7MAL. STM: W7GHT. OOC: WB7CYO. ASM: K7REX. ACC: N7BI. PIO: WG7E. Lots of activity in Idaho for field day. The Boise group had a nice set-up at the Discovery Center that attracted a good crowd and T.V. coverage. The Eagle Rock ARC & Twin Falls group were both out working hard. I worked KK7A who was out in the hills with a station. Should be some good scores for the Idaho Field Day Award. Dave Hubble, N7MAL, is the new SEC for Idaho. Dave, who lives in Lewiston, is very active in MARS and will do a super job for us as SEC. Traffic: W7GHT 255, WS7U 28. 73s Don.

NET	SESS	QNI	QTC	MGR
FARM	30	1923	83	WA7GSM

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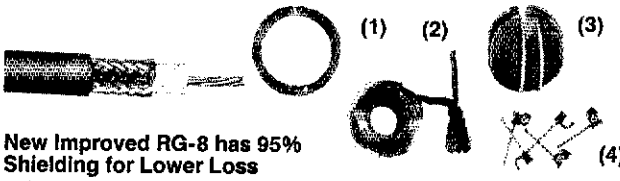

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Cable	Cat. No.	Per Foot
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RG-8M	278-1328	.25
RG-58	278-1326	.20
RG-59	278-1327	.20

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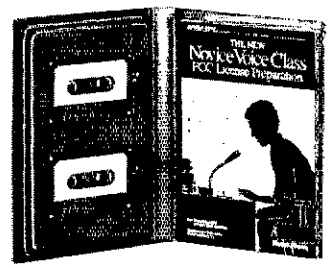

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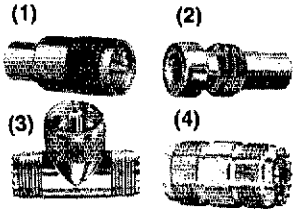
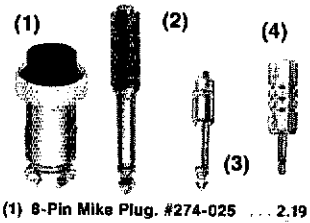


Fig.	Description	Cat. No.	Price
1	PL-259	278-205	2/2.79
2	Reducer for RG-8M, RG-59	278-204	2/.99
	RG-58 Reducer	278-206	2/.99
3	"T" Coupler	278-198	3.49
4	Double Female	278-1369	1.69

Audio Adapters



(1) 8-Pin Mike Plug. #274-025 ... **2.19**

(2) Headphone Adapter. Accepts ⅛" stereo plug and plugs into ¼" monaural jack. Use lightweight "mini" phones with your Ham equipment. **#274-348** ... **1.99**

(3) Plug Adapter. As above, but accepts ⅛" mono plug. **#274-325** **1.59**

(4) H-T Adapter. Accepts ¼" plug, plugs into 3/32" jack. **#274-381** **1.99**

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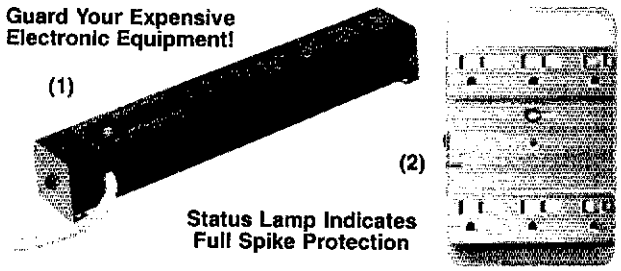


(1) Six-Outlet Power Strip. With noise filter, circuit breaker, and lighted on/off switch. 6-ft. cord. Rated 15 amps at 120VAC. **#61-2780** **29.95**

(2) Six-Outlet Cordless. Converts one grounded outlet to six with MOV protection. Breaker, noise filter, status LED. 13A. **#61-2786** **24.95**

Problem Solvers

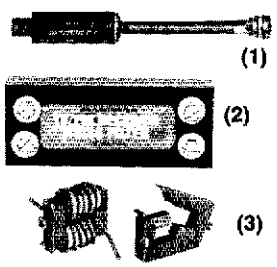


Fig.	Description	Cat. No.	Price
1	75Ω High-Pass Filter	15-579	3.95
2	300Ω High-Pass Filter	15-581	5.95
3	RF Choke Core	273-104	2/7.95

Caps and Choke

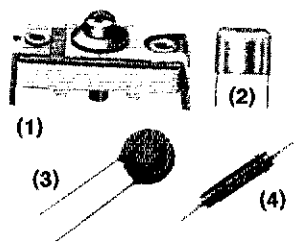
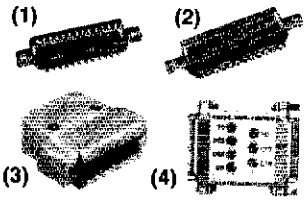


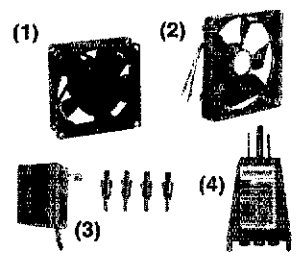
Fig.	Description	Cat. No.	Price
1	95-420 pF Trimmer	272-1336	1.69
2	6-50 pF Trimmer	272-1340	1.59
3	.01 µF, 2kV Disc	272-160	2/.99
4	.1 mH RF Choke	273-102	.99

D-Sub Essentials



Description	Cat. No.	Each
9-Pos. D-Sub Male	276-1537	.99
9-Pos. D-Sub Female	276-1538	1.99
9-Pos. Shielded Hood	276-1513	1.49
25-Pos. D-Sub Male	276-1547	1.49
25-Pos. D-Sub Female	276-1548	2.49
25-Pos. Shielded Hood	276-1536	1.99
RS-232 Line Analyzer	276-1401	14.95

Power Items



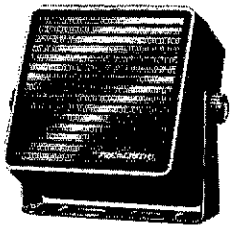
(1) 12VDC Fan. #273-243 ..... **14.95**

(2) 120VAC Fan. #273-241 .... **18.95**

(3) 12VDC 500 mA Adapter. Includes four Adaptaplugs. **#273-1652** ... **10.95**

(4) AC Outlet Analyzer. #22-101, 5.95

Extension Speaker



Superior to most built-ins! Improves tone quality of mobile or home rigs. Rugged 4" speaker has adjustable bracket, 10-ft. cord with ⅛" plug. **#21-549** **13.95**

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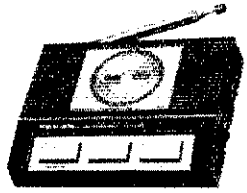

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DXer's and storm spotter's best friend! Receives WWV time signals and solar info on 5, 10 and 15 MHz. Gets local weather up to 50 miles on 162.4, 162.475 or 162.55 MHz. Battery extra. **#12-148** **39.95**

Engineering Calc

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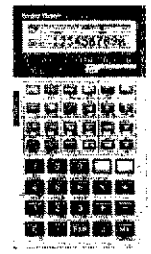
Uses Electrical Symbols For Input And Output



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CD	22	611	16	K7UBC
NWTN	30	932	46	N7LMA
IMN	30	269	123	KA7EEE

PSHR: W7GHT 255, WS7U 68.

MONTANA: SM, Pete, KF7R—ASM: WB7QDN, WA7PZO. SEC: KS7R. STM: W7TGU. OOC: W7DEO. ACC: KC7OA. SGL: KY7I. TC: K7YD. PIO: K7BFJ. BM: WA7TUW. DCM: KE7TB. The Glendive Digipeater KC7AA-8 is back up in Makoshika again. Congrats to WA7GVT, WM7D, N7BF, for quick VE exam get together. New tec. KC4GSL KB7GRX, KA7WDP: General Orin Watts: Novice Bill Rounce: KB7GDO completed his WAS: KA7YYR got second in state low power sweepstakes: in Missoula Novice: KB7HKU: TEC KB7APB, KB7HUJ, KB7HXM, N7SMU: ADV KB7FGV, N7MFO, N7MAN: EXTRA KF7BQ: WB7SWH picnic tec KB7HRV, KB7HNW, KB7HNX, KB7HMF, KB7HMW, KB7HME, KB7HMG, KB7HRU, and Lance Pedersen, Mark Menice: ADV KA7NLO, K7SZF: PSHR WB7WVD 80, TFC 48: Traffic KA7YYR 85.

NET	QNI	QTC	NET MGR
IMN	269	123	KA7EEE
MSN	66	0	KF7R

OREGON: SM, Randy Stimson, KZ7T—ASM: KM7R. ASM: W7FBP. STM: W7VSE. SEC: KV7F. PIO: KC7YN. SGL: KA7KSK. ACC: WF7Q. OO: WN7W. STC: N7ENI. Field Days everywhere. The most interesting in my area was the Salem ARC. They had their Field Day on the lawn in front of the Oregon State Capitol Building. Now that is the way to let the public know what we are doing and a chance to explain why we do Field Day. While we are talking about the State Capitol, Mike Dunlap, K7MYU, has succeeded in getting a new HF, two meters and a complete packet station in the Capitol. The packet is a full size computer with a 20 MB hard drive and AEA PK232 TNC. A great job Mike and I know when we have another SET that the State can participate without someone bringing all of their gear in. Bob Dorman, KV7F, has done just a great job getting new Emergency Coordinators and District ECs in the State. I would like to welcome Jackie, WX7A, as the new EC for Deschutes County and Clinton, NR7Y, as EC of Crook County. As of now there are 25 ECs and there are only 37 jurisdictions. We have one County that doesn't even have a ham. There are openings for Emergency Coordinators in Yamhill, Gilliam, Jefferson, Sherman, Wasco, Wheeler, Grant, Umatilla, Wallowa, Harney and Malheur Counties. If any ham would like to try their hand at the EC job in any of these counties please contact Bob or myself. Traffic (P) = Packet W7VSE 383, WB7VMS 262P, N7BGW 223, WG7H 186, KA7EEE 172, W7LNE 109, WT7A 105, WB7EMO 102, W7ODG 77, KA7AID 57, N7DRP 55, N7HZT 30P, KA7WFW 16, KA7DEF 8.

EASTERN WASHINGTON: SM, Tom Plaisance, KC7PH—STM: W7GB. SEC: WA7CBX. OOC: W7LKR. ASM: KC7MM. ACC: NQ7M. SGL: KD7AC. TC: W7DBV. Congrats to Jim, NY7T the new Franklin Co. EC; Ed, N7JOF the new Benton Co. EC; Jack, WA5ZAY on upgrade and OO appointment; and Ralph, N7DWD on OO appointment. Any repeater owners interested in rental reductions with sites on DNR land in Eastern Washington should send me information on location and call. See page 8 QST for address. Groups reporting to the SM or SEC on Field Day include W7NBR, Spokane Radio Amateurs; W7VPA, Tri-City ARC; W7DP, Walla Walla ARC; and W7LA, from Pasco. KC7MM suggests that local REACT CB clubs be invited to Field Day, it's not only good PR but a source for new amateurs. Don't forget the Walla Walla Hamfest September 23 & 24. Traffic: WA7YEN 114, W7LBK 43, W7GB 39, N7HXT 12.

WESTERN WASHINGTON: SM, Ed Holloway, KA7INX—@ KE7OM, STM: KD7ME @ K7KNZ. SEC: NM7N @ KE7OM. OOC: N7DVR @ W6LVJ. SGL: KD7AC. BM: N7CAK @ W6LVJ. PIO: N7FKV. ASM: K7CLL @ K7IFG. ACC: KR7L @ W6LVJ. A big thanks to the West Seattle Club's TVI Committee! They took an actual FCC complaint and used it as a training mission and cleared up the problem! Field Day!! Talked directly on packet to W7DK Tacoma Radio Club, Issaquah Radio Club, Cascade Radio Club. Received messages from Longview Club via K7CAP. W7VE Bremerton Club, North Kitsap Radio Club, Mt. Baker Radio Club, Boeing Bears, Hewlitt Packard ATC, Mike and Key, Island County ARC, Clark County ARC. Sounds like all had a good Field Day. Public Service hours none reported. Traffic: K7AJT 24, K7CLL 8, KA7CRN 24, N6EQZ 141, KR7F 36, N7GGJ 106, W7IGC 538, W7LG 203, KA7PMD 30, W1PRT 5, K7SUX 81, KA7TTY 41, W7TVA 318, K7UQH 75, WB7WOW 167. PSHR: W7TVA 164, KD7ME 122, WB7WOW 115, N6GGJ 62. So till next month 73 Ed KA7INX.

PACIFIC DIVISION

EAST BAY: SM, Bob Vallio, W6RGG. ASMs: W6ZF, WB3FCV. SEC: W6LKE. STM: K6APW. OOC: NY6Z. TC: N6AMG. K6APW reports that the UC/NALCO (W6BB) FD from the Lawrence Hall of Science drew lots of onlookers. I received FD messages from W6BB and W6CUS (EBARC). The Telephone Pioneers Radio Club mourns the loss of Frank Holmes, W6SST. SEC W6LKE reports these new ECs: KB6LHR/West Contra Costa, KJ6EP/Fremont, KG6MH/Union City, NH6CN/Vallejo, and WD6EYE/Newark. I've gotten back on the mailing list of "QRZ NBARA". They still hold an evening meeting and a breakfast each month. Their officers are: KA9MQF/P, N6NZO/VP, N6GHR/Sec, NH6CN/Treas, WD8JPA/D, W1VDE/D, K6EHR/D. VVRC is having a name-the-newsletter contest, with the winning member to receive one year's free membership. MDARC Education Chairman, KT6Y, reports that 25 students went through their Spring classes. Kudos to instructors KJ6GV, AC6Y, N6LGB, WQ6J, KB6FHC, K7SDF, KB2GV, AA6DL, and K6RK. The CCCC mourns the loss of Harold Annis, N6HAB. The BARC "LOG BOOK" featured as good an explanation of the origin of the term "HAM" as i've ever seen! EBARC welcomed new members KC6CTU, Gordon Davis, Wes Scarbrough, and Rick Muse. HRC added new members KC6DIE, W6QWK, and KA6ECD. June tfc: W66DOB 303, W6VOM 68, K6APW 43, WB6UZX 42.

NEVADA: SM, Joe Lambert, W8IXD—ASM: K7HRW. TC: NW7O. Congratulations to WA7JUO and NW7O who made 10 GHz VUCC—4 states and 5 grid squares. SNARS provided communications for a 400 mile off-road race near Yerington. The SNARS 146.61 repeater is back on the air. Many Nevada clubs had successful field days. LVRAC may have another Amateur Awareness Day this Fall, after the good reception at the Meadows Mall in June. If you have any ideas, contact WI7D, W6WBY reports that XYL and new Nevada resident Anne Marie, N6QPY worked 170 countries in 9 months after setting up in Nye County. Please send your traffic reports to KK4M. If you have info for this column, please get it to me before the first of the month (eg. info received 7/1 will go in Sept. issue.) '73 from Joe, W8IXD

PACIFIC: SM, Wayne Jones, NH6GJ—Field Day 1989 ended with a bang on the Big Island! At 0327Z, a strong (6.1 Richter) earthquake struck the Island of Hawaii. By 0330Z, the first net was activated — by KH6FKG, on 2-meters. In addition, three HF nets, one MARS net and one CB channel were activated for the emergency. Only one piece of traffic was handled, but the Civil Defense asked that the BIARC back-up the intermittent telephone connection to the Volcano Observatory. 28 amateurs and 17 CB'ers checked into the various nets. Congratulations for a job well done! As for Field Day itself, a good time was had by all! There were groups active on each major island, with at least seven groups active here on the Island of Oahu. I managed to visit five of the seven sites, and while I was at each site, contacts were coming in hot and heavy! Traffic: KH6GMP 26, KH6H 26, KH6S 30, Nets 59.

SACRAMENTO VALLEY: SM, Bob Watson, W6IEW—Just returned from the summer Section Meeting at Grass Valley where I received a big surprise. At the winter meeting, all present expressed strong objections to any NO-CODE entry level license. At this meeting the Section staff unanimously gave support to the ARRL committee's proposal. Quite a turn-around. Many thanks to Ken Blue, District EC for the Mother Lode Counties for arranging for the meeting location. Thanks also—all who came. NEEDED, a new EC for Lassen County. Long time EC Ken Estes, WA6BRV has moved out of the Section to Eureka. Thanks for your help, Ken and best of luck in your new location! Mt. Vaca RC should have their 2M and UHF systems back on the air at a new location after a bad year. They had fire damage, their building blown over in high winds, and were forced to abandon their old site after 20+ years due to a new landlord. Users of the MVRC systems should thank Jim, WA9KPW; Lew, WA6ESA; Bill, N6MSI; Ed, WA6WBH and Glenn, N6OQN their president. Twelve Field Day groups each remembered to get 100 points by sending a message to me, including one from a completely automated station located in the Section but run by Santa Clara Valley SM Glenn, WB6W. Welcome back to the active fold of Affiliated Clubs to the Sacramento ARC—seems that the renewal paperwork fell through the proverbial crack. Clubs, get your annual reports in—EACH AND EVERY YEAR. Traffic: WA6WJZ 141, K6SRF 40, WA6ZUD 28, W6RFF 24, W6CFQ 22.

SANTA CLARA VALLEY: SM, Glenn Thomas, WB6W—SEC: N6JCJ. TC: WA6PWW. STM: N6JLJ. PIO: N6HMO. ACC: W6MKM. BM: VACANT. OOC: KA6S. JUNE—My apologies for having missed the last few months. We have had some changes in the section staff. Susan WA6OCV has retired from the SEC position. I understand that she has plans to spend more time with her local ARES group and generally "just have fun". Our new SEC is Dave Larton, N6JCJ. Professionally, Dave is a 911 dispatcher for the City of Gilroy. He was also formerly our ASM for training. In his new slot, Dave will consolidate the training function he has been doing with the overall administration of ARES in the section. Congratulations on your promotion, Dave!... There is another change to the section staff. Bill WB6OML has left the area leaving a big gap at the PIO position. Many thanks to Bill for his tireless efforts on behalf of Amateur Radio in our area. Our new PIO is Randy Miltier N6HMO. Randy has been a PIA for some time and was part of the team that very successfully publicized our efforts during several fires last year. Welcome aboard Randy!... The Monterey County ARES seems to have some kind of event nearly every weekend. Their events included the John Steinbeck Bike Tour and the March of Dimes "WalkAmerica". Walt WD6EKR and the rest of the group with him are commended. The Moffett Field Air Show with the Blue Angels on the 4th of July weekend was supported by many SPECS/NASA/ARES folks as shadows, with ATV, and with a booth in Hanger #1. The crowd, variously estimated between 300,000 and 500,000 gave everyone a good workout on both days! Many thanks to all for a job well done. Special thanks to organizers KB6LCJ (booth), N6GAL (shadows), and KB6FEC (ATV), and WB5VUL (Navy interface)... There was a lot of Field day activity in the section this year. I received FD messages (100 point bonus for this) from W6OTX, K6YA, WB8JJJ, N6TU, N6KL, W6UW, K6FB, AA6BS, W6PIY, W6YL, K6LY, W6LMN and KA6ASV. Congratulations to all!... There is a telephone that has information on Amateur Radio License classes, (408) 971-1424. Well... it only has the info that I put on it, and I can only put on it what I know about. PLEASE, let me know about any classes your group or club is sponsoring so that I may include them on the recording. My phone number is on page 8 of this issue of QST... Traffic: (FEB) NR7E 141 (0), N6JLJ (3). (MAR) NR7E 78 (8), KA6SXW 26 (1), KB6IWG 12 (0), N6JLJ 4 (0). (APR) NR7E 91 (1). (MAY) NR7E 77 (0). (JUNE) NR7E 32 (0). WB6W 3 (2). Phone numbers: Amateur Radio Classes (408) 971-1424, License Exams (408) 984-8353 (ARRL VEC) or (408) 255-9000 (Sunnyvale VEC).

ROANOKE DIVISION

NORTH CAROLINA: SM, W. Reed Whitten, AB4W—ASM: AB4S. SEC: N4MYB. STM: K4NLK. BM: K4IWW. ACC: WC4T. TC: KM4OX. SGL: KE4ML. PIO: AB4FW. Field Day was a big success in North Carolina with many clubs and groups participating. Thanks to all participants and thanks for all the FD messages sent to the SM. Messages received from Union Co. ARS, JARS, Foothills ARC, Stanley Co. ARC, RARS (2 stations), Brightleaf ARC, Central Carolina RS, Iredell Co. ARS, Franklin ARC, Lexington ARC, Rocky Mt./Wilson combined effort, Carolina AR League, Cary ARC, and AA4MP group. Lots of good publicity throughout the State on TV Radio and in Newspapers. [BT] SEC N4MYB advises that the North Carolina Emergency Management Division's National Security Exercise scheduled for July 27, 28 & 29 has extensive Amateur Radio involvement. Report of the surprises they scheduled for us next month. [BT] SEC N4MYB also advises that the SET is tentatively scheduled for October 21. More information next month and from your county EC. Please plan to participate in this very important Amateur Radio sponsored emergency exercise. [BT] Spruce Pine Hamfest is scheduled for September 23. [BT] Johnston ARS sponsored JARSFEST is scheduled for October 1 in Benson (RARS VEC). [BT] Ninth

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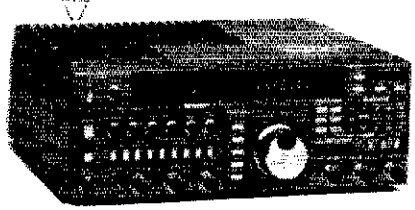

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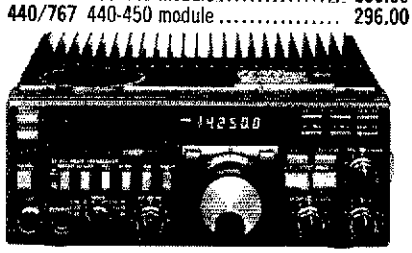
SP-767 Speaker w/audio filters	99.00
SP-767P Speaker/phone patch	136.00
2M/767 2m module	239.00
6M/767 6m module	196.00
430/767 430-440 module	296.00
440/767 440-450 module	296.00



FT-757GX MkII 9-band Xcvr/SW Rcvr/mic	$1280.00
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FP-700 Power supply	244.00
FRB-757 External relay box	14.00
FC-757AT Automatic ant. tuner w/memory	429.00
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FT-747GX HF transceiver	889.00
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MMB-38 Mobile bracket	14.00
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FT-70G* MANPACK HF xcvr (*Special Order)	$1070.00
FNB-70* Extra 12V, 4 amp-hour nicad	299.00
NC-70* Nicad battery charger/base sup	209.00
CSC-70* Canvas carrying case	90.00
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FC-70P* Preset antenna tuner	154.00
RSL-70* Whip antenna for FC-70P	28.00
MH-17* Speaker/microphone	28.00
YA-70* Tripod antenna	270.00
YH-70* Telephone-type handset	63.00

Misc. accessories	LIST
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MH-1B8 Mobile microphone	29.00
YS-60 1.8-60 MHz 2kw PEP wattmeter	127.00
YS-500 140-520 MHz 200w wattmeter	99.00
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FT-712RH 35w 440 FM w/autodial mic	536.00
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FT-709R 4w 440 FM HT/TTP/batt/cgr	389.95
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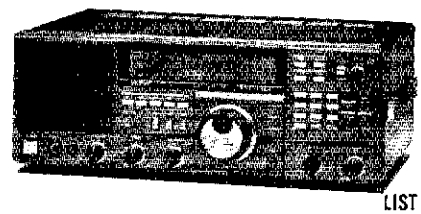
FT-23R 2.5w 2m HT	306.00
FT-23R/TTP 2.5w 2m HT w/TTP	351.00
FT-33R 5w 220MHz HT	328.00
FT-33R/TTP 5w 220MHz HT w/TTP	373.00
FT-73R 2w 440MHz compact HT	315.00
FT-73R/TTP 2w 440MHz compact HT w/TTP	355.00



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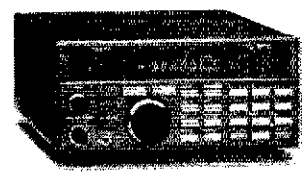
FRG-8800 150 KHz-29.999 MHz Shortwave	$784.00
FRA-7700 Indoor active receive antenna	58.00
FRT-7700 Antenna tuner	77.00
FRV-8800 118-174 MHz VHF converter	107.00
FF-5 500 kHz low-pass filter for VLF	40.00
DC-8800 DC kit	4.00
FM-W/8800 FM-wide kit	21.00



	LIST
FRG-9600 60 to 905 MHz receiver	609.00
Antenna Rotors	LIST
G-500A Heavy duty elevation rotor	$249.00
G-5400B Azimuth/Elevation rotor combo	473.00

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Annual Maysville Hamfest is scheduled for October 8. [BT] Triangle East ARS sponsored Smithfield Hamfest is scheduled for October 21 (RARS VEC). Support these hamfests and enjoy the fellowship they afford. [BT] Our involvement in Amateur Radio enriches our lives in many ways, one of which is the friendships that develop through participation in nets, clubs & hamfests. We also share the grief when one of these friends becomes a silent key. WB4DAR, a founding member of the Cary ARC, a long time participant in traffic nets and ARES activities and a major influence on many Amateurs throughout North Carolina is now a silent key and will be missed by many of us. [BT] Quarterly traffic report, Apr-Jun '89:

NET	QNI	QTC	TFC	QND	SES	NM
NCEN	1267	465	375	1575	90	WB4WII
NCMN	1027	380	293	1160	91	WD4MRD
CN	1547	691	662	3417	180	K4IWW
CSN	537	107	97	2117	90	AA4MP
CNCTN	3004	298	222	1657	91	WA4MNR
PCTN	1327	426	321	1436	91	N4SVZ
RARS	998	71	69	1491	90	K4ABJ
M2MEN	1554	57	56	842	90	KF4MZ
CFARS	1185	71	70	1226	90	W4EHF
PETN	730	105	91	655	81	WB4HRR
THEN	579	76	74	483	82	KA4LWH
ACAN	136	5	5	99	13	K4ULA
TOTALS:	13899	2752	2326	16158	1077	[BT]

June traffic: K4NLK 295, K4IWW 165, KI4YV 152, N9CGD 120, AA4ZV 83, WD4HTE 75, N4UE 50, N4LST 49, KF4NJ 48, WB4WII 47, WA9NEW 45, N4SVZ 43, W4EHF 43, WD4MRD 42, W4LWZ 33, KA4EYF 30, WD4LOO 29, WA4MNR 28, KB4FWL 28, N4MQU 25, KA4KGZ 19, AB4W 19, WA2EDN 15, N4SHE 15, N4SMS 14, N4VHU 14, KM4BN 11, K4YJB 11, KB7LX 9, N4UOE 7, W8KLF 6, KC4GCK 6, WA4NDF 4, WD4LSS 4, W4EAT 1, K4OGB 1 [AR]

SOUTH CAROLINA: SM, Ned Moeller, N4FVU—BM: K5CVD. SCSSB NM: WB4MBC. SCNT NM: KA4UIV. 2-METER NMs: KB4BZA, KJ4DT, NN4N, N4RQM. OOC: W4NTO. PIO: AB4ID. SEC: K8AFP. SDM: KA4GUT. STM: W4ANK. TC: WA4UNZ. ACC & SGL. I received 14 Field Day Acty Reports. Governor Carroll Campbell signed the Amateur Radio Week Proclamation. PIAs KA4UIV & N4VVG obtained their Mayor's Proclamations, plus TV & Newspaper coverage. PIA KA4UIV forwarded clippings about Ham acty in Spartanburg. K4AOH, KB4BZA, N4GIO & N4NDV received membership in the Amateur Auxillary to the FCC's Field Operation. AA4IX & N4GIC passed their EC Certification Exam. I need more traffic, net acty & public service acty reports. Packet BBS Sysops are doing a great job. All ECs are encouraged to sign up more ARES & RACES members. Now is the time to plan your October SET exercise. Inform your SEC so that we can plan state wide coverage. Utilize our NTS to keep us informed. Traffic: KI4FL 426, W4ANK 97, N4MEJ 74, KA4LRM 71, W4DRF 46.

VIRGINIA: SM, Claude Feigley, W3ATQ—There have been no changes in the section NTS traffic net assignments during the month of June. For complete section net listings see last month's QST. Again, a reminder N4GHI is now STM and WB4ZTR is the SEC and Virginia RACES coordinator. With these appointments there has been a slight change on the routing of your monthly station activity reports. Traffic reports go to N4GHI, DEC-EC reports go to WB4ZTR. OES and PSHR reports go to WB4ZTR. For those who use Packet N4GHI BBS is WA3TAI and WB4ZTR BBS is WB4D. What a glorious FIELD DAY!!! Many clubs report excellent participation with gud condx. The SM—SEC received a total of 20 FD activity messages, 13 of which were received via Packet. The Williamsburg report an outstanding satellite performance by working a total of 158 FD contacts thru OA13. CONGRATS to the Southern Peninsula Amateur Radio Klub (SPARK) for being designated as a Special Service Club. SPARK becomes the 6th member of this select group of clubs in the section. It is with deep regret that I report Bill Stone, W4KVI, as a Silent Key. Bill was a founding member of SPARC and was known as the Voice of Santa for many years as he thrilled children on Christmas Eve with his description of the arrival of Santa. WB4ZTR received the QCWA Meritonous Award from the Shenandoah Valley QCWA. N4EXQ sez approximately 40 amateurs supplied communication support for the summer Special Olympics in Richmond. The Virginia Amateur Radio Assn. (VARA) setup their communication van to serve as the base station for the VHF operation. WA4RTS brought his trailer equipped for ATV and setup 4 cameras and 4 monitor points which featured fast-scan, color TV coverage of the events. For those interested in earning the ARRL Diamond Jubilee Award you have until Dec. 31, 1989 to qualify. Contact W3ATQ for details. Upcoming VE exams; Sept 20, VA. Beach Hamfest contact Ken Pierpont, KF4OW—Oct. 7, Williamsburg contact Andy Swanson, WJ4X—Nov. 4 Shenandoah Valley ARC contact Walt Quitter, NC4B.—Nov. 4 Portsmouth ARC contact Art Thiemens, AA4AT. I have learned that the DC/Metro office of SKYWARN is moving to the Dulles airport from Camp Springs, Md. Although it is the DC office that is moving it should provide Virginia with the advantages of the new Doppler radar system that will be employed for weather observance. Anyone in Northern Virginia interested in instituting a SKYWARN Net? Traffic reports follow. Hope to see many of you at the Virginia State Convention Sept. 19-20. Traffic: WB0TAX 1160, K4DOR 596, N4GHI 519, W4JLS 264, N4HOG 254, W4SQQ 229, N4EXQ 191, W3ATQ 178, WB4VMX 102, K4MTX 98, KJ4VT 96, AA4AT 93, WD4MIZ 92, KB4WT 74, WB4KSG 67, WQ8Z 67, WB4ZNB 67, W4TZC 55, N4TE 50, WB4PNY 50, AA4GL 49, KC4ESG 48, KK4FV 35, WY7U 32, K4BGZ 30, WB4ZTR 29, WB4EDB 28, KB4OPR 26, K4GR 22, N4RHV 21, WD4MIS 21, K4MLC 15, K4JM 13, KD4NH 13, WB4UHC 13, WS8A 9, N4FNT 8, WB4KIT 8, N4TJT 7, WA4TVS 7, N6GVG 5, W4HU 3, KB2CEV 2, KA2IMI 2, K4VWK 1.

WEST VIRGINIA: SM, Karl S. Thompson, K8KT—SEC: K8QEW. STM: N8FXH. SGL: K8BS. TC: K8LG. ACC: WA8FLF. Repeater Coord. WB8GDY. Nice to have seen everyone who attended Jax. Mill. The WX was perfect. W8GUL was selected Outstanding Amateur of the year for 1989. Congrats. Jim. 1988 Field Day winners were MARA, nice going gang. Main prize winner was Delph. WA8NDY. Following Net Mgrs. were re-elected. KZ8Q, WVN. K8LG, WVRN. KA8ZGY was elected NM for WVNN. K8LG very badly needs NCS's for WVRN.

NET	FREQ	TIME	QNI	QTC	SESS	NM
WVFN	3865	6:00	831	88	30	WD8DHC
WVN	3567	7:00	248	105	30	KZ8Q
WVMD	7235	11:45	736	78	30	WD8V
WVRN	3640	6:30	159	14	30	K8LG
WVNN	3730	7:30	72	28	30	KA8ZGY
HILLBILLY	14290	NOONSU	148	8	4	W8YP

Traffic: WD8V 296, W8YP 136, K8TPF 60, KA8ZGY 46, W8FZP 46, K8KT 43, W9JWX 15, KA8OGF 8.

ROCKY MOUNTAIN DIVISION

COLORADO: SM, Edie Sheffield, KAØMQA; SEC: K4UBU, STM: KBØZ, ACC: WBØDUV, PIO: WBØFQB, OOC: KAØCDN/WØIJR, SGL: WDØHNP, TC: WØLJF, BM: KAØVKM. As I write this news, Boulder County amateurs are very involved in communications for a severe forest fire. Packet radio have been used by members of BCARES between the fire site and the Boulder command center. They have provided logistic support freeing up the public service emrgency communications to concentrate on the fire. Amateurs at the Longmont & Mile Hi Red Cross have helped many who have had to evacuate their homes. Thanks to all who participated in this emergency effort. Several ARES and amateurs from Denver & Colorado Springs provided communications for the MS Bikethon. Congrats to WB4ETT for coodinating this event and to all the amateurs who were involved in this two day trek to the Royal Gorge. Barcfest will be held September 24th at the Boulder County Fairgrounds in Longmont. Contact WBØZID for info. This is always a great Swap. Hope to CU there. 73, KAØMQA. Nets: Col: QNI 995, QTC 42-101, QNF 913, 30 Sess. CWEN: QNI 53, QTC 41, QNF 297, 25 Sess. CWXN: QNI 1708, QTC 1404, QNF 2700, 30 Sess. HNN: QNI 1600, QTC 162-542, QNF 940, 30 Sess. NCTN: QNI 294, QTC 99, QNF 392, 29 Sess. SCTN: QNI 351, QTC 55, QNF 366, 30 sess. Traffic: NØBQP 1910, WØLVI 857, NØHFZ 585, KØHOA 544, NØFCR 274, NØGVC 196, KAØWIE 198, WTØG 192, KØSN 129, WDØGVH 36, KBØZ 30, NØHIA 27.

NEW MEXICO: SM, Joe T. Knight, W5PDY—ASM: K5BIS. SEC: K6YEJ. DEC: WD5HCB. STM: ND5T. NMs: WA5UNO, KA5NNG, W5QNR. TC: W8GY. ACC: KA5BEM. Southwest Net meets daily, 3583 @ 0230 UTC, handled 79 msgs with 132 checkins. NM Roadrunner Net meets daily, 3939 @ 0100 UTC, handled 96 msgs with 935 checkins. NM Breakfast Club meets daily, 3939 @ 6:30AM, handled 142 msgs with 820 checkins. Yucca 2-mtr Net, 78/18 handled 17 msgs with 316 checkins. Caravan Club 2-mtr Net, 66/06 with 89 checkins. SCAT Net, 66/06 handled 8 msgs with 595 checkins. Info Net 12/72, with 87 checkins. HAMCOM 89 was a great success with over 10,000 in attendance. Lots of New Mexico hams were there and some even won prizes... Alamogordo Hamfest September 2-3, and the Northern New Mexico Hamfest is September 30th, Saturday only, so will be looking forward to seeing many of you at these hamfests. Very sorry to report the passing of W5DAD, one of our best traffic handlers, and K5YVO from Conchas, NM. Traffic: KF5VF 104.

UTAH: SM, Rich Fisher, NS7K—SEC/STM: Jim Brown, NA7G. PIO: Lon Stuart, WM7E. Tnx to NA7G for his work as SM the past 4 yrs. Mbrs of the Ogden ARC were first at the scene of a bad accident nr. Monte Cristo on FD weekend. Tnx for their quick action a critically injured person was successfully evac. by life flight. Oliver, N7JLC has graduated from HS. He is also the new NM for UCN. 73 de NS7K. Traffic: WA7MEL 57, N7JLC 24, NA7G 13, NS7K 12, KO7H 8.

WYOMING: SM, Jim Raisler, N7GVV—Shy-Wy Club did a bang up job on the 1989 WY Fest with 200 plus registered. In fact they did it so well they agreed to try again next year. The dates will likely shift to fit in to the busy 100 year birthday for our great state. Dale Putnam, WC7S, was named 1988 Ham of the Year. Thanks again Dale for your dedication to Hamming. NOTICE to all ECs: Get your updated ARES members sent into the State EOC, either direct or thru the County office so you can be registered by the state EOC and receive your RACES appointment. Traffic: NN7H 239, W7SQT 165. KC7AR reports Cowboy net held 22 sessions-539 QNI-10 QTC. WA7D reports Sheridan County ARES net held 4 sessions-53 QNI. Some clubs are planning special event stations for our 100th birthday, are you? cul & 73.

SOUTHEASTERN DIVISION

ALABAMA: SM, James Spann, WO4W—ASM: W4XI. SEC: KB4GDN. STM: W4PIM. PIO: KB4KCH. ACC: AA4BL. OOC: KF4VS. SGL: N4FRQ. BM: KA4ZXL. Our new Section Traffic Manager, Jack, W4PIM, has announced some changes in our section nets. The Alabama Day Net (ADN) will now meet on 7261.5 mornings at 10:00, while the AEND has now become the Alabama Training Net, or ATN, and will meet on 3725 at 7:30 p.m. Jack encourages all of you to check into the Alabama Section Net, ASN, on 3575. Try it, you'll like it! I regret to report, "Green," W4GBR, of Fort Payne is a Silent Key. Our ASM, Gordon, W4XI, of Tuscaloosa, operated K2BSA from the 1989 National Scout Jamboree in Virginia in early August. Gordon has been a long time Boy Scout volunteer. Congrats to the Huntsville ARC for another super hamfest/ARRL SE Division Convention! The Auburn University ARC has a new packet node up and running on 145.01 MHz, K4RY-1 (AU1). The summer of 1989 got off to an incredible wet start in Alabama, and the associated thunderstorms have knocked numerous repeaters and packet nodes off the air! Let's hope mother nature will settle down for the fall! I received over a dozen messages from Field Day groups all over the state—looks like participation in FD is up this year. A reminder—space is very limited for this monthly QST report—look for more details on Alabama Section News each month in the report written by PIO KB4KCH—it makes great reading.

GEORGIA: SM, Eddy Kosobucki, K4JNL—ASM: KC4MJ. SEC: NC4E. STM: WB4WQL. PACKET: W4QO. ACC: KM4IH. OOC: W4TG. SGL: WB4UVW. . . Well u all did it to me again. After serving the great GA section for the past ten & a half years I start a new term beginning OCT 1st. My wife says either I'm an idiot or just love HAM RADIO. I told her that my mama didn't raise no idiots so it must be the hobby. We'll celebrate our 44th wedding anniversary on Sept 1st so she knows what I love. For being a transplanted YANKEE I am ever so humble to u FB HAMS of this great section. I also want to tell u that if it wasn't for the FB staff I have & all 9000 of u GA HAMS my job wud be vy difficult. TNX to all who have supported me during the past yrs. Our vy fine Bulletin Mgr, Warren, WB4ZOJ & Morris, WD4PAH the Technical Coordinator both had to resign due to changes in their working conditions. To both of u FB hams TNX for the continuous help u have given us in the past. The Albany gang has to be congratulated on the great job they did with their HAMFEST. The rains didn't scare away anybody. Enjoyed it. U who qualify for PSHR ea mo PSE get it to me by the 5th. I have a deadline to meet. Send me a msg & it will come faster than the US mail. June PSHR honorees are: WB4DVZ, KC4BHX, KA4HHE, WB4WQL, KJ4NK, WA4YYQ, & K4ZUY. *Late May were: KJ4NK,* WA4TXT & WA4YYQ. The section's sympathy to the families of K4WXZ & K4GBQ who became SILENT KEYS during June. I must see the obituary out of the paper before I will put it in this column & also need it for the League. So please make an effort & get them to me via the mail. The annual HAMFEST in Gainesville takes place on Sept 24th & the DXPO'89 on Sept 30 & Oct 1. Anybody who hasn't been involved in putting on a hamfest doesn't know what it is. So PSE support the ones in ur section. If u think that u have qualified to have ur appointment & want it renewed Pse send me a radiogram. Once agn TNX fer ur support & I hope I can continue to keep this a great section. GOD bless & 73. Traffic: WB4DVZ 143, KA4HHE 131, KC4BHX 77, WB4WQL 60, N4UZ 39, KJ4NK 33, K4JNL 29, K4ZUY 28, WA4YYQ 23, WA4TXT 19, N4MWR 14, K4BAI 9.

NORTHERN FLORIDA: SM, Roy, N4ADI—STM: Cotton KB9LT. SEC: Rudy WA4PUP. OOC: John AB6I. TC: Ed WØRAO. BM: Dave N4GMU. PIO: Petey WA4PUO. SGL: John KC4N. ASM: Bill KB4LB. Field Day is now history and we wish all the clubs that participated the very best. For some it is a chance to score the highest, for others it's a chance to show the public some Hams in Action, and for others it can be a great time for families and friends to enjoy a day in the park! This year, Rudy WA4PUP and I received FD messages from the following clubs: NOFARS in Jax; NASA ARS Yulee County; N Okaloosa ARC; WA4GNR Quincy; OARC; Sky High ARC; Beaches ARS; W1SE Winter Springs; St Augustine ARS; Panama City ARC; Gulf Coast ARC; Suncoast ARC; SSARC Ocala. We thank all these clubs who reported their action, and remind the other clubs that you earn an extra 100 points by sending the FD message! Do it next year! Dave N4GMU has a number of stations who report ARRL Bulletins to their local areas on PBBS's as well as HF and VHF Nets. At the present these are the stations who are doing this; WC2G, N4FTF, WA4UAF, WA4EYU, KT4G, KA4YLH, W4UEA, KF4RV, N4JHI, KZ4L, WF4B, and KB4LB. We thank these people for their time and efforts in bringing all of us the latest info from ARRL. If you would like to assist this worthy effort let Dave, N4GMU in Deland know of your interest. 73 Traffic: (May) KB9LT 303, AA4HT 241, WD4IIO 237, WA4QXT 228, WC4D 221, N4SS 184, AA4FG 99, WA4EYU 86, KF4SP 75, N2AOX 70, N4JAQ 70, W4AT 45, W4ILE 44, W4KIX 44, N4GMU 43, KI4CQ 38, N4DY 38, W4DTV 30, W4MGO 30, W4UEA 30, W8IM 30, N4QYS 28, N4UF 28, K4CY 27, WA4STZ 27, WA8APQ 16, WA4PUP 11, N4OZD 11, KB4FDV 8, K4UTY 7, WB4JJH 3. (June) N4SS 271, KB4LB 192, WA4QXT 177, KB9LT 162, WD4IIO 110, AA4HT 108, AA4WE 105, WC4D 100, WA4EYU 98, N4GMU 91, K4CY 90, N4JAQ 71, W4UEA 66, NF4O 41, AA4FG 40, KI4CQ 35, W4AT 34, N2AOX 32, N4QYS 30, N4ADI 29, WB4FJY 26, N4DY 20, KJ4HS 16, N4OZD 16, W4ILE 14, K4UTY 12, WA4PUP 10, KB4FDY 6, W8IM 3, WA8APQ 2, WB4JJH 1.

SOUTHERN FLORIDA: SM, Richard D. Hill, WA4PFK—STM: K4ZK. SEC: W4SS. TC: KI4T. BM: WD4KBW. PIO: N4PBF. AAC: W4TAH. ACC: K4EUK. SGL: KC4N. PKT MGR: K4CY. In accordance with the Combined Section Net Agreement between Northern and Southern Florida the following changes have been made in net managers: N4SS relieves KA4FZI as QFN manager, N4MML replaces N4IWO as QFNS manager, WC4D is FMSN manager relieving N4MML, AA4CH is now TPTN manager replacing WB3AVZ, and N4UF will continue through July as FMTN manager then being relieved by W4NFK. Managers continuing indefinite terms are WB4WYG/FPTN, N4ET/GN, and WD4KBW/FAST. Congrats to the new managers and many thanks to the outgoing managers. They have given their time and talent in order that these nets can work in concert with the National Traffic System. On the local net level, K4FQU will continue as manager of the Southwest Florida Traffic Net for the next year and KD4GR, manager of the Southeast Florida Traffic Net announced that KF4RL has been named an assistant net manager. Next year there will again be a need to relieve the rotating net managers so net members need to be ready to volunteer to provide this necessary function of net operation. Radiograms were received from the following groups at their field day site—West Palm Beach ARC, Everglades ARC, Patrick AFB Mars Team, ARA of SW Florida, Manatee ARC, Tampa ARC, South Florida Hamsters, Martin County ARA, Racal Milgo Club, PCARS, Motorola ARC, The Old Fruitville Amateur Radio Transmitting Society, and the IBM Radio Club. WT4F sent info that he worked Field Day 1D portable from Paris Mountain SC. KD4GR reported that he gave a presentation on traffic handling at the Gold Coast FM Assoc. monthly meeting. The Fort Myers ARC *Modulator* reports that consideration is being given to upgrading the *Modulator*. WK4F gave an interesting illustration of print size—started with normal print and ranged downward through about 5 smaller sizes! I didn't realize print that small was still legible Hi. The South Brevard *Spark* had an interesting blurb regarding the fact that the Russian Navy still uses CW extensively for many of its communication needs. The Tampa ARC *QRM* congratulated AB4EC and WD4HHA, the instructors of a recently completed Novice class. The Martin County *Common Emitter* reported that W8KS was presented a certificate marking the 75th Anniversary of his first amateur license, 8KS, in 1914! The Englewood ARS stated that their June meeting was to be "Discussion on Emergency Preparedness". The Tamiami ARC *Communicator* reports indicates that their VE testing program is going great. AA4EE gave an interesting account of how he became a ham in the Palmetto ARC *Bug Juice*. K4ZK and his XYL are on their way to Kansas during the month of July and should be back by the time this reaches you. WB5YDD, manager of RN5D, sent his usual report of net activity—he also requests more participation by Florida in the day cycle of RN5. If is difficult for most Florida stations to get into RN5D—it is much easier on the evening cycle of RN5. WD4KBW reports 132 bulletins sent and received by WA4EIC 80, WT4F 6, K4IEK 32, WD4KBW 14. Remember that what

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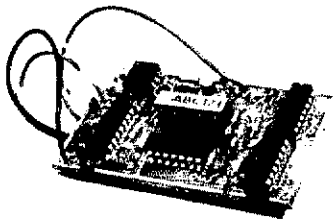

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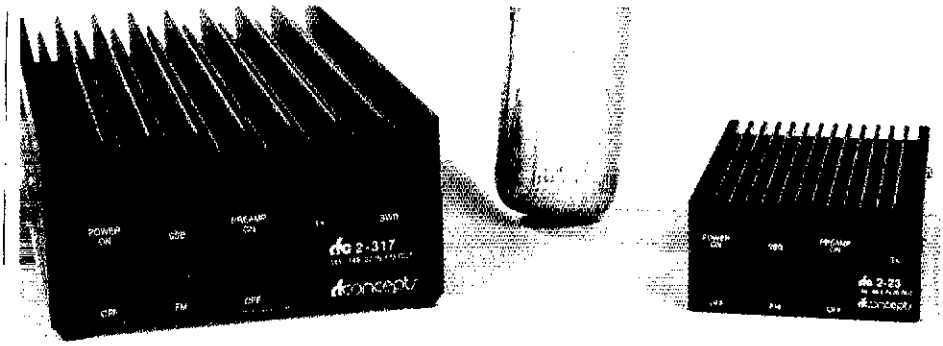

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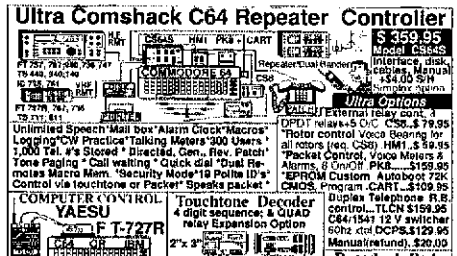

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I write for this column is basically what is sent to me—radiogram or US mail—I listen on the air but need your input. The ARRL Information Net meets on 3940 each Saturday morning at 8 AM. 73 de WA4PFK.

NET	SESSIONS	TRAFFIC	NET MANAGER
QFN	60	601	KA4FZI
FMSN	30	56	N4MML
GN	30	172	N4ET
QFNS	30	93	N4IWO
FMTN	30	208	N4UF
FPTN	30	311	WB4WYG
FAST	60	153	WD4KBW
TPTN	N/A	N/A	WB3AVZ
FPON	30	84	WB4GCK
SEFTN	30	180	KD4GR
SWFTN	26	85	K4FQU
PRVAN	9	6	WD4KBW
SPARC	30	46	WB8HOX
BCEN	N/A	N/A	KM4LP
ENMC	5	0	K4ZK
AIN	4	11	WA4PFK
DEN	4	17	N4RMB

Traffic: (May) N4QWN 116. (June) W3CUL 2846, W3VR 1001, WA9VND 534, WA4PFK 303, WA4EIC 285, W4NFK 249, KA4FZI 234, K4SCL 229, WB8HOX 185, K4IA 178, K4ZK 175, N4HAP 175, W3TLV 131, KD4GR 130, WA4RUE 101, WB4WYG 97, K4EUK 93, N4MML 82, N4ET 80, K4FQU 73, N4ORZ 73, AA4BN 71, WD4KBW 68, W4DWN 55, KA4NXF 54, N4KFU 48, KB4WBY 47, KB4MON 47, W7LUS 44, KF4RL 43, KC4VK 43, WA4NBE 38, N4TKS 31, WB4GCK 31, KB4UIA 29, AA4CH 26, K3KT 25, KA4AJR 22, KC4GHT 21, AB4MT 19, KA4SIH 17, K4JI 16, AB4OV 16, K9ALX 14, KB8ECH 13, W4MPV 10, N8ABC 8, KA8GYF 8, K9AKY 8, N4OIA 7, KA4GDU 5, W3IJR 5, N4HAS 5, KI4ZW 5, AB4BC 4, N4PSV 3, N4RHJ 3, WB4ZJS 2, KB4HAY 2, W4MFD 2, W4NSY 1.

PUERTO RICO: SM, Alberto L. Valldejuli, WP4CSG—I'm sure you will all be glad to again read this column. We had been out of the air for some time because we did not have an appointed SM. But we are back again. First of all, I would like to congratulate the P.R. Amateur Radio League for receiving its affiliation to ARRL. I encourage other ham organizations in P.R. to engage in a recruitment drive to increase their ARRL membership and thus affiliate themselves with the League and to take advantage of all the benefits of being an Affiliated Club. Also wish to thank Willy Warner for the excellent job he has done for quite a long time. TX KP4DJ. Traffic: PRN — 30 sessions 175 mins, 11 QTC, 156 QNI. Stations: KP4DJ (NM), KP4FFW, KP4AR, N5LYU, NP4D/KP4, K5HK, VP2VI. Join the PRARL's net: 3860 MHz, daily, 9 to 10 p.m.

VIRGIN ISLANDS: SM, Ron Hall, KP2N—ASM: KV4JC. SEC: NP2B. STM: NP2E. NM: VP2VI. June was a busy month here on the islands highlighted by the visit of Southeastern Division Director Frank Butler, W4RH, and his XYL Jean. With meetings with VIARC, BVIARL and SCARC, the locals got a chance to express their feelings for the upcoming ARRL Directors meeting. I hope Frank & Jean can make this an annual visit. VIARC & St. Thomas/St. John ARES had Field Day on the Northside of St. Thomas with 15 participating. St. Croix reports 8 participating at their FD. 8 ARES members from St. Thomas joined with VITEMA for joint emergency drills. Packet radio links were used from EOC on St. Thomas and EOC on Tortola BVI. Also joining the network was St. Croix and P.R. ARES St. Thomas/St. John report 4 sessions, QNI 27. St. Croix ARES had 4 sessions, QNI 38. VP2VI reports NBC filming remake of "The Old Man and the Sea" at his Tortola QTH. WP2ABG was RN on duty for filming of "Love Boat" scenes shot on St. Thomas. KV4KD operated ham station from 50' below the sea on St. Croix. 73 de "Paradise" de KP2N. Traffic: NP2E 3, NP2B 2, KP2N 3.

SOUTHWESTERN DIVISION

ARIZONA: SM, Jim Swafford, W7FF—STM: W7EP. NMs: K7POF, K6LL, KI6ZH. Official Field Day messages sent to the SM from 11 clubs operating on emergency power in the field. Such exotic places as Mingus Mtn., Mts' Lemmon and Bigelow, Goldwater Lake nr. Prescott, Mogollon Rim, Strawberry and other camping places around the State were checked in. The following clubs and call signs participated: OPRC (W7GV); Catalina RC (N7WS); Navajo ARC (KE7GP); Hualapai ARC (WS7T); Prescott ARC (K7AA); Coconino ARC (NN7A); Tucson IBM (WO7F); AzARA (W7IO); Scottsdale ARC (K7TR); AzPRA (N7JND); and Mogollon Monsters, (K7LPA). The last three reported using packet. A total of 188 operators of whom 34 were ARES members participated. (Note to EC's: This suggest more ARES recruiting may be in order). Congrats on a worthwhile FD drill, and hope everyone had fun. The Arizona Daily Star Sunday edition of June 25 carried a nice story with photo of the FD operations of Mt. Lemmon featuring the Tucson IBM and Catalina clubs in action. Good publicity! Both KD7RK and KD7WM are sporting new all band dipoles high up in the pine trees at their summer homes in Pinetop. Project Engineer was KE7WD with his trusty casting rod. Final Inspection by W7FF. KD7WM bought lunch. I goofed again! The SW Division Director's annual newsletter stated that Arizona had lowered its ham radio plate fee to five dollars. I gave WA6WZO wrong info. Actually the ham radio plate renewal and/or transfer fee for existing plates is five bucks, but for a new first-time applicant the fee is fifteen dollars. Sorry. (It was lowered from twenty-five about ten yrs. ago) Ron, KY7F reports attending Dayton HamVention this year along with 30,000 others! Awesome. Scottsdale ARC reports graduating 14 new Novices recently licensed, from their Feb'y class. Congrats (Tnx, ADAW). WVARC EC, W9WFV reports they supported Az Dept. of Emergency Services Palo Verde disaster drill in May with the following ops: K7VCI, W1JH, W2GOB, K8RAL, NY7S, N7RW, and KF7JO. Also support was provided to the Red Cross by: W7WZX, WA2OQU, N7BIE, K6LWX, and with W7JHQ and KM7L providing packet. FB. (Tnx Short Skip). Neil Wake, KV7O busily involved in working with the cities of Mesa, Tempe, and Glendale trying to get raised limits on antenna heights. He was recently listed as one of the "outstanding lawyers in Arizona". We're lucky to have Neil working for amateur radio. John, NJ7E our OOC in Phx, and your SM frequently get requests from the FCC Field Operations for assistance in solving local interference problems, mostly TVI, involving amateurs. We need assistance from the TC's and Club-sponsored interference committees to adequately do this job. How about some volunteers? Let John and me know if your club has an interference committee serving your local area, and who we can contact for help as the need arises from time to time. If you do not have one, how about forming one? This is important work and can enhance the image of the radio amateur to the public and to the FCC. Need more details? Just ask, thanks. Remember SW Divn Convention in L.A. Aug. 25-27. Hope to see many of you there. Traffic (June) W7AMM 450, W7EP 144, W7OIF 42, WE7G 39, K7POF 38, K7RLL 32, W7KXE 24, N7ETP 21, WW7P 14.

NET	ABBREV	QNI	TFC	SESS	LIAISONS
SOUTHWEST NET	SWN	132	79	30	TWN
ARIZONA CACTUS NET (HF)	ACN				TWN
ARIZONA CACTUS NET (VHF)	ACN				ACN(HF)
ARIZONA TFC & EMERG NET	ATEN	930	147	30	TWN

LOS ANGELES: SM, Phineas J. Icenbice, Jr., W6BF—Things are happening in Washington D.C.! Many people are very unhappy with the new rules laid down by the Supreme Court, the Congress and the FCC. Well you can do something about it if you really want to. QSL cards are most impressive when they arrive in large bundles. They are easily counted and identified by our elected politicians. Your vote does count and it can count many times if you write on your QSL card, sign it and send it to ALL OF YOUR CONGRESS PEOPLE. If you can't find the address (most are in the phone book) send your bundle to me and I'll try to put the address on for you. Two very fine VK6 brothers stopped in to see me yesterday VK6AGC & VK6AFC. They informed me, that in Australia, everyone (qualified) must vote! We talked to their home town Perth; they wanted to check out their accent. We found VK6XA, Bill, but no accent as it turned out Bill is from the USA with an N6 call. We did get their accent checked out though with several other VK stations and everything was ok even though they have been touring the USA for six weeks (great guys thanks for stopping). N6MAD, Kathleen reports the following TRAFFIC — EMERGENCY calls: #1 as usual N6NYK (126), K6IDU (66), KC6BCC (43), N6AHT (40), KD6CK (34) and KG6ZD (18). Thanks for the great public service work team. It is my pleasure to read about 25 news letters each month. G.M. Howard W5KM, is asking the FCC to amend the amateur rules to add another reason for the existence of Amateur Radio Service. The thrust of the petition is toward directing our young people's interest to science and engineering. According to W5KM, writing in the IEEE Life Member Fund News Letter S/Summer 1989. Amateurs should write to their Congress people and Senators to come forth with a concurrent resolution to expand and increase the amateurs contribution to our EDUCATIONAL SYSTEM. Write to W5KM, Gus for more information. Don't forget the Los Angeles County Fair in September. Participate with your Club if you possibly can. Amateur Radio needs this good publicity with the PUBLIC. CNN TV NEWS came out during THE ARRL FIELD DAY EXERCISES and took some video of field day operations. A special point was emphasized about field day operations—THAT THIS EMERGENCY EXERCISE was for practice so that when the big ONE ARRIVES a few people (Amateur Radio Operators) would be ready and able to communicate without telephones. The Great Mexican Earthquake awakened a few people to the fact that telephones don't always function. (USA is spoiled by the service ATT and the Bell System did for us, other Countries are not so lucky) The LA Council of Amateur Radio Clubs, Inc. meet as usual last night at the Red Cross Building in downtown LA. with about 30 clubs represented to hear the latest and greatest news from WA6WZO and the other speakers. The 15 and 20 meter bands are exclusively for amateur use. AIRS (ARRL Intruder Reporting Service) is still reporting about eight intruders, not legal operations per day, just on 20 meters. Your input data could help! 73 Phineas

SAN DIEGO: SM, Arthur R. Smith, W6INI—PIO: N6PKY. TC: N6JZE. SEC: W6INI. STM: N6GW. Palomar ARC is planning an Escondido- exchange phone patch linked via 900 MHz to 146.73 and 449.425. N9AKB is Palomar ARC's liaison with the city of Carlsbad and their safety center communications center. ARRL-affiliated clubs are reminded to make their annual reports to ARRL in order to maintain their active status. Forms were mailed to clubs earlier this year. ARES needs operators to support the Calif Dept of Forestry Red Flag Patrol. Call W6INI, 273-1120, for info or attend ARES meetings at 0900 on second Saturday of each month at Normal Heights United Methodist Church, 4650 Mansfield, San Diego. If interested, a pancake breakfast is served 0800-0845. K6SLA is new postmaster of Spring Valley CA. N6CQW edits SANDRA's Squelch Tales and ARC of El Cajon's COUNTERPOISE. He has received the NTS service award certificate for his NTS/BB operation. NCTN: 29 sessions, 90 msgs, 338 ck-ins. ARES/CW 4 sessions, 10 ck-ins. Traffic: (May) N6CQW-BBS 36, (June) KI6ZH 231, KI6ZM 75, N6RVO 47, WA1ZEN 41, KB6PCF 37, N6CQW-BBS 35, N6GW 18, WA6IIK 10.

SANTA BARBARA SECTION: SM, Thomas I. Geiger, W2KVA—ACC: KB5AH. ASMs: N.Vntra-N6MA, S.Vntra-W8AKF, Sbar-WB6BYU. BM: N6TNG. STM: N6WP. OOC: W8AKF. TC: W6KFV. SEC: WB6IIY. DECs: Vntra-WB6RVA, S.Sbar-KA6KGF, N.Sbar-KI6XG, SLO-WB6IIY. Your SM had the chance to visit W1 and W2 land in early June. A highlight of the trip was a visit to ARRL HQ in Newington. This provided the opportunity to meet, in person, all the folks I've been dealing with over the phone and by mail. The facilities tour was most interesting and included all the usual departments we normally think of—DXCC, QSL Bureau, membership services, etc., and some that are not usually foremost in our minds. The new layout and publishing equipment (well, new to me) was very impressive, and in very capable hands. The ARRL lab was in the midst of working with a "micro-sat" satellite, along with other projects in progress. The "outgoing QSL bureau" is piled high with your cards awaiting shipment to those exotic spots around the world. Still, the most impressive feature of the HQ tour was the PEOPLE—a friendlier, more helpful and more professional group would be hard to find. (If you get back east, don't miss the opportunity for a tour.) For all of US, to all of the ARRL HQ staff, a great big THANKS! I returned home at about 3:30 AM on June 18—just in time for the Santa Maria SWAPFEST. Some of you may know that the SWAPFEST Chairman, W6PME, was suddenly taken ill about six weeks before the event. The emergency committee that took over did a super job in the short time available to them, and another SBAR Section tradition came to a successful conclusion. Needless to say, all who attended had a good time and a great Santa Maria BBQ. A few lucky ones went home with Big prizes. While at SWAPFEST I had the chance to honor three of our section's outstanding hams. The three plaques presented are not annual citations, but rather, aperiodic awards recognizing superior contributions. Our Section Emergency Coordinator,

TECH TALK from ICOM

The IC-765: Designed By And For Today's Active Amateurs!

Your widespread interest in, and immediate acceptance of, ICOM's IC-765 HF transceiver is truly fantastic. Producing a unit of the highest quality, and then watching it successfully fill your most demanding requirements, is a serious manufacturer's greatest reward. Thanks to one and all! Celebrating that proud achievement naturally includes recognizing the closely related forces that also made it possible: specifically, today's active radio amateurs and ICOM's dedicated field representatives.

Through numerous hamfests, ICOM DAY discussions and accurate coordinations, your most requested features and operating assets were documented and relayed directly to ICOM's engineering team. Requested features were then combined with technology's most advanced circuit designs. The result was a total performance HF transceiver of world-respected quality. We are understandably proud of the incomparable IC-765 and wish to highlight some of its pacesetting features via this month's TECH TALK. Rather than discussing its obvious assets like all-band/all-mode operation, 100 watts output, built-in AC power supply, automatic antenna tuner, IF Shift, IF Notch Filter, etc., let's focus on more unique features separating the IC-765 from competitive units.

Numerous requests for high spectral purity and low noise reception were answered several ways in the IC-765. First, Direct Digital Synthesizing concepts were incorporated in the IC-765's dual VFO's. As discussed in a previous Tech Talk, a DDS-generated VFO/local oscillator signal assures high intermod immunity and very low noise reception under the most demanding conditions. Since that DDS-generated signal is used when transmitting and receiving, both modes reap its "clean signal" rewards. Additionally, the extremely fast PLL lock-in time and rapid T/R switching associated with DDS opens an exciting new dimension in full break-in CW and Packet operations. Utilization of Direct Digital Synthesizers, incidentally, was previously limited to commercial applications and sophisticated laboratory test equipment. Thanks to recent technological innovations and related cost reductions, ICOM can now integrate DDS concepts into top-line transceivers like the IC-765.

A panel-selectable RF preamp with balanced FET's and a 10/20/30 db attenuator compliments the IC-765's Direct Digital Synthesizers and add even greater operating flexibility to this versatile transceiver. The overall result is a high performance unit that cannot be equalled for DX'ing and contesting, especially in high RF level or multi-multi contest environments.

Superb multiband and multimode operations were also assigned high priorities in the IC-765's designs. First, newly-developed Band Stacking Registers were interfaced with the transceiver's dual VFO's for maximum versatility. Band Stacking Registers retain your last-selected frequency, mode, and filter selections on each band. This gives the IC-765 the dynamic operating equivalent of 10 VFO's and produces the equivalent to a full room of radio equipment in one cabinet. Further expanding the IC-765's operating assets are 99 panel-selectable memories that store frequency, mode and filter data. Each memory is tunable across the IC-765's full range, just like they are separate VFO's, and each one is reprogrammable without any VFO interaction with one button press. Selection of "tune but remember last-stored data" is right at your fingertips.

Efficient impedance matching is very important in multiband antenna systems, thus a new style automatic antenna tuner with its own CPU and memory section is featured in the IC-765. This high speed tuner matches impedances from 26 to 150 ohms while recalling and updating tuning data for hands-free operation. Combined use of the IC-765's 10 Band-Stacked VFO's, 99 memories and automatic antenna tuner is truly fantastic! Add ICOM's optional EX-627 automatic antenna selector if you use a combination of dipoles, verticals and beams, and ICOM's new IC-4KL high power linear amplifier for band-commanding authority. You'll have a winning setup everyone will envy!

Your requests for expanded multi-mode operating features also have been answered in the IC-765. Special SSB assets, for example, include a highly effective RF-level speech compressor for maximum "talk power", adjustable mike tone/frequency response to fit your voice, and an IF-level transmitted signal monitor. CW operations were given high design priority with front panel selection of wide or narrow filters for second and third IF stages (500Hz filters preinstalled, FL-53A and FL-101/250Hz filters optional). Full or semi break-in operations, an iambic keyer with dot/dash memory plus adjustable speed and weight, and a new CW pitch control are also included. The latter control is ideal for copying offset CW, RTTY and Packet signals on computerized systems with limited frequency range input circuits. The IC-765's 10Hz readout and rear socket for computer-controlled operation are simply icing on the cake!

Describing the IC-765's full story in a single TECH TALK is obviously compromising. This transceiver is absolutely loaded with high performance features, many of which are not simply defined or "called to attention" by a front panel knob. Considering its initial investment, years of top-line operating, and high resale value, the IC-765 is today's best amateur radio deal. Don't settle for less!

TALK TO US! What topics would you like to see discussed in ICOM's TECH TALK series? No subject is too simple or sophisticated if you need an answer! Send your request to:

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2380-116th Avenue, N.E.
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And continue reading ICOM's TECH TALK!

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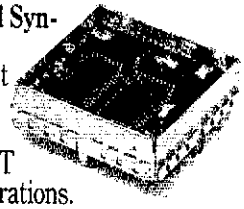
IC-765 HF Transceiver

MAKE YOUR DREAMS A REALITY!

ICOM incorporated your most requested features with modern technology's best designs to produce the remarkable IC-765 dream rig. Its combination of excellent performance and superb reliability truly open a new dimension in HF operating enjoyment.

THE HF FOR TODAY'S ACTIVE AMATEUR.

Includes: ***Band Stacking Registers.** Each band's VFO's retain the last selected frequency, mode and filter choice when changing bands. Produces the equivalent of 20 VFO's; two per band. Great for multiband DX'ing! ***99 Fully Tunable Memories.** Store frequency, mode and filter selections. Each one can be returned and/or reprogrammed independent of VFO operations. Memories 90-99 also store split Tx/Rx frequencies. ***10Hz Readout.** Perfect on-the-dot frequency selection for nets, DX skeds and data communication modes. ***Full QSK Break-in.** For super CW operations!



***Direct Digital Synthesizer (DDS).** Assures ultra-fast PLL switching and lock-in for excellent PACKET and AMTOR operations.

***Maximum Operation Flexibility!** The three step attenuator cuts multi-station overloads. ***Built-in AC Supply.** The IC-765 is 100 percent duty cycle rated for cool operation and superb performance on all modes! ***Fully Automatic Antenna Tuner.** With built-in CPU and memory for extremely fast tuning and one-touch operation. Wide tuning range. ***CW Pitch Control.** Total operating comfort and convenience for successful contesting and DX'ing. An iambic keyer with adjustable speed and weight is also built into the IC-765! ICOM also included ***Narrow 500Hz CW Filters.** The FL-32A and FL-52A deliver razor sharp selectivity. A serious DX'ers delight! 250Hz FL-53A and FL-101 optional.

The IC-765 **General Coverage Receiver** covers all bands, all modes and is backed by ICOM's full one-year warranty at any one of our four North American Service Centers. The IC-765 turns your dreams into reality!

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A DMM THAT'S GOT IT ALL

This powerful handheld does more than any DMM we've seen. It lets you measure frequency to 20 MHz, works as a logic probe to 20 MHz, tests transistor beta, measures capacitance plus does everything you'd expect a DMM to do. Even measures resistance to 2000 MΩ!

SM-2372 ..... $99.95

Specifications: At 23 ±5° C, DC Volts: ±0.5% of reading ±1 digit, 200 mV-1000 V. Input impedance 10 MΩ. Overload protection: 200 mV range, 500 VDC/350 VAC 15 seconds. Other ranges, 1200 VDC/850 VAC, 60 seconds. AC Volts: 200 mV–750 V. Accuracy ±1.0 % of reading ± 4 digits except 1.5% on 750 V range. DC Amps: 200 µA-10 A. ±1% of reading ±1 digit except 2.0 % on 10 A range. AC Amps: 200 µA-10 A. Accuracy ±1.2% of reading ± 4 digits except ±2% on 10 A. Resistance: 200 Ω-2000 MΩ. Overload Protection, 200 mV range, 500 VDC/350 VAC for 15 seconds; Other ranges, 1200 VDC/850 VAC for 60 seconds. Capacitance: 2 nF-20 µF. Frequency: 2 KHz-20 MHz. Logic: TTL to 20 MHz. Other: Diode test, continuity beeper, beta.

ONE OF OUR BEST SELLERS

Here's a 3-1/2 digit DMM that will give you excellent and reliable service. Full DMM functions include current to 10 A, capacitance and transistor beta. A lined carrying case keeps your DMM safe from the bumps and scrapes of everyday use. Kit version also available.

SM-2320 ..... $77.95

Specifications: DC Volts: 200 mV-1000 V ±0.5% of reading ±1 digit. Overload protection: 1000 VDC/750 VAC except 500/350 on 200 mV. Input 10 MΩ. AC Volts: 200 mV-750 V ±1.25% of reading ±4 digits, 40 Hz-10 kHz. Overload: 1000 VDC/750 VAC except 500/350 on 200 mV. Input 10 MΩ. DC Amps: 200 µA-10 A, ±1% of reading ±1 digit except ±2%/±3 digits on 10 A. AC current: 20 mA-10 A ±1.5% ±3 digits except ±2.5%/±4 digits on 10 A. Resistance: 200 Ω-20 MΩ. Overload protection, 500 VDC/VAC. Capacitance: 2 nF-20 µF. Other: diode check, continuity beepor, beta.

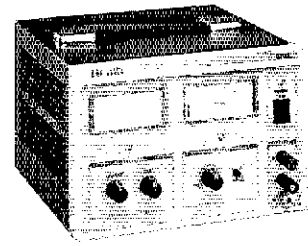
HALF PRICE SPECIAL!

ONLY $12.47

Order any product from this ad and get our popular shirt pocket miniature DMM SM-2300-A for only $12.47 — half our regular price.

Specifications: Autoranging 3-1/2 digit DMM. DC volts: 2000 mv to 450 V, ±1.3% ±4 counts. Approx. 11 MΩ input resistance. Max input, 450 VDC. AC volts: 2000 mV to 450 V, ±2.3% ±8 counts, 50 to 400 Hz. Approx. 11 MΩ input resistance. Max input, 450 V. Resistance: 2000 Ω to 2 MΩ ±2% ±4 counts.

A POWER SUPPLY FOR EVERY WORKBENCH

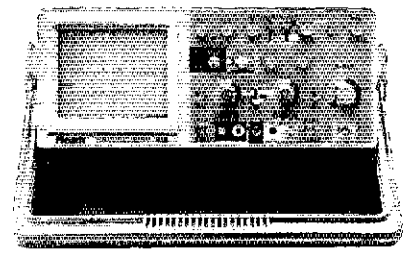


Here's an excellent value in an all-around bench power supply. Dual meters let you continuously monitor voltage and current, and 0-30 volt 3-amp output fills most common power supply needs. Use the constant current mode to charge rechargeable batteries, limit power to circuits under test and operate devices that are current dependent.

SP-2762 ..... $199.95

Specifications: Output voltage: 0-30 VDC continuously variable. Coarse and fine controls. Output load: 0-3 A continuous. Output impedance: Typically less 0.2 Ω to 10 KHz. Ripple: To 10 kHz, less than 5 mV p-p (0.5 mV rms typical). Load regulation: ±0.25%±3 mV, 1-100% of rated current. Line regulation: ±0.25% ±2 mV for ±10% line variation. Current limiting: 0-3 A, variable. Power: 120 VAC/240 VAC, ±10%, 50-60 Hz, 180 watts.

DELUXE SCOPES ARE A PLEASURE TO USE



These oscilloscopes offer the measurement capability you need, plus luxury features that make them fun to own. TV triggers, 1 mV/div sensitivity, differential and X-Y measurements, plus beam finder, component tester, graticule illumination, and other features many manufacturers omit. Enjoy a top-quality 25 or 40 Mhz scope backed by a reliable name, full warranty and complete specifications.

25 MHz: SO-4552 ..... $399.95

40 MHz: SO-4554 ..... $599.95

Specifications: Vertical: 1 mV/div-5 V/div. Bandwidth less at 1 mV/div. Accuracy ±3% at 1 KHz, ±5% at 1 mV/div. Overshoot: less than 5%. Max input: 400 V. Modes: CHA, CHB, dual, add. Horizontal: .2 s - .1 µs/div, plus X10 magnifier. Trigger: CHA, CHB, line, ext. Auto, norm, TV-V, TV-H, +/-. Power: 90-132/198-264 VAC, 50/60 Hz, 45 W. Weight: 16.7 lbs.

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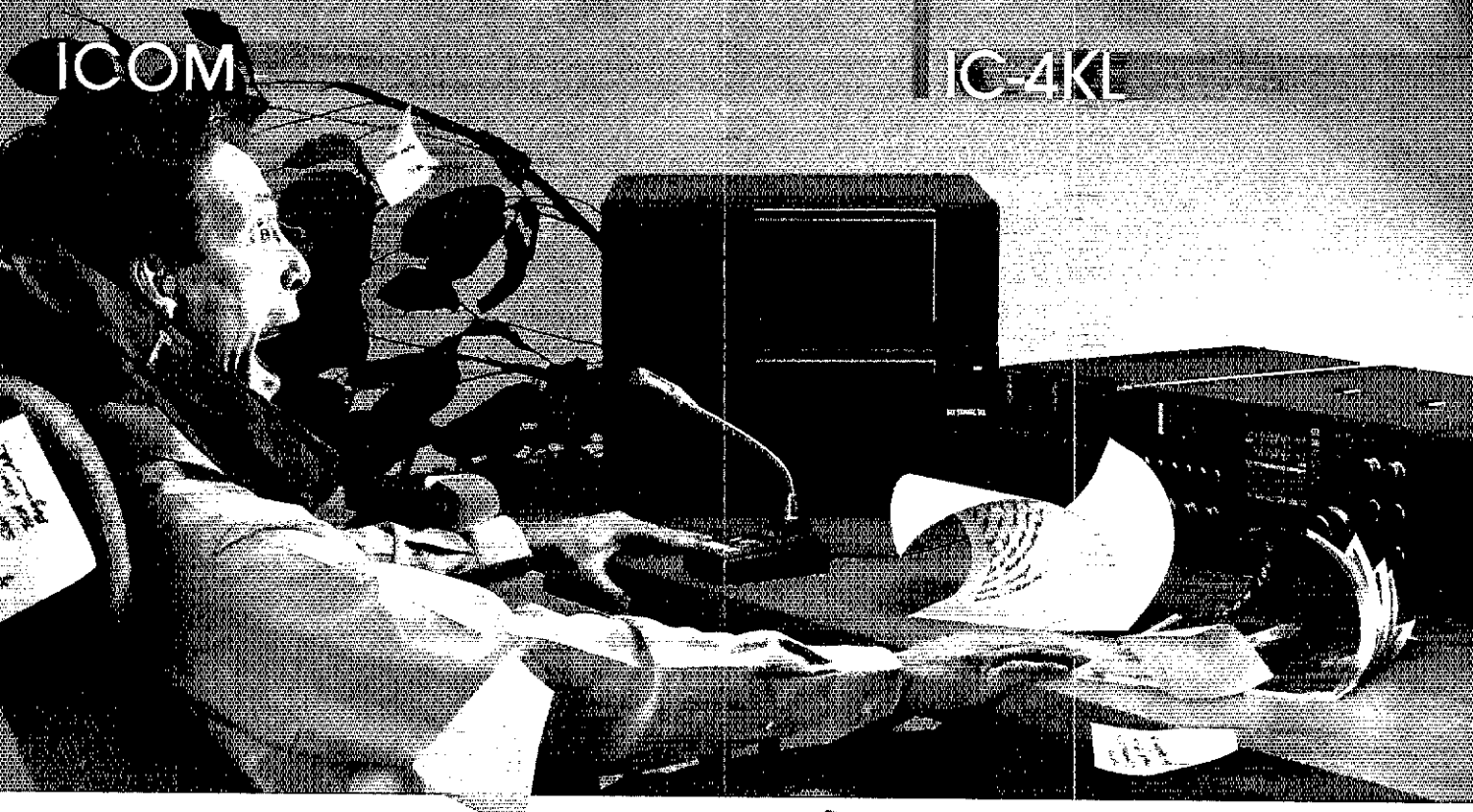


GIVE YOUR SIGNAL A BOOST!!!

ICOM's all new IC-4KL solid state HF linear amplifier represents a hefty step forward in modern electronic technology and futuristic station design.

It installs in a limited space, interconnects in a breeze and delivers band-commanding performance in the most reliable top-of-the-line fashion. Give your signal a power boost with ICOM's IC-4KL!

GLOBE SPANNING POWER.

The rugged IC-4KL delivers 1000 watts output with full 100 percent duty cycle. Covers 160-15 meters. A power boost that will be heard around the world!

ALL SOLID STATE AND FULLY AUTOMATIC.

No lethal high voltages required. No warm-up, no tune-up, no fumbles. Fully automatic and overload-protected. Just switch on and operate. Follows band selections on your ICOM transceiver. Add ICOM's optional EX-627 and setup even selects the proper antenna. The ultimate HF amplifier!

AUTOMATIC ANTENNA TUNER BUILT-IN.

Advanced design and wide impedance matching range. Internal CPU stores previous settings on each band for rapid single-button operation. Automatically seeks for and memorizes new settings if SWR changes or antennas are swapped.

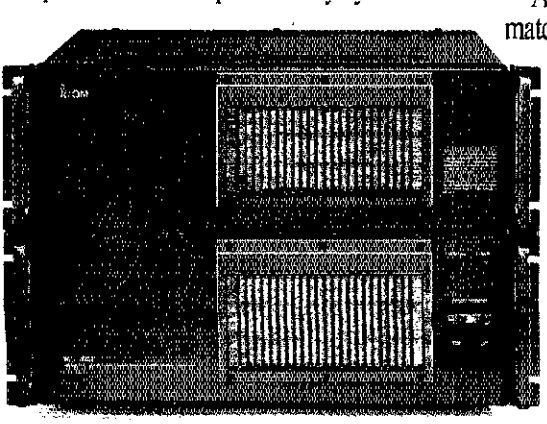
FULL CW BREAK-IN.

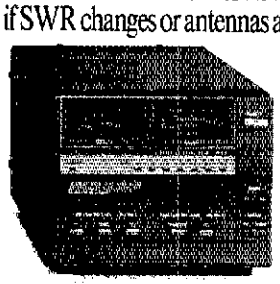
The IC-4KL uses extremely quiet and high speed relays. A DX'ers winning edge and a Packeteer's delight!

UNIQUE MODERN DESIGN.

Husky RF/PS unit rolls conveniently under desk or into nearby corner. All you see is a small remote control featuring dual multi-functioned meters for SWR and output watts.

The IC-4KL comes complete with a remote control unit, RF/PS deck and nine feet of interconnecting cable for easy installation. The IC-4KL... Big Signal Performance backed by a one-year warranty at any one of ICOM's four North American Service Centers.





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First in Communications

Van Lyons, WB6IIY, received a plaque for "Outstanding Contributions to Amateur Radio", in recognition of his many, many years of work with Ventura and San Luis Obispo County ARES, his leadership in establishing and running the first VE program in the section, and his commitment to helping hams and non-hams, alike, with a word of encouragement or a helping hand. Paul Ryan, WB6RVA, Ventura County DEC, received a plaque proclaiming him an "Outstanding Leadership Official" for his continual dedication to the organization and effective management for VARES. Paul has molded an organization that can respond virtually instantaneously to any emergency in Ventura County. In so doing he has earned the respect and admiration of all his served agencies, and garnered significant appreciation of amateur radio in his community. The final award, "Amateur Radio Ambassador", was given to Manny Chavez, W6QMV. Manny is a first class CW operator who's "fist" is pure music, an infrequent phone operator who's warmth and courtesy should be an example to us all. He, too, is always ready with a word of encouragement, a helping hand or a much needed part. He has, for years, gone out of his way to welcome the newcomer into the ham "family" and the stranger into our community. We couldn't ask for a better representative! While we often hold up some individual as an example to new hams, we would all do well to look to these three as examples for ourselves. May testing successes: SBARC/VE 13 May. To Extra: KE2HX, KJ6RF. To Advanced: KB6WIE, N6KGE, KB6YBB, N6LUC. To General: KB5FAI, Claude McKee (Unl.). To Technician: KC6DEA, KC6CZQ, KC6DCO, KB6NAT, KC6DHJ, KC6DMC, KC6DTO, KB6JIL, KA6YJB, KB7DGA, KC6DEB, Robin Gauss, John Maetta, Beverly & Harry Matlock, Brian Peterson, Wayne Speth and Robert Young (all Unl.). To Novice: Marie Parker. Examiners: KB5AH, K6QYL, W1UUQ, AA6JG, KB6ILQ, WU6L, AB6S, N6PIM, WD6ETK. Estero Bay/VE-6 May. To Advanced: N6TNG, N6TNO. To General: N6RAA, N6UIU. To Technician: KC6BSW, KC6CHN, KC6CFI, KC6CGY. Examiners: N6MUJ, AA6CT, W6FL, W6MSW, W7AZF, W6JU. My apologies to those who upgraded and are not listed here. The truth is I've misplaced the paperwork—please don't feel slighted at my error. Congratulations to all. Finally, Glenn Todd, KF6OY, retired as Santa Ynez Valley EC. We're very pleased that Glen Mays, N6JNS, has taken his place, effective immediately. Roger Laroche, N6FOU, has retired as Public Information Officer for the section because of other commitments. That position is now open, please contact me if you are interested in helping. Thanks to Glenn and Roger for their much appreciated help, and best wishes to all three in their new endeavours. 73 for now. Traffic: N6NLW 129, W6NOR 67, N6TPZ 17, VE6AWE/6 13.

WEST GULF DIVISION

NORTHERN TEXAS: SM, Dan Dansby, W5URI—ASMs: W5GPO, K5MXQ, KG5SC, W5IWE. ACC: KA1CWM. STM: W5VMP. SEC: N0AJP. OOC: WA5YKO. TC: K5SXK. PIO: K5HGL. BM: W5QXK. I am pleased to announce Pat Bell, KG5SC, Texarkana as ASM for the NE area and Ray Hennington, W5IWE, Trinidad, as ASM for So Cen area. With the appointment of KA1CWM as ACC & Section Newsletter Ed, our staff is full excepting an SCM. We have a fine group of leaders working for us. Peggy Gill, N5NWX & Charles Gill, N5OAN received the Emergency Commendation Certificates for their work in handling emergencies in Johnson Co. Johnson Co caught the works this year with Explosions, Hazardous material spills, and flooding and wind damage. Peggy is also planning school classes using ham radio for the fall semester. Application has been filed with the Foundation for funding. Peg & Chas are real Pushers & Movers. Traffic: K5UPN made BPL again with 0/324/213/7 Tot 544. W5TNT 271, W5YQZ 227, W9OYL 140, KF5BL 123, WB5CPY 79, KM5L 54, WA5MWD 32, N5KCL 40, KC5NG 43, N5NZH/T 28, WB5BNU/T 26, WA5EZT 18, W5VMP 8, K5MXQ 77, W5URI 41. Late for May KD5RC Orig 0, Rx 45, Sent 57, Del 4, tot 106, N5KCL 69.

OKLAHOMA: SM, Joe Lynch, N6CL—SM Jim, WB5SJX, became a Silent Key after a long illness. He showed great courage in organizing the Centennial Ham Radio Land Run despite being very sick. Jim was a Geography professor at OSU. He will be missed by many of his friends in Stillwater, OKC, Tulsa and throughout the state. Your SM was pleased to see so many OK hams at the National Convention. Andy, N5LRR, lost everything to a house fire recently. Fortunately, insurance is covering most of the loss. Many clubs were active during Field Day. Your SM received several FD msgs from throughout the state. Enid ARC is looking for check-ins to their Monday night net on 145.29 at 8pm. VE Exams are available at various locations throughout the state. Contact WB5OSM (Tulsa), N5HIP, (OKC), Lawton Ft. Sill ARC (Lawton) and your SM for other locations near you. Now is the time to pre-register for Texhoma. This year it will not rain on the outdoors flea market. N5HIP is authorized to check your QSL cards for ARRL awards (other than DXCC). 73 for now, Joe. Traffic: K5CXP 155, WA5OUV 97, K5GBN 91, N5IKN 83, WA5ZOO 36, WA5OGC 27, W5VOR 6.

SOUTH TEXAS: SM, Arthur R.Ross, W5KR, STM, WD5GKH. ACC, WB5YDD. PIO, WA5UZB. SEC, K5DG. TC, NZ5U. BM, WA5WCY. OOC, K5SBU. SGL, K5KJN. ASM, all of above plus N5TC. Beaumont ARC bulletin, BARN, rprts NG5F is new ARRL HF awards manager to validate WAS and 5-Band WAS; N5OED upgraded to Advanced; NICE GOING! PIA N5FIX, NWARS, Houston rprts June hurrican exercise went well, with W5BKK, KB5CL, KF5ZL, KE5IC, KA5QAP, N5KEU helping out; KF5ZL has 2 new hats - one as DEC for Harris County area and other as RACES District Radio Officer for Harris County area; a big hand for N5MJV for making DXCC. OBS W5KLV rprts 4 propagation tests, 6 bulletins given 32 readings on 7 nets. Johnson Space Center bulletin proudly announces its ARRL affiliation; welcome aboard. Six Meter International Radio Klub (SMIRK), via San Antonio ARC bulletin, BEXAR WIRE, rprts a special VE team of K5JWK, KG5IG and WB9BJR convened at shack of handicapped N5HOB who then upgraded to General; congratulations and WELL DONE go to all concerned; another great effort by SAARC helped two classes of 6th graders learn about Ham Radio when N5NVL and N5CNH gave an hour-long seminar at Pat Neff Middle School; they rprtd that even the teachers want to become Hams; that is real Amateur Radio at work in both cases; KB5JGF, KB5JGJ, KB5JGI and KB5IGG upgraded to Technician; more congratulations are in order. DRN5 NM WB5YDD rprts 478 msgs in 60 June sessions; STX represented 93% by W5KLV, W5CTZ, WB5HZQ, KE5ZV, N5NAV,

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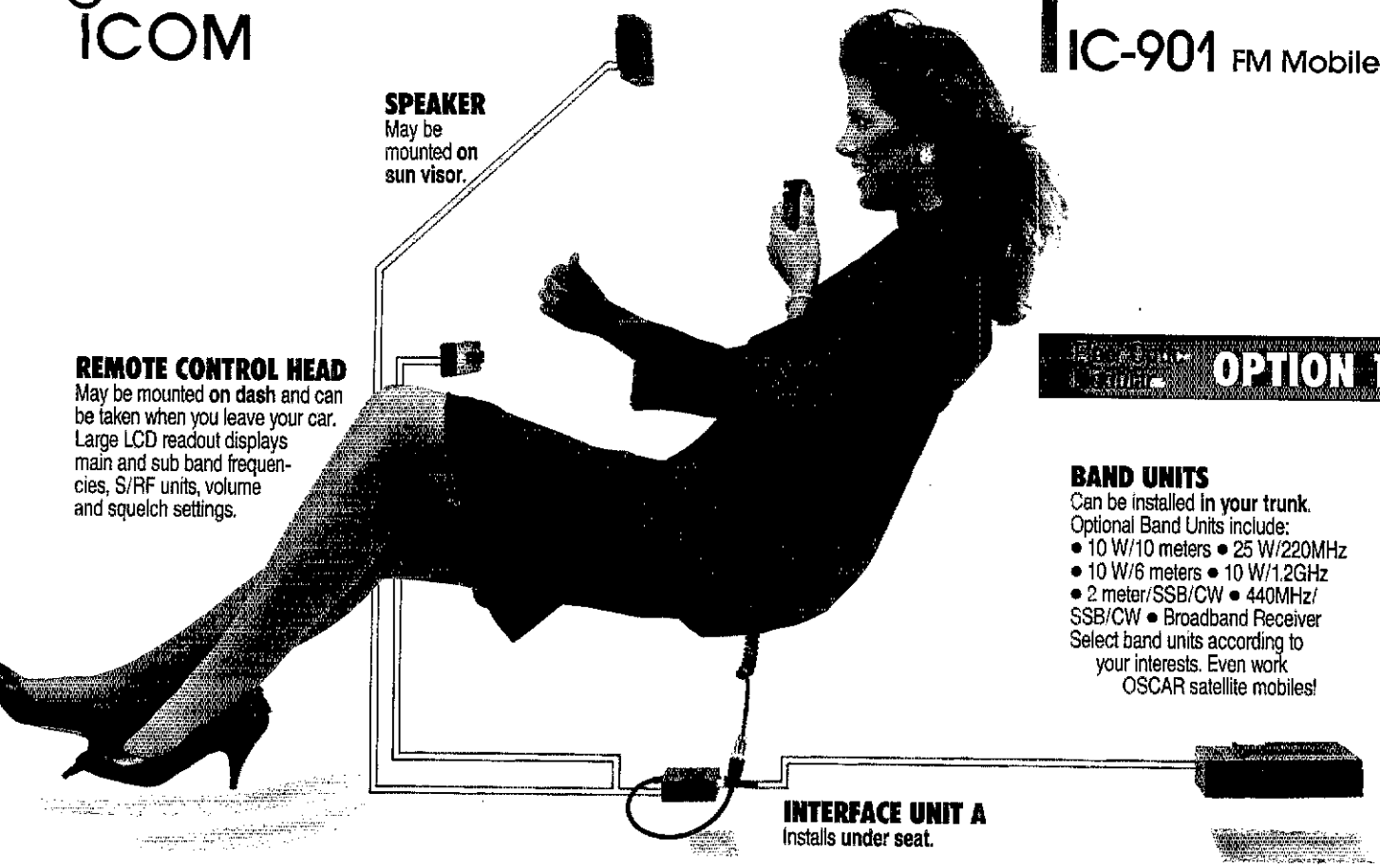

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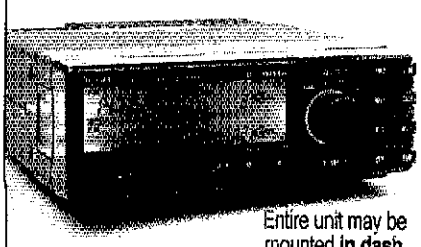
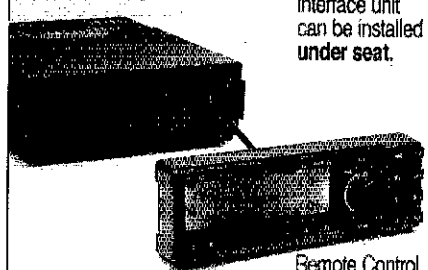


Entire unit may be mounted **in dash.**

OPTION 3

Dual band and interface unit can be installed **under seat.**



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WV5X and WB5YDD. San Benito ARC Pres WA2VJL reports SW Bell Community Resources Team donated an Amateur Radio VHF antenna for installation at San Benito PD, the EOC. 7290 Traffic Net Secy NF5T rprts 326 msgs in 48 June sessions; 3005 QNI; NTS liaison 2 per session; NM W5YQZ. CAND NM K5UPN rprts 568 msgs in 30 June sessions; STX represented 100% by KD5CB, W5KLV, KD5KQ, WB5YDD, N5NAV, KE5ZV. The number of FD msgs for '89 seemed greater than usual; major-it made it via packet over the hard-to-cross CRP-RGV jump. Brenham ARC rprts City of Brenham declared the week of June 19-25 as Amateur Radio Week. Houston ECHO Society began publishing a club bulletin; pres N5EJX should be quite proud of a good bulletin; PIA KG5HQ, with 18 ECHO members, provided communication for Red Cross Convention in Houston. Traffic: WB5J 317, WB5YDD 170, N5NAV 164, W5CTZ 134, WD5GKH 97, N5ILI 62, NZ5J 61, AC5Z 35, W5BGE 31, W5KLV 30, N5KAO 23.

WEST TEXAS: SM, A. Milly Wise, W5OVH—Congratulations to the San Angelo ARC who recently officially became a Special Service Club, through the efforts of its members and the ACC of West Texas Jerome Doerrie, K5IS they received the recognition they deserved. There is a packet digipeater in Pringle Texas and it is providing good direct connections with Amarillo. Congratulations to the following who upgraded and passed various testing. General, Tom KA5WSK; Gerald N5MGU; Mark N5MBX; Don KB5IOG; Terry KB5IRP; Advanced: In May Mark N5MBX; General: in May Don KB5IOG and Terry N5OMI; in April Tech.: John KB5IRR, Elena KB5DAK, in May Tech. Jason KB5IRQ and Charles KA5YFD. Don Swallow passed Novice theory and Fred Flanagan passed Adv theory. The West Texas ARC was very well represented at the March of Dimes Walk-A-Thon where they helped by furnishing communication for over 200 walkers, 50 bikers (pedal kind) and numerous joggers. Those assisting were N5FRN, N5KUC, KF5FY, KF5NI, KA5REL, N5ETX, WN5JMV, KB5EDF, N5LTS, N5KDA, and W5SHL. Thanks to K5AZY and the entire committee of the Abilene Hamfest, for putting on an excellent hamfest. The Big Spring Amateur Radio Club will start a new Novice class in September. George WA5RUF and Bonnie of the Big Spring ARC recently made a trip to Guatemala to set up a broadcast radio station. They have to have a little spirit of adventure to go into Central America. Congrats to Ken KB5HQJ who upgraded to General. From the Prairie Dog Chatter, the bulletin of the Childress ARC comes the news that during May and 14 days of June the National Weather Service states is declared 110 severe thunderstorm watches and 22 tornado watches. The weather watchers put in a total of 167½ hours during that time. That season should be over by now. Bill Brewer, K5KNC advises that Lubbock now has its first lady ham who has an Extra Class license. She passed July 8, Judy Gentry, KB5AJL. Congratulations. 73 Milly Wise, W5OVH SM.

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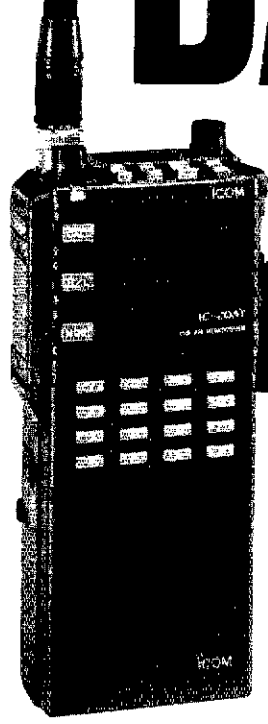

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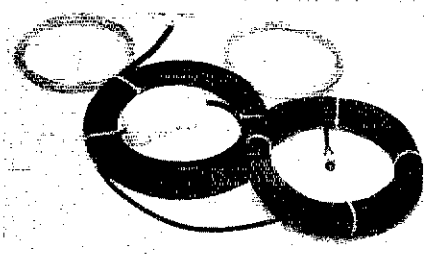

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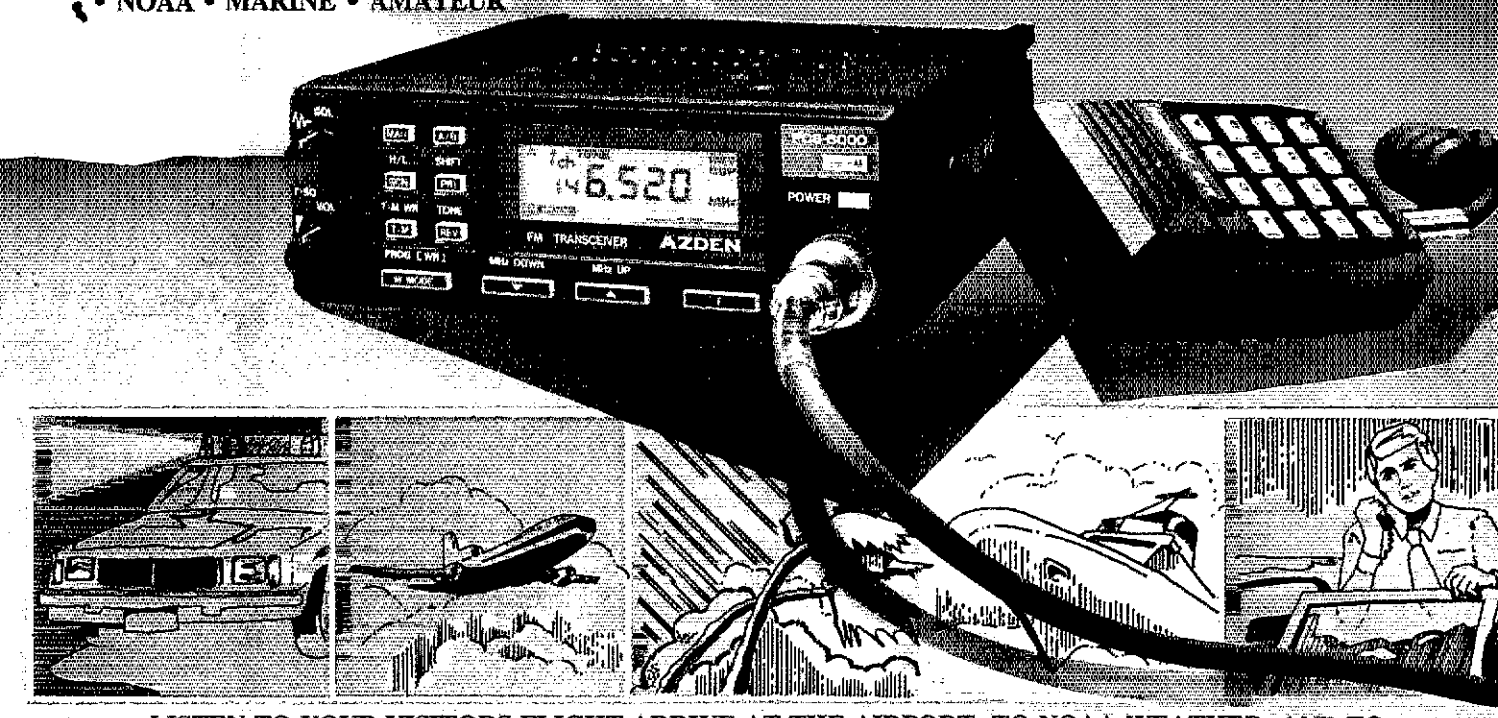

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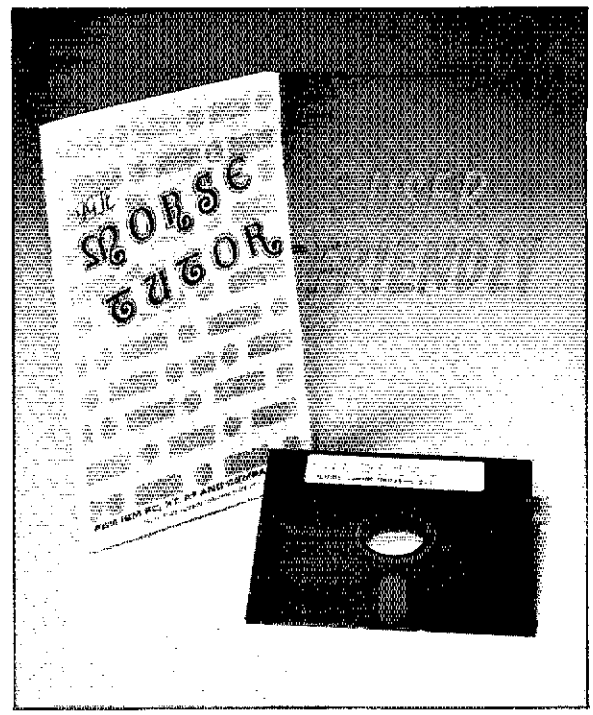

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393S	TH5MK2S Thunderbird, 5 elements	766.00
395S	Explorer 14 Broad Band	606.50
221S-1	TH3JRS Thunderbird, 750W PEP	383.00
390S	TH2MKS Thunderbird, 2 elements	360.00
396S	30/40 Meter Kit for Exp. 14	154.00

MODEL	MONOBAND BEAMS	AMATEUR NET
239S-1	103BAS 3 element 10 meter	$134.00
236S	153BAS 3 element 15 meter	190.00
226S	203BAS 3 element 20 meter	309.00
375S	105BAS Long John 5 element 10 meter	264.00
376S	155BAS Long John 5 element 15 meter	398.50
377S	205BAS Long John 5 element 20 meter	678.50
394S	204BAS 4 element 20 meter	513.00
371S	Discoverer 7-1 Rotary dipole 30/40 meter	280.00
372S	Discoverer 7-2 2 element 40 meter	630.00
373S	Discoverer 7-3 Director Kit for 7-2	396.00

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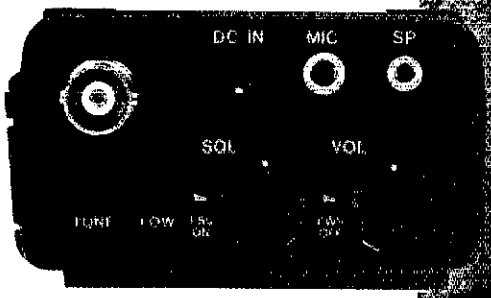
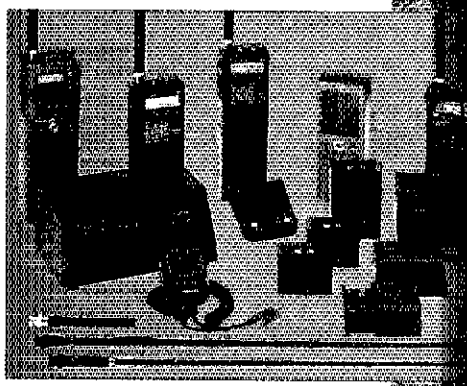
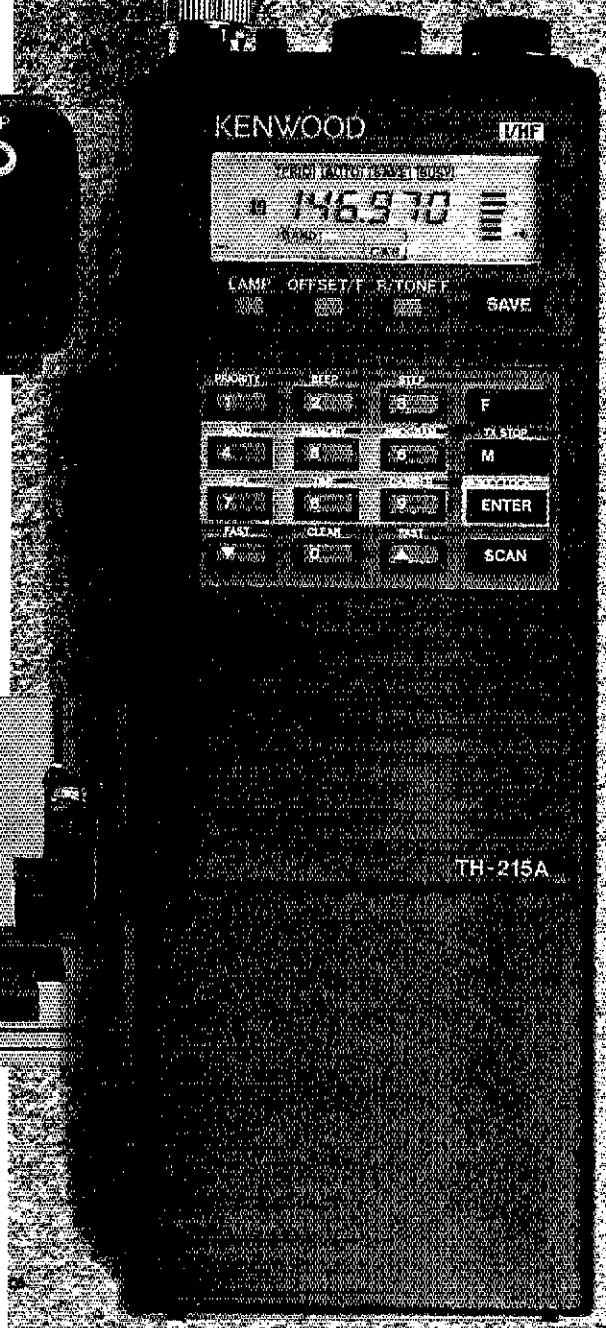


- **Wide receiver frequency range.** Receives from 141-163 MHz. Includes the weather channels! Transmit from 144-148 MHz. Modifiable to cover 141-151 MHz (MARS or CAP permit required).
- **TH-315A covers 220-225 MHz, TH-415A covers 440-449.995 MHz.**
- **5, 2.5, or 1.5 W output, depending on the power source.** Supplied battery pack (PB-2) provides 2.5 W output. Optional NiCd packs for extended operation or higher RF output available.
- **CTCSS encoder built-in.** TSU-4 CTCSS **decoder** optional.
- **10 memory channels store any offset, in 100-kHz steps.**
- **Odd split, any freqency TX or RX, in memory channel "0."**
- **Nine types of scanning!** Including new **"seek scan" and priority alert.** Also memory channel lock-out.
- **Intelligent 2-way battery saver circuit extends battery life.** Two battery-saver modes to choose, with power saver ratio selection.
- **Easy memory recall.** Simply press the channel number!
- **12 VDC input terminal for direct mobile or base station supply operation.** When 12 volts applied, RF output is 5 W! (Cable supplied!)
- **New Twist-Lok Positive-Connect™ locking battery case.**
- **Priority alert function.**
- **Monitor switch to defeat squelch.** Used to check the frequency when CTCSS encode/decode is used or when squelch is on.
- **Large, easy-to-read multi-function LCD display with night light.**
- **Audible beeper to confirm keypad operation.** The beeper has a unique tone for each key. DTMF monitor also included.
- **Supplied accessories:** Belt hook, rubber flex antenna, PB-2 standard NiCd battery pack (for 2.5 W operation), wall charger, DC cable, dust caps.





Optional Accessories:
• PB-1: 12 V, 800 mAH NiCd pack for 5 W output • PB-2: 8.4 V, 500 mAH NiCd pack (2.5 W output) • PB-3: 7.2 V, 800 mAH NiCd pack (1.5 W output) • PB-4: 7.2 V, 1600 mAH NiCd pack (1.5 W output) • BT-5 AA cell manganese/alkaline battery case • BC-7 rapid charger for PB-1, 2, 3, or 4 • BC-8 compact battery charger • SMC-30 speaker microphone • SC-12, 13 soft cases • RA-3, 5 telescoping antennas • RA-8B StubbyDuk antenna • TSU-4 CTCSS decode unit • VB-2530: 2m, 25 W amplifier (1-4 W input) • LH-4, 5 leather cases • MB-4 mobile bracket • BH-5 swivel mount • PG-2V extra DC cable • PG-3D cigarette lighter cord with filter

Complete service manuals are available for all Kenwood transceivers and most accessories. Specifications and prices are subject to change without notice or obligation.

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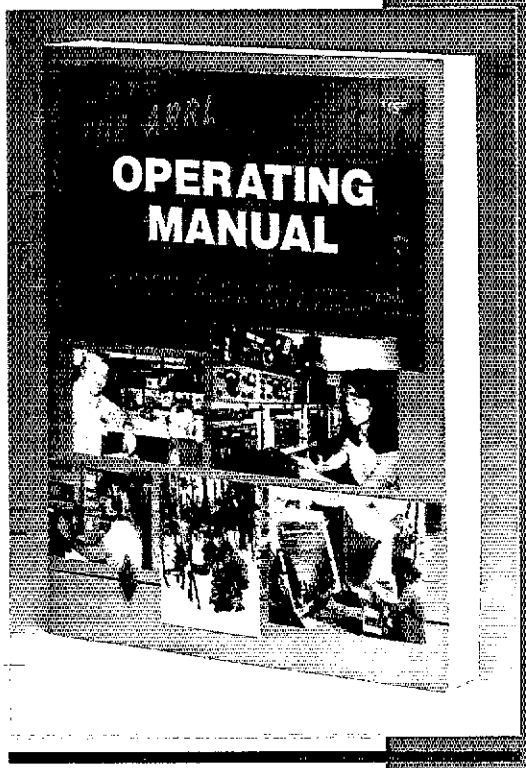

The chapters on Shortwave Listening, The Amateur Radio Spectrum, Antenna Orientation, and RTTY Communications were written by HQ staffers: AK7M, W4RI, K1TD and WA3VIL. Bob Halprin, K1XA was the editor of the *Operating Manual* and was responsible for the popular Operating Awards chapter where more than seven dozen awards are described and illustrated in full color.

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The TS-711A 2 meter and the TS-811A 70 centimeter all mode transceivers are the perfect rigs for your VHF and UHF operations. Both rigs feature Kenwood's new Digital Code Squelch (DCS) signaling system. Together, they form the perfect "matching pair" for satellite operation.

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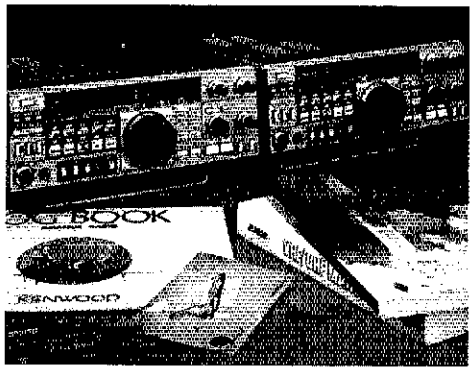
- **Large fluorescent multi-function display.** Shows frequency, RIT shift, VFO A/B, SPLIT, ALERT, repeater offset, digital code, and memory channel.
- **40 multi-function memories.** Stores frequency, mode, repeater offset, and CTCSS tone. Memories are backed up with a built-in lithium battery.



- **Versatile scanning functions.** Programmable band and memory scan (with channel lock-out). "Center-stop" tuning on FM. An "alert" function lets you listen for activity on your priority channel while listening on another frequency. **A Kenwood exclusive!**
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- **High performance noise blanker.**
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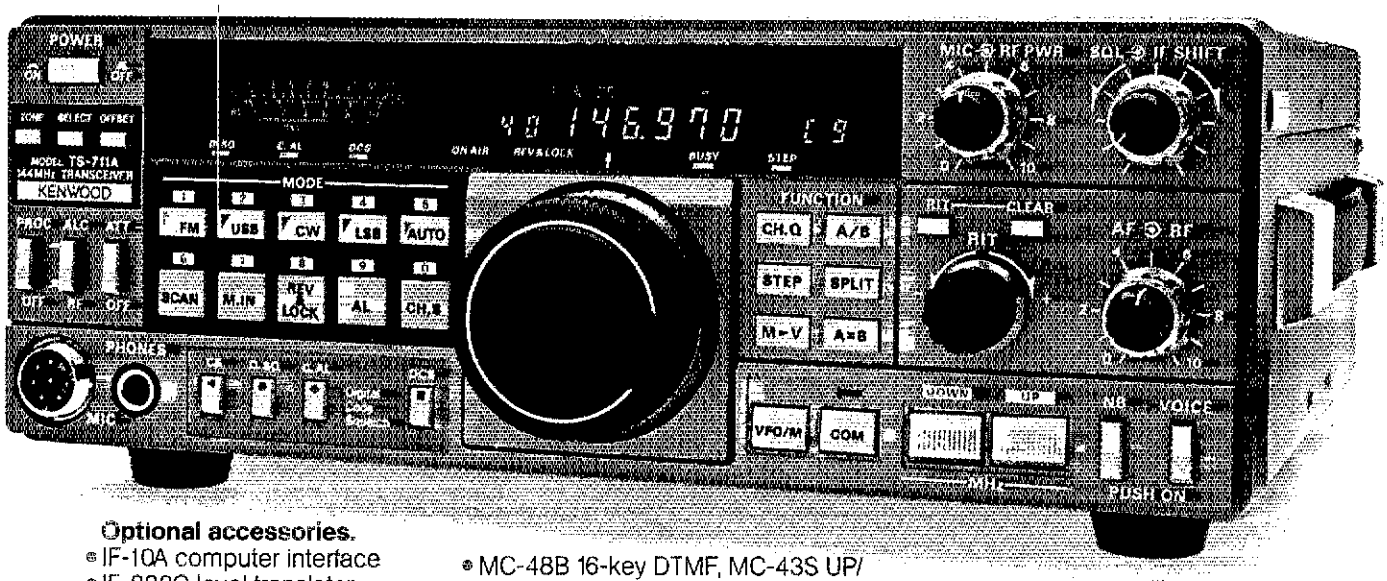
- **VS-1 voice synthesizer (optional)**

More TS-711A/811A information is available from authorized Kenwood dealers.



Optional accessories.

- IF-10A computer interface
- IF-232C level translator
- CD-10 call sign display
- SP-430 external speaker
- VS-1 voice synthesizer
- TU-5 CTCSS tone unit
- MB-430 mobile mount
- MC-60A, MC-80, MC-85 deluxe desk top microphones
- MC-48B 16-key DTMF, MC-43S UP/DOWN mobile hand microphones
- SW-200A/B SWR/power meters: SW-200A 1.8-150 MHz SW-200B 140-450 MHz
- SWT-1 2-m antenna tuner
- SWT-2 70-cm antenna tuner
- PG-2U DC power cable

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- **BUILT-IN DUPLEXER**
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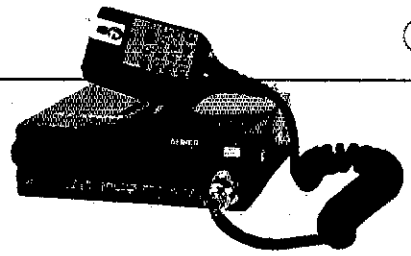

DR-110T
2m FM Mobile Transceiver
- 144.00–147.995 Mhz*
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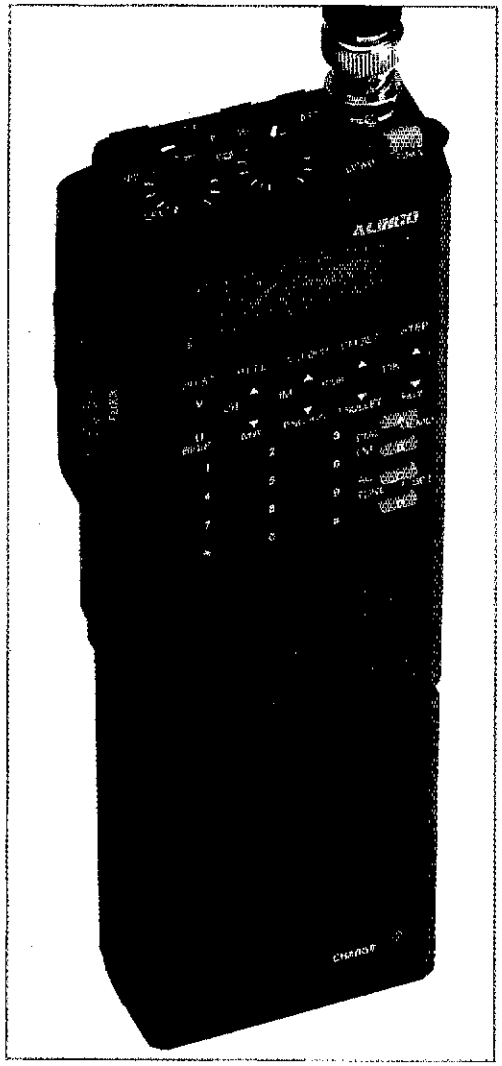

Engineered with the most advanced electronic technology, the Tiny, Tough and Terrific DJ-500T features two methods of Frequency Selection, Encode/Decode Subaudible Tones and a Single memory - 16 Digit Auto Dialer and the following plus:

- **144.00Mhz–147.995 Mhz/440–450 Mhz (Frequency Coverage is Modifiable*)**
- **Ultra Compact: 2 5/16" (W) x 7 1/2" (H) x 1 1/2" (D)**
- **Cross Band Full Duplex**
- **High Power Output: 2.5 W (VHF) /2.0 W (UHF) with Standard Ni-Cd battery**
  6Watts (VHF) /5 Watts (UHF) with Optional Battery*
- **Two methods of Frequency Selection**
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- **All Ni-Cd batteries have unique DC/DC converter for 13.8VDC input**
- **Programmable Odd Offsets**

- 20 Memory Channels (10 each band)
- Multiple Battery Options
- 10 db RF Attenuator
- Illuminated LCD
- Function Lock
- Unique Priority Function
- CAP and MARS modifiable (Permit required)

2-Year Limited Factory Warranty

DJ-100T
2m FM Transceiver
- 3 Watts/Standard
- 6.5 Watts/Optional

DJ-200T
220Mhz FM Transceiver
- 2.5 Watts/Standard
- 5 Watts/Optional

- LCD read out
- 10 Memories
- Dipswitch Programmable Subaudible Tone built-in
- MARS and CAP modifiable (DJ – 100T) (Certificated required)

* 6 WATTS VHF
5 WATTS UHF
(* With Optional EBP-8NAZ or 13.8VDC input)

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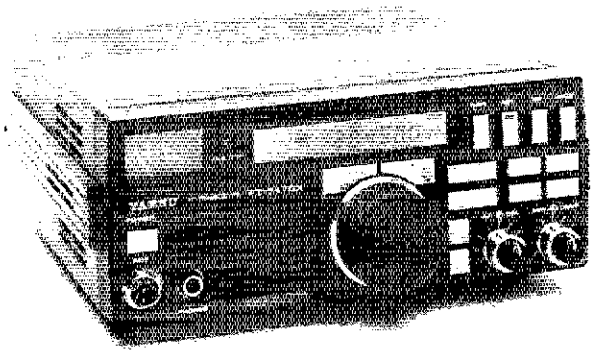

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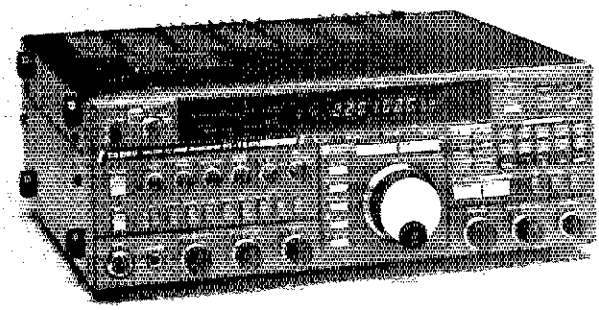

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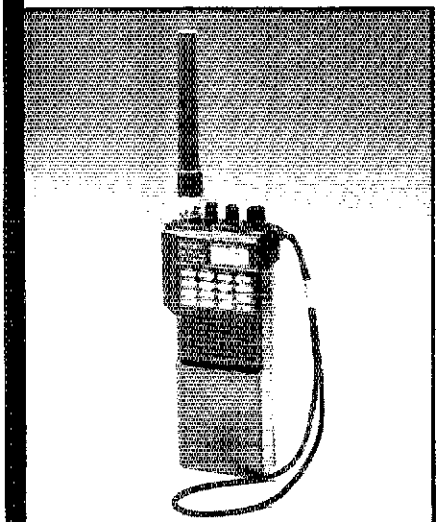

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From our recent DX-pedition to Taiwan, operators easily controlled pileups with the SB-1000 and nothing more than a dipole antenna. This means that when conditions are tough, you know you can depend on your SB-1000 to lift your signal above the rest. Whether you're using a dipole or stacked monoband beams.

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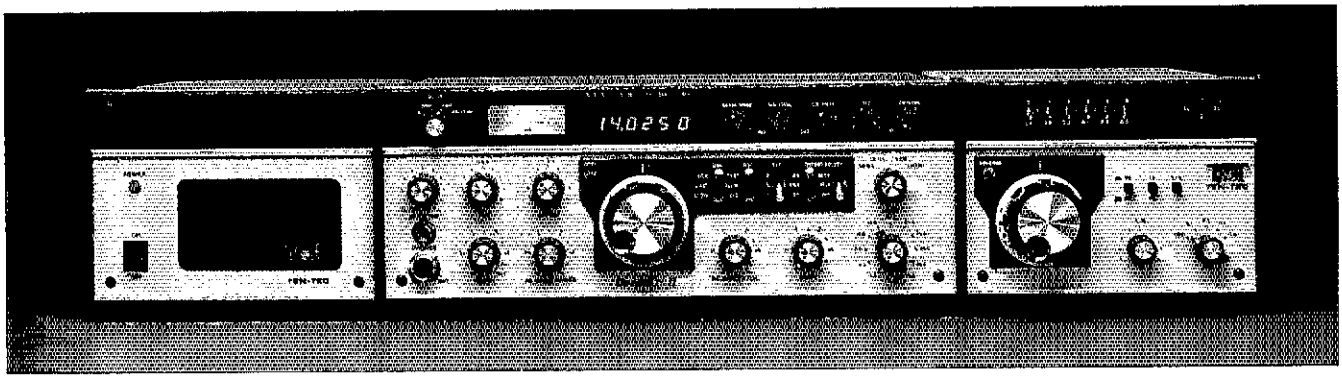
Sixty-two programmable memories that store frequency, mode, filter selected, channel number and a 7 character alpha-numeric "tag" for entering channel I.D. Scan rate is selectable and as each memory is scanned all of the stored information is displayed (what a light show!). Alternately, the memories can be tuned with the main tuning knob.

Frequency selection is with the main tuning knob, direct keypad entry or up/down buttons that will shift in 100 kHz or one MHz increments or to the next ham band. DISPlay button selects 24 hour clock or date or tag. VOICE button causes a voice frequency announcement with optional synthesized voice board installed.

Rear panel controls are provided to adjust the VOX, cw monitor level and tone, and SSB sidetone monitor level. Switching is provided to control conventional linear amplifiers and of course, high speed switching for QSK linears, such as the Titan or the Hercules II. Other rear panel inputs and outputs for transverters, FSK (170 Hz shift), fixed level audio out, audio in, external speaker, aux dc jack and provision for the optional RS-232 control interface. An absolute delight for the all mode operator.

The Paragon is the result of a three year engineering effort. We are proud of the Paragon and we think it has set new standards of excellence in synthesized rigs. Check it out yourself. We think that you will share our pride in the Paragon.



The Classic CORSAIR II...

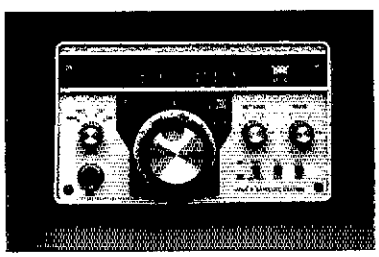
Unique in all the world, the CORSAIR II is the only ham transceiver available that uses a crystal mixed, permeability tuned oscillator. The ability of this scheme to reject strong adjacent signals and to dig out weak signals under the most adverse conditions is legendary. The 95 dB of dynamic range is all useable!

Frequency tuning is also unique. The main tuning is 18 kHz per turn. Dual range offset tuning can control transmit, receive or transceive. Selectivity is enhanced with a 16 pole crystal ladder filter and pass band tuning. The 50 + dB notch filter virtually eliminates carrier type interference. An eight pole audio filter is standard and the I-F filters are selectable independent of mode for superior operation on the digital modes.

The transmitter is well known for outstanding audio quality on SSB and QSK CW performance is simply beyond comparison. All ham bands are covered, 160 through 10 meters with WWV at 10 MHz. The front panel is a thoughtful and spacious arrangement with only the controls that you need.

If your number one priority is outstanding performance on the ham bands, and simplicity is still a virtue, you may be the kind of purist who deserves the classic CORSAIR II.

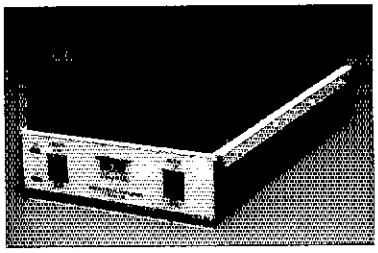
Add Satellite Communications To Your HF Station



Model 2510 B

The Model 2510 B, mode B, satellite station is a 70 cm, 10 watt SSB and CW transmitter with a super-sensitive, low noise, 2 meter to 29 MHz receive converter. The receive conversion idea takes advantage of the excellent selectivity and sensitivity that you already have in your HF station. Frequency tuning is with the PTO in the 2510B and the transmitter automatically tracks the receive frequency for "transceive" operation. "Split" operation is also provided. Two bands are included for full coverage of Oscar 10 and Oscar 13.

The Model 2410 is an all mode, broadband, 100 watt, 70 cm amplifier that adds 10 dB of gain to your up-link signal. Tx/Stby control can be hard-wired or automatic when the drive signal is present. Primary power is 12 to 14 Vdc at 20 amps.



Model 2410

TITAN: A Gallon And A Half Out! (5.68 Liters)

The TITAN has it all! 1500 watts output with ease, all legal bands 160 through 15 meters including MARS frequencies (10 meters after owner mod), lightning fast QSK for full break-in CW or the digital modes and a two speed blower for quiet operation on SSB. This awesome performance from a 17 lb desk top amplifier is made possible by a pair of Eimac® 3CX800A7 ceramic triodes and an external 45 lb power supply that is an absolute "horse."

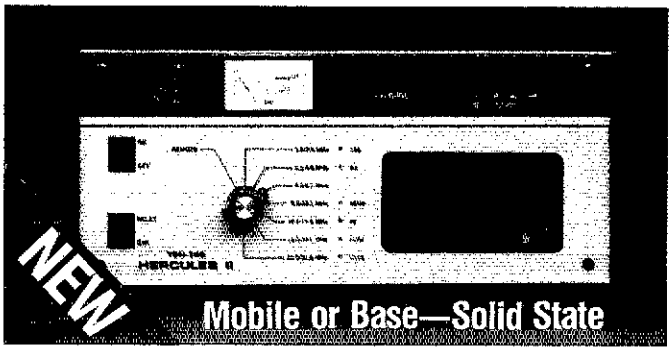
The heart of the power supply is our own tape wound, four core Hypersil® transformer that weighs in at an impressive 41 lbs. The transformer is conservatively rated at 2.5 kva CCS. (9.5 kva IVS.) The power supply is housed in a separate utility enclosure and is nearly noiseless even at full power.

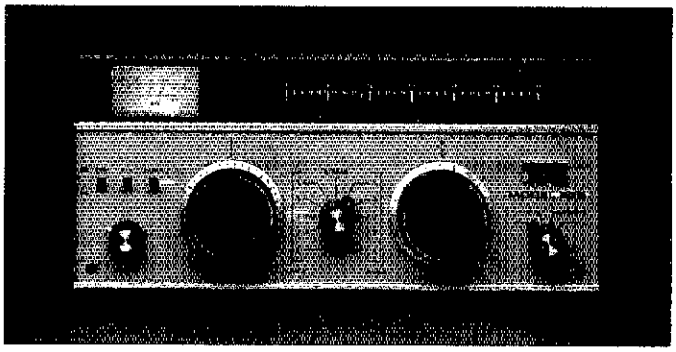
Front panel features include a ten element LED bargraph that displays peak power, a multi-meter selectable to read plate voltage, forward or reverse power and grid current. A matching meter is dedicated to display plate current. The TUNE and LOAD controls use 3:1 vernier drives which, in combination with a great RF deck design, make the TITAN a real "pussy cat" to operate.

The low drive requirement of the TITAN (65 watts for 1500 watts output, typical) makes life much nicer for your exciter too. This is especially comforting when operating keydown modes such as RTTY. Two product review articles have been published, see QST April 1986, CQ February 1986.

If you are ready to choose your dream amplifier the TITAN has everything but the highest price. Check it out!

THE TITAN IS BACKED BY A THREE YEAR LIMITED WARRANTY.





Hercules II No Tune 550 Watt HF Amplifier

The HERCULES II, Model 420, is an amplifier design that offers a combination of unique features that can only be achieved using modern solid state technology. Instant on, 12 - 14 Vdc operation, no-tune broadband final and compact size. General coverage operation from 1.8 to 22 MHz (to 29.999 MHz with authorized modification). Add to that lightning fast QSK cw, remote control, superb linearity and a low drive requirement. Outstanding!

The HERCULES II will interface nicely with virtually all transceivers. The front panel includes an analog multi-meter for collector current, voltage, forward power and SWR. A 10 element LED bar-graph display indicates peak output power. Band selection is made from the front panel switch or remotely controlled through a rear panel connector. Accessories are available for mobile remote control and automatic band tracking when using a Paragon. A front panel speaker is built-in.

The Model 9420 115/220 Vac power supply is in a separate utility enclosure and connects to the RF deck using a 6 foot power cable. It provides 80 amps to the amplifier plus 20 amps at 13.8 Vdc to power a 100 watt output exciter.

Two KW Antenna Tuner

The latest version of the highly regarded Ten-Tec antenna tuner is now the Model 238. The 238 has been re-styled to match our transceivers and looks great in your shack, whether your layout is "look alike" or "mix and match." This tuner adds a great deal of versatility. It will load virtually any unbalanced (coax fed or long wire) antenna. The high power balun is built in as standard which allows the use of balanced feeders also. Full coverage from 1.6 to 30 MHz. The modified "L" network will tame an SWR of at least 10:1, any phase angle, without false load problems. The lighted slide rule dial and calibrated tuning knob skirts make it possible to log settings and quickly QSY to the same frequency and antenna, without going through the tuning process again. Lighted multi-meter reads power in two ranges, plus SWR. A great way to operate all bands, including WARC and MARS, with something less than a world-class antenna farm.

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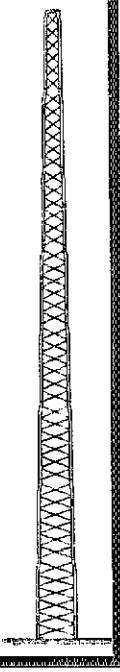

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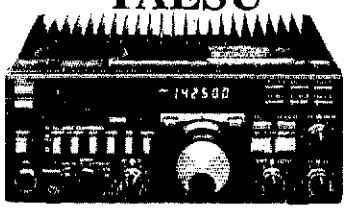

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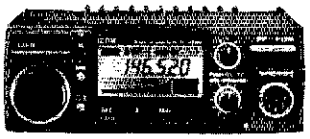
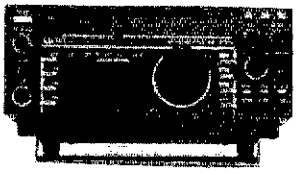


IC-228A/H



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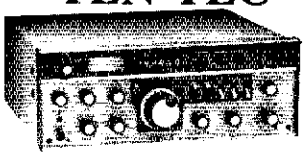

MODEL 561 CORSAIR II

OTHER TEN-TEC PRODUCTS:

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Model 238 Antenna Tuner
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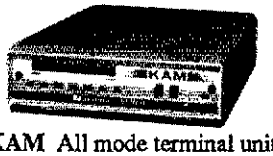

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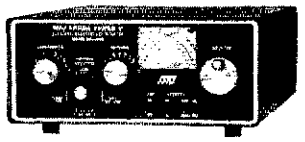

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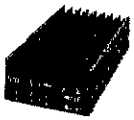
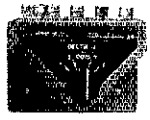
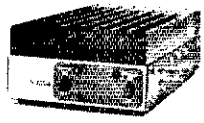


rf concepts amps



Alpha-Delta, B&W, & MFJ Coaxial Switches



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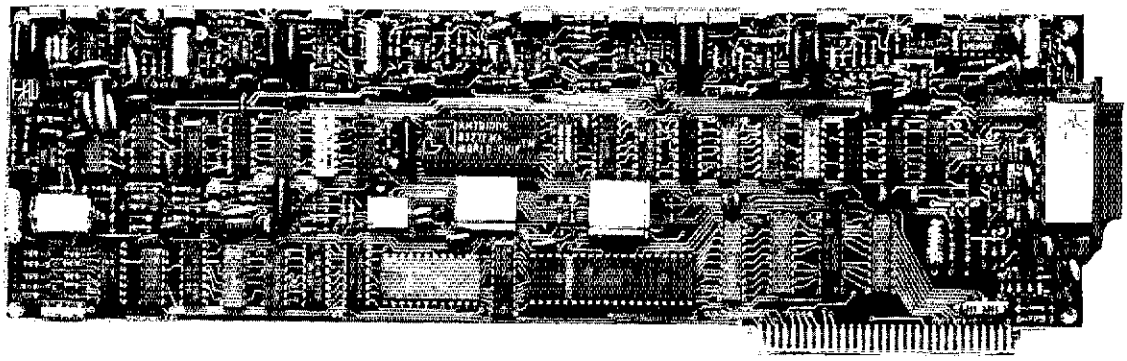
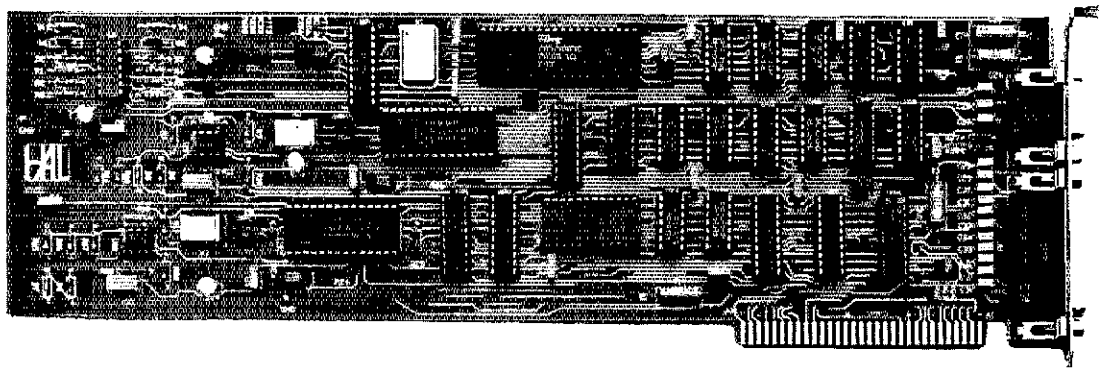


The PCI-2000 is a high-performance radio communications modem card for the HAL DS-3200 Radio Data Communications Terminal or any fully IBM-compatible computer. The PCI-2000 plugs into the computer just like any full size expansion card and will transmit and receive both RTTY and Morse code. Included on the card is a high-performance RTTY demodulator which includes separate active filters for mark and space, wide dynamic range limiter and detector, and autoprint noise suppression circuits. The PCI-2000 operates at all standard shifts and data rates for ASCII and Baudot and utilizes automatic speed tracking on Morse receive. The software provided offers a high degree of operator flexibility for normal communications as well as for extensive traffic handling operations.

RPC-2000

TWO-CHANNEL RADIO PACKET CONTROLLER



The RPC-2000 is a TWO-CHANNEL radio packet controller that adds fast, error free data communications to radio links. It plugs into an expansion slot of the HAL DS-3200 Radio Data Communications Terminal or any fully IBM-compatible computer.The RPC-2000 uses Packet Radio protocol based on AX.25 to provide data communications at rates from 45 to 4800 Baud.With its built-in modem and RS-232C I/O (for an external HF modem such as the HAL ST-7000 or ST-8000), the RPC-2000 is ready to work on VHF or HF. The software provided is entirely menu driven eliminating the need to memorize complicated commands and procedures.

CALL US FOR MORE INFORMATION AND PRICING ON THE PCI-2000 AND RPC-2000

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STEP UP TO THE BEST, STEP UP TO HAL!

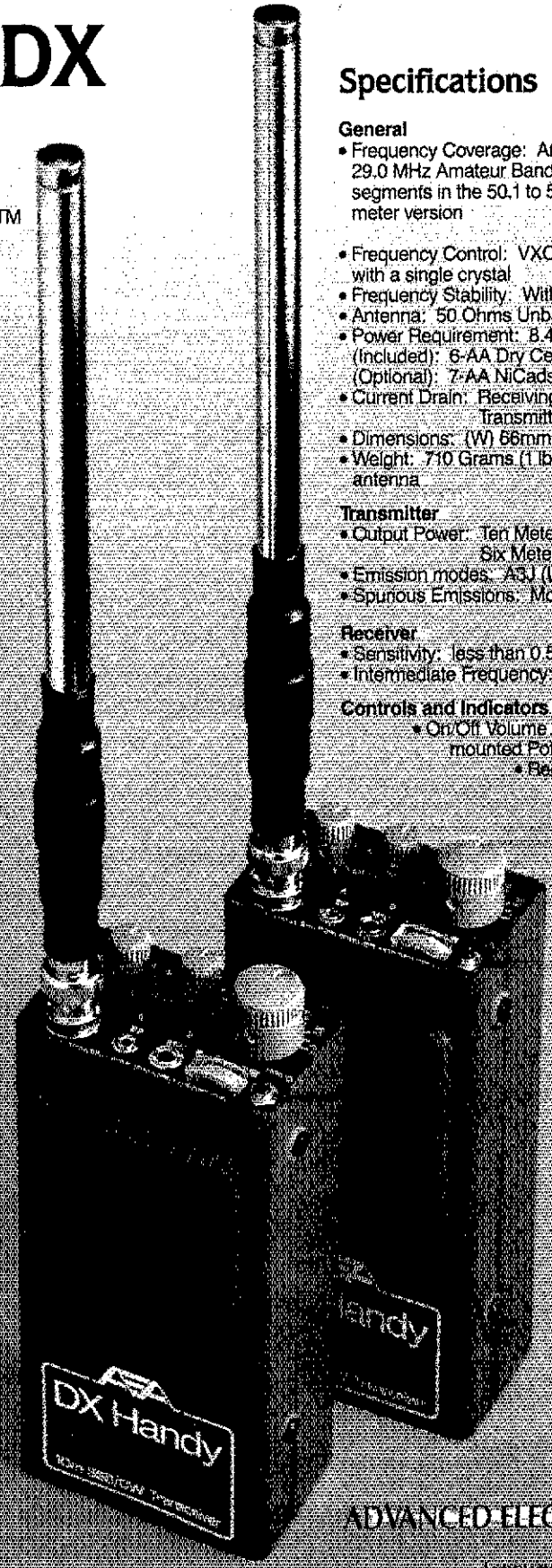
Handheld DX with the DX Handy™

The idea of handheld DX seems far-fetched, but it's actually very simple. The DX Handy is a battery powered (six penlight AA drycells included) SSB/CW transceiver with two watts output. DX Handy can also use nicad rechargeable batteries, or be powered with 9 VDC.

Two variable crystal oscillators (VXOs), each with 50 KHz range, can be selected with a top panel switch. Crystals for 28.250 to 28.300 and 28.300 to 28.350 Mhz are included in the ten meter DX Handy. Crystals for 50.1 to 50.15 and 50.25 to 50.3 are included in the six meter DX Handy. Other crystals are available at a nominal cost.

CW operation can be by either the built-in push button or with an external key or keyer. External speaker and microphone jacks are also provided, and the telescoping antenna is included. The DX Handy also has a top panel S-meter/output power meter and an effective noise blanker circuit. DX Handy is housed in an attractive gray metal case comparing in size to popular VHF FM handhelds.

With DX Handy all amateurs, novice to extra class, can enjoy the thrill of working handheld DX.



Specifications

General

- Frequency Coverage: Any 50 KHz segments in the 28.0 to 29.0 MHz Amateur Band for the ten meter version, or an 50 KHZ segments in the 50.1 to 50.3 MHz Amateur Band for the six meter version
- Frequency Control: VXO provides 50 KHz of continuous tuning with a single crystal
- Frequency Stability: Within ± 500 Hz from a cold start
- Antenna: 50 Ohms Unbalanced, BNC connector
- Power Requirement: 8.4–9.0 VDC
  (Included): 6-AA Dry Cells (1.5 volt/cell) = 9.0 VDC
  (Optional): 7-AA NiCads (1.2 Volt/cell) = 8.4 VDC
- Current Drain: Receiving - Approx. 70 mA
  Transmitting - Approx. 820 mA
- Dimensions: (W) 66mm × (H) 39mm × (D) 142mm
- Weight: 710 Grams (1 lb. 9 oz.) with batteries and antenna

Transmitter

- Output Power: Ten Meter DX Handy - 2 Watts at 9.0 VDC
  Six Meter DX Handy - 1 Watt at 9.0 VDC
- Emission modes: A3J (USB) and A1 (CW)
- Spurious Emissions: More than 40 dB down

Receiver

- Sensitivity: less than 0.5 uV for 15 dB S/N
- Intermediate Frequency: 11.2735 MHz

Controls and Indicators

- On/Off Volume control Top mounted Potentiometer
- Receiver Incremental Tuning (RIT): Top mounted Potentiometer with center off detent position
- Frequency: Top mounted 50 KHz VXO
- Frequency Range: Top mounted 2-position switch
- Noise Blanker: Top mounted On/Off switch
- S/RF meter: Top mounted S/RF meter
- Built in CW key: Top mounted momentary switch
- External Speaker output: Top mounted ⅛" phone jack
- External Microphone input: Top mounted ⅛" phone jack
- Antenna Connector: Top mounted Female BNC
- Transmit Indicator: Top mounted Transmit LED
- Push-To-Talk: Side mounted momentary switch
- External Power: Bottom mounted 2.1 mm coaxial
- External key input: Bottom mounted ¼" phone jack
- Mode Selector Switch: Bottom mounted 2-position switch
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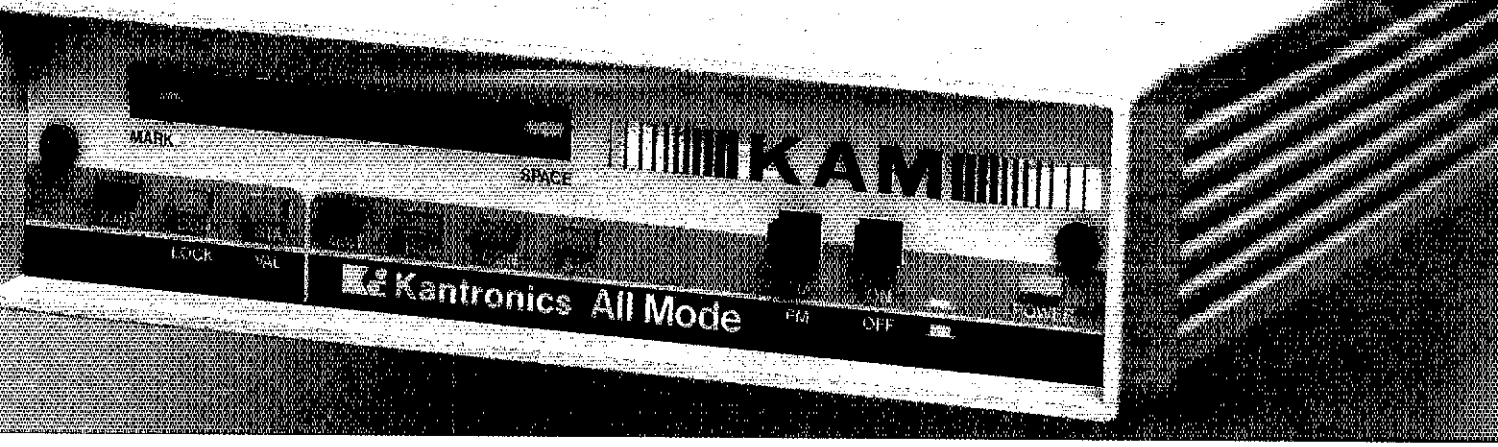


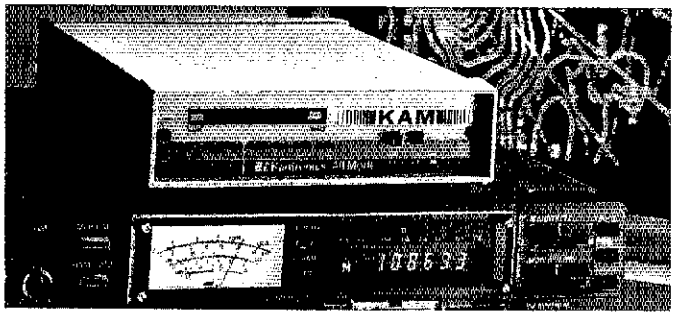
If You Want the Most Advanced TNC Today...

In 26 countries around the world, tens of thousands of amateurs know that Kantronics is the leader in bringing tomorrow's technology to their stations today. They also know they will always be among the first to incorporate just-introduced features and modes with Kantronics software and firmware updates.

And, they know that Kantronics is unique in its ability to seek out, develop and incorporate the most advanced features into each of five different TNC models before anyone else. Why? Because every program Kantronics writes, and every unit Kantronics designs and produces are born right here at the factory in the U.S.A.

Meet Your Mailman

In this age of telco LANS, E-mail and FAX,



PBBS is just one of the firsts Kantronics delivered.

you will know you have mail in your **Personal Packet Mailbox**™ when your KAM "STA" LED is blinking. New firmware level 2.85 has also added a handy automatic mailbox user-connect. So save your computer and monitor life by turning them off when you are away, and never miss a beat on the airwaves.

Version 2.85 KAMs have increased Packet Cluster™ compatibility, **KA-NODE**™ path preservation, KA-NODE recognition of the "NET" nodes and HF baud rates from 50 through 300! And there are three new mailbox commands: *List Mine, Read Mine* and *Kill Mine.*

and Tomorrow...

Will the Real Dual-Port Please Stand Up?

Read our lips. **The KAM™ is the only true dual- port when it comes to packet.** Your Personal Packet Mailbox™ is accessible from both HF and VHF! Version 2.85 has dual-port compatibility with RLI/MBL boards and KISS mode for both ports. You can monitor HF and VHF packet operations at the same time. Users can even gateway from HF to VHF (or in reverse) through your KAM.

Kantronics **All-Mode**™ (KAM) has Packet, WEFAX, ARQ, FEC, RTTY and CW reception. But we have five models to suit your particular taste. **Ask your dealer for the best choice today...and tomorrow.**

Kantronics
RF Data Communications Specialists

1202 E. 23rd Street Lawrence, Kansas 66046
(913) 842-7745

MFJ TUNERS

Here is the finest 3 KW Tuner money can buy with roller inductor, dummy load, *new* peak reading meter, antenna switch, balun plus more ... $349.95

The MFJ-989C is not for everyone.

However, if you do make the investment you get the finest 3 KW PEP tuner money can buy - one that will give you a lifetime of use, one that takes the fear out of high power operation and one that lets you get your SWR down to absolute minimum.

The MFJ-989C is a compact 3 KW PEP roller inductor tuner with a new **peak** reading Cross-Needle SWR/Wattmeter. The roller inductor lets you get your SWR down to absolute minimum.

With **three continuously** variable components - two massive 6 KV capacitors and a high inductance roller inductor - you get precise control over SWR **and** the widest matching range possible from 1.8-30 MHz.

MFJ-989C **$349.95**

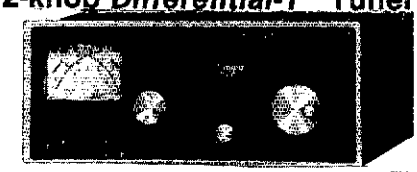
You get a **new** lighted **peak** and average reading Cross-Needle SWR/Wattmeter with a **new** more accurate directional coupler.

You get a giant two core balun wound with teflon wire for balanced lines and a 6-position antenna switch with extra heavy switch contacts.

Its compact 10¾x4½x15 inch cabinet fits right into your station.

You get a 50 ohm 300 watt dummy load for tuning your exciter, a tilt stand for easy viewing and a 3-digit turns counter plus a spinner knob for exact inductance control. Add $10 s/h.

2-knob *Differential-T*™ Tuner



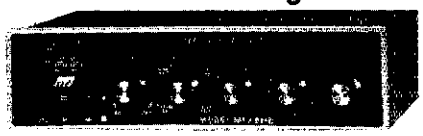
MFJ-986 **$269.95** The **new** MFJ-986 Differential-T™ 2-knob Tuner uses a differential capacitor to make tuning foolproof and easier than ever. It ends constant re-tuning with broadband coverage and gives you minimum SWR at only **one** best setting. Covers 1.8-30 MHz.

The roller inductor lets you tune your SWR down to absolute minimum. 3-digits turns counter lets you quickly return to your favorite frequency.

You get MFJ's **new** peak and average reading Cross-Needle SWR/Wattmeter with a **new** directional coupler for more accurate readings over a wider frequency range. It reads forward/reflected power in 200/50 and 2000/500 watt ranges. Meter lamp uses 12 VDC or 110 VAC with MFJ-1312, $12.95.

A **new** current balun for balanced lines reduces feedline radiation and forces equal currents into antenna halves that are not perfectly balanced for a more concentrated, stronger signal. Add $10 s/h.

MFJ's *Fastest Selling* Tuner



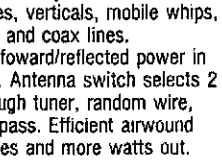
MFJ-941D **$109.95** **The MFJ-941D is MFJ's fastest selling 300 watt PEP antenna tuner. Why? Because it has more features than tuners costing much more and it matches everything continuously from 1.8-30 MHz.**

It matches dipoles, vees, verticals, mobile whips, random wires, banlanced and coax lines.

SWR/Wattmeter reads foward/reflected power in 30 and 300 watt ranges. Antenna switch selects 2 coax lines, direct or through tuner, random wire, balanced line or tuner bypass. Efficient airwound inductor gives lower losses and more watts out. Has 4:1 balun. 1000 V capacitors. 10x3x7 inches.

MFJ's *Random Wire* Tuner

MFJ-16010 **$39.95**



You can operate all bands anywhere with any transceiver when you let the MFJ-16010 turn any random wire into a transmitting antenna. Great for apartment, motel, camping operation. Install a wire anywhere! Tunes 1.8-30 MHz. 200 watts PEP. Ultra small 2x3x4 in.

MFJ's *Deluxe* 300 Watt Tuner

MFJ-949D **$149.95** **The** MFJ-949D gives you lower SWR than **any** tuner that uses two tapped inductors. Why? Because you get two **continuously** variable capacitors that give you infinitely more positions than the **limited** number on switched coils.

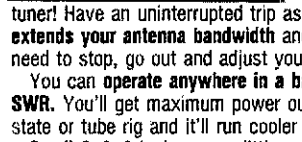
This gives you the precise control you need to get your SWR down to a minimum. After all, isn't that why you need a tuner? Covers 1.8-30 MHz.

You get MFJ's **new** lighted 2-color **peak** and average reading Cross-Needle SWR/Wattmeter, dummy load, antenna switch, and 4:1 balun - all in a compact 10x3x7 inch cabinet. Meter lamp uses 12 VDC or 110 VAC with MFJ-1312, $12.95.

With MFJ's **deluxe** 300 watt PEP tuner you get an MFJ tuner that has earned a reputation for being able to match just about anything - one that is highly perfected and has years of **proven** reliability.

MFJ's *Mobile* Tuner

MFJ-945C **$89.95**



Don't leave home without this **mobile** tuner! Have an uninterrupted trip as the MFJ-945C **extends your antenna bandwidth** and eliminates the need to stop, go out and adjust your mobile whip.

You can **operate anywhere in a band and get low SWR.** You'll get maximum power out of your solid state or tube rig and it'll run cooler and last longer.

Small 8x2x6 inches uses little room. **SWR/ Wattmeter and convenient placement of controls make tuning fast and easy while in motion.** 300 watts PEP output, efficient airwound inductor, 1000 volt capacitors. Mobile mount, MFJ-20, $3.00.

144/220 MHz VHF Tuners

MFJ-921 **$69.95**

MFJ's new VHF tuners cover both 2 Meters and the 220 MHz bands. They handle 300 watts PEP and match a wide range of impedances for coax fed antennas. SWR/Wattmeter. 8x2½x3 in. **MFJ-920, $49.95.** No meter. 4½x2½x3 inches.

MFJ

MFJ ENTERPRISES, INC.
Box 494, Miss. State, MS 39762
(601) 323-5869; TELEX: 53 4590 MFJSTKV

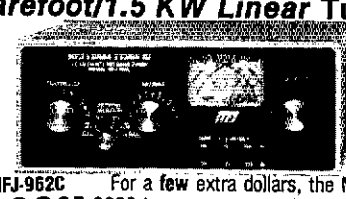
MFJ ... making quality affordable

MFJ's *Artificial* RF Ground

$79.95 MFJ-931

You can create an artificial RF ground and eliminate RF "bites", feedback, TVI and RFI when you let the MFJ-931 resonate a random length of wire and turn it into a tuned counterpolse. The MFJ-931 also lets you electrically **place a far away RF ground directly at your rig** -- no matter how far away it is -- by tuning out the reactance of your ground connection wire.

Barefoot/1.5 KW Linear Tuner



MFJ-962C **$229.95** For a **few** extra dollars, the MFJ-962C lets you use your barefoot rig now and have the capacity to add a 1.5 KW PEP linear amplifier later. Covers 1.8-30 MHz.

You get two husky **continuously** variable capacitors for maximum power and minimum SWR. And lots of inductance gives you a wide matching range.

You get MFJ's **new** peak and average reading Cross-Needle SWR/Wattmeter with a **new** directional coupler for more accurate readings over a wider frequency range. It reads forward/reflected power in 200/50 and 2000/500 watt ranges. Meter lamp uses 12 VDC or 110 VAC with MFJ-1312, $12.95.

Has 6-position antenna switch and a teflon wound balun with ceramic feedthru insulators for balanced lines. 10¾x4½x14 7/8 inches. Add $10.00 s/h.

MFJ's *smallest* Versa Tuner

MFJ-901B **$59.95**

The MFJ-901B is our smallest -- 5x2x6 inches -- (and most affordable) 200 watt PEP tuner --when both space **and** your budget is limited. Good for matching solid state rigs to linears.

It matches whips, dipoles, vees, random wires, verticals, beams, balanced and coax lines from 1.8-30 MHz. Efficient airwound inductor. 4:1 balun.

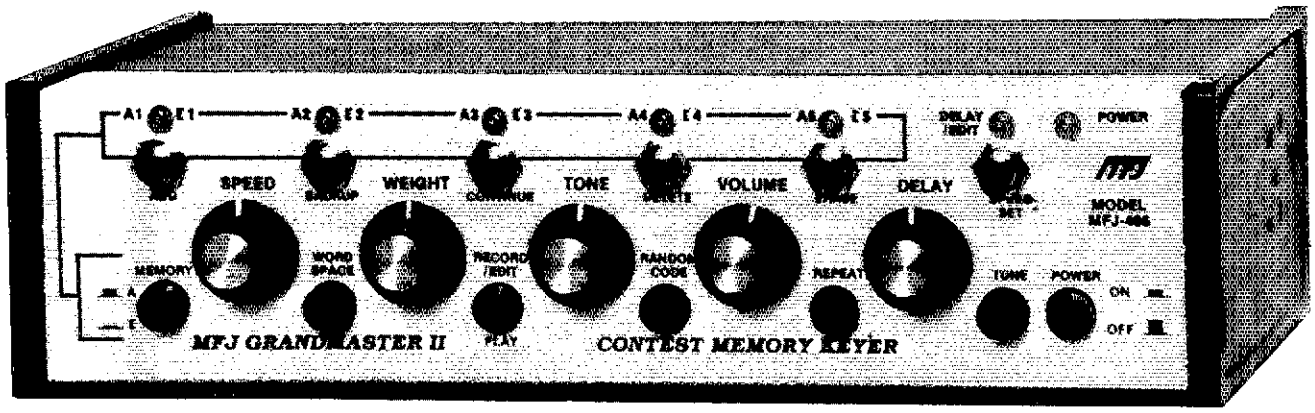
FOR YOUR NEAREST DEALER OR TO ORDER

800-647-1800

• 1 year **unconditional** guarantee • 30 day **money back** guarantee (less s/h) on orders from MFJ • Free catalog • Add $5.00 s/h (except as noted)

MFJ Grandmaster Memory Keyer

More than user-friendly . . . it's really easy-to-use



MFJ-486

$189.95

Made in U.S.A.

Simple . . . intuitive . . . you instantly know which knob to turn, what button to press. It's unmistakable.

That's the MFJ Grandmaster concept -- more than user friendly . . . it's really easy to use.

There's *no* keypad, *no* complex keystroke sequences to confuse you.

The new MFJ-486 Grandmaster Memory Keyer™ gives you the best of both worlds -- all the features you'll ever need *and* the easy-to-use MFJ Grandmaster concept.

Exclusive CW Word Processor™

MFJ's exclusive *CW Word Processor*™ lets you change a message in memory without having to rekey it all in.

Special function keys make it simple to move around within any message, insert, delete and change your message until it's just the way you want it.

With other memory keyers you have to erase an entire message and rekey it all in to make even the smallest change.

Combine messages into other messages

The MFJ-486 lets you combine frequently used messages into other messages.

You can store QTH, rig/antenna, QSL info and other comments in separate memories.

Then you can easily build a new message by keying in memory numbers wherever you want that info in your message.

MFJ's Custom-Speed™ Control

Customize your speed control to fit *you!*

By pressing the Speed Set button, you can set your slowest speed to start at 4, 5, 6 -- *any* speed up to 20 WPM -- and your fastest speed is 20 to 100 WPM.

Matching CW speed to a QSO is best done by ear as you adjust a speed *knob*.

With keypads you have to figure out the exact speed of your contact and then go through an awkward keystroke sequence.

That's why matching speed with a keypad is so demanding.

Without MFJ's Custom-Speed™, a wide range speed control is very hard to use because the *slightest* touch causes radical speed changes.

Built-in *CW Course*

The MFJ-486 gives you a well-organized three step CW course for upgrading and teaching.

The first step gives you random five character groups. After you learn the letters you can add punctuation.

The second step gives you random 1-8 character groups for real-world code practice.

The third step gives you an infinite number of random plain English QSOs in *the same format as FCC ham license tests.*

When you can copy these random QSOs, you're ready to pass your test and upgrade!

You also get Farnsworth option, answer-replay to check your copy, punctuation on/ off and earphone jack for private practice.

Remote Control . . . for memories *and* function keys

The MFJ-77 remote control lets you control your message memories *and* CW Word Processor™ function keys at your key paddle for only . . . $19.95.

It's a lot more useful than a remote that gives you *no* editing functions and only lets you control a *few* memories.

MFJ Keyers are *used* year after year

Not so long ago there was a glut of keypad keyers. They were novel, and a lot of hams spent their money.

But because they were hard to use they ended up in drawers and closets.

They were soon no longer made.

Most original MFJ keyers are still being used -- day after day and year after year.

Why? Because they're easy-to-use. And that's why more new MFJ keyers are being put on-the-air today than ever.

More for your money

To make it really easy-to-use, it cost more to build the MFJ Grandmaster.

It just takes more hardware -- knobs to turn, buttons to press, LEDs to show you what's going on. Plus it takes more labor, more software, more everything.

It's a *real bargain* compared to cheaper-to-build but harder-to-use keypad keyers.

Plus More . . .

You get over 8000 characters in 10 soft-partitioned memories -- far more than you'll ever need.

You also get . . . lithium battery backup, automatic serial numbering, automatic message repeat, beaconing, A or B type iambic keying, manual or automatic word spacing, speaker, earphone jack, easy-to-use front panel controls for speed, volume, tone, weight and delay, tune control, powerful Z-80 microprocessor plus much more. 9x2½x6 inches. Use 12-15 VDC or 110 VAC with MFJ-1312, $12.95.

One Full Year *No Matter What*™ Guarantee

You get MFJ's full one year *no matter what*™ guarantee.

That means MFJ will repair or replace your MFJ-486 (at our option) *no matter what* happens to it for a full year.

Others give you a 90 day *limited* warranty.

What do you do *after* 90 days when it burns up. Or *before* 90 days when *they* say, "Sorry, your *limited* warranty doesn't cover *that*?"

Why take chances when MFJ gives you *no matter what* protection for one full year?

Don't struggle with keypads -- enjoy the easy-to-use MFJ Grandmaster

Don't struggle with a hard-to-use keypad and complicated keystroke sequences.

Choose the memory keyer that's *really* easy-to-use *and* has all the features you'll ever need - the new MFJ-486 Grandmaster.

Get yours today . . . you'll love it!

Nearest Dealer/Orders: 800-647-1800

MFJ ENTERPRISES, INC.
Box 494, Miss. State MS 39762
601-323-5869; TELEX: 534590
FAX: 601-323-6551:Include s/h

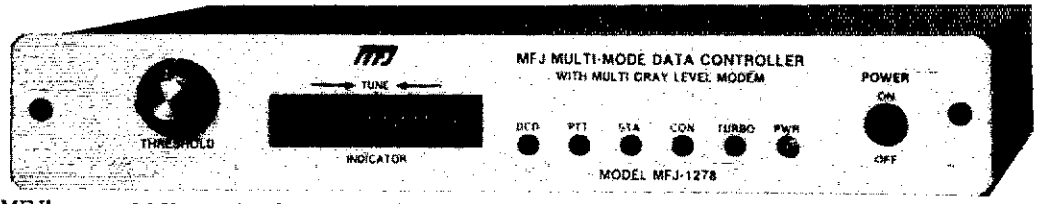
MFJ . . . making quality affordable

MFJ gives you *all 9* digital modes

and *keeps on* bringing you state-of-the-art advances

. . . while others offer you *some* digital modes using 3 year old technology

MFJ-1278
$279.95



No three year old technology at MFJ!

Using the latest advances, MFJ brings you 9 exciting digital modes *and* keeps on bringing you state-of-the-art advances.

You get tons of features other multi-modes just don't have.

Only MFJ gives you all 9 modes

Count 'em -- you get 9 fun modes -- Packet, AMTOR, RTTY, ASCII, CW, WeFAX, SSTV, Navtex and full featured Contest Memory Keyer.

You *can't* get all 9 modes in any other multi-mode at *any* price. And nobody gives you modes the MFJ-1278 doesn't have.

The best modem you can get

Extensive tests in *Packet Radio Magazine* prove the MFJ-1278 modems gives better copy with proper DCD operation than all other modems tested.

New Easy Mail™ Personal Mailbox

You get MFJ's new **Easy Mail™** Personal Mailbox with soft-partitioned memory so you and your ham buddies can leave messages for each other 24 hours a day.

20 LED Precision Tuning Indicator

MFJ's unequaled tuning indicator makes it really easy to work HF packet stations.

And unlike others, you use it *exactly the same* way for *all* modes -- not differently for each mode.

Just tune your radio to center a single LED and *you're precisely tuned in to within 10 Hz* - and it shows you which way to tune!

New MFJ technology prevents collisions: gets packets through faster

MFJ's new *Anti-Collision* technology gets packets through faster, more reliably.

How? Automatic random transmit delays prevent packet collisions.

An MFJ ***exclusive:*** MFJ-1278 is the only multi-mode to have this *new* technology.

Multi-Gray Level FAX/SSTV Modem

You'll enjoy natural looking pictures that only multiple gray levels can give you.

MFJ's new built-in modem gives you the *only* multi-mode with multiple gray levels.

Only MFJ can transmit FAX

Most packet stations can receive FAX.

But *only* the MFJ-1278 lets you transmit FAX without internal modifications that disable other modes.

So now you can send your own high resolution pictures, maps and diagrams by FAX to stations throughout the world.

Full Featured Contest Memory Keyer

Only the MFJ-1278 lets you plug in a keypaddle so you can use it as a memory keyer.

You get programmable CW message memories that you can link and repeat, auto serial numbering, weight control, beaconing, random CW generator and more.

One FREE Upgrade!

When you buy your MFJ-1278 *today*, you don't have to miss new modes and features that come out *tommorow*.

Why? Because your MFJ-1278 comes with a coupon good for one ***free*** eprom upgrade exchange that'll add new features.

Plus more . . .

Plus you get . . . 32K RAM, free AC power supply, KISS, *true* DCD, independent printer port, lithium battery backup, RS-232 *and* TTL serial ports, *standard* 850 Hz RTTY shift, socketed ICs, tune up command, software selectable dual radio ports and more --all in a sleek 9½x9½x1½ inch cabinet.

Get on the air instantly · Just plug it all in

All you need is an MFJ-1278, your rig, any computer and a terminal program.

With an MFJ Starter Pack, $24.95, you just plug it all in, wire up your mic connector and you're on the air.

Order MFJ-1282 (disk)/MFJ-1283 (tape) for C-64/128/VIC-20; MFJ-1284 for IBM compatibles; MFJ-1287 for Macintosh.

No Matter What™ Guarantee

You get the best guarantee in ham radio -- a *full one year unconditional guarantee.*

That means we will repair or replace your MFJ multi-mode (at our option) *no matter what* happens to it for a full year.

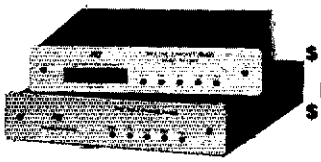
Get 9 new ways of having fun

Don't settle for 3 year old technology.

Choose the only multi-mode that gives you the latest advances and *all 9* modes.

Get 9 new ways of having fun *today!*

MFJ Packet Radio



MFJ-1274 **$159.95**

MFJ-1270B **$139.95**

MFJ-1270B super clone of TAPR's TNC-2 gives you more features than *any* other packet controller -- for $139.95.

You can double your fun by operating VHF *and* HF packet because you get **high performance** switchable VHF/HF modems.

You get the **Easy Mail™** Personal Mailbox with soft-partitioned memory so you and your ham buddies can leave messages for each other 24 hours a day.

In MFJ's new WeFAX mode you can print full fledged weather maps to screen or printer and save to disk using an IBM compatible or Macintosh computer with an MFJ Starter Pack.

A new **KISS** interface lets you run **TCP/IP.** They also come **NET ROM** compatible -- *no modification needed!*

You also get 32K RAM, one year *unconditional* guarantee and a *free* 110 VAC power supply (or use 12 VDC).

For dependable HF packet tuning, the MFJ-1274 gives you a high resolution tuning indicator that's accurate to within 10 Hz -- and it's only $20.00 more.

MFJ Video Digitizer

Here's Aimee from the MFJ order desk. This unretouched picture was shot directly from a VGA monitor. We digitized Aimee with a camcorder, MFJ "Picture Perfect" Video Digitizer and IBM compatible computer.

Create fascinating digitized snapshots you can transmit with your MFJ-1278 of *anything* you can point your camcorder at!

The MFJ-1292 "Picture Perfect" Video Digitizer connects your video camera to your IBM compatible computer so you can capture digitized video snapshots on disks.

You get a plug-in card for your computer and a versatile software package with instructions for only ... **$199.95.**

As an added bonus you get a handy Contrast and Brightness Control unit that you can conveniently place near your keyboard for fine tuning your pictures.

Packet Pictures

Transmit and receive high resolution VGA, EGA and CGA color pictures via packet with MFJ picture passing software.

Beautiful color pictures are automatically received, saved to disk and "painted" to screen.

Pictures are compressed as they are transmitted - so you get true high speed picture passing.

You can save to disk any CGA picture you can see on your screen.

You can set up your own picture bulletin board and exchange pictures with others - even if you're not there.

Let's help spread picture passing throughout the world and create a new world standard. Get this ***powerful*** new software for only ... **$9.95.**

MFJ-1288 works with virtually any packet radio controller and IBM compatible computer. It's included *free* in the MFJ-1284 IBM Starter Pack.

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Include shipping and handling

MFJ ... making quality affordable

Ham-Ads

(1) Advertising must pertain to products and services which are related to Amateur Radio.

(2) The Ham-Ad rate is 85 cents per word. This includes firms or individuals offering products or services for sale. A special rate of *25 cents* per word applies to individuals seeking to dispose of or acquire personal station equipment, and to hamfest and convention announcements. **Note these rates will be changing in the November 1989 issue of *QST* to $1.00 and 30 cents per word respectively.**

3) Remittance in full must accompany copy since Ham-Ads are not carried on our books. Each word, abbreviation, model number, and group of numbers counts as one word. Entire telephone numbers count as one word. No charge for postal Zip code. No cash or contract discounts or agency commission will be allowed. Tear sheets or proofs of Ham Ads cannot be supplied. Submitted ads should be typed or clearly printed on an 8-1/2" × 11" sheet of paper.

(4) Closing date for Ham-Ads is the 13th of the second month preceding publication date. No cancellations or changes will be accepted after this closing date. Example: Ads received August 14 through September 13 will appear in November *QST*. If the 13th falls on a weekend or holiday, the Ham-Ad deadline is the previous working day.

(5) No Ham-Ad may use more than 100 words. No advertiser may use more than two ads in one issue. A last name or call must appear in each ad. Mention of lotteries, prize drawings, games of chance, etc. is not permitted in *QST* advertising.

(6) New firms or individuals offering products or services for sale must submit a production sample (which will be returned) for our examination. Dealers are exempted, unless the product is unknown to us. Check with us if you are in doubt. You must furnish a statement in writing that you will stand by and support all claims and specifications mentioned in your advertising before your ad can appear.

The publisher of *QST* will vouch for the integrity of advertisers who are obviously commercial in character, and for the grade or character of their products and services. Individual advertisers are not subject to scrutiny.

The League reserves the right to decline or discontinue advertising for any reason.

CLUBS/HAMFESTS/NETS

PROFESSIONAL CW operators, retired or active, commercial, military, gov't., police etc invited to join Society of Wireless Pioneers—W7GAQ/6, 146 Coleen Street, Livermore, CA 94550.

IMRA—International Mission Radio Association helps missionaries by supplying equipment and running a net for them daily except Sunday, 14.280 MHz, 1:00-3:00 PM Eastern Time. Rev. Thomas Sable, S.J., University of Scranton, Scranton, PA 18510.

THE Veteran Wireless Operators Association, a non-profit organization of communications people founded in 1925, invites your inquiries and application for membership. Write VWOA, Ed F. Pleuler, Jr., Secretary, 46 Murdock Street, Fords, NJ 08863.

FCC EXAMS. Novice-Extra Class, Walk-in's only. Sunnyvale VEC ARC, POB 60142, Sunnyvale, CA 94088-0142, 408-255-9000, 24/hr. Gordon, W6NLG, President. Flea Market, March-Sept, Foothill College, Los Altos Hills, CA.

MARCO: Medical Amateur Radio Council, operates daily and Sunday nets. Medically-oriented amateurs (physicians, dentists, veterinarians, nurses, therapists, etc.) invited to join. For information, write MARCO, Box 73's, Acme, PA 15610.

JOIN The Old Old Timers Club, an international non-profit organization. If you operated a radio station, commercial, amateur or Armed Forces 40 or more years ago, and have an Amateur license at present you are eligible. Join the real pioneers of ham radio. Write O.O.T.C., 1409 Cooper Drive, Irving, TX 75061.

LITTLE Big Horn Nets Sundays: 14.057-2200Z, 21.150-2230Z. Native American Indians and Others Welcome. Info WA2DAC.

AYN RAND admirers net 2nd Sunday every month 0045Z, 14270-14280 from RI discuss ideas in her novels Atlas Shrugged and The Fountainhead. K1UKQ.

RADIO EXPO 89. The Chicago FM Club will sponsor Radio Expo 89 on Sept. 23rd & 24th at the Lake County Illinois Fairgrounds near Rts. 45 & 120 in Grayslake, IL. Manufacturers & distributors of radio & computer technologies will display their products. VE exams will be given by DeVry covering Novice thru Extra. Indoor flea market tables & electricity available. Overnite security provided. Camping & parking available. Admission: $4 advance, $5 at door. Talk-in on 146.16/76. For more information contact Mike Brost, WA9FTS, P.O. Box 1532, Evanston, IL 60204.

INTERESTED In Public Service. Join your local radio emergency associated communications team. In Pennsylvania call 717-938-6943.

GOOD SAM RV Radio Network—Largest int'l group of hams that are Good Sam's. M-F 2100 Central 7.292. Sunday 1400 Central 14.240. Info send 9x4 SASE to Net Manager Jack Russell, KG5IO, P.O.B. 207, Golden, TX 75444. Do join with us.

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NEW Top-of-the-Line HF Transceiver
- 100% Duty Cycle
- 40 Memory Channels

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TS-140S
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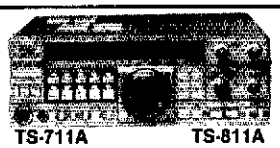

TS-711A TS-811A
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TM-721A
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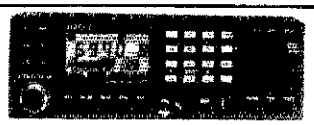
TR-751A
All Mode 2m Mobile



COMPACT 2M FM Mobile

TM 2570A (70W) TM3530A (25W)
TM 2550A (45W) TM231A (50W)
TM 2530A (25W)

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TH-75A
2m/70cm Dual Band HT

TH215A
2m HT XCVR
TH-25AT, TH-45AT, TH-205AT
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IC-781
HF "PERFORMANCE" RIG
- 160-10M/General Coverage Receiver
- Built-in Power Supply and Automatic Antenna Tuner
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IC-765 New HF XCVR
- Built-In Automatic Antenna Tuner & Power Supply
- 99 Memories • 100W Output
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- Band Stacking Registers

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IC-725 Ultra Compact HF XCVR
- 26 Memories w/Band Stacking Registers
- USB/LSB/CW, AM Receive Optional Module for AM Transmit and FM TX/RX
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IC-2GAT
2 meter HT
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7 Watts

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- 5 Watts on Both Bands
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Model	Cont. Amps	ICS Amps	Price
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RS7A	5	7	59
RS12A	9	12	79
RS20A	16	20	99
RS20M	16	20	119
RS35A	25	35	159
RS35M	25	35	179
RS50A	37	50	229
RS50M	37	50	249

YAESU

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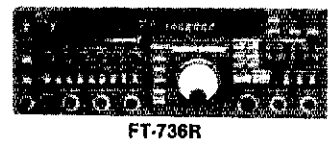

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2 meter HT
- 49 Memories
- 2.3 to 5 Watts
- Extended Rec.

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2m/70cm Dual Band
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- DTMF Autodialer
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- compact size
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AL80A	$985.00	ATR15	380.00
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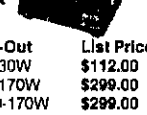
rfconcepts



rfc 2-317 2M
30W in = 170W out
LIST $299.00

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2-217	2M	2-170W	$299.00
2-117	2M	10-170W	$299.00
2-417	2M	45-170W	$299.00
3-22	220	2-20W	$112.00
3-211	220	2-110W	$299.00
3-312	220	30-120W	$264.00

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New HF Transceiver, Ham Band Optimized for Reduced Phase Noise and Dynamic Range, Dual VFO's, Scannable Memories & More.

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HF Linear Amplifier
1500 Watts Output Full QSK
160-15 Meters Pair of EIMAC 3CX800A7
List $2,685 CALL FOR SPECIAL PRICE

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144 MHz Isopole	CALL
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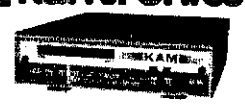

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KPC 4 Node Controller	$299.90

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MISSOURI (Marshall)—September 17. Sponsor: Indian Foothills ARC. Time: 8 AM. Place: Marshall Senior Citizens Building, one block south of the Marshall Square. Features: refreshments, free parking, exams 9 AM. Talk-in: 147.765/165. Admission: $2 each, 3 for $5 at door, 4 for $5 in advance. Tables: free, first come first serve. Contact: Gordon Buckner, WØVZK, Box 721, Marshall, MO 65340.

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CANADIAN QSL Cards, send $1 for samples refundable with your order. M. Smith, VE7FI, 18610 - 62nd *Avenue, Surrey*, BC CANADA V3S 4N9.

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FREE Logbook with first order. QSL samples cost 3 stamps. Gazebo Press, 4148 Mimosa Lane, La Plata, MD 20646.

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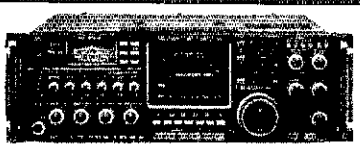

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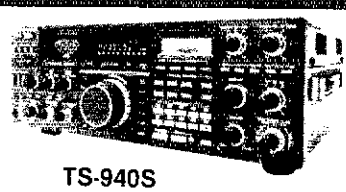
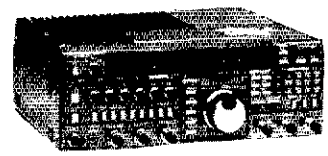
HF Equipment	List	Juns
IC-781 Super Deluxe HF Rig	$5995.00	Call $
IC-765 New, Loaded with Features	3,149.00	Call $
IC-735 Gen. Cvg Xcvr	1099.00	Call $
IC-751A Gen. Cvg. Xcvr	1699.00	Call $
IC-725 New Ultra-Compact Xcvr	949.00	Call $
IC-575A 10m/6m Xcvr	1399.00	Call $
Receivers		
IC-R7000 25-1300 + MHz Rcvr	1199.00	Call $
IC-R71A 100 kHz-30 MHz Rcvr	999.00	Call $
VHF		
IC-228A/H New 25/45w Mobiles	509./539.	Call $
IC-275A/H 50/100w All Mode Base	1299./1399.	Call $
IC-28A/H 25/45w, FM Mobiles	469./499.	Call $
IC-2GAT, New 7w HT	429.95	Call $
IC-2SA New Micro Sized HT	419.00	Call $
IC-900 Six Band Mobile	639.00	Call $
IC-901 New Remote Mount Mobile	TBA	Call$
UHF		
IC-475A/H 25/75w All Modes	1399./1599.	Call $
IC-48A FM Mobile 25w	509.00	Call $
IC-4GAT, New 6w HT	449.95	Call $
IC-04AT FM HT	449.00	Call $
IC-32AT Dual Band Handheld	629.95	Call $
IC-3210 Dual Band Mobile	739.00	Call $
IC-2500A FM, 440/1.2 GHz Mobile	999.00	Call $
220 MHZ		
IC-375A All-Mode, 25w, Base Sta.	1399.00	Call $
IC-38A 25w FM Xcvr	469.00	Call $
IC-37A FM Mobile 25w	499.00	Call $
1.2 GHz		
IC-12GAT Super HT	529.95	Call $



TS-940S

HF Equipment	List	Juns
TS-940S/AT Gen. Cvg Xcvr	$2499.95	Call $
TS-440S/AT Gen. Cvg Xcvr	1449.95	Call $
TS-140S Compact, Gen. Cvg Xcvr	949.95	Call $
TS-680S HF Plus 6m Xcvr	1149.95	Call $
TL-922A HF Amp	1749.95	Call $
Receivers		
R-5000 100 kHz-30 MHz	1049.95	Call $
R-2000 150 kHz-30 MHz	799.95	Call $
RZ-1 Compact Scanning Recv.	599.95	Call $
VHF		
TS-711A All Mode Base 25w	1059.95	Call $
TR-751A All Mode Mobile 25w	669.95	Call $
TM-231A Mobile 50w FM	459.95	Call $
TH-215A, 2m HT Has It All	399.95	Call $
TH-25AT 5w Pocket HT NEW	369.95	Call $
TM-721A 2m/70cm, FM, Mobile	729.95	Call $
TM-621 2m/220, FM, Mobile	729.95	Call $
TM-701A 25w, 2m/440 Mobile	599.95	Call $
TH-75A 2m/70cm HT	549.95	Call $
UHF		
TS-811A All Mode Base 25w	1,265.95	Call $
TR-851A 25w SSB/FM	771.95	Call $
TM-431A Compact FM 35w Mobile	469.95	Call $
TH-45AT 5w Pocket HT NEW	389.95	Call $
TH-55 AT 1.2 GHz HT	524.95	Call $
TM-531A Compact 1.2 GHz Mobile	569.95	Call $
220 MHZ		
TM-3530A FM 220 MHz 25w	519.95	Call $
TM-321A Compact 25w Mobile	469.95	Call $
TH-315A Full Featured 2.5w HT	419.95	Call $



FT-767GX

HF Equipment	List	Juns
FT-747 GX New Economical Performer	$889.95	Call $
FT-757 GX II Gen. Cvg Xcvr	1129.95	Call $
FT-767 4 Band New	1929.00	Call $
FL-7000 15m-160m Solid State Amp	1995.00	Call $
Receivers		
FRG-8800 150 kHz - 30 MHz	759.95	Call $
FRG-9600 60-905 MHz	699.95	Call $
VHF		
FT-411 New 2m "Loaded" HT	399.95	Call $
FT-212RH New 2m, 45w mobile	459.95	Call $
FT-290R All Mode Portable	599.95	Call $
FT-23 R/TT Mini HT	344.95	Call $
UHF		
FT-712RH, 70cm, 35w mobile	499.95	Call $
VHF/UHF Full Duplex		
FT-736R, New All Mode, 2m/70cm	1749.95	Call $
FEX-736-50 6m, 10w Module	259.95	Call $
FEX-736-220 220 MHz, 25w Module	279.95	Call $
FEX-736-1.2 1.2 GHz, 10w Module	539.95	Call $
FT-690R MKII, 6m, All Mode, port.	569.95	Call $
Dual Bander		
FT-4700RH, 2m/440 Mobile	889.00	Call $
FT-470 Compact 2m/70cm Mobile	559.95	Call $
Repeaters		
FTR-2410 2m Repeaters	1269.95	Call $
FTR-5410 70cm Repeaters	1289.95	Call $

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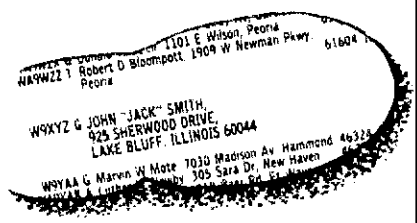

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Do you have special requirements for your Callbook listing? Would you like to include your nickname, the clubs you've joined, or the former calls you've held? Do you have more than one postal address, say one in the summer and a different address in the winter? Would you like to add a slogan to your listing, or include the many awards you've won? All these, and more, can be accommodated in a Callbook Special Listing.

Just let us know what you'd like to have included in the 1990 Callbook. Special Listings are printed in bold type in the big winter Callbook, so they really stand out on a page. In designing your Special Listing, please note the limit of 44 characters and spaces per line. Of course, the publisher reserves the right to refuse any copy not in keeping with the Callbook's standards. Please type or print your order to prevent errors.

The basic 3-line Special Listing in the 1990 Callbook is $10.00. You may have additional lines, up to a total of nine, for $3.00 each.

Please note: The deadline for this service in the 1990 Callbook is October 1, 1989. Your order and payment in U.S. funds must be in our hands by that date.

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WANTED: Radio, magazines, horn speakers, pre 1930. W6THU, 1545 Raymond, Glendale, CA 91201, 818-242-8961.

WANTED: *QST* VOLUME 1. W6ISQ, 82 Belbrook Way, Atherton, CA 94025.

SCHEMATICS: Radio receivers 1920's/60's. Send Brandname, Model No., SASE Scaramella, Box 1, Woonsocket, RI. 02895-0001.

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WANTED: WWII Military Radios and Accessories. Need ATD Tuning Units, DY43 Dynamotor, BC 222/223 Manuals, ART-13 Connectors, ARR/41/MT-1518 Mount, ATB, GRC 106 Receiver, Hallicrafters HT20. Charlie, 501 Mystic Valley Pkwy., Medford, MA 02155.

WANTED Books: Pre-1900 Electricity and Telegraphy, Pre-1925 Radio, Pre-1940 Television. Books, Magazines or any other related literature. Jim Kreuzer, N2GHD, 6270 Clinton Street, Elma, NY 14059, 716-681-3186.

WANTED: The entire 1934 "Z" and "H" line of Silver-Marshall Radios, any condition. Chuck Dachis, WD5EOG, The Hallicrafter Collector, 4500 Russell Drive, Austin, TX 78745.

CODE/CIPHER Machines Wanted! Historian buys code/cipher devices, manuals, books, etc! All periods! Melton, Box 5755, Bossier City, LA 71171, 318-798-7319.

E.F. JOHNSON Transmitters, Literature and Accessories wanted for my station. Will pickup. Len Crispino, Box 702, Hudson Falls, NY 12839, 518-638-8199.

WANTED: Pre-1930 *QSTs*. Richard Titus, NV2C, 231-9 Lucas Lane, Voorhees, NJ 08043, 609-772-0316.

WANTED: McIntosh Tube Type Hi-Fi Gear, any condition for my collection! Ask your friends too! Marcus Frisch, WA9IXP, Box 28803, Greenfield, WI 53220-0803, 414-545-5237.

WANTED: reward for Harvey Radio FT-30 Transmitter. Looks like Collins 32B. Robert Enemark, W1EC, Box 1607, Duxbury, MA 02331, 617-934-5043.

WANTED: Pre-WW2 Pan American Airways aircraft transmitters/receivers and schematics/manuals for same: Pre-WW2 Speed-X bugs. Conly, 819 Henrietta Avenue, Sunnyvale, CA 94086.

TELEGRAPH BUGS, early American keys, mid-century paddles wanted. Write John Hensley, WJ5J, 5054 Holloway Avenue, Baton Rouge, LA 70808.

WANTED: Johnson kilowatt and/or Viking 500 for my station. Will pay cash and pick up. All inquiries are cheerfully answered. Phone 518-638-8199 or write Len Crispino, P.O. Box 702, Hudson Falls, NY 12839.

SELL—HRO 60 with 7 coil sets, 1 coil storage box and matching speaker. No mods. Very clean. Best offer. Ken, WB9OZR, 362 Echo Valley, Kinnelon, NJ 07405, 201-492-9319.

WANTED For My Collection: SX-88, HRO, NC-400, NC-183D, HQ-170, HQ-140X, RME 45-50, 51S1, above speakers, nos receiving tubes, HRO-50 and 60 coils. Sell: Azden PCS-4000 and PCS-4300 2 meter/440 Transceivers. Lee Bahr, W6VT, 914 Golden Bear Lane, Kingwood, TX 77339, work 713-780-4360.

WANTED: old proportional R/C systems manufactured between 1960 to 1975. Ron Gwara, WA2GBG, RD 1, Box 355, Waverly, NY 14892, 607-565-7486.

RCA 1942, AM, Shortwave Receiver and Phono Player. Exterior excellent, chassis needs some work. New tubes. Best offer. Call Mike, 203-755-1209 after 6 PM.

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WANTED: Elmac Xmtr Model AF-67, any condx & manual. Call/write Charles Stokes, N5GFX, 8803 Sparkling Creek Drive, Austin, TX 78729, 512-250-8005.

WANTED: German, Japanese, Italian WW2 radio equipment or parts, any condition, and any articles, manuals, bulletins on same. My interest is putting together original systems, repairing, and bringing back into operation - not just static display. Also: Electronic Industries, USN Electron, Bendix Engineer, almost any other uncommon paper dealing with 1930s-40s communications, and some US hardware: ARQ-any, ARR-16, BC-224 thru BC-224-C, RAX, TBY, suitcase or portable CW trans-receivers. Possible trade item: RS-6 clandestine set. Thank you. Hugh Miller, KA7LXY, 6400 Maltby Road, Woodinville, WA 98072-8375 or try 206-487-3047 weekends.

HAMMERLUND HQ180-A Receiver, very good to excellent condition, 24 hr. clock and manual. You pay shipping. Best offer. WD8MRC.

WANTED: by collector Collins 32S3A and 75S3C, also any Collins Transmitter made prior to WW II. Parker, W1YG, 87 Cove Road, Lyme, CT 06371, 203-434-7783.

TELEGRAPH Items Bought By Collector: old or unusual keys, bugs, sounders, call boxes, etc. - any condition. Pre-1920 telegraph or radio literature. Larry Nutting, WD6DTC, 4025 Slate Court, Santa Rosa, CA 95405, 707-539-1883.

HOPE all those who have helped me in collecting old bugs had an enjoyable summer. Am now looking for Martin Rotoplex and Melehan Valiant among others. Smiley, WB4EDB, P.O. Box 5150, Fredericksburg, VA 22403, 703-373-0996 collect. Tnx.

GENERAL

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6BTV	6 band trap vertical	$124.00
ROTORS		
Alliance	HD73 (10.7 sq.ft.)	$119.00
Alliance	U110	$49.00
CABLE		
[2-18 & 6-22]	4080 - per foot	$0.25
[2-16 & 6-20]	4090 - per foot	$0.35
1600	RG8U Mini 8 low loss foam per foot	$0.22
1198	RG8U Columbia superflex 100'	$31.00
1180	RG8U Low loss 100% bonded foil shield 88% tin copper braided sheild -per foot	$0.42
1176	RG213 Columbia - per foot	$0.40

TENNA PHASE III POWER SUPPLIES

PS4 ..... **$21.90**
Fully regulated, 13.8 VDC - 4 amps constant with surge protection, overload protection w/instant auto reset.

PS7 ..... **$27.90**
Fully regulated, 7 amp constant, 10 amp surge capacity.

PS12 ..... **$37.90**
Fully regulated, 10 amp constant 13 amp surge, electronic overload protection w/instant auto reset.

PS20 ..... **$72.90**
Fully regulated, 25 amp surge capacity, 13.8 VDC, 17 amp constant, with meter.

PS25 ..... **$89.90**
Regulated 4.5-15VDC-25 Amp constant 27 amp surge, instant auto reset, dual meter for current & voltage.

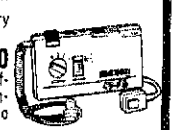
PS35 ..... **$109.90**
Same as above except, 35 amp constant, 37 amp surge, adjustable from 10 to 15 volts.

PS50 ..... **$179.90**
Fully regulated 50 amp, adjustable voltage 11-15VDC, dual metering, short circuit protection, multiple binding posts (4), carry handles.

MAXON . . $26.95

Model 49SA - 49 MHz, FM 2-WAY RADIO hands free operation, voice activated transmit up to ½ mile. Batteries optional

model 49S **$34.95**
same features as 49SA except uses "AA" nicad batteries and comes with battery charger



model 49F5 ..... **$49.90**
5 Ch FM 2-way, with Earphone mic, offers hands free voice activated or push-to-talk TX, VOX activated by Hi-Med-Lo mic sensitivity switch, 5¼x2¾x1.

unIden

BC100XLT
$169.90
100 Ch 11 band, channel lockout, scan delay, auto search, programmable, track tuning, direct channel access, built-in nicad battery pack, w/AC adapter & charger, carry case, earphone.

BC800XLT $219.90
WHILE THEY LAST! The units that receive CELLULAR telephone, 40 Ch 12 band, 800MHz, instant weather, priority, track tuning, auto search, direct Ch access, lockout, memory backup, AC/DC

BC200XLT
$239.90
200 Ch 11 band w/800MHz, 10 priority ch's, ch lockout, scan delay, auto search, battery pack, AC adapater charger, carry case earphone.

BC145XL . . $92.90
16 Ch 10 band programmable, built-in delay, review, priority, memory backup, Ch lockout, direct Ch access, weather search, track tuning, AC/DC

BC55XLT	10 Ch 10 band hand held	**$114.90**
BC70XLT	20 Ch 10 band hand held	**$149.90**
BC175XL	16 Ch 11 band aircraft AC/DC	**$149.90**
BC210XLT	40 Ch 11 band aircraft & weather	**$169.90**
BC560XLT	16 Ch 10 band mobile	**$99.90**
BC590XLT	100 Ch 11 band mobile weather	**$199.90**
BC760XLT	100 Ch 12 band aircraft & 800 MHz	**$259.90**

Regency

R1077 . . . . . $89.90
10 Ch 6 band digital display, search, lockout, scan delay, dual scan speeds, function verification, AC only.

INF10 . . . . . $104.90
Preprogrammed for police & fire in all 50 states, Super Turbo Scan, weather ch scan, hold/scan key. Mobile.

R4010 . . . . . $114.90
10 Ch 10 band hand held.

R4020 . . . . . $199.90
100 Ch 11 band hand held.

R4030 . . . . . $269.90
200 Ch 12 band 800MHz H/H.

R1099 . . . . $99.90
45 Channel 6 band, weather, digital display, priority, instant weather, search, lockout, scan delay, dual scan speeds. AC only.

RADAR DETECTORS

BEL **976** **$164.90**
Tri band Vector 3, sequential LED's, volume control.

847 ..... **$134.90**
Express remote, X & K band superhet, audible & visual alarm.

MAXON **RD25** **$74.90**
Deluxe mini, X & K band, dual conversion superhet.

RD2A **$45.90**
Dual conversion superhet, X & K band, audible & visual alarm.

RD3 ..... **$49.90**
Dual conversion Superhet, X & K band, sequential LED alarm.

UNIDEN **RD9** **$109.90**
MINI, dual conversion superhet, sequential LED's, audible alarm

ASTATIC

D104 Silver Eagle **$69.90**
Chrome plated base station amateur microphone, factory wired to be easily converted to electronic or relay operation. Adjustable gain for optimum modulation.

ETS D104 SE **$84.90**
Same as above with end of transmission Roger Beep.

uniden

25 WATT 10 Meter Transceiver, all mode operation, backlit multi function LCD meter, frequency lock, auto squelch, NB, RF gain, PA, external speaker jack, 7¼Wx9¼Dx2½H.

HR2510 ..... **$239.90**

HR2600 ..... **$289.90**

EXCALIBUR
VEHICLE SECURITY SYSTEM

AL900ATX **$119.90**
Car ALARM System, w/2 remote key chain transmitters that operate up to 170', shock glass sensors, full time panic alert, starter interrupt, LED status, passive and/or active arming, 120Db siren

NEED Eddystone Radio 940 or 830 for display. Not working ok. Give price. John Gibson, 1075 Sterling Avenue, Berkeley, CA 94708, 415-849-1051.

KDK 2016A For Sale, 2 Meter FM 15 Watt Xcvr. with Drake 1525 EM Mic, Memory, Scanning, and Tone (burst or continuous) clean $150. Paul, K1SSO, 203-633-3806.

FOR SALE: Kenwood TS-520, mint, one owner, $375. Drake 2A Receiver, $75. BK820 Digital Capacitance Meter, $50. Shure 444 Microphone, $20. Will trade for 2 meter rig. Nate, WA6GJO, 37 Bluecoat, Irvine, CA 92720, 714-731-1321.

WANTED: E.F. Johnson low voltage choke L44 drawing #22.749, part #SNC P 1501 for Valiant. Dom, WA2ESU, 516-599-3775.

10 METER Monoband Yagi Beams, high performance 3, 4, 5, 6, 7 and 8 element models available. Weatherization kits, will waterproof connectors - coax cables. Send SASE for a free sample of our WX kit. Drake R4C modifications. For free catalogs on all products, call or write: LTA Industries Inc., P.O. Box 92, Canfield, OH 44406, 216-533-0087.

WANTED: Globe Sidebander DSB-100 Transmitter. W8PY, 216-755-2870.

WILSON T-T-45 Crank-Up Tubular Tower with Rotating Base Raising Fixture and WR-500 Rotor. System-2 4 Element Tribander. Johnson Low Pass Filter. Heathkit Phone Patch. K8OOG, 313-535-0410.

KENWOOD AT250 Automatic Antenna Tuner $290, MFJ 422B Electronic Keyer with Bencher Paddle $90. WA1IWD, 203-848-1376.

CLEANING Out Shack. LSASE for list. G. Cain, 1775 Grand #302, St. Paul, MN 55105.

BEAM HEADINGS, DX and WAS from your QTH $7. Wagner, WD8SBB, 855 North Willowglen, Tipp City, OH 45371.

SWAP my little-used Kenwood TH-215A, 3-months old, for a nice TS-530, or a Digital General Coverage Receiver like R-600. WB8P, 419-726-0084.

SUPERFAST Morse Code Supereasy. Subliminal cassette. $10. Learn Morse Code in 1 Hour. Amazing new supereasy technique. $10. Both $17. Moneyback guarantee. Free catalog: SASE. Bahr, 1196-G9 Citrus, Palmbay, FL 32905.

KENWOOD TS-130S, 500 Hz Filter, $525. WE0R, 314-544-5584.

WANTED: manual for Bandit 2000B Amplifier. Also need external power supply. Hal Deitz, WB9VMY, 1021 W. Griggs Way, Mustang, OK 73064, 405-376-0410.

WANTED: Ham Equipment and Other Property. The Radio Club Of Junior High School 22 NYC Inc. is a nonprofit organization, granted 501(c)(3) status by the IRS, incorporated with the goal of using the theme of Ham Radio to further and enhance the education of young people nationwide. Your property donation or financial support would be greatly appreciated and acknowledged with a receipt for your tax deductible contribution. The new crew has arrived. Clean up, clean out and make a difference, plus tax time is fast approaching. Donate that equipment now. We depend on you. Please write us at: P.O. Box 1052, New York, NY 10002. Round the clock hotline: 516-674-4072. Thank you!

WANTED: Ten-Tec Omni-A Model 545 or Model 546 D. State condition and accessories available with manual. P. Bayne, N9IKD, P.O. Box 71071, Milwaukee, WI 53211-71071.

DIGITAL AUTOMATIC DISPLAYS. Any Radio. Be specific. Large 45 cent SASE. Grand Systems, P.O.B. 3377, Blaine, WA 98230.

DRAKE WANTS: L75 Amp, B1000 Balun, R7A Manual, P75 Patch. Also want Kenwood SM220/BS8; Hammarlund HQ 215 and HQ 200. KG6KB, 120 Cedar Lane, Santa Barbara, CA 93108, 805-962-8957.

WANTED: IC-551D in excellent condition. Will pay fair price. Call Andy, WA9WWA, 219-346-2529 after 4 PM.

WANTED — Hallicrafter Speaker PM23 (or others) and parts for SX28. Write Edward Farrell, W1MQF, 115 Greenwood Avenue, Rumford, RI 02916.

FOR SALE: ICOM 751A, IC 2KL Amplifier. Both for only $2200. Also Business Band ICOM Radio $250. WA9DDS, 618-546-1487.

HT-CLONE BATTERIES: ICOM: BP-3S Double BP3 "Wall Chargeable" $43.95, BP5 $42.95, Yaesu: FNB2 $21.95, Santec 142/442/1200 (3 pin) $22.95. "Rebuilding: Send-Ur-Pack" ICOM BP3 $20, BP5 $28, BP7/8 $34, BP70 $30, Yaesu FNB4/4A $37, Kenwood PB21 $18, PB25/H/26 $28, T-T 2991 $28. "U-Do-It Repair Inserts" ICOM: BP2 $18.95, BP3 $16.95, BP5 $22.95, BP7/BP8 $28.95, Kenwood: PB21 $12.95, PB24/25/26 $19.95, Azden 300 $19.95, Yaesu: FNB4/4A $32.95, Tempo: S1, 2, 4, 5, 15/450 $22.95, 12V/5A hr Porta-Pac w/Chgr $49.95, "Antennas" 2Mtr 5/8-Tel/BNC $14.95, "Telephone/Pager & Commercial Packs" "Free Catalog" $3 shipping/order. PA + 6%. Visa/MC + $2. Cunard Associates, Dept. A, RD 6, Box 104, Bedford, PA 15522, 814-623-7000.

TEN-TEC Century 21 (CW only) Rig. 35 W output, mint condx, $150 includes shipping. KJ6QG, 805-498-4493.

NICAD Battery Pacs. Gordon West Tapes. Florida Nicad Specialties, 1-800-666-4223.

CRYSTALS, Build Something. QRP gets out during these sunspot upcycle days. Try it! Fall begins, static diminishes. It's easier with crystals. Low cost FT-243s made to your order. 30M fundamentals $2.95, five or more $2.50 each. 17M - 9MHz doublers $2.95, five $2.50. 40M fundamentals and multipliers from 40M to 20M, 15M, 10M, $2.95, five $1.95 each. 80M $2.95, five $2.50. 160M $4.95, five $3.95. 10M, 12M, 17M overtones $4.95. Airmail 35 cents per crystal. Four stamps or $1 for listings-circuits package, 1700 - 60000 kilocycles. "Crystals Since 1933." W0LPS, C-W Crystals, Marshfield, MO 65706.

SELL: used Cushcraft three-element twenty meter beam. Make offer. Van Newkirk, Box 277, Ozark, AL 36361.

WANTED: Ten-Tec 505 Argonaut, 405 Linear, 210, 250 or 251 Power Supply, S-20 or S-30 Signalizer, KR-5 or KR-40 Keyer. Also 214/234 Mike/Speech Processor. KH6MM, Box 392, Wailuku, HI 96793.

WANTED—Knight "Space Spanner" for enjoyable memories. Charles, K4QZO, 4538 Menewa Path, Pensacola, FL 32504, 904-438-8766.

YAESU FT-102, three 6146B finals gives clean high power output, beautiful condition $585. SP102P $85. FC102 Tuner 1200 watt rating $225. Money back guarantee. I pay shipping. John Korona, WA2V, 1117 Dewitt Terrace, Linden, NJ 07036, 201-486-0039.

DRAKE RR-2 commercial marine general coverage receiver, $250. Drake MN-4C antenna tuner with B-1000 balun, $100. Qubie' XT-300 computer backup power supply, $100. Josh Rovero, KK1D, 804-479- 2277.

5894 TUBES (2) VHF twin tetrodes (new) $115 for both. W2JOF, 10733 Footprint Lane, Port Richey, FL 34668.

WANTED: Drake RV-75 Remote VFO for the TR-7 Tranceiver. Dave, W8GUR, 313-676-6856.

KENWOOD 530SP CW Filter, excellent MFJ-949C Tuner, Low Pass Filter, Line Filter, Speaker, Mic, Cables, Manuals. Original Cartons, $600. N2AJV, 201-881-0448.

WANTED: Zenith Transoceanic with "Ship or Airplane" Front. For Sale - Browning "Eagle" in nice condition. Wade, 657 14th Avenue, Prospect Park, PA 19076.

SELL: Rohn 25G 10 ft. tower sections, $40 ea. SB25G short base $25 ea. TB-3 thrust bearings $30 ea. HB25G house bracket $25. WP25G work platform $25. Hazer-3 aluminum elevator system $125. Hy-Gain Ham-4 rotators, brand new $250, used 6 mos $175. Pick-up or will deliver to any east coast hamfest. KV2I, 201-337-2350 or FAX 201-337-1686.

WANTED—Ten-Tec Century 21 or 22. Mike, WB2PSL, 516-666-0071.

NATIONAL SW3, SW4, SW5, FB, or AG Wanted. Bob Mattson, KC2LK, 10 Janewood, Highland, NY 12528, 914-691-6247.

HAMSOFT—Public Domain Software For Amateur Radio. Hundreds of titles, lowest prices, satisfaction guaranteed! IBM, C-64, many more. Catalog $1 refunded first order. Hamsoft, P.O. Box 2525, Morgan City, LA 70381.

KENWOOD TS-140S, like new, $650. 2M Kenwood TR-7400A, $150. Azden PCS-2000, 2M, FM, $175. Fred, W1FC, 508-369-5833.

TENMA RF Generator, new, never used, $100. I ship. NM0L, 612-426-4751.

WANTED: Hal RS2100 RTTY Scope. R. Cook, 6326 NE Barrett Drive, Poulsbo, WA 98370, 206-598-4916.

HEATHKIT Sale. Monitor Scope HO-5404 $125, HD-4040 Packet TNC (new kit) $115, HD-4040-1 TNC Status Indicator $25, DC Supply Model IP-2718 (new kit) $75, HD-3030 RTTY Terminal Interface $40. Call Charlie, KD4AJ, 404-396-0276 after 7 PM.

DIGITAL DIGEST, timely information on all modes and aspects amateur digital communications, computers and software. Published bi-monthly, $16 per year USA. Digital Digest, 4063 N. Goldenrod Road, Winter Park, FL 32792.

SALE KC4EP station complete $1250 or as listed. Ten-Tec Corsair & mod. 620 power supply new 1984 all filters but CW $600. Drake MN - 2000 matching network new 1979 $125. Amentron AL80A amp new 1987 $575. Ten-Tec KR20A keyer self comp. dot & dash & monitor single paddle new 1978 $30. Astatic mike TUG8 stand with ceramic 10-DA head $30. Ernie Magnuson, Box 3255, Nalcrest, FL 33856, 813-696-2554.

WRITTEN Exams Supereasy. Memory aids from psychologist/engineer cut studytime 50%. Novice, Tech, Gen: $7 each. Advanced, Extra: $12 each. Moneyback guarantee. Bahr, 1196-G9 Citrus, Palmbay, FL 32905.

ROSS' $$$$ New September Specials: Kenwood TS-440S $1044.90, TM-721A $604.90, TM-231A $389.90, TM-621A $576.90, TM-401B $334.90, Alinco EP-2010 $99.99, EP-2030 $119.99, Tempo 61T $179.99, S4 $239.99, C9-15 $339.90, S4T $269.90, ICOM IC-28AW/TTM $389.90, IC-37A $329.90, IC-32AT $539.90, IC-725 $809.90, IC-45A $289.99, Yaesu FT-2311R $479.90, FT-411 $336.90, FT-470 $465.90, FT-709R $284.99, FT-73RTT $269.90, FT-33RTT $299.90, Hustler 5BTV $109.90, G7-144 $118.90, FX2 $22.90, HAV-225 $69.90. All LTO (limited time offer). Looking for something not listed?? Call or write. Over 8780 ham-related items in stock for immediate shipment. MENTION AD. Prices cash, FOB Preston. Hours Tuesday - Friday 9:00 to 6:00 PM, Monday 9:00 to 2:00 PM. Closed Saturday & Sunday. Ross Distributing Company, 78 South State, Preston, ID 83263, 208-852-0830.

COLLINS KWM-380 sn906. Original owner. Processor, blanker, 6.0, 1.7, 360 filters. Keypad and Kiron memory board. All factory mods. Prime condition. $2850. Ron, W8GUS, 1516 Essex Road, Columbus, OH 43221, 614-486-5746.

COLLINS 30L-1, cables, manual, works fine, pickup, $500. Gene Simon, W2KOY, 12 Remington Street #206, Cambridge, MA 02138.

WANTED: Atlas DD-6C Digital Dial. George Rancourt, K1ANX, 82 White Loaf Road, Southampton, MA 01073, tel. 1-413-527-4304.

DRAKE WANTED: C-4 station console, L-4B, L-7, L-75 amplifiers, TR-6 six meter transceiver, RV-6 remote VFO, TC-2, TC-6 transmitting converters, CC-1 converter console, SC-2, SC-6 receiving converters. Contact: G. Hawrysko, K2AWA, P.O. Box 568, Boro Hall, Jamaica, NY 11424.

KWM-380 Keypads. Brand new, very hard to find, several available. W3ALZ, 301-384-2969.

KENWOOD TS-820S, Remote VFO, CW Filter, Microphone, Digital Frequency Readout. Great Novice Rig, $650. N8NT, 314-642-8780.

NOW: Class Type Ham Radio Rings Too! 14 karat gold call-sign jewelry. Lapel pins, necklaces, more. Information: KB2MB, H & M Jewelry, 26 Edgecomb, Binghamton, NY 13905.

GENERAL Coverage Transceiver Wanted, TR-7, TS-430, IC-720, etc. Clean TS-530S For Sale $450 or Trade toward above. N5OFF, 116 Fernway, Duson, LA 70529, 318-984-2561 nights.

1990 RADIO Amateur Callbooks: Prepublication orders until 9/15; North American, $22; International, $25. Any two or more, subtract $1.50/book. Postpaid USA. Century Print, 6059 Essex, Riverside, CA 92504-1511, 714-687-5910.

TEN-TEC Argonaut 509, 405 Linear, Power Supply, $350. W9ATU, 414-778-2096.

WANTED: Collins 30S-1, BTI LK 3000, 8170, 8171, SK300A, SASE for KWM-380 user group and parts. WD5JFR, 4161 Oak Road, Tulsa, OK 74105, 918-742-1845.

DRAKE C-Line, mint; R4C, T4XC, AC4, MS4 $450; 250, 1500 Filters $35 each; new tube set $80; FS4 Synthesizer $250. All $750. WE2T, 716-334-1103.

AMP LK500ZC (160-10) tabletop linear trade for Henry 3KA; SB220 (less tubes) $450 or trade for Henry 3K (less tubes); Johnson Thunderbolt (pair 4-400's) tabletop linear $450 or trade for Henry 2K. I will pick up and deliver on trades. Wanted pair of 3-500Z chimneys, any pre-WW II amateur xmtrs. Parker, W1YG, 87 Cove Road, Lyme, CT 06371, 203-434-7783.

WANTED—Service Manual and/or Diagram for Radio Specialty Deviation Monitor 1100 Series. W6VDR, 24 Goya Drive, Fairfield, CA 94533-1008, 1-707-426-3240.

COMMODORE/AMIGA CHIPS—Complete Stock, Parts, Repairs - call for lowest prices. Commodore "Pet" Computers removed from service (may work) $49.95. Hard Drives for Pets, tons of parts, "As Is" $29.95. New Heavy Duty Power Supply for C64 $27.95 (plus UPS), New Amiga Power Supply - PS102 $73.95 (plus UPS). Call about Amiga Expansion Board. "The Diagnostician" save money save downtime with this invaluable diagnostic guide for C64/1541 units $7.95 ppd. QEP Co, Inc., Kasara Microsystems Division, Stony Point, NY 10980, 1-800-248-2983.

SELLING Super Tucson QTH, three bedroom, two bath, energy efficient adobe, corner lot, downslope in all directions, low taxes, crankup tower, walk to shopping, hospital, community college. NI7Y, 602-623-0921.

QUADS Lightweight Fiberglass Construction, 10 Meters $99.95, 10-15 $139.95, 10-15-20 $239.95. Lightning Bolt Antennas, RD #2, Volant, PA 16156, 412-530-7396.

LIST OF HF and VHF Ham, Audio, Microwave Gear and Parts. Many new and all very clean. SASE for 3 page list. WA6JRA, 714-637-3989.

WANTED—ACC RC-850 or RC-85 Controller. N0GYY, 6016 Drew Avenue, Minneapolis, MN 55410.

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HAM STATION, TS-820S, MC50, SP-180, TH5DX, Ham IV, 40 Foot Tower, and Accessories. Sell as unit only. Pick up. KA9EZB, 618-283-3116 for details.

SELL or Trade ICOM 765, SM 6 new, $2450 or your ICOM 735/751A and cash. K1DFC, 1-413-323-4088.

T-4XC, AC-4, $225; late R-4C, $220; Collins 310B-1 Exciter, $30; SB-610 Monitor Scope, $95; HW-7, $55; Sealed 4CX250B, $45; Transformer 17V-0-17V, 100A, $90; 500pF/15KV Vacuum Variable, $100. Paul Husby, W0UC, 1462 Midway Parkway, St. Paul, MN 55108, 612-642-1559.

AEA PK-232 Data Controller, $250; Kenwood TM-201B 2M FM, 45 watts, never mobile, $250; both like new, postpaid. KI4SU, 216 Harrogate Place, Longwood, FL 32779, 407-682-5431.

WANTED: Collins 312 13-6 Remote VFO, Phone Patch. State price & condx. Thomas E. Cole, W8KMB, 4143 W. Kelley, Fresno, CA 93722, 209-431-9683.

DRAKE C-Line. Includes FS-4 Synthesizer, 4-NB Noise Blanker, IC Product Detector, .8 KHz Sherwood Filter, 4.0/1.5/.5/.25 KHz Drake Filters, Fresh Tubes Plus Spares. $500 plus shipping. Michael McAmis, WA3ECT/1, Hanover Center Road, Etna, NH 03750, 603-643-3768.

MIDLAND 13-513 220 MHz FM Xcvr, Lunar 70 Watt 220 MHz Linear Amp/Pre-Amp, mint condition, manuals, no mike, $250. Heath HW-2036A 2 Mtr Xcvr w/AC Supply and Drake 1525EM T/T Mike, mint, manuals, $150. Call or write: Bob, W5SUR, 220 Stonewall Jackson Drive, Conroe, TX 77302, 409-273-1902 evenings.

HAM MUG beautifully hand-crafted pottery mug with your name and call imprinted into the clay. It features over 16 oz. capacity and your choice of the following commercial lead free glazes. Combination of cinnamon and oatmeal, midnight blue and oatmeal, or light and dark aqua blue. $16.95 ppd. JC Cramer, 650 Cascade, Shelton, WA 98584.

AUTO-KALL AK10 complete with speaker, cord, AC adapter. Give your ears a break! I have 2 unused! $69 each. Harris Kenner, K1UKQ, 222 Wm. Henry Road, North Scituate, RI 02857.

WANTED: ICOM SM-8, HM-14, IC-27A/H; Kenwood TR-7930/50, TM-201A/B. K1LEC, 802-886-8121.

HALLICRAFTERS Skyrider S or SX1 thru 28 Wanted. Bob Mattson, KC2LK, 10 Janewood, Highland, NY 12528, 914-691-6247.

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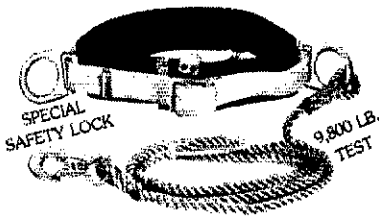

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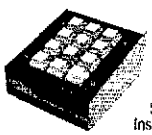

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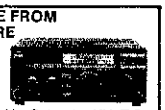

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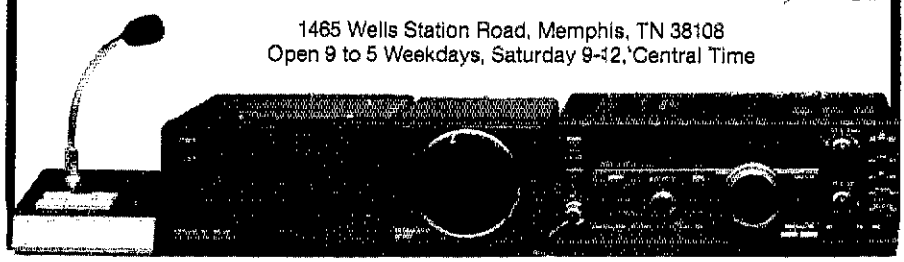

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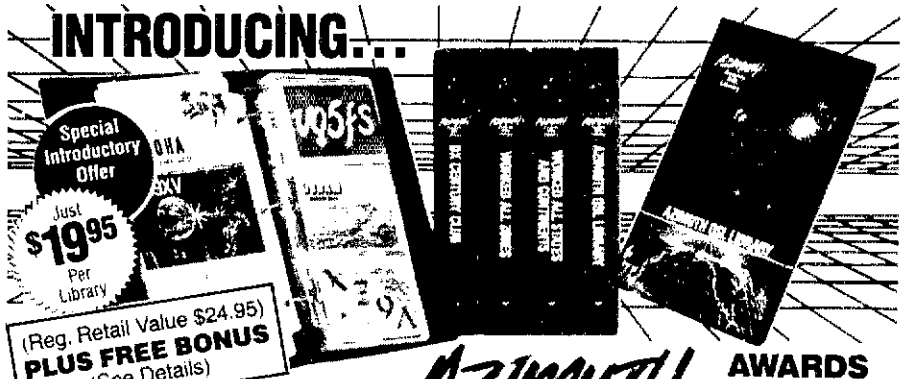

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Angela M. Beebe, KA1SER, Advertising Assistant

203-667-2494 is a direct line, and will be answered only by Advertising Department personnel.

Index of Advertisers

ANTENNA/TOWER SALE!

CRANKUP SALE!

All Models Shipped Factory Direct—Freight Paid*!

Check these features:
- All steel construction
- Hot dip galvanized after fabrication
- Complete with base and rotor plate
- Totally self-supporting—no guys needed

Model	Height	Load	Sale Price
HG37SS	37 ft	9 sq ft	$CALL
HG52SS	52 ft	9 sq ft	$CALL
HG54HD	54 ft	16 sq ft	$CALL
HG70HD	70 ft	16 sq ft	$CALL

Masts—Thrust Bearings—Other Accessories Available—Call! Prices Shown Are Your Total Delivered Price in Continental U.S.A.!

ROHN Self Supporting Towers On SALE! FREIGHT PREPAID

- All Steel Construction—Rugged
- Galvanized Finish—Long Life
- Totally Free Standing—No Guy Wires
- America's Best Tower Buy—Compare Save $
- Complete With Base and Rotor Plate
- In Stock Now—Fast Delivery

Model	Height	Ant Load*	Weight	Delivered Price*
HBX40	40 ft	10 sq ft	226	$449
HBX48	48 ft	10 sq ft	303	$589
HBX56	56 ft	10 sq ft	385	$699
HDBX48	48 ft	18 sq ft	281	$569
HDBX48	48 ft	18 sq ft	363	$689

*Your Total Delivered Price Anywhere in Continental 48 States. Antenna Load Based on 70 MPH Wind.

ROHN Guyed Tower Packages

- World Famous Rohn Quality and Dependability
- Rugged high wind survival provides safe installation
- Multi purpose towers satisfy a wide range of needs
- Complete packages include: guy hardware, turnbuckles, guy assemblies, concrete base, rotor plate and top section per manufacturers specs.

Packages shown below are rated for 70 mph wind zone. 90 mph wind zone packages slightly higher. All tower packages shipped freight collect from our Plano, TX warehouse, in stock for prompt delivery.

	Model 25G	Model 45G	Model 55G
50'	$839	$1499	$1939
60'	929	1679	2169
70'	1129	1879	2399
80'	1199	2199	2799
90'	1279	2369	2999
100'	1529	2569	3239
110'	1629	2979	3449
120'	1699	3149	3699

US TOWER CORPORATION

These rugged crankup towers and masts now available from Texas Towers!

Check these features:
- All steel construction
- Hot dipped galvanized
- Totally self-supporting-
- No guys needed

Coax arms, Thrustbearings Masts, Motor drives, Remote controls, Hinged bases, Rotor bases, & Raising fixtures also in stock.

CALL FOR SALE PRICES!

Model	Min.Ht.	Max.Ht.	Ant.load*	Sale price
MA40 mast	21'	40'	10 sq ft	$629
MA550 mast	22'	50'	10 sq ft	999
TX438	22'	38'	18 sq ft	919
TX455	22'	55'	18 sq ft	1385
TX472	23'	72'	18 sq ft	2279
HDX555	22'	55'	30 sq ft	2079
HDX572	23'	72'	30 sq ft	3559

Note-US Towers Shipped Freight Collect From Visalia, CA Factory

**Note-towers rated at 80 mph to EIA specifications*

RG-213U

$.39/ft $379/1000 ft. Up to 600 ft via UPS

- RG-213/U—95% Bare Copper Shield
- Mil-Spec Non-contaminating Jacket for longer life than RG8 cables
- Our RG-213/U uses virgin materials.
- Guaranteed Highest Quality!

RG-8X

$.22/ft $209/1000 ft.

- RG8X—95% Bare Copper Shield • Low Loss
- Non-contaminating Vinyl Jacket Foam Dielectric

9086

$.45/ft $439/1000 ft.

- Same Specs as Belden 9913
- Lower loss than RG8U
- 100% shielded-braid & foil

HARDLINE/HELIAX®

Lowest Loss for VHF/UHF!

½" Alum. w/poly Jacket.....$.79/ft.
½" LDF4-50 Andrew Heliax®.....$1.99/ft.
⅞" LDF5-50 Andrew Heliax®.....$4.99/ft.
select connectors below

Heliax® is a Registered Trademark of the Andrew Corp.

Coaxial Cable Loss Characteristics (DB/100 ft)

Cable Type	Imped.	10MHz	30MHz	150MHz	450MHz
RG-213/U	50	.6	.9	2.3	5.2
RG8X	52	.8	1.2	3.5	5.8
9086	50	.4	.64	1.7	3.1
½" Alum	50	.3	.5	1.2	2.2
½" Heliax	50	.2	.4	.9	1.6
⅞" Heliax	50	.1	.2	.5	.9

HELIAX® CONNECTORS

Cable Type	UHF FML	UHF MALE	N FML	N MALE
½" Heliax®	$29	$29	$29	$29
⅞" Heliax®	$55	$55	$55	$55

COAX CONNECTORS

Amphenol Silver PL259.....$1.50
UG21B N Male.....$3.50
9086/9913 N Male Connector.....$4.95

ANTENNA WIRE & ACCESSORIES

Stranded Copper 14ga.....$.10/ft.
¼ mile 18ga copper-clad steel wire.....$30
Dog bone end insulator.....$.79 ea.

Van Gorden

1:1 Balun.....$15 Center Insulator.....$8
Dipole Kits.....D60 $31.95/D40 $28.95
Short Dipole Kits.....SD60 $35.95/SD40 $33.95
All-band Dipole w/ladder line.....$29.95
G5RV all band antenna.....$49.95

ALPHA DELTA

DX-A 160-80-40 Sloper.....$49

CUSHCRAFT

CALL FOR SPECIAL PRICES!

A3 3-el Tribander.....
A4S 4-el Tribander Beam w/S.S. Hdwre.....
A743 & A744, 30/40 mtr KIT for the A3 & A4.
R4 20-10 mtr Vertical.....
AP8 80-10 mtr Vertical.....
AV5 80-10 mtr Vertical.....
D40 40 mtr Dipole.....
40-2CD 2-el 40 mtr Beam.....
A50-5 5-el 6 mtr Beam.....
215 WB NEW 15-el 2 mtr Beam.....
230 WB NEW 30-el 2 mtr Beam.....
4218 XL 18-el 2 mtr Beam.....
3219 19-el 2 mtr Beam.....
424B 24-el 432 MHz Beam.....
ARX2B 2 mtr Vertical.....

hy-gain

CALL FOR SPECIAL PRICES!

Discoverer 2-el 40-mtr Beam.....
Discoverer 3-el Conversion Kit.....
EXPLORER-14 SUPER-SPECIAL.....
QK710 30/40 mtr. Add-On-Kit.....
V2S 2-mtr Base Vertical.....
V4S 440MHz Base Vertical.....
TH5MK2S Broad Band 5-el Triband Beam.
TH7DXS 7-el Triband Beam.....
TH3JRS 3-el Triband Beam.....
205BAS 5-el 20-mtr Beam.....
155BAS 5-el 15-mtr Beam.....
105BAS 5-el 10-mtr Beam.....
204BAS 4-el 20-mtr Beam.....
64BS 4-el 6-mtr Beam.....
12 AVQ 20-10 mtr vertical.....
14 AVQ 40-10 mtr vertical.....
18 AVT/WB 80-10mtr Vertical.....
18HTS 80-10 mtr Hy-Tower Vertical.....
23BS 3-el 2 mtr Beam.....
25BS 5-el 2 mtr Beam.....
28BS 8-el 2 mtr Beam.....
214BS 14-el 2-mtr Beam.....
2BDQ 80/40 mtr Trap Dipole.....
5BDQ 80-10 mtr Trap Dipole.....
BN86 80-10 mtr KW Balun W/Coax Seal...

HUSTLER

6BTV 80-10 mtr Vert $149 5BTV 80-10 mtr Vert $129
4BTV 40-10 mtr Vert $99 G7-144 2-mtr Base $129
G6-144B 2-mtr Base $89

Mobile Resonators	10m	15m	20m	40m	75m
400W Standard	$16	$17	$19	$22	$26
2KW Super	$20	$22	$25	$29	$39

Bumper Mounts - Springs - Folding Masts in Stock!

BUTTERNUT ELECTRONICS CO

HF6VX 80-10m Vertical $159.95 Delivered
- Full Legal Power
- Highest Q Tuning Circuits

HF2V 80-40m Vertical $149.95 Delivered
- Full Legal Power
- Automatic Band Switching

Accessories:
RMK II Roof Mtg. Kit.....$59.95
STR II Stub-Tuned Radials.....$39.95
TBR160 160m Coil Kit.....$59.95
30m Add-on Kit.....$39.95
17/12m Add-on Kit.....$39.95

HF6V HF2V

FREE UPS on ACCESSORIES when purchased with antenna

HF5B "Butterfly" 20-10m Compact Beam $259.95

- Unique Design Reduces Size
- No Lossy Traps
- Turns w/TV Rotor
- Boom Length 6 Feet
- Element Length 12.5 Feet

FREE UPS Shipping in Continental USA

MIRAGE/KLM

KT34A 4-el Broad Band Triband Beam.....$419
KT34XA 6-el Broad Band Triband Beam.....$519

ROTORS

Alliance HD73 (10.7 sq. ft. rating).....$129.95
Alliance U110 (3 sq. ft. rating).....$49
Telex CD 4511 (8.5 sq. ft. rating).....$Call
Telex HAM 4 (15 sq. ft. rating).....$Call
Telex Tailtwister (20 sq. ft. rating).....$Call
Telex HDR300 Heavy Duty (25 sq. ft. rating).$Call

ROTOR CABLE

Standard 8 cond cables $.25/ft. (vinyl jacket 2-#18 & 6-#22 ga)
Heavy Duty 8 Cond cable $.45/ft (vinyl jacket 2-#16 & 6-#18 ga)

ROHN GUYED TOWER SECTIONS

10 FT. STACKED SECTIONS

20G.....$54.50 45G.....$153.50
25G.....$65.50 55G.....$197.50

ALL ACCESSORIES IN STOCK—CALL

ROHN FOLDOVER TOWERS

Model	Height	Ant. Load*	Price
FK2548	48 ft.	15.4 sq. ft.	CALL FOR PRICES
FK2558	58 ft.	13.3 sq. ft.	
FK2568	68 ft.	11.7 sq. ft.	
FK4544	44 ft.	34.8 sq. ft.	
FK4554	54 ft.	29.1 sq. ft.	
FK4564	64 ft.	28.4 sq. ft.	

25G Double Guy Kit.....$299.
45G Double Guy Kit.....$319.

*Above antenna loads for 70 mph winds w/guys at hinge and apex. All foldover towers shipped freight prepaid in 48 states. Prices 10% higher west of Rockies.

TOWER/GUY HARDWARE

3/16 EHS Guywire (3990 lb rating).....$.15/ft
1/4 EHS Guywire (6650 lb rating).....$.18/ft
5/16 EHS Guywire (11,200 lb rating).....$.29/ft
5/32 7 x 7 Aircraft Cable (2700 lb rating).....$.15/ft
3/16 CCM Cable Clamp (3/16" or 5/32").....$.45
1/4 CCM Cable Clamp (1/4" Cable).....$.55
1/4 TH Thimble (fits all sizes).....$.45
3/8EE (3/8" Eye & Eye Turnbuckle).....$6.95
3/8EJ (3/8" Eye & Jaw Turnbuckle).....$7.95
1/2 x 9EE (1/2" x 9" Eye to Eye Turnbuckle).....$9.95
1/2 x 9EJ (1/2" x 9" Eye & Jaw Turnbuckle).....$10.95
1/2 x 12EE (1/2" x 12" Eye & Eye Turnbuckle).....$12.95
1/2 x 12EJ (1/2" x 12" Eye & Jaw Turnbuckle).....$13.95
5/8 x 12EJ (5/8" x 12" Eye & Jaw Turnbuckle).....$16.95
3/16" Preformed Guy Grip.....$2.49
1/4" Preformed Guy Grip.....$2.99
6" Diam - 4 ft Long Earth Screw Anchor.....$19.95
500 D Guy Insulator (5/32" or 3/16" Cable).....$1.69
502 Guy Insulator (1/4" Cable).....$2.99
5/8" Diam - 8 ft Copper Clad Ground Rod.....$12.95

PHILLYSTRAN GUY CABLE

HPTG2100 Guy Cable (2100 lb rating).....$.32/ft
HPTG4000 Guy Cable (4000 lb rating).....$.52/ft
HPTG6700 Guy Cable (6700 lb rating).....$.72/ft
9901LD Cable End (for 2100/4000 cable).....$9.95
9902LD Cable End (for 6700 cable).....$11.95
Socketfast Potting Compound (does 6-8 ends).....$16.95

GALVANIZED STEEL MASTS

Heavy Duty Steel Masts 2 in OD - Galvanized Finish

Length	5 FT	10 FT	15 FT	20 FT
.12 in Wall	$29	$49	$89	$89
.18 in Wall	$49	$89	$129	$149
.25 in Wall	$69	$129	$169	$249

ORDER TOLL FREE 1-800-272-3467

Texas, Alaska & for information 1 (214) 422-7306

VISA MasterCard

TEXAS TOWERS

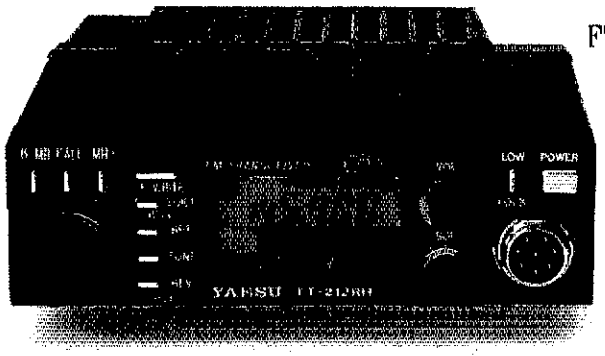
Mon-Fri: 9 am-5pm
Sat: 9 am-1pm

Div. of Texas RF Distributors Inc., 1108 Summit Ave., Suite 4 • Plano, Texas 75074

(Prices & Availability Subject To Change Without Notice)

(Antenna/tower product prices do not include shipping unless noted otherwise)

TWO OF AMERICA'S MOST POPULAR FM STATIONS.

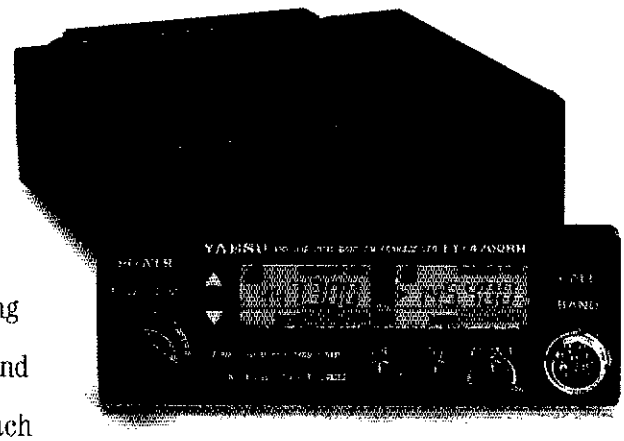


No wonder Yaesu's FT-212R Series and FT-4700RH mobiles are so popular.

Not only are the features unique and plentiful. The operation hassle-free. And the mounting options flexible. But also, each radio now features a built-in PL board. Plus *you* choose the optional mic that best fits your operating and budget needs.

FT-212R SERIES. MOBILES THAT DOUBLE AS ANSWERING MACHINES.

Let the 2-meter FT-212R and 440-MHz FT-712R take messages while you're away (with DVS-1 option)! 45-watt output (35W on 440 MHz). Built-in PL encode/decode. 18 memories. Auto repeater shift. Scanning routines. Offset tuning from any memory channel. Extended receive. Audible command verification. High/low power switch. Oversize amber display. Choice of optional mic. More.



FT-4700RH. DUAL-BAND PERFORMANCE, REMOTE-HEAD DESIGN.

Mount the FT-4700RH almost anywhere—the "brains" on your dash, visor, or door; the "muscle" under your seat. 50 watts on 2 meters, 40 watts on 70 cm. Full crossband duplex. Simultaneous monitoring of each band, complete with independent squelch settings on the main and secondary bands. Built-in PL encode/decode. 9 memories (each band). Extended receive. Reverse repeater shift. High/low power switch. Patch cord for remote mounting. Bright LCD display. Backlit controls. Choice of optional mic. More.

Choose your optional mic: MH-15 C8 DTMF mic, or MH-15 D8 DTMF auto-dialer mic

Want more information? Call **(800) 999-2070** toll-free. Or ask your dealer about Yaesu's FT-212R Series and FT-4700RH mobiles today. Two of America's favorites.

YAESU USA 17210 Edwards Road, Cerritos, CA 90701 (213) 404-2700. **REPAIR SERVICE:** (213) 404-4884. **PARTS:** (213) 404-4847.

YAESU

Prices and specifications subject to change without notice. PL is a registered trademark of Motorola, Inc. Specifications guaranteed only within amateur bands.

KENWOOD

...pacesetter in Amateur Radio

DX-cellence!

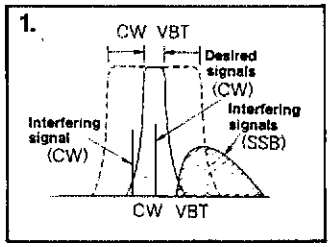
#1 Rated HF!

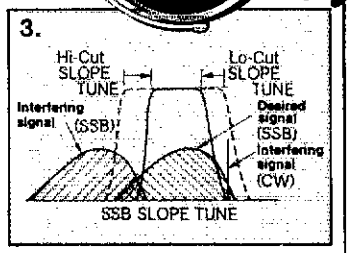
TS-940S

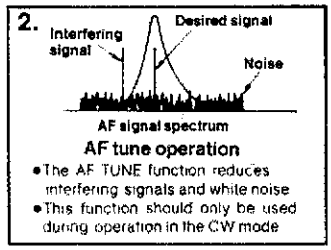
Competition class HF transceiver

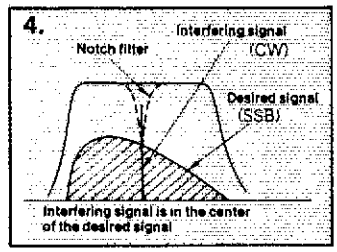
TS-940S—the standard of performance by which all other transceivers are judged. Pushing the state-of-the-art in HF transceiver design and construction, no one has been able to match the TS-940S in performance, value and reliability. The product reviews glow with superlatives, and the field-proven performance shows that the TS-940S is "The Number One Rated HF Transceiver!"

- **100% duty cycle transmitter.** Kenwood specifies transmit duty cycle ***time.*** The TS-940S is guaranteed to operate at full power output for periods ***exceeding one hour.*** (14.250 MHz, CW, 110 watts.) Perfect for RTTY, SSTV, and other long-duration modes.
- **First with a full one-year limited warranty.**
- **Extremely stable phase locked loop (PLL) VFO.** Reference frequency accuracy is measured in ***parts per million!***









1) CW Variable Bandwidth Tuning. Vary the passband width continuously in the CW, FSK, and AM modes, without affecting the center frequency. This effectively minimizes QRM from nearby SSB and CW signals.

2) AF Tune. Enabled with the push of a button, this CW interference fighter inserts a tunable, three pole active filter between the SSB/CW demodulator and the audio amplifier. During CW QSOs, this control can be used to reduce interfering signals and noise, and peaks audio frequency response for optimum CW performance.

3) SSB Slope Tuning. Operating in the LSB and USB modes, this front panel control allows independent, continuously variable adjustment of the high or low frequency slopes of the IF passband. The LCD sub display illustrates the filtering position.

4) IF Notch Filter. The tunable notch filter sharply attenuates interfering signals by as much as 40 dB. As shown here, the interfering signal is reduced, while the desired signal remains unaffected. The notch filter works in all modes except FM.

- **Complete all band, all mode transceiver with general coverage receiver.** Receiver covers 150 kHz-30 MHz. All modes built-in: AM, FM, CW, FSK, LSB, USB.
- **Superb, human engineered front panel layout for the DX-minded or contesting ham.** Large fluorescent tube main display with dimmer; direct keyboard input of frequency; flywheel type main tuning knob with optical encoder mechanism all combine to make the TS-940S a joy to operate.
- **One-touch frequency check (T-F SET) during split operations.**
- **Unique LCD sub display indicates VFO, graphic indication of VBT and SSB Slope tuning, and time.**
- **Simple one step mode changing with CW announcement.**
- **Other vital operating functions.** Selectable semi or full break-in CW (QSK), RIT/XIT, all mode squelch, RF attenuator, filter select switch, selectable AGC, CW variable pitch control, speech processor, and RF power output control, programmable band scan or 40 channel memory scan.

Optional accessories:
• AT-940 full range (160-10m) automatic antenna tuner • SP-940 external speaker with audio filtering • YG-455C-1 (500 Hz), YG-455CN-1 (250 Hz), YK-88C-1 (500 Hz) CW filters; YK-88A-1 (6 kHz) AM filter • VS-1 voice synthesizer • SO-1 temperature compensated crystal oscillator • MC-43S UP/DOWN hand mic. • MC-60A, MC-80, MC-85 deluxe base station mics. • PC-1A phone patch • TL-922A linear amplifier • SM-220 station monitor • BS-8 pan display • IF-232C/IF-10B computer interface.

Complete service manuals are available for all Kenwood transceivers and most accessories. Specifications, features, and prices are subject to change without notice or obligation.

KENWOOD

KENWOOD U.S.A. CORPORATION
2201E. Dominguez St., Long Beach, CA 90810
P.O. Box 22745, Long Beach, CA 90801-5745