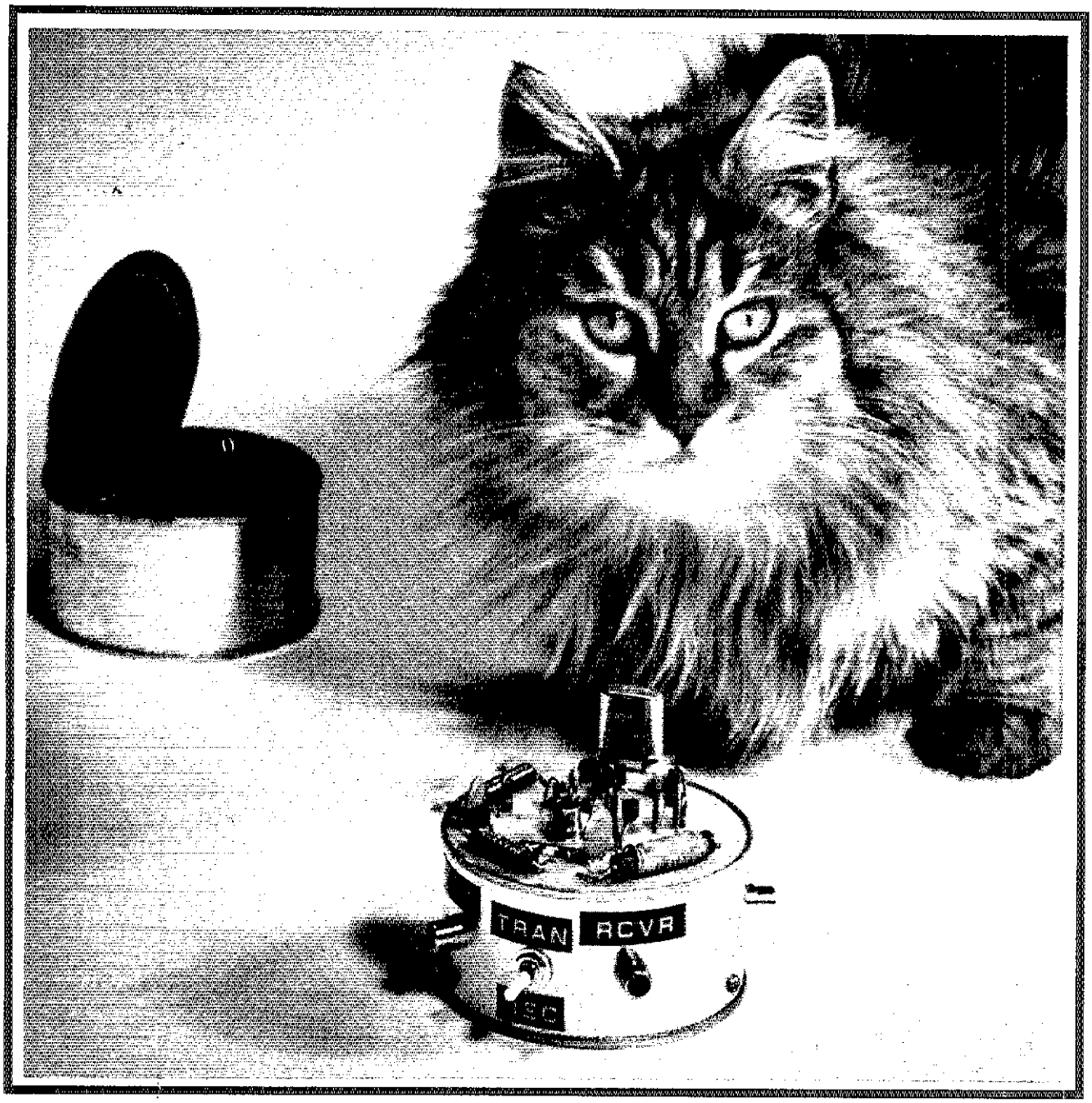
QST

devoted entirely to Amateur Radio

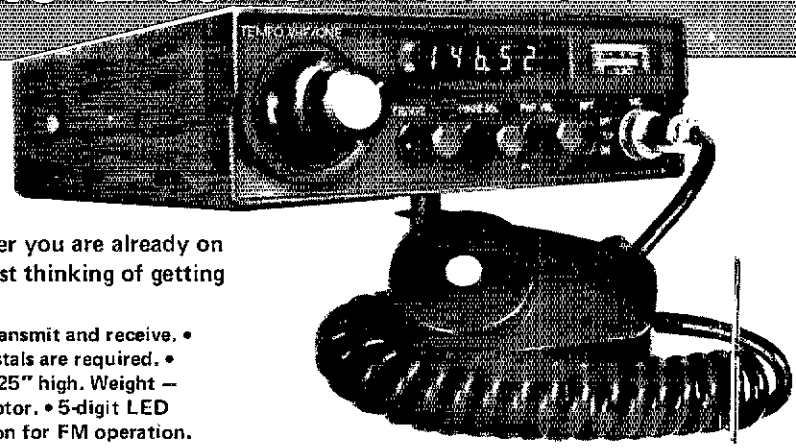
May 1976 $1.00



A Boondoggle in the Boondocks

Page 11

Now...more than ever---the TEMPO line means solid value



Tempo VHF/ONE

the "ONE" you've been waiting for

No need to wait any longer -- this is it! Whether you are already on 2-meter and want someting better or you're just thinking of getting into it, the VHF/ONE is the way to go.

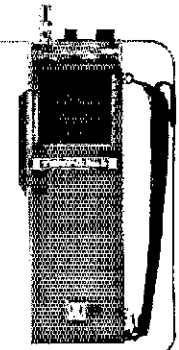
• Full 2-meter band coverage (144 to 148 MHz for transmit and receive. • Full phase lock synthesized (PLL) so no channel crystals are required. • Compact and lightweight – 9.5" long x 7" wide x 2.25" high. Weight – About 4.5 lbs. • Provisions for an accessory SSB adaptor. • 5-digit LED receive frequency display. • 5 KHz frequency selection for FM operation. • Automatic repeater split – selectable up or down for normal or reverse operation. • Microphone, power cord and mounting bracket included. • Two built-in programmable channels. • All solid state. • 10 watts output. • Super selectivity with a crystal filter at the first IF and E type ceramic filter at the second IF. • 800 Selectable receive frequencies. • Accessory 9-pin socket. • $495.00

TEMPO SSB/ONE

SSB adapter for the Tempo VHF/One

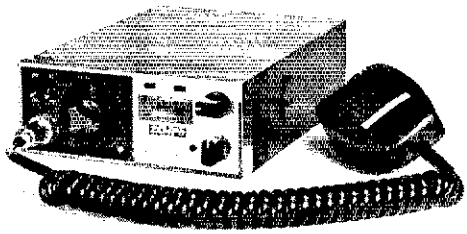
• Selectable upper or lower sideband. • Plugs directly into the VHF/One with no modification. • Noise blanker built-in. • RIT and VXO for full frequency coverage. • $225.00

TEMPO/fmh



So much for so little! 2 watt VHF/FM hand held 6 Channel capability, solid state, 12 VDC. 144-148 MHz (any two MHz), includes 1 pair of crystals, built-in charging terminals for ni-cad cells, S-meter, battery level meter, telescoping whip antenna, internal speaker & microphone. $199.00

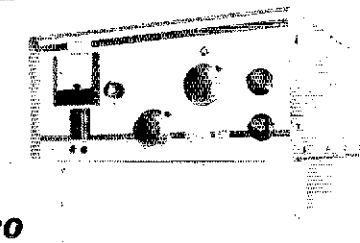
FMH-MC for Marine & Commercial service also available



TEMPO/CL 146A

. . . .a VHF/FM mobile transceiver for the 2 meter amateur band. It is compact, ruggedly built and completely solid state. One channel supplied plus two channels of your choice FREE

144 to 148 MHz coverage • Multifrequency spread of 2 MHz • 12 channel possible • Metering of output and receive • Internal speaker, dynamic microphone, mounting bracket and power cord supplied. A Tempo "best buy" at $239.00.

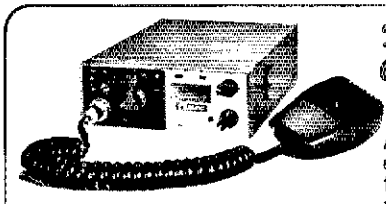


TEMPO 6N2

The Tempo 6N2 meets the demand for a high power six meter and two meter power amplifier. Using a pair of Eimac 8874 tubes it provides 2000 watts PEP input on SSB and 1000 watts input on CW and FM. Completely self-contained in one small desk mount cabinet with internal solid state power supply, built-in blower and RF relative power indicator. $795.00

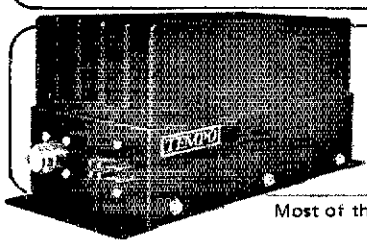
The Tempo 2002.. 2 meters only $695.00

The Tempo 2006.. 6 meters only $695.00



TEMPO CL 220

As new as tomorrow! The superb CL-220 embodies the same general specifications as the CL-146A, but operates in the frequency range of 220-225 MHz (any two MHz without retuning). At $299.00 it is undoubtedly the best value available today.



TEMPO

VHF/UHF AMPLIFIERS

Solid state power amplifiers for use in most land mobile applications. Increase the range, clarity, reliability and speed of two- way communications.

VHF (135 to 175 MHz) Drive Power	Output	Model No.	Price
2W	130W	130A02	$199
10W	130W	130A10	$179
30W	130W	130A30	$189
2W	80W	80A02	$169
10W	80W	80A10	$149
30W	80W	80A30	$159

UHF (400 to 512 MHz) Drive Power	Output	Model No.	Price
2W	70W	70D02	$270
10W	70W	70D10	$250
30W	70W	70D30	$210
2W	40W	40D02	$180
10W	40W	40D10	$145
2W	10W	10D02	$125

FCC Type accepted models also available.

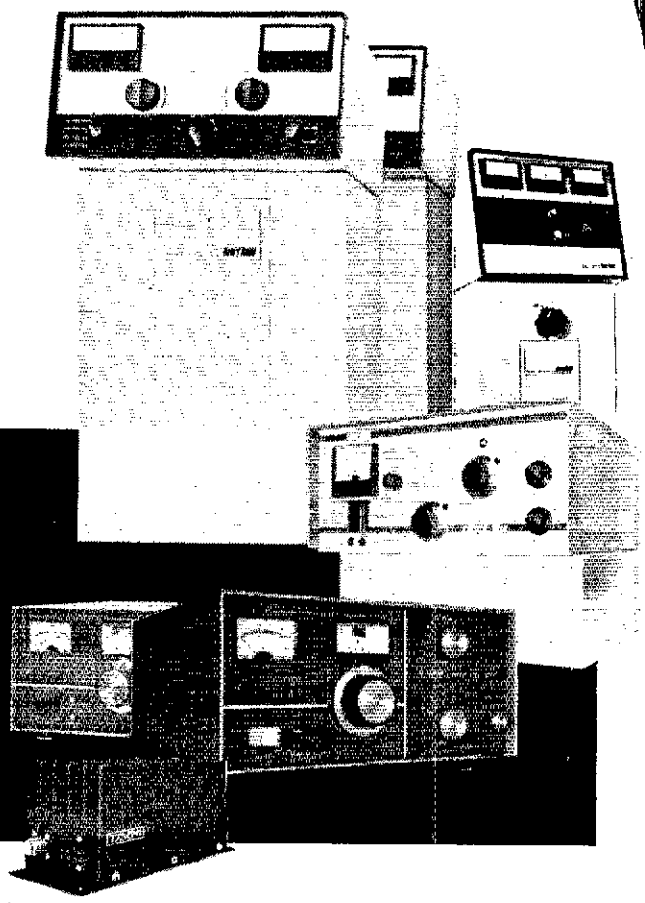
Most of the above products are available at dealers throughout the U.S.

Henry Radio

11240 W. Olympic Blvd., Los Angeles, Calif. 90064 213/477-6701
931 N. Euclid, Anaheim, Calif. 92801 714/772-9200
Butler, Missouri 64730 816/679-3127

Prices subject to change without notice.

Henry Radio has the amplifier you want



Never before has one company manufactured such a broad line of amateur amplifiers, both vacuum tube and solid state, for HF, VHF and UHF; fixed station and mobile; low power and high power. Take your pick from 20 models...the world's finest line of amateur amplifiers.

2K-4. . .
THE "WORKHORSE"
The 2K-4 linear amplifier offers engineering, construction and features second to none, and at a price that makes it the best amplifier value ever offered to the amateur. Constructed with a ruggedness guaranteed to provide a long life of reliable service, its heavy duty components allow it to loaf along even at full legal power. If you want to put that strong clear signal on the air that you've probably heard from other 2K users, now is the time. Move up to the 2K-4. Floor console or desk model...$995.00

3K-A COMMERCIAL/MILITARY AMPLIFIER
A high quality linear amplifier designed for commercial and military uses. The 3K-A employs two rugged Eimac 3-500Z grounded grid triodes for superior linearity and provides a conservative three kilowatts PEP input on SSB with efficiencies in the range of 60%. This results in PEP output in excess of 2000 watts. In addition, the 3K-A provides a heavy duty power supply capable of furnishing 2000 watts of continous duty input for either RTTY or CW with 1200 watts output. Price...$1250.00

4K-ULTRA
The 4K-ULTRA is specifically designed for the most demanding commercial and military operation for SSB, CW, FSK or AM. The amplifier features general coverage operation from 3.0 to 30 MHz. Using the magnificent new Eimac 8877 grounded grid triodes, vacuum tune and load condensers, and a vacuum antenna relay, the 4K-ULTRA represents the last word in rugged, reliable, linear high power RF amplification. 100 watts drive delivers 4000 watts PEP input. This amplifier can be supplied modified for operation on frequencies up to about 100MHz. Price...$2950.00

TEMPO 6N2
The Tempo 6N2 brings the same high standards of performance and reliability to the 6 meter and 2 meter bands. Using a pair of advanced design Eimac 8874 tubes, it provides 2,000 watts PEP input on SSB or 1,000 watts input on FM or CW. The 6N2 is complete in one compact cabinet with a self-contained solid state power supply, built-in blower and RF relative power indicator. Price...$795

TEMPO 2002
The same fine specs and festures as the 6N2, but for 2 meter operation only. ...$695.00

TEMPO 2006
Like the 2002, but for 6 meter operation. ..$695.00

TEMPO T-2000 LINEAR AMPLIFIER
The brand new T-2000 linear is the perfect companion for the Tempo ONE. It is compact, reliable, and priced right. Uses two Eimac 8873 grounded grid triodes cooled through a large heat sink. The T-2000 offers a full 2 KW PEP input for SSB operation and provides amateur band coverage from 80—10 meters. Provides a built-in solid state power supply, built-in antenna relay, a relative RF power indicator, and built-in quality to match much more expensive amplifiers. $795.00

K-2000 LINEAR AMPLIFIER
The new K-2000 is the perfect companion for Kenwood's TS-520...matched for style and circuitry. The same specifications as the T-2000...$795.00

TEMPO VHF/UHF AMPLIFIERS
Solid state power amplifiers for use in most land mobile applications. Increases the range, clarity, reliability and speed of two-way communicatios. FCC type accepted also.

TEMPO 100AL10 VHF LINEAR AMPLIFIER
Completely solid state, 144-148 MHz. Power output of 100 watts (nom.) with only 10 watts (nom.) in. Reliable and compact.

please call or write for complete information.

Henry Radio

11240 W. Olympic Blvd., Los Angeles, Calif. 90064 213/477-6701
931 N. Euclid, Anaheim, Calif. 92801 714/772-9200
Butler, Missouri 64730 816/679-3127

Prices subject to change without notice.

Congratulations, somebody. You just bought the 27,000th Collins KWM-2A transceiver.

That's right.
In the last 15 years some 27,000 Collins KWM-2A units have been sold. Sold to amateur operators worldwide, governmental agencies, public and private emergency services, exploration parties. And used in such diverse climates as those of the polar ice-caps and the jungles of Southeast Asia.

Behind this popularity is Collins' basic philosophy: "A conservative design makes a high-reliability design." And KWM-2A reliability is legend. So is its high stability and its high resistance to electrical and physical punishment. And, as a result, it enjoys high resale value.

KWM-2A utilizes only U.S. standardized tubes and components. Because of its conservative, high-reliability design, maintenance is comparatively simple. In fact, many maintenance operations can be performed by most any operator. And good parts availability means air time, not downtime.

When you add the technical assistance, service and support by Collins' factory professionals, you have plenty of good reasons to see your Collins distributor about becoming the owner of KWM-2A number 27,001.

Amateur Radio Marketing, Collins Radio Group, Rockwell International, Cedar Rapids, Iowa 52406. Phone 319/395-4507.

Rockwell International

QST

May 1976
Volume LX Number 5

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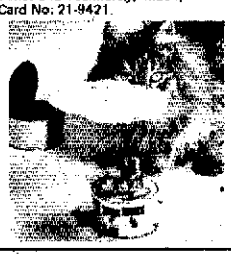
INDEXED BY Applied Science and Technology Index, Library of Congress Catalog Card No: 21-9421.

THE COVER

Don't recycle food containers — turn them into chassis, as described on page 14.



Contents

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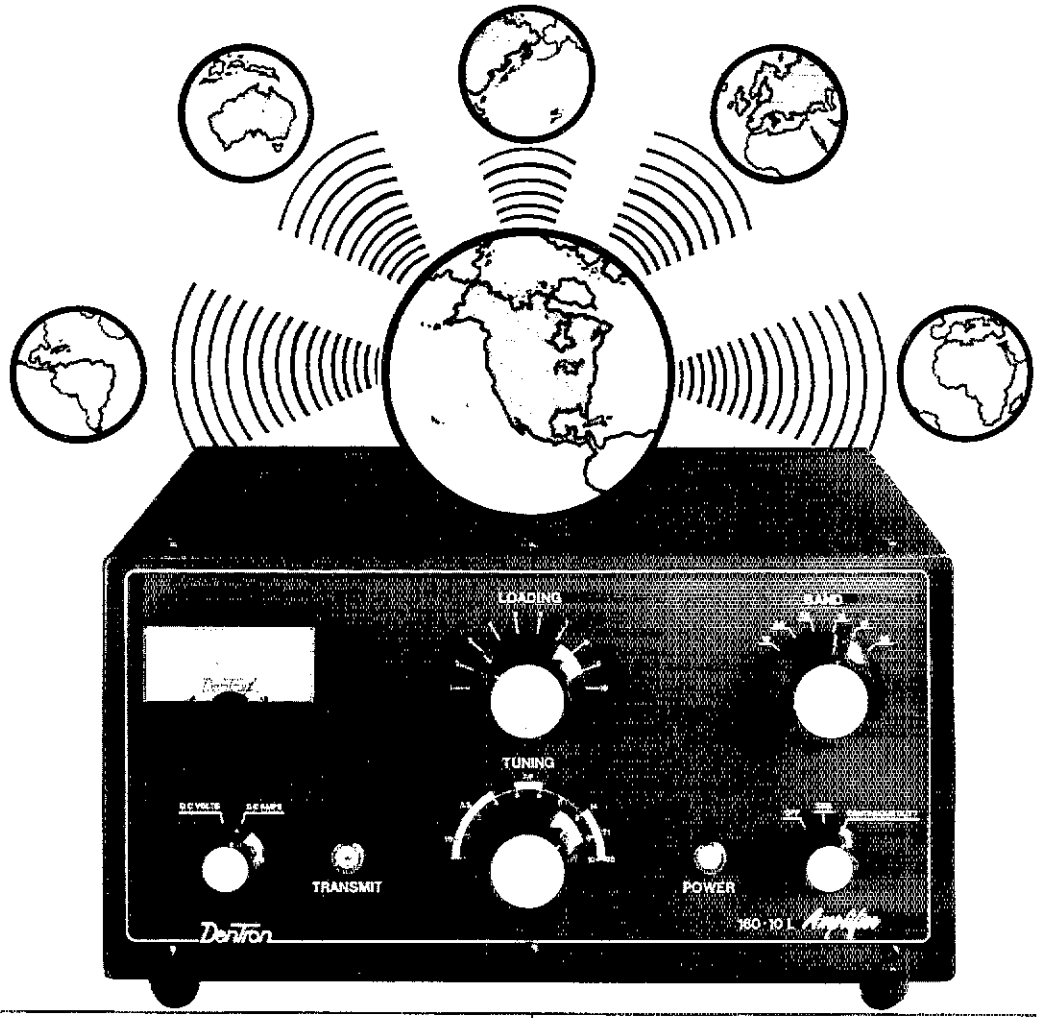
Operating

Organizational and Regulatory

Departments

Dentron Amplifies America

We took the most desirable and important features and engineered them into the all new Dentron **Continuous Duty** 160-10 meter amplifier.



160-10L Specifications

Size: 7¼"Hx14½"Wx14"D
Weight: 43 lbs.
Frequency Range: 1.8 MHz (1.8-2.5) 3.5 MHz (3.4-4.5)
7 MHz (6.0-9.0) 14 MHz (11.0-16.0)
21 MHz (16.0-22.0) 28 MHz (28.0-30.0)
Power Input: SSB 1200 P.E.P. Continuous
CW 1000 watt DC Continuous
SSTV 1000 watt DC input 25 minute continuous
RTTY 1000 watt DC input 25 minute continuous
TUNE 1000 watt DC input 15 minute continuous
Output impedance: 50-75 ohms Pi network wide range
VSWR not to exceed 2 to 1
Third-order Distortion: Down at least 30 db

Meter Selector Switch-plate, voltage, Plate Current
Built-in Antenna change over relay
Dual-speed Cooling System
AC Input Source 110V or 220V AC, 50-60 Hz
Automatic Circuit Breaker Protection

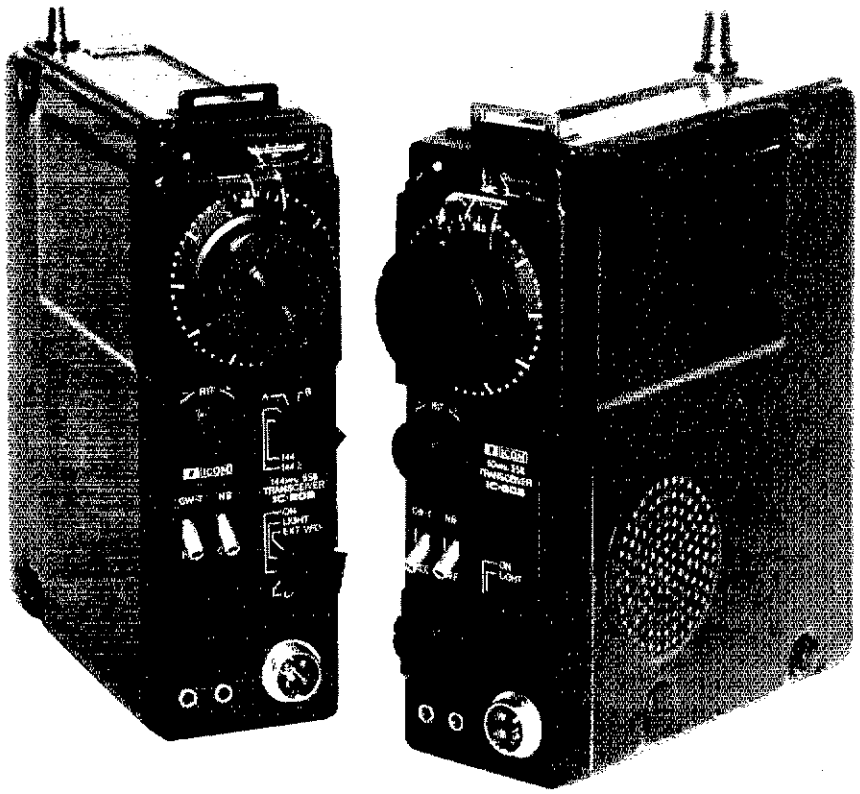
160-10L Features

- **160 thru 10 meters**
- **1200 watts P.E.P. on SSB continuous**
- **1000 watts DC on CW, RTTY or SSTV**
- **"On demand" Variable forced air cooling system**
- **Self contained continuous duty power supply**
- **4-811A Triodes in Grounded Grid mounted in cooling chamber**
- **Compact, low profile, solid, one-piece cabinet, tube cooling chamber eliminates need for perforated cabinet.**
- **Covers MARS Frequencies without modifications**
- **Broadbanded input and output circuit**
- **70 watt drive for maximum legal input**

DenTron Radio Co., Inc.
2100 Enterprise Parkway
Twinsburg, Ohio 44087
(216)425-3173

Another surprise from Dentron, but the biggest surprise of all is the price.
Just $499.50 Post paid USA from Dentron Radio Co., Inc.
Also available from your favorite dealer.

All Dentron products are made in U.S.A.

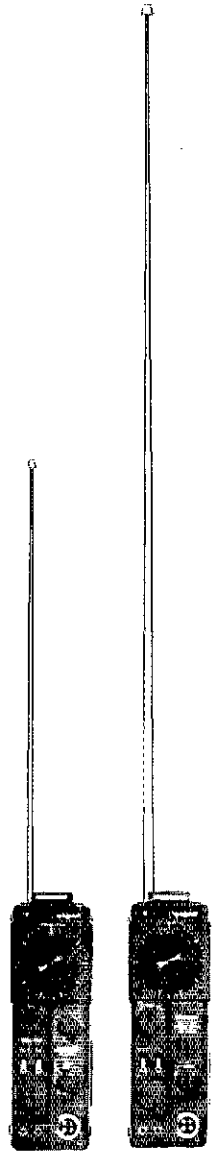


Hold it!

Take hold of SSB with these two low cost twins. ICOM'S new portable **IC-202** and **IC-502** put it within your reach wherever you are. You can take it with you to the hill top, the highways, or the beach. Three portable watts PEP on two meters or six!

Hello, DX! The ICOM quality and excellent receiver characteristics of this pair make bulky converters and low band rigs unnecessary for getting started in SSB-VHF. You just add your linear amp, if you wish, connect to the antenna, and DX! With the **202** you may talk through OSCAR VI and VII! Even transceive with an "up" receiving converter! The **IC-502,** similarly, makes use of six meters in ways that you would have always liked but could never have before. In fact, there are so many things to try, it's like opening a new band.

Take hold of Single Side Band. Take hold of some excitement. Take two.



IC-202
2 Meter SSB • 3 Watts PEP • True IF Noise Blanker
Switched Dial Lights • Internal Batteries • 200KHz
VXO Tuning • 144.0, 144.2 + 2 More! • RIT!

IC-502
6 Meter SSB • 3 Watts PEP • True IF Noise Blanker
Switched Dial Lights • Internal Batteries • 800KHz
VFO • RIT!

VHF/UHF AMATEUR AND MARINE COMMUNICATION EQUIPMENT

Distributed by:

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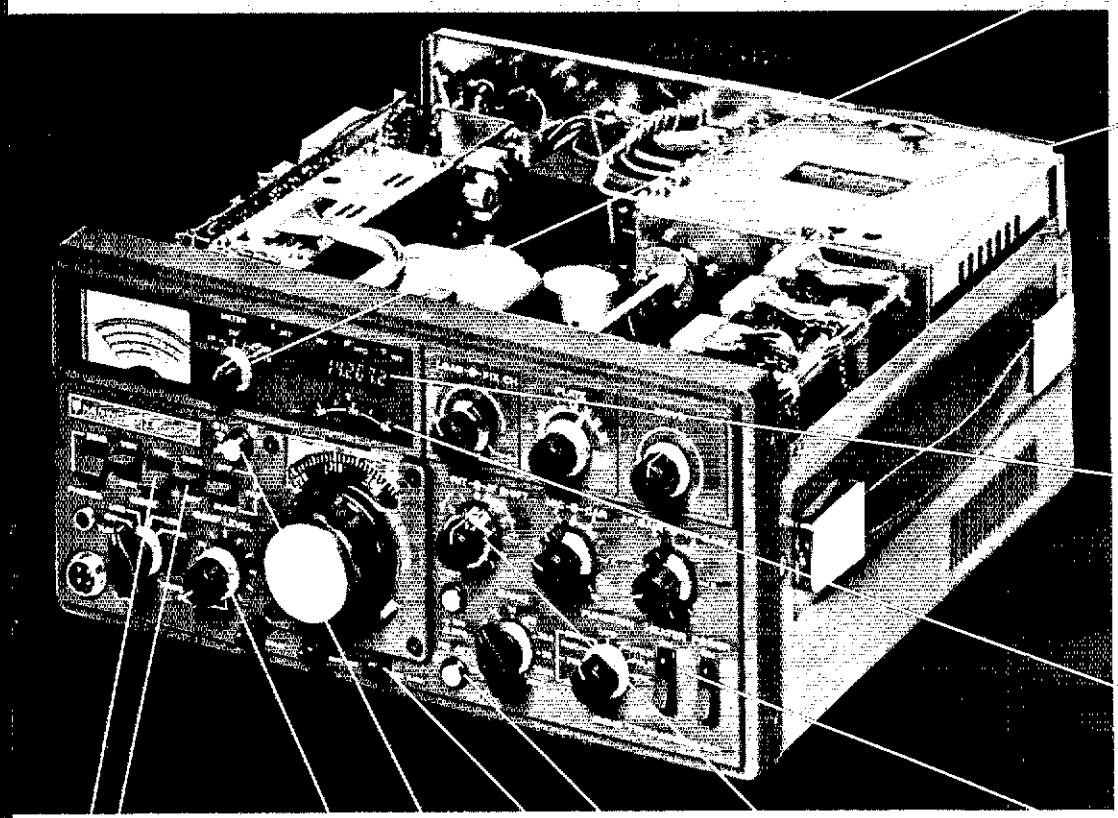
KENWOOD'S TS-820 *the Pacesetter*

LIMITED QUANTITIES AVAILABLE IN JULY

Kenwood's well deserved reputation for fine craftsmanship and superb performance has never been more evident than in the TS-820. As a result of a host of innovative features being brought together, the 820 offers a degree of versatility, performance and pleasure second to none.

The Kenwood TS-820 is destined to be the world's new standard of excellence in amateur radio for years to come . . . a true "Pacesetter".



Features

PLL • The TS-820 employs the latest phase lock loop circuitry. The single conversion receiver section performance offers superb protection against unwanted cross-modulation. And now, PLL allows the frequency to remain the same when switching sidebands (USB, LSB, CW) and eliminates having to recalibrate each time.

FULL METERING • During receive, an easy to read meter functions as an S-meter. The same meter displays ALC level, plate current, RF output, and plate voltage during transmit. Includes COMP setting for adjusting the compression level of the built-in speech processor.

FINAL AMPLIFIER • The TS-820 is completely solid state except for the driver (12BY7A) and the final tubes. Rather than substitute TV sweep tubes as final amplifier tubes in a state of the art amateur transceiver, Kenwood has employed two husky S-2001A (equivalent to 6146B) tubes. These rugged, time-proven tubes are known for their long life and superb linearity. The input power of the TS-820 is conservatively rated at 160 W DC, 200 W PEP. Tubes run cool with the aid of a noiseless fan (standard) mounted on the rear panel. The above tube and power combination minimizes the possibilities of TVI and helps to maintain the Kenwood reputation for excellent audio quality.

DIGITAL READOUT DG-1 • (optional) A digital counter display can be employed as an integral part of the VFO readout system. Counter mixes the carrier, VFO, and first heterodyne frequencies to give *exact* frequency. Figures the frequency down to 10 Hz and digital display reads out to 100 Hz. Both receive and transmit frequencies are displayed in easy to read, Kenwood Blue digits.

DRS DIAL • Includes the same satin-smooth planetary drive found on other fine Kenwood models plus special, high-precision gears to add a new "monoscale" feature for easier frequency readout. LSB, USB, and CW operating frequencies can be accurately read from the same pointer.

HEATER SWITCH • The filaments of the three vacuum tubes may be turned off during periods of "receive only".

CW AUDIO CHARACTERISTICS • During CW reception, a special filter is used to alter the audio frequency response to provide a more comfortable, easy to copy tone.

Other features include:
- Built-in 25 kHz calibrator*
- Built-in speaker*
- CW Sidetone and semi-break in*
- Rear panel terminals for linear amplifier, IF OUT, RTTY, and XVTR.
- Handy phone patch IN and OUT terminals*

*Also available, the VFO-820 . . . the perfect companion to the TS-820.

NOISE BLANKER • The TS-820 uses an efficient noise blanker circuit, another Kenwood exclusive. A special crystal filter assures unsurpassed efficiency in eliminating unwanted pulse noises.

RF MONITOR • Built-in monitor circuit allows you to hear your own voice by sampling the RF signal. Especially useful for adjusting the RF Processor.

HIGH STABILITY VFO • The VFO, heart of any SSB transceiver, is an exclusive Kenwood design using FET technology.

DIGITAL HOLD • A single pushbutton switch offers the operator unprecedented versatility. The digital hold circuit will lock the counter and display at any frequency, but will allow the VFO to tune normally. Ever wanted to return to a certain spot on the band and forgotten the frequency? That won't happen again with the new digital hold feature on the Kenwood TS-820.

SPEECH PROCESSOR • An HF circuit provides quick time constant compression using a true RF compressor as opposed to an IF clipper. Amount of compression is adjustable to the desired level by a convenient front panel control.

IF SHIFT • The IF SHIFT control varies the IF passband without changing the receive frequency. Enables the operator to eliminate unwanted signals by moving them out of the passband of the receiver. This feature alone makes the TS-820 the pacesetter that it is.

RF ATTENUATOR • Easy, one touch activation of the attenuator supplies 20 dB of padding on receive.

VOX • A voice-activated microphone circuit is built into the TS-820 with VOX GAIN, ANTIVOX, and VOX DELAY controls placed on the front panel for convenient adjustment any time.

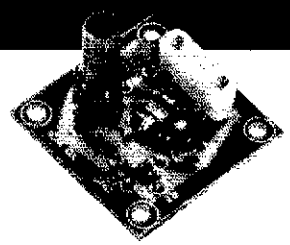
TRIO-KENWOOD COMMUNICATIONS INC.
116 EAST ALONDRA/GARDENA, CA 90248

KENWOOD
. . . *pacesetter in amateur radio*

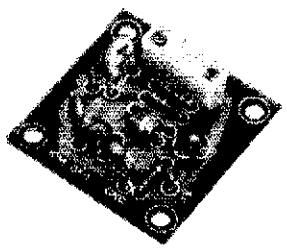
for the experimenter!

INTERNATIONAL CRYSTALS & KITS

OSCILLATORS • RF MIXER • RF AMPLIFIER • POWER AMPLIFIER



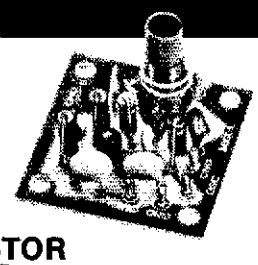
OX OSCILLATOR
Crystal controlled transistor type. 3 to 20 MHz, OX-Lo, Cat. No. 035100. 20 to 60 MHz, OX-Hi, Cat. No. 035101
Specify when ordering.
Price $3.95 ea.



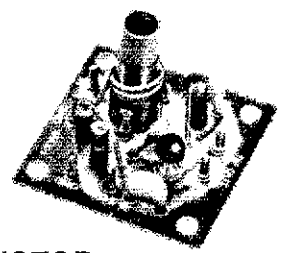
OF-1 OSCILLATOR
Crystal controlled transistor type. 3 to 20 MHz, OF-1, Lo, Cat. No. 035108. 20 to 60 MHz, OF-1, Hi, Cat. No. 035109
Specify when ordering.
Price $3.25 ea.

EX CRYSTALS
(HC 6/U HOLDER)

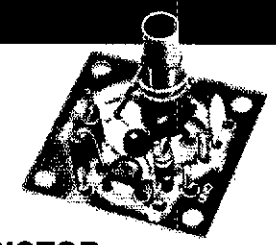
Cat. No.	Specifications
031080	3 to 20 MHz — For use in OX OSC Lo Specify when ordering $4.95 ea.
031081	20 to 60 MHz — For use in OX OSC Hi Specify when ordering $4.95 ea.
031300	3 to 20 MHz — For use in OF-1L OSC Specify when ordering $4.25 ea.
031310	20 to 60 MHz — For use in OF-1H OSC Specify when ordering. $4.25 ea.



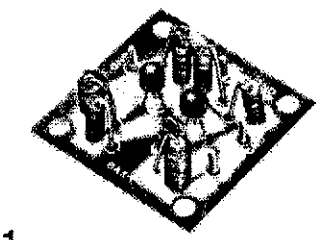
MXX-1
TRANSISTOR
RF MIXER
A single tuned circuit intended for signal conversion in the 30 to 170 MHz range. Harmonics of the OX or OF-1 oscillator are used for injection in the 60 to 179 MHz range. 3 to 20 MHz, Lo Kit, Cat. No. 035105. 20 to 170 MHz, Hi Kit, Cat. No. 035106
Specify when ordering.
Price. $4.50 ea.



SAX-1
TRANSISTOR
RF AMP
A small signal amplifier to drive the MXX-1 Mixer. Single tuned input and link output. 3 to 20 MHz, Lo Kit, Cat. No. 035102. 20 to 170 MHz, Hi Kit, Cat. No. 035103
Specify when ordering.
Price $4.50 ea.



PAX-1
TRANSISTOR
RF POWER AMP
A single tuned output amplifier designed to follow the OX or OF-1 oscillator. Outputs up to 200 mw, depending on frequency and voltage. Amplifier can be amplitude modulated. 3 to 30 MHz, Cat. No. 035104
Specify when ordering.
Price $4.75 ea.



BAX-1
BROADBAND AMP
General purpose amplifier which may be used as a tuned or untuned unit in RF and audio applications. 20 Hz to 150 MHz with 6 to 30 db gain. Cat. No. 035107
Specify when ordering
Price $4.75 ea.

Shipping and postage (inside U.S., Canada and Mexico only) will be prepaid by International. Prices quoted for U.S., Canada and Mexico orders only. Orders for shipment to other countries will be quoted on request. Address orders to: M/S Dept., P.O. Box 32497, Oklahoma City, Oklahoma 73132.

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Oklahoma City, Oklahoma 73102

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Vice-Director: Jack D. Gant, W5GM
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*Members Executive Committee

Section Communications Managers of the ARRL

Reports Invited: All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. ARRL Field Organization station appointments are available in areas shown to qualified League members. General or Conditional Class licensees or higher may be appointed ORS, OPS, OO and OBS. Technicians may be appointed OVS, OBS, or VHF PAM. Novices are eligible for ORS - II. SCMs desire application for the leadership posts of SEC, EC, RM and PAM where vacancies exist.

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Maritime-Nfld	Aaron D. Solomon, VE1OC, 8 Crichton Park Road, Dartmouth, NS B3A 2N8
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Quebec	Lawrence P. Dobby, VE2YU, 157 Sedgefield Ave., Point Claire, P.Q. H9R 1N8
Saskatchewan	Percy A. Crosthwaite, VE5RP, R.R. 3, Saskatoon, S7K 3J6

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*Official appointed to act temporarily in the absence of a regular official.

"It Seems to Us..."

WARC Update

The ITU World Administrative Radio Conference is three years away, but some key deadlines for preparation already are behind us. February 2 was the date for non-government users of the radio spectrum to submit their future allocation requirements to the FCC Steering Committee through their respective Service Working Groups. (See *QST* for September, 1975, page 9, and March, 1976, page 42.) On March 22, the FCC issued a Public Notice listing the requirements that were submitted, with no attempt to reconcile or even to verify the conflicts between the services. The tabulation fills 128 pages, and includes requests from 10 kHz to 1,040 GHz. The Working Groups were not required to justify their requests in any great detail; the justifications are to follow later this summer.

The tabulation of requests is only a rough guide to the needs of the various radio services within the U.S. There is no way to gauge the relative merits of conflicting requests, and there is no input from the government side of the fence (including the military, a major user of the spectrum). Also, U.S. spectrum needs may be quite different from the needs of the developing countries who now hold the balance of voting power within the ITU. But the list does point up *some* of the conflicts between the Amateur Radio Service and the other radio services.

The tabulations of Amateur Radio Service requests run to 9 pages. Briefly, we're asking for new allocations at 160-200 kHz, where some amateurs are now experimenting under the FCC's rules covering restricted radiation devices; 10.1-10.6, 18.1-18.6, and 24.0-24.5 MHz, presently allocated to the Fixed Service; and 902-928 MHz, now used by industrial, scientific, and medical (ISM) equipment such as microwave ovens. We're asking for expanded allocations at 1715-2000, 7000-7500, 14000-14500, and 21000-21500 kHz to accommodate future growth. Finally, we're asking for either exclusivity in, or simply retention of, our other allocations.

We have conflicts with the present occupants of most of our proposed new or expanded allocations, of course. There is also quite a crowd going for 902-928 MHz, apparently in the belief that ISM interference will not impair commercial communications uses. The 902-928 MHz band is right in the middle of recent allocations to the Land Mobile Service and so is prime territory in spite of the ISM problem.

At hf our main competitor is the International Broadcast Service, which is requesting a total of 4.46 MHz. Their requests include new bands at 3900-4060 kHz (encompassing the most heavily-occupied portion of the 75-meter ham band!) and at 7300-7700 kHz. And this is just the position of the *private* hf broadcasters in the U.S., of which there are only *three* at the present time; the Voice of America, as a government user, has not yet been heard from!

At vhf and uhf we face a multitude of challenges. The Aeronautical Mobile Service has requested 140-144 and 146-150 MHz, though it has indicated that " . . . equivalent alternate spectrum of the same frequency order is acceptable." This would cut the size of the amateur two-meter band in half. The Citizens Radio Service has requested 5 MHz "in the band 216-300 MHz with the band 220-225 MHz preferred." At 420-450 MHz, the Private Land Mobile Service says it requires an *exclusive* allocation for the "development of a new generation of radio-location equipment . . . giving recognition to the worldwide nature of usage in geophysical exploration activities." The Maritime Mobile Service wants a protected and/or expanded allocation for the same purpose.

In the microwaves we find the Fixed Service requesting access to 3300-3400 and 5650-5670 MHz and the Fixed Satellite Service to 5625-5925 MHz and 48-50 GHz for earth-to-space links, the latter on an exclusive basis.

We can't be complacent about those bands where there are no conflicts, because the government users and other countries haven't been heard from. Also, in the process of resolving conflicts between other services some additional conflicts with the Amateur Radio Service may be created. But just because another service has indicated a "requirement" for spectrum now allocated to us is no reason to believe that their request will prevail over ours. The history of amateur radio proves that! The detailed justifications will have a lot to do with how the conflicts are decided.

The conflicting claims being made to "our" bands should serve to remind us that amateur radio does not enjoy frequency allocations by devine right. We have to *work* to *justify* our continued access to the spectrum. — *K1ZND*

League Lines...

After an 18-year struggle by the Radio Society of Ontario and others, VE3 amateurs have won call-letter license plates. The Ontario Legislature took the enabling action on March 18, making the province the last jurisdiction in Canada and the U.S. to grant the privilege. Special thanks go to VE3OR, VE3ACL, and VE3FAA for their efforts.

On March 11, The Hon. Robert W. Edgar of Pennsylvania's Seventh District introduced a resolution in the House of Representatives designating June 21-27, 1976, National Amateur Radio Week. Designated H. J. Res. 858, the resolution was referred to the House Committee on Post Office and Civil Service. In Mr. Edgar's words, the resolution "recognizes the many contributions made by the thousands of licensed amateur radio operators in servicing the needs of humanity during natural disasters."

If you turn to page 38 you'll see a brand new, regular feature: Washington Mailbox. The FCC rece hundreds of letters each week requesting clarifications and interpretations of the amateur radio reg tions. The new question-and-answer column will respond to a representative cross-section of the letters. Let us know what you think of the new feature.

Attention VHF operators. Here is a rules change for the June VHF QSO Party, recommended by the Contest Advisory Committee and approved by the Communications Manager. Rule 3, paragraph 3 is changed as follows: "Contacts made by retransmitting either or both stations do not count for conte purposes. When using fm, only simplex operation with both stations transmitting and receiving wi in 15 kHz of each other is permitted. No frequency normally used as either the input or output of a repeater within 150 miles may be used for contest contacts, even if the repeater is turned off at th time. The 15-kHz frequency conformity requirement does not apply above 1200 MHz." The new ru will also apply to the September VHF QSO Party and the January VHF SS. The CAC invites comment on the change.

Help Wanted: An amateur with background in journalism to edit non-technical articles for QST, as staff member. Contact Bill Dunkerley at Hq.

Amsat is sponsoring a special three-day low-power test of the Oscar 7 satellite, Mode B (70 cm. t 2m.), on June 16-18. Stations using the satellite on those days should limit their effective radiat power to 10 watts. Signal reports should include the erp being used so listeners can judge the effe tiveness of the low-power transmissions. Send your results along with a station description to Am P.O. Box 27, Washington, DC 20044.

Keep an ear out -- during May and June weekends there will be a number of Boy Scout Bicentennial Encampments, complete with ham radio stations. Two of these miniature versions of the Jamboree that we know about are W1BSA, Barton, VT, May 14-16, and N1BSA, East Hartford, CT, May 21-2

May 10-16 is Bicentennial Amateur Radio Week for South Carolina, complete with special-events station AA4SC operating from the Governor's Mansion.

PC-76, the first trade show for the personal communications industry, including both the amateur a CB markets, was a huge success. ARRL was there, in Las Vegas in late March, explaining amateu radio, making new friends, and greeting old ones--including more than 200 hams who were at the s on business!

A new Emergency Reference Information operating aid, of particular use to mobile repeater users, i available from Hq. The card fits the sun visors of most automobiles, and provides a convenient pl to record the information needed to report emergencies accurately and efficiently. To receive your send an addressed envelope (at least 6 by 9 inches, so we don't have to fold the card) with 13 cen U.S. postage. Ask for CD-209.

ASCII STA OK for Oscar through August 16. Need a translation? FCC has extended the special tem porary authorization for the use of standard eight-level teleprinter code by amateur stations commu cating through the Oscar satellites. More translation? ASCII means the American Standard Code f Information Interchange; Oscar means Orbiting Satellite Carrying Amateur Radio; and FCC means . oh, guess we don't need to explain that one!

Boondoggle in the Boondocks

A lesson on how to make an impossible task into an even more difficult one — twice!

By Wayne Overbeck,* K6YNB

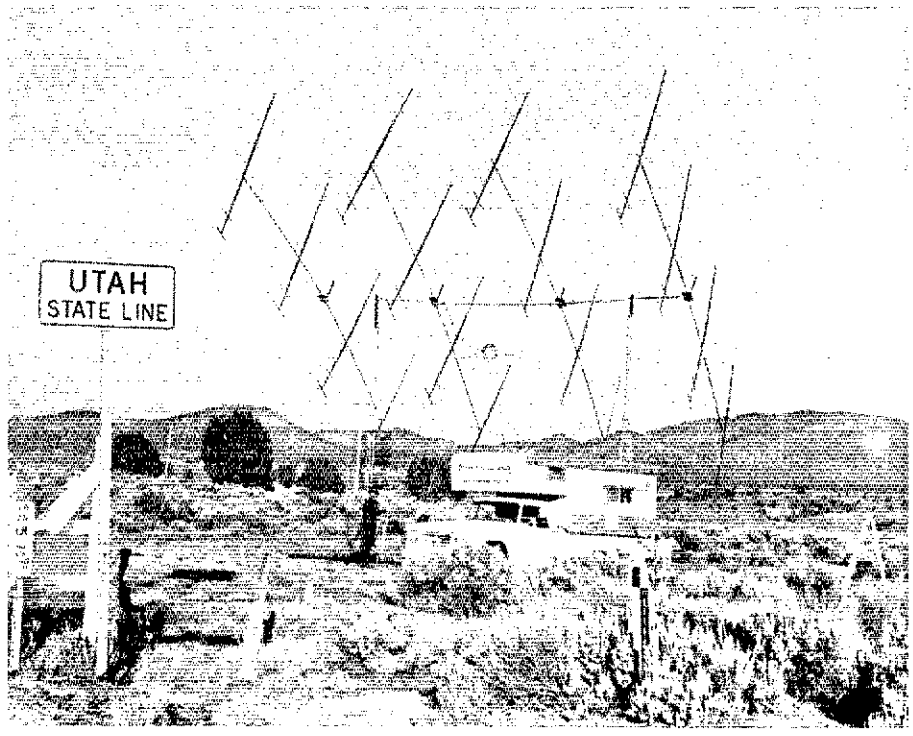
Boon·dog·gle, *n.*, 2. *Informal.* work of little or no practical value done merely to keep or look busy.

That's the definition as given in a dictionary, but is a work of love or curiosity ever of little or no practical value? Perhaps to a large number of non-vhfers, yes. But to those who dig doing things the hard way, the following description may guide them in fullfillment of their aspirations — or whatever!

Until recently, EME communications have been regarded as just barely within reach for the most able vhf/uhf amateur experimenters. Only a handful had succeeded with this very difficult mode.

But thanks to the advent of low-noise preamplifiers, high-power grounded-grid transmitting tubes that work well into the lower uhf region, and even complete antenna systems that can be purchased over the counter, dozens of newcomers have joined the earth-moon-earth club in the 1970s. EME is still a major technical challenge, requiring large antenna arrays with sophisticated phasing arrangements, plus the highest amateur power. Nevertheless, it has now become possible to stage "DXpeditions" to states and countries that were previously unavailable on the vhf/uhf bands.

This article describes the first two such EME "DXpeditions" that produced complete QSOs from a portable site: Two-meter operations on the Utah-Nevada border by K6YNB/7 in July and August, 1975.



For the moment, the 16-bay array is up and ready to go.

Like most DXpeditions on the lower frequencies — and not unlike the typical field day operation in a remote locality — these vhf expeditions encountered serious difficulties with logistics, weather, and what might best be described as the ravages of Murphy's Law. This was especially true of the first trip.

That trip, which put K6YNB/7 at a spot on the Utah-Nevada border 50

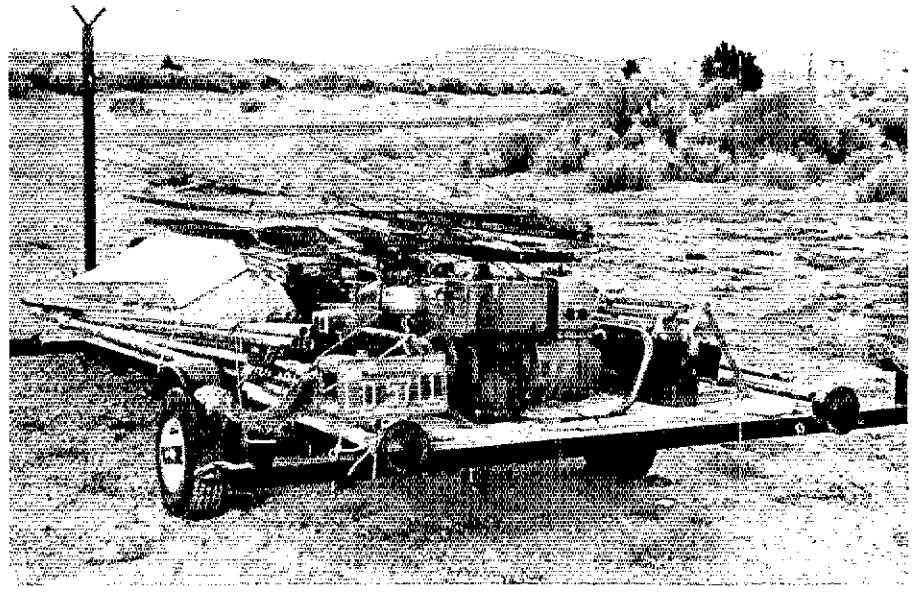
*11552 Gail Lane, Garden Grove, CA 92640

miles from the nearest town of more than 500 people, turned out to be a shakedown voyage. It produced marginal success (one complete EME QSO plus good echoes of the K6YNB/7 signal), but it revealed numerous flaws in the portable system. The most important of these was that the original antenna system of 16 long quad-driven Yagis could not withstand the winds in an exposed desert location.

Several weeks of redesigning back home in Southern California produced a smaller, but more mechanically sound, 8-bay antenna system that developed about 21 dB of gain over a dipole. It was supported by two crank-up towers mounted at opposite ends of an 18-foot catamaran trailer, to simplify rotation.

The addition of this trailer was a considerable improvement over the original design, which used a fixed tower on the truck rear deck to provide half the support for the array. A portable tower on a Christmas tree type of stand provided the rest of the support, and the array was rotated by driving the truck in a circle around the fixed tower.

The truck-mounted tower arrangement had worked well for smaller portable antennas. Its use with a rotary triband cubical quad was described in an article and pictured on the cover of the August, 1971, issue of *QST* (see "The Cabover Kilowatt," Aug. 1971, page 48). But for an EME array that was too big for a single support, two towers mounted on a trailer – so they could be rotated without moving the truck – worked out very well. Better still would have been a bigger truck, a single larger tower, a prop-pitch motor, and a much heavier boom, but that seemed like carrying things a bit too far.

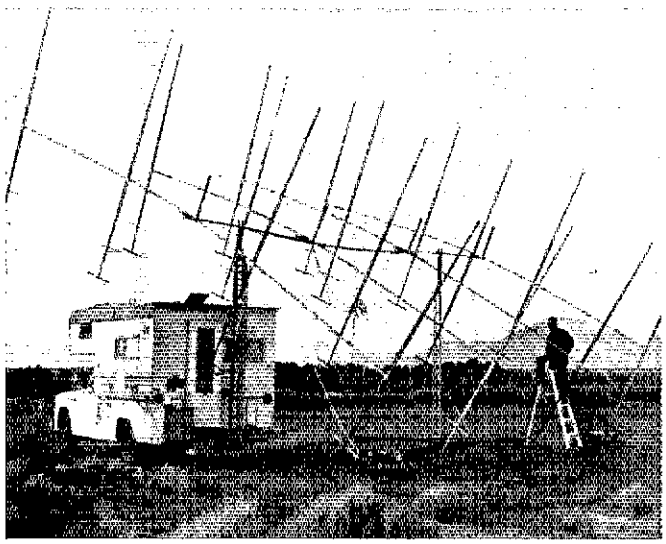


On trip number two, the trailer load of gear awaits unloading at the site.

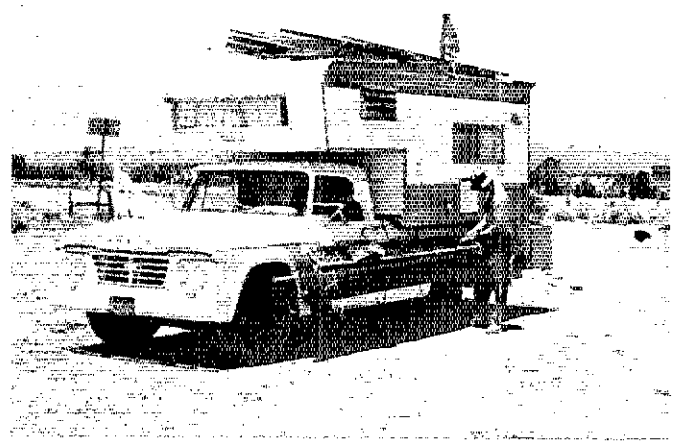
The new system was set up on the Utah-Nevada border for three days of almost continuous schedules in mid-August. The results were complete EME QSOs with three more stations, plus solid copy from six others (two of whom copied complete call sets from K6YNB/7, but not at the same time).

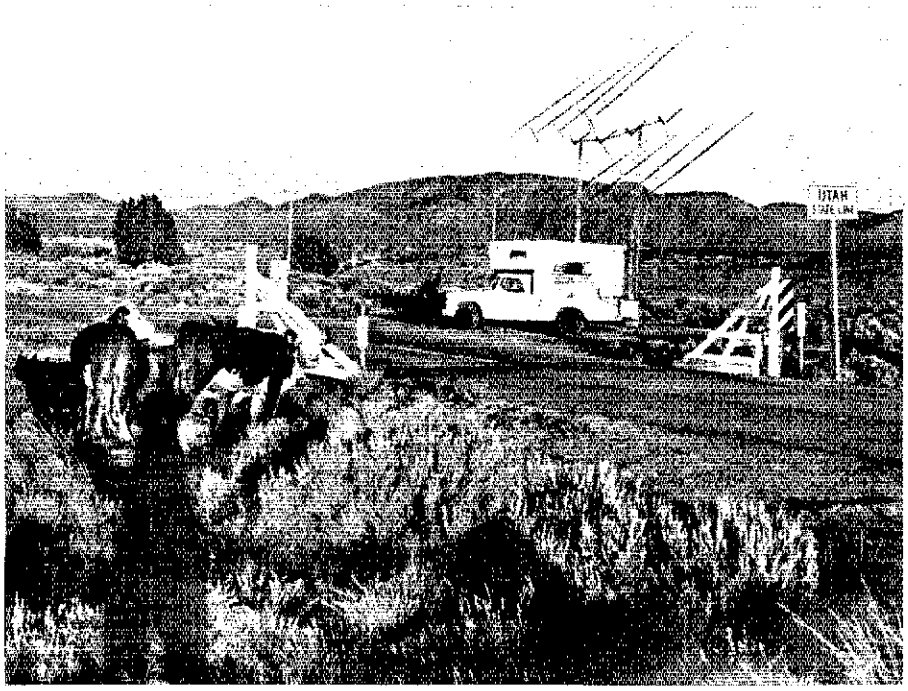
The expedition proved that it is indeed possible for amateurs to communicate via the moon on a fully portable basis, using emergency power and home-built transmitters, receivers, and antennas. But it also reinforced what has long been known: That there are some variables (notably Faraday rotation) which can render two well-equipped stations unable to communicate via the moon for extended periods of time. A three-day operation may be about all that is humanly bearable in a hot, arid, and windy desert environment without some break in the routine. That isn't nearly long enough to catch all the

Desert winds transform the array into a work of abstract art.

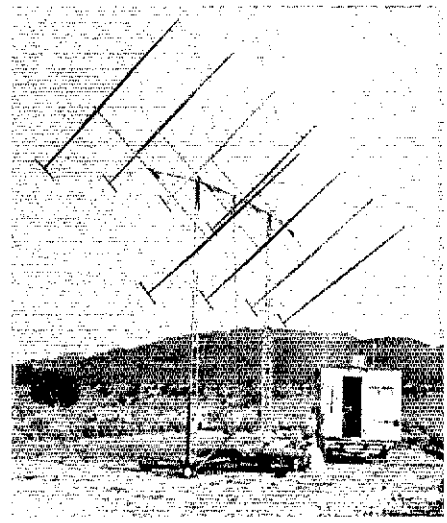


WB6RIV (who went on trip number one but discreetly bowed out of number two) unpacks the truck at the Utah-Nevada border.





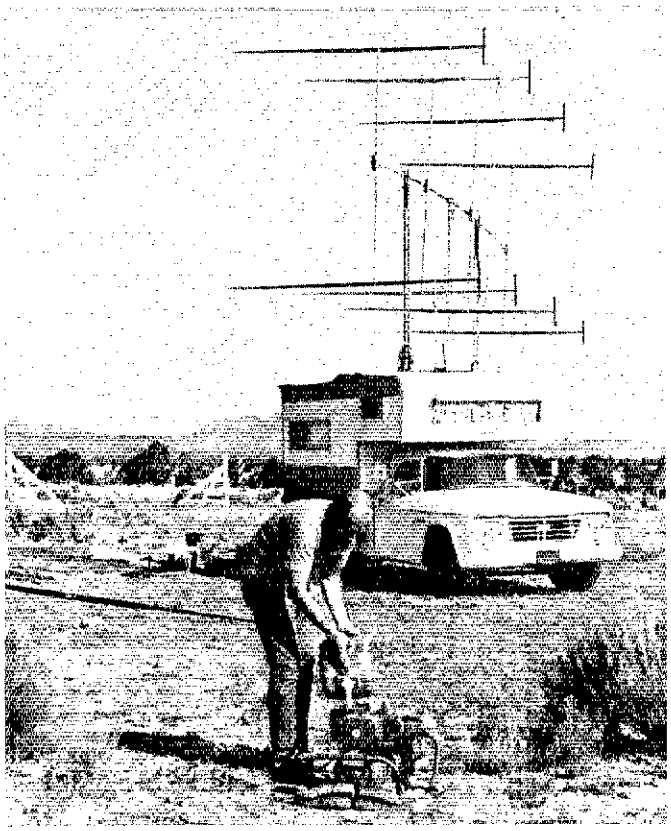
A local resident voices his opinion of EME expeditions.



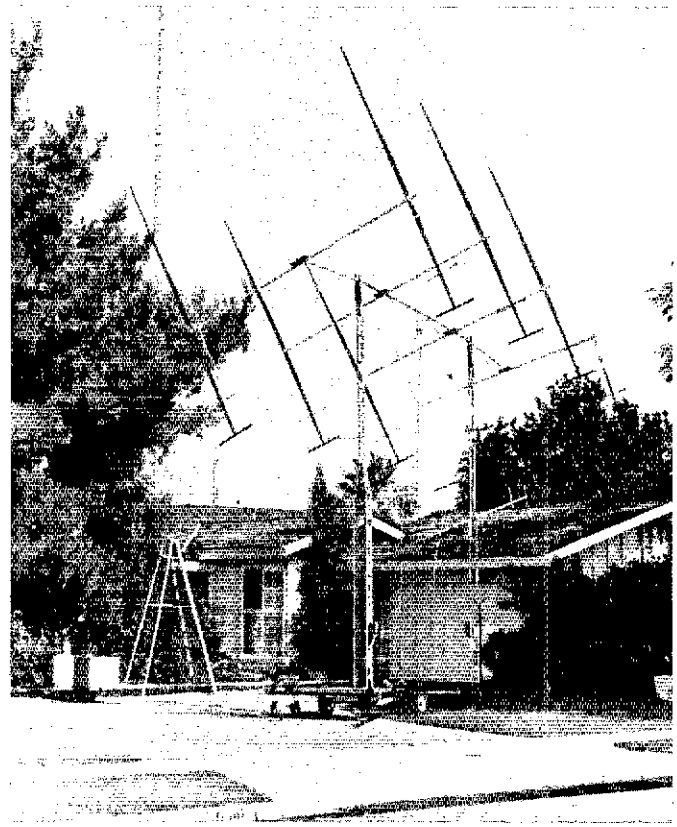
K6YNB/7 keeps three days of skeds with results that are at once exciting (the thing works) and disappointing (many skeds do not produce complete QSOs).

variables right for complete QSOs with everyone who wants to work the portable station. EME expedition planners should probably think in terms of weeks rather than days at the remote site if more than a few of the stations seeking to work the rare state or country are to make it.

The two trips here involved 3,000 miles of driving (in a vehicle that travels 8 miles per gallon) and required about two months of full-time efforts. The net result was four complete EME contacts from a remote site — at a cost of nearly $400 per QSO, not counting the value of the participants' time. QST



Isn't there some sort of multiplier for using emergency power in moonbounce work???



Back home, the neighbors grumble while K6YNB perfects the moonbounce-system-on-a-trailer in his driveway.

Build A Tuna-Tin 2

Ham radio lost its kick? Go QRP with this weekend-project transmitter! WAS with a 40-meter half-watter? You betcha!

By Doug DeMaw,* W1CER

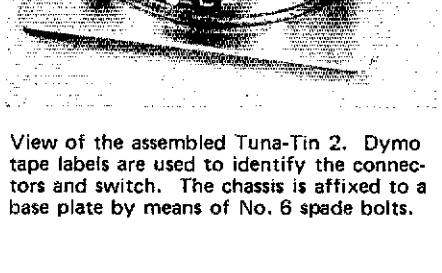
Workshop weekenders, take heart. Not all building projects are complex, time consuming and costly. The Tuna-Tin 2 is meant as a short-term, go-together-easy assembly for the ham with a yen to tinker. Inspiration for this item came during a food shopping assignment. While staring at all of the metal food containers, recollections of those days when amateurs prided themselves for utilizing cake and bread tins as chassis came to the fore. Lots of good equipment was built on make-do foundations, and it didn't look ugly. But during recent years a trend has developed toward commercial gear with its status appeal, and the workshop activities of many have become the lesser part of amateur radio. While the 1-kW rigs keep the watt-hour meters recording at high speed, the soldering irons grow colder and more corroded.

A tunafish can for a chassis? Why not? This inspiration led the writer to a nearby Radio Shack store, where most of the parts for a two-transistor 40-meter cw transmitter were gleaned. A few hours later 350 milliwatt were being directed toward the antenna, and QSOs were taking place.

Maybe you've developed a jaded appetite for operating (but not for tuna). The workshop offers a trail to adventure and achievement, and perhaps that's the elixir you've been needing. Well, Merlin the Magician and Charlie the Tuna would probably commend you if they could, for they'd know you were back to the part of amateur radio that once this whole game was about — creativity and learning!

Parts Rundown

Of course, a tunafish can is not essential as a foundation unit for this QRP rig. Any 6-1/2-ounce food container will be o.k. For that matter, a sardine can may be used by those who prefer a rectangular format. Anyone for a Sardine-2? Or, how about a "Pineapple Pair?" Most 6-1/2-ounce cans measure 3-1/4 inches in OD, so that's the mark to shoot for. Be sure to eat, or at least *remove* the contents before starting your project!



View of the assembled Tuna-Tin 2. Dymo tape labels are used to identify the connectors and switch. The chassis is affixed to a base plate by means of No. 6 spade bolts.

One object of this venture was to obtain as many of the parts as possible from Radio Shack. A bargain pack of disk ceramic capacitors was acquired for this and other jobs in the future. All of the capacitors needed were found in the pile of mixed-value types. Coils, L1 and L2 of Fig. 1, were fashioned from ferrite-core rf chokes found in the store. A scan of the transistor types available led to the purchase of of eight substitutes for the popular 2N2222A device. That left six spares for the rig or for use in other projects. The important characteristics for the transistors are (should you want to try substitutes) a maximum collector voltage of 30 or more, a gain (Hfe) of at least 100, and a maximum frequency (f_T) of 100 MHz or higher. Also, the transistors should have a dissipation rating of 500 mW or more.

Resistors for the circuit were already on hand, but new ones could have been purchased singly or in an assortment. Circuit-board material is also in supply at Radio Shack, so a sheet was added to the shopping bag. The tiny send-receive toggle switch is a mite expensive. The builder may want to substitute a low-cost miniature slide switch in its place. A small bag of phono jacks was purchased also, as those connectors are entirely adequate for low-power rf work.

Finding a crystal socket may be a problem of minor proportion. The type used will depend on the style of crystals the operator has on hand. International Crystal Co. has a variety of sockets for sale at low prices (see *QST* ads for their address). A Millen steatite crystal socket was used in the model shown. It is designed to handle HC-6/U crystals with the small-diameter pins. Fundamental crystals are used in the transmitter — the general-purpose (GP) type sold by International Crystal, 30-pF load capacitance. Surplus FT-243 crystals will work fine, too, provided the appropriate socket is used. If only one operating frequency will be used, the crystal can be soldered to the circuit board permanently. Estimated maximum cost for this project, exclusive of the crystal, power supply and tunafish, is $10. The cost estimate is based on brand new components throughout, inclusive of the

*Technical Editor, *QST*

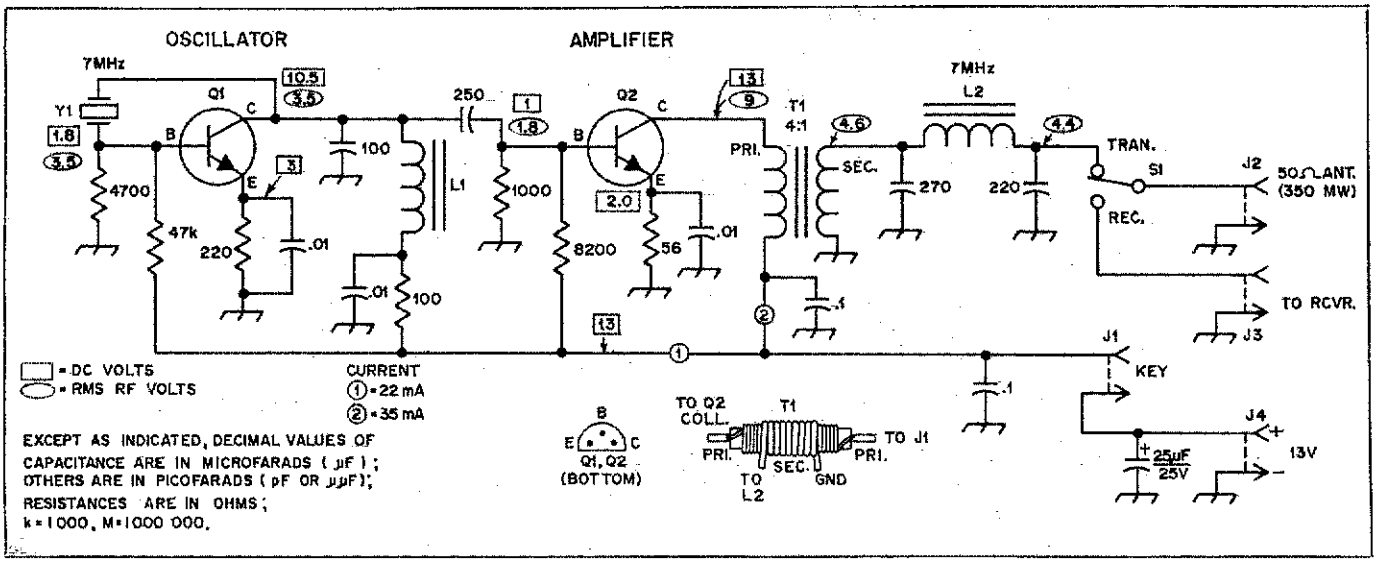


Fig. 1 — Schematic diagram of the two-transistor QRP rig. The polarized capacitor is electrolytic. See parts list for data on other components. Capacitors are disk ceramic. Resistors are 1/2-watt composition.

J1 — Single-hole-mount phone jack. Must be insulated from ground. Mount on tuna tin (Archer 274-346).
J2, J3, J4 — Single-hole-mount phono jack (mount on tuna tin).
L1 — Modified Archer 273-101 rf choke (see text).
L2 — Modified Archer 273-101 rf choke (see text).
Q1, Q2 — Archer 276-1617 npn silicon transistor. Equivalent to 2N2222A type.
S1 — Antenna changeover switch. Miniature spdt toggle (see text).
T1 — 4:1 broadband transformer. Modified Archer 273-102 100-μH rf choke. Primary has 50 turns, secondary has 25 turns (see text).
Y1 — Fundamental crystal, 7 MHz (International Crystal Co. type GP or equiv.).

left-over parts from the assortments. Depending on how shrewd he is at the bargaining game, a flea-market denizen can probably put this unit together for two or three bucks.

Circuit Details

A look at Fig. 1 will indicate that there's nobody at home, so to speak, in the two-stage circuit. A pierce type of crystal oscillator is used at Q1. Its output tickles the base of Q2 (lightly) with a few milliwatts of drive power, causing Q2 to develop approximately 450 milliwatts of dc input power as it is driven into the Class C mode. Power output was measured as 350 milliwatts (1/3 W), indicating an amplifier efficiency of 70 percent.

The collector circuit of Q1 is not tuned to resonance at 40 meters. L1 acts as a rf choke, and the 100-pF capacitor from the collector to ground is for feedback purposes only. Resonance is actually just below the 80-meter band. The choke value is not critical and could be as high in inductance as 1 mH, although the lower values will aid stability.

The collector impedance of Q2 is approximately 250 ohms at the power level specified. Therefore, T1 is used to step the value down to around 60 ohms (4:1 transformation) so that the pi network will contain practical values of L and C. The pi network is designed for low Q (loaded Q of 1) to assure ample bandwidth on 40 meters. This will eliminate the need for tuning controls. Since a pi network is a low-pass filter, harmonic energy is low at the transmitter output. The pi network is designed to transform 60 to 50 ohms.

L1 is made by unwinding a 10-μH Radio Shack choke (No. 273-101) and filling the form with No. 28 or 30 enamel covered wire. This provides an inductor of 24 μH. In a like manner, unwind another 273-101 so that only 11 turns remain (1.36 μH). The 11 turns are spaced one wire thickness apart. Final adjustment of this coil (L2) is done with the transmitter operating into a 50-ohm load. The coil turns are moved closer together or farther apart until maximum output is noted. The wire is then cemented in place by means of hobby glue or Q dope. Indications are that the core material is the Q1 variety (permeability of 125), which makes it suitable for use up to at least 14 MHz.

T1 is built by removing all but 50 turns from a Radio Shack No. 273-101 rf choke (100 μH). The ferrite core in this choke seems to be on the order of 950, in terms of permeability. This is good material for making broadband transformers, as very few wire turns are required for a specified amount of inductance, and the Q of the winding will be low (desirable). A secondary winding is added to the 50-turn inductor by placing 25 turns over it, using No. 22 or 24 enameled wire. The secondary is wound in the same rotation sense as the primary, then glued into position on the form. Tests with an *RX* meter show this to be a very good transformer at 7 MHz. There was no capacitive or inductive reactance evident. The primary winding has an inductance value of 80 μH after modification.

Increased power can be had by making the emitter resistor of Q2 smaller in value. However, the collector current will rise if the resistor is decreased in value, and the transistor just might "go out for lunch," permanently, if too much collector current is allowed to flow. The current can be increased to 50 mA without need to worry, and this will elevate the power output to roughly 400 mW.

Construction Notes

The pc board can be cut to circular form by means of a nibbling tool or coping saw. It should be made so it just clears the inner diameter of the lip which crowns the container. The can is prepared by cutting the closed end so that 1/8 inch of metal remains all the way around the rim. This will provide a shelf for the circuit board to rest on. After checkout is completed, the board can be soldered to the shelf at four points to hold it in place. The opposite end of the can is open. The container can be mounted on a metal plate if the builder wishes. A base plate will help keep the transmitter in one spot on the operating table, especially if adhesive-backed plastic feet are used on the bottom of the plate.

Those with art in their souls may choose to paint the tuna can some

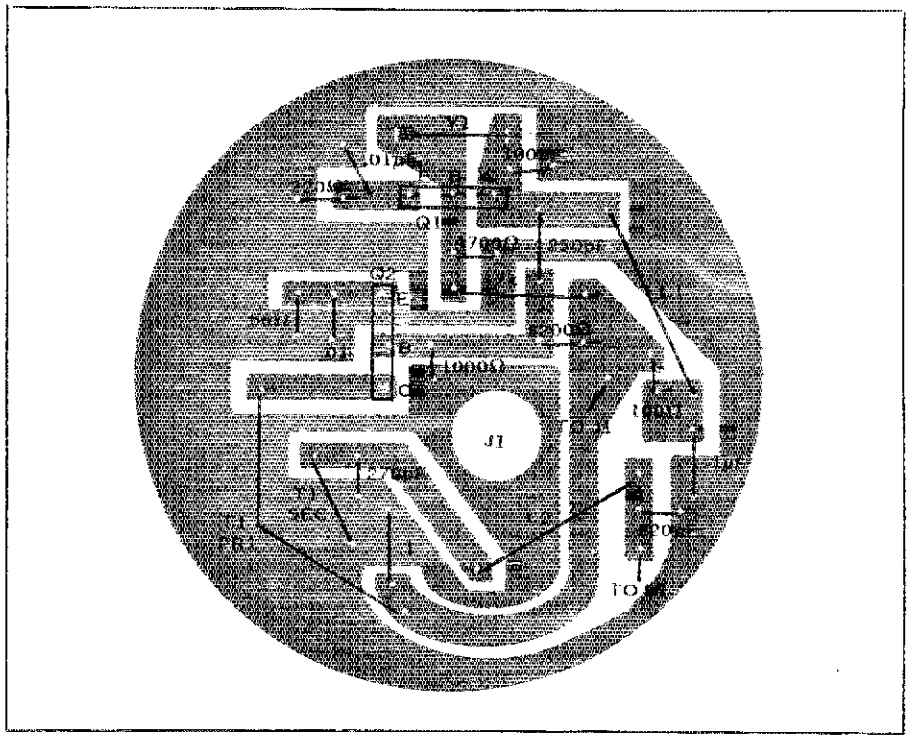


Fig. 2 — Scale layout of the pc board. Copper is etched away where J1 is mounted to prevent shorting the terminals to ground and other parts of the board. Size is for 6-1/2-ounce food can. Square format may be used if different chassis is desired. The 25-μF capacitor mounts between J4 and the pc-board ground foil.

favorite color. Alternatively, decorative contact paper may be used to hide the ugliness of the bare metal.

Summary Comments

Skeptics may chortle with scorn and amusement at the pioneer outlook of QRP enthusiasts. Their lack of familiarity with low-power operating may be the basis for their disdain. Those who have worked at micropower levels know that WAS *is* possible on 40 meters with less than a watt of rf energy. Of course, the odds are a bit greater against a speedy WAS achievement when crystal-controlled QRP rigs are used, but it can be done. From the writer's location in Connecticut, all call areas of the USA have been worked at the 1/4-W power plateau. It was done with only a 40-meter coax-fed dipole, sloping to ground at approximately 45 degrees from a steel tower. Signal reports ranged from RST 449 to RST 589, depending on conditions. Of course, there were many RST 599 reports too, but they were the exception rather than the rule. The first QSO with this rig came when Al, K4DAS, of Miami answered the writer's "CQ" at 2320 UTC on 7014 kHz. An RST 569 was received, and a 20-minute ragchew ensued. The copy at K4DAS was "solid."

Keying quality with this rig was good with several kinds of crystals tried. There was no sign of chirp. Without shaping, the keying is fairly hard (good for weak-signal work), but there were no objectionable clicks heard in the station receiver.

There is a temptation among some QRP experimenters to settle for a one-transistor oscillator type of rig. For academic purposes, that kind of circuit is great. But, for on-the-air use, it's better to have at least two transistors. This isolates the oscillator from the antenna, thereby reducing harmonic radiation. Furthermore, the efficiency of oscillators is considerably lower than that of an amplifier. Many of the "yoopy" QRP cw signals on our bands are products of one-transistor crystal oscillators. Signal quality should be good, regardless of the power level used.

The voltages shown in Fig. 1 will be helpful in troubleshooting this rig. All dc measurements were made with a VTVM. The rf voltages were measured with an rf probe and a VTVM. The values may vary somewhat, depending on the exact characteristics of the transistors chosen. The points marked 1 and 2 (in circles) can be opened to permit insertion of a dc milliammeter. This will be useful in determining the dc input-power level for each stage. Power output can be checked by means of an rf probe from J2 to ground. Measurements should be made with a 51- or 56-ohm resistor as a dummy load. For 350 mW of output, there should be 4.4 rms volts across the 56-ohm resistor.

Operating voltage for the transmitter can be obtained from nine Penlite cells connected in series (13.5 volts). For greater power reserve one can use size C or D cells wired in series. A small ac-operated 12- or 13-volt regulated dc supply is suitable also, especially for home-station work.

A fellow staff member, WA1LNQ, was inspired by the size of this transmitter. He vowed to build a mating receiver for it. I think I heard him refer to his upcoming project as the "Clam-Can 5." QST

Feedback

□ Silent Key Charles D. Miller's call is WB4GZP not WA4GZP as listed in *QST* for March, 1976.

□ The name of Russell Groth, W9CW, of Park Ridge, IL, inadvertently appeared among Silent Keys for July, 1975, *QST*.

□ The Key West Amateur Radio Club Conchfest will be held on May 8-9 instead of March 27-28 as listed in Hamfest Calendar in *QST* for March.

□ W1KLK, author of "A VOX for a Very Small Box." *QST* for March, 1976, states that the input resistor should be 100,000 ohms rather than 100 ohms. Also, older models of the NE-555 IC may cause latch-up of the relay. If that happens, insert a 1N914A or equivalent diode in series with the lead to the relay coil.

□ Re the September FMT (reported on p. 89 of the November issue): W4AWS should have been shown with 8.2 ppm (not 40.0!). Although we got K6MZN's correct for the November FMT placement in the Honor Roll (p. 74, February *QST*), the feedback listed his call incorrectly as K6MLN. Our apologies, Art. In the November FMT W1JH was shown with .6 ppm and in actuality he scored .5 ppm.

Strays

1975 10-Meter Contest High-Claimed Scores (W/VE only)

K3OIO 116,556, W4WSF 104,340, K9HMB 97,600, WA8ZDF 95,160, K3IGA/4 87,408, K9BGL 71,280, WA3WIK 71,036, K2GBC 70,980, W3RRX 62,976, K9EGA/2 57,780, W9LT (K9UWA, opr.) 55,696, K1RQE 53,550 W1CWU 51,282, K1JKN 51,520. *Multi-Operator*: K3EST 152,352, W2SKE 104,580.

Learning to Work with Integrated Circuits

Part 5: Latch the gate — before the hertzes get out!†

By Jerry Hall,* K1PLP and Charles Watts,** WA6GVC/1

As we put away our Ouija boards and brush the dust off our clothes after herding those cattle into the pens, it's time to put analogies aside and start to apply this information to ICs. Terms such as runup, fanout, inverted and not-inverted, loads and time base should now start to make sense. And as we have progressed this far, it should be plain to see that the frequency counter we're building will indeed fit within the confines of a shoebox (provided the shoebox is large enough). The use of a metal chassis is suggested by the authors due to the ineffective rf shielding offered by cardboard.

In Part 4 we mentioned that the time base section is boss over the whole operation of the counter, because it tells all the other circuits when it's time for them to do their job. The time base does this through the various gating circuits in the counter — the count-gate, the latch-gate and the reset-gate circuits. You'll also remember we said that a NAND gate was a good circuit for detecting time coincidence in two or more signals. This is exactly what we need to know in terms of information from the time-base divider section — when various signals available along the divider chain occur in time coincidence. There are several different signals available, and by detecting time coincidences of appropriate combinations of those signals, we can have a neat and orderly set of commands passed along to the various counter sections.

In order to visualize this more clearly, let's take a look at Fig. 14. It'll also help if you look back at Fig. 12 in Part 4, the circuit diagram of the 60-Hz clock. Coming from U8 and U9 are several signals or waveforms, depicted in Fig. 14. The CL or clock signal is a train of pulses occurring at the rate of ten per second. In addition to being brought out to a terminal pad on the clock board, this signal is fed to U9 which is wired in a divide-by-12 arrangement. While it divides by 12 (providing one output pulse for every 12 input pulses), it simultaneously divides by 2 and 4. The A output from the time-base divider is the input signal divided by 2, the B output is the input divided by 4, and the D output is the input divided by 12, with one pulse occurring every 1.2 seconds. You can see the time relationships of these signals in Fig. 14. (There is also a C output available from pin 8 of U9 which we don't utilize in our gating scheme.)

"Yipes! How can we combine all these signals to make order out of chaos?" you ask. Admittedly there are a lot of things going on in that time base section all at once, but precise time relationships exist among them which we can use to advantage. For the moment, look at just the B and D outputs shown in Fig. 14, and more particularly, look to see when they are both in a high logic state (the way an AND gate would look at them). These two signals are high in time coincidence only during clock-pulse periods 10 and 11. Perfect! Just what we need for our count-gate signal — a waveform which is in one logic state for one second (the period of ten clock pulses) and in the other for the remainder of the complete count/latch/reset cycle. This is shown as the waveform B·D in Fig. 14, where the · means a logic AND function. If we use an inverting AND or a NAND gate in our counter with inputs wired to B and D, its output will be right side up to be fed directly to another gate — the actual count gate. In this second gate, the train of pulses from the unknown input signal can be turned on for exactly one second and then turned off by this $\overline{B \cdot D}$ signal. (Remember, the overscore means *not*.)

Similarly, we can combine other signals in AND-gate fashion to obtain a latch pulse and a reset pulse. On occasion we may find a need to invert a logic signal so that it'll combine as we require in one of the gates, and to do this we simply use an inverter section. In Fig. 14 you can see that, if we AND the B·D signal with the CL signal (B·D·CL), we are well on our way toward obtaining a latch pulse (a pulse which must occur after the count gate has ended but before the counting section is reset to zero) and a reset pulse (which must occur after the latch pulse has ended but before the count gate is opened). Separating the two pulses of the B·D·CL waveform is done in AND-gate fashion by combining this waveform with an inverted A or $\overline{A}$ signal to obtain the

*Associate Technical Editor, *QST*
**Editorial Assistant, *QST*
†Parts 1 through 4 appeared in *QST* for January through April, 1976.

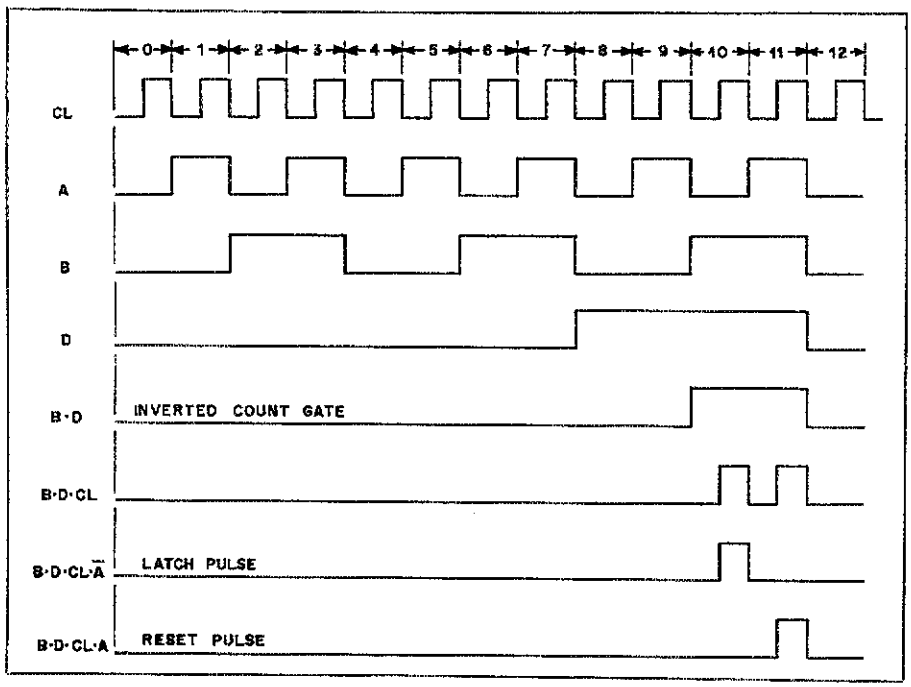


Fig. 14 — Waveforms used in deriving the count, latch, and reset gating signals in the frequency counter. Those identified as CL (clock), A, B, and D, are obtained from the 60-Hz clock board.

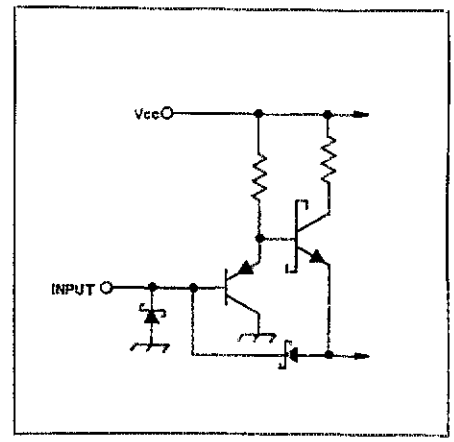


Fig. 16 — Low current pnp input structure of the 82S MSI-series Schottky TTL circuits. Pnp transistors are used to reduce input loading. The maximum input current requirement for a logic low is 400 μA, whereas for ordinary TTL ICs it is on the order of 1.6 mA. This allows the circuit designer to improve existing systems without exceeding fanout limitations.

latch pulse, and with the A signal to obtain the reset pulse. That's all there is to it.

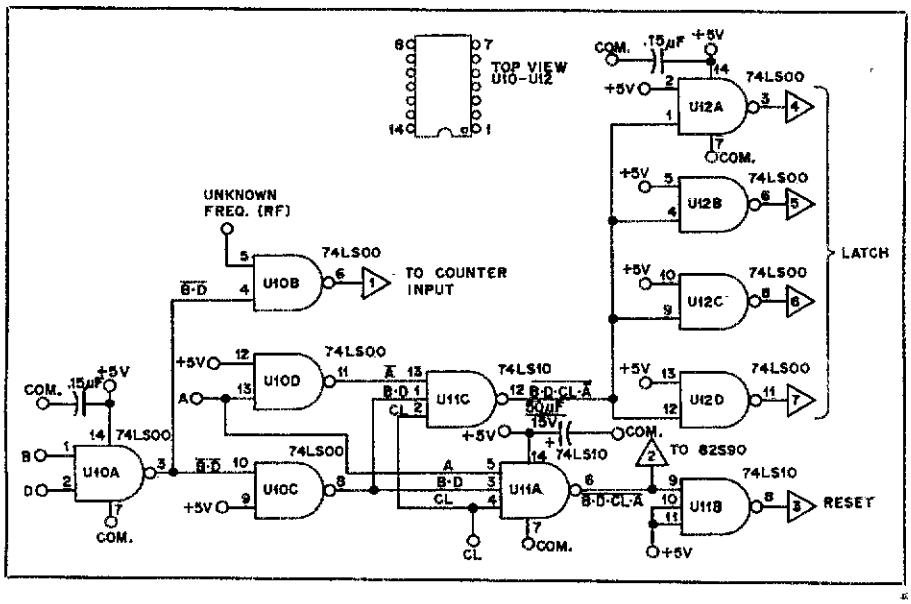
"Wait a minute," we hear you saying. "You're telling me that you've got gates gating gates that gate gates, with a few inverters thrown in for good measure?" Yes, complicated as it may sound, that's the way it's done. But when it's all laid out end to end, we'll bet it won't seem so complicated.

The Gating Circuitry

The complete gating scheme is shown in Fig. 15. Let's "take a walk" through that diagram so all these pieces of information will fall into place. At the left, U10A is our old friend, a NAND gate, with input signals connected to the B and D outputs from the clock board. The output of U10A will be $\overline{B \cdot D}$, upside down from the B·D waveform shown in Fig. 14. This signal is fed to U10B, which gates the train of pulses from the unknown frequency on for one second and then off during latch and reset. The $\overline{B \cdot D}$ signal is also fed to one input of U10C, which has its other input wired to +5 V. When connected in this manner, the NAND gate functions merely as an inverter, so the output of U10C is B·D, fed to pin 1 of U11C. U11C is a 3-input NAND gate with CL applied to pin 2 and $\overline{A}$ applied to pin 13 (an A signal inverted in U10D). The output is $\overline{B \cdot D \cdot CL \cdot \overline{A}}$ inverted, upside down from that shown as the latch pulse in Fig. 14. U12A through D are each wired as inverters to bring the pulse right side up for passing along to the latch circuits. Four sections are used because of the heavy fanout requirements of the latch circuits. Meanwhile, U11A has as its inputs A, B·D, and CL, so its output will be $\overline{B \cdot D \cdot CL \cdot A}$ inverted, upside down from the reset pulse shown in Fig. 14. U11B is wired as an inverter, setting upright the reset pulses going to the 7490 counter ICs. The 82S90 input IC of the counter section requires a negative-going reset pulse, just the opposite of that for the 7490s, so this signal is taken out ahead of U11B.

So you see, it's not really so complicated now. As shown here, the B and D signals were already combined in a

Fig. 15 — Schematic diagram of the gating circuit. Points marked common should be tied together and connected to the common leads of other boards and the power supply, but isolated from the chassis. No connections are made to pin numbers not shown on the ICs. Inputs A,B,D, and CL come from the clock board (see Fig. 12 of Part 4). Numbers within the triangles refer to connections made to the circuit of Fig. 17. All capacitances are shown in microfarads (μF). Parts required are listed with Fig. 17.



NAND gate early in the gating scheme (U10A), so we make use of this B·D signal in combined form in later gates, U11A and C. Four-input gates could have been used where U11A and C are shown, with B and D being separate inputs. Electrically, either approach would be satisfactory. In designing circuits such as this, the total package count and cost are usually the most important deciding factors. Advantage can be taken of the fact that NAND-gate integrated circuits contain several independent sections and, as in the case of U10C, sections not actually required for a NAND-gate function may be used as inverters.

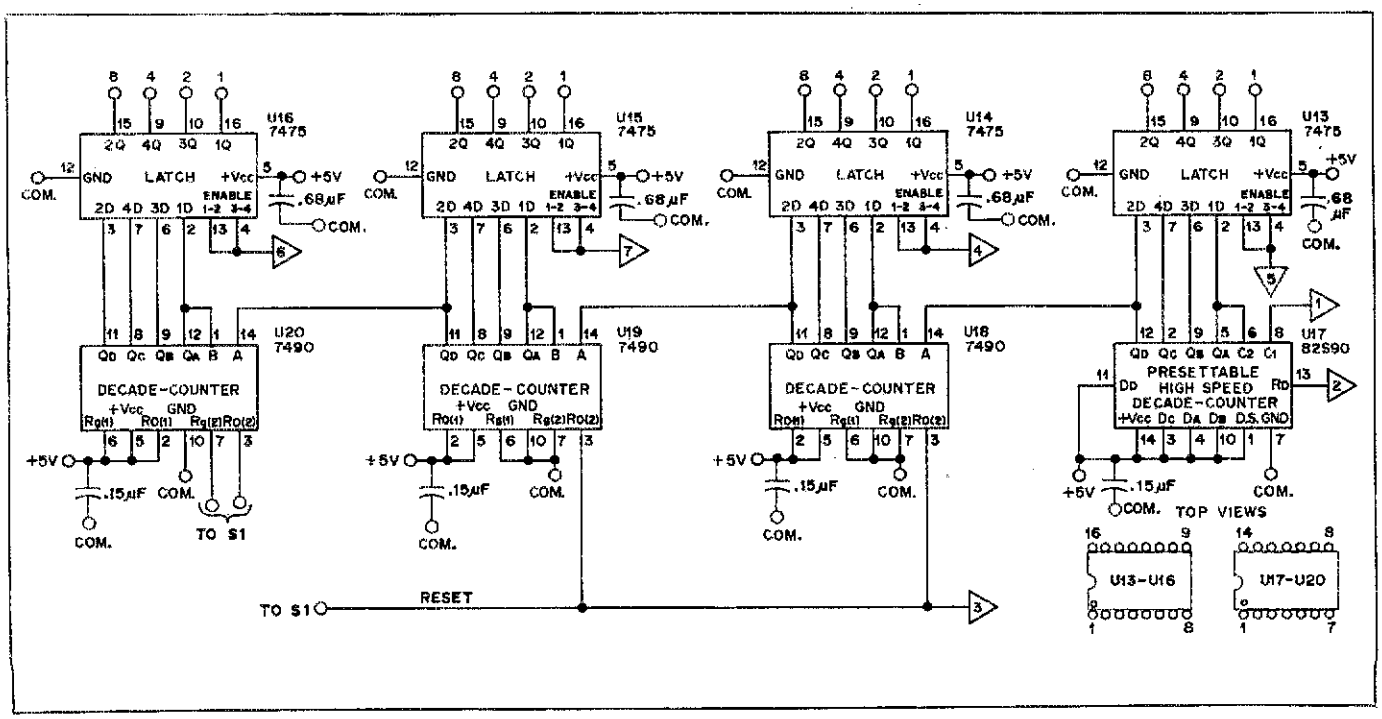
To Count or Totalize

In Part 4 of this series we discussed the operation of the 7492 and 7493 counter ICs, with emphasis on the divide-by-six function of the 7492 and reset-at-twelve operation of the 7493 4-bit binary counter. And in Part 4 we also discussed the operation of an EPUT meter, a term often used to describe the type of frequency counter we are building (we've added a voltage-to-frequency converter so we can measure ac and dc voltages). Now let's take a closer look at the 7490 decade-divider IC, and the 82S90 ultra-high-speed presettable decade counter, shown in the "count" blocks of Fig. 9, Part 4. "How come you call an IC a divider one time and you call it a counter the next?" you ask. The easiest way to answer that question would be to say that while the IC does divide, it is actually performing a counting operation. Still confused? Let's review some of the basics on IC counters that we talked about in Part 4.

Refer to Fig. 9 of Part 4 for the following discussion. Let's assume that the frequency coming from the 566 IC is 2222 Hz. When the count gate is told to open by the clock, all 2222 of those "hertzes" (a train of pulses, 2222 in number) flow into the first decade (units) IC. This poor first IC can't hold all of these pulses, but it can count every single one of them and retain up to 9 pulses. But since this is a divide-by-ten IC, it divides by ten with the tenth pulse providing a carry-over signal. The result is that the IC sends 222 of the carry pulses on to the next decade (tens) IC while retaining the 2 from the units position of the 2222 pulses counted. The tens decade can only hold up to 9 tens, but there are more than 9 tens. So after division in this IC by ten, 22 pulses are sent on to the next IC (the hundreds decade) with the 2 from the tens position of 2222 retained. And from the

Fig. 17 — Schematic diagram of the totalizer circuit. Points marked common should be interconnected with the common leads of other boards and the power supply, but not connected to the metal enclosure. No connections are made to pin numbers not shown on the ICs. Numbers within the triangles refer to connections made to the circuit of Fig. 15. All capacitances are shown in microfarads (μF). The two circuits, that of Fig. 15 and that shown here, are constructed on one circuit board (CW-LW4). Parts required for construction of both circuits are listed below.

U10, U12 — Schottky clamped TTL quad 2-input positive NAND-gate IC, type 74LS00.
U11 — Schottky clamped TTL triple 3-input positive NAND gate IC, type 74LS10.
U13-U16, incl. — TTL 4-bit bistable latches, type 7475.
U17 — Schottky clamped TTL ultrahigh-speed presettable binary counter, type 82S90. Note: The 82S90 will operate to 100 MHz. The lower cost (and perhaps more readily attainable) 74196 IC, rated for only 50 MHz, may be used as a direct replacement.
U18-U20, incl. — TTL decade-counter IC, type 7490. (For lower power consumption, Schottky clamped 74LS90 ICs may be used.)
IC sockets for 14-pin dual in-line IC packages, Cambion 3788-0416 or CA 14S105D, or equiv. (7 req'd.)
IC sockets for 16-pin dual in-line IC packages, Cambion 3789-0416 or CA 16S105D or equiv. (4 req'd.)
Electrolytic capacitor, either 47 μF or 50 μF, 15 V. (1 req'd.)
Disk or rectangular ceramic capacitors, 0.15 μF, 50 V. (6 req'd.)
Disk or rectangular ceramic capacitors, 0.15 μF, 50 V. (5 req'd.)
Plastic-covered hookup wire, No. 24 or No. 26, assorted colors. Solid-conductor wire may be used for jumper connections on the circuit board, but stranded wire is preferred for interconnections between boards.



hundreds decade-divider IC, a final 2 pulses are sent on to the last IC (the thousands decade).

If we place these numbers in our display, from right to left (actually displayed from left to right on our readout), the number would read 2222 units, in this case hertz. So what has resulted from our dividing is in reality a *totalizing* or representation of all the pulses that went into our frequency counter. More specifically, a *count* of the pulses (frequency) has occurred.

It's What's Inside That Counts – Have You Heard That Before?

The 7490 IC, a high-speed (?), monolithic decade counter consisting of four master-slave flip-flops, provides divide-by-two and divide-by-five operation. Internal gate circuits allow for resetting the outputs of the 7490 to 0 or BCD count of 9 for nine's compliment decimal application. We will be using this set-to-nine feature in the frequency counter project we are building; we'll talk more on this feature later.

To achieve a divide-by-ten function with the 7490, the divide-by-two and divide-by-five sections of the IC are wired externally in cascade. The B input is connected to the Q_A output, and the input count pulses are applied to input A.

Similar only in function and circuit operation to the 7490, the 82S90 will perform a divide-by-10 operation in the frequency counter and, at the same time, allow for utilization of the frequency counter through the 6-meter amateur band. The 82S series Schottky TTL circuits are implemented with Schottky-barrier-diode clamping to achieve very high speed operation that previously could be obtained only with emitter-coupled logic. And yet Schottky ICs can be used with most of the saturated logic circuits.

Schottky-barrier-diode clamping prevents transistors in the IC chip from attaining "classic" saturation, effectively eliminating *excess* storage charge and the resultant recovery times.[9] Schottky is the name given to an extra step in the process of manufacturing the IC chip. This process results in devices on the chip which greatly increase the speed at which the IC performs its assigned operating task. Schottky-barrier-diodes in parallel with the collector-base junction form the Schottky-clamped transistors. This diode has a lower forward voltage than the collector-base junction. As a result the transistor cannot go completely into saturation because most of the base current is diverted by the diode. The use of small area in IC chip design, coupled with reduced stored charge, results in significant improvement in switching characteristics. See Fig. 16 for an example of a typical input circuit for an 82S MSI Schottky IC.

In order for the 82S90 to be utilized in the frequency counter, we have to "preset" the data inputs so a divide-by-ten function will result. This task is accomplished by wiring all the data inputs and the data strobe input to +Vcc, and then using the *RS* input for resetting all stages and outputs to zero (logic 0). The outputs, Q_A through Q_D of the 82S90 are wired to the same corresponding inputs on the 7475 (U13) as the Q outputs of the 7490s are to their respective 7475s. See Fig. 17.

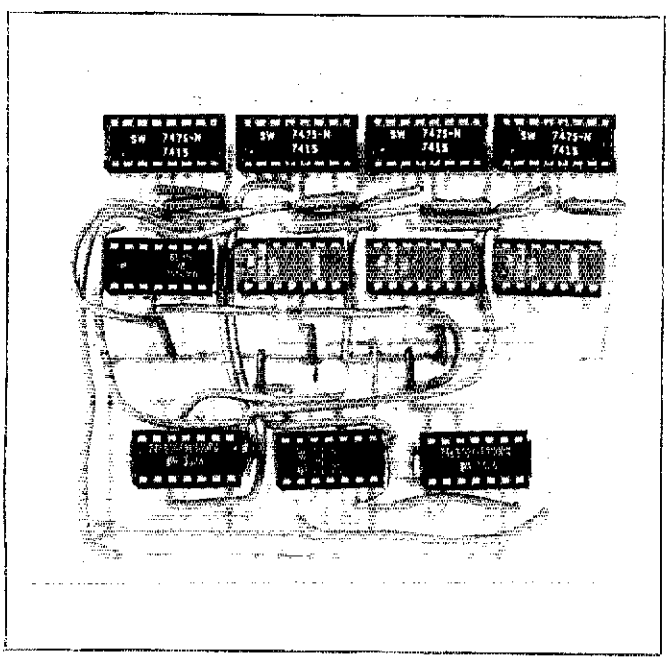
Latch the Gate – Before The Hertzes Get Out!

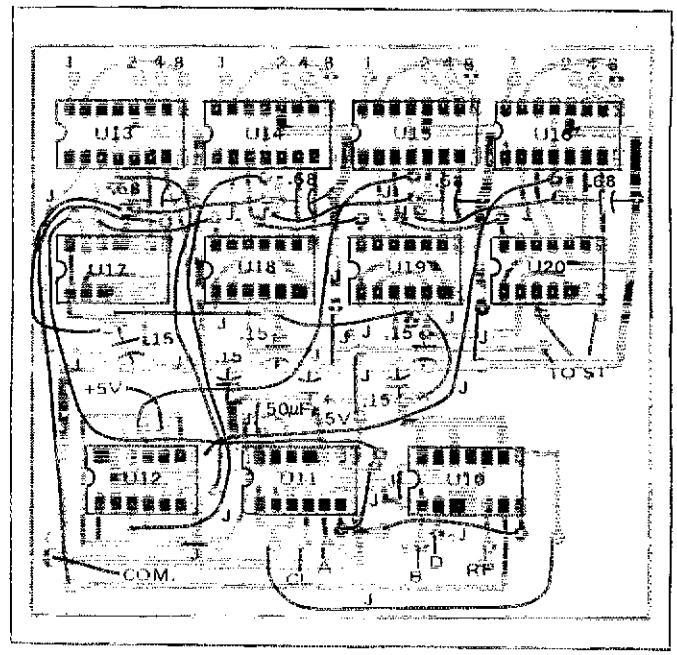
The 7475 4-bit bistable (flip-flop) latch integrated circuit is the electronic "memory" or storage element between the counter circuits and the decoder-driver and display units. Circuits of the 7475 IC will temporarily store information between processing units (the 82S90 and 7490s in this case) and input-output or indicator units (the 7447s used in the display section). Information at a data input, 1D of U13 in Fig. 17 for example, is transferred to the Q output (1Q of U13) when the clock input (enable 1-2 and 3-4) is a logic high. The Q output will follow the data input as long as the enable remains at logic high. When the clock goes low at the enable inputs, the information that was present at the 1D input at the time the transition occurred is retained at the 1Q output until the clock pulse to the enable again goes high. If the input information is BCD, then the output information will follow, also BCD.

The 7475 latches offer the advantage, of course, that one doesn't have to watch those displays blink madly away as the counters run up. By placing the latch IC between the counter and the decoder-driver ICs, runup is not dis-

[9] See bibliography references at the end of Part 4.

Fig. 18 – Parts placement guide for the counter board, not shown at actual size. These views show the component side of the board. J = wire jumper. Some jumper wires may be seen in the photograph as bare, with the plastic insulation removed. This is permissible when such wires are in the clear and there is no chance of their touching other conductors.





played and frequency changes are indicated by instant changes on the display.

Let's Build It

Despite the fact that the counter and gate board has the highest density of ICs of all the five boards, no special techniques are required for assembling the pc board. The gating circuits of Fig. 15 and the counting (totalizer) circuits of Fig. 17 are all included on what we've called the counter board. One item worth mentioning, though, is that there are a large number of jumpers required for making all the necessary circuit interconnections. Routing of the jumpers can be seen in the parts placement guide, Fig. 18. If you want to etch your own board, the etching pattern is shown in Fig. 19. Placing the capacitors and IC sockets on the pc board as the first steps in assembly should make routing the jumper wires easier, since they can then be "snaked" around the sockets and capacitors. Approximately 26 jumper wires are required on the board, making the use of color-coded wires a good approach for this assembly.

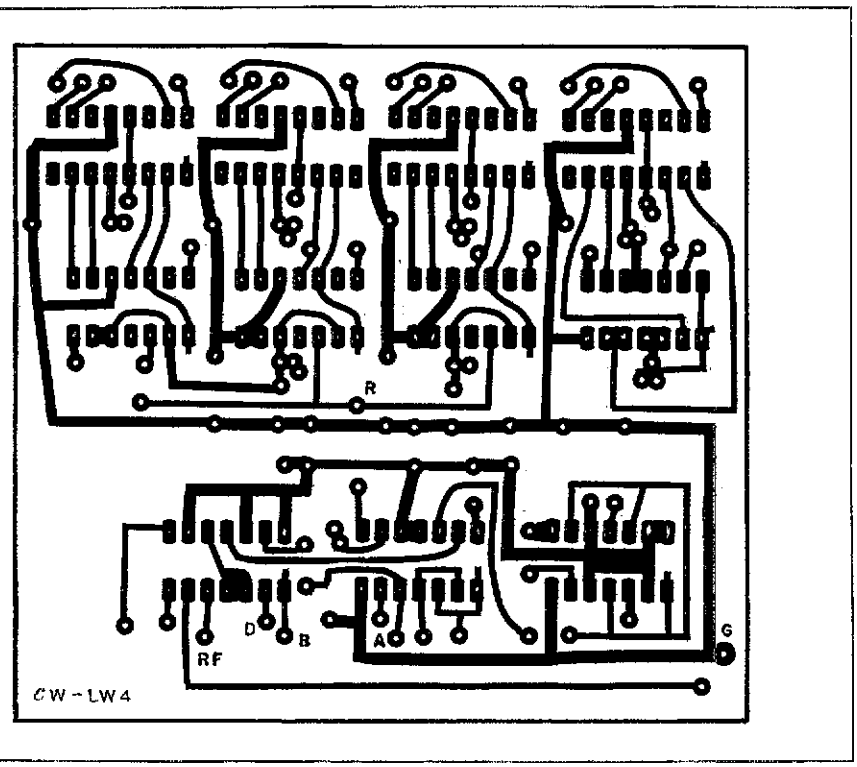


Fig. 19 — Etching pattern for the counter board, actual size. The pattern is shown from the foil side, with black representing copper.

Once you've wired up the board itself and checked to be sure you have no solder bridges or wiring errors, you're ready to connect the outputs from the clock board, A, B, D, and CL. Temporary interconnections will be okay for now, and we can dress them up and make them permanent when we assemble the complete instrument. Also connect common and +5-volt leads to the power supply section. Now insert all the ICs in the proper sockets and apply power. Again we dig out our trusty voltmeter and check the gating circuits. Measure the dc voltage at pin 3 of either U18 or U19, the reset pulse. The voltage should flick positive to 5 volts every 1.2 seconds. The duration of the positive pulse will be so short that probably the meter needle will never reach the 5-volt mark, so any flicking at all at the proper time interval is sufficient. Next check the four outputs of U12, pins 3, 6, 8, and 11. The results should be the same, positive flicking every 1.2 seconds, indicating the latch pulses are okay.

Now comes the moment we've been waiting for! Interconnect the 16 BCD wires between the counter board and the display board. Here again, temporary interconnections will be okay for now. The boards are constructed so that one should have the foil side up while the other is foil side down, and the wires may be run straight across from one board to the other. Refer to the layouts for both boards if you have doubts about these interconnections. If you end up with BCD wires crossing each other, you've done something wrong.

With the +12- and +5-volt leads connected as required from each board to the power supply and with all common leads hooked together apply power. The readout displays should illuminate immediately and, after a second or so, should display the numbers 9001. If the readouts remain dark, you're in for some detective work. Check your power supply connections first, and then your other board interconnections. The figures 9001 should be displayed without flicker and without changing to other numbers after the first second or so.

Now remove power and locate the pad connected to pin 5 of U10, identified as "RF" on the counter board. To this pad solder a length of stranded wire which will become our test lead. This is the counter input lead. Reapply power, and connect this test lead to common. The 9001 display should change to 9000. Now touch the test lead to pin 6 of U7, the 74121 IC on the clock board. The display reading should change to 9060. Do you know why? Your pride-and-joy is counting 60-Hz line-frequency pulses, as shaped by the 74121! The 9 on the left of the display appears because the left-most 7490 is being reset to 9 at present, rather than to 0. We'll use that feature when we go to DVM operation. For now let's solder in some temporary jumpers to make it reset to 0. Looking at the board from the foil side, remove power and connect a jumper between the pad near pin 3 of U20 and the pad at the left end of the R (reset) line. Next connect a jumper between the pad near pin 7 and common. All set? Okay, reapply power. With the test lead not touching anything, the display should now read 01, and with the test lead grounded to common, 00 should be shown. Touching the test lead to pin 6 of the 74121 should produce 60. Immediately after you touch the test lead to pin 6, you may note a reading of other than 60. This is normal, as you may have made the connection when the count sequence was already in progress. The counter will update its display in another 1.2 seconds after the erroneous number is displayed.

At this point the counter is ready to count unknown frequencies, but for one small detail . . . we've got no circuit to shape the unknown signal. As a temporary expedient you may wish to build up another 74121 circuit like that of U7, Fig. 12 of Part 4. The 1000-ohm resistor from pin 5, rather than going to the 60-Hz source, will become your counter input. The test lead which is connected to "RF" on the counter board may then be connected to pin 6 of this additional 74121 IC. With this arrangement you should have no difficulty in counting audio and low-frequency rf signals which are upwards of 10 volts or so rms amplitude.

Part 6 of this series will appear in a subsequent issue of *QST*.

A PROM for the Accu-Keyer

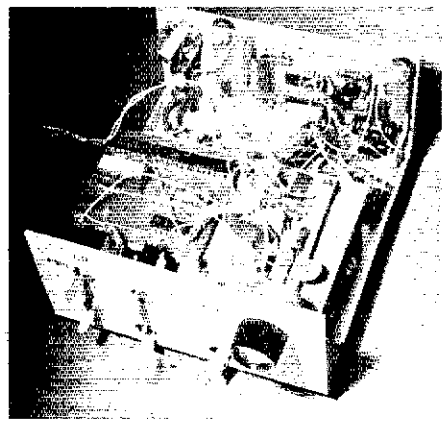
The Accu-PROM . . . a device that doesn't lose its memory when power is removed.

By David L. Madison,* K3ACN

The Accu-Keyer[1] has all of the qualities of a classic amateur design: relative simplicity, fool-proof operation, and low cost. The popularity of the Accu-Keyer is reflected by periodic reports in *QST* of the number of circuit boards shipped by Mr. Garrett.

In a more recent paper, an Accu-Keyer with memory is described.[2] The heart of the Accu-Memory is a metal-oxide-semiconductor (MOS) memory device which can be programmed and erased repeatedly. The Accu-Memory will undoubtedly be built and used by large numbers of contest operators and cw enthusiasts.

For the occasional cw operator, the Accu-Memory may entail more complexity and expense than desired. A simpler alternative is possible through the use of a programmable read-only memory (PROM). The system to be described converts the Accu-Keyer to a message generator, or Accu-PROM. The modifications to the Accu-Keyer are minor and have no effect on keyer operation when a message is not being sent. Perhaps the best feature is the cost, which can be kept to about seven dollars if surplus ICs are used.



The author's version of the Accu-PROM is installed in his Accu-Keyer cabinet. The pc board on the back panel is the original Accu-Keyer circuitry. The white IC on the left of the pc board in the foreground is a programmable read-only memory (PROM) with 1024 bits of memory.

There are a couple of trade-offs, of course. The type of PROM used here cannot be erased once it is programmed. Several PROMs can be programmed though, for calling CQ, for contests or Field Day, and so on. The other disadvantage is that some circuitry must be constructed to program the PROM. The programming device can be bread-boarded from readily available parts. however, and can be used to program any number of PROMs, making the Accu-PROM a good club project.

Operation of the PROM

A type N82S129 PROM is used to provide 1024 bits of memory, organized as 256 words at 4 bits per word. In some respects this type of PROM is an IC version of the diode matrices used in earlier message generators.[3] In those circuits, the presence or absence of a diode at a particular location in the matrix represented a logic 0 or 1. The N82S129 is effectively a matrix of 1024 diodes, each in series with a miniature nichrome link. Prior to programming, the entire memory is in the logic 0 state. The chip is programmed by electrically fusing the appropriate nichrome links, thereby changing the corresponding bits to the logic 1 state.

The chip also contains all of the required address decoding and output buffering, and is fully compatible with TTL ICs. Eight of the sixteen pins on the N82S129 are used to specify the desired word. The address of the first word is 00000000, and the 256th word is 11111111. If the two chip-enable pins are grounded, the contents of the addressed word will appear on four of the pins.

Logic Description

Four instructions are required to control the Accu-Keyer: Send a dot,

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[1] This and succeeding references may be found on page 24.

Table 1

Word Address							Contents of Word						
IC PIN													
5	*6*	*7*	*4*	*3*	*2*	*1*	*15*	*11*	*12*	*	*9*	*10*	*
0	0	0	0	0	0	0	0	0	1	—	1	0	.
0	0	0	0	0	0	0	1	0	1	—	1	0	.
0	0	0	0	0	0	1	0	0	0	space	0	1	—
0	0	0	0	0	0	1	1	0	1	—	1	0	.
0	0	0	0	0	1	0	0	0	1	—	0	0	space
0	0	0	0	0	1	0	1	0	0	space	0	0	space
0	0	0	0	0	1	1	0	0	1	—	1	0	.
0	0	0	0	0	1	1	1	0	1	—	1	0	.
0	0	0	0	1	0	0	0	0	0	space	0	1	—
0	0	0	0	1	0	0	1	0	1	—	1	0	.
0	0	0	0	1	0	1	0	0	1	—	0	0	space

Sample message coding for the Accu-PROM. Each word contains two instructions. Pins 11 and 12 contain the first instruction of a word, and pins 9 and 10 contain the second instruction. A space is represented by 00, a dot by 10, a dash by 01, and halt (not shown) is 11. The first eleven words of a 3 X 3 CQ are given.
*Instruction

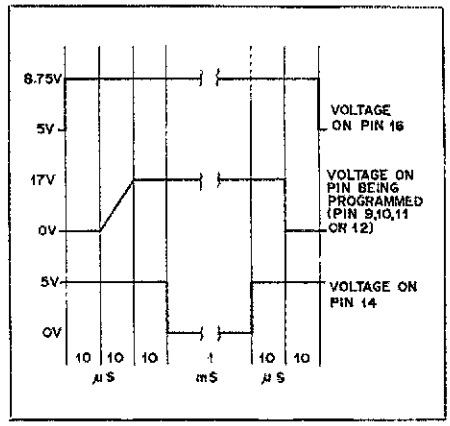


Fig. 2 — Timing diagram for the programming sequence of the N82S129 PROM. The above pulses will change the bit being programmed from the logic 0 to the logic 1 state.

send a dash, send a space, and stop or halt. A space is coded in the PROM by 00, a dot by 10, a dash by 01, and halt by 11. Since the PROM used here is organized in the 256 X 4 configuration, each word will contain two instructions.

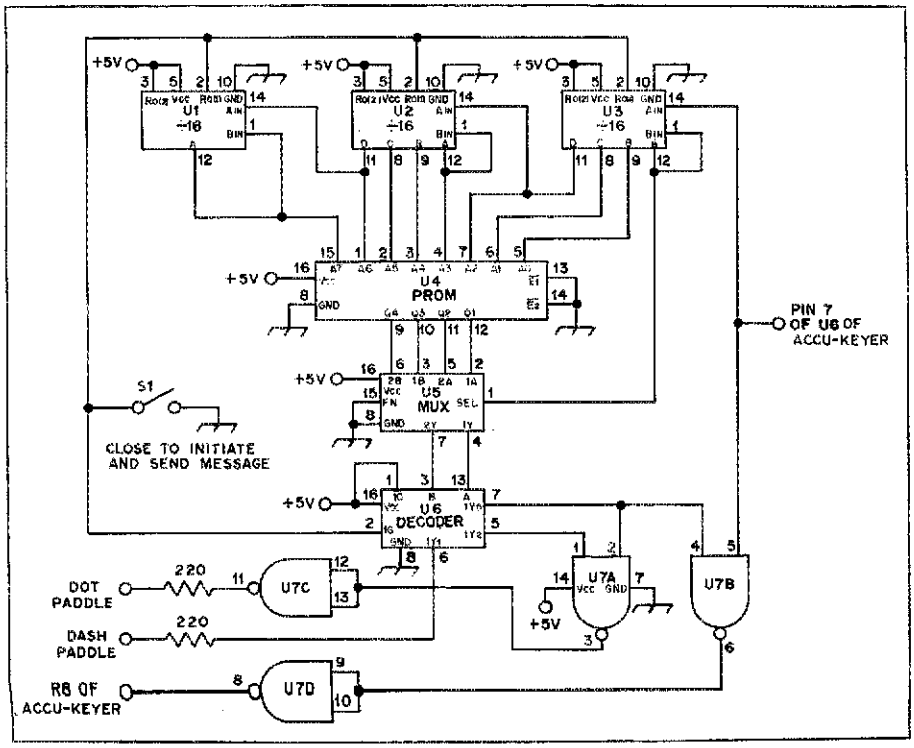
As shown in Fig. 1, U1, U2, and U3 form a binary counter. When S1 is open, pin 2 of each 7493 is high, holding the count to zero. When the switch is closed, the 7493s are enabled to count. The least significant bit of the count, available at pin 12 of U3, is used by U5 (a 2-input multiplexer) to select the "left" two bits of a word (pins 11 and 12 of U4), or the "right" two bits (pins 9 and 10 of U4). The next most significant 8 bits of the counter specify which of the 256 words is required.

The output of U5, on pins 7 and 4, represents one coded instruction. It is decoded by U6 into the four possible instructions. If the instruction is halt, pins 5, 6, and 7 are high and nothing further happens. If a dot is to be sent, pin 5 goes low, causing pin 3 of U7A to go high. After inversion by U7C, this condition causes the dot-paddle contact to go low as though it had been tapped manually. If a dash is to be sent, pin 6 of U6 goes low, effectively grounding the dash paddle. A space is sent in the same manner as a dot, but U7B prevents the output of the Accu-Keyer (pin 7 of U6) from reaching R8. The Accu-Keyer is thereby "faked" into sending a space by sending a dot but suppressing the output. This allows any number of spaces to be sent sequentially without having the Accu-Keyer clock stop. Pin 7 of U6 in the Accu-Keyer is also tied to pin 14 of U3 in the Accu-PROM. The falling edge of the pulse generated by a keyer dot, dash, or space advances the binary counter by one, allowing the next instruction to be decoded.

During manual operation, S1 is open and pin 2 of U6 is high. This holds pins 5, 6, and 7 high regardless of the inputs to pins 3 and 13; therefore, the paddle contacts are high unless they are manually keyed. The 220-Ω resistors are included to prevent damage to U7 when the paddles are closed. When S1 is open, pin 4 of U7B is high, and the Accu-Keyer output from pin 7 of U6 is routed to R8 essentially unaltered.

Fig. 1 — Diagram of the Accu-PROM. There are 256 words of memory, each containing 4 bits, provided by U4, the N82S129 programmable read-only memory.

S1 — Spst toggle.
U1-U3, incl. — TTL 4-bit binary counter, type 7493.
U4 — Programmable read-only memory, Signetics type N82S129.
U5 — TTL quad 2-input multiplexer, type 74157.
U6 — TTL dual 2-line to 4-line decoder, type 74155.
U7 — TTL quad 2-input NAND gate, type 7400.



Programming the PROM

The first step in programming the PROM is to construct a table of the required state (logic 1 or 0) of each bit of each word. Table 1 shows how the

first two CQs of a message are coded. The halt instruction can be omitted; if it is not included, the Accu-PROM will consider the unused portion of the PROM to be filled with spaces, and the message will eventually repeat unless S1 is opened first.

Fig. 2 shows the timing diagram of the pulses used to program the N82S129. Fig. 3 is a circuit which will generate the required pulses; it is similar to the circuit recommended by Signetics. Slide switches S6 through S13 are used to set the address of the word being programmed. As previously mentioned, only the bits requiring a 1 are programmed. To program a bit, hold down S2, S3, S4, or S5 (corresponding to the required bit) and momentarily depress S1. The programming must be done carefully, since a bit that has been programmed to a logic 1 cannot be changed back to a logic 0. Also, after each bit is programmed, it is wise to check the status of the pin with a voltmeter. A pin voltage of at least 2.4 V indicates that the bit has been successfully programmed.

Building and Using the Accu-PROM

The Accu-PROM circuit is simple enough that it can easily be wired on a small piece of perforated board, or, if preferred, a pc board can be etched. It is suggested that an IC socket be used for the PROM so that the message can be changed by replacing the IC. The only modification to the Accu-Keyer board involves breaking the connection between R8 and pin 7 of U6 and bringing leads from those points to the Accu-PROM board as indicated in Fig. 1. If the Accu-Keyer was constructed with the simple Zener-diode-regulated supply, better voltage regulation may be required to power the Accu-PROM. It is suggested that an LM309 5-V regulator to be used in lieu of the Zener diode.

Using the Accu-PROM is easy. Closing S1 initiates and sends the message, and opening S1 stops the message at any point and reverts the keyer to normal operation. The message rate is determined by the Accu-Keyer speed control.

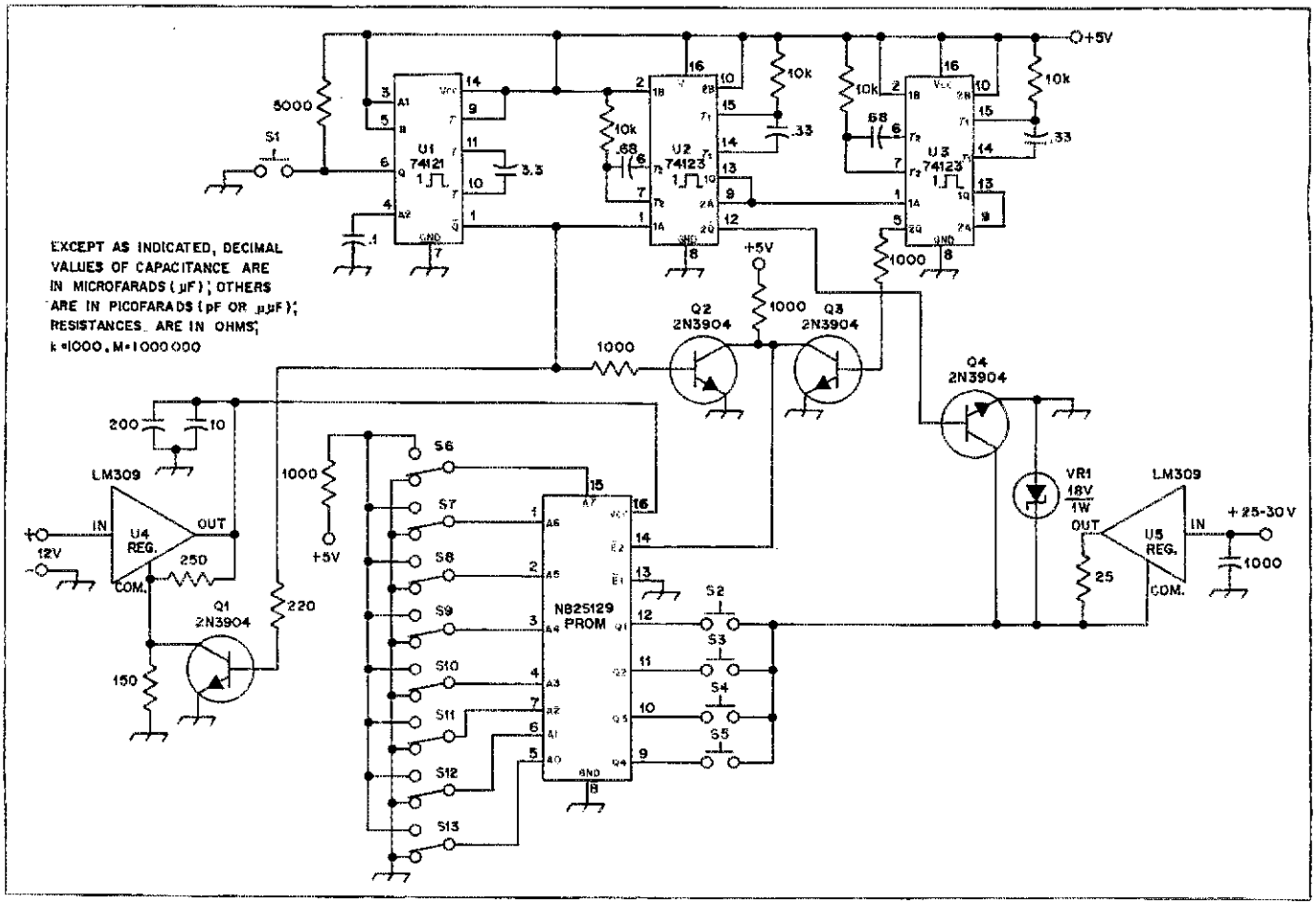
Several variations of the Accu-PROM are possible. If the capability to send one of several messages is required, the messages can be programmed on separate PROMs. If the corresponding pins of each PROM are wired in parallel, with the exception of pin 14, one PROM can be addressed by using a rotary switch to ground pin 14 on the desired chip. Another possible variation is the addition of a dpst switch to break the connections to pin 14 of U3 and pin 2 of U6. This switch, when open, would cause the Accu-PROM to pause during a message so that code (e.g., RST) could be inserted manually.

References

[1] Garrett, "The WB4VVF Accu-Keyer," *QST*, August, 1973.
[2] Garrett, and Contini, "The Accu-Memory," *QST*, August, 1975.
[3] Hall, "A Digital Morse-Code Message Generator," *QST*, June, 1970.

Fig. 3 — Schematic diagram of the programming device for the N82S129 PROM. The word address is entered with S6 through S13. A logic 1 is programmed by holding either S2, S3, S4, or S5 closed, as required, and momentarily pressing S1. U5 is wired as a current regulator.

Q1-Q4, incl. — Silicon npn 250-mW switching transistor.
S1-S5, incl. — Normally open push-button switch.
S6-S13, incl. — Spdt slide or toggle switch.
U1 — Monostable multivibrator, type 74121.
U2, U3 — Retriggerable monostable multivibrator, type 74123.
U4, U5 — 5-volt regulator, type LM309.



Power Amplifier Development with Your Transistors

Simple test equipment and methods for making-do with devices on hand, on frequencies you want to use.

By Adrian Weiss,* K8EEG

One of the more exciting phases of ham radio today is the use of rf power transistors in transmitter amplifier stages. Solid-state design has obvious weight and power-drain advantages, especially in gear that may be used for mobile or portable operation. Development of balanced-emitter rf power transistors, virtually blowout proof and superior to earlier types in regard to stability, gave great impetus to use of all-solid-state equipment in both the hf and vhf ranges.

For the amateur who wants to do other than make exact copies of described equipment, a problem has been lack of understandable information that will permit him to work out transmitter designs for transistors he may have on hand or be able to pick up at moderate prices. Even when good information is available, it may be for only the vhf range, or the circuits described may not necessarily be the best available for amateur-band use. Unlike vacuum tubes, solid-state devices may exhibit wide variations between individual units of the same type. This is in part the result of applications design for top-quality production runs intended for military or space use, whereas the amateur may have to contend with second- or third-level quality. There is also the matter of the practical unreliability of mathematical calculations used in solid-state amplifier design. Johnson and Artigo have noted that competent engineering can produce "ball-park" errors ranging from -22 to +25 percent between calculated values and those that actually work.[1]

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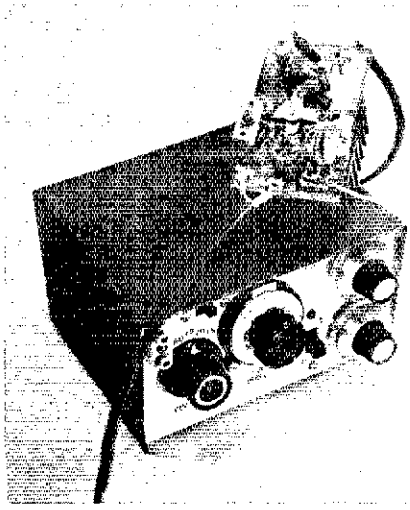
Solid-state 40-meter amplifier, built by the author for use with his QRP rig, was tested and adjusted using the methods he describes.



Assumptions

The objective here is to allow the average amateur to circumvent the above obstacles, by placing emphasis on the actual device on hand through in-circuit measurements made during amplifier development. The method is based on several general assumptions which will hold in most cases. A reader unfamiliar with solid-state amplifier basics is encouraged to study papers by Franson, Hayward, Hejhall, and others.[2]

It is assumed that the base input impedance of the amplifier will be quite low, in the range of 1 to 15 ohms. The input matching network must be able to transform this low impedance to whatever is present at the output of the driver stage. This could be 50 ohms, as in using an amplifier with a separate exciter such as one described by the author in an earlier article,[3] and shown in the photograph, or some higher value if the exciter is to be an integral part of a complete transmitter. A reactive component will be present in the base input impedance, so the interstage matching network must tune the base input circuit to resonance, as well. The amplifier will operate properly only when both conditions are satisfied.

Any balanced-emitter device will have an absolute minimum gain of about 6 dB if operating properly. Efficiency will be 45 to 65 percent. At least 8-dB gain is expected normally. On this basis, the drive required for 10-watts output is 1.25 watts. In practice, the writer has found the 2N5590 can be driven to about 12.5-watts output with 1 watt of drive. In another application the 2N5590 delivered 5.5 watts of clean output with only 220 mW of drive -- about 14-dB gain. A word of caution is in order here: Maximum efficiency is obtainable only at the collector voltage specified by the manufacturer. Don't expect high efficiency if a 28-volt device is operated at 12 volts.

Practical Circuit Details

Hayward discussed choosing values for the base swamping resistor, collector rf choke, bypass capacitors, and other components of the typical Class-C amplifier. Bearing in mind that these criteria are not official "dogma," the reader is advised to familiarize himself with them. There are several usable circuits, descriptions of which can be found in the references and in the RCA *RF Power Transistor Manual.* The author prefers the input network shown in Fig. 1, because it will yield practical component values in nearly all cases.

[1] This and all subsequent footnotes will appear at the end of this article.

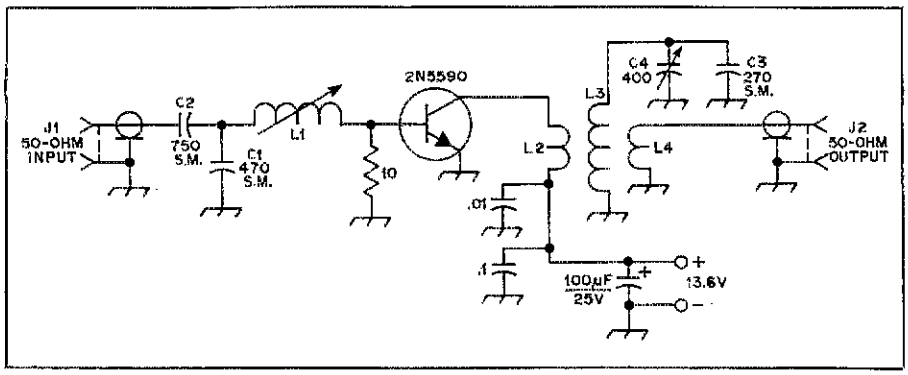


Fig. 1 — Schematic diagram and parts information for the K8EEG 40-meter amplifier. Capacitor values not otherwise marked are in pF. Some parts are numbered for text reference only. All grounds should be made directly to the transistor emitter strip. C1, C2 — Final values given; can be made variable as with C3-C4, for experimental purposes.

C4 — 400-pF miniature trimmer. Small broadcast-type capacitors suitable for low-power applications. See text.

L1 — 9 turns No. 22 enamel, closewound on 1/4-inch dia. slug-tuned form.

L2 — 2.5 turns No. 22 enamel, closewound on Amidon T-50-2 toroid core.

L3 — 13 turns, spaced to occupy entire core of L2.

L4 — 4.5 turns, spaced over 1/3 of core.

In using the toroidal circuit for interstage coupling, make L1 1 to 2 turns for 10- to 40-ohm collector load impedance, and 4 turns for 40 to 80 ohms.

If the amplifier is to be used with a separate exciter, as in this instance, the input network is designed and adjusted to match the low-base input impedance to 50 ohms, the usual output impedance of such an exciter. Where the amplifier is to be part of a transmitter, the collector circuit of the driver can be connected in place of J1. To provide for matching the capacitors C1 and C2 should be made variable in this case. A better way would be to make a toroidal matching transformer similar to L2-L3-L4, using slight alterations for this application given under Fig. 1. In the first case there are two unknowns present: The output capacitance of the driver and the input impedance of the amplifier base. This makes optimum adjustment rather complicated, since the output capacitance of the driver stage varies with its collector load impedance. With the tuned circuits in both stages, the driver can be optimized for 50 ohms and will work equally well when the amplifier is installed.

There are additional advantages. The tuned network will provide at least twice the harmonic rejection, and there will be much less loading of the previous stages by the final amplifier. The latter is very important in simple VFO-controlled transmitters, where pulling of the oscillator can result in considerable difference in frequency between the SPOT and OPERATE conditions.

The circuit used for the output network is a matter of personal preference. The double-link tank shown yielded an efficiency in excess of 50 percent at 7 MHz, so it was left in. In a 20-meter application the efficiency was about 40 percent. Conversion to the network described by Hayward (reference 2) brought the efficiency up to 62 percent.

Test Equipment

Three simple instruments, shown schematically in Fig. 2, were used in the development of the amplifier: A roughly calibrated wavemeter capable of tuning to the desired frequency and to its second harmonic, a power-output indicator, and an impedance bridge. The wavemeter, Fig. 2A, was calibrated with the aid of a multiband transmitter.

The power-output meter, Fig. 2B, should be isolated from the transmitter and dummy load by shielding and RFC2. Actual output is obtained from the formula:

$$P_o = \frac{V^2}{2R_1}$$

The meter is used to measure power output from a driver or amplifier stage during developmental work. Remember that it is not frequency sensitive. It will read combined fundamental and harmonic power, hence the need for the wavemeter.

The variable impedance bridge, Fig. 2C, is similar to one described by Hayward (reference 2) except that the diode is connected to the arm of a 1000-ohm variable control, instead of to the junction of two 470-ohm resistors. The control can be calibrated by connecting fixed resistors of known value across the output. Adjust the control for null, and mark down the resistance value used for that setting. When you want a circuit to look like, say, 70 ohms, you set the control to 70 and adjust the circuit for null. Parts placement is not critical, but it is wise to use short lengths of coaxial line in connecting the bridge into the circuit to be tested, and to ground both braids at the same point.

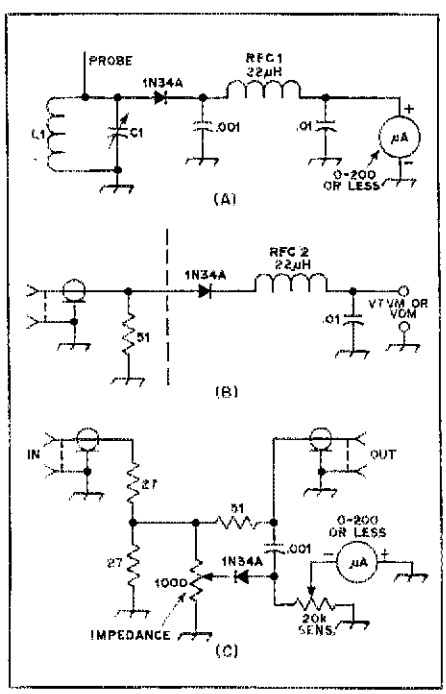


Fig. 2 — Simple test equipment used in optimizing the solid-state amplifier includes a wavemeter, A, a power-output indicator, B, and a variable impedance bridge, C. Values of L1 and C1 depend on the band being checked. Parts designations are for text reference.

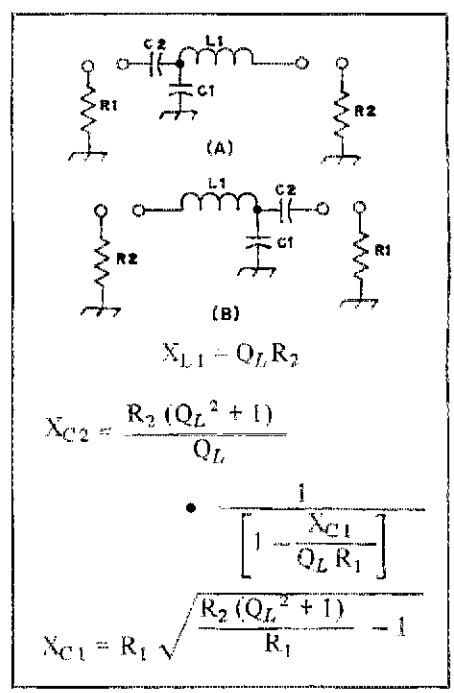


Fig. 3 — Basic circuit for use with Tables 1, 2 and 3. Circuit A, for Tables 1 and 2, shows the network for input matching. B is used in matching the amplifier to 50-ohm output. The formulas are for operating conditions other than those assumed in the tables.

If the bridge is to be used only between 50-ohm circuits, coaxial connectors will be suitable, as shown.

Construction and Testing

Armed with the above assumptions and test equipment, we can monitor several aspects of the circuit operation in the process of getting the amplifier to work properly. This is a rough duplication of the procedure followed in the manufacturer's laboratory in determining the performance characteristics of a device for given sets of conditions. These appear later on a data sheet. Our purpose is not quite the same, in that we are not looking for a set of "numbers." Rather, we seek to take into account automatically the actual characteristics of the device *on hand*, in achieving optimum operation for our application.

An experimental amplifier can be bread-boarded or built on a circuit board similar to the one shown. It is recommended that a single parallel-tuned circuit be used for the output side of the amplifier during developmental work on the input matching. It can be replaced when the work is completed. Calculated values for both input networks, and the output network, Fig. 3A and B, respectively, are given below for the hf bands.

Table 1
Input network, R1 = 50Ω, R2 = 5Ω, Q = 5.

	3.5	7	14	21	28 MHz
X_{L1} = 25Ω	1.25	0.63	0.29	0.2	0.18 μH
X_{C1} = 31Ω	1400	700	380	260	170 pF
X_{C2} = 64Ω	750	370	180	150	85 pF

Table 2
Input network connected to driver stage collector and load impedance of 70 ohms (1.25 watts at 12 volts dc), R1 = 5Ω, Q = 5.

		3.5	7	14	21	28 MHz
X_{L1}	40	1.25	0.63	0.29	0.2	0.18
X_{C2}	21	1700	1100	580	380	260
X_{C1}	64	750	370	180	150	85

Table 3
Output network, final collector impedance 8Ω, (10 watts output at 13.6 volts dc), 50Ω load. (From Motorola AN-267.)

		3.5	7	14	21	28 MHz
X_{L1}	40	2.0	0.95	0.49	0.3	0.23
X_{C1}	65	720	350	175	125	90
X_{C2}	89	530	260	140	90	65

The formulas given in Fig. 3 can be used to calculate approximate values, should the driver stage operate at a different power level or load impedance. C1, C2, and L1 should be variable, to allow for initial adjustments. Inexpensive broadcast-receiver capacitors, 365 pF, are ideal for tuning. Where higher capacitance is needed, fixed-value micas can be connected across the variables. A 40-meter amplifier is shown in Fig. 1 with component values arrived at by experiment, as described below.

Apply at least 500 mW of drive to the network through the impedance bridge. The network is adjusted for deepest null, first by C1, where the indication will be broad, then by C2, which gives a deeper null, and finally by L1. This is done with the wavemeter coupled to the final-amplifier tank, and the output meter connected to the tank as an indicating load. No dc voltage is applied to the amplifier thus far, as only the feed-through energy will be monitored at this point. With one watt of drive there should be 5 to 15 mW showing on the output meter, when the latter is tuned to the drive frequency. Remove the impedance bridge and repeak slightly for maximum feed-through indication.

Set the wavemeter to the second harmonic frequency. If the drive is clean and the circuits are properly tuned, there should be little or no output detectable at the harmonic frequency. Recheck tuning for minimum harmonic level, if any shows. Optimum adjustment should give maximum fundamental output and rejection of harmonic output.

Apply collector voltage, with no drive. If the transistor is the balanced-emitter type, full collector voltage may be used. With other types it is well to start with about 70 percent of the maximum. De-couple the wavemeter, in anticipation of the 40-dB increase in power to be expected, and apply drive. Readjust both input and output networks for maximum output and minimum harmonic power. The wavemeter should be coupled to the lead going to the output meter for the latter check, as harmonic currents circulate in the output tank, and coupling to it will give an erroneous reading of harmonic level when the amplifier is running normally. Measure the dc input power and the rf output power and compute the efficiency which should be at least 40 percent. Substitute the double-tuned tank circuit for the simple parallel-tuned one, if the output is low.

If an external exciter is to drive the amplifier, no further adjustment is required, and the amplifier is ready for service. If you intend to connect the input network directly to the driver collector, the impedance bridge is set to the desired collector load impedance Figure (70Ω for 1.25 W at 12 V), and adjustment is made for best match. Each of these steps monitors some aspect of circuit operation, using the actual components available, and gives assurance that optimum results are being obtained.

The amplifier shown in the photograph was adjusted by these methods and was ready for use, in the last hours before Field Day, in about a half hour after it was assembled. Running at reduced power, it gave a good account of itself on 40 meters the following day, using the exciter previously described by the writer.

References

[1] Johnson and Artigo, "Fundamentals of Solid-State Power Amplifier Design," Part III, *QST*, April, 1973.

[2] Franson, "How to Use RF Power Transistors," *Ham Radio*, January, 1970. Hayward, "Increased Power for the Solid-State Amplifier," *QST*, May, 1972. Lowe, "15-Watt Solid-State Linear," *QST*, December, 1971. Heihall, "Broadband Solid-State Power Amplifiers," *QST*, March, 1972. Schoening, "Transistorized Amplifier for 40 Meters," *73*, August, 1964. White, "Thermal Design of Transistor Circuits," *QST*, April, 1972.

[3] Weiss, "Multiband FET VFO QRP$_p$ Transmitter," *Ham Radio*, July, 1972. QST

Strays

Amateur radio will join festivities in the 1976 quincentenary celebration at Stow-on-the-Wold, England. The celebration will mark twin historical events significant to town residents. In 1476, King Edward IV signed a special charter to allow the people of Stow-on-the Wold to hold an annual horse fair. Ever since, this event has attracted equestrians from far and wide. The same year, 1476, saw completion of the town's church tower.

To commemorate these two events, townspeople of Stow are staging numerous festivities from May through October: A medieval market with period costumes, an ox roast, exhibitions, and a carnival.

As part of these festivities, local amateurs under the direction of Harry Heath, G2AOK, will set up a special commemorative station, GB2SW, in the market square. Contacts with GB2SW will be confirmed with special QSL cards. The station will be operative from 0900 to 1900 UTC on all bands, 160 through 10 meters, May 1-31.

One KW—Solid-State Style

Part 2: Part 1 of this paper described the 300-W power blocks of the system. Here is the wrap-up information.

By H. Granberg,* WB2BHX/OH2ZE/7

The driver contains a pair of MRF427A devices. It follows the same circuit-board pattern as the power amplifiers, output transformer excepted. The input transformer has a 4:1 impedance ratio. Minimum inductance in the one-turn secondary is:

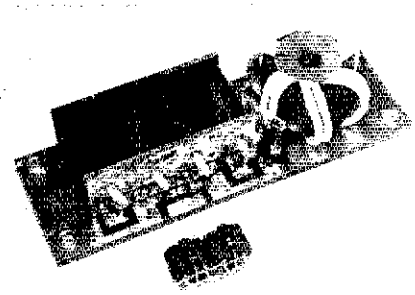
$$\frac{4R}{2\pi f} = \frac{4 \times 12.5}{12.5} = 4\mu H$$

The foregoing applies also to the output transformer, which is a 1:1 balun. The required minimum inductance at 2 MHz is 16 μH, amounting to 11 turns on a Ferroxcube 2616P-A100-4C4 pot core, which was preferred over a toroid because it is easier to mount. The transformer is wound with RG-196 coaxial cable, the type which is used also for interconnecting the driver to the remainder of the amplifier.

The component values for the base input network and the feedback system were established by computer. Neither amplifier employs low-frequency compensation. C7 and C8 are dc blocking capacitors. Their value is not critical. Leads *b* and *c* of T2 represent the rf center tap, but are separated in both designs, partly because of layout convenience and also for stabilization purposes.

Combining Four 300-W Power Modules

The input power divider establishes four equal sources and provides reasonable isolation between each. The outputs are designed for a 50-ohm impedance, which sets the common input at 12.5 ohms. This requires an additional 4:1 step-down transformer to provide a 50-ohm load for the driver amplifier. Another requirement is a 0° phase shift between the input and the 50-ohm outputs, which can be accomplished with a 1:1 balun (*a*, *b*, *c* and *d* in Fig. 6). For improved low-frequency isolation the line impedance must be increased for the parallel currents. This can be done by loading the line with magnetic material. In this type of transformer the currents cancel, making it possible to employ high-permeability ferrite and a relatively short physical length for the transmission lines. In an absolutely balanced condition, no power will be dissipated in the magnetic cores, and the line losses are minimized. The required minimum inductance for each line is 16 μH at 2 MHz. A low inductance value degrades the isolation characteristics between the 50-ohm output ports, which is necessary to maintain a low SWR, should a change in the input impedance occur in one or more of the power modules. Because of the base-compensation networks, the power splitter will never be subjected to a completely open or shorted load.



View of the assembled hybrid combiners. The large unit is the output combiner.

Balancing resistors R dissipate the excess power if the SWR increases. The optimum values for R, which are equal, are determined by the number of 50-ohm sources assumed unbalanced at one time. The resistor values are calculated accordingly.

If we examine the currents with one load open, it can be seen that the excess power is dissipated in one resistor in series with three parallel ones. Their total value is 50 – 12.5 = 37.5 ohms. Similarly, if two loads are open, the current flows through one resistor in series with two parallel ones, totaling 37.5 ohms again. The situation is illustrated in Fig. 8.

Except for a two-port power divider,[6] the resistor values can be calculated for odd or even number systems as:

$$R = \left[\frac{R_L - R_{in}}{n+1}\right] n$$

where R_L = impedance of the output ports (50 ohms), R_{in} = impedance of the input port (12.5 ohms), and n = the number of output ports, properly terminated. Although these resistor values are not critical in the input divider, the formula applies also to the input combiner, where mismatches have a larger effect on the total power output and linearity.

The practical power divider employs large ferrite beads (Fair-Rite 2673000801, Amidon equivalent, or Stackpole 57-1511-24B) over a 1.2-inch piece of RG-196 cable. The arrangement is shown in Fig. 7. The ferrite materials have a permeability of 2500, and the inductance for one turn is in excess of 10 μH. Step-down transformer T1 (Fig. 7) is wound on a Stackpole 57-9322-11 toroid core with 25-ohm miniature coaxial line. Seven turns will give a minimum inductance of 4 and 16 μH, required at 2 MHz. The structure is mounted between two phenolic terminal strips. This provides a sufficient number of tie points for the coaxial cable connections.

Output Combiner

Output combiner operation is reversed from that of the input power divider. We have four 50-ohm inputs and one 12.5-ohm output, which is transformed up to 50 ohms by means of a 1:4 transformer. An arrangement similar to that of the input divider is employed in the combiner. The baluns consist of straight pieces of coaxial cable which are loaded by a sleeve of ferrite. The line length is determined by the physical dimensions of the sleeves, for which the μ versus cross-sectional area should be

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Note: Part 1 appeared in April *QST*.

*This and all subsequent footnotes can be found at the end of this article.

calculated or measured to give sufficient loading inductance.

These straight-line baluns have the advantage over multi-turn toroidal types in introducing a smaller possibility for phase errors, because of the line length. The greatest phase errors occur in the input and output connecting cables, whose lengths are 18 and 10 inches, respectively. All four input and output cables must be of equal length (within 1/4 inch), and the excess in some, caused by unsymmetrical layout, can be formed into loops. The connecting cables between the power-amplifier outputs and the combiner are made of RG-142B/U cable. The balun lines are made from the same type of cable. The length is not critical since it is well below the maximum length permitted at 30 MHz. The minimum inductance is 16 μH per line. Fig. 9 shows the electrical design of the four-port combiner.

The power output with various numbers of disabled sources (Figs. 8 and 9) can be calculated as:

$$P_o = P_n - P_R + \frac{P_R}{n}$$

where n = number of operative sources, P_n = total power of operative sources (watts), and P_R = power (watts) dissipated in the balancing resistors. Thus, for one disabled source:

$$P_R = 250 \left[\frac{28.13}{50}\right] = 140.65 \text{ watts.}$$

$$P_{out} = (250 \times 3) - \left[140.65 + \frac{140.65}{3}\right]$$

$$= 750 - 187.5 = 562.5 \text{ watts.}$$

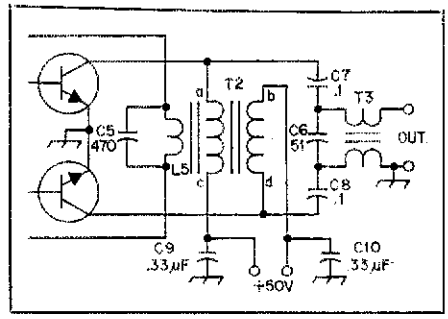
This is assuming that the phase errors between the active sources are negligible.

From the foregoing we see that 140.65 W will be dissipated by one of the balancing resistors, and only 15.6 W by the other three. For this high power dissipation the resistors must be a type which can be mounted on a heat sink, and they must be the noninductive type. After experiments with noninductive wire-wound resistors, which exhibited excess inductance at 30 MHz, and were bulky, some Motorola thin-film attenuators were modified for this application. The balancing resistors can be seen on the upper side of the combiner, which is shown in the photograph. Similar attenuators and terminations are available from EMC Technology, Inc., Solitron Devices, Inc., and other manufacturers of microwave components.

The purpose of T2 is to transform the 12.5-ohm impedance from the combiner up to 50 ohms. It is a 1:4 transmission-line transformer.[3,4,7] The line is made of two RG-188 coaxial cables connected in parallel in the manner shown in Fig. 10. The impedance becomes 25 ohms, but depending on how close the cables are to each other physically, it can be as low as 22 ohms. The line inductance is 16 μH for the 50-ohm side. This is achieved by winding several turns of dual cable on a magnetic core. In contrast to the balun transformers in the combiner, the line currents do not cancel. The magnetic core must handle the full power, and must be made of low-loss material. A toroid provided the shortest line length for a specific inductance. Two stacked units resulted in a shorter line length than was possible with a single larger core with similar cross-sectional area. Six turns on two Indiana General F626-12-Q1 toroids give 4.8 and 23 μH for the secondary, the line length being 16 inches.

Fig 6 — Schematic diagram of the driver module output circuit. The remainder of the circuit is similar to that of the power modules shown in Fig. 3 of Part I. The differences are given below.

C1, C2 — 3300 pF.
C3 — 39 pF.
C4 — Not used.
C5 — 470 pF.
C6 — 51 pF.
R1, R2 — 7.5-ohms 1/2-W composition.
R3, R4 — 18-ohm 1/2-W composition.
T1 — 4:1 transformer (see text).
T3 — 11 turns of RG-196 miniature 50-ohm cable on the bobbin of a Ferroxcube 2616P-A100-4C4 pot core.



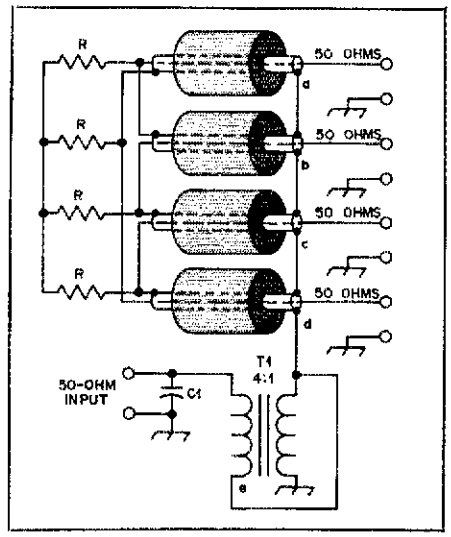


Fig. 7 — Details of the four-port power combiner.

In continuous operation the core temperature was measured as 95 to 90° C. This resulted in a decision to change the core material to the Q2 variety, which exhibits about 70% lower loss at 30 MHz. The lower permeability (35) yields 13 μH for the same number of turns. The maximum flux density of the toroids is:

$$B_{max} = \frac{V_{max} \times 10^2}{2\pi f n A} \text{ gauss}$$

where V = peak voltage across the

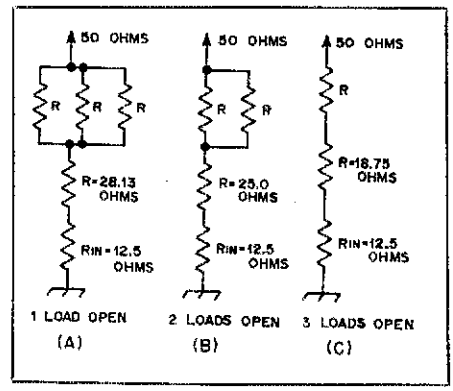


Fig. 8 — Various possibilities for open loads.

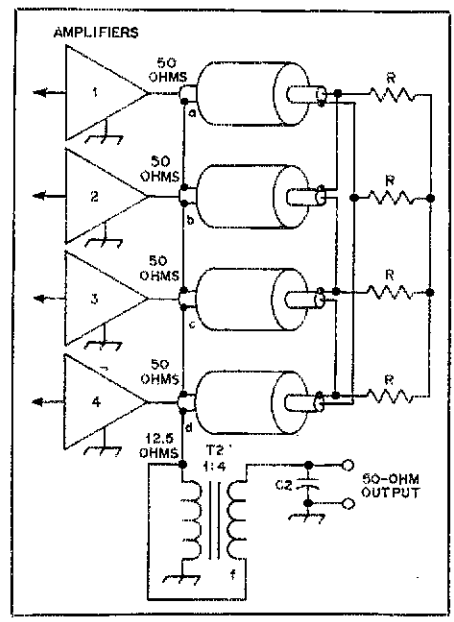


Fig. 9 — Circuit of the four-port output combiner.

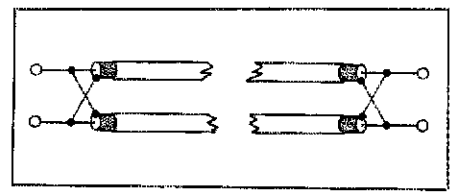


Fig. 10 — Cable connection for the 1:4 transformer used at T2.

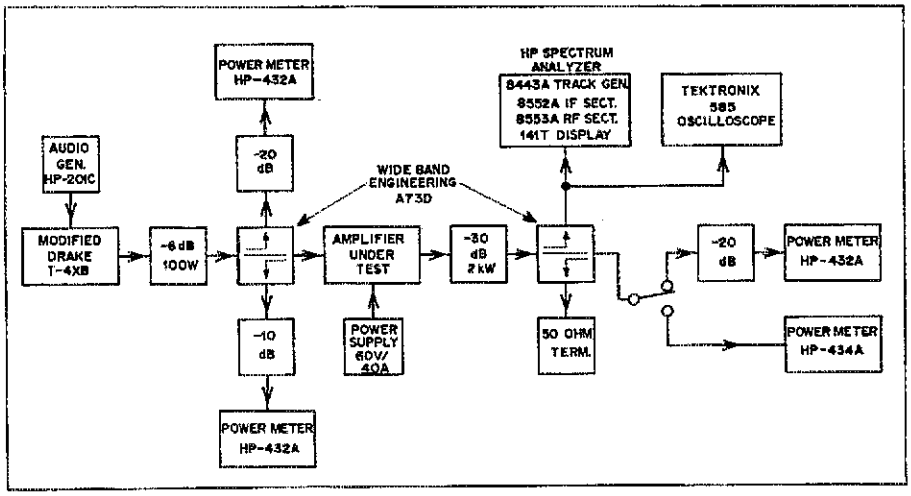


Fig. 11 — Test setup for checking amplifier performance.

secondary 50-ohm point (316.2 V), f = frequency in MHz (2.0), n = number of turns at the 50-ohm point (12), and A = core cross-sectional area (1.21 cm^2). Therefore:

$$B_{max} = \frac{316.2 \times 10^2}{6.28 \times 2 \times 12 \times 1.21}$$

$$= 260 \text{ gauss.}$$

From the BH curves we can see that the linear portion extends up to 800-1000 gauss, and the saturation occurs at over 3000 gauss. Comparable materials are Stackpole grade 14 and Fair-Rite 63. Core losses are minimal as compared to line losses, which for a 16-inch length amount to .035 dB.

As in the input transformer, the hf compensation (C2) was not required. The layout of the combiner and T2 is such that minimum lead lengths are obtained, and the structure is mounted on a pc board having feedthrough eyelets to a continuous ground plane on its lower side.

Measurements

Six 300-W modules were built with matched-pair MRF-428s. The maximum gain distribution was 0.9 dB. In the four units selected for the amplifier the gain varied from 13.7 to 14.1 dB at 30 MHz. It was not necessary to utilize the input attenuators. Fig. 16 shows the arrangement for the test setup used in testing the modules and combined amplifier.

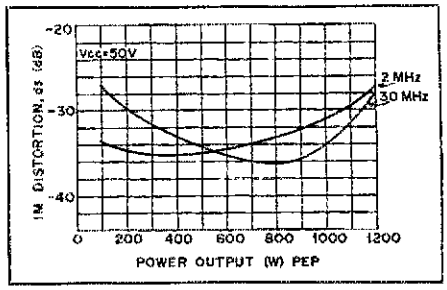
Closing Remarks

The heat-sink design is beyond the scope of this report. Therefore, the details which follow do not represent an optimized design, but provide data for adequate sinking for short-period two-tone or cw conditions at full power. The heat sink consists of four 9-inch lengths of Thermalloy 6151 extrusion, each having a free-air thermal resistance of 0.7° C/W. They are bolted in pairs to two 9 X 8-1/2 X 3/8-inch copper plates, to which the four power modules are mounted. Assuming a coefficient of 0.85 between two parallel extrusions, a total thermal resistance of 0.4° C/W is realized. Two of these dual extrusions are mounted back to back to provide a channel for the air flow from four Rotron SP2A2 4-inch fans. Two fans are mounted at each end of the heat sink, and the four fans operate in the same direction to deliver an air flow of approximately 150 cfm.

The third-order harmonic is only 14 dB below the fundamental at certain frequencies, as can be seen in Fig. 15. This number is typical in a four-octave amplifier, and it is obvious that some type of output filter is required when the amplifier is used for communications purposes.

Fig. 13 shows the IMD characteristics of the amplifier as provided by means of a spectrum analyzer. The purpose of this paper has been to illustrate how a high-power solid-state amplifier can be designed and tested. Although this presentation was not intended as a construction project, those interested in building one or more of the individual 300-W amplifier modules can order components from M-RED-C & L, 1475 Oakdale, Pasadena, CA 91106. In quantities of 1 to 9 the finished double-sided pc board (without components) is $22.50. A set of three wound transformers costs $15, and a complete assembled board (minus transistors) is $69. Scale pc-board templates for the double-sided board are available from The ARRL for 50¢ and a large s.a.s.e.

Fig. 12 — Curves for IMD versus power output.



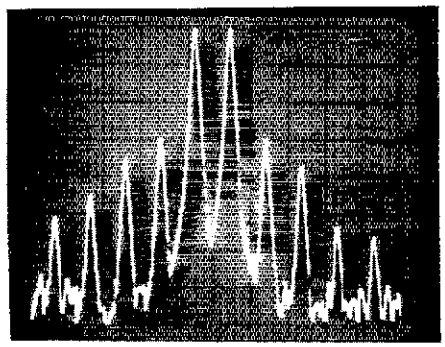
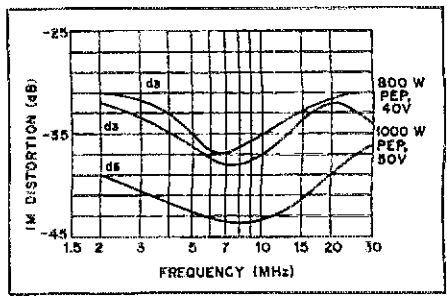


Fig. 13 — Spectral presentation of the IMD products through the 9th order (10 dB per division vertical scale).

Fig. 14 — IMD versus frequency at 800 and 1000 watts PEP, 40 and 50 volts supply.



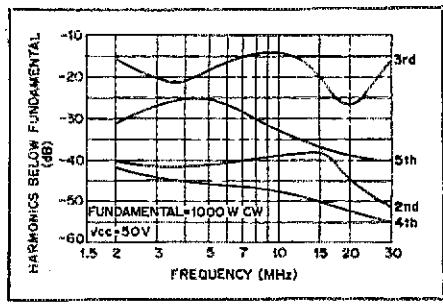


Fig. 15 — Curves for frequency versus harmonic level in dB.

Footnotes

[6] Krauss-Allen, "Designing Toroidal Transformers to Optimize Wideband Performance," *Electronics*, Aug. 1973.

[7] *Philips Telecommunication Review*, Vol. 30, No. 4, pp. 137-146, Nov. 1972.

References

[1] Ruthroff, "Some Broad Band Transformers," *IRE*, Vol. 47, Aug. 1957.

[2] Lewis, "Notes on Low Impedance H. F. Broad Band Transformer Techniques," Collins Radio Company, Nov. 1964.

[3] Hejhall, "Solid-State Linear Power Amplifier Design," Motorola AN-546 application note.

[4] Lefferson, "Twisted Wire Transmission Line," *IEEE Transactions on Parts, Hybrids and Packaging*, Vol. PHP-7, No. 4, Dec. 1971.

QST

The 40-Meter Triangle

Hams like to experiment with antennas. Here's one that should pique your interest!

By Byron Self,* WB6UFW

Are you looking for a good DX antenna for 40 meters that doesn't cost a fortune? One that is simple to make? Well, that's what I have and, with so many requests for information about the system, I decided to write an article about it. The antenna is a triangular-shaped full-wavelength loop, similar to an inverted Delta Loop element. The triangle measures one-third wavelength on each side, making it an equilateral triangle.

I had been using an inverted V, so all that was necessary to convert that antenna to a full-wavelength loop was to add another half-wavelength wire and to move the feed point to the bottom of the loop, at the center (see Fig. 1): The former feed point at the top of the inverted V was shorted together to make the full-wavelength loop.

The apex height of the inverted V and triangle was the same — 35 feet — and I immediately noted a difference in the performance of the triangle compared to that of the inverted V. The triangle was much better! This antenna is similar to a quad loop, and, of course, the quad has some gain over a half-wavelength dipole. Another advantage of the triangle is that only one support is required. This article provides information on making the antenna, plus an installation method that I found very satisfactory.

Construction

The first step is to measure the antenna wire. Use the formula: $1000 \div f$ (MHz) to obtain the overall wire length. Next, find the center of the total length by temporarily securing both ends a couple of feet apart. Then, while keeping the wire from becoming tangled, lay out both wires so they meet at the farthest end. Mark this place by forming a small bend in the wire. Next, slide the apex insulator (Fig. 2) onto one end of the wire and along the wire until it comes to the bend in the wire. By rotating the insulator, the wire will twist together and secure the insulator at the desired point. Calculate one-third wavelength using the formula in Fig. 1. Then measure this length from the apex insulator toward the ends of both wires. Attach insulators at these points, using the same twisting method as described previously. Solder both ends of the wire together to complete the loop. The ends can be twisted together, then soldered to provide additional strength at the connection.

Installation

Many hams have a tower that the antenna can be installed on, but others may wish to use a homemade mast installed against the side of the house, as I have done. The mast I used was a 20-foot length of 2-inch OD galvanized steel pipe, with a 20-foot telescoping mast inside. At the top, a 10-foot length of 7/8-inch conduit is installed. Figs. 2 and 3 show most of the mounting

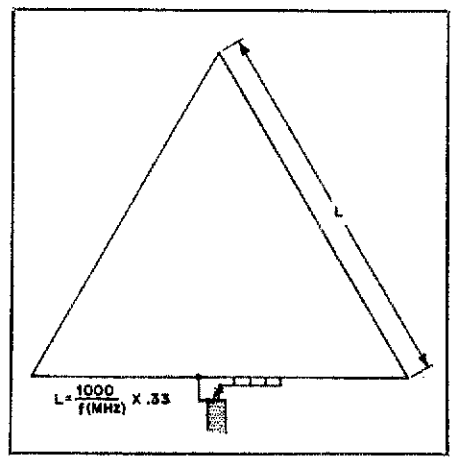
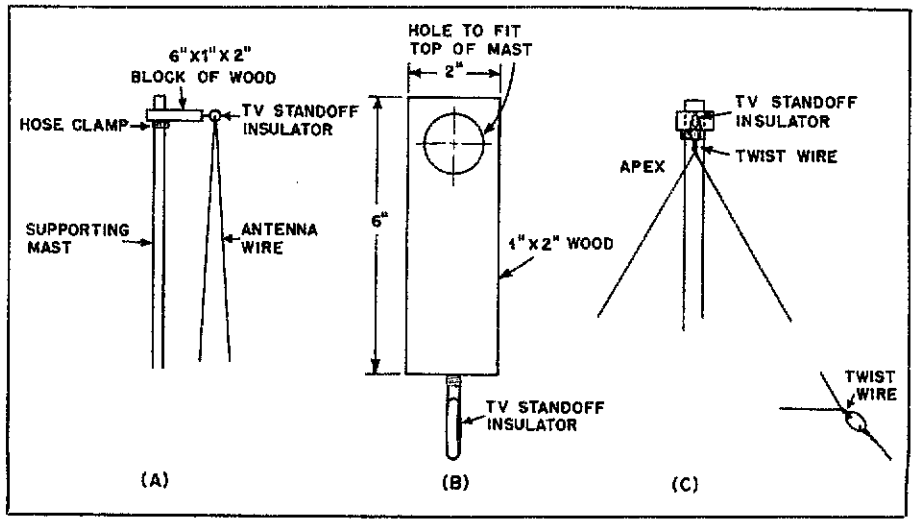


Fig. 1 — The 40-meter triangle or Delta Loop. The length of one side L, is equal to:

$$\frac{1000}{f\,(\text{MHz})} \times 0.33$$

Fig. 2 — Details of the apex insulator.



*9859 Maple St., Bellflower, CA 90706

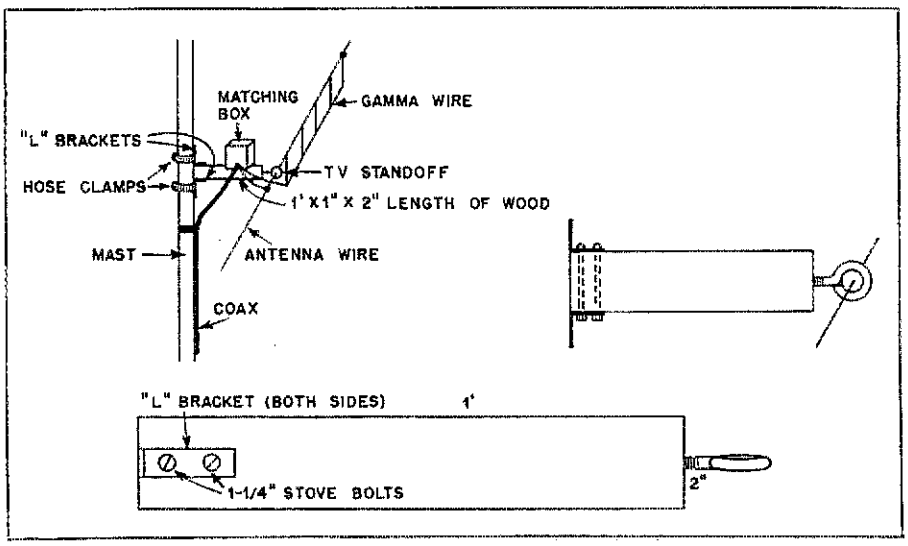


Fig. 3 — Gamma-match box mounting information.

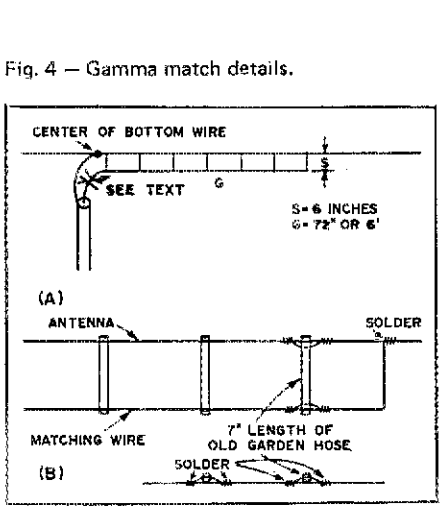
details. First, slide a hose clamp over the top of the mast and tighten it in a position about 3 or 4 inches from the top of the mast. Put the apex insulator over the top of the mast so that it rests on the hose clamp. The mast can now be raised and mounted permanently to the side of the house. I used a homemade bracket at the peak of the roof to secure my mast.

Nylon cord or a heavy grade of nylon fishing line can be used at the lower corner insulators. These lines should be tied off as taut as possible to prevent sag at the bottom of the antenna. Mount the bottom center insulator on the mast, (Fig. 3) and attach the antenna wire to the insulator.

The Gamma Match

Next, the gamma match can be installed on the antenna. Refer to Fig. 4 for electrical details of the matching section. I mounted the gamma capacitor in a waterproof container (such as a plastic refrigerator box). The capacitor I used was a variable 365-pF broadcast-type plate which does not arc with my 100 watts. For higher powers, at least .025-inch plate spacing should be used. A gamma-matching system requires about 7 pF per meter, so 40 meters requires about 280 pF. Mount the gamma box on the bottom center insulator by means of a couple of screws. Solder the outer conductor of the coaxial feed line to the center of the bottom wire of the antenna. Solder the center conductor of the coaxial line to one side of the capacitor and the gamma wire to the other side of the capacitor.

Fig. 4 — Gamma match details.



Matching

Matching the antenna to the line isn't difficult. All that is needed is an SWR indicator and a helper to adjust the capacitor while you operate the transmitter and observe the SWR indicator. Feed enough power into the feed line to get a reading on the SWR indicator. Then adjust the gamma capacitor to the lowest reflected SWR reading.

Evaluation

This antenna has been effective while working DX. I have contacted with my 100 watts, EA8, FP8, KP6, FWØ, and lots more on 40 meters from here on the West Coast. Many of these QSOs were in pile-ups, and I was always the first to fifth station called.

Of course the triangle can be built for any band. Also, with two supports and a line strung between them, it would be possible to use the triangle as a fixed-direction parasitic array. I suggest using the standard quad formulas for directors or reflectors. One last point: This has been a very inexpensive antenna. I made mine from galvanized bailing wire that sells for about one-half cent a foot. QST

50 Years Ago

May, 1926

□ The synchronous rectifier often produces more hash than carrier, so *QST* hasn't encouraged it much; but now some new schemes are outlined by Technical Editor Kruse to stop the sparking. The treatise makes good use of others' ideas, including some from Bob Morris, 2CQZ.

□ "When the craving for DX reaches the proportions of an obsession, when it blinds its possessor to the realization that there are other forms of amateur activity, it is just as bad as any other form of intemperance," says the Editor. 'Twas ever thus.

□ Readers who started the "how to become" transmitter last issue can now finish up the job with a power supply including a 15-jar lead-aluminum rectifier. Couple the rig to 130 feet of antenna and counterpoise and you're ready to go.

□ Lou Hatry says a single-tube reflex circuit doesn't save much, but the four-tuber he describes represents a real saving in tube cost and battery consumption.

□ The crystal-control rig can be highly temperamental, but Stan McMinn shows us an orderly procedure for adjustment to achieve good results.

25 Years Ago

May, 1951

□ Technical Editor Grammer says double-sideband, reduced-carrier transmission doesn't quite match s.s.b. efficiency, but is a good step in that direction and a great improvement over a.m. His treatise explains why.

□ The mysteries of ground resistance and how to measure it are tackled by K2BZ, with the conclusion that 8 feet of ground rod is an optimum depth, and that a series of such rods connected by bus achieves minimum resistance.

□ "There are many rewards in amateur radio," says staffer W1IKE, who then proceeds to describe the various ARRL and other awards for achievement in amateur operating.

□ Now that we have new civilian defense rules, W1HDQ has come up with a four-pound, 6-meter portable unit which National Emergency Coordinator W1NJM demonstrates on no less a place than the cover.

□ The BC-610 is big in war surplus, but also in interference to TV, so W4CVO details a number of remedies to keep signals out of the neighbor's picture.

W1RW

Product Review

Motorola MRF472 HF-Band Power Transistor

The burgeoning CB market has inspired a new Motorola plastic power device which is designated MRF472. The component is an npn silicon type which is meant for Class C amplification, with a-m modulation, at 27 MHz. It looks like a winner for cw work from 1.8 to 30 MHz!

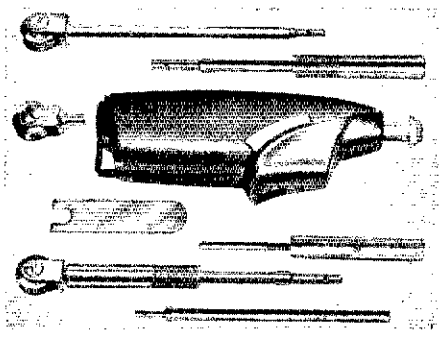
It comes in a Case 77 plastic package with a metal center surface for attaching an external heat sink. The collector is common to the metal face, in which a hole exists for mounting purposes.

Maximum ratings are: V_{CEO}, 30 V; V_{CBO}, 60 V; V_{EBO}, 3 V; I_C, 1 A; P_D @ T_C of 25° C, 10 W; power gain, 10 dB and power output @ 150-mW input, 4 W. With 200 mW of drive the power output is 5 W. Based on the foregoing information it seems that some interesting amateur possibilities exist for parallel or push-pull combinations of these transistors. Price class is $1.50 each. Full details appear on Motorola's data sheet, available on request from Motorola Semiconductor Products Inc., Box 20912, Phoenix, AZ 85036.

WIRE-WRAP FAMILY OF TOOLS

Those who experiment with logic and other non-rf circuits should find the wire-wrap method of breadboarding a useful one. A test fixture can be put together quickly when using the wire-wrap method with IC sockets and perforated board. Vector Electronic Company is presently marketing a low-cost collection of tools for this purpose. The line includes what they call a Dual-Way Wrap-N-Strap tool, a Dual-Way unwrap implement, and a rechargeable power driver. These items are shown in the photograph. Wire sizes 22 through 30 can be accommodated, as can three popular post sizes.

The power driver contains Ni-cad batteries, but a separate ac-operated supply is available. Vector will sell these tools direct, but they are also available through Vector distributors. Kits are available for either right- or left-hand rotation. Price class is $50. Vector Electronic Company, Inc., Sylmar, CA 91342.



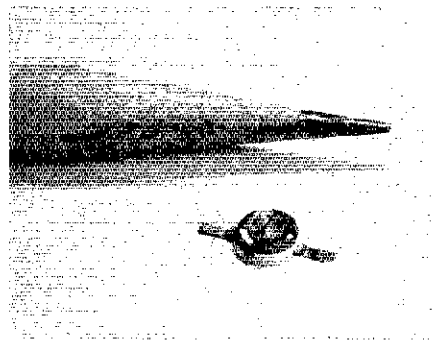
MICROMINIATURE CERAMIC ROTARY TRIMMER CAPACITORS

One of the stumbling blocks for an amateur who wishes to build compact equipment is the difficulty in obtaining miniature components. This includes the trimmer capacitors used for setting crystal oscillators to a precise frequency, as tuning elements in resonant circuits, or wherever a really small variable-capacitance element is needed.

The ECV-1NW miniature ceramic trimmers should help shrink the size of some home-built projects. Manufactured by Matsushita Electric Industrial Co., Ltd., the ECV-1NW series covers several capacitance ranges that will be useful to the builder or designer. Number ECV-1NW4OT72, shown in the photograph, has a nominal range of 5.5 to 40 pF. Other ranges available are 2.5 to 10 (ECV-1NW1OT72) and 5.0 to 20 pF (ECV-1NW2OT21). The first two capacitors listed have a diameter of 0.197 inch, and the 2OT21 is of 0.157-inch diameter.

In addition to the line of capacitors, available since our catalog was obtained, is a 25-pF unit (25T72B) and a series that is physically smaller than those described above (3OT18B). Price in quantity of 1 to 9 is $2.75 ea., 10 to 24 is $2.50 ea., 25 to 99 is $2.40. Above 100 the price drops to $2.25 each.

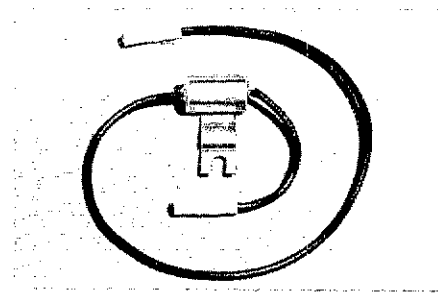
Units are available off-the-shelf from Nurmi Electronic Supply, 1727 Donna Rd., West Palm Beach, FL 33401. – *WISL*



IGNITION-NOISE FEEDTHROUGH CAPACITOR

Cornell-Dubilier Electric has released a new coaxial feedthrough capacitor for automotive use in eliminating noise from heater motors, rear-window defoggers, air horns, and the like. It is called the CBFT 864, will handle 50 volts dc at 30 A, and is a 0.25-μF unit.

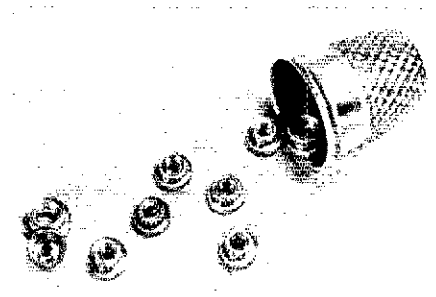
This product should be useful to amateurs who have problems suppressing noise from the various vehicular accessories. Connection to the noisy item is made by cutting the original supply lead, then inserting the capacitor in series with the line at that point. The capacitor is furnished with a "crimp-splice" fitting on each pigtail. The case must be grounded to the automobile body. Further information is available from Cornell-Dubilier, Newark, NJ 07105.



SPLINE NUTS FOR BUILDERS

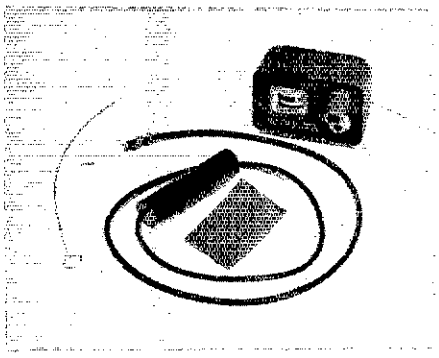
Press-in spline nuts are available from Precision Metal Products and are supplied in carbon-steel, nonmagnetic, and stainless steel materials. They are ideal for use with pc boards, epoxy laminates, Nylon, and aluminum castings.

The splines on the nuts cut their way into the material as they are pressed into place, thereby exhibiting good torque resistance. They are relatively immune to pull-out force, once installed. A catalog is available from the manufacturer. Precision Metal Products Co., 41 Elm Street, Stoneham, MA 02180.



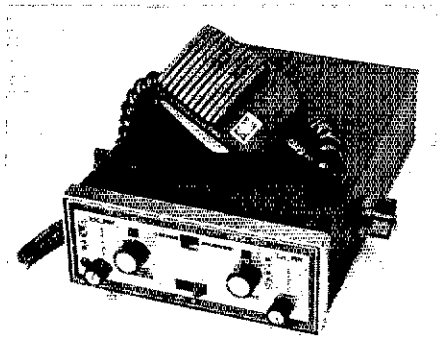
LS-10B FIELD-STRENGTH METER

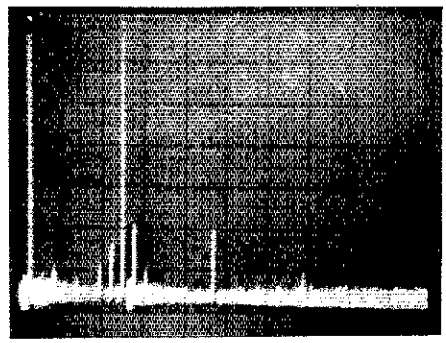
Ever need a field-strength meter that's so compact it will fit in your shirt pocket? If so, Infinite Inc. had you in mind when they designed their field-strength meter. It measures a mere 1 × 1-1/4 × 2 inches and will detect rf energy from 50 kHz to 1000 MHz. No tuning is required and it will respond to signal levels as low as 4 mW, but won't be harmed by a 1-kW signal. A front-panel headphone jack has been included should one wish to monitor his a-m signal. A 12-inch whip antenna is supplied, and a super-sensitive rf probe is available as an accessory. Either may be connected to the binding post on the front panel. The instrument is supplied with a small piece of sticky-backed Velcro dry adhesive material so that the instrument may be placed at the operating position in the home or car without the probability of it being dropped and damaged. The Velcro may be stuck together and separated a countless number of times without losing its adhesive property, allowing the unit to be removed from its permanent location for field work. The price class is $12 without the super-sensitive probe, and $17 with the probe. The instrument is available from Infinite Inc., 151 Center St., Cape Canaveral, FL 32920. – *WA1LNQ*



GENAVE GTX-100 220-MHz TRANSCEIVER

The crowded repeater spectrum on 2 meters is forcing people to look for other frequencies for repeater operation. The 220-MHz band now takes up this burden. In response, General Aviation Electronics Company is marketing the Genave GTX-100 for 220 MHz. The unit provides ten standard possible repeater pairs, or 100 different receive/transmit combinations. It is possible for the operator to select a receive channel that does not correspond with the transmit frequency. The compact unit size





allows the transceiver to be tucked away under the dash. One interesting feature is the locking device provided for the cradle. The normal thumb screw for one side is replaced with a comparable bolt. This bolt holds the transceiver and the locking device to the cradle. After the unit has been installed, it is possible to insert a lock over the bolt head. Removal of the transceiver from the cradle without a key for the lock and a nut driver would be difficult at best.

Circuitry

The receiver is a fairly standard dual-conversion superheterodyne. The signal goes through two sections of filtering prior to reaching the first mixer. The mixer converts the signal down to the first i-f of 13.1 MHz. This signal is amplified and then converted down to the second i-f of 455 kHz. Prior to detection the signal goes through three stages of i-f amplification. The detector is a multifunction integrated circuit. This IC contains the limiter, detector and an audio preamplifier. The external squelch circuitry is applied to the preamplifier. A second IC is used as an audio amplifier.

The transmitter uses a single IC in the audio stage. The basic rf-oscillator frequency is multiplied 16 times to reach the 220- to 225-MHz range. The final rf amplifier delivers greater than 10-watts output. A low-power mode of one watt is provided by inserting a 330-ohm resistor in the collector lead of a low-power stage. This eliminates the higher amounts of heat caused by inserting the resistor in the collector lead of the final amplifier stage.

Performance and Operation

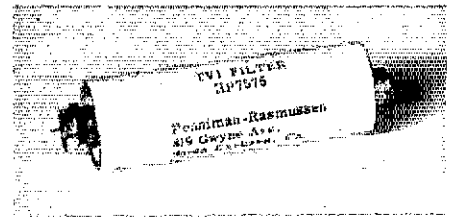
Through daily winter operation the unit performed exceptionally well. It was subjected to temperatures of 0 to 80°F during this use. There is provision for an external speaker, though its use was never desired. The audio level was sufficient during some window-down driving during our early spring weather. There is no provision for a Touch-Tone pad to be wired in externally. It would have to be connected via the audio input jack. The only feature of the transceiver objectionable to this writer is that white light from the dial lamps shines through openings in the front panel. This can be quite annoying while driving at night.

The operating manual is excellent. Information needed to fix nearly any problem is contained in the manual. There are two large parts-location diagrams for each side of the pc board. A parts list is also included. There is a table that lists the dc voltages throughout the circuit.

The rig comes from the factory with microphone, mounting cradle, locking device and crystals for 223.5-MHz simplex operation. – *W1GQO*

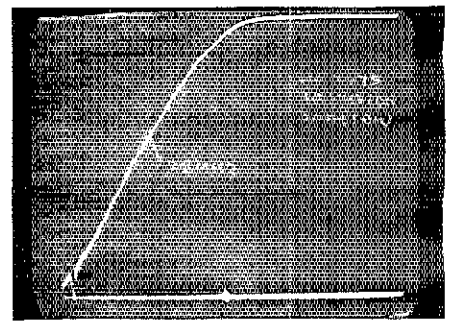
PENNIMAN-RASMUSSEN TVI FILTERS

One item that was hard to come by is a high-pass filter designed specifically for cable TV, 75 ohms. Not any more. A couple of hams on the West Coast have come up with a 75-ohm to 75-ohm filter (HP7575) or a 75-ohm to 300-ohm filter (HP75300). The



filters have an insertion loss of less than 1 dB above 54 MHz. The attenuation provided is 30 dB at 28 MHz (10-meter and CB frequencies) and 60 dB at 14 MHz. Both models are available from Penniman-Rasmussen, 819 Gwyne Ave., Santa Barbara, CA 93111. Price class is $6. – *W1ICP*

Attenuation vs.frequency display of the HP7575 high-pass filter.



MFJ CMOS-44ORS ELECTRONIC KEYER

Completely self-contained in MFJ's standard 4 × 3-1/4 × 3-3/16-inch enclosure, the CMOS-44ORS electronic keyer includes sidetone with speaker, relay output, and is powered by four penlight cells. Using CMOS electronics, the unit features self-completing dots and dashes with "jam-proof" spacing and instant start with keyed time base, and fixed 3-to-1 dash-to-dot ratio. The sidetone oscillator utilizes an NE-555 timer IC which provides ample audio output to drive the speaker. Tone and volume are both adjustable with internal Trimpots. A fast-response reed relay, rated for 1-1/2 A at 250 V, provides for either grid-block or cathode keying of a transmitter. The built-in paddle features adjustable contact spacing and has proved comfortable for use during extended periods of operation. The CMOS-44ORS is available from MFJ Enterprises, P. O. Box 494, Mississippi State, MS 39762. The keyer is priced in the $40 class. – *W4WFL*

Hints and Kinks

SEALANTS FOR AMATEUR USE

Many radio amateurs will find uses for one-part-silicon rubber sealer that is sold under such names as RTV, Silastic, and bathtub and tile sealer. On exposure to the air, the material forms a waterproof rubbery substance. This type of sealer has been used at WB6GNM for over two years, and no deterioration of the material is apparent.

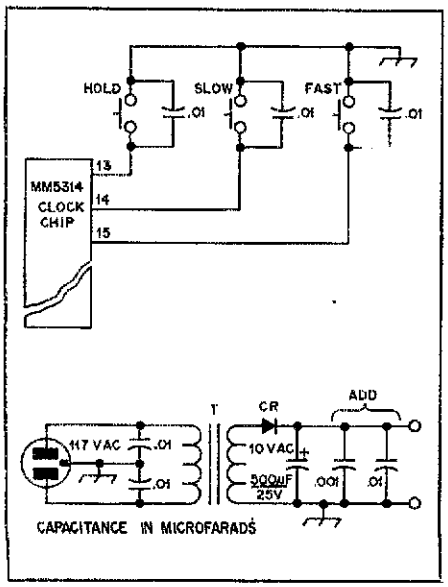
One use of the material is to seal antenna connectors. I have also used it to form non-skid feet for a keyer-paddle base. Clean the base with alcohol to remove any grease or oil; then put a dab of the silicon-rubber on the key base for each foot. Set the key on a sheet of waxed paper and allow to cure or set overnight. – *Paul Zander, WB6GNM*

MORE ON DIGITAL CLOCKS FOR THE AMATEUR STATION

For those who may have constructed the digital clock described in the November, 1974, issue of *QST* (by Bert Kelly, K4EEU), using the 60-Hz time base, you may have found to your dismay that it gained time radically. This is due to noise pulses getting into the chip and upsetting its normal operation. The following procedure was used with success to solve this problem in six different clocks:

1) Bypass each of the *set* and *hold* switches (pins 13, 14 and 15 of the clock chip) to ground with a .01-μF disk capacitor (see Fig. 1).

2) Bypass each side of the ac line to ground with a .01-μF disk capacitor.



3) Parallel a .001-μF and a .01-μF disk capacitor and place this combination across the 500-μF filter capacitor in the power supply. Your clock should then be essentially noise immune and a nice asset to the ham shack. – *Leland R. Shultz, KØRAB*

LIGHTNING ARRESTORS FROM SPARK PLUGS

Though many ham stations have effective lightning protection in the form of directive antennas of all-metal construction, mounted on towers that are well-grounded, there are still uncounted random-length-wire and resonant-wire antenna systems in use. Many of these have no real protection against lightning, despite the well-publicized need for it. John Askew, W4AMK, who recently came back into amateur radio after 25 years away from it, was lightning conscious from "way back." But when he started looking in radio stores for lightning arrestors, he found nothing he wanted to trust in this critical role. Particularly, most of them were not suitable for outside installation, which John deemed a must.

Every issue of *The Radio Amateur's Handbook* shows spark-gap protection for wire antennas and feeders. W4AMK was about to make up something of this kind when he had a tune-up job done on his car and was left with a bag of old spark plugs. Would these work? He called Headquarters for suggestions, and the writer "just happened" to have some old plugs rolling around in his car after a tune-up, too, so some checks were run.

With nothing more than a wire brushing and cleaning with grease solvent, plugs were checked on the Lab's Q-Meter for capacitance and *Q*. The Q was nearly infinite, and the capacitance was 10 pF. The undersigned uses an end-fed random wire for occasional work on the bands from 21 through 3.5 MHz. It is ungrounded – but is its own protection, being of No. 24 wire eminently "meltable," and strung between two grounded towers. A spark plug was connected between this wire and the common ground, which includes everything metal in the house and an underground copper pipe to an outside well. No observable effect except a very small retuning for minimum reflected power resulted. The spark plug stays!

The gap, as the plug comes out of the car, is probably OK, though purists may want to file both parts to points, and adjust their spacing to the lowest that will stand the highest rf power used. Where balanced feed lines are used, mount two plugs on a grounded metal plate at approximately the feed-line spacing. The *Handbook* gives all important safety details. – *W1HDQ*

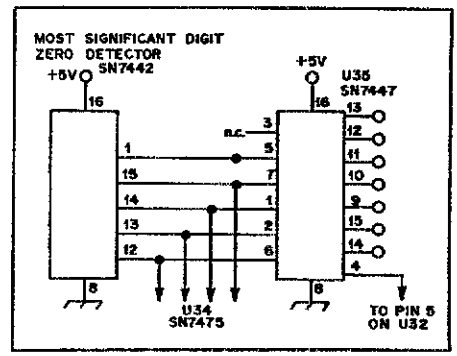
A TIP ON SOLDERING-IRON TIPS

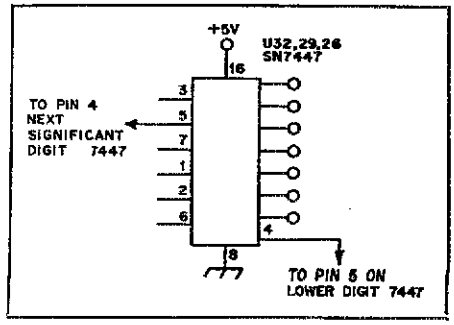
The tip on my 30-watt soldering iron never seemed too massive until I tried soldering a 24-pin IC socket to a circuit board. The old trick of wrapping a piece of copper wire on the tip as a thin extension was an unwieldy arrangement. I removed the tip from the soldering iron, chucked it in my electric drill and "turned" the tip down against a file. The best shape for my purpose was a thin section, terminating in a long tapering point. This ruined the tip for other uses, but soldering-iron tips are relatively inexpensive to replace. – *Julian N. Jablin, W9IWI*

LEADING ZERO BLANKING FOR LED DISPLAYS

Here is an inexpensive and simple circuit modification for the frequency counter described in *QST* for January and February, 1975, by W2TJZ. The modification will give leading zero blanking capability to the display. This results in an easier-to-read display and also reduces power consumption.

Apart from some extra wiring, the modifi-





cation requires only the addition of one integrated circuit device (a 7442, one of which I had in my junk box) to the frequency counter circuit. Follow the schematic diagram for particulars on the modification. – *Mike Frey, G3VXZ*

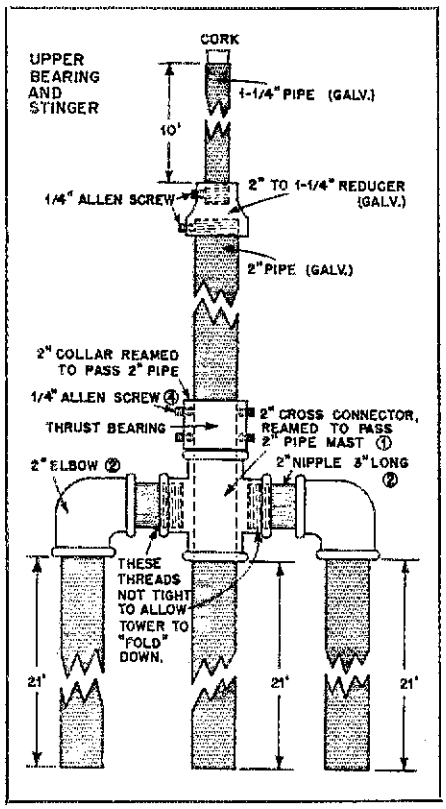
W5LW – NEW APPROACH TO THE FOLD-OVER TOWER

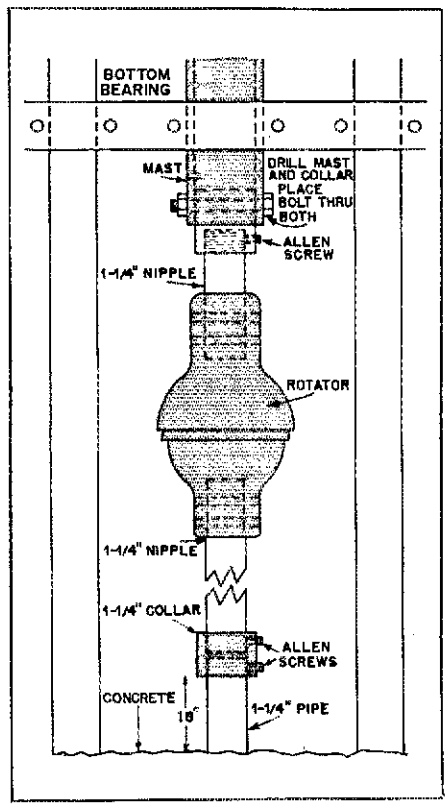
Those of us who cannot tolerate heights will find this fold-over tower a possible solution to the need for an instant sky-hook. The tower was assembled using only pipe wrenches with four-foot handle extensions. Galvanized steel pipe was used throughout for construction of the tower. The one built at my location was braced by attaching the tower to the house at a point about nine feet above the ground. No further guying was done, and it appears that none will be required. The tower has weathered some stiff gales here at my location on the Gulf of Mexico.

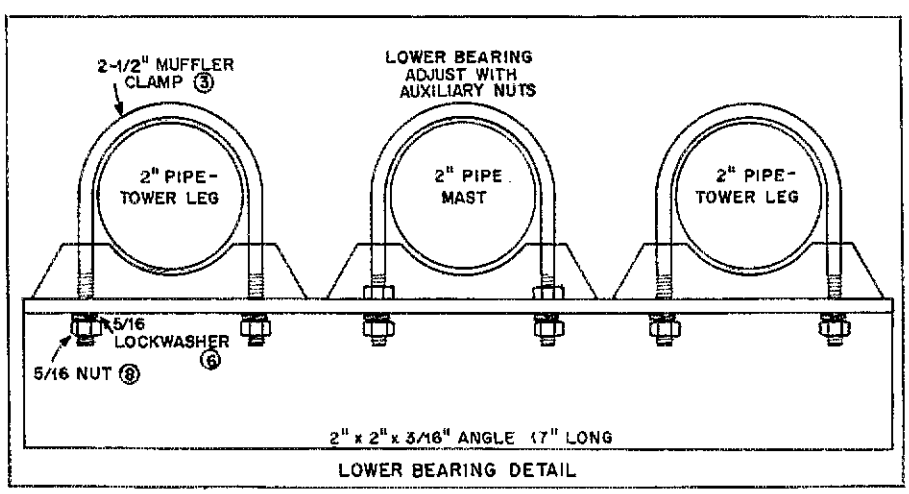
The tower will support any of the smaller beams and should handle some of the larger ones, too. Galvanized pipe of larger diameter should be used for the tower if you are going to have one of those "monster" beams mounted atop it. Dimensions and type of material used for construction of my tower are given in the accompanying drawings. The photograph is of the installation of the tower at my QTH. – *Lyle Smithers, W5LW*

Fold-Over Tower Material List

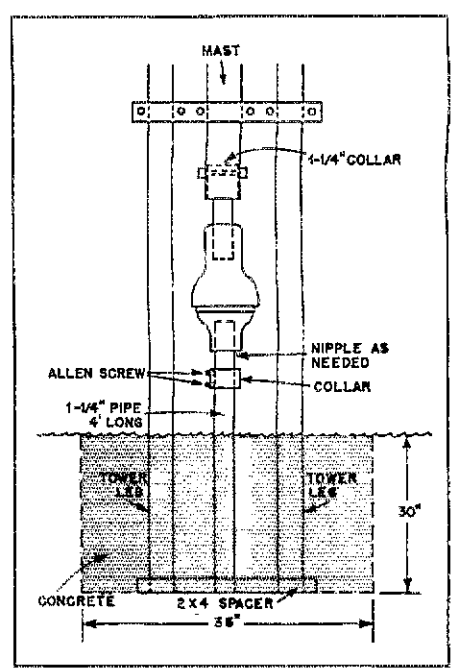
3 - 21-foot sections of galvanized pipe, 2-inch OD.
1 – 21-foot section of galvanized pipe, 1-1/4-inch OD.
2 – 2-inch elbow connectors.
1 – 2-inch cross connector.
2 – 2 X 3-inch nipples.
1 – 2-inch to 1-1/4 -inch reducer.
3 – 2-1/2-inch muffler clamps.
6 – 1/4-20 X 1-inch Allen-head setscrews and lock nuts.
1 – piece of 2 X 2-inch angle iron 17 inches long.







LOWER BEARING DETAIL



Home For Sweepstakes....???

QTC 1 Hanover. That's a Roger!

By John G. Troster,* W6ISQ

"Got one for your area tonight OM. QRV? W6ISQ de KQ3QQ."

"Sure fella, all QRVed up. . . . dar de dar."

"OK, cpi this gud, it vy impt msg QRS. . . . Q R S dah dit dit dit dit

Nr 912 KQ3QQ ck 36 Atlantis Island 0235Z Nov 5

Mrs. Eleazer Wheelock

1769 Green Dolphin Rd.

Hanover, California Fone (123)456-7890 BT

Hello Bessie stop coming home Friday stop will be in Charlie Whiskey sweepstakes over weekend then take you dining and dancing after contest stop meet me airport 1900 stop your loving husband 88 BT sig. Eleazer AR BK

"BK . . . RRRRRR . . . solid cpi OM . . . wl get it rite off on local net . . . gld QSP ani time . . . 73. KQ3QQ de W6ISQ . . . ditdit."

"Hmmmm, now what do ya suppose that clown sent me anyway? With a miserable fist like he was using he should of QRSed to about 3 wpm . . . he must of made 50 mistakes. I'd better correct up all his mistakes afore I pass it on to the locals."

Lessee . . . 'nr 912'??? Nobody could of originated that many. He must of meant 'nr 12.' Ain't important. Nobody never reads it anyway."

"Now . . . 'station.' . . . Hmmmm. . . . What's this 'KQ3' call? Maybe he's a pirate. . . . No such call. . . . He must be a 'K3' . . . yeah . . . and this 'ck 33.' . . . I'll recount it after I correct it. . . . And who's he trying to fool with this 'Atlantis'? Why that Atlantis sunk even before them Scandahoovians got here. Hmmmm. Maybe it's 'Atlantic' something. . . . That's it . . . Atlantic City! Yeah, with a 'K3' call? . . . Close enough anyway."

"Now . . . 'time' . . . who cares? 'Date' . . . ditto . . . skip 'em."

"To 'Mrs Eleazer Wheelock' . . . hmmmm. That's ridiculous. Never heard of such a name. Ahhhhhh . . . must be 'Eleanor'. . . . Yeah, 'Eleanor Wheelot.' . . . Make it Ms . . . flatter the old gal. 'Address' . . . ahhhhh. . . . Who ever heard of a 'Green Dolphin'? . . . Small matter. . . . There's a phone number to call . . . yeeeaaahhh. . . ."

"Now, this text. . . . Wheeeewww . . . chee . . . this fella must be a real charger. Oh boy, I better piece and shuffle this thing around so's it makes sense. . . ."

"And the language he starts with. . . . Whew . . . supposed to be FCC rules about that. . . . Oh well . . ."

"And who is 'Bessie'? . . . That should be 'Eleanor.' Lessee . . . somebody's coming 'Friday.' . . yeah . . . Can't be her OM. . . . Hmmmm . . . must be some other fella. . . . Ahhhh . . . says he'll take her to the 'sweepstakes.' . . . Guess he means the horse races. . . ."

"And then, 'over weekend' . . . hmmmm . . . 'dining and dancing' . . . and something about a 'whiskey contest.' . . . Gad zooks . . . this is a real bounder-type fella we got here. I gotta fix this up."

"Then he says to 'meet me at airport' at . . . ahhhh . . . '1900" it says here. . . . Hmmmm . . . guess that must be zulu time . . . yeah. I'd better put that in American time so's Eleanor don't get confused. That would be . . . lessseee . . . guess I subtract 6 hours . . . or is it 8? . . . plus one hour for daylight savings. . . . But it ain't daylight savings. . . . Naw, it must be I add 8 hours. . . . That must be about . . . ohhhh . . . say about 3 o'clock in the morning . . . yiii. I dunno. . . . 3 is pretty early in the morning. . . . Better make it 0400. . . . So she waits an hour. Now. . . . hmmmm . . . which morning. . . . Can't be Friday . . . that's daylight . . . and this is night . . . ahhh . . . Saturday? Aw, say Friday. She'll find it. How many planes they got flying in from Atlantic City anyway?"

"Then this character has the nerve to send '88.' I'll not be a party to such carryings-on. Make it 'best regards.' . . . And that signature . . . ahhh . . . can't be 'Eleanor' again. . . . Hmmmmm . . . oooohhh, here's his name in the text. . . . Says 'Charlie.' OK, sign it 'Charlie.' . . . Better make that 'Charles' . . . give the the thing a little dignity anyway."

"Aaannnnndd, count the words. . . . See now, is it that I don't the address? . . . Or maybe it's that I count the address and not the name. I won't count any of 'em. Sooo, I get . . . ahhhh . . . 41 . . . 42. . . . Might as well count the sig . . . 43 and 44. Wonder if that 'sweep stakes' is one word or two . . . make it two. Oh well, who counts 'em? The other fella miscounted so bad anyway. . . . Yeah?"

"CQ CATS Net . . . is that station from Hanover on tonight?"

"Yeah, I'm here."

"Well, I just got a QTC message for ya fresh off the air. It's got a phone number so's you can get your extra delivery points without paying for a stamp too . . . haw."

"OK, I'll get a pencil."

"Now listen up. The fella who sent me this cw message really goofed up pretty bad. And I don't want you making any more mistakes on it. OK? So I'll read it real slow so's ya can get it right. Ya QRVed up yet?"

"I'm QRVed."

"Nr 12 K3QQ ck 44 Atlantic City

Ms. Eleanor Wheelot

1769 Dolphin Rd.,

Hanover, Calif. Fone 123-456-7890 break

Hell Eleanor if you stop your husband from coming home this weekend I will take you to the sweep stakes Saturday then dining and dancing and to the drinking contest over the weekend stop meet me at airport Friday 0400 best regards sig Charles.

Ya copy that traffic OK?"

"Yeah . . . cheeee . . . dunno if I wanna read this one to Eleanor over the phone or not. You sure that's what the message said?"

"Come on, fella . . . it was a straight Morris Code message just come over the big net. Yeah! Hmmm . . . but maybe when ya telephone . . . just in case . . . ahhhh . . . don't tell Eleanor who ya are! And if a man answers . . . you'd better hang up and mail it." QST

*82 Belbrook Way, Atherton, CA 94025

Washington Mailbox

□ Q. What is meant by a "third-party agreement?"
A. A third-party agreement is simply an agreement between the administrations of two countries which authorizes licensed amateurs of those countries who are control operators to handle messages on behalf of other people. The other persons, whether licensed or unlicensed, are known as "third parties," whereas the control operators are the "first and second parties." (97.3w)
□ Q. What are the international regulations on third-party traffic?
A. International regulations expressly forbid amateur stations being used for transmitting international communications on behalf of third parties unless a specific agreement exists between the countries involved. In addition, whenever amateur stations of different countries are in contact the transmissions shall be in plain language and limited to remarks of a technical nature or personal character that by virtue of their unimportance do not justify the use of public telecommunications services.
□ Q. Who decides if a third-party message can be sent from a U.S. amateur station?
A. It is determined by the station licensee, and in all cases a control operator, either the station licensee or one designated by him, must be present to continuously monitor the transmission. (97.79d)
□ Q. What type of third-party traffic is prohibited in the U.S.?
A. U.S. amateurs enjoy considerable freedom when handling third-party messages; however, there are certain restrictions which must be followed. Of course, U.S. amateurs can not conduct third-party traffic with countries with which we have no formal agreement. Furthermore, no third-party traffic involving material compensation to anyone involved is allowed; and, except in emergencies, third-party traffic involving business communications on behalf of any party is prohibited. (97.114)

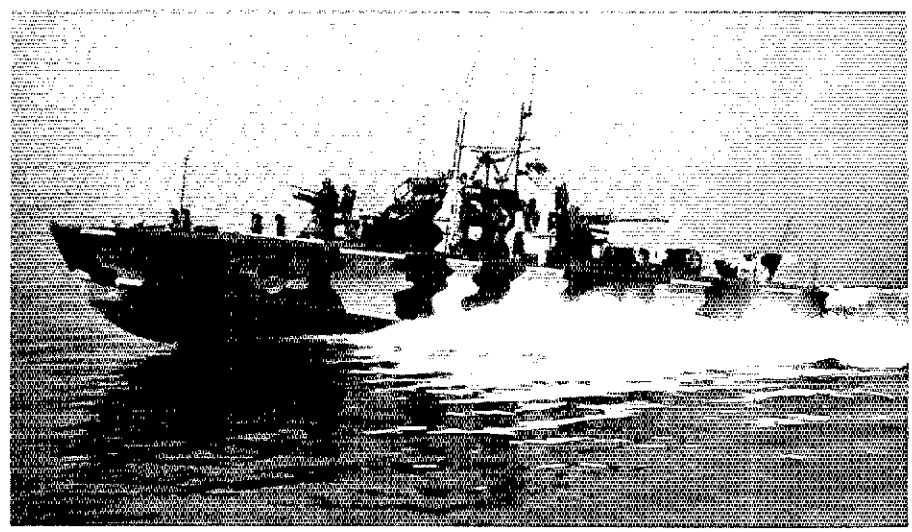
It should be mentioned here that phone-patching is a type of third-party traffic and must conform to the above rules. Although not specifically mentioned in the rules, domestic phone-patching solely to avoid toll charges gives rise to questions as to whether amateurs should have these privileges.
□ Q. What countries does the U.S. have third-party agreements with?
A. The U.S. has third-party agreements with Argentina, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Israel, Jordan, Liberia, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay, and Venezuela.
□ Q. Why do international regulations prohibit third-party traffic at all, unless the individual countries enter into a formal agreement?
A. It's often a matter of vested interests. It is not the purpose of amateur radio to take revenue away from normal communication outlets such as the phone company and common carrier services. In many countries these services are operated, as well as regulated, by the government, and they are very protective of these means for producing needed revenue – to the extent that if you are monitored while handling a third-party message with an amateur in a country with which we have no third-party agreement, you, or the other amateur, could be charged the price of an equivalent phone call. Or even lose your license.
□ Q. How does one go about creating a third-party agreement between the U.S. and another country where there is no present agreement in force?
A. It is *not* simply a case of writing the FCC and asking that one be put into effect. The FCC can not enter into third-party agreements as it is only a domestic regulatory agency. Such agreements are diplomatic matters that are handled by the Department of State. However, the U.S. stands ready to enter into third-party agreements with any foreign administration.
□ Q. How can I, as an individual amateur, help create a third-party agreement where no current one exists?
A. It is necessary to create the desire for such an agreement in the other country – to demonstrate that the usefulness of amateur radio as a tool to create and cement international friendships and as an absolute necessity in times of disaster far outweigh any possible conflict with established interests. The Sister Cities program is one way to do this because it introduces amateur radio to people in a position to influence the powers-that-be. Or you could ask friends in other countries to write their government representatives citing the many values of amateur radio, especially in the light of the recent Guatemalan tragedy. You *can* help.

[Note: Send *your* FCC questions to Hal Steinman, K1FHN, ARRL, Newington, CT 06111. Questions appearing in this column are typical of those frequently asked of the FCC and other agencies. Answers, prepared at ARRL, have been approved by FCC staff. Interpretations contained herein concur with those of the Amateur and Citizens Division of the FCC. Numbers in parentheses refer to specific sections of the FCC rules.] QST

Strays

FASTEST HAMSHACK AFLOAT?

□ WB2VYU/MMR2 claims his "100% Mahagony Hamshack" powered by twin diesels of 3100 h.p. each for unusual station status. Presently assigned as commander on the PTF-17 which operates on the Great Lakes, Tim Sammons operates his SB102 into a 28' fiberglass whip. While on board, he has had opportunity to make numerous hf and uhf antenna and propagation experiments. Tim also operated Field Day '75 aboard.



Happenings

Conducted By Perry F. Williams, W1UED

Goldwater Enters RFI Fray

"Mr. President, I am pleased to introduce today a companion bill to legislation proposed by Congressman Charles Vanik of Ohio to drastically reduce the amateur and CB radio bugaboos of television interference, hi-fi interference and other radio frequency interference to home electronics equipment.

"Most consumers do not understand that when they may encounter interference with their home television or radio set after an amateur or citizen band radio operator moves next door, the source is not a defect in the equipment of their neighbor but with their own radio or television . . . ." (Congressional Record - Senate - February 25, 1976)

Right On, Senator Goldwater! And our warm thanks for introducing Senate Bill 3033 to compliment the Vanik Bill, HR-7052. S-3033 has been referred to the Senate Commerce Committee and will be considered first by the Subcommittee on Communications, of which the Hon. John O. Pastore is chairman. The address is simply: United States Senate, Washington, DC 20510.

The Vanik bill is under consideration by the Subcommittee on Power and Communications of the Interstate and Foreign Commerce Committee, headed by the Hon. Torbert Macdonald, House of Representatives, Washington, DC 20515.

Both bills would give FCC the authority to require consumer electronic devices to be protected from radio frequency interference. As K7UGA points out in the remarks quoted above, the consumer doesn't realize that the device for which he paid so much money is missing a few parts which could keep it from trying to be a receiver. The industry has been slow to recognize the rapid growth in the number of radio transmitters, and thus, the great increase in potential RFI.

In this election year, letters from constituents are especially important in getting bills through Congress. The session will be shorter than normal because of the need for campaigning. The issues which generate the most mail are likely, therefore, to get the attention. Have you supported RFI legislation yet?

ALSO ON RFI

In the March issue, we briefly mentioned Docket 20654, the FCC study of automotive ignition noise as it affects radio and television receivers.

The deadline for submission of comments in the inquiry has been moved from March 19 to June 18, and for reply comments from May 4 to August 3.

Among the questions asked is: To what extent are other kinds of radio services, such as television, microwave and amateur degraded by ignition interference. The League will be making a filing, and we'll welcome your thoughts on the subject.

Another study is underway now by FCC, this one related to industrial, scientific and medical devices, such as diathermy equipment. Part 18 of the FCC rules was originally written in 1946, and although it has been updated from time to time, the basic technical specifications originally adopted have not changed.

In Docket 20718, therefore, the Commission is inquiring about technical specifications, measurement procedure, equipment authorizations, equipment in screened enclosures, and interference control. Anyone having thoughts to offer on regulating ISM devices so that they will not cause interference to communications may file comments with the FCC by May 18.

*Assistant Secretary, ARRL

Is ham radio "for the birds?" Amateurs of the Nortown ARC displayed amateur radio during the annual "Finch Festival" at Seneca College in Ontario. In the foreground, VE3HOB and VE3HCN charm a visitor. VE3BJI and VE3HGA lounge in the background. Some 5000 people wandered by, watching hf and vhf activity; picking up copious amounts of ham radio literature from ARRL, RSO and other groups; and asking myriad questions about "how to become." *(VE3HOB photo)*

BEHIND THE DIAMOND

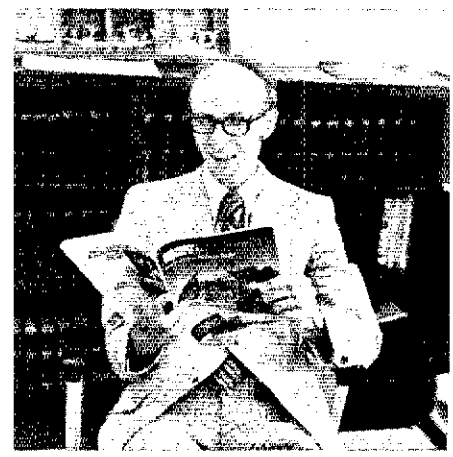
William I. Dunkerley, WA2INB/KL7ELA, first came to the ARRL in 1966 as an assistant secretary for membership services. In 1972 he assumed the position of managing editor for *QST*, and in that post has been responsible for the publication of *QST* and all ARRL books plus typesetting, layout, paste-up, proofreading, and overall production. As head of the production department, he currently supervises a staff of thirteen.

Bill was originally licensed in 1956 as KN2UDH in East Paterson, NJ. He was a founder and vice president of his high school radio club, past vice president of the East Coast VHF Society and a founder of its Space Communications Group. He also served as assistant director of the ARRL Hudson division and was formerly Communications Officer for East Paterson Civil Defense. He has attended Fairleigh Dickinson University, Columbia University, and the University of Alaska.

One might think that being managing editor for *QST* would not leave a great deal of time for other activities. But Bill, since 1970, has also been in charge of the League's Oscar Educational Program – a program which encourages live demonstrations of satellite communications right in the classroom. He is also a member of the board of directors of Amsat and a member of the Scientific Advisory Council of the Talcott Mountain Science Center, which serves the pupils of the Hartford area. Bill is also a member of the U.S. CCIR, a technical study branch of the International Telecommunication Union.

Bill says that the high point of his career in amateur radio was when he sent the first ground control signals to Oscar 5 – the first amateur satellite capable of responding to ground commands. As Bill puts it, he was the first person "ever to tell an amateur satellite what to do." He was also primarily responsible for the design of ARRL's membership opinion survey, which last year tabulated the opinions of some 56,000 League members on FCC's restructuring proposal. Another project that Bill is proud of is the production of *QST* in its new format. The copy that he's holding in the accompanying photo is a mockup that was produced last year when the idea of a larger *QST* was first being studied.

Bill resides in New Britain, CT, with his wife Jill and four-year-old daughter Lori. He is mainly interested in Oscar and two-meter work and spends much of his spare time at the office studying for his Extra class ticket. – *K1FHN*



Fifty years of continuous affiliation by the San Antonio Radio Club are here celebrated by club president James M. Wright, K5CDT, holding certificate, Roy Albright, W5EYB, West Gulf director, ARRL, left and vice director Jack Gant, W5GM.

MILITARY ON MODEL FREQUENCIES

From time to time, military agencies have made temporary use for tactical and training purposes of frequencies normally assigned for non-government use – including a few in the amateur bands. These are coordinated with the Field Operations Bureau of FCC in advance. The military use occurs only between 0600 and 1800 hours local time, is on a "non-interference to amateurs" basis, should be short-range and low-power, and should be away from population centers.

Nevertheless, interference has occurred, and especially to amateurs controlling models in the 53 to 53.6-MHz subband. Accordingly, at a meeting with ARRL and the Academy of Model Aeronautics, FCC agreed not to "clear" any future military use of 53-53.6 MHz. Until present authorizations expire this year, amateurs should notify ARRL of any interference.

AMATEUR TV REPEATERS

The Federal Communications Commission has issued a waiver of section 97.61(c) for a period of one year, so as to permit operation of fast-scan amateur television repeater stations outside the 442-450 MHz subband to which repeaters are normally restricted.

WR4AAG in the greater Washington, DC, area has been operating as a TV repeater since January 1974 under a series of special temporary authorizations, the latest of which expired March 3, 1976. A petition for rule-making, RM-2507 was filed in January this year to allow permanent operation of TV repeaters; several similar requests have also been made. "Pending formal consideration of these petitions, and pending implementation of a formal frequency coordination mechanism within the Amateur Radio Service which would oversee the frequency selections of all repeater stations, the Commission is waiving Section 97.61(c) for a period of 1 year to permit continued experimentation in this mode of operation. Any licensed amateur repeater station operating in the 450-MHz band may conduct such tests without prior Commission approval," the announcement said.

COLLEGE, HERE I COME!

If that is your cry for the coming year, you'll want to know about the scholarships offered by the Foundation for Amateur Radio, Inc., a non-profit group of radio clubs in the Washington, DC/Maryland/Northern Virginia area.

All amateurs, wherever resident in the U.S. and holding an FCC license of at least General Class, can compete for one or more of the awards if they plan a full-time course of studies beyond high school.

The John W. Gore Scholarship pays $750. Applicants must intend to pursue a career in electronics or a related science and have completed at least one year in an accredited college or university toward a baccalaureate or higher degree. Preference will be given to residents of the District of Columbia, Maryland, and Northern Virginia.

The Richard G. Chichester Scholarship also pays $750. Applicants must be members of the ARRL and be sponsored by an ARRL-affiliated club. There is no restriction on the course of study, but applicants must be enrolled in or have been accepted by an accredited university or college and intend to seek a baccalaureate degree. Preference will be given to residents of Ohio, Kentucky, Indiana, Illinois, the District of Columbia, Maryland and Northern Virginia.

The Edwin S. Van Deusen Scholarship pays $250. Applicants must have been accepted or enrolled in an accredited 2-year technical school and intend to seek an Associate degree in a science-related area. Area preference is the same as for the Gore Scholarship.

Application froms can be requested from the Chairman, Scholarship Committee, 8101 Hampden Lane, Bethesda, Maryland 20014. Requests must be postmarked prior to June 1, 1976.

WE LOSE ONE – HIRAN SHARES 420

Despite strong opposition from the League and the amateur fraternity, pulse-ranging devices used for radio navigation in connection with offshore oil exploration may be used from April 22, 1976, until January 1, 1981, on a non-interference basis. Base and mobile stations may be authorized on a case-by-case basis along the shorelines of Alaska and the contiguous 48 states.

Amateurs should notify the League of harmful interference arising from Hiran or similar systems to their operations in the 420-450 MHz band, with as much detail as possible about hours, directivity of the signals, signal strength and the like.

CODE RULES CHANGE

The Commission is planning to begin administration of multiple-choice "message content" telegraphy examinations on a limited, trial basis in the near future at a few FCC examination points. Under this system, applicants will listen to a five minute message in the International Morse Code and make whatever notes or copy they wish. Then, they will be given a multiple choice test on the contents of the transmission; 80 percent will be the passing grade.

To pave the way for this, and similar experiments in alternative ways of administering code tests, the Commission has changed Section 97.29(c) to delete the words, "free from omission or other error for a continuous period of at least 1 minute." In part, the language now reads, " . . . messages in the International Morse Code at not less than the prescribed speed during a five minute test period . . . ."

Qualified instructors who will be examiners for tests under the mail-exam system may obtain assistance with a suitable format from the Clubs and Training Department at ARRL Hq.

Another minor change was made to Section 97.29 (d); references to the drawing of schematic diagrams have been deleted, reflecting the fact that no one has had to draw a diagram for an FCC amateur exam in several years.

CANADA EASES SSTV RULES

The Department of Communications has liberalized its rules for slow scan television. Endorsement for SSTV privileges is now required only once instead of annually. In the eighty-meter band, the frequencies 3725 to 3890 kHz are now available. Bandwidth at ten meters and below remains 3 kHz. On the bands 50 MHz and higher, slow scan is considered equivalent to facsimile, A4, and is permissible wherever A4 is authorized, with bandwidths up to 6 kHz. Repeater licenses may also be endorsed for SSTV, but the originator of the SSTV signal will have to ensure that deviation does not exceed 6 kHz. The changes are already in effect.

More than a hobby: Recipient of the Foundation sponsored Richard G. Chichester Scholarship, Catherine Fitts, WA1RAQ, accepts congratulations from ARRL General Manager Richard L. Baldwin. The University of New Hampshire senior is majoring in Communication Disorders. Presently, she is a member of the Handi-Hams of Minnesota, an organization of handicapped amateur radio operators.

No neophyte to amateur radio, Miss Fitts received her Novice license at age 14. More recently, she was elected president of the UNH Amateur Radio Club, W1ASZ. Along with her father, W1SAQ, she is a member of the newly reactivated Willimantic (CT) Radio Club.

International News

Conducted By David Sumner,* K1ZND

OSCAR Satellites Enjoy Worldwide Popularity

Recently compiled figures which show the number of stations (in each country) using the Oscar 6 and Oscar 7 amateur radio satellites demonstrate clearly that the program has international significance. As of early November, 1975, stations in 96 countries on the ARRL Countries List had established two-way communication through one or both of the satellites. In many of these countries, where the commercial use of satellites is still several years away, this activity by amateurs using low-cost equipment represents the first communication to be undertaken using space techniques.

Records maintained by Radio Amateur Satellite Corporation (Amsat) reflect the following pattern of satellite activity:

Countries with the Most Oscar Activity

COUNTRY	*NO. OF USERS*
United States	997
Fed. Rep. of Germany	315
England	172
France	170
Japan	136
Canada	70
The Netherlands	60
Czechoslovakia	58
Sweden	52
Australia	52
New Zealand	51

The figures represent only those stations known to Amsat who have definitely completed contacts, so as indicators of overall activity, they are very conservative. Including those countries with less than 50 satellite users, the total number of reported users is 2,655.

The pattern is somewhat different for the use of Oscar 7 Mode B, which uses a 432-MHz input and 145.9-MHz output and therefore requires a 432-MHz transmitter at the ground station. Here, we find that North America is far behind Europe in activity:

Countries with the Most Mode B (432 MHz) Activity

COUNTRY	*NO. OF USERS*
Fed. Rep. of Germany	146
United States	114
England	58
France	41
The Netherlands	28
Czechoslovakia	22
Japan	17
Sweden	14
Italy	14
Canada	7

The Mode B translator was built by amateurs in Germany, so it is appropriate that Germany should lead the way in activity! Of course, this also means that when the satellite is accessible from North America and Europe at the same time, the U.S. and Canadian stations are the "rare DX"!

Of course, some countries have far more amateurs than others, so it's only fair to take this into consideration when comparing levels of activity. Here's how the number of stations using Oscar *as a percentage of the total number of licensed amateurs* looks, taking into account only those countries with more than five Oscar users:

Top Countries in Percentage of Amateurs Using Oscar

COUNTRY	*%*
Rhodesia	4.04
Luxembourg	3.73
Czechoslovakia	1.90
The Netherlands	1.87
Bulgaria	1.38
Switzerland	1.36
Fed. Rep. of Germany	1.35
Dem. Rep. of Germany	1.28
New Zealand	1.28
Austria	1.16
Finland	1.14
Hungary	1.13
Belgium	1.07
United Kingdom	1.02
Yugoslavia	1.00
Sweden	0.97
France	0.86
Australia	0.76

If we were to continue this tabulation, we would find Canada in 22nd place with 0.48% and the U.S. in 24th with 0.40%.

TEMPORARY LICENSES AVAILABLE FOR CONVENTION IN MEXICO

The annual Convention of the Liga Mexicana de Radio Experimentadores, A. C., will be held in the City of Puebla, State of Puebla, Mexico, on May 28-30. In past years many amateurs from north of the border have found the LMRE Convention to be an enjoyable occasion.

Of special interest to U.S. amateurs is that anyone wishing to make the trip may obtain a temporary license to operate from Mexico. The only requirement is that a letter be sent to the LMRE, Apartado 907, Mexico, D.F., together with a photostatic copy of the home license. There is no charge for this service. Temporary or reciprocal licenses have not been routinely available in Mexico for several years, and the provisions being made for the convention are appreciated as an expression of good will by the Mexican government.

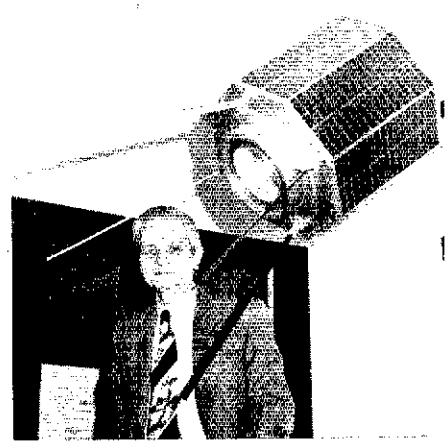
*Assistant Secretary, ARRL

WORLD TELECOMMUNICATION DAY, MAY 17

The International Telecommunication Union annually sponsors World Telecommunication Day on May 17, the anniversary of its founding in 1865. The theme of this year's event is "Telecommunications and the Media," highlighting the importance of electronic communication to broadcasting and the printed media.

Each year, radio amateurs sponsor and take part in special activities to call attention to the important relationship between the ITU and the Amateur Radio Service. This year, for example, members of the Department of State Amateur Radio Club, W3DOS, will be operating special-events station N3ITU during the month of May. Other special stations, such as 3AØITU in Monaco, are expected to be active.

On the weekends before and after World Telecommunication Day, the Brazilian Ministry of Communications will sponsor a contest to mark the event. The phone section is May 15, and the cw section is May 22. See page 62, *QST* for April, for details.



Indicative of the amateur satellite interest in Germany is this full-sized model of Oscar 7 which hangs in the lobby of the Deutscher Amateur Radio Club headquarters in Baunatal. Here, DC7AS, who is in charge of the "Amsat-DL Information Service," is standing underneath to give an idea of the relative size of the satellite package. *(DJ4JI photo)*

Hamfest Calendar

California: The LERC Amateur Radio Club's Burbank Hamfest is May 15-16. Write: Alex Sheriff, WA6HUE, P. O. Box 1236, Canyon County, CA 91351.

California: The 27th annual Fresno International DX Convention, sponsored by Southern California DX Club, is May 15-16 at the Hilton Hotel in Fresno. Speakers from the latest DXpeditions, technical talks, DX forum. Write: Southern California DX Club, P. O. Box 73, Altadena, CA 91001.

Florida: *The Playground Amateur Radio Club's Fort Walton Beach Swapfest is May 8-9. Free swap tables. Registration $1.50 advance; $2 door. Write: Swapfest Comm., P. O. Box 873, Fort Walton Beach, FL 32548.

Illinois: The Dekalb County Hamfest sponsored by the Dekalb Repeater Club and Kishwaukee Amateur Radio Club is May 2 from 8 A.M. – 3 P.M. The location is at the Notre Dame Special Education Complex on Gurler Rd., (3 mi. south of Dekalb between Rte. 23 and South First St.) Tickets $1.50 advance; $2 door. Write: Howard Newquist, WA9TXW, P. O. Box 349, Sycamore, IL 60178.

Illinois: *The Starved Rock Radio Club hamfest is June 6 at the Bureau County Fairgrounds, Princeton. Free coffee and doughnuts 10 – 10:30 A.M. CDST. Good food and refreshments. Camping and trailer space on first-served basis for a nominal fee. Many nearby historical sights of interest. Advance registration until May 20 $1.50; $2 after. Write SRRC, W9MKS, RFD No. 1, P. O. Box 171, Oglesby, IL 61348. 815-667-4614.

Indiana: The annual Evansville hamfest on Sunday, May 16, is located at Vanderburg Co., 4H Center (8 mi. north of Evansville on Hwy. 41). Large indoor flea market area, and auction sponsored by the Tri-State Amateur Radio Society. Lunch available; free admission. Talk-in on 75/15 and 52/52. Write: Tom Dick, WA9QDZ, 2851 Wayside Dr. 812-476-2188 or Randy Riggs, 1552 Keck Ave. 812-464-3111. Both are from Evansville, 47711.

Indiana: The Wabash County Amateur Radio Club's 8th annual hamfest is Sunday, May 23, rain or shine, at the 4-H Fairgrounds in Wabash. Large flea market (no charge), technical forums, bingo for XYLs, free overnight camping with ac hookup. Plenty of parking. Good food at reasonable prices. Admission is $1.50 advance; $2 gate. Write: Bob Mitting, 663 Spring St., Wabash, IN 46992.

Kentucky: The Kentucky Ham-O-Rama is Sunday, May 30, (Memorial Day Weekend). Location at Boone County Fairgrounds, Burlington (10 mi. south of Cincinnati, Ohio near I-75). Indoor exhibits, forums, XYL program, flea market, refreshments. Tickets $1.50 advance; $2 door. Write: NKARC, P. O. Box 31, Fort Mitchell, KY 41017.

Maine: The Portland Amateur Wireless Assoc.'s auction and dinner is in Portland, at the Ramada Inn, 1230 Congress St. (just off 1295, exit 5) on Saturday, May 22. Auction is at 10 A.M. Dinner starts at 6:30 P.M. Write: Martin Feeney, K1OYB, 38 Howard St., Portland, ME 04101. 207-775-2274.

Maryland: The Eastern Shore of Maryland Hamfest is May 23. This second annual event is sponsored by the Easton Amateur Radio Society, rain or shine 10 A.M. – 4 P.M. (Located 5 mi. north of Easton on Rte. 50 at the Talbot County Agriculture Center. From Baltimore and DC area go across the Chesapeake Bay Bridge and ride approx. 1/2 hr., signs posted both ways on Rte. 50) Talk-in on 52/94 and 146.445/147.045. Plenty of tables and chairs. Reasonably priced food and drinks. Admission $2, additional $2 for tailgaters. Write: Tim Meekins, K3RUQ, P. O. Box 805, Cambridge, MD 21613. 301-228-8534.

Massachusetts: The Hamden County Radio Assoc.'s flea market is on May 7 at the Feeding Hills Congregational Church in Feeding Hills (location is just off Rte. 57 in Feeding Hills Center). Approx. ten square feet of space $1 flat fee for one-third table. Doors open to sellers at 6:30 P.M.; buyers 7:30 P.M. Write: Mr. Richard Stevens, Crest Rd., Monson, MA 01057.

Minnesota: The Twin Ports FM Club's swapfest is on May 8 from 11 A.M. – 3 P.M. at the First Methodist Church, 230 E. Skyline Pkwy., Duluth, MN. 34/94 talk-in. Registration $1.25, table space $.75, bring your own table cover. Food nearby. Write: WA0BJY.

Nevada: The Sierra Nevada Amateur Radio Society in Reno plans a Memorial Day weekend excursion on the *MS Dixie* paddlewheeler on Lake Tahoe. The date is May 29, Saturday, with plans for the floating ham shack to operate from 1 P.M. till 10 P.M. PDT. A complete tour of the Lake Tahoe shoreline, steak dinner at 7 P.M. Music, dancing after dinner. Special QSL cards to anyone working the Dixie Mobile. SNARS has chartered the *Dixie* for the entire day. Cost $25 per person. SNARS requests a 50% deposit no later than May 1. Write: Sierra Nevada Amateur Radio Society, P. O. Box 7808, Reno, NV 89502. Non-collect calls to Sherrie Golden 702-831-3228.

New Jersey: The Irvington Radio Amateur Club's annual flea market-hamfest is May 16 at the P.A.L. Bldg., 285 Union Ave., Irvington (right alongside the Garden State Pkwy. at Exit 143). Doors open at 10 A.M. Talk-in 34/94 and 146.52. Refreshments. Table rental $3. Write for table reservations to: Ed, WA2MYZ, 201-687-3240.

New Jersey: The Tri County Radio Assoc. Inc. hamfest at Nick's Grove, 318 William St., Piscataway, is on June 6. For info call 201-725-0778 or 201-752-4307 or write TCRA, P. O. Box 412, Scotch Plains, NJ 07076.

New York: LIMARC NYC area flea market is Sunday, June 6, at the NY Institute of Technology, Old Westbury, L.I. Talk-in 25/85, W2KPQ. Admission $1 per buyer; $2 per space seller. Proceeds to be used for construction of emergency and public service communications facilities for Long Island. Call 516-938-5661, W2KPQ.

North Carolina: The Durhamfest, fm convention and flea market, is May 15 – 16 featuring technical seminars, ladies activities Saturday night banquet, 2-day covered flea market. Advance registration $2; $3 at door Children free. Write: Durham F.M. Assoc. Inc., P. O. Box 8651, Durham, NC 27707 Talk-in 22/82, 28/88, 222.34/223.94.

Ohio: The Erie Amateur Radio Society is sponsoring the Vacationland Hamfest on Sunday, May 23, at Erie County Fairgrounds from daybreak till 3 P.M. Free camping Saturday night, free transportation to Cedar Point ferry boat dock. Plenty of flea-market tables, dealers welcome, 8 acres for trunk sales. Talk-in on 52-52. Tickets $1.50 advance; $2 at gate; flea market vehicles $1 each. Write: E.A.R.S., P. O. Box 2037, Sandusky, OH 44870.

Ohio: The Champaign Logan Amateur Radio Club's 6th annual flea market and auction is May 16 at noon at the West Liberty Lions Park at West Liberty. Free admission; table and trunk sales $1. Talk-in on 146.52 and 13/73. Write: John L. Wentz, W8HRK, P. O. Box 102, West Liberty, OH 43357.

Tennessee: The Radio Amateur Club's annual Greater Knoxville hamfest is May 29 – 30 at the National Guard Armory, 3330 Sutherland Ave., N.W. Indoor and outdoor flea market. Admission $1; $2.50 per table. Banquet on 29 at 8 P.M. $6 per person. Talk-in on 16/76; 34/94; 39/80. Write: s.a.s.e. Edward L. Melton, WB4JGF, 749 Elkmont Rd., Concord, TN 37922.

Tennessee: The annual Humboldt ARC hamfest is Sunday, May 30, Shady Acres City Park, Trenton. Flea market, ladies activities, playground. Contact: Ed Holmes, W4IGW, 501 N. 18th Ave., Humboldt, TN 38343.

Texas: The Texas State RACES conference at the Texas Department of Public Safety, 5805 N. Lamar Blvd. in Austin is May 29 – 30. Registration at 10 A.M. Conference opening and programs from 1 P.M. to 5:15 P.M. Sunday coffee bar open at 8:30; program going from 9 A.M. to noon. Write for details.

Virginia: *On Sunday, June 6, a hamfest in Manassas is at Prince William County Fairground, 1/2 mi. south of Manassas on Rte. 234. Flea market, over 300 spaces available rain or shine. Parking for over 2,000 cars. Exhibit buildings inside and outside; refreshments on grounds. YL programs, children's entertainment. Special activities include: Fm clinic, ARRL booth, QSL bureaus etc. Advance registration $1.50; at gate $2.50. Children under 12 free. Tail gating $3 per space. Tail gaters set up at 7 A.M. Others 8 A.M. Write: Ole Virginia Hams ARC, Inc., Tim Wayne, WA4GVX, 1708 Sharp Drive, Woodbridge, VA 22191.

Wisconsin: The Yellow Thunder Amateur Radio Club's 6th annual hamfest is Saturday, May 22 at the Dell View Hotel in Lake Delton. Starting 10 A.M., meetings and events include: Swap n' Shop, DX, vhf RTTY, MARS, ARPSC, hidden transmitter hunt, ladies activities, liars contest and evening banquet with entertainment including somethin new – "The Kitchen Maids". Admission $7 in advance or $7.50 door ($1.50 or $2 without banquet). Write: Kenneth A. Ebneter, K9GSC, 822 Wauona Trail, Portage, WI 53901.

*ARRL Hamfests

Coming Conventions

May 21-23
New York State, Rochester, NY

June 11-13
Southeastern Division, Atlanta, GA

July 2-4
West Virginia State, Jackson's Mill, WV

July 9-10
Central Division, Milwaukee, WI

July 16-18
ARRL National, Denver, CO

July 24-25
Atlantic Division, Philadelphia, PA

July 31-August 1
Roanoke Division, Norfolk, VA

August 20-22
Maritime Section, Halifax, NS

September 3-5
Pacific Division, San Jose, CA

September 10-12
New England Division, Boston, MA

October 8-10
Midwest Division, Omaha, NE

November 6-7
South Florida Section, Clearwater, FL

November 13-14
Hudson Division, McAfee, NJ

HIGHLIGHTS

1976 ARRL Convention Preview from Mile-High Denver

Denver at night is like an ocean of light in a pleasant valley at the foot of the majestic Rockies. The bawdy, brawling gold – and later, silver – towns have become settled communities, catering to tourists, or ranchers, or the new energy population. Cattle and horses range mountain pastures, where not so long ago, the buffalo ran. But, centuries don't change the Rockies, or the wilderness lands, or the high lakes and streams . . . the big trout still lurk under a rock poised at 10,000 feet, there's still snow on Mt. Evans in July, the deer come into suburban back yards.

Colorado has water, rocks, sand, great vistas . . . for example, to the South lie the sand dunes, the ancient cave dwellings, the breathtaking Garden of the Gods, the Air Force Academy, the Broadmore Hotel . . . have we whetted your vacation appetite? Well, that's not the half of it. Here are our plans for the biggest, best, and certainly, highest ARRL National to be held yet. You see, we believe that the whole family should enjoy a convention. So we started by trying to figure out what might be fun for the YL, OM, and junior Ops . . . and we think that we've got some great things planned . . . bus tours to almost everywhere you might want to go, maps of the whole state for your driving pleasure, a list of restaurants as long as your arm, lakes spotted for your boat, camping sites for your camper, a tour to a summer ski resort, directions and programs for theaters, night clubs, hotels and last, but by no means least, a great convention.

Some of the things you probably haven't or won't see again at any amateur radio convention are:

1) A WWV time and frequency demonstration using their satellites.

2) The National Bureau of Standards.

3) The new ionosphere 2-megawatt heater for experimental vhf/uhf propagation tests.

4) Transmissions of multi-thousand messages using fiber-optics.

5) Communication by infrared - with a unit any amatuer can build at low cost.

6) Propagation results from a repeater at 30,000 feet.

7) Father David Reddy of Easter Island.

8) Geoffrey Bryson of the BBC.

Those are just a few of the many happenings in Denver in July. And again, we haven't forgotten the ladies.There will be two major, grand, glorious, satisfying prizes given away – one for a lady, and one for an amateur. Of course, this doesn't count all the "little" multi-buck other things you both can win. A little hint about the lady's grand prize. Did you ever dream of an all expense paid vacation to an exotic place, where the sun always shines on sparkling water? You have? Better get your reservation in right away, to where it says in our ad in this issue . . . .

We'll keep this a bit brief, because we don't want to give away *all* our secrets this time. More about Colorado and the convention next month. In the meantime, we'll watch for your letter . . . '73

NEW YORK STATE CONVENTION

May 21-23, 1976, Rochester, New York

The 43rd annual Rochester Hamfest, now combined with the New York State ARRL Convention, will be held the weekend of May 21-23, at the Monroe County Fairgrounds near Rochester, New York.

Activities begin on Friday, May 21, at the Rochester Marriott Inn (hotel headquarters), where an evening Funfest in the main banquet hall begins at 7:00 P.M. Club groups, manufacturers, distributors and publishers will have open-house suites on Friday evening at the hotel.

Before dawn on Saturday, May 22, the huge flea market will begin to form at the Monroe County Fairgrounds. Indoor and outdoor flea-market facilities are available. At 9:00 A.M., the huge Dome Center will open for commercial exhibits and programs. Also at 9:00 A.M., FCC amateur tests for General and higher class licenses will begin.

At 7:00 P.M., activities return to the Marriott where the annual awards banquet will be held. Following the banquet, the Antique Wireless Assn. will present a polar-expedition show. At midnight, Royal Order of the Wouff Hong ceremonies will be held.

Beginning at 9:00 A.M., Sunday, programming will begin at the Marriott. Programs will conclude at noontime. The final event of the day will be an areawide 2-meter transmitter hunt at 2:00 P.M., sponsored by the Rochester and Buffalo repeater groups.

For the ladies, buses will operate between the Fairgrounds and Rochester's famous Midtown Plaza for shopping and sightseeing. At 3:00 P.M., a fashion show and tea will be presented in the Top of the Plaza Restaurant at Midtown, after which buses will be available for return to the Fairgrounds and hotel.

Registration in advance is $3.50. Advance registration closes May 15. Registration at the gate is $4.00. Banquet tickets are $8.50. Unlimited outdoor flea-market space available at $1.00 per parking space. Indoor flea-market space, available by advance order only, at $5.00 per table. A limited number of "RV hookups" available at $15.00 each (includes two registrations). Ticket orders and information requests: Rochester Hamfest, Box 1388, Rochester, NY 14603.

SOUTHEASTERN DIVISION CONVENTION

June 12-13, 1976, Atlanta, Georgia

The ARRL Southeastern Division Convention and the Atlanta HamFestival 1976 will be held at Dunfey's Royal Coach Motor Hotel, I-75 at Howell Mill Road, Atlanta, Georgia. Special HamFestival rates of $16 single, $21 double are in effect; for hotel reservations contact the hotel directly.

A great convention is planned with nearly 100 major exhibitors in the air-conditioned Exhibit Hall and hundreds more displaying their wares in a mostly-covered outdoor flea market adjacent to the Exhibit Hall.

A Saturday night banquet and dance are planned. Pre-registration is a *must* for banquet tickets.

Individual registration is $3.00 in advance, $4.00 at the door; family registration is $5.00 in advance, $6.00 at the door. Flea-market spaces (outdoors) are $5.00 each, first come, first served.

For more information and pre-registration forms, write: Atlanta HamFestival 1976, 53 Old Stone Mill Road, Marietta, Georgia 30062, or telephone area 404-971-HAMS, day or night.

The U.S. Bicentennial and Colorado's Centennial are both being celebrated at the '76 ARRL National Convention in Denver, Colorado, sponsored by the Colorado Council of Amateur Radio Clubs. Here are some of the hard-working committee members: (l to r) Lys Carey, (KØPGM; Dick Schmidt, KØFLQ; Larry Steimel, WØACD; Chic Cottereli, WØSIN, Rocky Mountain Division Director; Jim White, WBØFPH; Boris R. "Slats" Council, KØATZ, Convention General Chariman; Mel Knoll, WAØYGU; Joe White, KØCNV; Dave Richardson, KØWOP and Clyde Glass, WØBPT. *(William E. DeWolfe photo)*

Strays

□ WI9ANG (WIsconsin 9 Air National Guard) will be on the air May 15, 1976. Special Armed Forces Day Certificates will be issued to all stations worked. The operating schedule for Saturday, May 15 is: 7.280 MHz, ±5 kHz, 1330-2130 UTC, 14.310 MHz, ±5 kHz, 1330-2130 UTC. To obtain a free certificate your QSL card is required. Send all QSLs to WI9ANG, c/o WA9DZL, 128th Air Refueling Group (TAC), General Mitchell ANG Base, Milwaukee, WI 53207. Multiband contacts with WA9DZL will count towards Certificate Hunters Club points. In addition, WA9DZL is a Flying Club Member.

STOLEN EQUIPMENT

□ IC-230, Serial No. 1787. Contact John Weber, K4JW, 102 Southgate Blvd, Melbourne, FL 32901 or Ft. Lauderdale police, report 76-001694.

□ Midland 13-505, Serial No. 030577, stolen from car. Randall S. Krakauer, M.D., 9908 Pomona Drive, Bethesda, MD 20034 or Montgomery County police.

□ Drake TR4-C, Serial No. 36938, stolen from auto in Miami, FL. Robert H. Reid, 1510 River Hills Circle, Jacksonville, FL 32211.

□ Heath HW-12A, Serial No. 04346, stolen from car in Milwaukee, WI. Andrew W. Reichert, W9AQZ, Rte. 1, Rhinelander, WI 54501.

□ Heath HW-202, Serial No. 00316. Staber W. Reese, W9DOO, 1652 Norman Way, Madison, WI 53705.

YL News and Views

Conducted By Louise Moreau,* W3WRE

YL Trademarks

We all have special symbols that indicate our affiliation with organizations. One key to YL identification is invariably that "33" which we use when we conclude a contact. It signifies "love sealed with friendship between one YL and another." Ever since 1939, the blue diamond with the scroll has identified the oldest women's international radio club, YLRL, as has the YL on the globe which marks its publication *YL Harmonics*.

Across the country, the chosen trademarks of the many YL clubs earmark their bulletins, membership pins, or stationary: Mermaids and MINOWS in the west, the "Acorn" YL of WRONE, Georgia "Peaches," frilly Floridora ladies, the crinolins of the Buckeye Belles, or the kuspak and mukluks of the Alaskan Lassies. Still other clubs use the bird as an insignia such as LARK in Illinois, (which has been adopted and modified into WAYLARC in DC, GAYLARK in Texas, and BAYLARK in San Francisco), or the Indiana HAWKS.

Canada's YL clubs use flower trademarks as for example, the Ontario Trilliums, the first of the YL clubs in that country, and the roses of CLARA, Canada's nationwide YL club.

While the many identity symbols chosen by the clubs accent the feminine touch in amateur radio, most emblems also include a pattern of a key and microphone interlocking to indicate the major interests of their members.

The "QRV" motto of YLRL combined with YLISSB's "Torch of Friendship" might well be selected by all YLs to underscore the main goal of the growing number of female amateur radio clubs around the world – achievement of international friendship and understanding through amateur radio.

WA4FIS, Bonnie Jean Gross, was first licensed as a Novice at age 11, and now holds an Advance license at the age of 13. Active in 2 meter repeater work, Bonnie is a Life member of ARRL. *(WA4FIQ photo)*

TWO MORE FIRST YLS

During a visit in April, 1976, LA8KT, Inger Bjerrang, became the first YL to operate from Svalbard Island. Her call at Svalbard was JW8KT. Inger and OM LA5NM/JW5NM are active members of YLISSB.

When Dr. Greta Hubacher, HB9ARC, operated as HBØARC, she was believed to have become Lichtenstein's first YL.

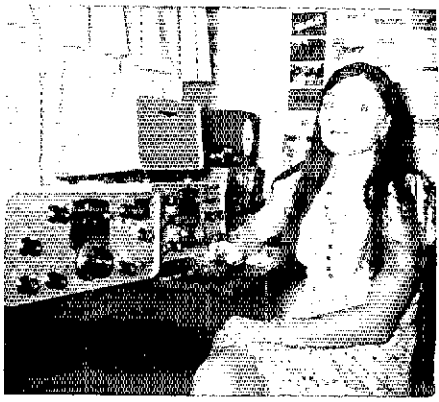
1976 BUCKEYE BELLE PROJECT

Eila Russell, WA8EBS, 1976 Buckeye Belle president-elect, has proposed a "Radio Pal" program for the club. Through this plan, members of other radio clubs may become close on-the-air friends of Buckeye Belle members. The twin goals of this project are sharing ideas – club as well as personal – and improving code to upgrade licenses through cw skeds. The idea has been well accepted by clubs in this country and in Canada to promote a closer relationship among YL amateur radio operators through their primary interest.

1976 DX YL TO NORTH AMERICAN YL CONTEST RESULTS

The winners: DX Phone: HC2YL, YN1KG, KH6IPL. N. A. Phone: WA8AHU, W2GLB, W4LKM. (Note W4LKM operated as W4CWV.) DX cw: DJØEK, YV5CKR, I3MQ. N. A. cw: WA2DMK, WA5PQX, AC2HFR. DX Phone scores: HC2YL 540, YN5KG 378, KH6IPL 190, DJØEK 150, F5RC 110*, VE2JZ 110*, DJ1TE 100*, YV5CKR 90, VE7DTO 78.75*, DJ5UAC 30*, G8LY 24, ZS2AA 20*, DF2SL 15*, DK2KD 5*, ZS2GH 1.25*. N. A. Phone: WA8AHU 247.5*, W2GLB 242, W4LKM 220* (W4LKM operated as W4CWV), K6DLL 169, K4RNS 36, WA2DMK 30*, WB4QVD 30*. DX cw scores: DJØEK 48, YV5CKR 30, I3MQ 24, DF 2SL 11.25*, G8LY 1.25*. N. A. cw: WA2DMK 15*, WA5FOX 3, AC2HFR 1.25*. Combined scores: DJØEK 198, YV5CKR 120, DF2SL 26.25*, G8LY 25.25*. N. A. combined scores: WA2DMK 45*. Note: * indicates low-power multiplier.

Dr. Greta Hubacher, HB9ARC, active YLISSB member, fulfilled a desire when she operated as HBØARC and became the first known YL to work from Lichtenstein.



Linda, WN9DSR, has logged 30 states toward a goal of WAS Novice. She is busy on 80 and 40 meters, with plans for 15-meter operation in the near future. *(K9GTJ photo)*

BRAZIL YL AWARD

Brazil is offering a certificate to all radio amateurs who submit the following qualifications: An authentic log record of two-way contact with YLs in Brazil. For DX stations requirements are 12 YL stations of different countries, and 8 YL stations in Brazil. The YL countries must be located on 3 different continents. Brazilian amateurs must work 20 YL stations in Brazil, and 5 YL stations of different countries located on 3 different continents. Send information to BRYLA, A/C 1 FI, P. O. Box 58 20.000 RIO, RJ Brazil. All applications should include a QSL for BRYLA's files and 10 IRCs for return postage. All logs must be certified by a recognized amateur radio association. QST

*YL Editor, *QST*. Please send all news notes to W3WRE's home address: 305 N. Llanwellyn Ave., Glenolden, PA 19036.

FM Repeater News

Conducted By Lew McCoy,* W1ICP/WR1ABH

450 MHz ATV Repeaters

In a public notice dated March 1, 1976, the FCC has waived Section 97.61 (c) of the rules for a period of one year to permit operation of fast-scan amateur television repeater stations outside of the repeater subbands. By this notice, fast-scan repeater stations can operate *anywhere* within the 450-MHz band.

At press time, we have word of three such repeaters on the air. Two have inputs at 427.25 MHz and outputs at 439.25 MHz and one uses the same frequencies but with input and output reversed. Additionally, we have word of four more systems planned, with two in the same metropolitan area. Fast-scan repeater proponents claim no more than a total *theoretical* bandwidth of 9 MHz, 5-MHz bandwidth centered around the repeater input and 4 MHz at the output. The important point here is that frequency coordinators should exercise caution in assigning frequencies for ATV repeaters. Oscar 7 has an input at 432.125 to 432.175 MHz. In addition, world-wide moonbounce adherents do all their work at 432 MHz (and cannot *move*). Also most weak signal experimentation is conducted in the 432-MHz region. Assuming the stated *theoretical* bandwidth of 5-MHz for an ATV input signal, that frequency spread covers above 432 MHz. We would be less than honest if we didn't point out that the 5-MHz bandwidth may not be within the capabilities of many amateurs (or commercial manufacturers, for that matter). The 450-MHz band is from 420 to 450 MHz. The regular repeater band is 442 to 450 MHz so if we subtract this figure it leaves us 22 MHz. It is quickly apparent that three 9-MHz bandwidth ATV repeaters in a single city or area wouldn't work. In fact, two could cause problems. Again, frequency coordinators should use cautious judgment. And, any ATV groups *should* work through their coordinators.

MORE ON AUTOPATCH AND 911 SYSTEMS

"Dear Lew:
With regard to your interest in automatic 911 autopatches, I would like to give you some of my personal observations in the Nassau County, Long Island area.

There are several machines on Long Island, having autopatch, but not the auto-911 system. The predominant problem on a/p calls to the police is that the operator at the police hq. is not familiar with a/p and the ham in the mobile talks too much.

We have duplexed our patch (WR2ADZ) and found that while the longwinded mobile ham is giving the police operator a lot of useless information, the operator is asking a lot of specific questions that the mobile can not hear. Many times the police operator has said: "Hold on, I'll connect you with Highway Patrol" and the ham does not hear this and assumes that his call was disconnected or didn't go through at all. He then hangs up, redials 911 and starts all over again!

Another problem we have on this particular repeater (WR2ADZ) is that we are on the same frequency as WR2ADD in New Jersey. Although we do not cause each other too many headaches, there have been times that someone dialing 911 on our autopatch has brought up their auto-911 patch. Imagine the amazement of the police operator in New Jersey hearing our traffic and scratching his head!

As a result I feel that: If the police operators could be taught who we are and how we communicate, and if the ham could be taught to keep it down to very short transmissions of few words in length, and if care was taken to insure that not more than one machine on a frequency pair had the 911 system, then it might work.

It's a fantastic idea, but will it really work? We have found it best to call for a land station to take the information and pass it on, and use the a/p only if none was available. This additionally lets someone filter out the useless calls.

*VRAC Liaison, ARRL Hq.

Just adding our two-cents, I remain, Yours truly, Manny Marcel, WB2BON."

Manny has some good points. Probably what we need is a guide for hams to use when calling the police via autopatch. During a bad storm in Connecticut, the autopatch/police calls were going hot and heavy on the local repeater. One ham accessed the patch and started off: "This is K1XXX, reporting an accident, etc." Some of the hams who also have police monitor receivers reported that the police dispatcher said he had a report from a CBer (!) on an accident. The CBers are getting enough credit so let's not foul up *our* public service efforts. It is probably a good idea to preface any calls: "This is *amateur radio station* K1XXX, etc." This puts the emphasis where it belongs.

TIME-OUT AND LINKING

Phil Snyder, W9LVY, writes, "I like the repeater column very much. Here are a couple of items that might be of interest to other repeater people:

1) A number of repeaters in the midwest are adding something new to their systems. One or two seconds after you let go of your microphone button, you will hear a short beep. This indicates that the three-minute timer has reset. Waiting for the beep is required to keep from timing out the repeater. Of course, this time delay permits others to jump in by giving their call or for emergency traffic. Also, the last five or ten seconds before the repeater times out, there will be a continuous tone transmitted. This lets everyone know what has happened. After the timer resets, the repeater comes back on with an identifier.

2) I would like to see more information on how to link repeaters. I know that some are very exotic methods while others are extremely simple. The Columbus, Ohio, 16/76 machine is linked to Dayton via a 450-MHz link and to Newcomberstown by the 'Spectrum Conservation' method which was covered at the Dayton Hamvention last year. Briefly, the system is as follows: When a station desires to link with Newcomberstown, he calls a control station who then dials the appropriate Touchtone digits. Now, whenever station A transmits on 16 in Columbus, a PL tone is added to the 76 transmitter. This is picked up by a 76 receiver at Newcomberstown (whose normal channel is 19/79), and if nothing is coming in on the main receiver (19), it retransmits the 16 signal on 79. When a station in Newcomberstown answers back on 19, this puts PL on the 79 transmitter which is picked up in Columbus and rebroadcast on 76. This is a very simple system and, of course, could be extended to any number of stations, assuming that no two adjacent repeaters were on the same frequencies.

We repeater people would like to hear more about linking, such as how the TIRS Texas system works." (How about it, Texas, anyone want to write us a short description?)

RIP-OFFS

Hugh Vandegrift, DA1VH, writes that he liked the article we ran on the year of the rip-off but that we missed one big point. He had to testify in a court case in St. Louis involving the conviction of two thieves who had stolen radio gear from cars. They testified that their best indicator was the ham license plates! Hugh doesn't believe in advertising the fact that he is a ham.

He adds one further piece of noteworthy news: In Germany, there are no thefts of radio gear. Any theft of anything with a value of over 20 dollars means *20 years* in jail! Maybe something like that is needed here.

Canada is another country that isn't too bothered by thefts, but we did get one humorous story out of Toronto. A ham up there had his transceiver ripped off. Two days later, he got a telephone call. The caller told him to look in his back yard for a plastic bag and he would find his rig in the bag. The caller then apologized for the theft stating that he was sorry but it wasn't the right kind of transceiver! (Maybe a sticker in the window of your car stating that the radio *is not* CB is worthwhile.) QST

Correspondence

The publishers of QST assume no responsibility for statements made herein by correspondents.

GUATEMALA EARTHQUAKE

□ I wish to take this opportunity to express my appreciation and that of our staff from Guatemala for the kind assistance provided by your League through radio communications between the U.S. and Guatemala during the first hours and days of the recent disaster.

Your reference to Mr. Socrates A. Martinez of Middle River, Maryland, provided invaluable communications assistance to members of this office during periods of uncertainty regarding the welfare of their families in Guatemala.

Also, your organization is to be commended for its maintainance of radio communication services into Latin America through its members operating amateur radios. — *Dr. Harold B. Hubbard, World Health Organization, Washington, DC*

□ We wish to express our gratitude and appreciation for the service you gave in time of trouble. A recent service was one concerning our daughter and son-in-law living in Guatemala when the earthquake occurred.

We received word twice that all was okay from Columbus; then it was relayed to California where our son-in-law lives. — *Mr. and Mrs. John S. R. Turner, Sylvania, OH*

□ The Managua and Guatemala City disasters point to the very real need for U.S. stations to work foreign voice stations in the 14.1-14.2 MHz subband. Let's change those antiquated regulations to read: "U.S. amateur radio stations may utilize the 14.1-14.2 MHz amateur band segment to conduct voice communications with other than U.S. stations. — No communications between U.S. stations except disaster emergency traffic, foreign or domestic. — *Virgle H. Meador, W4LVZ, Miami, FL*

WHICH WAY AMATEUR GROWTH?

□ It was with great pleasure that I read "It Seems to Us" in *QST* for March.

I am an associate member of ARRL and have vowed that "this is the year that I will finally get my Novice license." I have been trying on and off for the past eight years to acquire what I must know, but it has always been easier to "wait until I have more time," than to teach myself (or find someone to teach me) and take the exam.

This is how it has been ever since junior high when WA1SIT kindled the flame of my interest. After reading your article, my hopes are again high. Thanks for the good news. Now if I can only get some time after work. — *Charles E. Biss, Rochester NY*

□ I am sure the Northwest Arkansas ARC will support and participate in your new growth for amateur radio.

We have recently completed a Novice class with 12 students having passed the code test and taken the FCC exams. There was a five to six week wait between passing the code test and receiving the exams. Your proposal for certification through ARRL affiliated clubs will be a breakthrough in cutting that unneeded red tape and should further enhance recently laudable FCC deregulation.

Most students for our recent class came from word of mouth advertising although as an afterthought we put a sign in a local radio store. That sign has generated so many inquiries that we are starting another class. We may have to hire a hall! — *Clement R. Coggin, W5TXA, Fayetteville, AR*

□ The League seems to be plugging all out for a rapid increase in the number of licensed amateurs. This will effect an extra nudge that the manufacturers' lobby wants for admitting one and all into the amateur ranks and bands.

Such a trend is detrimental to the interests of all bona-fide radio amateurs. Even now, the general public lumps CBers and amateurs into one general category of "radio nuts."

However, the radio amateur is a distinct breed and has historically come from those possessing more than a cursory interest in the development of the art itself. Many rose to prominence as inventors, organizers and executives in the developing electronics fields.

It seems to me that amateur radio is not for everybody and entrance into the fraternity should be predicated on certain minimum requirements set at today's level. Try to equate in your mind such names as Marconi, Maxim, Handy, Schnell and yes, Doug DeMaw, too, with the CB characters. — *Clark F. Koffke, KØKO. Grand Island, NE*

[Editor's Note: The new training program does not intend to lower the present requirements for the Novice license, but merely to smooth the presently rocky road towards this license.]

□ After reading other ham magazines, I have come to the conclusion that the ARRL has more going for it and *QST* is the backbone of amateur radio. I firmly believe in your worthy organization and if we stick together we can have amateur radio the way we want it. Many changes are being made, some good, some bad, but if amateurs stay together we have a definite future for all. Let's preserve our hobby! — *Kelly McGrew, WA7VCL, Caldwell, ID*

□ When things get back to normal and everybody begins to think that we are all human beings and not numbers or indifferent to people's feelings and big companies begin to have feelings for people in general, then I will be the first to join the League. After 26 years in your organization, I find that big business doesn't care for little people, but for how much money they can take. — *Carl Saglimben, W7IBM, Tempe, AZ*

EASY ON OSCAR: OSCAR IS EASY

□ AMSAT recommends the use of 80 to 100 watts effective radiated power with the mode B transponder (432.15-MHz input, 145.95-MHz output) to prevent overloading and excessive discharge of the spacecraft's battery. The use of 10 to 20 watts to a 10-element beam yields excellent results, and some operators report establishing two-way communications with power down to a watt or so! — *Perry T. Klein, K3JTE, Washington, DC*

IN ADVANCEMENT OF THE ART

□ I do not think it is too early to start thinking about standards to be used when the FCC gets around to OKing RM-1550 [ARRL's request for "deregulation" of teleprinter. — ED.] It might be a good idea to use the following universal computer industry standards for low-speed (up to 300 baud) terminals: *Originate* (uplink) mark: 1070 Hz, space: 1270 Hz. *Answer* (downlink) mark: 2025 Hz, space: 2225 Hz.

Note the use of 200-Hz shift, space high, for both data directions. While full data duplex may not be common among amateurs, I feel that we should still use that shift to allow those with commercial modems to use them without modification. We should decide as soon as to which pair of tones should become the amateur standard for non-duplex work. — *Phil R. Karn, Jr., WB2AJX, Ithaca, NY*

□ For those people interested in experimental radio operation, WN4RBU and I now have a beacon on 163 kHz using narrow-band carrier-shift keying. A transistor controlled relay shifts the carrier a few hertz to produce a siren-like sound. In compliance with FCC rules, power input is about a watt or under.

Reception reports would be of great benefit to us particularly with details concerning time-differential of keying rate and receiving conditions. We will issue a carefully prepared QSL card to all who successfully report reception. — *Robert D. Null, K4JVH, 501 N First Ave., Maiden, NC 28650*

*[Editor's Note: §15.112 allows license-free operation of one watt or less from 160-190 kHz with a transmission line plus antenna length of less than 15 meters.]

QST "STYLE"

□ I read with dismay several "Correspondence" letters about the over technical nature of *QST*. If we are to follow the directives of amateur radio as stated in 97.1, surely we cannot stand idle and be satisfied as mere equipment operators. While some articles may be difficult to comprehend in their entirety by some, careful reading will almost certainly allow a basic idea of what is going on. For those who choose to fully understand the underlying theory, a watered-down version is of little use. I urge you not to degrade the quality of *QST* by reducing the number or technical content of the many fine articles. There are plenty of popular magazines available for those who are interested in mere tinkering. — *Michael B. Hayden, WA3WTQ, Greenbelt, MD*

□ Please understand that I've been a member for more than 20 years, but I've never seen a black American presented in your articles. They, too, represent part of the ham fraternity. There are many black clubs and organizations to be presented. I think this will give a great uplift to the minority groups, who, although small in number, are true members. — *Thomas Shields, W9NYW, Gary, IN*

□ After several months of reading the correspondence section of *QST* I noticed the main topic concerns the size, what was on the cover, how many mistakes were made, an increase of advertisers and so on. Some people like it and some don't. I don't care if you made it the size of a matchbook, I would read it anyway to learn about electronics! — *Doug Johnson, Highlands, TX*

AWARDS AND SUCH

□ How about drumming up some business for prefix chasers? I was disappointed that many Novices were not "AK" during the Novice Roundup. Cards don't have to be printed as long as the operator puts his bicentennial call on the card. — *G. Scott Henninger, AD8HBN, Loveland, OH*

How's DX?

Conducted By Rod Newkirk,* W9BRD

They Should Have Tried Tea Leaves

The overflow mob jamming Long Hall finally quieted enough for chairperson Shirley Screamsalot to introduce our scientific guests of honor, Professor Phlim and Doctor Phlam of Phlim-Phlam Ionospheric Consultants, Ltd. The bewhiskered pair bowed to the DX Hoggery & Poetry Depreciation Society multitude just in time to duck the whizzing Rettysnitch that wasted Shirley. "The crux of your problem, as I see it, is excessive smoothing of sunspot numbers," declared Prof. Phlim. "They slide right off Old Sol before they really get rolling." This triggered Alvis Tuninup from the balcony:

Pioneer Pinhead McBlotz
Keeps doodling orbital plots.
It's really quite plain
He could be more sane,
Bombing Oscar with 900 watts.

"On the contrary," opined Dr. Phlam. "The far side of the solar disk has all the spots you need but they are completely sucked dry by DX hounds on Mercury and Venus as they cross its horizon." Sue Perlid shouted from the floor:

A new low in sickening sound,
The sideband of Lardmouth von Klown.
He processed his speech
From a scream to a screetch –
It's the hairiest signal in town.

"If we multiply the solar flux in bicks by the A-index in eenies," asserted the Professor, "we arrive at the X-factor in bickeenies, a figure quite revealing." Morris Codehater bellowed from the orchestra:

Power-crazed Dimmer O'Blocks
For Kilowatts blew all his rocks.
The ampere-mad dunce
Tried twenty at once –
That's him in his little black box.

"You might simply switch to secondary-emission moonspots which could be more readily studied without hazard to the naked eye," suggested the Doctor. Kent Sendright howled from somewhere up front:

Sunspot computers a-glowing,
The researchers look wise and knowing.
But it's clear to me
They barely can see
Where we've been, much less where we're going.

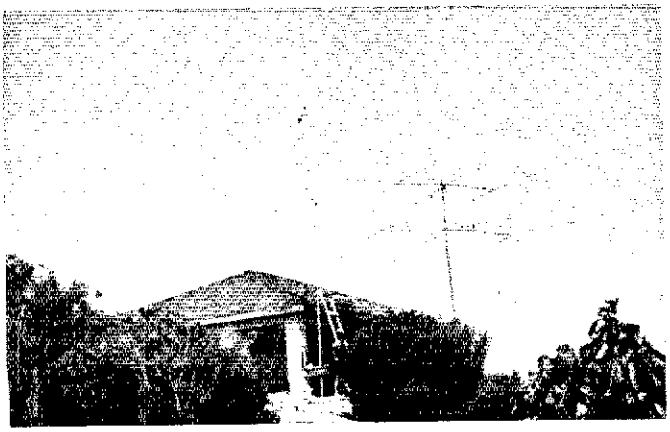
Our learned guests closed their glib presentation in cheery agreement. "The current sunspot decline actually bottomed out six months ago but you won't realize it until eight years from now." That won them this May's DXHPDS farewell award, a huge matched pair of lifetime-guaranteed final tubes that led to the river through a trap door beneath them.

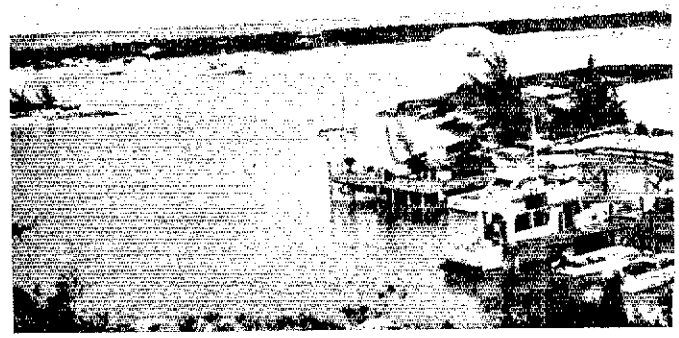
WHERE

NORTH AMERICA: How about that Cincinnati couple who put a note in a bottle and dropped it into the Ohio five years ago? Got a QSL from the west coast of Scotland this year after a 6800-mile trip down the Ohio, the Mississippi, through the Gulf and across the Atlantic. Real DX! Other "QSLers of the Month" in spring's bountiful harvest, all commended for remarkably rapid and reliable wallpaper output in "How's" mail from Ws 1BFK 1CDC 1JUB 1SWX 7HPI 7YF, WAs 1UAW 3DMH 4UPR 8UUY, WBs 4WHE 5HVY and VE3CUI: A35FX, CR6s GA IK, CTs 1UM 2BS, DJ4PI, DK1FW, DL9OT, DU8ED, EAs 5TD 6BJ, EL8G, EP2s MW SN, FC2CI, FP8s DX FU, FR7AI/J, FYs 7AE 7AK ØBHI, G4CNY, GM4DGT, HA3KNA, HC2HX, HKs 4BVV ØBKX, HR6SWA, JAs 1QOW 8AA 8BAR ØRR, KA8OP, KCs 4AAC 6AQ, KH6s IKB IJE, KP4EAS, KS6FF, KZ5BK, LA2BG, OH2LU, OK3ØCAW, OXs 3CS 5BW, P29GW, PJs 8YFQ 9JT, SK6CF, SM6BGG, SP4ETO, TF3IRA, TG9LW, TI2WX, TJ1s BF EZ, VE8AK, VK3CB, VPs 2A 2AYL 2DAR 2DH 2DX 2EEG 2LBR 2MAH 5AH 9GE 9HT VQ9D, WA4KPH/HKØ, WB8QMG/HK9, XE1s EL PGB, YBØABV, YN1FWN, YS1MAE, YVs 1AQE 4AGP, ZDs 7FT 8TM, ZEs 4JS 6JJ, ZF1s AL TW, ZK2AO, ZLs 1CO 2AFZ 4CA, ZS6JK, 3A2GX, 3B8DN, 3D6BE, 4U1ITU, 4W1GM, 4Z4MJ, 5L2FT, 6W8FP, 6Y5DA, 7P8AQ, 8P6DR, 9G1JX, 9H4G, 9J2BL, 9M8HB, 9Q5SW, 9V1RR, 9Y4s HM NP and VU, together with QSL tenders Ws 1BIH 3EVW 3HNK 3KT 4MYA 6KLI 7PHO 8CNL, Ks 2IGW 4GKD 7ODK 9OTB, WAs 3NCP 3NGS 4BTC 4DRU 4SVH 4WTG, WB2JYM, VE1AIH, DL7SI, F2QQ, G3RWL, JA8JN and SM6CKU. And though they don't astound you with direct mail these Russians are credited with steady performance via bureaus: UAs 4AZ 6HZ, UB5s GBD MAI NA, UF6QAC, UJ8AH, UKs 2BAO 2BBH 2FAH 2GAG 2RAE 3MAQ 4LAD 5EAC 6FAX, UO5ØA, UQ2OL, UR2s MO NW, UT5s BO EH HF, UVs 3AF 6GN 9AX and UY5OQ. Any recent zippy returns out your way? . . . I have copies of the logs of Sable Island stations VE1ASE (September 1, 1966, to June 10, 1967) and VE1ZQ (May 7, 1965, to August 2, 1966). Due to limited and irregular mail service to Sable, many QSLs may not have been acknowledged. A limited supply of cards is on hand. If necessary it will take time to have more printed. VE1ASE was a multi-operated club station while VE1ZQ was on Sable with the Department of Transport. (VE1BDT) . . . W4GSM still has QSLs available for VP2MAH work back in '73, also for DL4GS, FP8CQ, PJ5MO and VP2EEA. (VE3CUI) . . . Currently poor QSO conditions may account for increased receipts of QSLs for 1972-'73 QSOs, both foreign and Stateside. (WA3DMH) . . . I'd like to close the book on FM7AA QSLing but I act as his QSL manager only for contacts from April 9, 1971, to February 24, 1973. No other logs are available here. I also have VP2AR logs only for January through March 6, 1972, but other VP2AR QSOs can be confirmed through Mickey's XYL, VP2AYL. FG7TD logs are on hand dating from 1972. No further ZF1CW QSLing from here although I've been receiving requests about this one, a call sign probably re-reissued. (WA8TDY) . . . My DX QSL returns appear to be helped by my filling out each card in the language of the country concerned per K3CHP's *QSL Guide*. (W1BFK) . . . I have all my logs back to 1971 and do QSL but I may have missed some requests in the past. Note that my *Callbook* QTH is no longer valid; QSLs must be sent to my Bermuda address. Cards unaccompanied by s.a.s.e. (self-addressed

*c/o ARRL, 225 Main St., Newington, CT 06111

VP5s CW WS and WW (W4s ORT SME and WB4EYX) recommend the Third Turtle Inn at Providenciales for your Turks & Caicos QTH of the Month. W4BRB more recently signed VP5GS at the Inn and enthusiastically endorses the location. With such a view you can almost shake hands with DX.





UW0MF refreshes himself between 20-meter openings in Vladivostok. Mike is also heard from university club station UK0LAB. *(KH6IKB-W1HOC photo)*

stamped envelopes) or s.a.e. plus IRCs (International Reply Coupons) are answered via bureaus. (W4EV/VP9) . . . I always QSL on written request. IRCs are welcomed but not essential. (6Y5HJ) . . . My being listed as VP2M's QSL manager was a big mistake. Hundreds of cards received were forwarded to VE7BXG. (W4QL) . . . We operate from the same quarters in Managua and QSL 100 percent. Bicentennial WAS here we come! (YN1s KG RWG) . . . EX-WA1TNC/HI8, now W1DLF, offers to clear up QSL debts, if any, for his 1974 D.R. operation. (VE3CUI) . . . We volunteer our clerical services as QSL aides to needful ops at the DX end. (K5VTC, WA2YPF, WB7CGO) . . . Another big salute to Sterling (VA) Amateur Radio Club's effort at ARRL's Fourland QSL Bureau branch. Just received an 84-card batch. (WB4WHE) . . . It's important to recognize that some overseas amateur radio societies franchise their QSL bureaus on a members-only basis. QSL DX stations via bureaus only when they instruct you to do so. (DXNS) . . . 'Alp! 'Alp! These parenthesized brethren seek hints and kinks toward rounding up pasteboards from hold-outs specified: (W1JUB) CE9AJ, EA6BD, LU1s ZE ZR, UJ8AC, XE4EX, 3B8RS, 3D6AA, 7X2AN; (W5UQZ) FW8DA; (W7HPJ) YN1MHL, ZF1AK, ZL1AA/c; (K4IQN) 4S7SW '74; (K4MZE) FW8DA, JA1KJW, TI9FAG, VP1LE; (K6ZIF) SV0WGG; (WA3DMH) HK0AA, TI9FAG, 5N2NAS; (WB5HVY) FG0MM, HK0MM, HK0AA, OD5HQ, UJ8AC, VR6TC, VU2DK, 7X4MD, 9Q5DM; (VE3CUI) IS0PUB, ZL4AU/c and 8P6GB. Any succor?

AFRICA: This business of W/Ks including dollar bills with their QSLs is a problem that could ultimately affect newly licensed stations all over the developing parts of Africa. One IRC for surface mail reply, two for airmail, and a printed self-addressed envelope are sufficient. After nine years in Zambia I really don't need more QSLs, except for certain United States toward WAS, but I do QSL 100 percent via RSZ's bureau. (9J2CL) . . . I'm managing QSLs only for Canadian and USA contacts by ZE4JH and ZL1BIL. My *Callbook* QTH prior to the 1976 issue is not correct. S.a.s.e., or s.a.e. plus IRCs, please, whichever is appropriate. (WA4UPR) . . . As QSL manager for the QSOs of C9MJO, CR6s II IK WW YY, TY5ABK and operator Dale of HR6SWA, please specify my new QTH, 763 Graham Lake Terrace, Battle Creek, Michigan 49017. (W8CNL) . . . In forming the Radio Society of Swaziland, we have established a QSL bureau at P. O. Box 21, Ezulwini, where 3D6BG will manage our incoming and outgoing confirmations. (3D6AW) . . . Contrary to some directories, I do not handle QSLs for FG7XJ and CR6FW. (W5QPX) . . . The D5 prefix block goes to Liberia, D6 to the Comoros, courtesy International Telecommunication Union. In fleeing from Angola to ZS3-land ex-CR6LF was able to salvage his logs of the past ten years. (DXNS) . . . QSLs for all but a few of my QSOs from Egypt have been issued and I've already sent out about 550 cards for contacts from Israel. I'll soon be taking all logs back to Canada with me and can be reached via the home QTH or through VE1FQ's bureau facility. (VE1VE/SU/4X) . . . A2CCY expects his logs to catch up with him shortly at his new Toronto address. (WCDXB) . . . I can still confirm TJ1AD contacts made between December, 1974, and February of '75. Try me at 3264 S. Perkins, Memphis, Tennessee 38118. (WB4WHE)

ASIA: I'd like to close the QSL books on MP4BJR-A9XO operation from May 15, 1973, to May 15, 1975. Anyone still in need of his card should now write Mike direct at Rte. 2, Box 155M, Arlington, Washington, where he's signing K7CTW. (K9KXA) . . . I do not hold the logs of EP2PP who will QSL when he returns to the States in June. (W2BU) . . . Anybody still needing my HS2AKZ pasteboard for activity from May 6 to December 19, 1975, should apply to my California address. Same goes for WB6SCQ/KG6. (WB6SCQ) . . . Still have plenty of cards and all logs for my DXtensive HS4AHQ career of 1972-'75. My present Texas QTH should be good for the next two or three years. (W0EFD/5) . . . I still have a few 9V1QD cards left, should there be some still requiring confirmation of my Singapore QSOs. (W2MIG) . . . K6TWT no longer handles VU2ANI-VU7ANI QSLing. Go direct to the Andamans. (WCDXB) . . . HZ1TA indicates that W/Ks may QSL via W4UL, British stations via G3RSL. (DXNS)

EUROPE: SV0 suffixes are passed around to new operators so quickly that we at the SV0 QSL Bureau have lost track of who held what call and for what period. Hence we have a stack of undeliverable cards we'd like to forward to the proper operators. EX-SV0s can help clear the backlog by sending me their current addresses, former calls and dates of operation. By the way, "SV0PN" is very active but fictitious, and SV0s do not use 75 and 80 meters. (SV0WEE-WA4KSQ) . . . Those needing QSLs from SV0WJJ for QSOs between September 26, 1973, and January 25, 1976, should apply to my New York address. I no longer hold the call. (WA2AMY) . . . I manage 4U1ITU QSLs only for contacts made on November 25-26, 1975. Cards received for other QSOs of are being forwarded to Geneva. (W4KA) . . . QSLs for 4U1ITU contest QSOs of November 29-30, 1975, may go to DJ9ON. WA1NRV operated 4U1ITU on January 15, 1976, and can confirm his contacts. (DXNS) . . . Alas, dozens of HA LZ and YO stations are up to four years in QSL arrears at my end. (VE3CUI) . . . Re QSLing for GWs 4ENT and 6GW, use only my address as it appears in the '76 *Callbook*. Cards also may be sent via RSGB for my attention. (GW4BLE)

OCEANIA: VR4DX and YB0ABV ran out of QSLs and will resume QSO confirmation on receipt of delayed stock from the printers. (WCDXB) . . . Former KJ6CF operator Herb now signs KH6IPS. (DXNS) . . . W7OK's QSLing for FK8BG and VP2KC is slowed by tardy log receipts. W6RGG keeps plugging away at the *Yasme* Foundation QSLing for the VR1Z, VR8B, 3D2KG and C21 operations of W6s KG and DOD. Patience! (WCDXB)

SOUTH AMERICA: Our Chilean Amateur Youth Association began QSLing for Antarctic stations CE9s AA and AL as of the first of this year. (CE3AXO) . . . With two thousand cards on hand to answer, F2QQ regrets delay in sending forth FY7AK confirmations. Logs were slow arriving. FY7AK QSOs of March 15-16, 1975, can be confirmed through K3BSY. (K9OTB) . . . Now for our periodic QTH catalog but remember that each suggestion is not necessarily accurate, complete or "official." . . .

ex-A2CCY, R. Furzer, Apt. 411, 20 Carabob ct., Agincourt, Toronto, Canada
A2s CGD CNN (via SM3CXS)
ex-A4XVE-MP4BHY-MP4QHY-3B8DQ-4W1GS (to A9XBD)
AP5HQ, Commandant, Signal Training Centre, Kohat, West Pakistan
C5s AH AQ, P. O. Box 254, Banjul, Gambia
ex-C9MIZ-CR7IZ-CQ7IZ-XX7IZ (via REP of Portugal)
CE9s AA AL (via CE3AOX)
CO6OM, Box 3011, Havana 3, Cuba
CO7KZ, Box 41, Camaguey, Cuba
ex-CR6LF-CQ6LF-XX6LF, P. O. Box 2154, Windhoek 9100, South-West Africa
ex-CR6OZ-XX6OZ, J. Fidalgo, Rue Marque de Pombal 4, Tomar, Portugal
DA1TH, T. Huston, PSC Box 251, APO, N York, New York 09123 (or to WA8RY
DL0FOC/HB0/LX (to DJ6SI)
EA9EJ, J. Perez, Calle Madrid 1, El Aaiun, Spanish Sahara
EA9EW, Box 213, Ceuta, Spanish North Africa
EP2EJ, E. Diehl, Jr., Box 170, Litton AMECOM Div., c/o U.S. Embassy, APO, New York, New York, 09080
F2MO, M. Dort, 12 Av. de la Mongie, Puzac F65200, Bagneres de Bigorre, France
FB8s XN XP (via F5VU)
FL8AC, B. P. 215, Djibouti, T.F.A.I.
FL8s GL GT, SP.85038/GET, Djibouti, T.F.A.I.
FL8KP, P. Kissonerghis, B. P. 1958, Djibouti, T.F.A.I.
GC3YHU, D. Robinson, Solanita, Park Estate, St. Brelade, Jersey, U.K.
GWs 4ENT 6GW (via GW4BLE)
HC1PZ, Box 289, Quito, Ecuador
HC1SE, Box 4731, Quito, Ecuador
HR1DH, Box 698, Tegucigalpa, Honduras (or via WA4UPR)
ex-HS4AHQ, J. Boots, W0EFD/5, 447 Demya st., San Antonio, Texas 78227
JH1KSB/JD1, T. Sato, JE3AFS, 1-22 Shioiri cho, Yokosuka, Japan
JR1BRV, M. Ohta, P. O. Box 244, Kyobashi Tokyo 104-91, Japan
JWs 2CF 5NM 8KT (to LA5NM)
JY9RA, Box 183, Amman, Jordan
ex-KA6DE, J. de Mott, K5DED/0, 12240 E. Arkansas Av., Aurora, Colorado 80012
KC4USG, USCGC *Glacier*, FPO, San Francisco, California 96601
KM6CV (via KM6BI or WA6ZMN)
ex-KZ5WA, W. Mader, Jr., WA8WWM, Box 2, Empire AFS, Michigan 99630
SV0WEE, M/Sgt L. Dale (WA4KSQ), USAF Hospital, Athens, P. O. Box 225, APO, New York, New York 09223
TA1MB, Box 1167, Istanbul, Turkey
TR8JCV, B. P. 4110, Libreville, Gabon (or via REF)
VE1VE/SU/4X (to VE1VE or via VE1FQ)
VK2s FT/lh OO/lh (via VK2OO)
VP2GAG, Radio Club of Grenada, St. Georges, Grenada, W.I.
VP2s LCJ LCN MEV MWN (via WB9IWN)
VP2MGB, P. O., Bethel, Montserrat, W.I.
VP8s ML NY (via W5TWI)
VR8A J. Thompson, Weather Office, Funafuti, Tuvalu
W4EV/VP9, G. de Vilbiss, Tudor Hill Lab., FPO, New York, New York 09560
WA2BIH/TU, A. Grossman, c/o U.S. Embassy, Abidjan, I.C.R.
XE2RLP, P.O. Box 1147, Mazatlan, Sin., Mexico
YB0ACG, R. Wirth, c/o Siemens Indonesia, Box 2469, Djakarta, Indonesia
YN1s KG RWG, U.S. Military Gp., Nicaragua, APO, New York, New York, 09885
YN8ODM, P. O. Box 20, Esteli, Nicaragua
YS1WLE, C. Lund, A.P. 05-93, San Salvador, El Salvador
ZK2AO, W. McNearnie, c/o A. Smith, Mangawhata RD7, Palmerston No., New Zealand
ZL1GP/k, L. Orange, 2 George St., Manurewa, Auckland, New Zealand
ZS1ANT, G. Puts, 8 Kenray Ct., 525 Edmundstr., Pretoria 0002, S. Africa
ZS3WK, Box 804, Otjiwarongo 9210, Namibia
3D2KG, Yasme Foundation, P. O. Box 2025, Castro Valley, California 94546
5Z4s PG RG (via WB9MFC)
6Y5HJ, J. Hollingsworth, P. O. Box 160, Kingston 10, Jamaica
7P8s AG AH (via SM3CXS)
7Q7RM, P. O. Box 472, Blantyre, Malawi
9L1NP, N. Price, P. O. Box 12, Freetown, Sierra Leone
9M6MU, Box 101, Keningau, Sabah
9Q5DM, Songa Hospital, Kamina, Zaire

A35AM (JR1BRV)
A4XFU (G3XAR)
A9XCON (via ARAB)
A9XO (see text)

AH3DV/AG2 (KS6DV)
AJ4DIW (W3HNK)
C5AP (LA6LE)
C6ABA (G3AMR)
C6ABC (WB4YHN)
C9MJO (see text)
CE9AV (CE2MZ)
CR6FW (see text)
CT4AT (W1YRC)
CV4BL (CX4DL)
ex-CX6BT (YS1WLE)
D4CBS (CR4BS)
DJ8LP/5A (DJ8LP)
EA8CR/9 (EA8CR)
EL2ED (WA2BIH)
EL8O (OE6WMG)
FP2PP (see text)
FB8XO (F6CRT)
FB8ZG (F8US)
FG7AR/FS7 (K1LPA)
FG7AYO/FS7 (W2JKN)
FG7TD (WA8TDY)
FG7XJ (see text)
FGØBKZ (F6BBJ)
FGØCEN (F6AQO)
FMØBKZ (F6BBJ)
FMØBZW (W2MIG)
FL8BO (via REF)
FM7AA (see text)
FOØTF (DK7TF)
FY7AK (see text)
G4AMJ/VP9 (G4AMJ)
GW4CXM (G4CXM)
HC8RG (DJ9IK)
HD5EE (WA8TDY)
HK3CLX (W6OKW)
HS1ALE (via RAST)
HS2AKZ (WB6SCQ)
HZ1TA (see text)
ISØXKF (DL1RK)
IX4GN (LA4GN)
JX6DS (LA6DS)
JY8HXK (G3HXK)
K3HVG/HR6 (K3LLL)
KA8OP (W7PHO)
KC4AAA (W6MAB)
KC6AQ (WA6AHF)
KG4JS (WB5HGS)
KJ6DL (WB5HVY)
KL7RN (WA6SEY)
KS6DV/KB6 (KH6FF)
LH2A (LA2AD)
LU1ZA (LU2CN)
LU2A (LU2AFH)
LU8A (LU8AJG)
MP4BJR (see text)
OE7XBI (OE5CA)
PA5GIG (PI1ARS)
PA9ANY (DA1TH)
PJ8CDC (W1CDC)
PJ8CO (W1YE)
PJ8KI (W8KI)
SVØWJJ (see text)
TA1ZB (W5QPX)
TG9YN (DK5VW)
VE1BFV (W3HNK)
VE2AQS/TG9 (VE2KQ)
VP2EEE (K2BPP)
VP2G (W5MYA)
VP2GFA (KL7FA)
VP2GJI (W2BJI)
VP2KN (W7OK)
VP2LCO (VP2MGB)
VP2SV (K3GYD)
VP2VJ (VE3MJ)
VP5AH (WA4DRU)
VP5BR (K4GWK)
VP5DF (K4VMA)
VP8DL (WB4ASV)
VR3AG (K2BT)
VS9MPH (G4DVP)
VU2GO (VU2IJ)
VU7ANI (VU2ANI)
WØOIR/C6 (WØOIR)
WA1UGC/VP9 (WA1UGC)
WA4WME/HBØ (DA1VH)
WA7SIN/8R1 (W3HNK)
WB8HEY/VP2 (WB8OBA)
ex-XW8CO (HS1ALE)
YA1ZWA/5U7 (I1HAG)
YBØABV (WA7OBV)
YC7HV (JA8BMK)
YK1AA (DJ9ZB)
ZD7WT (ZD8TM)
ZE4JH (see text)
ZF1CM (WØZTC)
ZL1BIL (see text)
ZL3LN/c (via NZART)
ZS5PD/3 (WA4HHG)
ZS6BNF (SM4ANV)
ZS6DN (WA4HHG)

DX Century Club Awards

Administered by R. L. White, W1CW

The following listings show DXCC Awards issued by Headquarters during the period from February 1, through February 29, 1976.

New Members

CW/F

280	DL2FV	128	PAØUU	WB5NEO	K7RSB	JA4IYL	K4IBP
JA2HO	215	EA3AEA	119	108	106	102	K8EEW
246	W4PZV	124	HB9AZO	KL7BVY	W8VZE	WA7JBE	KØFZT
JH1QOJ	205	OZ3XS	115	WB2QAX	105	101	VE6KY
222	YU3BU	121	DK6TP	WA7LAG	WB9OUX	W2TE	WA2JOC
K9DTZ	134	W5UFF	110	107	WAØIYY	WA6IYN	WB2NOM
219	WB9BQV	120	DL7KL	K4KFH	104	100	W4FOM
							WAØWNF

Radiotelephone

221	144	WB9BQV	WB4VNG	106	W6ZUM	JAØAIE	W4TNX
JH1QOJ	DK8CO	123	112	VE3BR	104	102	WB4KTR
212	138	G3ZHC	CT1QZ	WA7LAG	WB6CKO	LU1BJZ	100
K9DTZ	JA2HO	113	107	105	103	WIJAA	IØZTG
173	134	EA5TD	K7RSB	EL2DT	DL6WO	101	K5VVV
W4PZV							W3FZE

CW

102		101		100		K6RLY	
WØBN		JA1KWV		K6KII		W4WSF	

5BDXCC

#475	#476	#477
K4TIG	G3ZBA	VE3BMB

Endorsements

In the endorsement listings shown, totals from 120 through the 240 level are given in increments of 20, from 250 through 300 in increments of 10, and above 300 in increments of 5. The totals shown do not necessarily represent the exact credits given but only that the participant has reached the endorsement group indicated.

CW/F

350	W4ZSH	270	250	W4JUK	180	K9KEV	VE6CV
W2QHH	300	EA6BN	K4ZYU	WA4HPF	I1SBU	W7RUK	WA2GEZ
325	W9KNI	W4AFS	K8HLR	W5RUB	W2TKZ	W8WCW	WB2AFS
W8RT	WØCAW	W6ZYC	OZ1AJ	W6THR	WA3SRY	WA9SVZ	WB4RFZ
315	290	WA7RFH	W4FZO	VE3CEA	W4CZU	WØKMN	W7EEJ
WA8ZDF	K3EH	260	W5ZSX	200	XE1FR	140	YU2RMS/X
310	PY5UG	OE3HOW	W8QFR	HR1RTS	160	JA1IZ	120
W6MUM	280	W2VYX	W9LUD	JW5NM	JA2ETQ	K2IGW	I5ØAEW
305	K8UNG	W9LF	220	WB4OXD	K4WVT	K4HLJ	WA2LUF
		W9NN	KØHGB	YU3TDX	K9BCK	KH6HML	

CW

200	180	140					
W9KNI	W1DAL	K9UTN					

Radiotelephone

315	280	260	DK4YA	WA2FLA	JA3WBK	WØEVE	K9UTN
WA8ZDF	W8GUZ	WA4ZLP	I1TBE	W6THR	JW5NM	WBØNHG	KH6HML
300	270	250	KH6BZF	200	W2UFS	160	WB4OVX
WØBN	EA6BN	OZ1AJ	PY8JO	HR1RTS	W3WM	WA9SVZ	WA9FUD
290	W6GTL	VP9GE	220	ZL1AJL	WB4OXD	140	120
W6TCQ	W6ZYC	240	PY2JY	180	W9PBY	JA2ETQ	W9QVY

ZY5YC (PY5YC)
3D2JP (JA2JPA)
5B4CO (SMØCHB)
5B4CX (OE8GMK)
5N2FAX (W1WTE)
5W1AZ (WA6AHF)
5X5NK (DJ3JV)
6Y5BF (DJ6RX)
6Y5DE (G4DEM)
7Q7DW (WB9EBO)
8P6ES (K4GLJ)
9G1TF (via GARS)
ex-9M2BU (YBØACG)
9M6MP (JA2KLT)
ex-9V1QD (W2MIG)

Thanks for the preceding directory are due Ws 1CDC 1JUB 1SWX 4KA 7HPI 7YF 9LNQ, Ks 4KCK 6ZIF 9KXA, WAs 2EAH 2UYL 3DMH 4EWX 8TDY 8UUY, WBs 4WHE 9IWN, VE3CUI, PAØHTR and literature of clubs, groups and individuals to be credited subsequently. Come again!

OKINO TORI-SHIMA — A NEW COUNTRY

As part of the year-long celebration of the Japan Amateur Radio League's 50th anniversary, ARRL is pleased to announce the addition of Okino Tori-shima to the ARRL Countries List. Even though Okino Tori-shima does not quite meet the specified mileage used in conjunction with additions made to the ARRL Countries List, an exception has been made for this one event and is effective with the activation of the JARL DXpedition to Okino Tori-shima. Advice from JARL indicates that the DXpedition to Okino Tori-shima is scheduled for June or July of 1976. A further announcement will be made concerning submission of confirmations for DXCC credits for contacts with the JARL DXpedition at such time as the operation does take place. ARRL is pleased to join with hams worldwide in celebration of the JARL's golden anniversary.

DXCC NOTES

Attention holders of the CW DXCC Award. Starting with the June, 1976, issue of *QST*, there will be an Honor Roll listing shown for the CW DXCC. For the purposes of establishing the first such listing, CW DXCC holders having a total of at least 108 undeleted credits on their CW DXCC record may make a submission in June, 1976, without regard to the number of confirmations submitted. QST

The World Above 50 MHz

Conducted By
William A. Tynan,* W3KMV

New Blood

We stand at the threshold of an opportunity to win many new converts to the kind of vhf operation that many of us consider to be in the best ham tradition. The new 2-meter transceivers, providing multi-mode capability, are just starting to appear in quantity. Some new owners are finding their own path to the part of the band where ssb, a-m and cw activity take place. When they arrive, we should all go out of our way to welcome them and to provide them with information concerning regular activity such as nets, contests and such. Alternatively, many may not be aware that anything (besides fm) goes on in the 2-meter band. They may believe that the frequencies below 146 MHz are a vast empty wasteland. It is this group that we must find and convince that they are not getting all they paid for, if they fail to use the full potential built into their versatile gear. One place we can be certain to encounter these likely converts is on fm. So, if we hear someone sporting a new Yaesu 221, Kenwood TS700A or KLM Multi-2000 on the local repeater, how about giving him a call. Make a schedule for a contact on ssb, a-m or cw. With a little missionary work like this, we can tap this source of new blood for our vhf/uhf bands.

The coming year should be an important one in the development of vhf/uhf, particularly with respect to increased population. Not only are the multi-mode 2-meter rigs appearing in increasing numbers, but ssb/cw transceivers for 6 and 2 meters as well as 70 cm are also becoming readily available. In addition, transverters for use with low-band equipment are once again finding their way to the market. We sorely need the increased population which this new equipment represents in order to justify retention of our bands. And from its pool of talent will come tomorrow's leaders in the world above 50 MHz. Every amateur should do his part in bringing these newcomers along. This column – and your League – hope to provide leadership, but the major people-to-people effort must come from the present occupants of the vhf/uhf spectrum

The site of ZL2WB. Gear for 2 meters, 70 cm, 23 cm, 9 cm and 3 cm was in place atop 4800 foot Mt. Murchison.

WA6LET SCHEDULES ADDITIONAL 70-CM EME TEST

The next series of moonbounce tests from WA6LET, using the SRI 150-ft. dish, will be held May 23 from 1000 to 1900 UTC. According to a message phoned into the answering machine by Vic Frank, WB6KAP, overwhelming demand dictated that these tests again be conducted on 70 cm. Tests on 23 cm will not be held until late summer at least. Plans are being formulated for 13-cm tests which may well take place before the 23-cm attempts. Because of lack of interest, no 1-1/4-meter tests are presently scheduled.

The imminent 70-cm test will use a format similar to that of last November. This time, WA6LET will transmit on 432.095 MHz and listen up from 432.000 to about 432.050. Special effort will be made to listen between 432.025 and 050 for the lower power, smaller antenna stations never having made an EME contact. Those stations having already worked WA6LET on 70 cm are requested not to call in this part of the band. The sequence will be as follows: Starting on the hour, and for every 10-minute period, WA6LET will transmit for one minute, listen for one minute, transmit for one minute, etc. Left-hand circular polarization will be used for transmission and right-hand circular for reception. Request for an STA for more than 1 kW may be made. Listen to W1AW for late information on this.

It is also understood that twin-phase plans are underway for a 13-cm EME operation from the 85-ft. dish at Goldstone, CA. One phase is intended for completing two-way contacts on 2304 MHz. For these tests, the rig at Goldstone will run normal amateur power. The other phase involves one-way operation only and apparently would be conducted using the planetary radar transmitter installed at the site. It runs 100-kW output and operates on 2388 MHz. More information on this intriguing series of tests will be provided as received.

*Send reports to Bill Tynan, W3KMV, P. O. Box 117, Burtonsville, MD 20730 or call (301) 384-6736 and record your message.

FINAL CONFERENCE PLANS SET BY VHFERS

Plans are now firm for the second annual Eastern Vhf/uhf Conference. This year's affair will be held May 15 and 16 at the Howard Johnson Motor Lodge, Middlesex Turnpike, Burlington, MA 01803. The agenda includes technical seminars, equipment displays, noise figure measurements, awards and general good fellowship. For more information on the program, contact Joe Reisert, W1JAA, at 17 Mansfield Dr., Chelmsford, MA 01824. Registration details can be obtained from Chuck Benevides WA1KIR, 103 Peabody Dr., Stow, MA 01775. This is fast growing into one of the must events for serious vhf/uhf amateurs.

ON THE BANDS

6 Meters – This year's better than average winter E_s season apparently did not carry over into February. The mail is almost completely devoid of reports of openings for the second month of 1976. WA0MRH of Omaha, NB, cites just a single E_s session on the 9th at 2139 UTC to Texas with W5EUB, WA5IYX of San Antonio, TX, confirms the poor E_s showing for February. In his always meticulous report, Pat notes the opening on the 9th with stations from Illinois, Indiana and Kansas being heard. He rates February 1976 as the poorest February since 1964 and notes the comparison with last year in which he recorded the best February for E_s ever.

So much for the bad news, for the summer E_s season should be on us any day now. Along with it will blossom good weather for taking to the hills and fields. Reminiscent of the sport of radio outings, we have been saving a report submitted a few months back by WA1RKS. It recounts a trip with his XYL, several ham friends, and their wives to Mt. Graylock in western Massachusetts last August. The trusty Swan 250 and 6-meter beam went along. Without aid of a band opening, numerous stations in 5 states were easily worked. Most important, a fine time was had by all. Ellis wants it known that hill-topping is far from dead. Incidentally, some of the newly marketed rigs such as the little Icom 502 6-meter ssb hand-held unit and the Yaesu 621 10-watt transceiver should make 6-meter portable operation easy indeed. The Icom 202 2-meter counterpart to the 502, along with the raft of other transceivers now available for that band, should fill a similar need for the 144-MHz enthusiast.

Hopefully, coinciding with some of the better E_s days to come are several contests. As a tune-up for the ARRL June Vhf QSO Party to be held June 12 and 13, the SMIRK 6-Meter Party contest will be run June 5 beginning at 1100 UTC and ending at 0500 UTC the next morning. For further details, send an s.a.s.e. to K5ZMS, 7158 Stone Fence Dr., San Antonio, TX 78227. Speaking of s.a.s.e.s, Ray asks that SMIRK members send him some so that he can get the various bulletins to them.

When sending your envelopes to Ray, ask about the new 17/76 SMIRK award. It's open to all 6-meter operators and requires contact with any 17 states and 76 stations during the bicentennial year.

For the June Vhf QSO Party, W0NRI has offered to travel to South Dakota, Wyoming, North Dakota or Montana, or possibly a combination of these states. Frank would like to know what states the gang needs most. Drop him a line at 3041 Ursula St., Aurora, CO 80010 to express your preferences.

A few more tidbits of what we might expect to find on 6 this summer keep showing up. WA5UUD in Louisiana is reported to have heard an HR6 on 52.525 fm, while from WA1OLK's OVS report we learn that VO2AG is on 6 and will be looking for contacts this summer. An OVS report filed by K7GWE informs us that W7KFS in Washington is loaded for bear this summer with a kW to a Tempo 6N2. We anticipate another big signal out of the Pacific Northwest this year. Congratulations are in order for K7TUO, new member of the 50-MHz WAS ranks. From the other end of the country, a station we should be hearing from in the months to come is 70-cm notable W1JAA near Boston. Joe has completed a 100-watt solid-state amplifier for 6 meters and expects to make good use of it. Another well-known vhfer who has recently added 6 meters to his higher band activities is K8III. Paul has an 8877 running on 50 MHz

which should stand him in good stead.

2 Meters – Anyone need Idaho on 2 meters? According to a letter from K7ZCB, WA7BJU is planning to operate a portable EME station from that rare state during the June contest. Dan's reason is two-fold. One is to provide the state to as many as possible and the other is to demonstrate the viability of moonbounce for contest operation. Expressions of interest should be sent to WA7BJU as soon as possible.

Speaking of moonbounce, W1FZA proposes that some kind of progressive award be instituted for EMEers and suggests that its requirements be adapted to the level of current activity. Ken thinks that the award could take the form of "THE QUARTER MOON", for working one quarter of the active states. [How about adding countries? ED.] Active states would be those with at least one operational moonbouncer. An operational moonbouncer would be defined as one who has worked at least one station other than the big special stations like WA6LET. The award would progress up through THE HALF MOON, THE THREE-QUARTER MOON and THE FULL MOON. What are your thoughts on the idea? A new moonbouncer is K5MWH who made his first contact March 12 with K1WHS.

From Cherry Valley, NY, WA2TOI writes that he is operating an attended beacon on 144.115 or 145.030 MHz most evenings from 1800 to 2200 local time. The rig puts out 100 watts to an 8 over 8 J-Slot usually aimed southwest. Jim asks that anyone hearing his beacon give him a ring on the phone and he will get on the air. He hopes to get some activity going in this way and has plans for a bigger antenna and more power in the not-to-distant future. Also from upstate New York, K2KIR sends word that he is back on 2 meters from his Syracuse QTH. Bud is running an SB-500 driven by a 32S-3. He says that it's easy to make the provisions in the 32S-3 to provide excitation for the SB-500 and would be glad to pass along details to anyone sending an s.a.s.e. to him at 112 Kenned Lane, North Syracuse, NY 13212.

Some of the San Francisco Bay area fellows have been clammering to change the standard calling frequency to 145.010. They feel that the even 10-kHz spot is easier to locate and is consistent with most of the other calling frequencies used. How about some comments from the rest of the gang on this proposal.

WA4MMP says that activity continues to increase in the Tidewater area of Virginia. WA2CJK/4 is a new arrival. Jerry plans to bring his big rig down from New York soon. The 2-meter Tidewater Net still meets every Tuesday evening at 2100 local time on 145.025 MHz.

The members of the Rocky Mountain Vhf Society of Boulder, CO, have a novel idea. They have considered launching a free balloon carrying either a 2-meter fm repeater or some type of beacon during the ARRL National Convention.

Fron Houston, TX, WB5JHG, a 6-meter enthusiast for several years, is now on 2 meters with a TV-2. Pat says that he is just as enthusiastic about 2 as he is about 6. The first day on the band, he worked WA5CHK/M5 who was about 175 miles from Houston. The antenna at WB5JHG presently consists of 11 elements at 72 feet but Pat hopes to have a bigger one up soon. W5JTA informs us of a new organization recently formed in the Dallas/Fort Worth area to help further the use of ssb on 2 meters. It's called "SWOT" for Sidewinders on Two. The group hopes to organize nets and relays in various parts of the country. As a start, they have picked as a frequency for their area 145.1 MHz which is Channel 20 on the KLM Echo 11. Many of the gang regularly monitor this frequency with squelched receivers. Len would like to hear from others around the country who would be interested in expanding the SWOT organization. An s.a.s.e. would be appreciated. Address 1704 Glenn Dr., Forth Worth, TX 76131.

1-1/4 Meters – A letter from WA6GYD provides some details on 1-1/4-meter activity in the San Francisco Bay area. Don says that quite a few of the 2-meter people there are also on 1-1/4. Every Sunday at 2000 local time, WB6TJO runs a net on about 222 MHz. All modes, including fm, are welcome. Don points out that, on the West Coast, most long haul 1-1/4 work is conducted on 222 MHz and just above. He notes that some conflict exists as a result of one of the area's fm repeaters being on 223.62 with an input of 222.02. Apparently, most activity on the band in other parts of the country is on 220 rather than 222. An advantage of the higher frenquency is, of course, that it is farther from potential interference from nearby Channel 13 TV stations. We would like to hear from 1-1/4-meter operators who have opinions as to what parts of the band should be used for various modes of operation.

A well-known vhfer newly on 1-1/4 is K7NII of Queen Creek, AZ. Tom has 120 watts of cw and can work WA5MFZ and W5LO, both of Edgewood, NM, a distance of 350 miles, quite regularly. Loaded for bear on 223.5-MHz fm is WB2WIK. With 500 watts out to a gain omnidirectional antenna, Steve can work mobiles up to 100 miles from his 1200-foot site near Arlington Landing, NJ.

70 Cm – ATV repeaters were given a temporary green light to use any frequency in the 420- to 450-MHz band by an FCC order released in early March. The order applies to any repeater licensed to operate in the band and runs for a period of one year. It will be interesting to see how the operation of these repeaters works out and what, if any, interference is caused to other users of the band. While on the subject of ATV, W9ZIH in Hickory Hills, IL, pleads for standardization among those operating the mode. Ron notes that some use fm sound 4.5 MHz above the picture carrier. This has the advantage that the transmissions can be received on regular TV sets with a converter. Others normally use an fm frequency somewhere in the 2-meter band. Ron indicates that, in the Chicago area, the frequency normally employed is 145.240 MHz. He suggests that ATV stations put up a sign from time to time indicating where their sound can be heard.

On the EME front, the monthly 432 EME News put out by K2UYH and VE7BBG states that during February more QSOs were generated by CQs than by schedules. Al, K2UYH, attributes this, at least in part, to the widespread damage to installations by severe winter storms which struck Europe and parts of the U.S. in January. One wonders if increased activity may also be a contributing factor. Some of the contacts resulting from CQs include W1SL's exchanges with K2UYH, VE4JX and VE7BBG and K2UYH's QSO with K8UQA, VE4JX as well as W1SL. Signal reports between K2UYH and K8UQA were 539 one way and 529 the other. Al also reports having what could be characterized as an "EME ragchew" on an ssb QSO with VE7BBG. All-in-all February was a good EME month for those stations not put out of action by the weather. Among those silent are W3CCX and G3LTF. We hope that repairs can be affected soon.

An interesting observation in the newsletter is that VK2ALU has petitioned The Wireless Institute of Australia to reserve 432.000 to 432.050 MHz *exclusively* for EME operation. Comments from the moonbounce gang and other 70-cm operators relative to this approach would be welcome.

23 Cm and Down – A new 9-cm (3300 MHz) world record of 238 miles is official, as far as the San Bernadino Microwave Society is concerned. In a recent telephone conversation, Chuck Swedblom, WA6EXV, confirmed that his organization considers the work reported in the December column by two parties from the Wellington Vhf Group in New Zealand to consittute a new record for the band. The contact took place on Feb. 2, 1975, between ZL2WA on 6000-foot Mt. Raupehu and ZL2WB atop Mt. Murchison at 4800 feet. The 60-percent over-water path was negotiated with 60 milliwatts and 3-foot dishes at each end. Congratulations are in order to this intrepid and hard working bunch of ZLs.

What part of the country can claim the most activity on 13 cm? K2RIW says that the Long Island area leads the pack. Dick lists the following as being on 2304 regularly: K2JNG (NJ), WB2FPE, W2OTA, W2UWC, and himself. Illustrative of the high level of activity and the good performance of the band, Dick cites a 5-way roundtable which took place Feb. 11. All stations were able to hear one another at all times, which is noteworthy when one considers the type of antennas used on the microwave bands. Power used by the group ranged from 6 to 40 watts with 2C39s, working as triplers, being quite popular. Most stations are using a-m but a few employ nbfm. It is understood that WA2EUS, W2GNI, WA2VTR, W3HMU, W1AJR, W2CQH, K1JIX and W1JAA are to join the 13-cm ranks soon. The Long Island group meets every Wednesday evening at 2100 local time on or near 2304 MHz.

This is the scene at the ZL2WA, Mt. Raupehu end, of the record breaking 238 mile 9 cm QSO. ZL2HI (then ZL2THW), who built the gear used at both ends, is handling the mic.

On the West Coast, 23 cm seems to be quite active. Every month we receive several OVS reports mentioning operation on the band. One filed by WB6JNN notes reception by himself and W6BWB of WA6NRV Visalia and K6ZMW Fresno. Jim says that this is the first instance of reception in his area of 1296-MHz signals from outside of Santa Cruz County. Can it be long before they make it two-way? A factor helping 23-cm activity in the area is, most certainly, the availability of modules for the band from Microcomm. A card to them at 14908 Sandy La., San Jose, CA 95124 will provide info on these units. In the Washington area it is understood that W4UCH and K2UOP/4 are having some success with 23-cm operation. How about news of microwave activity in other parts of the country?

OSCAR DOINGS

Ever since he started listening to the Oscar satellites, ZK1DX in the Cook Islands has been reporting, via the weekly Amsat 15-meter net, that he frequently hears many U.S. and European stations on the 10-meter downlink. I finally asked Wyn to make a tape recording of the signals so we could hear what they sound like. Listening to the received tape is absolutely amazing. On one pass of Oscar 6 (15344 at 0025 UTC Feb. 23, Equator crossing 60.5 degrees), the tape sounds like it was recorded here on the East Coast rather than about 7,000 miles away from where the satellite was at the time. Many stations on both ssb and cw are plainly audible including some that could be given S-9 reports without stretching a point. Among the mass of signals is a two-way ssb QSO between W1NU and W8SMC. On later orbits, the tape includes good ssb transmissions from K7MWC/KL7 in Anchorage along with many signals from the rest of the U.S. and western Canada. Just what is responsible for these quite consistent extended range transmissions is hard to say but it appears tha some type of transequatorial propagation is involved. Wyn points out that 10 meters is usually not open for normal work at these times. The satellite signals are all that are heard *in most instances. This* phenomenon certainly bears further consideration. QST

Public Service

Conducted By Robert J. Halprin,* WA1WEM

RACES—A New Look

They finally did it: "They," meaning FCC, and "it" meaning action on Docket 19723 concerning deregulation of RACES. Sooner than we expected, actually. On the surface, it looks like "a lick and a promise," but on closer inspection it appears that a lot of thought went into it, even though the final product bears a remarkable resemblance to FCC's original proposal.

One thing that should be gratifying to most amateurs is that the new look in RACES is definitely an *amateur* look. This column has repeatedly insisted that RACES was intended as an amateur service for civil defense communication, not as a way for civil defense to use amateur frequencies. Some have contended that the end result is the same, and perhaps this is true, but the matter of perspective is all-important. Through the years, your ARRL has jealously guarded amateur frequencies against intrusion by non-amateur services and entities, *including* instruments of government at any level. The termination of the RACES procedure is an indication once more that this perspective prevails. Amateur radio is an important communications service and is expected to perform as such. It is not "only a hobby."

Much of the original work on the League's filing on the RACES docket was performed by the Emergency Communications Advisory Committee under the dynamic chairmanship of M. F. "Bud" Cone, WA4PBG. Although Bud has retired as chairman, he has followed up this function by a paper addressed to the ECAC which sums up the final result of the proceeding. We paraphrase from it with due credit to source.

What the Order Does

1) It "deregulates" by simplifying regulation and streamlining administration.

2) It authorizes a civil defense entity to hold a special RACES amateur radio station license.

3) It provides for sharing of all amateur-band frequencies between RACES and regular amateur stations except in the event of a war emergency.

4) It eliminates from operating all who are not licensed amateurs. This puts the burden of *control* operating squarely on the shoulders of us amateurs.

5) It restricts amateurs operating in RACES to communicating with other operators licensed in RACES. The League objected to this, but the restriction is not so severe as it sounds.

6) It limits RACES tests and drills to not more than one hour a week. The League's filing also objected to this. In reply, FCC says: "Those amateurs wishing to sharpen their . . . skills beyond that . . . may do so through those amateur networks organized for this purpose."

7) It abolishes tactical ("secret") call signs.

8) It reaffirms and recognizes that RACES is in fact an *amateur* radio service.

9) It requires the original license, or a photocopy thereof, to be attached to each transmitter, with original license available.

The order does not require immediate cessation of operation under the old provisions, even though its effective date was March 23, 1976. Existing RACES licensees may continue under the old rules until expiration of their licenses, or if such expiration is less than 18 months away, on proper application, for one year thereafter.

What effect the order will have on the future of RACES remains to be seen. We could predict that some civil defense entities will drop RACES from their communications plans, but if the amateur response to the challenge is sufficient this will not be necessary. In that connection, here's a quote from (are you ready?) April, 1951, *QST*'s "With the AREC" column, on this very subject. The same philosophy applies today.

"Actually, we amateurs are being put on a spot. Recognition means responsibility. We have now come of age, to the point where we are recognized as a service, and it now looks as though our service, the *Amateur Service*, will be put to work in civil defense. We rise or fall in the public esteem with the success or failure of RACES. It's up to us. We will get The credit if we put it over, but don't forget also that we take the rap if we fail!

Can we do it? You bet we can! We'll have to — or else!"

PUBLIC SERVICE DIARY

□ Snohomish Co., WA — December 3-10. Floods knocked out telephones in the area, and over 75 local amateurs kept authorities advised of developments. (WA7UQB, EC HAMS ARC)

□ Tucker Co., WV — January 21. A plane crashed during a snow storm, and members of The Mountain State Transmitters Club provided operators and the use of the club's repeater, WR8ABM, to Civil Air Patrol search teams. (W8DUV, SCM WV)

□ Kenai, AK — January 24-25. Mt. Augustine began a volcanic eruption while Alaskan SET exercises were taking place. 24 amateurs on the Alaska Sniper's Net and the SE Alaska Emergency Net provided back-up communications for the agencies involved. (KL7JDO, SEC AK)

□ Baja, Mexico — February 13-15. Mexican and American amateurs provided communications during the search for a lost plane. (W6GBF, SEC SDgo)

□ International Falls, MN — February 23. WAØCEL/mobile reported a serious truck accident to W1FAB, on the 20-meter County Hunters Net. W1FAB called a hospital in International Falls, and help was sent. (W2SDU, KØMAH)

□ San Diego, CA, and Manzanillo, Mexico — February 10. K6EDA intercepted a call from VP2VBI/maritime mobile, requesting an air ambulance. K6EDA made the necessary arrangements. (W6GBF, SEC SDgo)

□ *Special Activities, October.* On October 5, Kern Co. (CA) Radio Club members used WR6AGQ to furnish communications for a national diabetes bike-a-thon. — (W6LIE). The Raleigh (NC) ARS held a traffic handling service at a local shopping mall on October 17. — (W4FMN, EC). *November.* Eight Birmingham, AL, amateurs provided communications over WR4AEJ for the Alabama Touring Club's motorcycle "enduro" on November 16. — (WB4CXD, EC). *December.* The AREC supplied communications for the annual "Christmas on the River" pageant and parade in Demopolis, AL, on December 6. — (WB4SVH, EC). Children in the pediatrics ward of Metropolitan General Hospital were able to talk to Santa Claus (WA8SVX) thanks to the efforts of some thoughtful Cleveland, OH, amateurs. — (WB8PSO). *February.* Members of the Emergency ARC (EARC) provided communications for the annual Haleiwa (HI) Sea Spree cycling race on February 14. — (KH6GQW, SCM). The Miami Valley (OH) Boy Scouts of America sponsored a Yukon Trails activity on February 21, involving over 200 scouts. Local amateurs linked the various events using Dayton area repeaters. — (W8ILC, EC). During 1976, the Cranford (NJ) ARS will operate AB2CLW at the 250 year-old Williams-Droescher Mill, with power supplied by the mill's water wheel. The station is expected to handle approximately 2500 messages and greet over 30,000 visitors. — (WB2PBO, SEC).

□ *Repeater Log.* Reports received to date show repeaters were used to report 25 auto accidents and related occurrences, and assisted in communications during one ice storm, one tornado, one flood and four searches. Repeaters involved were: WR1s AAC ABB, WR2s ACD ADM ADZ AFS AHR AHU, WR3ADG, WR4s ABR AEH AFE AGX AGZ, WR5AJG, WR6s ACD AHK, WR7s ACH ADX AFJ, WR8ABM, WR9ABY, WRØAGU and VE3RPT.

For the month of February, 32 SEC reports were received, showing a total AREC membership of 11,015. Last year at this time, 38 reports, listing 14,001 members, were received. Sections reporting were: Alta, Ariz, Colo, Conn, Del, EMass, Ga, Ind, Ky, Me, Mich, Mont, NC, NFla, NNJ, Ohio, Okla, Org, Pac, SV, SDgo, SCV, Sask, SFla, SNJ, STex, Tenn, Utah, Wash, WVa, WMass, WPa.

NATIONAL TRAFFIC SYSTEM

We regret to report the passing of WB4TRI, who for so long held the fort on 4RNd. W5KLV reports that the intertace between RN5 and RN5d is working well and the espirit de corps is high. According to WB2FWW, there were a record number of 3RNd sessions in February. Harv attributes this to leap year. NYPON reps are now appearing regularly on 2RN. VEØFS issued RN7d certificates to VE5KS and VE7CJY. WA5ZZA indicates that DCAN is making headway. TWN manager WØHXB sez that conditions are better, except he is starting to hear summer-type QRN. Oh well . . .

*Communications Assistant, ARRL

February Reports

1	2	3	4	5	6
EAN	29	1546	53.3	1.099	93.6
DEAN	58	454	7.8	.472	89.9
CAN	29	972	33.5	.928	97.7
DCAN	58	212	3.6	.210	82.0
PAN	29	1069	36.9	.899	98.8
DPAN	42	51	1.2	.102	69.0
CTN	29	360	12.4	.364	98.9
1RN	56	429	7.7	.354	86.2
1RNd	29	192	6.6	.395	78.3
2RN	83	591	7.1	.490	88.1
2RNd	57	397	6.9	.461	92.4
3RN	50	318	6.3	.340	81.4
3RNd	29	161	5.5	.405	95.4
4RN	57	640	11.2	.421	94.5
4RNd	52	192	3.7	.246	46.4
RN5d	29	167	5.7	.248	88.3
RN6	58	653	11.2	.384	95.0
RN6d	28	266	9.5	.236	80.0
RN7	57	274	4.8	.343	90.0
RN7d	44	70	1.5	.175	25.8
8RN	49	252	5.1	.273	77.0
8RNd	29	98	3.4	.505	94.3
9RNd	29	83	2.8	.209	81.8
TEN	47	282	6.0	.303	61.5
DTRN	24	65	2.7	.160	29.5
ECN	58	247	4.2	.335	90.0
TWN	58	446	7.6	.292	96.6
TWNd	20	70	3.5	.120	60.0
TCC Eastern	102[1]	616			
TCC Central	79[1]	466			
TCC Pacific	107[1]	749			
Sections[2]	3428	14137	4.1		
Summary	4645	26525	5.7		
Record	5065	34238	24.3		

1 — NET
2 — SESSIONS
3 — TRAFFIC
4 — AVG.
5 — RATE
6 — % REP.

[1] TCC functions not counted as net sessions.
[2] Section and local nets reporting (94): AENB AEND AENJ AENR AENW (AL), ASN (AK), ATEN HARC (AZ), APN ARN (AR), NCN NEN SCN (CA), DEPN DTN (DE), FAST FMTN FPTN GN NFPN (FL), GSN (GA), IMN (ID-MT), ILN (IL), TLCN (IA), QKS (KS), LAN LRN LSN (LA), PTN (ME), MDCTN MDD (MD), WMN WMPN (MA), MACS MI6M MNN QMN WMN (MI), PAW (MN), MSBN MSN MTN (MS), MON MOSSBN (MO), MTN (MT), NAN WNN (NE), BARTEN NJN NJPN NJSN (NJ), SWTN (NM), NLI NLIPN NLS NYS (NY), CN NCSSBN THEN (NC), BRTN OSSBN O6MN (OH), CAN OLZ OTWN STN (OK), BSN (OR), EPA EPAEP&TN PTTN WPA (PA), CNN (SC), TN TPN (TN), TEX TTN (TX), BUN UCN (UT), VN VSBN VSN (VA), NSN (WA), WVMD WVPN WVN (WV), WIN WNN WSBN WSSN (WI), MTN (MB), GBN ODN OPN OSN (ON).

Transcontinental Corps

1	2	3	4	5
Eastern	116	87.9	1746	616
Central	87	90.8	961	466
Pacific	116	92.2	1508	749
Summary	319	90.3	4215	1831

1 — AREA
2 — FUNCTIONS
3 — % SUCCESSFUL
4 — TRAFFIC
5 — OUT-OF-NET TRAFFIC

TCC Roster

The TCC roster (February): Eastern Area (W2FR, Dir.) — W1s NJM QYY, K1s EIR GMW, WA1s MSK WEM, W2s FR GKZ, K2HI/VE2, WA2s DSA ICB PJL UWA, WB2s PYM RKK UBW, W3EML, K3MVO, W4UQ, K4KNP, W8PMJ, K8KMQ, WA8HGH, WB8ITT, VE3s GOL SB. Central Area (W5GHP, Dir.) — WB4s DXN SKI, W5s GHP MI QU UGE UJJ, WA5IQU, W9s CXY DND NXG, WA9EED, WB9NOZ, WØs HH HI INH LCX QMY, KØs AEM CVD, WAØTNM. Pacific Area (K5MAT, Dir.) — W5RE, K5MAT, WB5K5S, W6s BGF EOT MLF TYM VZT, K6HW, WA6DEI, W7s DZX GHT KZ, K7s IWD NHL QFG, WA7WXY, WØs ETT IW LQ LRN, KØDRL, WAØKKR/7, WBØs HCK QOT, VE7ZK.

Independent Nets (February)

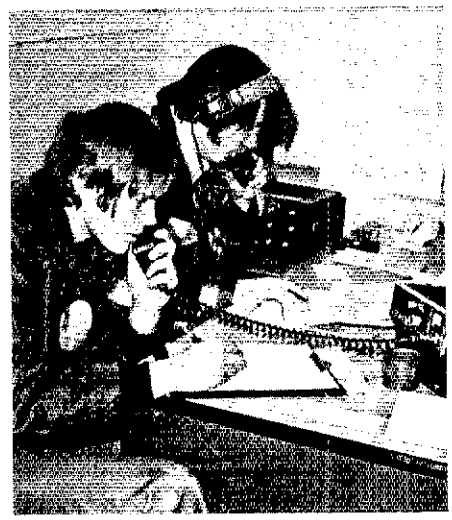
1	2	3	4
Central Gulf Coast Hurricane	28	64	1868
Clearing House	24	295	468
Hit & Bounce	29	1460	417
Hit & Bounce Slow	17	107	189
IMRA	25	585	1118
Mike Farad	4	204	32
North American SSB	24	203	392
Washington Region PON	12	36	227
20 Meter ISSB	20	951	236
75 Meter ISSB	29	520	1355
7290 Traffic Net	40	480	1932

1 — NET
2 — SESSIONS
3 — TRAFFIC
4 — CHECK-INS

Public Service Honor Roll February 1976

This listing is available to amateurs whose public service performance during the month indicated qualifies for 40 or more total points in the following nine categories (as reported to their SCM). Please note maximum points for each category: (1) Checking into cw nets, 1 point each, max. 10; (2) Checking into phone/RTTY nets, 1 point each, max. 10; (3) NCS cw nets, 3 points each, max. 12; (4) NCS phone/RTTY nets, 3 points each, max. 12; (5) Performing assigned liaison, 3 points each, max. 12; (6) Phone patches, 1 point each, max. 20; (7) Making BPL, 3 points regardless of traffic total; (8) Handling emergency traffic directly with a disaster area, 1 point each message; (9) Serving as net manager for entire month, 5 points.

1694 WA4BZY
167 WBØLYU
108 K7NTG
92 TI2PTS/KP4
83 WA4UVG
79 WB2VTT
77 WB5AMN
73 WB6YID
72 WAØGLI
70 WBØHOX
64 W5GHP
63 WBØOAG
62 K1PAD W5KLV
61 WA1MHJ WB2FWW/3 WB2RUZ WB2WRT WA3PHQ WA4FBI K4VHC WA5IQU
K5TTC WA5ZZA W7OCX W8IBX WBØHBM
59 WB2RKK
58 WA1PSI WA2PJL WA5RKU WA6TVA
56 WA1FCM WA2DSA W2MLC WA2PCF WA4EPJ WB4ZDW WA5TQA WA5YEA W6RNL VE3GJG
55 W2MTA W4WXZ W6QIE
54 WA5VBM
53 W6INH WBØQOT
52 W5GSN WA7MEL WBØMNK KP4BSQ
51 WB4QXT K4YRL
50 W4OGG WAØFMD WAØKKR KP4HG
49 WB2LZN WB2RMK WA3DUM WA3OGM K3YHR WB4EKJ K5MAT W7GHT WB8JGW WB9KPX W9MFG K9ZTV KØMRI VE3FRG
48 WA3UKZ WB4DXN WB5NUM
47 VE3DPO VE3GOL
46 WA2RMZ WA3VBM W6RFF VE3GFN
45 W3IPX WA9QVT
WBØJFZ KL7JDO
44 W1BVR W1EIH WB2YKG K3KAJ K3OIO WA3WPY WB4DJU WB4GHU WB4SKI WB4ZSO W5UGE W5UJJ WB8WKQ K9KHI W9NXG WBØJYF WØOTF VE3FQZ VE3GT VE3SB VE4UL
43 WA1MJE W2FR K4FTB WB8NCD
42 WA2WIW
41 K4TH WB5GVO VE4PG
40 WB2EMU WB2VRJ W7LG



The Los Angeles Area Council of Amateur Radio Clubs provided communications for the ten-thousand walkers who participated in a March of Dimes walk-a-thon in the San Fernando Valley on January 11. Shown here are two of the 68 amateurs who joined in: WA6GLC and WA6GFM. *(W6DDB photo)*

More-Than-One-Operator Station

WA4BZY	1150	516	1150	498	3314
K3CR	344	8	344	8	704

BPL for 100 or more originations-plus deliveries

WA3THT	319	WBØMNK	132
KØYFK	233	WBØNOH	130
WA3ATQ	231	WØFIR	114
WBØLYU	163	VE3GOL	101
W4YZC	142	WB2WRT*	123
W5TI	141		

More-Than-One Operator Station

W2ZQ	264

1 — CALL
2 — ORIG.
3 — RECD.
4 — SENT
5 — DEL.
6 — TOTAL

*January totals

Brass Pounders League February 1976

BPL Medallions (see December, 1973 *QST* p. 59) have been awarded to the following amateurs since last month's listing: W7DAN WBØQOT.

The BPL is open to all amateurs in the United States, Canada and U.S. posessions who report to their SCM 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 standard ARRL form.

Winners of BPL Certificates for Feb. Traffic

1	2	3	4	5	6
W3CUL	574	1196	1485	77	3132
WØWYX	50	941	312	629	1932
K3NSN	0	500	500	0	1000
W3VR	267	219	428	12	926
K9CPM	1	446	140	210	797
WA5ZZA	67	385	295	6	753
WB6YID	0	312	0	312	624
ABØHOX	105	281	222	7	615
WBØMTA	29	276	276	0	581
W5GHP	59	288	202	12	561
KØZSQ	0	272	0	271	543
AB2VTT	121	133	230	54	538
W4WYR	9	405	54	63	531
WA3UKZ	14	275	224	4	517
W3CVE	150	70	265	30	515
WBØMTA*	31	281	281	0	593

Some of the folks at a recent Virginia Traffic Nets gathering: (l. to r.) W4YZC, WA4YRH, WB4SZE, WB4JMD and WA4DHH. *(WB4FDT photo)*

Results, 42nd ARRL November Sweepstakes

Operating fun? Two thousand entrants can't be wrong.

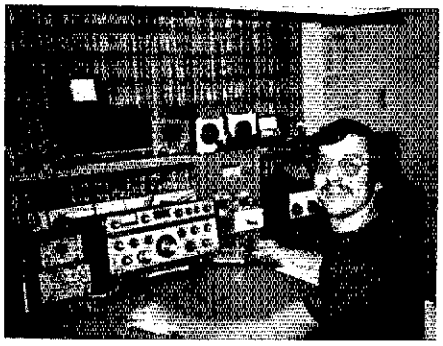
By Jim Cain, WA1STN*

The November Sweepstakes is the biggest single operating activity of the year. Someday we're going to go through all the logs from one of the two weekends of the SS and see just how many different call signs are represented there. Someday, when we have about a month to spend without doing anything else! It looks like somewhere around 10,000 different stations were on for one or the other of the SS weekends (how's that for hedging?). It looks like . . . maybe . . . somewhere . . . Actually, we received 2299 entries, 1152 on cw and 1147 on phone.

Sweepstakes entries come from phone-only men, from die-hard cw operators, from vhfers who make all their contacts on six to two meters, from Novices, and from casual operators who get caught up in the activity and who end up making perhaps ten times the number of contacts they thought themselves capable of. Your first contact may be with someone who has been a licensed amateur (and SS participant) for decades and the next with last year's Novice Roundup winner. Half your contacts are with old standby operators, but the other half are with newcomers still trying to figure out the exchange.

SS entrants run the gamut from super-operator to dabbler, making writing a capsule summary of the activity a nigh-impossible task. The "big guns" want to read about how well they did, the little guys want to see their calls in print and get some tips on how the big guns do it, and the great mass of operators in the middle want to read . . . well, we aren't sure. There is a wealth of information to be had just by scanning the tabular scores. One can see, for instance, where the prime spots in the U.S. and Canada are for winning score production. One can see what sections produce a multitude of high scores through sheer peer competition, and conversely which areas of the two countries are represented by one or two standout operators having nothing by which to gauge their efforts but their own past performances. What you don't see from the scores and the "leader boxes" are all the actual logs. You just would not believe what's to be gained from poring over them. That's what we get to look at, with our prime responsibility being to convey some thoughts on the over-all picture of the contest. from this vantage point. Here goes.

*Asst. Communications Mgr., ARRL



WA9 Black White Yellow led the Central Division and seventh-place Indy DXers on both cw and phone. Outside hardware for the SS included Yagis on 20 and 40 at 30 meters above ground.

We always thought the November Sweepstakes was one simple contest, one weekend for cw and one weekend for phone. Everyone on the air was participating in that one event, and any stations we didn't manage to work were just because we weren't everyplace at once. After seeing all the logs, that is obviously not the case. There are really two SS contests going on at the same time: All on the same frequency bands, all under the same rules, all sending the same exchange, all figuring scores the same way. The similarity ends when you look at who's working whom.

There are, of course, the Big Guns. They may be defined as those stations making over 100,000 points. They make QSOs the same way everyone else does, by calling CQ or by answering CQs. They prefer calling CQ and having others answer them, because that's usually faster than hunting around. They must make 30 contacts per hour and 40 is better. In some contests 40 is a *bad* hour; in the SS (we're talking about cw now) a 40 average is *good*.

If you don't fall into the Big Gun category, maybe a category called Potential Big Guns fits you. These PBG operators just don't put in quite enough time to make 100K, or else their stations aren't up to Big Gun effectiveness. But, they're every bit as good at operating as the Big Guns. Potential Big Guns are lifesavers for the Big Guns, because the PBGs follow the same strategy and they are easy for the Big Guns to seek out and work.

The third category of SS participants makes up about 80% of the entries received. They are the ones who (at first glance at their logs) appear to be operating in a contest of their own. Many of them have weak signals, send slowly, don't copy very well, and always seem to be on the wrong band at the wrong time. Many of them are "one band wonders" usually on either 40 or 20 meters. These *Casual Participants* tend to work mostly each other, taking undue amounts of time to do so.

All this is important because the separation of the SS into two basic categories, Gun and non-Gun, is standing in the way of achievement of contesting's main goal . . . improving operator proficiency. By not venturing into the heat of battle and working the Guns, the "little guy" is hurting both himself (by not challenging himself to higher speeds of operating) and also hurting the Big Guns, who depend on contacts with the casual operators to run up their totals. Seems there is a barrier which exists between these two groups which must be broken down so that more contacts across the demarcation line can be made.

That's the feeling we get from the Big Guns, that we should exhort the casual operator to not be afraid to jump into the middle of things. Coming up with what the little guys want to tell the Guns isn't so difficult, either. Slow Down! If you (as a Gun) have been sending at 35 and reduce to 20 wpm, it may seem like crawling, but try slowing down to 15 and see what happens. Spread out over the band more, and lessen the clutter in the prime spots; the higher in the band you go the more likely you are to run into the casual operators. Finally, try turning off your amplifier and run "barefoot." If you aren't so overpoweringly loud the little guys may not be scared off so easily (really).

This is the drift one gets from talking to SS participants and from reading comments from logs and letters to the Contest Advisory Committee (CAC). Actually, scores are getting better and better every year because the Guns and the "little guys" are both, as groups, becoming more proficient and better equipped. It merely remains for all of us to keep pushing and not let the progress lag from year to year.

About those contest entries, from an administrator's point of view. If you have access to *QST* for April, 1969, dig it out and check page 69. Seems that even in those days and undoubtedly long before we were having

problems with homemade log forms and summary sheets. The time it takes to do routine processing of entries, time which is lost for better purposes (like more interesting write-ups) is directly proportional to the number of non-standard formats in entries submitted. We admit that a handful may be because a few requests for contest forms went astray, but most are just a lack of interest in getting the right forms. The problems result from the inevitable: A homemade summary sheet will probably be lacking some vital bit of information. We can usually get that information by rummaging through the log, but that's time wasted.

Perhaps contest editors through the years have been seething and wishing they could spell out just what makes their work unnecessarily difficult. Or maybe this editor is just overly sensitive. Here are some of our headaches:

1) Bad photocopies that Sherlock Holmes couldn't read.

2) Logs so sloppy they would get an "F" in a third-grade penmanship class.

3) Logs sent by the deadline, but posted Third Class mail (meaning they can take as long as six weeks in transit).

4) Entrants who write above the "Do Not Write Above This Line" line.

5) Use of one dupe sheet *per band* instead of just one overall dupesheet.

6) Sections not numbered as worked, or not crossed off on the list at the bottom of the summary sheet, or both.

7) Logs in anything other than UTC/GMT.

8) Summary sheets indicating the operator's ARRL division instead of his *section*.

9) Logs of 100K points or more with no indication that the amount of operating time was figured.

10) Homemade log sheets where the exchange information is out of proper order.

11) One-point QSOs claimed (hasn't been allowed for years).

Before lambasting the editor for not first cleaning his own house (there may be a few mistakes in this report) keep in mind that time which could have been spent proofreading and analyzing was wasted instead in trying, often with patience considerably less than that of Job, to decipher the entries in the first place.

We think a Soapbox comment from the cw log of W3DBT is appropriate here. "I apologize for the writing and condx of my logs. I had a spasm in an artery going to my brain that wiped out most of my vision (and perspective) from center of nose to the rest of the left field of vision." To be honest, we would have accepted anything as a contest entry from W3DBT, under those circumstances, but we didn't have to. Everything was in order, all the information was there, and was quite readable. So was the log from sightless WB8OBR, whose mother sees to his logs after each contest. What ARRL members get out of contests and contest reports is a direct result of what they put into it, both in their performance and in the contest report. Neater logs, more pictures, and more Soapbox comments will spruce up these pages for all to read.

In the affiliated club listings, we have returned to the traditional method of listing the clubs from top total score to bottom, without subdividing by call area. The latter method was used the past two years, at the suggestion of the CAC. Comments have generally favored a return to the "national" listing, which is more meaningful to most. Also relative to the club competition, an idea has popped up recently which deserves looking into. The most important person in the club is the one who contributes the most *total* points on both cw and phone. Unfortunately, that person is often not a club certificate winner, because someone in the club beat him on each mode. If the idea is to encourage versatility, and to reward the person who makes the greatest overall point contribution to the club, then perhaps the club total winner should get the club certificate. We are proposing that this single certificate be in lieu of, *not* in addition to the separate phone and cw club certificates. If you feel that such an award would more accurately reflect who was most important in *your* club's effort, send a letter to the Contest Advisory Committee (c/o ARRL Hq.) and say so. If you think the idea is so much hogwash, write and say that.

Apology Corner. "Sorry to those of you who received SS log sheets numbered 1-50 on *both sides*, and also to you who got summary sheets missing SV on the checkoff at the bottom of the sheet. Both forms were withdrawn from circulation as soon as the errors were discovered, and suitably relegated to the scrap heap. If you still have any of the 1-50 log sheets, we will gladly take them in trade for some proper ones. Your editor will do penance by using them himself for the next 117 years.

Credits. The compilation of this report began as a two-person job, spent two heady weeks with three licensed amateurs working on it, and ended up a one-man finale. WA3NAF was with us in the Fall and did much of the scoring and entry analysis. WA1NNC spent two school vacations doing the same kind of work. WN1WEV spent days laboriously typing 2,299 line scores on an IBM composer. Final responsibility lies with the person whose name appears on page one of this report. If no response is received after such a report appears, the writer, being basically a pessimist, assumes that no one liked it. Your comments, suggestions, and criticisms would be most appreciated . . . please write and let us know what you think.

SOAPBOX

Worked all four corners of the U.S., plus NDak, CZ, and KH6, but where were all the KL7s??? – (KL7IDT). Operated by portable power plant from the Carrizo Desert . . . no commercial power available. – (K6PY). Bands seemed reversed: 6's and 7's on 80 and 2's and 3's on 15. – (WA3KOS). Spent a lot of

W6RTT operated this fine station himself on cw, but gave it up in favor of W6RR on phone. The combination worked, as Pete placed in the top ten on both modes.

Top Ten

CW		*PHONE*	
WA5LES	177,244	W7RM	261,300
KP4EAJ	169,344	WAØCVS	246,900
K4PUZ	164,396	W6HX	243,164
W7RM	162,652	WA7NIN	229,950
K5PFL	161,172	WB5DTX	228,636
W6HX	160,016	W6RR	227,032
WA7NIN	159,988	WB4AEX	223,628
W6RTT	159,544	WA5RTG	222,300
WB4AEX	159,504	W5MYA	219,000
K4GSU	159,286	K5PFL	218,562

Clean Sweep Phone

W1ZM (WA2CLQ)	WB6KBK
K1DQV/1	W6ONV (WA9UCE)
WB2OEU	W6NUT
W3AU (W3ZKH)	K6CQF (WB6CEP)
K4TIG (W8FAW)	WA7WXY
WA5RTG	WA7NIN (W6OAT)
WA5VDH	W7RM (K7VPF)
WA6AHF (WA6TLV)	WA9BWY
W6DGH (WB6ZVC)	WAØCVS (WBØDJY)
W6JZU (WB6AIN)	WA2WMT/Ø
W6MUR (W6PAA)	WBØIKN (KØCVA)
W6OKK (WB6DSV)	KØCVA

Division Leaders

CW SINGLE OP.	MULTIOP.	DIVISION	PHONE SINGLE OP.	MULTIOP.
K3EST	K3GJD	Atlantic	W3LPL	W3BWZ
WA9BWY	W9YH	Central	WA9BWY	W9YH
WAØONL	WØOXN	Dakota	WAØCPX	WAØVQX
K4PUZ	--	Delta	WA5RTG	W5GAD
K4GSU	WB8JBM/8	Great Lakes	WA8YWX	WB8JBM/8
WA2UOO	K2BMI	Hudson	WB2OEU	WB2GKE
KØGXR	WØZLN	Midwest	WAØPAO	KØRPH
W1FBY	K1JHX	New England	W1ZM	W1DGL/1
W7RM	W7YH	Northwestern	W7RM	W7FO/7
WA7NIN	W6YX	Pacific	WA7NIN	K6BR
K4VX	W4HJ	Roanoke	K4VX	WA4QOC
WAØCVS	--	Rocky Mtn.	WAØCVS	WAØUWF
KP4EAJ	WB4YFF	Southeastern	WB4AEX	WA4ECY
W6HX	W6YRA	Southwestern	W6HX	W6YRA
WA5LES	WB5NDQ	West Gulf	W5MYA	W5YJ
VE3EJK	--	Canadian	VE6ATT	VE3ECP

time trying to tune the final with a pair of pliers as the shaft coupling on the final capacitor stripped on me for the second contest in a row. Any SB-102 owners out there who know how to solve that problem with the nylon coupling? – (WBØOGK). Although the contest was fun, I found the logging nerve wracking. – (WN2ZOR). [See our article for some hints. – ED.] Please be sure to put me under "low power" this year; last year you put me in the "B" category and I was a Novice then! – (WB9PIR). The rules and scoring make this my favorite contest. – (W3GNR). WB4VVF memory keyer sure worked neat. – (W3BGN and countless others). Worked four new states! – (WN4NID). I'd do anything to operate a big station during the next SS. – (WB2QCF). Any articles on contests you could refer me to would greatly help; how do these guys work 60+ QSO/hour? – (WA7QQD). [New Operating Manual, available later this year, will have some of the answers. – ED.] I sure lost points by having stations confuse me with KH6IJ. – (KH6IJA). My wife showed her wisdom by going to Palm Springs for the weekend. – (WB6YMO). Braving the elements without a beam was a most exciting experience. – (WB6ITN). Keeping our antennas up for the two weekends became a daily problem, and they call Chicago the Windy City. – (WB8JBM/8). Signing WA4UAZ not nearly as attractive as it was signing KZ5NG. – (WA4UAZ). Used a machine which sent the complete SS exchange, including the number. Even has a repeat button which will repeat the last message without affecting the sequence. W6JDA did the logic design and W6GBY the logic wiring. – (W6BIP). My 20' of wire in the attic is fed against the water pipes; it's nice someone answered me. – (WB5JFR). All large antennas should be disallowed, at least until mine go up. – (WA9YOL). Novices provided three unrepeated sections; next year I'll try to work more. – (WAØURW). Thanks to WA4BYI, manager of Roy Rogers Restaurant, for free cokes to keep us going. – (K3CR). My number 727 was W8TWA. – (W5HGT). We put up dipoles by drilling holes through baseballs, attaching the wires, and throwing them through the nearest trees. – (WA2PKL). Any YL advantage I have on phone disappears after about five hours when my voice begins to sound as if I've been gargling with sandpaper. – (WA7WEQ). Guess we didn't top the college club stations this year, but just wait; a new rig is on the way. – (W7YH). [Remember, W7YH is the Alpha Chapter, Rho Epsilon radio fraternity, Washington State University – ED.] K6CQF brought in a hired gun (me) so he could hire himself out to W6MAV. – (WB6CEP). What's this one-way skip stuff? – (WA1KOO). [He's talking about 75 meters from New England the phone weekend. – ED.] At approximately 2100 a well-meaning neighbor dropped in . . . literally. Result: One piece of equipment dropped on left foot and broken metatarsal. I continued operating until 2400 when XYL forcibly removed me from operating desk and took me to operating table! – (K6ITL). Problems with K2DW also active, from the same section no less. – (W2DW). Took time out on Sunday for skydiving instruction, made my first jump and broke my ankle. Guess that was my sentence for trying to cheat the great Spirit of SS. – (WAØRAD/5). I worked the phone SS with 22 stiches in my head, a sprained knee and a dislocated right shoulder . . . result of an automobile accident. Murphy? Who's he? – (W7GKF). Operating a kW in a fringe TV area can be fun at times. My neighbors stated that Cher's costumes were really wild and, in fact, *out of sight* at times. – (K8WSN). [Hmmmmm.] First phone attempt . . . Horrors! Back to cw. – (K9KRN). I almost forgot the SS was approaching; the antennas forgot to fall down beforehand. – (WB2JSJ). Fun contest, even though you have the silliest, most complicated exchange of any contest. – (WØIUB). Had trouble reading the "HOT SHOT" speed merchants. – (W2FSL). Young ops seem only to read electronic keyers; my bug resulted in many interpretations of my call. – (W3ADE). That new guy on the contest desk at Hq. sure did a lousy job of arranging propagation conditions. (W1ERW). Sending with a straight key it was hard for me to keep up with all those "sharks." – (WA3YQP). For your information, we are *not* the University of Washington; we're the Mighty Fighting Cougars of Washington State University, Alpha chapter of Rho Epsilon radio fraternity. – (W7YH). Pleased to provide some Maine contacts. – (WA1TWN). A small tornado went through town but was five hours too late to use as an excuse for my poor score. – (W9EI). Never expected to pick up a new country (W5TES/KJ6) in the SS. – (W2FVS). Thanks for the Generals (sic) who made it more fun. – (WNØOLA). Like always it was a great pleasure to hear some of the same calls that I worked in the SS nearly 30 years ago. – (W7WW). I've found a new hobby: contesting! – (WN3YQB). After twenty years of being licensed, the 1975 Sweepstakes was my first contest ever. – (KØVOM). With three different antennas I still could not work my own state of West Virginia. – (WN8SNO). First effort in one of these contests in my hamming career (1935); found it to be a lot of fun. – (W7SQT). Those who only send their suffix in the message are only hurting themselves. – (K9KHI). [We agree – ED.] I had requests for 25 QSLs in only 49 contacts. – (WN4KOS). My VFO committed suicide and I worked the whole contest on two crystals. – (WN7CJY). Thank you for the opportunity of again stating my belief that the Sweepstakes is an abomination and would be abandoned if the ARRL staff had the gumption of H. P. Maxim. – (W3RIL). While checking over my entry, I discovered a stupid mistake on the summary sheet; I am enclosing a corrected summary sheet. Just shows you some people can't read instructions no matter how clear you make them. – (WA4MJE).

No doubt what mode Tim, WA3SZX, is using here. He operated WA3FAL to second place in WPA on cw and the section-high score on phone. Note sign on keyer.

Top Ten – Low Power

CW CALL	SCORE	PHONE CALL	SCORE
WA5VDH	119,422	WA5VDH	179,400
W8CQN	116,060	WBØMIV	138,816
WA5KLY	111,580	KØCVA	120,000
K5BSZ	102,816	WA4TYL	111,020
WA8ZDT	102,528	WB5AAR/5	110,296
WA7SLG	99,400	W4WSF	108,916
WA4TYL	99,216	KØPVI/5	107,800
W1FCC/3	94,944	K4VFY	105,408
WB4KSE	91,306	W1FCC/3	104,098
WB5OOW	90,170	WB4DXD	102,200

Scores are grouped by call area, section, and in order from highest to lowest score; single operator stations first and multi-operator second. The letter "A" or "B" at the end of each line score indicates the power class of the entry. Example: VE1VI 31,900-290-55-19-A means 31,900 total points, 290 contacts, 55 section multipliers, 19 hours of operation, and power under 200 watts. Asterisks denote Hq. staff members, who are not eligible for awards when operating their own station or that of another staff member.

CW Scores

VE

MARITIME

VE1VI 31,900-290-55-19-A

QUEBEC

VE2AQP 31,200-240-65-20-B
VE2YU 29,250-225-65- 9-A
VE2HY 15,210-169-45-13-A

ONTARIO

VE3EJK 56,496-428-66-22-A
VE3DH 7272-101-36- 6-B

MANITOBA

VE4VV 26,096-233-56-13-A

SASKATCHEWAN

VE5XC 18,328-158-58-12-A
VE5TT 16,366-167-49-12-A

ALBERTA

VE6ATT 14,456-139-52-14-A

BRITISH COLUMBIA

VE7IQ 34,224-276-62- -B
VE7CE 17,238-169-51-10-A

U.S.A.

1

CONNECTICUT

W1FBY* 142,568-1004-71-23-B
W1ZM(WA2CLQ,opr.) 131,546-901-73-24-B
WA1KID 122,256-849-72-24-B
WA1SYN* 117,714-853-69-21-B
WA1QNF 117,504-864-68-24-B
W1GNC* 111,440-796-70-22-B
WA1NRF 92,460-670-69-24-B
WA1SSH 86,632-637-68-23-A
K1ASJ 85,952-632-68-24-B
K1GUD 79,350-575-69-14-B
W1GPK 75,978-567-67- -B
WA1JZC 75,752-557-68-18-B
W1DGL 72,468-549-66-18-A
K1THQ/1 68,120-524-65-21-A
WA1OBY (WA1OCU,opr.) 58,496-457-64-23-A
WA1LNQ* 53,460-405-66- 7-B
WA1MAO 51,282-407-63- 9-B
W1VV 42,976-316-68-10-B
W1HKH 41,454-329-63-19-A
WA1HNI 38,308-314-61-18-B
K1KRY/1 36,344-308-59-21-A
WA1SHX 31,752-294-54-23-A
WA1UBX 27,022-229-59-22-A
W1BIH 26,880-210-64- 5-B
WA1QZH 26,208-252-52- 6-B
WA1PXM 25,422-223-57- 9-A
WA1HRC (WA1TUT,opr.) 24,426-207-59-16-A
K1DPB 24,300-243-50- 7-B
WA1NLD 17,672-188-47- 6-B
WA1TQO 15,456-161-48-14-A
K1DQV 12,342-121-51-10-B
WA1QJ/1 12,314-131-47- 4-B
WA1UAC 7878-101-39-20-A
WA1UAD 7800-104-39-13-A
WA1SQB* 6588-122-27- 7-B
W1HV 6336- 88-36- 5-A
WA1RYL 6272- 98-32- 3-A
W1HFB 3840- 60-32- 3-B
WN1USJ 3472- 62-28- -A
WN1UHN 3120- 60-26- 6-A
WN1VWS 1944- 54-18- 9-A
W1FFR 1558- 41-19- 4-A
WA1TWW 1224- 34-18- 3-A
WN1UOX 1008- 36-14- 4-A
W1JJR 70- 7- 5- 2-B
WN1VDK 2- 1- 1- 2-A
K1JHX (+W1GQO) 93,025-646-72-18-B
WA1KOC(+WA1RRS K8BXU) 69,696-528-66-24-B

EASTERN MASSACHUSETTS

W1DAL 126,540-855-74-24-B
WA1JUY (WA1JYY, opr.) 106,416-739-72-22-B
WA1EOT 76,314-553-69-22-B
W1NJL 56,290-433-65-15-A
WA1OLV 52,008-394-66-17-B
K1OME 46,816-418-56-14-A
K1JMR (WA1MHJ, opr.) 43,648-352-62-15-A
W1FMZ 36,736-328-56-24-A
WA1QKD 35,400-300-59-14-B
W1PL 33,456-246-68-11-B
WA1RGW 33,000-375-44-18-B
WA1UDH 26,220-230-57-14-A
WA1PDM 22,184-236-47-11-B
WA1PQY 20,382-237-43-14-A
WA1IEB 9266-113-41- 7-B
WA1UOF 9072-108-42-17-A
WN1TQP 8960-128-35-13-A
WA1MSK 8080-101-40- 3-B
WA1MHJ 6200-100-31- 4-A
K1AGB 5568- 87-32- 3-B
K1HRV 5390- 77-35- 6-A
WN1TYX 4888- 94-27-11-A
W1SR 4608- 72-32- 5-B
WA1RLI 4488- 68-33- 8-A
W1PLJ 3660- 61-30-10-B
WA1SCX 2700- 50-27- 3-B
W1RND 1536- 48-16-11-A
WA1NME 1280- 32-20- 6-A
W1YO 672- 24-14- 7-A
WA1ITZ 2- 1- 1- 2-A

MAINE

K1SWK 44,688-399-56-23-A
WA1TWN 33,814-319-53-14-A
W1IT 22,082-181-61-13-B
W1ERW 18,886-133-71-20-A
WA1FCM/1 15,990-205-39- 8-A
W1SD 10,282- 97-53-13-A
WA1VAI 6844-118-29-17-B
WN1TYT 3658- 59-31-15-A
K1GAX 3400- 50-34- 2-A
WA1NMW 700- 25-14- 2-A

NEW HAMPSHIRE

W1FMF (WA1ABV,opr.) 121,968-847-72-24-B
WA1RFI 47,580-390-61-23-A
K1FWE 32,144-287-56-18-A
WN1UAV 4500- 90-25-10-A
W1FWZ 2964- 57-26-14-A
WB6IPR/1 1720- 43-20- 5-A
WN1TVB 1558- 41-19- 4-A

RHODE ISLAND

K1GMW 80,860-622-65-22-B
WA1IJC 41,040-342-60-15-B
K1LPA 33,824-302-56-10-B
WA1KVM 7770-111-35-10-A
W1SXX 6192- 86-36- 8-A
WA1JHW 3288- 68-24-10-A
WA1UPL 2544- 53-24- 2-B
WA1RFT 1178- 31-19- 2-A
WA1POJ/1 1056- 33-16- 2-A

VERMONT

K1IIK 81,250-625-65-24-B
W1GLZ 41,958-333-63-21-A
WA3FFR/1 24,648-237-52- 5-B
WA1SVR 7600-100-38-11-A
W1GPM 4884- 66-37-10-A

WESTERN MASSACHUSETTS

WA1ABW 100,660-719-70-19-B
W1DKU 81,650-575-71-24-A
K1RQF 38,350-325-59-10-B
WA1PZM 35,532-329-54-15-A
WA1TAI 14,014-143-49-16-A
W1GNH 13,200-150-44-11-B
W1GSJ 5478- 83-33- 8-A
W1EBW 3410- 55-31- -A
W1YK (multi-op) 67,402-503-67-16-B

2

EASTERN NEW YORK

W2PV (K1ZND, opr.) 146,146-1001-73-24-B
W1BGD/2 111,398-763-73-19-B
W2AZO 101,104-712-71-22-B
W2HHC 90,720-630-72-23-B
WA2EAH 82,410-615-67-16-B
WB2AXV 77,970-565-69-24-A
WB2OEU 73,840-568-65-16-B
WB2WZA 65,688-483-68-22-A
WA2HAI 59,392-464-64-24-A
WB2FMK 47,056-346-68-20-B
WA2SPL 43,848-348-63-11-B
K2TTG 41,202-327-63-20-A
WB2WQA 40,560-338-60-18-A
K2DW 34,314-301-57-19-B
WB2QDP 29,120-280-52-21-A
W2DW 27,816-244-57- 9-B
WA2RKI 14,190-165-43-15-A
WA2CJY 14,100-150-47-11-A
WA2UYL 8432-124-34-15-A
WA2PNQ 5920- 80-37- 9-A
WB2TGL 4802- 49-49- 7-A
WN2BDW 4592- 82-28-13-A
WB2VPE 3024- 54-28- 8-A
WN2CFP 1558- 41-19- -A
WN2BBN 1260- 35-28- 9-A
W2ODC 1026- 27-19- 4-A
W2FSL 756- 21-18- 5-A
W2BRA (+WN2WXG) 10,920-140-39-18-A
WB2TXI (+WA2YYM) 2552- 58-22-17-A

N.Y.C.-L.I.

K2AU 123,224-844-73-24-B
W2FVS 102,200-730-70-23-B
WB2QCF 99,636-722-69-20-B
WA2YHK 94,288-664-71-22-B
WB2SJG 87,320-590-74-24-A
WB2HZH 75,140-578-65-24-A
WB2WBH 64,660-530-61-23-A
WA2IYH (WB2FLF, opr.) 60,852-461-66-11-B
WA2DLV 59,400-450-66-20-A
WB2WXS 51,984-456-57-23-A
WB2QBP (WB2UFG, opr.) 49,166-403-61-13-B
WA2WKH 48,128-376-64- -A
WB2WRT 46,612-408-57-24-A
W2GKZ 39,000-300-65-14-B
WB2BXO 33,916-278-61-14-B
WB2EHM 25,984-224-58-13-A
WA2ROK 21,836-206-53- 7-A
WB2NOR 19,788-194-51- 9-A
WB2UVL 17,696-158-56-11-A
WA2GMD 17,160-165-52-15-A
WA2UXO 15,480-180-43-15-A
WN2ZOR 10,530-135-39-21-A
WN2YYL 7100-142-25-19-A
WA2ZGR 7040-110-32- 9-A
W2AYJ 6962- 59-59- 8-A
WA2LLF 6060-101-30- 4-A
WB2FVT 4216- 68-31- 5-A
WA2SRH 3692- 71-26- 6-A
WA2SUH/2 2596- 59-22- -A
WA2URD 2310- 55-21- 4-A
WB2YKL 1360- 34-20- 2-A
WN2AMJ 1224- 34-18-17-A
WN2ZOA 288- 18- 8- 2-A
W2TUK 100- 10- 5- 1-A
WB2TLD 2- 1- 1- 1-A
WN2AKB (+WN2ZQZ) 5890- 95-31-22-A
K2FO(multi-op) 4200- 70-30-10-B
WB2JJD/2 (multi-op) 3726- 69-27-12-A

NORTHERN NEW JERSEY

WA2UOO 146,736-1019-72-24-B
W2YD (WA2SRQ, opr.) 139,722-957-73-24-B
WB2RKK 127,098-921-69-24-B
WB2RJJ 108,882-789-69-24-B
W2SHM 98,490-735-67-22-B
WB2AEH 97,980-710-69-20-B
WA2SZQ 96,288-708-68-24-B
WB2FIT 92,460-670-69-20-B
WA2DNY 80,802-603-67-18-B
WA2NPP (WA2LBT, opr.) 70,448-518-68-24-A
WA2LUG 67,840-530-64-21-A
WA2OSA 60,672-474-64-13-A
WB2CST 54,280-460-59-18-B
WB2FVO 51,000-375-68-17-A
W2HTR 48,642-363-67-20-B
WB2FRH 41,358-339-61-18-A
WB2VFT 40,560-312-65-24-A
W2ZZ 38,324-286-67-15-B
WB2TBB 28,160-256-55-16-A
WN2VCV 23,328-243-48-24-A
K2OQJ 20,520-190-54- 7-A
W2BSC (WA2NTI, opr.) 15,920-199-40-12-A
W2HCA 14,210-145-49-11-A
K2TWK 11,352-132-43-16-A
WN2ASD 10,500-150-35-20-A
W2HR 3528- 84-21- 5-A
WB2TDI 2964- 57-26- 5-B
WN2BAW 1800- 45-20-19-A
WA2DJM 1280- 40-16- 8-A
W2WHB 1020- 34-15- 2-A
K2BMI (+WA2ZKY, WB2RWY) 95,472-702-68-24-B

SOUTHERN NEW JERSEY

K2JOC 105,846-767-69-24-B
W2REH 90,596-638-71-15-B
W2LYL 89,318-629-71-22-B
W2HNO 81,934-577-71-20-B
W2PAU 59,664-452-66-18-B
W2HVO 53,170-409-65-21-A
W2ESX 52,910-407-65-21-B
W2EA 42,368-331-64-21-A
W2ZHN 41,448-314-66-21-A
W2EPA 38,144-298-64-17-B
WB2BWL 15,738-183-43-21-A
WB2OSQ 13,932-162-43- 7-B
W2FGY 10,148-118-43-15-B
WA2YEM 8200-100-41- -A
W2FBF 8200-100-41- 3-A
WA2NEQ 6324- 93-34- 8-A
WN2AEJ 6144- 96-32-16-A
WA2WJL 5550- 75-37-14-A
W2REB 4828- 71-34- 6-A
K2SBW 3300- 50-33- 4-A
K2QXQ 2900- 58-25- 9-A
W2SDB 1848- 42-22- 3-B
K2HPV 1840- 40-23- 6-A
WA2NUL 1280- 40-16- 7-A
WB2VLD 616- 22-14- 6-B
WB2LCC 256- 16- 8- 4-A
W2OGZ 100- 10- 5- 1-A
K2KA (+WB2BXV) 33,930-261-65-19-B

WESTERN NEW YORK

K2KIR 126,560-904-70-23-B
WA2MBP 110,676-802-69-24-B
K2IGW (WA2BCK, opr.) 104,938-739-71-22-B
WA2LCC 78,936-572-69-21-A
W2HPF 71,264-524-68-16-B
WA2EKW 70,488-534-66-19-B
WA2SON 69,088-508-68-16-B
WB2FNS 62,720-490-64-21-A
WB2ABD 53,690-413-65-16-A
WB2THS 53,454-453-59-18-A
WA2QXA 46,200-350-66-14-B
W2IAM 39,996-303-66-14-A
WA2WDE 36,478-299-61-17-A
K2MQY/2 34,568-298-58-17-A
WA2SFT 28,098-223-63- -A
WA2ZRI 26,334-231-57-18-B
WB2KJT 26,038-277-47-17-A
WB2SMP 23,744-212-56-16-A
WB2KLA 21,056-224-47-12-A
WA2AOG 20,304-216-47- 7-A
WA2AIV 9996-102-49- 8-A
WA2MBM 9000-100-45- 7-B
W2ECW 7210-103-35-21-A
WA2MPC/2 7200-100-36- 2-B
K2OVF 6984- 97-36- 9-A
WB2KNZ 5550- 75-37- 3-A
WN2AFQ 5110- 73-35-20-A
W2OW 3600- 60-30-12-A
WA2LEZ 3230- 85-19- 8-A
K2DTQ 1440- 36-20- 6-A
K2UAN 960- 30-16- 3-A
WA2RIC 850- 25-17- 6-A
WB2FJC 240- 12-10- 3-A
K2GXT 182- 13- 7- 2-B
WB2QAX 60- 10- 3- 1-A
WB2FYZ 16- 4- 2- 1-A
W2GRU (+WB3AJQ) 57,960-414-70-24-A

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DELAWARE

W4FRO/3 53,170-409-65-21-A
K3HBP 37,050-285-65-15-B
WA3TVS 13,716-127-54-10-B
WA3WPY 11,676-139-42-12-A
W3ZNF 714- 21-17- 5-A
K3YHR 200- 10-10- 1-A

EASTERN PENNSYLVANIA

W3WJD (W3DQG, opr.) 121,968-847-72-24-B
K3DZB 102,950-725-71-21-B
K3ANA 94,384-694-68- -B
W3BIP (WA3JYB, opr.) 84,840-606-70-23-B
W3HAE 84,042-609-69-23-A
K3RZF 70,356-533-66-23-A
W3ARK 68,000-500-68-19-A
K3BFA 57,708-458-63-20-A
W3ADE 44,880-340-66-18-B
WA3YIV (WA3GYT, opr.) 31,200-260-60-10-A
WB2DAA/3 30,366-241-63-14-A
K3DTD 27,540-255-54-18-A
K3TEJ 26,676-234-57-10-B
K3EGE 26,544-237-56-13-A
WA3QYY 17,576-169-52- 6-B
WA3MVP 13,932-162-43-10-A
W3BGN 10,108-133-38- -A
WA3ABN 6553- 78-42- 9-A
WA3RTY 6120- 85-36-13-A
WN3ZXI 3360- 60-28-17-A
WN3AAL 1248- 39-16- 2-A
WN3ZKU 900- 30-15-15-A
WA3WJX 308- 14-11- 3-A
WA3VUE 224- 14- 8- 5-A
K3PCX 18- 3- 3- 1-A
WA3RCA (multi-op) 65,000-500-65-24-A
W3OI (multi-op) 34,200-342-50-24-A
WA3OVH (multi-op) 6480-108-30-15-A
WN3WQP (multi-op) 868- 31-14- 4-A

MARYLAND-D.C.

K3EST 155,696-1052-74-24-B
W3LPL 152,366-1073-71-24-B
W3EZT (K3OAE, opr.) 131,546-901-73-24-B
W3PZW (WB2JYM, opr.) 127,800-900-71-24-B
W3CRE 123,824-872-71-24-B
W9SZR/3 121,410-855-71-24-B
W3IN 114,192-793-72-23-B
K3ZAW 112,840-806-70-24-B
W3AZD (WA3QIA, opr.) 109,620-783-70-24-B
W3KMV (WA3GUL, opr.) 106,642-751-71-24-B
WA3NYU 102,534-743-69-24-B
W3GRF 101,080-722-70-20-B
W3ZSR 88,704-616-72-16-B
WA3LHG 87,368-652-67-21-B
WA3GVP 85,400-610-70-24-A
WA3NGS (K4CFB, opr.) 83,766-607-69-21-B
W3DBT 83,490-605-69-21-B
K3CQ 79,288-583-68-22-B
W1FLM/3 76,032-576-66-24-A
W3BQV 72,896-536-68-15-B
WA3AFQ 68,876-574-67- -B
WA3UTA/3 68,376-518-66-24-B
W3MFJ 67,056-508-66-20-B
W3TOS 61,740-490-63-21-A
K3IMC 56,048-452-62-22-B
W1NJX/3 52,204-421-62-22-A
W3FA 51,584-403-64-16-B
WA3UHJ 51,480-429-60-24-A
W3BWZ 51,328-401-64-21-B
K3NPV 43,680-336-65- 8-B
K3AV 41,358-339-61-19-B
K3URZ 40,896-426-48-20-A
K3AVT 40,474-343-59-20-A
WA3AMH/3 40,260-305-66-13-B
K3CKT 37,170-315-59-10-B
WA3RSK 31,720-260-61- -A
W3DBT 31,066-317-49-12-B
W3ABC 30,720-256-60-17-A
W8BZY/3 29,646-243-61- -A
W3ZNH 28,672-256-56- 8-B
W3GZQ 27,170-247-55-18-A
W3HVM 27,084-222-61-11-B
K3DI 26,936-259-52-12-B
W3TMZ 26,000-200-65- 7-B
WA3TOE 23,520-210-56-12-B
WA3VPI 22,632-276-41-16-A
WA3NGL 22,320-180-62-19-A
K3PZE 20,800-200-52- -B
K3YOF 16,952-163-52-19-A
W3USS (WA1FEO, opr.) 14,812-161-46-20-A
K3RFB 13,500-150-45-15-A
WA3VPL 10,032-114-44-15-A
W3FSP 8550- 95-45- -A
WA3WTQ 8208-108-38-15-A
W3ML 7800-100-39- 3-B
WA3SLW 6720-120-28- 6-A
W3FZV 6608-118-28- 5-A
WN3ZTW 5372- 79-34-12-A
W3HPF 5220- 90-29- 7-A
W3HH 4980- 83-30- 6-B
WA3UHO 3432- 66-26- 7-A
WB3AMM 1974- 47-21- 7-B
W3KA 1248- 39-16- 3-A
W3TUX 1230- 41-15-12-A
WA3YYK 1020- 30-17- 7-A
WN3ARX 960- 30-16- 3-A
W3GZP 784- 28-14- 2-B
WN3YQB 648- 27-12- 7-A
WA3ZAS 598- 23-13- 2-A
W3HVQ 494- 19-13- 2-B
K3GJD (multi-op) 111,300-795-70-24-B

WESTERN PENNSYLVANIA

WA3SWF 129,500-925-70-24-B
WA3FAL (WA3SZX, opr.) 115,782-839-69-24-B
W1FCC/3 94,944-688-69-24-A
WA3KOS 77,980-557-70-20-A
K3VCH 46,604-382-61-20-A
K3VXV 45,678-331-69-16-A
W3HDH 43,112-317-68-11-A
WA3VBM 41,448-314-66- 9-A
W3GNR 31,752-252-63-17-A
WA3TJB 31,506-267-59-19-A
WA3WMB 16,082-187-43-17-A
WA3WSC 13,000-130-50-10-A
WA3QJR 10,810-115-47- 8-A
K3RXK 9660-115-42- 7-A
WA3YQP 8944-104-43-21-A
WN3AHC 6864- 88-39-16-A
W3HUI 6786- 87-39- 7-B
WA3TYI 6650- 95-35-11-A
WA3WZR 5214- 79-33-15-A
W3KQD 4872- 58-42- 9-A
WA3WYV 2464- 44-28- 4-A
W3LQD 144- 9- 8- 2-A
K3BSY (+W3IWT) 54,784-428-64-20-B
K3CR (multi-op) 23,154-227-51-15-A
W3VC (multi-op) 2944- 64-23- 9-A

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ALABAMA

K4TIG (W8FAW, opr.) 126,432-878-72-21-B
WA4BDW 62,100-450-69-17-B
K4ZGB 47,702-391-61-19-A
K4JYO 44,144-356-62-14-B
WB4FZQ 39,270-357-55-12-B
W4FSZ 7134- 87-41-12-A
W4OR 644- 23-14- 9-A

GEORGIA

K4BAI 131,572-889-74-24-B
W4BTZ 82,800-600-69-22-B
K4DJC 74,658-541-69-16-B
K4BAM 55,566-441-63-21-A
W4LDD 11,264-123-44-11-A
K4EZ 5800-100-29- 2-B
WB4LOK (multi-op) 57,834-459-63-15-B

KENTUCKY

K4GSU 159,286-1091-73-24-B
K4FU 64,464-474-68-16-B
WB4FOT 37,760-295-64-14-A
WB9LHO/4 29,280-240-61-20-A
WA4EBN 18,304-352-52-16-A
WN4RYB 16,072-196-41-21-A
WA6BAY/4 14,476-154-47-20-A
WN4QMQ 11,938-127-47-21-A

NORTH CAROLINA

W4NQA 121,248-842-72-20-B
K4FOB 82,104-622-66-24-A
WA4MWP 46,368-368-63-18-B
K4EOF 18,120-151-60-14-A
WA4FFW 15,048-171-44- 5-A
K4CAX 13,800-150-46- 5-B
W4TYE 2024- 44-23- 2-A
WA4DEQ 896- 28-16- 3-A
WB4JDM 180- 10- 9- 4-A

NORTHERN FLORIDA

W4YUU 124,676-878-71-21-B
WB4FEC/4 105,364-742-71-20-B
WA4TYL 99,216-689-72-23-A
WA4UFW 61,774-454-68-19-A
K4LAN 58,528-472-62-14-B
W4FDA 49,800-415-60-20-B
W4WKQ 25,536-228-56- 9-B
WA4KAM 11,628-114-51-11-A
WN4NID 7616-112-34-14-A
WA4GEL 2430- 45-27- 2-A
WN4NDO 736- 23-16- 7-A
WB4YFF (+WB4DRZ) 59,904-468-64-23-A
WBØHHC/4 (multi-op) 12,288-128-48-11-B
W4NN (multi-op) 7120- 89-40- 9-A

SOUTH CAROLINA

WB4KSE 91,306-643-71-22-A
WN4KOS 2744- 49-28- 7-A

SOUTHERN FLORIDA

WB4AEX 159,408-1107-72-24-B
W4OZF 144,414-1017-71-23-B
K4DBZ 129,930-915-71-24-B
WA4LZR 128,880-895-72-24-B
K4HWW 86,580-666-65-22-A
WB4OGW 76,860-549-70-18-B
K4JDC 56,364-462-61-22-A
WA4AIS 49,764-377-66-13-A
WB4HYN 48,120-401-60-19-A
K4DAS 33,720-281-60- 7-A
WA4NFF 26,676-247-54-13-A
WA4LWL 21,318-187-57-16-A
WA4KMO 18,400-200-46- 9-B
W4DGJ 10,120-115-44-15-B
WN4AUG 6972- 83-42-10-A
WBØNUO/4 5668-109-26- 9-A
WA4GNI 2648- 49-26- 3-A
WA4LXF 1026- 27-19- 6-A

TENNESSEE

K4PUZ 164,396-1126-73-24-B
K4AMC 90,032-662-68-24-A
WA4UAZ 86,620-610-71-20-B
K4KCK 42,496-332-64-15-A
WB4WHE/4 39,168-306-64-22-B
WA4MKU 37,088-304-61-20-A
WA4JBP 36,208-292-62-19-A
WA4ZUI 28,910-245-59-21-A
WA4BTK 25,680-214-60-10-A
WA4CMS 1750- 35-25- 6-A
WN4CJV 32- 8- 4- 1-A

VIRGINIA

K4VX (WB4SGV, opr.) 130,356-918-71-24-B
K4DTO 115,446-813-71-24-B
W4KFC 115,162-811-71-18-B
WB4BGY 109,620-783-70-22-B
W4MYA 106,540-761-70-22-B
W4DM 88,340-631-70-21-B
K4IAF 85,680-612-70- -A
WB4BUL 83,766-607-69-20-B
W4WSF 80,008-548-73-20-A
W4BQF 79,924-689-58-20-B
WA4DUS 72,312-524-69-20-A
WA4TLB 71,240-548-65-23-A
WA4KKP 68,640-520-66-22-B
K4JM 65,152-509-64-11-B
W4NH 57,620-430-67-15-B
W4YZC 56,980-407-70-14-A
WB4OXD 56,374-397-71-20-A
WA4JVO 54,516-413-66-20-A
W4ZM 52,662-393-67-15-B
W4HBK 52,260-402-65-20-A
W4GF 51,968-406-64-15-A
WB4TBO 48,642-363-67-17-B
W4NQV 42,768-324-66-16-A
W4TKR 42,024-308-68-16-A
K4CTY 36,844-302-61-14-B
W4WBC 36,540-290-63-14-B
W4ZC 29,106-231-63-12-A
W4CRW 25,870-199-65-14-B
K4KA 24,662-209-59- 8-A
K4EJG 22,800-190-60-19-A
K4FJW 22,700-227-50-20-A
WB4UMJ 20,188-206-49-15-A
K4CG 18,920-215-43-10-B
K4WVT 18,666-183-51-10-A
K4TM 16,758-147-57- 5-A
WA4HUB 15,876-147-54-14-A
K4DSZ 15,000-150-50-10-A
WA4MJE 12,192-127-48-11-A
W5VZO/4 11,700-130-45- 9-B
W4KP 11,544-111-52-15-A
K4JWD 10,208-116-44- 8-B
WA4QOC 9250-125-37- 4-B
WN4NFS 8192-128-32-22-A
K4GEL 8000-100-40- 7-A
K4FTO 4864- 76-32- 5-A
W4UQ 3082- 67-23- 1-B
WN4CSE 3060- 51-30- 7-A
W4HJ (multi-op) 80,266-599-67-18-B
WB4RDV (multi-op) 75,480-555-68-23-B
K4EBY (+K4LDR) 72,226-539-67-24-B
W4UPJ (+WA3HRV) 64,944-492-66-13-B

WEST INDIES

KP4EAJ 169,344-1176-72-24-B

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ARKANSAS

WA5RTG 137,376-954-72-24-B
WA5VDH 119,422-841-71-24-A
W5TXA 67,402-503-67-12-B
WB5IGF 12,852-153-42- 8-A

LOUISIANA

W5WMU 146,292-1002-73-24-B
W5RTX 131,184-911-72-23-B
K4CHE/5 43,306-367-59-24-A
W5UO 40,468-302-67-13-B
W5WG 36,356-298-61-16-A
WB5CKR 29,736-252-59-24-A
WB5KQJ 6642- 81-41- 5-A

MISSISSIPPI

W5RUB 52,130-401-65- 8-B

WB5BNV 14,344- 163-44-20-A
K4KEW/5 10,302- 101-51-10-A
WN5NDE 9476- 103-46-21-A
WN5OUC 7220- 95-38-13-A

NEW MEXICO

W5QJH 114,104- 839- 68-21-B
W5UQB 70,752- 536-66-17-B
WA5YTX 69,000- 500-69-15-B
WB5ORF 49,800- 400-62-22-A

NORTHERN TEXAS

W5MYA 133,632- 928-72-24-B
W5ZSX 130,232- 892-73-23-B
K5VTA 120,096- 834-72-24-B
W5ONL 110,538- 801-69-24-B
K5RHZ 93,288- 676-69-22-B
W5UOJ 49,248- 342-72-18-B
WA5ZKO 26,182- 231-61-17-A
WB5OKA 20,022- 213-47-11-B
W5UJI 19,712- 176-56-12-A
WB5AAR/5 15,548- 169-46- 4-A
WB5BNG 9504- 108-44- 9-A
K5PXV 7098- 91-39- 9-A
W5SOD 5254- 71-37-11-A
W5YR 4526- 73-31- 5-A
K5SRC 3450- 69-25- 5-A
W4GXW/5 3240- 60-27- 5-A
WN5PIP 2132- 41-26- 6-A
W5KYD 1008- 24-21- 2-B
W5OKS 896- 28-16- 5-A

OKLAHOMA

K5OCX 106,812- 774-69-21-B
K5LUR 100,050- 725-69-24-B
WA5ZWW 43,904- 343-64-13-A
K5QEA/5 36,356- 298-61-15-A
WAØRAD/5 12,420- 135-46-13-A
WB5JFR 200- 10-10- 4-A

SOUTHERN TEXAS

WA5LES 177,244-1214-73-24-B
K5PFL 161,172-1089-74-24-B
K5TSR 118,698- 813-73-17-B
WA5KLX 111,580- 797-70-24-A
WB5IZN 106,642- 751-71-15-B
K5BSZ 102,816- 714-72-22-A
WB5OOW 90,170- 635-71-20-A
WB5QDW 80,920- 578-70-15-A
WA5TPO 67,728- 498-68-20-A
WA2JAM/5 63,784- 476-67-23-A
W5SBX 59,796- 453-66-11-A
WA5WQF 50,160- 380-66-16-B
K5KYU 44,100- 315-70-19-A
W5RPJ 42,624- 333-64-22-A
K5DEG 38,512- 332-58-13-B
W5WZQ 23,562- 231-51- 4-B
WA5UHT 18,720- 180-52-14-A
W5RRR 17,640- 196-45- 7-B
WA5QPA 17,328- 152-57- 7-B
WB5LAL 12,954- 127-51-20-B
W5BWM 12,150- 135-45- 9-B
WA5MCU 2430- 45-27- 5-A
WB5QDO 2340- 45-26- 5-A
WB5NOQ (multi-op)
13,630- 145-47-10-A

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EAST BAY

WA6NGG 114,878- 809-71-23-B
K6HIH 105,120- 730-72-24-B
K6AHV 101,952- 708-72-18-B
WA6AHF 93,520- 668-70-24-A
K6AUC 91,140- 651-70-22-B
W6RGG 83,658- 573-73-24-B
WA6VEF/6 81,696- 592-69-24-A
K6UWR (K6RM, opr.)
75,888- 558-68-22-B
WB6BKB 74,888- 506-74-19-B
WB6BBC 56,576- 442-64-16-A
WA6TQK 52,500- 375-70-13-B
WA6BMV 44,226- 351-63-24-A
K6ZM 37,324- 301-62-23-A
W6MSB 34,220- 290-59-24-A
K6JSI 27,888- 249-56-19-B
W6UZX 26,230- 215-61-10-B
W6RQZ 13,500- 150-45- -B
W6BSL 5832- 81-36- 9-A
K6CSL 120- 12- 3-19-A
WA6DIL (multi-op)
90,880- 640-71-20-B
W6BB (multi-op)
34,160- 305-56-23-B

LOS ANGELES

W6HX (WB6OLD, opr.)
160,016-1096-73-24-B
W6RTT 159,544-1078-74-24-B
K6OVJ 146,584-1004-73-24-B
WB6YBL 138,408- 948-73-24-B
W6DGH (WB6ZVC, opr.)
130,378- 893-73-24-B
K6JAN (WB6VZI, opr.)
107,310- 735-73-21-B
K6MP 92,158- 649-71-17-B
WB6KPN 81,056- 596-68-24-A
W6BAB 70,716- 498-71-18-B
WA6DPQ 54,536- 401-68-15-B
WA6NRQ 53,760- 420-64-20-A
W6OEO 46,540- 358-65-17-B
WB6JFD 40,560- 312-65-23-A
K5MHG/6 24,308- 206-59-18-A
W6VPZ (WA6BIL, opr.)
16,744- 182-46- 8-B
WA6FWH 7326- 99-37- 8-A
WN6BRQ 3720- 60-31- 7-A
W6DAB 3538- 61-29- 3-A
WA6ECJ 3024- 54-28- 3-A
WN6LCL 1716- 39-22- 6-A
W6YRA(multi-op)
132,110- 905-73-24-B
WB6EPS (+WB6OYD)
40,560- 312-65-22-A
WB6FZL (+WA6HQQ)
30,840- 257-60-22-A

ORANGE

K1JYN/6 121,034- 829-73-23-B
WB6JYQ 28,536- 246-58-21-A
W6RYA 8316- 99-42- -B
W6IOS 6392- 94-35- 4-A
WA6LSL 1672- 38-22-13-A

SANTA BARBARA

WA6DEI 102,950- 725-71-24-B
K6QPH 68,976- 479-72-18-B
W6GEB 63,204- 458-69-16-B
W6KPJ 38,396- 331-59-21-A
WB6HTK 17,814- 149-43-12-A
W6PRP 750- 25-15- 1-B
WA6KAC (+WA6PJJ)
24,054- 211-57-17-B
W6BHZ (multi-op)
16,544- 176-47-16-A

SANTA CLARA VALLEY

W6MUR (W6PAA, opr.)
138,116- 946-73-24-B
W6JZU (WB6AIN, opr.)
119,574- 819-73-24-B

WA6PGB 118,712- 836-71-24-B
W1ARR/6 118,440- 846-70-22-B
W6MSF (WAØENP, opr.)
116,654- 799-73-24-B
WA6DQM 106,726- 731-73-23-B
K6LU (VE3DXV, opr.)
99,400- 700-71-23-B
K6QZ/6 97,820- 670-73-22-B
W6OKK 84,286- 629-67-24-B
K6KLY 83,504- 614-68-23-B
WB6DSV 80,802- 603-67-24-B
W6HJP 75,600- 540-70-23-A
K6HMO 70,620- 535-66-24-A
W6OCP 54,780- 415-66-18-B
W6ISQ 52,736- 412-64-14-A
WA6UZA 51,832- 418-62-20-A
K6ZX 47,060- 362-65-21-A
WB6KSZ 43,680- 364-60-21-B
K6BR 43,264- 338-64-16-B
WB6RGR 42,752- 334-64- -A
K6QX 41,600- 325-64-12-B
W6LPM (WA6GSN, opr.)
37,278- 327-57-23-B
WA6GFY (WB6EXW, opr.)
35,380- 305-58-15-B
WA6CUX 33,306- 273-61-18-A
WA6CFJ 28,620- 265-54-11-A
K6YGS 26,950- 245-55-13-B
WB6JGS 26,070- 237-55-17-A
WB6EMR 23,504- 226-52-19-A
K6YA 13,728- 143-48- 5-B
WB6AZK 12,510- 139-45-16-B
K6LWT 11,858- 121-49-11-A
K6OG 11,610- 135-43-12-A
W6ZRJ 10,584- 126-42- 7-B
WB6FHC 10,530- 135-39-12-A
W6GWQ 10,406- 121-43- 6-B
WB6CJE 8214- 111-37- 9-A
WA6FKK 6600- 100-33- 6-A
K6OOF 6468- 98-33- 6-A
WB6GNM 6400- 100-32- 8-B
WA6BZT 5610- 85-33- 6-A
K6EIH 4380- 73-30- 7-A
W6OAT (K6CQF, opr.)
4002- 69-29- 1-B
K6AQ 3528- 63-28- 1-B
K6DC 2862- 53-27- 3-B
K5SMH 2484- 54-23- 3-A
WA6HAD 1050- 35-15- 8-A
WB6HWQ 520- 20-13- 2-A
W6YX (multi-op)
97,488- 677-72-24-B
WB6LPK (multi-op)
95,282- 671-71-24-B
WA6NKK (multi-op)
56,810- 437-65-23-B
WB6WSL (multi-op)
26,606- 251-53-20-B

SAN DIEGO

W6MAR 154,176-1056-73-24-B
W6RDF 85,932- 651-66-17-B
K6EBH/6 59,532- 451-66-19-A
WB6DPV 25,488- 216-59- 8-A
K6PY 18,684- 173-54-23-A
W6JOT 17,300- 173-50-13-A
WN6EJL 6972- 83-42-22-A
WA6UFY 6808- 92-37-12-B
WA6ORJ 2800- 50-28- 5-A
W6JXA 1394- 41-17- 4-A
WB6NCJ 864- 24-18- 4-A
K6UMI (+K6LKD)
105,080- 740-71-24-B
K6UMI(+K6LKD)
105,080- 740-71-24-B

SAN FRANCISCO

W6NUT 148,592-1004-74-24-B
W6KQG 86,380- 617-70-24-B
WB6NHF 49,896- 396-63-23-B
W6KHI 48,922- 401-61-23-B
WB6BDL 42,840- 357-60-24-A
W6ZT 41,580- 330-63-24-B
W6JZZ 35,636- 302-59-17-A
WA6YIU 11,508- 137-42-22-A
WB6ITN 9990- 135-37-12-A
K6JFY 3660- 61-30- 9-B
WB6YCB 3072- 64-24- 6-A
K6LRN/6 1596- 42-19- 3-A
WA6HPF 384- 16-12- 2-A
W6BIP (+WA6DJI)
70,488- 534-66-20-B

SAN JOAQUIN VALLEY

K6CQF (WB6CEP, opr.)
120,742- 827-73-24-B
K6OZL 74,550- 525-71-14-B
K6AYA 55,968- 424-66-23-B
W6SF 47,616- 672-64-16-A
WB6YMO 23,296- 182-64-21-A
K6TG 17,992- 173-52-15-A
WB6TQS/6 12,600- 126-50-16-A
WB6ITM 5040- 70-36 7-A
WA6WRS 4340- 62-35-16-A
WB6IUK 2898- 63-23-10-A
WA7WKW/6 2254- 49-23-11-A
WA6YAB 30- 5- 3- 2-A

SACRAMENTO VALLEY

WA6NYV 96,944- 664-73-23-B
WA6JVD 91,152- 633-72-24-B
K6SG 82,662- 599-69-23-B
K6RLY 68,862- 499-69-13-B
W6NKR 58,220- 410-71-18-B
WA6HAF 52,390- 400-65-13-A
W6NJU 48,180- 365-66-16-B
W6KYA 28,080- 234-60-13-B
W6EGX 22,400- 200-56-13-A
K6KWN 8774- 107-41- 8-B

HAWAII

KH6IJ 84,420- 603-70-22-B
KH6IJA 18,656- 176-53-18-A
KH6HML 15,548- 169-46-12-B
KH6GQW 6216- 74-42- 4-A

7

ARIZONA

W7IR 148,032-1028-72-24-B
W7ZMD 95,900- 685-70-21-B
WA7WMG 77,000- 550-70-22-A
WB7APW 75,888- 558-68-24-A
K7WQO 47,988- 387-62-20-A
WA7V1M 34,456- 292-59-15-A
W7KPL 29,768- 244-61-17-A
K7JVR 29,618- 251-59-12-B
W7FCD 11,280- 120-47- 5-A

IDAHO

K7NHV 155,198-1063-73-24-B
WA7WXY 55,338- 401-69-10-A
WA7QGD 32,040- 267-60-15-A
WAØKKR/7 11,526- 113-51- 6-A
WN7CJY 600- 25-12- 6-A

MONTANA

W7GKF 110,814- 759-73-23-B
K7CPC 67,402- 503-67-24-A
K7LTV 33,524- 289-58- 8-B
W7HAH 27,552- 246-56-15-A
W7LR 19,552- 188-52- 8-B

W7FO/7 (multi-op)
23,868- 234-51-17-B

NEVADA

WA7NIN (W6OAT, opr.)
159,988-1081-74-24-B
WA7WYF 11,408- 124-46- 7-B

OREGON

W7TML 122,202- 837-73-24-B
W7WW 79,236- 558-71-17-B
W7WHO 42,362- 359-59-20-A
W7JZV 39,808- 311-64-19-B
K7BPR 20,944- 187-56-14-A
WA7GOO 16,116- 158-51- 6-A
W7LT 2900- 50-29- 8-B
WN7CHN 1332- 37-18- 7-A

UTAH

WA7SLG (WA7VCE, opr.)
99,400- 700-71-24-A

WASHINGTON

W7RM (K7VPF, opr.)
162,652-1099-74-24-B
W7SFA (VE7ZZ, opr.)
127,576- 862-74-24-B
K7RSC (WA7UQG, opr.)
105,080- 740-71-24-B
W7YTN 78,260- 559-70-24-A
WA7OBL 71,280- 540-66-23-B
W7WMY 52,096- 407-64-16-B
W7JEG 29,868- 262-57-16-A
WA7JCB 28,652- 247-58-17-B
K7MOK 27,612- 234-59-14-B
W7HAD 27,376- 236-58-20-A
K7GGD 24,522- 201-61- 9-B
WA7RKJ 23,544- 218-54-13-A
WA7ZTN 13,824- 144-48- 8-A
W7NP 10,640- 140-38- 5-B
W7IEU 9600- 96-50-10-A
W7GYP 7918- 107-37- 5-B
W7DFO 7440- 93-40- 7-A
WA7OJI 6068- 82-37- 9-A
WN7APV 5372- 79-34-18-A
W7APN 3132- 58-27- 3-A
K7BFL 1638- 39-21- 5-A
WN7BNP 1064- 29-18- 9-A
W7YH (multi-op)
65,144- 479-68-24-B
W7FR/7 (multi-op)
24,304- 217-56- 5-B

WYOMING

W7HRM 42,210- 315-67-16-B
W7SQT 8200- 100-41- 8-A
W7LR/7 7200- 90-40- 7-A

ALASKA

WA3GHC/KL7
8640- 135-32-19-A
KL7JDO 700- 25-14- 3-B
KL7IDT (+KL7HFV)
8320- 104-40-16-B

8

MICHIGAN

W8CQN 116,060- 829-70-20-A
WA8ZDT 102,528- 712-72-23-B
WA8ZAV (WB8BPY, opr.)
85,342- 601-71-20-A
W8KRR 77,760- 540-72-18-A
WB8WKQ 63,648- 468-68-22-B
W8VPC 62,016- 456-68-16-B
WA8RRR 57,330- 441-65-21-A
W8GLC/8 56,146- 419-67-18-B
K8HWW 53,802- 427-63-17-B
WB8DCR 53,040- 408-65-16-A
W8PBO 52,800- 400-66-15-B
WA8MEC 52,352- 409-64-19-A
WA8HTL 51,136- 376-68-22-B
W8TZZ 50,304- 393-64-23-A
K8WSN 48,384- 378-64-19-B
K8MWB 46,720- 365-64-22-A
W8IHE 41,600- 325-64-17-A
W8TJQ 41,540- 310-67-17-A
W8QM 38,232- 324-59-23-B
W8BNF 36,000- 300-60-18-B
W4AKS/8 33,524- 289-58-15-A
W8DC (WA1SHO, opr.)
31,500- 250-63-13-A
WA8RTP 29,500- 250-59-16-A
WA8JFQ/8 27,600- 230-60-12-B
W8PVI 22,260- 210-53-18-A
WA8RXI 21,902- 233-47-14-A
WA8MOY 19,656- 182-54-19-A
WB8IOT 16,854- 159-53-21-B
WB8KFV 15,980- 170-47-11-A
WA8ZCO 15,800- 158-50-13-B
WB8NII 14,960- 170-44- 8-A
W8KZM 14,112- 144-49-12-A
WB8NTX 13,440- 140-48-17-A
WA8VMQ (K8HLR, opr.)
12,600- 140-45- 2-B
W8JUP 12,446- 127-49-10-A
WA8ZTQ 11,730- 115-51-15-A
WB8ITB 11,528- 131-44- 6-A
W8KPK 11,520- 120-48-19-A
K8CVV 10,742- 131-41-14-A
W8OM 10,028- 109-46- 7-A
K8HLR 10,004- 122-41- 2-A
WB8RVG 9280- 116-40-12-A
WB8TZF 8640- 90-48-12-A
WN8SVI 8664- 114-38-19-A
K8DDV 8424- 117-36- -A
WB8IMI 7320- 122-30- 5-A
WA8WBZ 7308- 87-42- 7-A
WB8NTD 6764- 89-38- 8-A
WA8TDY 6450- 75-43- 4-A
WA8YPY 5848- 86-34- 9-A
K8KQJ 5472- 79-34- 5-B
WB8KFU 4970- 71-35-14-A
WN8VBC 4884- 74-33-15-A
WB8AYW 4464- 62-36- 7-A
WN8UEI 4212- 78-27-19-A
WN8TKZ 4092- 66-31-10-A
W8HAN 3968- 62-32- 7-A
WB8AAX 3132- 54-29- 5-B
K8BZK 2596- 59-22- 4-B
W8EGI 2500- 50-25- 3-A
WA8WWM/8 2400- 60-20- 3-A
WB8PIW 2142- 51-21- 4-A
WB8VWW 1936- 44-22- 4-A
WB8ILV 1932- 42-23- 8-A
K8SIA 1720- 43-20-11-A
W8WVU 1764- 42-21- 1-A
K8LNR 1496- 34-22-12-A
W8ROS 1152- 32-18- 3-A
WN8SFK 598- 23-13- 4-A
WB8RUQ 540- 18-15- 1-A
WB8FBG 442- 17-13- 1-A
WB8NSF 408- 17-12- 4-A
W8DYC 324- 18- 9- 4-A
WN8TLD 168- 12- 7- 4-A
WN8VAP/8 120- 24- 5- 9-A
WN8SFJ 30- 5- 3- 1-A
W8IVY 2- 1- 1- 1-A
W8UM (multi-op)
91,254- 681-67-24-B
WB8LZA (+WB9EGZ)
51,740- 398-65-22-A

W8YY (multi-op)
22,080- 184-60-21-A

OHIO

W8KIC 125,102- 881-71-24-B
W8EDU (WA3BGE, opr.)
123,620- 883-70-23-B
K8MFO 117,460- 839-70-23-B
K8RMK 112,840- 806-70-22-B
WB8NUA 91,874- 647-71-24-B
K8YQW 88,400- 650-68-21-B
WB8OFR 83,912- 617-68-23-A
K8RMN 75,752- 557-68-24-A
W8OK 71,856- 499-72-12-A
WB8MZZ 70,040- 515-68-24-A
W8OYI 68,832- 478-72-16-A
W8RSW 65,262- 447-73-17-B
W8IBX 61,336- 451-68-13-A
W8SWB 60,200- 430-70-22-B
WB8SVN 53,868- 402-67-17-A
W8IDM 42,250- 325-65-17-B
WB8NLG 42,240- 320-66-23-A
K8NEB 41,044- 331-62- -A
W8VQI 38,430- 315-61-18-B
WB8FFM 35,200- 275-64-16-A
WB8ROX 31,808- 284-56-19-A
W8MVT 31,598- 259-61-18-A
WB8FMX 31,476- 258-61-20-A
K8CVJ 28,800- 225-64-13-A
WA8PLZ (WB8AYC, opr.)
28,670- 305-47- 8-A
K8MLO 27,206- 223-61- 8-B
WB8TXG 26,314- 223-59-21-B
W8GOC 26,244- 243-54-15-A
K8SWE 26,040- 186-70-11-B
WB8RKA 24,750- 225-55-10-B
WB8LCF 23,744- 212-56-15-A
WB8URG 19,176- 188-51-14-A
W8PCS 15,162- 133-57- 8-A
K8RXD 15,120- 140-54- 8-B
WA8VYG 14,688- 153-48-24-A
WN8RTJ 14,608- 166-44-11-A
K8HBN 14,602- 149-49- 5-B
W8DWP 13,328- 136-49- 9-A
WB8QFB 10,434- 111-47- 7-B
WB8TSJ 10,200- 102-50-13-B
WB8NJJ 9720- 108-45-12-B
WB8STU 7360- 92-40-12-A
W8VZE 6300- 75-42- 7-A
WN8TSY 4740- 79-30-11-A
WB8NBY 3584- 56-32-15-B
K8NXV 3224- 62-26-10-B
WN8UPZ 2016- 84-24- 8-A
W8MXO 1152- 32-18- 7-B
WN8TJS 1008- 28-18- 6-A
W8QL 972- 27-18- 5-A
WN8UFO 576- 18-16-10-A
WA8KEX 552- 23-12- -A
WA8OYR 36- 6- 3- 1-A
WB8JBM/8 (multi-op)
118,818- 861-69-24-B
W8LT (multi-op)
114,026- 803-71-24-B
W8KMF (multi-op)
22,144- 173-64-20-A
WN8UAV (+WN8WAH)
8364- 123-34-24-A
WB8PCN (+WN8RXE)
8160- 102-40-14-A

WEST VIRGINIA

W8HRQ 84,048- 618-68-20-B
WA8POS/8 72,204- 547-66-15-B
WB8IJW 70,216- 524-67-22-A
K8OQL 34,574- 293-59-17-A
W8JWX 21,358- 181-59- 9-A
K8LOU 25,200- 225-56-13-A
WN8SNO 13,670- 152-45-21-A
K8QYG 50- 5- 5- 1-A

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ILLINOIS

WB9BWU (WA8RXM, opr.)
123,060- 879-70-24-B
K9BGL 112,056- 812-69-24-B
K9UKM 106,950- 775-69-21-B
K9KHI 104,160- 744-70-24-B
W9VBV 93,840- 690-69-23-B
K9UIY 78,064- 574-68-22-A
K9DDA 72,380- 517-70-20-A
WB9CGL/9 64,812- 491-66-22-A
WA9IXF 62,152- 457-68-21-A
W9ZAV 58,368- 456-64-19-A
K9DWK 49,632- 376-66-11-B
WB9FON (K9EIV, opr.)
49,446- 369-67-21-A
W9NU 42,284- 341-62-20-A
W9UDK 39,360- 328-60-18-B
WB9FVD 37,406- 317-59-17-B
WB9GCQ 33,360- 278-60-21-A
W9HPG 29,736- 236-63-20-A
W9FVI 27,084- 222-61-16-A
W9REC 25,792- 208-62-18-A
WB9DEO 24,304- 217-56- 9-B
WB9NIO 22,048- 208-53-12-A
WA9JJE 14,872- 143-52-14-A
W9LNQ 9600- 80-60- 5-A
W9WR 8256- 86-48-10-B
WB9LVC 7904- 104-38-11-A
W9YYG 6656- 104-32- 4-B
WA9YOL 6384- 84-38-10-A
W9ZEN 2900- 50-26- 8-A
W9AGM 2200- 50-22- 4-A
WN9RDI 1334- 29-23-11-A
WA9LEY 1280- 32-20- -A
W9NLR 1184- 37-16- 2-B
WA9WXC 900- 30-15- 4-A
K9ZTV 660- 22-15- 1-A
K9JIQ 476- 17-14- 4-B
WB9EMD 176- 11- 8- 3-A
K9GHR 70- 7- 5- 1-B
W9YH (multi-op)
96,180- 687-70-24-B
WB9EBO (multi-op)
78,658- 587-67-23-B
WA9ZJL (multi-op)
40,440- 337-60-24-A

INDIANA

WA9BWY 126,720- 880-72-24-B
WB9LHI 120,528- 837-72-24-B
K9UWA 104,244- 714-73-22-B
W9LT 101,220- 723-70-24-B
WA9ITB 99,684- 702-71-23-B
WB9MDB 70,420- 503-70-17-B
W9JOO 62,176- 464-67-24-A
K9CLO 52,800- 400-66-19-B
WB9IVC 50,630- 415-61-23-A
WB9QCP 45,540- 345-66-24-B
W9IIL 42,752- 334-64-12-A
W9STW 40,176- 324-62-22-A
W9LTU 39,600- 300-66-23-A
WB9MDS 30,666- 269-57-18-A
W9EI 30,134- 247-61-12-A
K9UBF 28,224- 252-56- 9-B
W9MDW 25,200- 200-63-11-A
K9HCK 11,520- 128-45-10-A
WB9PIR 10,528- 112-47-17-A
WN9SEC 9494- 101-47-11-A
WB9NEU 7224- 84-43-11-A
K9TKE 3472- 62-28- 7-A

WN9RRF 2400- 50-24-11-A
WN9QZT 308- 14-11- 5-A
K5LZT/9 72- 12- 6- 2-A
WB9PUM 50- 5- 5- 4-A
W9YB (multi-op)
84,280- 602-70-18-B
WB9NMC (+WB9OSJ)
37,504- 293-64-19-A

WISCONSIN

K9KGA 109,060- 779-70-24-B
W9LO 66,464- 496-67-20-A
W2WDE/9 63,376- 466-68-22-B
K9LWV 51,216- 388-66-15-A
WB9NDO 46,620- 370-63-23-A
K9EYA 43,400- 350-62-12-B
W9MSE 39,312- 312-63-17-A
W9MDU 28,000- 250-56-13-A
WA3VJZ/9 23,868- 221-54-13-A
WB9EJE 22,140- 205-54-17-A
W9FBC 18,156- 178-51-12-B
K9GSC 17,270- 157-55- 7-B
W9GKJ 16,536- 159-52-12-A
W9MY 15,120- 168-45- 9-B
WB9PCQ 11,956- 122-49-11-A
WB9MRF 7800- 100-39- 7-A
K9JPS 7040- 176-40-12-B
WN9PYE 5390- 78-35-10-A
WB9KPX 4560- 60-38- 6-A
WA9TPQ 3906- 63-31- 4-A
WB9QKU 3016- 58-26- 9-A
WN9PRG 2784- 58-24-20-A
W9ERW 644- 23-14- 2-A
WB9NME (+WN9PTX)
37,210- 305-61-21-A
WB9NKC/9 (+WN9OEC)
21,670- 197-55-11-A
WB9KZZ (multi-op)
13,776- 164-42- 9-A

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COLORADO

WAØCVS 146,880-1020-72-24-
WØETT 87,630- 635-69-22-A
WBØGEX 76,314- 553-69-22-A
WBØHBS 70,980- 546-65-21-A
WBØQOT 52,800- 400-66-14-B
WBØIWL 24,976- 223-56-13-A
WØDSW 11,352- 132-43- 6-A
WNØPEA 9200- 100-46-13-A
WAØYED 5544- 77-36- 7-
WØEJD 728- 26-14- 4-A

IOWA

KØGXR 115,632- 803-72-22-B
WAØNLK 33,176- 286-58-24-A
KØAZJ 29,868- 262-57- 6-A
WBØJEE 24,592- 212-58-15-A
WØDSP 10,904- 116-47-11-B
WØYI (WAØMHJ, opr.)
8560- 107-40- 2-B
WNØOHE 4760- 68-35-10-A
WØJTC 352- 16-11- 2-B

KANSAS

WBØKWI 74,244- 538-69-22-A
WØIUB 69,680- 520-67-17-B
KØCVA 53,040- 408-65-19-A
WAØGSG 19,344- 186-52- 9-A
WNØNOR 15,000- 150-50-18-A
WBØISW 12,768- 133-48-10-A
WNØOLA 2392- 46-26- 8-A
WØQQQ (multi-op)
79,998- 597-67-24-B
KØCML (+WBØKWJ)
19,186- 181-53-10-A

MINNESOTA

KØIJL 90,738- 639-71-19-B
WØHW 86,478- 609-71-21-B
WØYCR 76,720- 548-70-21-B
WAØOKV 71,264- 524-68-24-A
WBØANT 64,600- 475-68-20-
WAØURW 55,200- 400-69-14-A
KØMPH 51,282- 407-63-19-A
WBØNZX 32,248- 278-58-13-A
WAØMSI 16,300- 163-50-11-A
WØPPJ 13,630- 145-47- -A
WAØWHT 10,320- 120-43-11-A
WAØVDG/Ø 8600- 100-43- 7-A
WNØNPB 6992- 92-38-22-A
WNØNFV 3672- 68-27- 6-A
WBØNIU 3300- 60-23- 6-B
WBØNCJ 240- 12-10- 2-B
WBØKTH 112- 8- 7- 1-A
WØOXN (+WAØVKF)
81,600- 600-68-21-B

MISSOURI

KØRPH 107,164- 734-73-22-B
WAØNVZ 97,488- 677-72-24-B
WØOWS 85,626- 603-71-23-A
KØDEQ 81,464- 599-58-18-B
WØNVP 68,206- 509-67-22-A
WAØFRQ 65,868- 499-66-18-A
WBØOGK 10,890- 121-45-10-A
WØBV 8568- 102-42- 7-A
KØVOM 4340- 70-31-12-A
WAØQOA 1200- 30-20- 2-A
WØYZZ 140- 10- 7- 2-A
WØZLN (multi-op)
98,264- 692-71-24-B
WØEEE (multi-op)
90,252- 654-69-24-B

NEBRASKA

WØAIH 71,346- 517-69-14-A
WBØINQ 39,564- 314-63-18-A
WBØGTJ 29,256- 276-53- 8-A
WØQNP 16,542- 157-53-18-A
WØDYK 15,198- 149-51- 8-A
WAØHAL 9594- 123-39-11-A
WØOYW 2860- 55-26- 5-A
WBØKHQ (+WBØMTS)
40,796- 329-62-22-A

NORTH DAKOTA

KØFRP 51,610- 397-65-17-B
K3ZMI/Ø 30,150- 225-67-20-A

SOUTH DAKOTA

WAØONL 123,136- 832-74-24-B
WBØEVQ 61,100- 470-65-20-A
WBØLJM 22,512- 201-56- 8-A
WBØCRE 10,912- 124-44-17-A
WNØPEG 3190- 55-29- 8-A
WNØPYL 2576- 46-28-16-A

Phone Scores

VE

Ontario

VE3DAC 67,400- 410-70-19-B
VE3GJI 43,520- 340-64-19-A
VE3EJK 30,876- 249-62-18-A
VE3ERM 5928- 78-38- 6-A
VE3ECP (multi-op)
29,824- 233-64-15-A

Manitoba

VE4RP 30,988- 254-61-13-B

Saskatchewan

VE5TY 15,504- 152-51-19-A

Alberta

VE6ATT 57,684- 437-66-23-A
CY6AGV 6956- 94-37- 5-B

British Columbia

VE7WJ (VE7BBQ, opr.) 155,548-1051-74-24-B
WA6GUK/VE7 28,188 261-54-18-A
VE7CE 21,168- 189-56-10-A

U.S.A.

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Connecticut

W1ZM(WA2CLQ, opr.) 181,650-1211-75-24-B
W1FBY* 172,944-1201-72-24-B
K1JHX 155,844-1053-74-21-B
K1VIM 144,144-1001-72-22-B
WA1STN* 120,700- 850-71-15-B
WA1NRF 104,098- 713-73-19-B
WA1QNF 102,120- 740-69-19-B
W1GPK 96,276- 678-71-17-B
WA1MAO 36,802- 629-69-11-B
WA1KOC 75,402- 531-71-17-B
WA1KID 73,416- 532-69- 8-B
WA1SQB* 63,252- 502-63-14-B
K1ASJ 56,908- 407-70-23-A
WA1SSH 54,432- 378-72-14-A
WA1RYL 52,080- 420-62-15-A
K1THQ/1 51,198- 371-69-16-A
WA1IQJ/1 51,156- 408-63-15-B
K1DPB 50,148- 398-63-12-A
W1VV 45,582- 321-71-10-B
WA3NAF/1* 44,640- 310-72- -A
K1NGL 38,610- 297-65-13-B
WA1OBY (WA1OCU, opr.) 37,888- 296-64-18-A
WA1UAD 33,976- 274-62-22-A
WA1RQB 32,400- 300-54-12-A
WA1NLU 31,752- 252-63- 7-B
WA1PXM 31,248- 248-63-11-A
WA1DWF 19,488- 203-48- 7-A
WA1NES 13,608- 162-42- 3-B
WA1TUT 10,944- 144-38-11-A
WA1UBX 10,164- 121-42- 7-A
W1HFB 7752- 114-34- 3-B
WA1UOI 6840- 90-38- 7-B
K1KRY/1 5580- 93-30- 5-A
W1JJR 1440- 40-18- 4-B
WA1UOU 1428- 34-21- 3-A
K1PQA 1428- 34-21- 5-A
WA1SPW 594- 27-11- 3-B
WB2TRY/1 60- 6- 5- 2-B
W1OGL/1 (+W1GNC) 148,464-1031-72-24-B
K1GUD (+WA1JYY) 87,264- 606-72-21-B
WA1HRC (multi-op) 37,044- 294-63-21-A

Eastern Massachusetts

K1EUF 125,060- 845-74-23-B
WA1EOT 102,960- 715-72-19-B
WA1JUY, (WB2GXW, opr.) 76,160- 595-64-19-B
W1HWM 55,900- 430-65-22-B
WA1IEB 51,156- 406-63-10-B
WA1EQU 46,728- 396-59-21-A
WA1PDM 44,616- 338-66-15-A
K1ECC 44,604- 378-59-17-B
K1PDX 27,342- 217-63-12-B
WA1OLV 26,606- 251-53- 9-B
WA1KAJ 17,034- 167-51-16-A
WA1MSK 15,134- 161-47- 7-B
K1HRV 9600- 120-40- 6-A
W1PLJ 8580- 110-39-10-B
W1CRL 6688- 88-38- 9-A
WA1TLX 5858- 101-29-10-A
W1HFN 4290- 55-39- 7-A
WA1ITZ 2550- 51-25-11-A
WA1QQK 2300- 46-25- 2-B
OL2AA/W1 1440- 36-20- 1-B
W1YO 616- 22-14- 4-B
WA1RVZ 2- 1- 1- 1-A
W1MX (multi-op) 128,448- 892-72-24-B
K1JMR (multi-op) 41,040- 360-57-12-B

Maine

K1GAX 46,632- 348-67-14-B
W3RR/1 35,502- 291-61-17-A
WA1VAI 21,714- 231-47-20-B
WA1SDQ 19,256- 166-58-14-A
WA1SUR 13,884- 178-39-20-A
W1SD 10,560- 96-55-11-A
WA1PAY 4480- 70-32-14-B
W1CTR 216- 12- 9- 3-A

New Hampshire

W1FMF (WA1ABV, opr.) 164,016-1139-72-24-B
W1HAF 61,272- 444-69-22-A
K1FWE 33,394- 283-59-20-A
WA1VJI 13,330- 155-43-10-A
W1HDI 1216- 32-19- 2-A
WB6IPR/1 7600- 100-38-12-A
WN1VOG 1044- 29-18- 8-A
WA1UBC (multi-op) 4080- 68-30- 6-A

Rhode Island

K1LPA/1 75,900- 550-69-19-B
K1HMO 72,420- 510-71-22-B
WA1IJC 63,920- 470-68-18-A
WA1KOO 40,382- 331-61-21-A
W1SXX 15,936- 166-48-14-A
W1KMV 672- 24-14- 1-A

Vermont

WA3FFR/1 131,400- 900-73-19-B
K1DQV/1 74,100- 494-75-24-B
K2PAY/1 2340- 45-26- 6-B

Western Massachusetts

WA1ABW 139,160- 980-71-20-B
WA1PCJ 32,670- 297-55-19-A
WA1FKF (WA1PZM, opr.) 22,500- 225-50-15-A
WA1LMZ 16,192- 176-46-11-A
W1GNH 14,850- 165-45-10-B
W1EBW 9240- 105-44- -A
K1RQF (multi-op) 72,760- 535-68-21-B
W1PUO (multi-op) 70,006- 493-71-19-B

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Eastern New York

WB2OEU 207,450-1383-75-24-B
W2PV (K1ZND, opr.) 169,164-1143-74-24-B
W2HHC 108,576- 754-72-22-B
W2AZO 101,520- 705-72-17-B
W2FVS/2 101,388- 714-71-16-B
WB2AXV 65,700- 450-73-19-A
K2DW 60,456- 458-66-22-B
WA2YBF 60,298- 511-59-22-A
WA2HAI 34,060- 262-65-18-A
WB2QOP 30,910- 281-55-20-A
WB2WQA 22,256- 214-52-16-A
WA2SPL 16,854- 159-53- 4-B
WB2STZ 13,900- 139-50-11-A
WA2EKH 11,760- 210-28- 7-B
W2DW 11,564- 118-49- 4-B
WA2UYL 10,494- 159-33-13-A
WB2SZV 10,296- 132-39-11-A
WA2RKI 8346- 107-39- 9-A
WA2EAH 5832- 108-27- 1-B
WB2JLM/2 5394- 93-29- 6-A
WB2VPE 4464- 72-31- 5-A
WA2CJY 504- 21-12- 1-A
WA2LNX/2 (WA2EAH, opr.) 56- 7- 4- 1-B
WA2WSX (+WA2TEO) 55,692- 442-63-20-A
WA2YYM (multi-op) 5896- 134-22-17-A

N.Y.C.-L.I.

WB2WBH 96,702- 681-71-24-B
WB2JSJ 92,418- 633-73-24-A
WA2IYH 88,020- 633-70-23-B
WA2DLV 74,796- 542-69-20-A
K2AU 74,296- 502-42-17-B
WB2QCF 66,132- 501-66-11-B
WA2WKH 63,114- 471-67-21-A
WB2HZH 58,800- 490-60-20-A
WB2WRT 57,330- 455-63-21-A
WB2SJG 51,120- 360-71-15-A
WB2QBP (WB2UFG, opr.) 44,400- 370-60- 8-B
WB2FLF 39,312- 378-52- 7-B
WA2YHK 37,252- 278-67- 7-B
WA2SNQ/2 27,084- 222-61-10-B
WB2WXS 25,488- 236-54- 9-A
WB2BXO 21,624- 212-51- 7-B
WB2FHN 20,868- 222-47-14-A
W2MOY 18,462- 181-51-13-B
WA2UXO 16,000- 200-40- 9-A
WB2ZIN 13,724- 146-47-10-A
WB2SGT/2 13,624- 131-52-15-A
WA2YMX 13,608- 162-42- 8-B
WA2GMD 13,442- 143-47-13-B
W2HAE 13,340- 145-46- 7-A
W2GKZ 13,152- 137-48- 6-B
WB2NDR 12,600- 140-45- 3-A
WB2TLD 12,512- 136-46- 9-A
K2OVS 10,890- 121-45- 6-A
WB2EKW 10,600- 105-50- 7-B
WA2YEI 10,452- 134-39-10-A
WA2ROO 7632- 106-36-15-A
WA2SRH 6708- 86-39- -A
W2KDI 6272- 56-56-10-A
WA2PFY 5742- 87-33-13-A
W2PDM 4752- 99-24- 4-A
W2NBI 3300- 66-25- 6-B
WA2MXI 2760- 60-23- 8-A
WB2MAN 2420- 55-22- 2-A
WA2SUH/2 912- 24-19- 3-A
WA2HGG 810- 27-15- 6-A
WB2FVT 432- 24- 9- 2-A
W2OTS 216- 12- 9- 2-A
WB2NXF 208- 13- 8- 3-B
WA2OVG 144- 9- 8- 2-A
WB2KNK 60- 6- 5- 2-A
WB2YKL 24- 4- 3- 1-A
W2CZZ 9- 3- 3- 1-A
WA2BVU (multi-op) 82,512- 573-72-24-B
WA2ROK (multi-op) 67,268- 502-67-18-B
K2PO (multi-op) 59,658- 489-61-22-B
WB2RCJ (multi-op) 28,644- 231-62-17-A
WA2PKL (multi-op) 28,202- 239-59-15-A
WA2PFZ/2 (+WN2YYT) 19,500- 195-50-20-A
WA2ZKA/2 (+WN2VHH) 17,028- 198-43-18-A
WB2JJD/2 (multi-op) 13,728- 143-48-22-A

Northern New Jersey

WA2UOO 174,518-1229-71-23-B
WB2RKK 159,696-1109-72-24-B
WB2RJJ 131,790- 955-69-24-B
WA2NPP (WB2AEH, opr.) 124,600- 890-70-19-B
W2SHM 73,000- 500-73-18-B
WA2SZQ 66,690- 513-65-16-B
WB2APO 61,040- 436-70-16-A
WB2SXD 50,250- 375-67-13-A
WB2QYT 49,980- 357-70-14-B
WB2VTT 47,994- 421-57-18-A
WB2CST 39,114- 369-53-16-A
W2ZZ 35,100- 270-65-10-B
WB2HJW 31,059- 303-51-13-B
WB2DWF 26,216- 226-58-16-A
WA2RMZ 25,560- 213-60-12-B
WB2FRH 20,648- 178-58-11-A
K2QBW 19,502- 199-49- 3-B
WB2VFT 15,184- 146-52- 7-A
WA2QHN 9682- 103-47- 5-B
K2JLT 5396- 71-38- 9-A
WA2DSA 2730- 65-21- 1-A
WB2FIT 2090- 55-19- 1-B
WB2QWU 1020- 30-17- 3-A
WB2GKE (multi-op) 135,468- 954-71-22-B

Southern New Jersey

K2JOC 155,052-1062-73-24-B
K3DVS/2 73,030- 545-67-16-A
WB2OSQ 71,622- 519-69-19-B
WA2OMY 62,372- 503-62-19-B
W2EPA 58,624- 458-64-17-B
W2REH 54,656- 427-64- 6-B
W2PAU 43,940- 338-65-16-B
WB2BYU 42,752- 334-64-21-A
W2FGY 39,072- 296-66-23-B
WA2VYA 38,480- 296-65-11-B
W2EA 35,910- 285-63-20-A.
W2ZHN 27,246- 239-57-18-A
WA2KOK 24,528- 219-56-21-A
WA2NUL 23,184- 207-56-20-A
WA2WJL 21,340- 194-55-18-A
W2ORA 19,456- 152-64-12-A
W2ITG 14,896- 152-49- 7-B
WA2PAT 14,528- 227-32-12-B
W2REB 14,352- 184-39-11-A
W2TDN 13,528- 178-38-21-A
W2HVO 12,342- 121-51-10-A
K2QXQ 9240- 140-33-17-A
W2OGZ 8692- 106-41- 8-B
W2PFG 7560- 108-35-12-B
WB2LCC 7000- 100-35- 9-A
K2HPV 4514- 61-37- 8-A
W2EKB 3304- 59-28- 4-B
W2GQO 2988- 83-18-10-A
WA2RFK 2842- 49-29- 7-A
WB2VLO 2688- 48-28-10-B
W2SDB 1584- 44-18- 2-B
W2ROW 1216- 32-19- 5-B
K2KA (+WB2BXV) 70,656- 512-69-23-B

Western New York

W2HPF 134,496- 934-72-20-B
K2IGW 133,200- 900-74-22-B
WA2BCK (WA2MBP, opr.) 104,098- 713-73-17-B
WA2EKW 95,566- 673-71-18-B
WA2MBM 78,912- 548-72-22-B
WA2SON 71,960- 514-70-19-B
WA2LCC 64,680- 490-66-12-A
WA2AOG 63,000- 450-70-15-A
WA2BAO 62,622- 441-71-24-A
WA2WDE 50,960- 392-65-18-A
WB2LOF 47,748- 346-69-18-A
WB2TKY 40,064- 313-64-15-B
W2GHD 40,020- 345-58-21-A
K2SOT 37,122- 269-69-21-B
K2DTQ 29,412- 258-57-16-B
W2IAM 26,082- 207-63- 9-A
WA2LOF 22,950- 225-51-18-A
WB2YZX 22,892- 194-59-15-A
WB2ABD 21,576- 186-58- 6-A
WA2SFT 18,142- 193-47- -B
W2DXE 17,544- 204-43-13-A
WB2AIO 17,384- 164-53- 5-A
W2IPO 16,000- 200-40-15-B
WB2FYZ 15,476- 146-53- 9-B
WB2OSJ 14,696- 167-44-10-B
K2EQB 13,230- 189-35- 5-B
WB2FNS 5936- 106-28- 3-A
WB2BXM/2 5628- 67-42-17-A
W2KDE 3250- 65-25-24-A
WA2MBP 2184- 39-28- 1-B
WA2LEZ 1760- 44-20- 5-A
WA2RIC 960- 30-16- 4-A
WA2ZJP 432- 18-12- 5-A
W2VDX (multi-op) 56,090- 395-71-24-B
WB2PNN (+WB2ZOW) 43,554- 357-61-16-A
K2GXT (multi-op) 40,690- 313-65-19-B
W2OW (multi-op) 28,600- 260-55-24-A
K2GEE (multi-op) 20,776- 212-49-20-A

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Delaware

K3HBP 52,800- 400-66-16-B
WA3TVS 50,468- 407-62-22-B
K3YHR 35,510- 265-67-13-A
WA3UUN 20,178- 171-59-13-B
WA3VKZ 9424- 124-38-18-A
W3ZNF 7488- 104-36- 7-A

Eastern Pennsylvania

K3JGI 149,040-1035-72-24-B
W3YP (W3DQG, opr.) 142,496- 976-73-24-B
W3DHM (K3DPQ, opr.) 136,368- 947-72-23-B
K3HXS 64,128- 501-64-15-B
K5JZN/3 59,800- 460-65-14-B
K3DZB 52,500- 375-70-10-B
WA3MKB 42,448- 379-56-21-A
WA3OVZ 34,760- 316-55- 9-B
WA3WIM 30,624- 319-48- 7-B
K3PCX 27,060- 246-55-16-A
W3ETB 26,904- 228-59-18-B
K3LDR 20,056- 218-46-10-B
WA3WVT 19,240- 185-52-19-A
WA3SVJ 18,800- 188-50- 7-A
WA3VUE 17,914- 169-53-18-A
WA3ABN 15,892- 137-58- 9-A
WA3VJS 8448- 96-44-14-A
WA3AXS 8316- 99-42- 9-A
WA3RTY 6534- 99-33-11-A
K3BFA 5858- 101-29- 2-B
WA3WMF 5082- 77-33- 7-A
W3HMU 4828- 71-34- 4-A
K3MUQ 4756- 82-29-10-A
WA3YIV (WA3GYI, opr.) 3696- 56-33- 2-A
WA3NGK 3500- 50-25- 5-A
WA3TUQ 3060- 51-30- 7-A
WA2AKN/3 2700- 50-27- 4-B
WA3DMH 1890- 35-27- 9-A
WA3YMV 1216- 38-16- 5-A
K3AGU 960- 32-15- 4-A
WA3QYY (multi-op) 49,104- 396-62-16-B
WA3RCA (multi-op) 47,092- 386-61-24-A
K3DCC (+K3DCB) 30,264- 291-52-21-A
WA3OVH (multi-op) 29,808- 324-46-22-A

Maryland-D.C.

W3LPL (WA2LQZ, opr.) 193,742-1327-73-24-B
W3GRF (W3BQV, opr.) 178,044-1203-74-24-B
W3EZT (W3ADT, opr.) 175,972-1189-74-24-B
W3AU (W3ZKH, opr.) 169,500-1130-75-22-B
W3AZD 149,628-1011-74-24-B
W9SZR/3 149,504-1024-73-22-B
W3IN 144,596- 977-74-24-B
WA3NYU 143,420-1010-71-24-B
W3ZSR 138,672- 963-72-19-B
W1FLM/3 135,240- 966-70-24-B
WA3AMH/3 132,608- 896-74-22-B
W3CRE (WA1RGW, opr.) 129,312- 898-72-24-B
WA3UTA 122,056- 836-73-21-B
WA3VQP 117,576- 828-71-24-B
K3ZAW 107,068- 754-71-17-B
K3BNS 101,376- 792-64-10-B
W3SW (WA3QIA, opr.) 94,360- 674-70-15-B
W3FA (WA3ZAS, opr.) 84,554- 631-67-19-B
K3LYW 76,300- 545-70-18-B
W3ZNH 73,554- 533-69-10-B
WA3SXH 63,420- 453-70-22-A
WA3AFQ 61,758- 423-73-14-B
W3USS (WA1FEO, opr.) 59,840- 440-68-16-B
W3KWB (WB3AJQ, opr.) 59,150- 455-65-13-A
WA3UHJ 51,100- 365-70-18-A
W3JPT 50,526- 401-63-23-B
WA3UHO 50,432- 394-64-21-A
WA3LHG 48,800- 400-61-13-B
K3CKT 48,048- 364-66-13-B
WA3VUQ 45,486- 399-57-20-B
WA3ZGS 44,530- 365-61-19-A
W3MFJ 41,448- 314-66-15-B
W3RRX 40,824- 324-63-18-B
W3GZQ 37,920- 316-60-11-B
K3IMC 33,000- 300-55-12-B
WA3TOE 27,240- 227-60-10-B
K3DI 26,240- 320-41-11-B
K3NPV 25,984- 224-58- -B
WA3YSQ 25,868- 223-58-19-A
WA3ZJT 25,058- 187-67-19-A
W3HVM 23,436- 189-62- 8-B
W3ML 20,976- 185-57- 8-B
WA3VPI 20,430- 227-45-12-A
WA3VPZ 16,020- 178-45-20-A
WB3AHN 15,568- 139-56-10-A
WA3OLQ 11,832- 116-51- 7-A
WA3WTQ 11,160- 124-45-12-A
W3PWO 10,000- 100-50- 8-B
WB2JYM/3 9768- 132-37- 1-B
W3TMZ 9400- 100-47- 2-B
W3HH 6992- 92-38- 5-B
W3AEL 6336- 88-36- 6-B
K3IXO 6068- 74-41- 6-A
W3FSP 4350- 75-29- 5-A
K3EJ 3570- 51-35- 4-B
W1NJX/3 3068- 59-26- 6-A
WA3YCZ 2576- 56-23- 9-A
WB9NZY/3 704- 22-16- 1-A
W3HPF 480- 24-10- 3-A
K3OAE 44- 11- 2- 1-A
W3RIL 2- 1- 1- 1-B
W3BWZ (+K4CFB) 140,744- 964-73-24-B
K3GJD (+WB3AVN) 137,640- 930-74-24-B
WA3QQQ (+WA3QQR) 60,582- 439-69-18-B
LU1BAR/W3 (+LU2DX) 40,870- 305-67-17-B
WA3UUO (+W6NSE) 28,768- 248-58-15-A
WA3WCO (+WA3WRE) 22,288- 199-56-15-A
W3ZH (multi-op) 6930- 99-35- 6-B

Western Pennsylvania

WA3FAL (WA3SXZ, opr.) 151,656-1068-71-24-B
W1FCC/3 104,098- 713-73-24-A
WA3UEN 36,984- 276-67-17-A
W3GNR 35,490- 273-65-16-A
W3TOO/3 34,314- 301-57-14-A
WA3VJA 33,600- 300-56-10-B
WA3WMB 22,800- 200-57-14-B
W3QII 21,624- 204-53-16-A
WA3TPN 12,852- 126-51-12-B
WA3KOS 11,100- 150-37- 3-A
WA3LJW 9964- 106-47- 6-B
WA3QJR 8272- 94-44- 3-A
WA3WZR 6460- 85-38-14-A
K3MPB 4692- 102-23- 7-A
WA3LUM 2756- 106-26- 7-A
K3TLP 2576- 46-28- 5-A
K3LVO 1512- 42-18- 2-A
WA3TJB/3 (+WA3MYI) 70,242- 509-69-22-A
W3VC (multi-op) 60,702- 453-67-24-A
W3HGT (multi-op) 58,112- 454-64-18-B
W3YA (multi-op) 55,062- 399-69-17-B
WA3WIK (multi-op) 47,124- 357-66-22-A
K3CR (multi-op) 17,034- 167-51- 8-B
WA3WNT (+WA3ZWN) 17,028- 198-43-11-A

Alabama

K4TIG (W8FAW, opr.) 195,300-1302-75-23-B
K4JYO 103,222- 707-73-17-B
WB4FZQ 92,442- 651-71-21-B
WA4MIT 30,160- 260-58-12-B
WA4MFF 26,082- 207-63-17-A
W4DS 14,560- 104-70-21-B
WA4VEK 2754- 51-27- 6-A

Georgia

W4YWX 176,120-1190-74-24-B
K4BAI 130,498- 919-71-24-B
K4EEK 70,140- 501-70-17-A
WB4SMZ 65,392- 488-67-20-A
K4EZ 25,608- 194-66- 5-B
WA4IYB 21,240- 180-59-16-A
W4JM 8820- 98-45- 5-B
WB4LOK (multi-op) 24,516- 227-54- 4-B

Kentucky

WB4OSS 143,372- 982-73-24-B
K4FU 102,200- 700-73-16-B
WB4KTR 97,720- 698-70-24-B
WA4UNJ 38,412- 291-66-23-A
K4RZK 35,360- 260-68-19-B
WB4FOI 34,304- 268-64-11-A
WA4FWW 23,680- 185-64-15-A
WB4FVP 23,436- 186-63-14-A
K4ADJ 17,136- 168-51-12-B
WA4EBN 8400- 100-42- 8-A

North Carolina

W4NQA 143,712- 998-72-20-B
WB4MPZ 59,214- 417-71-18-A
WA4KCO 37,620- 342-55-20-A
WA4MWP 37,548- 298-63-12-B
WA4OEQ 29,540- 211-70-12-A
K4FOB 21,690- 241-45- 7-A
W4TYE 21,420- 210-51- 6-B
WA4FFW 16,660- 170-49- 7-A
WB4VHE 14,204- 134-53-10-B
WA4DWC 2600- 52-25- -B

Northern Florida

WB4UZT 142,820- 965-74-19-B
WA4TYL 111,020- 793-70-23-A
K4VFY (WA4IMC, opr.) 105,408- 732-72-23-A
WA4UFW 85,200- 600-71-22-A
W4WKQ 82,740- 591-70-14-B
WB4FEC/4 77,560- 554-70-12-B
W4ZTW 73,834- 551-67-22-B
K4LAN 64,320- 480-67-10-B
WB4JGY 59,658- 489-61-18-B
WB4FSG 24,200- 220-55-14-A
WB4KXF 2100- 50-21- 7-A
WA4ECY (multi-op) 84,916- 593-71-21-B
W4NN (multi-op) 33,480- 270-62-21-A

South Carolina

WA4ALC 88,750- 625-71-22-B
K4ADI 27,040- 208-65-18-A
WB4IUX 18,476- 149-62- 4-B
WA4DZG (+K4KXO) 33,406- 288-58-15-B

Southern Florida

WB4AEX 223,628-1511-74-24-B
WA4LZR (WA4FCT, opr.) 180,560-1220-74-24-B
W4QZF(K7JCA, opr.) 157,768-1066-74-21-B
WA4SVO 119,980- 857-70-21-B
WB4DFV 69,412- 518-67-18-B
WB4OGW 64,032- 464-69-16-B
WA4ZLW 49,982- 373-67-19-A
WA4ASJ 32,000- 250-64-17-A
K4BNC 27,440- 190-70-14-B
WB4BNH (WB4WYI, opr.) 21,840- 182-60-11-A
W4MGK 14,336- 128-56-11-B
WB4VVG 8036- 98-41- 7-A
WA4KOV 1344- 32-21- 4-B
K4EN 72- 6- 6- 1-A
K4VB/4 (multi-op) 38,936- 314-62-22-A

Tennessee

K4PUZ 116,982- 873-67-12-B
K4PJ 90,000- 600-75- -B
WA4UAZ 86,432- 592-73-14-B
WB4DKM 70,216- 524-67-22-B
K4AMC 56,560- 404-70-19-A
WB4RJF 54,944- 404-68-19-B
WA4ZBC 50,820- 385-66-23-A
WB4WHE/4 47,580- 366-65-18-B
K4YEH 38,220- 273-70-18-B
WB4DGI 31,648- 344-46- 5-B
WA4MKU 26,028- 241-54-17-A
W4OGG 12,814- 149-43-10-A
K4KTX 10,656- 111-48- 8-B
WA4BTK 4050- 45-45- 6-A
WA4RZF 220- 11-10- 2-A
WB4WME (multi-op) 60,288- 471-64-19-B
WA4ASL/4 (multi-op) 49,600- 400-62-11-B

Virginia

K4VX (K3EST, opr.) 212,380-1435-74-24-B
W4RX (WA3HRV, opr.) 167,832-1134-74-24-B
W4DM 130,782- 921-71-20-B
K4PQL 118,996- 838-71-20-B
W4KFC 115,776- 804-72-14-B
W4WSF 108,916- 746-73-20-A
WB4BGY 107,440- 790-68-14-B
WB4OXD 102,200- 700-73-19-A
WB4VMB 100,100- 715-70-21-B
W4MYA 99,072- 688-72-17-B
WA4KKP 87,640- 626-70-24-A
W4UGE 73,780- 527-70-12-B
K4LBY 71,760- 520-69-24-B
WA4DUS 65,992- 452-73-19-A
WA4TLB 63,190- 445-71-22-A
WA7AFE/4 60,166- 449-67-23-A
W4CRW 56,286- 474-59-12-B
K4DTD 46,336- 362-64-11-B
WB4BUL 43,290- 333-65- 9-B
WA4EJJ 42,240- 352-60-15-B
W4YZC 39,168- 306-64-11-A
W4ZM 36,960- 280-66-16-B
W4GF 33,138- 263-63-12-B
W4NH 33,000- 250-67- 9-B
WA4JIY 24,624- 216-57-18-A
WA4HPF 22,400- 200-56- 6-B
W4NQV 21,924- 189-58-13-A
W4LGM 20,586- 219-46- 7-A
K4GKD 20,400- 200-51- 6-A
WB4GXH 19,822- 187-53- -A
WA4MJE 16,468- 179-46-14-A
W4JVN/4 16,072- 164-49-11-A
WA0MYM/4 14,880- 124-60-12-A
W4NND 14,720- 160-46- 8-B
WA4CGX 13,500- 135-50-14-B
K4WVT 11,088- 132-42- 6-A
WB4YZS 6264- 87-36- 8-A
K6ETM/4 3696- 66-28- 5-A
K4TM 2880- 45-32- 1-A
W4KP 2184- 42-26- 6-B
W4QCW 1978- 43-23- 2-B
K4DSZ 312- 13-12- 2-A
WA4QOC (multi-op) 141,932- 959-74-24-B
WB4TBO (multi-op) 73,008- 507- 72-22-B
WB4DZL/4 (multi-op) 45,260- 365-62-24-A
WB4RDV (multi-op) 27,432- 254-54-10-B
WB4BRC (+WN4DGG) 9760- 122-40-11-B
K4FJW (multi-op) 3190- 275-58-24-A

West Indies

KP4EAJ 167,160-1194-70-19-B

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Arkansas

WA5RTG 222,300-1482-75-24-B
WA5VDH 179,400-1196-75-24-A
WB5KED 98,946- 717-69-23-B
WB5EET 15,494- 127-61-15-A
W5PGM 1872- 39-24- 4-A

Louisiana

W5WMU 191,552-1312-73-24-B
K5FVA 175,784-1204-73-23-B
W5RTX 159,678-1093-73-21-B
K5YMY 144,414-1017-71-24-B
W5HGT (WB5GVE, opr.) 101,982- 739-69-18-B
WB5KQJ 59,782- 421-71-23-A
WB5KFA 47,736- 351-68-24-A
W5WG 42,204- 314-68-19-A
WA5TRX 10,028- 109-46- 6-A
W5GAD (multi-op) 168,554-1187-71-24-B

Mississippi

W5RUB 180,056-1268-71-24-B
WB5BNV 16,016- 143-56-18-A
W5UCY 14,396- 122-59-15-B
K4KEW/5 11,700- 117-50- 8-B

New Mexico

K5FPO 146,828-1034-71-21-B
WA5YTX 110,460- 789-70-22-B
WA5RGI 38,480- 320-57-20-B
WB5HAE 20,700- 207-50-12-B
WB5ORF 18,032- 184-49-12-A
WB5MVA 15,604- 166-47-12-A

Northern Texas

WB5DTX (WB5IZN, opr.) 228,636-1566-73-24-B
W5MYA 219,000-1500-73-24-B
W5TMN 190,476-1287-74-22-B
K5RHZ 166,032-1153-72-23-B
WB5AAR/5 110,296- 811-68-17-A
WB5HIH 106,580- 730-73-17-B
W5QXK 84,084- 637-66-19-B
K5VTA 55,476- 414-67- -B
WA5SRK 51,968- 406-64-16-A
W5UOJ 48,816- 339-72-13-B
WB5OFB 48,236- 389-62-24-A
K5SOR 34,060- 262-65- -A
WA5VOQ 28,080- 216-15-14-A
WB5BNG 18,240- 152-60-12-A
WB5GJD 12,728- 148-43-12-B
W5OFI 10,764- 117-46-11-B
W4GXW/5 9810- 109-45- 7-A
WA5VDY 5928- 78-38- 6-A
W5KYD 4160- 65-32- 2-B
WB5NHL 2576- 46-28- 3-A

W5SOD 2304- 48-24- 4-A
W5YR 2100- 42-25- 5-A
W5ONL (multi-op) 73,728- 512-72-17-B

Oklahoma

K5LUR 41,236- 338-61-10-B
K5OEC 37,944- 279-68-21-B
WA5ZWW 29,500- 250-59- 9-A
WA5RRY 2352- 42-28- 5-A
WB5JFR 200- 10-10- 3-B
W5YJ (multi-op) 130,272- 944-69-24-B

Southern Texas

K5PFL 218,562-1497-73-24-B
WA5LES (K5LWL, opr.) 214,474-1469-73-24-B
WA5WQF 158,112-1098-72-19-B
KØPVI/5 107,800- 770-70-19-A
K5BSZ 97,270- 685-71-18-A
K5OOU 79,194- 591-67-17-B
WB5QOW 75,710- 565-67-16-A
WB5IFY 43,772- 353-62- 9-B
W5JWM 41,400- 300-69-15-B
K5KYU 32,886- 261-63-11-A
WB5FVT 30,134- 247-61-18-A
WB5LAI 24,898- 211-59-19-B
WB5OOW 17,952- 173-52- 5-A
K5DEG 13,416- 156-43- 7-B
K5LZJ 8954- 121-37- 4-B
W5OP 2760- 46-30- 4-B
WB5QDO 1760- 40-22- 4-A
WA5UHT 1054- 31-17- 2-A
W5UDG 900- 25-18- 3-A
W5ZO (multi-op) 53,550- 425-63-12-B

Canal Zone

KZ5MY 2064- 43-24- 6-A

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East Bay

WA6DIL 154,216-1042-74-22-B
WA6AHF (WA6TLV, opr.) 152,550-1017-75-24-B
W6MAV (K6CQF, opr.) 128,880- 895-72-23-B
K6HIH 128,760- 870-74-20-B
W6RGG 108,780- 735-74-24-B
K6AUC 107,778- 759-71-23-B
K6ZM 94,464- 656-72-24-B
WA6VEF/6 89,286- 647-69-24-B
K6AHV 55,342- 413-67- 8-B
K6HM 48,880- 376-65-18-A
K6JSI 29,817- 257-58-16-B
K6UWR 25,288- 218-58-12-B
K6BE 10,286- 139-37- 3-B
WA6BMV 2356- 62-19- 3-A
W6RQZ 1216- 32-19- -B
W6BSL (+WA6JUO) 107,310- 735-73-24-B
WA6TQK (+WA6BMV) 103,968- 722-72-21-B
W6BB (multi-op) 61,248- 464-66-21-B
W6OT (multi-op) 21,518- 203-53-19-A

Los Angeles

W6HX (WB6OLD, opr.) 243,164-1643-74-24-B
W6RR (W6RTT, opr.) 227,032-1534-74-24-B
WB6YBL 202,176-1404-72-24-B
W6DGH (WB6ZVC, opr.) 195,750-1305-75-24-B
K6OVJ (WB6VZI, opr.) 152,736-1032-74-24-B
WB6PXP 136,656- 936-73-24-A
WB6JFD 66,464- 496-67-24-A
WB6BDB 46,494- 369-63- -A
K6MP 44,268- 357-62- 7-B
W6OEO 43,092- 342-63-17-B
WB6KPN 37,332- 306-61-12-A
WA6ELI 8856- 108-41- 8-A
WA6IDN 1716- 33-26- 2-A
W6PFE 1680- 40-21- 6-A
W6YRA (multi-op) 138,116- 946-73-24-B
W6VPZ (multi-op) 69,224- 509-68-24-B
WB6YAS/6 (multi-op) 52,000- 400-65-20-A
W6YQQ (+WA6DZW) 35,990- 305-59-24-B
WB6FRM/6 (multi-op) 34,692- 294-59-22-A

Orange

K1JYN/6 137,376- 954-72-20-B
WA6WZO 108,040- 740-73-24-B
WB6ERG 73,640- 526-70-12-B
WB6KRI 45,672- 346-66-20-A
WA6FIT 38,556- 306-63-14-A
K2UVG/6 36,040- 292-60-17-A
K6HRI 25,764- 226-57- 9-A
W6RPZ 13,254- 141-47- -B
WA6TMY 12,936- 132-49-13-A
WA6DBA 3648- 76-24- 9-A
WB6AJV 3630- 55-33- 7-A

Santa Barbara

WB6DOI/6 68,904- 522-66-18-B
K9AIY/6 19,910- 181-55-17-A
W6PRP 15,158- 143-53- 2-B
W6GEB 11,440- 130-44- 4-B
WA6DEI 2862- 53-27- 1-B
WA6KAC (+WA6PJJ) 78,526- 553-71-24-B

Santa Clara Valley

W6JZU (WB6AIN, opr.) 185,550-1237-75-24-B
W6MUR (W6PAA) 178,350-1189-75-24-B
W6OKK (WB6DSV, opr.) 168,000-1120-75-24-B
W6LPM (WA6GSN, opr.) 146,876-1006-73-22-B
WA6DQM 131,572- 889-74-22-B
WB6KBK 120,000- 800-75-24-B
WB6LPK 119,574- 819-73-23-B
W6HJP 102,384- 711-72-22-B
WA6GFY (WB6EXW, opr.) 88,708- 662-67-20-B
WB6JGS 75,480- 555-68-24-B
WB6RGR 73,152- 508-72- -A
WA6HCI 72,288- 502-72-23-A
K6KLY 69,550- 535-65-22-A
WB6DSV (W6OKK, opr.) 69,496- 511-68-23-B
W6NLG 69,296- 488-71-22-B
W6OCP 67,620- 490-69-12-B
WB6GNM 52,920- 420-63- -B
WA6UZA 50,400- 400-63-16-A
K6QX 43,560- 330-66-13-B
WB6HWQ 43,148- 322-67-19-A
WA6MQS 40,560- 312-65-11-B
K6ITL 39,520- 304-65-12-B
WA6AVS 33,480- 270-62-21-B
K6ZX 27,264- 213-64-10-A
W6LQC 26,910- 207-65-10-B
K6DC 25,370- 215-59- 9-B
WB6EMR 20,800- 208-50-11-A
K6VGW 20,748- 182-57- 7-A
WB6CJE 19,108- 281-34-17-A
VE3DXV/W6 18,816- 192-49- 6-B
W6PLQ 16,608- 173-48- 9-A
WB6HBL 13,904- 158-44-13-A
K6AQ 13,248- 138-48- 3-B
WA6BZT 6438- 87-37- 5-A
W6ODM 4814- 83-29- 8-B
WØBWJ/6 2600- 50-26- 4-A
W6WZF 2530- 55-23- 6-A
K6SMH 2500- 50-25- 4-A
K6ODK 2196- 61-18- 2-A
WA6LIJ 756- 27-14- 2-B
K6QZ/6 648- 27-12- 2-A
K6BR (+WAØENP) 161,768-1108-73-24-B
W6YX (multi-op) 142,350- 975-73-24-B
W1ARR/6 (+W6OWQ) 132,164- 893-74-24-B
W6MSF (+W6KQG) 130,684- 883-74-24-B
K6YA (multi-op) 66,654- 483-69-19-B
WA6NKK (multi-op) 61,750- 475-65-22-B
WB6WSL (multi-op) 52,716- 382-69-24-B
K6EIH (multi-op) 34,100- 310-55-13-B

San Diego

W6MAR (K9LBQ, opr.) 218,124-1494-73-23-B
W6ONV (WA9UCE, opr.) 190,950-1273-75-23-B
W6RDF (WB6DPV, opr.) 141,784- 958-74-22-B
W6JOT 125,706- 861-73-24-B
WA6ELX 42,880- 335-64-18-A
WA6UGU 19,992- 196-51-21-B
WB6NCJ 14,076- 153-46-12-A
WA6UFY 11,180- 130-43- 9-B
W6KBD 1044- 29-18-10-A

San Francisco

W6NUT 191,550-1277-75-24-B
W6KHI 39,840- 332-60-16-B
W6JZZ 28,600- 260-55-17-A
WA6VPB 18,156- 178-51-21-A
WB6YCB 10,164- 154-33- 7-A
WA6HPF 9398- 127-37- 9-A
WB6ITN 6004- 79-38- 8-A
WB6HZO 3520- 55-32- 6-A
WB6OHF/6 468- 18-13- 1-B
W6BIP (multi-op) 86,762- 611-71-18-B
WB6MBB (+WB6FEF) 49,792- 389-64-14-B

San Joaquin Valley

K6CQF (WB6CEP, opr.) 136,950- 913-75-24-B
K6OZL 106,416- 739-72-15-B
WA6WRS 81,082- 571-71-18-A
K6AYA 54,784- 428-64-21-B
WA6KMW 20,600- 206-50-21-A
W6DPD 16,100- 161-50-11-A
WA6FUZ 9494- 101-47- 9-B
WB6WFQ 1700- 34-25- 3-A
K6TG 1364- 31-22- 4-A
WA6YAB 968- 22-22- 5-A
WA6WLJ 560- 20-14- 1-A
WB6ITM 384- 16-12- 1-A

Sacramento Valley

K6SG 99,498- 721-69-21-B
WA6NYV 94,572- 666-71-19-B
WA6JVD 81,620- 583-70-21-B
WA6HAF 76,358- 523-73-10-A
K6RLY 59,150- 455-65-15-B
W6NJU 56,848- 418-68-16-B
W6KYA 32,612- 263-62-10-B
WB6RQE 8436- 114-37-10-A
WA6UOS 7600- 100-38-14-A
K6KWN 1872- 36-26- 4-B
WA6OWH 884- 26-17- 2-A
WA6IMY (multi-op) 48,856- 394-62-24-A

Pacific

KH6HML 122,832- 853-72-21-B
KH6IJ 116,496- 809-72-24-B
KH6IJA 29,928- 258-58-15-A
KH6GQW 4950- 75-33- 2-A

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Arizona

K7JVR 99,540- 711-70-22-B
WA7VTM 69,414- 503-69-16-A
W7ZMD 52,440- 380-69-16-B
W7FCD 19,320- 161-60- 6-A
WA7UKZ 6800- 85-40- 5-A

Idaho

WA7WXY 124,800- 832-75-12-B
WØLOI/7 252- 14- 9- 3-A
WA7YIH (+WA7YXZ) 57,684- 437-66-24-A

Montana

K7LTV 136,220- 973-70-20-B
W7GKF 115,344- 801-72-22-B
W7TYN 35,360- 272-65-19-A
W7FO/7 (multi-op) 75,762- 549-69-23-B

Nevada

WA7NIN (W6OAT, opr.) 229,950-1533-75-24-B
WAØKXJ/7 21,420- 210-51-17-A
WA7WYF 1178- 31-19- 1-B

Oregon

W7TML 147,314-1009-73-24-B
WA7IHN 70,560- 490-72-21-B
WA7PEZ 67,392- 468-72-17-B
W7KMB 54,234- 393-69-24-A
WA7JBE 25,598- 237-54- 7-B

Utah

K1PKQ/7 138,384- 961-72-18-B
WA7SLG (WA7WEQ, opr.) 60,324- 457-66-17-B
W7GXC 32,016- 276-58-12-B
WA7GWU 9384- 102-46- 3-B
W7OGU 6596- 97-34- 8-B
WA7VCE 2024- 44-23- 3-A

Washington

W7RM (K7VPF, opr.) 261,300-1742-75-24-B
K7RSC 157,472-1064-74-23-B
VE7ZZ/W7 142,524- 963-74-24-B
W7YTN 101,808- 707-72-21-B
WA7OBL 92,584- 652-71-17-B
WB4JBS/7 73,500- 525-70-18-B
W5QQQ/7 72,100- 515-70-23-A
W9IRH/7 48,484- 395-62- 9-B
WA7SCN 48,416- 356-68-22-B
K7MOK 36,360- 303-60-13-B
WA7JCB 28,448- 254-56-14-B
W7HAD 27,724- 239-58-13-A
W7WMY 22,568- 217-52- 5-B
K7GGD 18,400- 200-46- 7-B
W7APN 17,544- 172-51- 5-A
WA7UQG 15,048- 171-44- 7-B
WA7PVE 8316- 99-42- -A
W7AZI 7800- 100-39- 8-B
W7GLS 7326- 99-37-11-A
K7LAY 7200- 100-36- 8-B
K7DS 7128- 99-36- 7-B
W7WLX 4526- 73-31- 5-B
WA7OJI 4488- 68-33- 8-A
W7BUN 3500- 70-25- 4-B
W7GYP 2256- 47-24- 2-B
K7UWT 1184- 37-16- 2-B
WB7AJR 644- 23-14- 2-B
W7OS 616- 22-14- 4-B
K7CZM 546- 21-13- 3-B
W7GRW 72- 6- 6- -A
W7YH (multi-op) 70,932- 514-69-24-B
WA7WMD (+WA7WMC) 48,100- 370-65-21-A

Wyoming

WA7ZZY 35,092- 283-62-17-A

Alaska

KL7GRP 11,040- 120-46-11-A
KL7IIK 2120- 53-20-16-A
KL7JDO 104- 17- 6- 2-B

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Michigan

WA8ZDT 168,338-1153-73-24-B
WA8FRE 96,986- 683-71-22-B
K8IDE (WB8PIW, opr.) 88,416- 614-72-24-B
K8BZK 80,730- 585-69-19-B
WA8JFQ 74,880- 520-72-24-B
K8MJZ 61,800- 442-70- -B
WA8WWM/8 59,630- 445-67-21-A
WB8IOT 58,374- 423-69-21-B
W8BNF 54,020- 370-73-19-B
W8AP 51,870- 399-65-15-B
K8SIA 51,840- 405-64-18-B
K8WSN 51,724- 386-67-18-B
W8KZM 45,560- 335-68-15-B
WA8HTL 41,470- 319-65-16-B
K8CVV 40,176- 372-54-22-B
WB8DZR 39,424- 308-64-19-B
WB8GAO 35,520- 296-60-19-A
WA8MEC 31,570- 287-55-14-B
K8DDV 31,232- 244-64-12-A
WA8RRR 30,464- 238-64-13-A
K8EPZ 28,684- 202-71- 9-B
K8HWW 28,050- 255-55- 7-B
WB8OBR 27,108- 251-54-15-B
WB8TOT 25,992- 228-57-15-A
WA8ZTQ 24,840- 207-60-15-B
W2CWO/8 22,692- 184-61-12-B
WB8TZF 22,572- 198-57-17-A
W8PBO 21,384- 198-54- 6-B
WA8MJY/8 19,320- 161-60-10-A
W8CQN 17,400- 174-50- 3-B
WB8OBF 14,789- 154-48-13-B
WB8SNW 12,768- 133-48-10-B
WB8ILV 12,212- 142-43-18-A
W8QAO 11,800- 118-50-12-A
WB8DKQ 11,322- 111-51- 9-B
W8VFM 10,464- 109-48-11-B
WA8ZCO 9804- 114-43- 5-B
K8KQJ 9702- 99-49- 5-B
WB8CCS 9360- 120-39-17-A
K8ZKM 9016- 98-46-14-A
W8VPC 8856- 108-41- 5-B
WB8PKU 8800- 100-44-13-A
W8ETH 8740- 115-38-17-A
W8TZZ 8600- 100-43- 6-A
W8TJQ 8192- 64-64-15-A
WA8OJI 8000- 100-40- 2-B
WB8ARC 7752- 114-34- 7-B
WB8NTD 7708- 94-41-13-A
W8HAN 5472- 76-36- 9-A
WA8KME 5304- 68-39- 5-B
K8AYZ 3776- 59-32- 4-B
W8BXS 2800- 50-28- 4-A
WB8IMI 2288- 52-22- 2-A
W8TXM 2200- 44-25- 3-A
W8KRR 1700- 50-17- 1-A
WA8DNM 1224- 34-18- 1-B
W8TIC 744- 31-12- 4-A
WB8KFV 560- 20-14- 1-B
W8FUR 308- 14-11- 3-B
WB8LWS 88- 44- 3- 7-A
WB8WMU 64- 32- 1-10-A
WB8NSF 56- 7- 4- 2-A
W8TVY 50- 5- 5- 1-A
WB8WMQ 8- 4- 1- 1-A
K8PBQ (multi-op) 103,914- 753-69-24-B
WB8QXR (multi-op) 89,886- 633-71-24-B
WB8HNB (multi-op) 64,152- 486-66-24-B
WB8LZA (+WB9EGZ) 58,240- 455-64-21-B
WA8QCW/8 (+WB8JVW) 44,880- 340-66-22-A
WA8ILQ (multi-op) 35,136- 288-61-23-B
WA8SZY/8 (+WB8LWS) 23,868- 221-54-22-A
WB8AYW/8 (+WN8TLD) 22,572- 209-54-21-A
K8DAC (multi-op) 16,000- 160-50-23-A
WB8KFU (+WB8TLZ) 14,490- 161-45-17-A
WB8NII (+WB8PEP) 10,480- 131-40- 7-A

Ohio

WA8YWX 184,398-1263-73-24-B
W8KIC (WA3BGE, opr.) 156,768-1104-71-21-B
W8SWB 113,040- 785-72-23-B
WB8IAY 103,092- 726-71-19-B
WB8MZZ 96,702- 681-71-24-A
WB8DGO 70,858- 499-71-23-B
K8MFO 60,680- 410-74-13-B
W8KEL 54,002- 403-67-17-A
K8HBN 42,108- 319-66- 7-B
W8KZP 41,202- 327-63-22-B
K8NXV 36,740- 334-55-14-B
W8OK 33,000- 275-60- 6-B
K8CVJ 30,622- 251-61-12-A
WB8NUA 28,148- 227-62- -B
WB8SVN 27,956- 241-58- 9-A
W8VQI 27,450- 225-61-16-B
K8RMN 26,666- 199-67-14-A
WB8EHS 26,106- 229-57-17-B
WB8WDO 25,404- 219-58-24-A
WB8STU 24,420- 222-55-16-B
WB8JVT 24,278- 199-61-11-B
WB8NLG 24,244- 209-58-17-A
WB8URG 23,712- 208-57-17-A
WB8NBY 23,214- 219-53-18-A
W8MXO 21,594- 177-67- 7-B
W8OJW 19,800- 165-60-18-A
W8IDM 15,376- 124-62-13-B
WB8LCF 10,500- 125-42-11-A
WB8WHS 10,320- 120-43- 8-A
W8IMF 9588- 94-51-10-B
W8VZE 8858- 103-43- 7-A
K8SWE 7110- 79-45- 8-A
WB8SPS 7448- 76-49- 5-B
WA8DBI 6000- 75-40- 7-B
W8ETK 5440- 80-34- 9-A
WA8KQF 4752- 72-33- 6-B
WB8RQD 3300- 55-30- 9-A
K8MLO 1450- 29-25- -A
K8RXD 1440- 30-24- 2-A
WA8OYR 736- 23-16- 3-A
K8OGH 70- 7- 5- 1-A
WB8JBM/8 (multi-op) 168,192-1162-73-24-B
W8LT (multi-op) 145,584-1011-72-24-B
K8RMK (multi-op) 145,124-1022-71-20-B
WB8URN (+WB8SWH) 120,304- 824-73-22-B
W8EDU (multi-op) 107,568- 747-72-20-B
W8UMD (multi-op) 61,908- 462-67-15-B

West Virginia

WB8CGC 70,716- 498-71-21-B
WB8ESB 23,664- 174-68-14-B
K8LOU 1428- 34-21- 3-A
G3PAC/W8 (multi-op) 62,100- 450-69-24-B

9

Illinois

WB9BWU (WA8RXM, opr.) 180,748-1238-73-24-B
K9BGL 177,304-1198-74-24-B
WB9HAD 171,072-1188-72-24-B
K9HMB (WA9PBK, opr.) 167,536-1132-74-24-B
K9KOI 69,948- 522-67-19-B
WB9AJZ 55,760- 410-68-13-B
W9ZMR 55,044- 417-66-10-B
WB9OQJ 52,632- 387-68-17-A
W9ZJS 50,116- 374-67-21-A
WB9KLW 47,472- 344-69-22-A
WB9FON 41,044- 331-62-16-B
WA9IXF 40,936- 301-68-11-B
W9DY 40,736- 304-67-10-B
WA9SVZ 38,458- 287-67-18-A
WB9OCH 37,320- 311-60-21-A
WB9BDK 34,320- 286-60-19-B
WB9MKL 32,984- 266-62-15-B
W9CRN 27,720- 210-66-12-B
WA9LEY 25,760- 230-56- -B
WB9EBO 25,600- 200-64-10-A
WB9KXI 22,896- 216-53-10-A
WB9DED 22,790- 215-53- 6-B
W9LNQ 20,100- 150-67-11-B
W9CQD 14,672- 131-56-12-A
WB9DVV 13,024- 148-44- 4-B
W9ZCL 12,900- 129-50- 8-A
WB9GSZ 11,856- 152-39- 5-A
W9UDK 10,648- 121-44- 2-B
W9IB 8910- 99-45- 7-A
WA9BLP 7910- 113-35- 4-B
WB9FRV 7584- 79-48- 8-A
W9REC 7560- 84-45-10-A
WA9SFY 5904- 82-36-11-A
WB9DVQ 5600- 70-40- 5-B
W9USS 3692- 71-26-16-B
WA9WXC 2958- 51-29- 5-A
K9DWK 2856- 51-28- 1-B
WB9OWT 2580- 43-30- 3-A
WA9OUE 2400- 50-24- 3-A
WB9NZZ 1480- 37-20- 4-A
W9PII 1440- 40-18- 4-B
WA9NEJ 1440- 40-18- 3-A
W9HPG 1320- 33-20- 4-A
WB9ONP 1140- 30-19- 5-B
W9BPU 340- 17-10- 1-A
W9NNU 84- 7- 6- 1-B
W9YH (multi-op) 164,304-1141-72-24-B
WB9IDS (multi-op) 161,184-1104-73-23-B
W9NLS (multi-op) 101,232- 684-74-24-B
WB9NWO (+WB9SDE) 71,400- 525-68-20-B
WB9AGY/9 (multi-op) 62,424- 459-68-24-B
W9DYH (multi-op) 45,994- 377-61- -A
WB9FVD (+WB9EYR) 9282- 119-39- 5-B
W9NYO (+WN9RMP) 2346- 51-23- 4-B

Indiana

WA9BWY 210,750-1405-75-24-B
W9LT 151,344-1051-72-24-B
WB9CEP 138,040- 986-70-20-B
WB9LHI 133,196- 938-71-16-B
K9UWA 106,960- 764-70-16-B
W9QXO 80,008- 548-73-23-B
K9CDB 77,720- 580-67-18-A
K9UBF 71,128- 523-68-12-B
K9CLO 61,864- 418-74-16-B
WB9IWN 61,740- 490-63-11-A
WB9KTA 51,198- 371-69-21-A
W9CUC 49,500- 375-66-21-B
W9MDW 42,140- 301-70-13-A
WB9MMD 26,596- 218-61-14-A
W9JOO 22,528- 176-64- 9-B
W9NMT 17,064- 158-54-14-B
WB9LXU 16,112- 152-53-14-A
W9NNC 12,654- 111-57-12-B
W9ZRX 8000- 100-40- 2-B
WB9QDM 7600- 100-38- 9-A
WB9NEU 960- 30-16- 3-A
WB9PUM 4- 2- 1- 1-A
WB9BPG (multi-op) 141,450-1025-69-22-B
W9OG/9 (multi-op) 105,432- 764-69-19-B
WB9NMC (+WB9OSJ) 77,520- 570-68-21-A
W9CSL (+WB9SMC) 33,672- 226-71-17-B
WB9CEX (+WA9ZCE) 22,064- 197-56-18-B
WB9PRZ (+WB9CDH) 18,468- 171-54-11-A
K9KRN (multi-op) 9120- 114-40-11-B
WB9PNP (+WB9NIF) 6450- 75-43- 9-A

Wisconsin

K9KGA 159,408-1107-72-24-B
WB9ASN 129,204- 873-74-23-B
WB9MOG 82,144- 604-68-18-B
K9EYA 75,072- 552-68-18-B
WB9HRP 62,496- 496-63-24-A
WB9NKC 52,650- 405-65-18-A
WB9NDO 39,816- 316-63-21-A
WB9PLM 38,192- 308-62-16-B
K9LWV 37,848- 332-57- 9-B
K9HFR 37,800- 300-63-20-B
WB9KZZ 37,358- 283-66-16-A
W9GKJ 35,360- 272-65-18-A
WB9OAO 26,432- 224-59-24-A
WB9NME 26,040- 217-60-12-A
K9JPS 22,848- 204-56-16-B
WB9GKU 19,360- 176-55-17-A
WB9MRF 15,210- 169-45-13-B
WA9TPQ 15,184- 146-52- 9-A
WB9EJE 14,400- 144-51-13-A
W9SFK 10,622- 113-47-11-B
WB9MFC 9792- 102-48- 7-A
W9KI 7000- 70-50-10-B
WB9BGJ 2790- 45-31- 4-B
W9ERW 2700- 50-27- 7-B
K9GSC 494- 19-13- 1-B
WB9QXO (multi-op) 5254- 71-37-17-A

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Colorado

WAØCVS (WBØDJY, opr.) 246,900-1646-75-24-B
WA2WMT/Ø 189,300-1262-75-24-B
WBØIKN 169,200-1128-75-24-B
WBØNYY 157,536-1094-72-24-B
WBØMIV (WBØQHV, opr.) 138,816- 964-72-24-A
WØETT 83,504- 614-68-22-A
WAØYFU (WBØIWL, opr.) 74,370- 555-67-14-A
WBØDJY (WAØCVS, opr.) 65,816- 522-64-11-B
WBØQOT 61,100- 470-65-13-B
WBØBLJ 33,642- 267-63-13-B
WBØLVR 33,480- 270-62-10-A
WØTPO/Ø 32,890- 253-65-14-B
WBØIPL 23,128- 196-59-16-B
WB2PGA/Ø 18,720- 180-52-13-A
WØPWS 13,050- 145-45- 8-B
WAØPYY 6642- 81-41-13-A
WAØUWF (+WBØITQ) 105,140- 751-70-24-B

Iowa

KØGXR 148,248-1044-71-23-B
WAØTAU 111,044- 782-71-19-B
WBØJGS 23,650- 215-55-18-A
WAØNMA 1750- 35-25- 8-A

Kansas

KØCVA 120,000- 800-75-24-A
WBØISW 94,220- 673-70-23-A
KØEGY 72,352- 532-68-17-B
WAØTKJ 65,224- 526-62- 8-B
WBØNCB 63,280- 452-70-22-A
WAØPBQ 58,872- 446-66-18-A
KØHYG 19,928- 188-53- -A
WAØDOZ 9450- 75-63-14-A
WAØGSG 7400- 100-37- 3-A
KØCML 3410- 55-31- 2-B
WØQQQ (multi-op) 149,520-1068-70-24-B
WBØNZF (multi-op) 109,848- 796-69-22-B
KØTLQ (Multi-op) 46,150- 355-65-22-A
WBØFKF (multi-op) 38,520- 321-60-14-B
WBØKDE (+WBØKDF) 10,168- 124-41- 9-B

Minnesota

W2GUH/Ø 149,924-1013-74-19-B
WAØMHJ 144,982-1021-71-22-B
KØIJL 90,848- 668-68-15-B
WAØMSI 58,752- 408-72-18-B
WBØDOU 52,164- 414-63-21-B
WØPAN 26,640- 222-60-15-A
WAØFPL 25,842- 219-59-14-B
WAØVDG/Ø 16,422- 161-51-11-A
WØTIV 16,120- 155-52- 7-B
KØMPH 10,560- 120-44- 6-A
WBØNBJ 9828- 117-42- 6-A
WBØOCT 8658- 111-39- 6-A
WBØNCJ 1330- 70-19- 4-A
WBØQAP 1254- 33-19- 4-B
WAØVQX (multi-op) 59,052- 399-74-23-A
WAØYJB (multi-op) 30,336- 237-64-19-A
WAØNWR (+WAØIOK) 16,920- 188-45-13-B
WAØURW (multi-op) 3834- 71-27- 2-A

Missouri

WAØPAO 159,728-1192-67-21-B
WØQWS 75,486- 547-69-22-A
KØJGH/Ø 58,888- 433-68-23-A
WA9ZGJ/Ø 32,500- 250-65-15-A
WBØAEW 22,388- 193-58-12-B
KØOEQ 22,366- 211-53- 4-B
WBØAJO 16,016- 143-56- 8-B
KØRPH (+WBØLPM) 159,320-1138-70-24-B
KØAZV (multi-op) 131,776- 928-71-24-B
WØZLN (multi-op) 102,346- 701-73-24-B
WØEEE (multi-op) 71,622- 519-69-24-A
WBØOKX (multi-op) 45,694- 341-67-23-B
WAØQWW (multi-op) 33,824- 302-56-13-B
WAØSFS (+WBØNXX) 8610- 105-41- 9-A

Nebraska

KØSCM 92,862- 693-67-24-B
KØKKV (WØOYW, opr.) 41,216- 322-64-19-A
WBØGTJ 12,330- 137-45- 7-A
WBØINQ 7128- 99-36- 4-A
WBØCBI 5092- 67-38- 5-B
WBØLXP 836- 22-19- 2-B
WAØWHB (+WBØDIQ) 10,152- 94-54-11-B

North Dakota

KØFRP 70,272- 549-64-21-B
WØZSW/Ø (WAØSGJ, opr.) 34,304- 268-64-19-B
WBØKSD 5076- 94-27- 8-A

South Dakota

WAØCPX 181,152-1224-74-24-B
WAØONL 180,894-1239-73-24-B
KØMZN 53,856- 396-68-14-B
WAØBWF 28,674- 243-59-16-B

Affiliated Club Scores

Club	Score	Entries	Phone Winner	CW Winner
Northern California Contest Club	9,561,630	128	WA7NIN	WA7NIN
Potomac Valley Radio Club	9,201,978	135	K4VX	K3EST
Murphy's Marauders	5,534,247	76	WB2OEU	W2PV
Wireless Institute of The Northeast	3,768,883	57	WA2UOO	WA2UOO
West Valley Amateur Radio Club(CA)	1,899,396	17	W6HX	W6HX
Richardson Wireless Klub(TX)	1,798,130	28	WB5DTX	W5MYA
Indy DXers	1,725,636	18	WA9BWY	WA9BWY
Western Washington DX Club	1,624,944	31	W7RM	W7RM
Texas DX Society	1,460,806	21	K5PFL	WA5LES
Buffalo Area DX Club	1,376,030	21	W2HPF	WA2MBP
South Jersey Radio Association(NJ)	1,114,792	43	K2JOC	K2JOC
Frankford Radio Club	1,110,706	13	K3JGL	W3WJD
Canton Amateur Radio Club(OH)	1,068,732	30	W8SWB	K8MFO
Colorado Contest Conspiracy	1,027,428	9	WA0CVS	WA0CVS
Delta DX Association(LA)	1,021,302	10	W5WMU	W5WMU
L'Anse Creuse Amateur Radio Club(MI)	804,982	35	K8BZK	K8HWW
Nights of The Roundtable(MD)	713,420	11	WA3NYU	WA3NYU
Southeast DX Club(GA)	697,196	8	W4YWX	K4BAI
Norwood Amateur Radio Club(MA)	594,310	22	WA1EOT	WA1EOT
Central Virginia Contest Club	504,190	7	W4MYA	W4MYA
Johnson County Radio Amateur Club(KS)	460,076	9	K0CVA	WB0KWI
Saginaw Valley Amateur Radio Association(MI)	398,180	26	WB8IQT	W8QM
Radio Society of Greater Brooklyn(NY)	387,936	9	WB2JSJ	WA2WKH
Ohio Valley Teratology Network	361,148	6		WB8OFR
Mid-Mo Amateur Radio Club	350,706	4		
Warren Amateur Radio Association(PA)	343,968	5	WA3FAL	
Blossomland Amateur Radio Club(MI)	314,626	8	WB8DZR	W8KRR
Reading Radio Club(PA)	308,934	14	K3PCX	W3HAE
North Florida Amateur Radio Society	305,260	8	WA4UFW	WA4UFW
WisconsinValley Radio Association	302,596	10	K9EYA	K9EYA
Foothills Amateur Radio Society(CA)	280,936	9	W6OCP	W6OCP
South Peninsula Amateur Radio Klub	279,090	12		K6YGS
Radio Amateur Megacycle Society(IL)	268,414	8	WB9AJZ	
Central Michigan Amateur Radio Club(MI)	267,674	10	K8ZKM	WA8ZAV
Wantagh Amateur Radio Club(NY)	267,158	6	WB2WBH	
Poughkeepsie Amateur Radio Club(NY)	264,984	3		
Radio Amateur Technical Society(IN)	235,686	5	WB9IWN	
Pennsylvania Amateur Radio Club(PA)	220,490	10	K3LDR	
Motor City Radio Club(MI)	218,764	9	W8BNF	W8TZZ
Bluegrass Amateur Radio Club(KY)	215,436	3		
Schenectady Amateur Radio Association	213,772	8	WB2AXV	WB2AXV
Dayton Amateur Radio Association	207,948	3		
Southern New England DX Association	165,564	3		W1DAL
Gloucester County Amateur Radio Club(NJ)	162,480	6	WB2OSQ	WB2OSQ
WELI Amateur Radio Club(MA)	160,912	6	WA1PXM	WA1SHX
South Hills Brass Pounders & Modulators(PA)	153,990	5	WA3UEN	
Penn State Amateur Radio Club(PA)	153,104	7	WA3VJA	
IBM Owego Amateur Radio Club(NY)	146,536	5	K2DTQ	
Ozaukee Amateur Radio Club(WI)	143,574	4		
Oak Ridge Youth Amateur Radio Club(TN)	141,536	3		
Radio Club of Tacoma	139,548	8	WB4JBS/7	
Northwest Amateur Radio Club(IL)	135,384	7	WB9UED	W9ZAV
Hall of Science Amateur Radio Club(NY)	127,124	12	WA2SNQ/2	
ARINC Amateur Radio Club(MD)	121,918	9	W3PWO	W3TOS
Radio Amateurs of Greater Syracuse(NY)	119,532	3		
Delaware Amateur Radio Club	111,570	5		
Fresno Amateur Radio Club	110,204	9	WA6WRS	WB6ITM
Nittany Amateur Radio Club(PA)	109,650	4	WA3LJW	
Utica Amateur Radio Club(NY	97,690	9	K2SOT	WA2LEZ
Wabash County Amateur Radio Club(IN)	93,260	7	W9JOO	W9JOO
Winona Amateur Radio Club(MN)	86,356	5		WA0URW
Chicago Radio Traffic Association	77,942	8	WA9BLP	W9HPG
West Park Radiops(OH)	76,210	6	W8IDM	W8IDM
West Allis Amateur Radio Club(WI)	73,042	3		
Wheaton Community Amateurs(IL)	65,936	11	WB9FVD	WB9FVD
South Towns Amateur Radio Society(NY)	61,280	5	WA2SFT	
Muskegon Area Amateur Radio Club	59,908	8	WB8OBF	
Parma Radio Club(OH)	51,170	5		WB8QFB
Alamance Amateur Radio Club(NC)	45,912	3		
Middlesex Amateur Radio Club(MA)	46,758	3		
Yellow Thunder Amateur Radio Club(WI)	44,118	6	W89MRF	K9GSC
University of RI Amateur Radio Club	43,208	3		
Horseshoe Radio Club(PA)	20,746	4		WA3YQP
Delmarva Amateur Radio Club(DE)	17,626	3		
Kankakee Area Radio Society(IL)	8,902	3		WA9YOL
Lake Success Radio Club	3,685	5	W2NBI	

1975 ARRL DX COMPETITION

Here are some corrections to scores given in *QST* for October, 1975, for the 1975 ARRL DX Competition. DX CW, High Band: I2FGP should read 504 contacts, *not* 74. DX CW, High Band: LU3EX was omitted. His score should read 943,245-153-2055-C. DX Phone, All Band: C6ABN should be listed as "A" power, *not* "C". All French Guiana calls and scores were mistakenly placed in North America; they belong in *South* America. Affected calls are FY7AA, FY7AK, and FYØBHI. Pacific Division multi-op cw winner should be W6NUT, *not* K6AQ. DX CW, Low Band: VK3XB was omitted. His score should read 61,803-63-327-27-A. ZB2USA, operated by W9JVF, should have been listed in the One-Weekend DXpedition box on page 57.

Disqualifications – Sweepstakes

Cw: WB6ION, K4PQL, K5LZO, WA9GAM, WB9GFC. Phone: KØUYN, K5LZO, WB6HDH (operator of WA6NGG), K6LU, WB6ION, WA9GAM, WB9GFC.

Madeleine, WA3UTA, contributed 193,000 points to the PVRC effort, operating both cw and phone. You may remember her as the 1974 Novice Roundup winner.

Frequency Measuring Test

By Ellen White,* W1YL

FMTs are fun! If you haven't as yet participated in these quarterly events, you're missing another interesting phase of amateur radio. The first of the four 1976 FMTs took place on February 15. Participants submitting eligible reports numbered 170, with 45 achieving Honor Roll standing. A total of 2085 measurements was reported. Our "umpire" notes that the propagation curtains were once again pretty dense, so dense, in fact, that he found nothing to measure on the late 20-meter run! His official readings were: Early run 14069.761, 7084.733 and 3558.386 kHz; late run 7088.818 and 3564.454 kHz. Your writer's special thanks go to all the calculator aid from W1CKK.

*Deputy Communications Manager, ARRL.

May 8 is the schedule for the next FMT, rules in full in the April issue.

Honor Roll

This top listing is the standing of the frequency measuring leaders. In consideration of the minimum possible error due to Doppler (and other unavoidable factors), we accredit as of equal merit all those reports computing 4/10ths parts per million (or better) accuracy. Please note that a participant must submit a minimum of 2 measurements to qualify for this listing. Again, the following are of equal merit, and are most conveniently shown in an alphabetical listing by call area.

W1BGW W1JH WA1NJG W1PLJ K1VHO WA2BXK WA2VPA W3BFF K3WIK K4BE K4KA W4NTO WB4UUI WA5CBT K5EVK W5IJW W5KK K5LAZ K5WVX WB6AAL K6BE WA6CKD W6CLM W6KT K6MZN W6OQI W6RQ K7CC ex-7HM WB8BGY W8CUJ WA8KWM W8OK WA8ULG W9FKJ W9MNY WA9PVS K9WGN WØBJ WØBKV WØDJV WØIHI WØRUR VE7HQ Ireland.

Better Than 35 Parts Per Million

(.5) W1JOT W6CBX, (.6) WB2REE/6 WA5QMI KØTIV, (.7) W8OMY WBØDRV, (.8) K4RTA, (.9) WA1SQB WA3GAY, (1.0) WA4AIS K7EGA W7WM, (1.1) WA1WDU WB2NYK W6JQR, (1.2) W1AYG W4IBU, (1.3) K2JFJ W9KO, (1.4) K1ZND WA8TIC, (1.5) W4THZ, (1.8) WB8DCR, (2.0) WA1JZC, (2.1) W9HPG K9WMP, (2.3) K4CHE/5, (2.9) K4JK, (3.0) W3YO, (3.1)

WB8STQ, (3.4) WB2WQA WA6VPJ, (3.5) Fulcher, (3.8) W1MBX, (3.9) K6EC, (4.1) WB4BAP, (4.3) W4ZAU KH6CZ, (4.5) K2FA K5MUK, (5.3) K6ASK, (5.9) WA1SSH Rosenberg, (6.7) WA6INF/7, (6.8) KØAZJ, (6.9) W3NNC, (7.0) WØOKS, (7.7) W9MZE, (7.9) W2JDC WA7HGB, (8.3) WA1USZ, (8.7) W1VZ, (8.8) W8OW Andi Bingham, (8.9) K3EQ W9AG, (9.5) WØKH, (10.3) K9CCX, (11.0) WA3JSU/1, (11.3) W4UCL, (11.5) WBØHBM, (11.8) W1VH, (11.9) WA3TYB, (12.3) W7FIS, (12.6) W5PW, (12.7) WA3JSZ, (12.9) WN8UPN, (13.1) WØHBH, (13.3) K6HI, (13.7) WB5EXI, (13.8) W4YOK, (13.9) W2AIQ, (14.4) W3GDZ/4 WA4VEC VE6MJ, (14.6) K1KSY, (14.8) W9WYB, (16.2) W9TGN, (18.6) W3KVS K4YO, (19.1) W3ZW, (19.3) AC3KEK, (19.9) W8BU, (20.1) W7JMS, (21.1) W3ADE, (22.4) WA1RFT, (22.7) K9UML, (23.3) W2TE, (23.8) WA3VJA, (25.7) W6PRP, (26.4) K4TXJ WB5DCY, (27.0) Dick Bingham, age 9, (27.8) WNØPGZ, (29.4) WAØTKJ, (30.2) K5BSZ, (31.3) W9JOO, (32.1) WA2LLP, (33.3) WB7CRU.

Better Than 179 Parts Per Million

(37.9) WB8PGK, (38.0) WØMQE, (39.8) W6PZU, (40.3) W1AQS, (41.3) K4QG, (41.4) W6AEE, (43.5) KØFPC, (45.2) Bill Bingham, (48.4) K6CL, (52.3) WØNEE, (53.0) K6EPX, (61.1) WA1OHA, (62.9) K6DBJ, (66.1) W6SSB, (68.6) WØIB, (70.9) WA7BYP, (71.1) WAØDEM, (72.9) W6GBF, (78.0) W5YTN, (97.2) WA7TZO, (101.0) WA3BGE/8, (110.4) K2DW, (118.8) W5FFW, (136.1) WA4ZEN, (140.7) WØMDL.

QRGee

Like the new soapbox caption? Thank Gene Mendenhall, ex-7HM! Was quite confident after being off only one Hz in the November FMT, but lost all that confidence when I was confronted once again with weak signals and mucho QRM. – KØTIV. Sure do enjoy this activity. – WBØDRV. The sequence of transmissions is an improvement over the previous method. I appreciate the change. – W7WM. The early run signals were terrible with no signals on 20 or 40 whatsoever! I use a BC-221 as a transfer oscillator fed into a special circuit whereby the amplitude of the 221 output could be controlled and also fed into a frequency counter. It was recognized that the BC-221 operates on its fundamental in the 80-meter band. This meant that I must use the appropriate multiplier when zeroing bands other than 80, such as 40 or 20. As in all frequency measuring, the chief source of error is in the method used to zero W1AW. The amplitudes must be kept as near alike as possible and great care must be used to obtain the exact zero beat. A mixing box accomplishes this as well as controlling the amplitude of the signal fed into the receiver. I suggest that coax-fed systems be used into the receiver to minimize the pickup from stray radiation from the BC-221 in the same room. This is very important in my case as I'm not so fortunate in having a metal cased unit. – W4RHZ. Our first FMT and an excellent technical exercise. We (WB8DCR op., WB8KCY logger) hooked up the equipment just before the start of the FMT. Approximately 15 minutes before callup, we tested our techniques for the first time. Most of the gear is in regular use at WB8DCR, with the exception of the counter (which belonged to a local CB repair shop). We used an SB-301 receiver, 18-ft. vertical and phones. An SB-401 was loaded at minimum power into a Cantenna, and beat against W1AW to put it on the unknown frequency. The SB-401 frequency was then measured with a Heath-Schlumberger SM-110C counter with a 10-second time base. The longer counting period allowed measurement to .1 Hz. However, we were basically interested in eliminating the plus/minus digit ambiguity in the Hz digit which we did by transferring the ambiguity to the tenth Hertz digit. Since the counter has a compensated timebase, the only inaccuracy in the system comes in the beating of the local signal against W1AW. In the SB-301, zero beat is not aurally discernible because the crystal filter cuts off response below about 300 Hz. Thus we had to use an audio beat note and match the two notes in our head. Improvements to be made in the future will be a receiver with a BFO set in the middle of the filter passband and a meter in the detector circuits to locate the exact zero beat. – WB8DCR. Enjoyed the FMT. As usual, signals here in CA were poor. Used an ST-5 RTTY Terminal Unit to obtain a scope pattern for zero beating the BC-221 with the signal from the Drake 2-B receiver. I read the BC-221 frequency with a Heath IB-1100 counter. – WA6VPJ. Merry old Sol gave W1AW 599 on 14 MHz, for a change! – KØAZJ. Enjoyed it thoroughly and wish you had it every month. – W8OW. Using a new HW-104 equipped with my old SB-650 frequency display. It works very well as I feed the B. O. input of the 650 from the i-f out and then peak the signal using the cw filter to reduce the noise and interference. Gives very stable readings on signals of above S-2 with the S meter set for 100 microvolts = S-9. – WØKH. My first FMT and I found it to be interesting. – WØHBH. I sure learned a lot in a short time about measuring received frequencies under poor conditions. I think I'll try this again! – W3GDZ/4. My first FMT. I found it most enjoyable as I was able to apply some of the experimental techniques I am presently learning in college. Whether I was close or not, I shall return! – WA3VJA. Sure would like to have some helpful hints from others using the LM-18 Het. Freq meter. – K4TXJ. QST

VHF QSO Party

If you haven't already done so, it's time now to start planning for this year's June VHF QSO Party to be held June 12-14.

Contest logs (38 QSOs per sheet) are available. Unless first class postage is included with your request, the logs will go via third class (slow!) mail. One unit of first class postage is sufficient to send 5 sheets of paper. Using this as a guideline, you can determine the amount of postage to include.

Be sure your entry is postmarked no later than July 12, 1976. – *WA1STN*

Rules

1) The 1976 June VHF QSO Party begins at 1900 UTC, Saturday, June 12, and ends at 0600 UTC, Monday, June 14. Entrants may operate no more than 28 out of the 35 hours. The seven hours of off-time must be taken in increments of 30 minutes or more. Listening time counts as operating time. All contacts must be made on amateur bands above 50 MHz using authorized modes of emission.

2) Name-of-section exchanges must be acknowledged by both operators before either may claim contact point(s). A one-way exchange, confirmed, does not count; there is no fractional breakdown of the 1-, 2-, or 3-point units.

3) Fixed, portable or mobile operation under one call, from one location only, is permitted. A transmitter used to contact one or more stations may not be used subsequently under any other call during the contest period (with the exception of family stations where more than one call is assigned to one location by FCC/DOC).

While no minimum distance is specified for contacts, equipment in use should be capable of real communications (i.e. able to communicate over at least a mile).

Contacts made by retransmitting either or both stations do not count for contest purposes.

4) Scoring: 1 point for completed two-way exchanges on 50 or 144 MHz; 2 points for such exchanges on 220 or 420 MHz; 3 points for such exchanges on the higher uhf bands. The sum of these points will be multiplied by the number of different ARRL sections worked per band; i.e., those with which at least one point has been earned. Reworking sections on additional bands for extra section credits is permitted. Cross-band work does not count. Aircraft mobile stations cannot be counted for section multipliers.

Contacts made by retransmitting either or both stations do not count for contest purposes. (See League Lines for late info.)

5) Foreign entries: All contacts with foreign countries (such as Mexico and the Bahamas) count for score. All foreign countries are grouped together, and a multiplier of no more than one (per band) may be claimed for contacts with all foreign stations worked

Foreign stations may only work stations in ARRL sections for contest credit and will give their country name.

6) A contact per band may be counted for each station worked. Ex.: W2EIF (SNJ) works K1YON (Conn) on 50, 144, and 220 MHz for complete exchanges. This gives W2EIF 4 points (1 – 1 – 2) and also 3 section-multiplier credits. (If W2EIF contacts other Conn stations on these bands, they do not add to his section multiplier but they do pay off in additional contact points.)

7) Each section multiplier requires a complete exchange with at least one station. The same section can provide another multiplier point only when contacted on a new vhf band.

8) Awards: Entries must be postmarked no later than July 12, 1976. A certificate will be awarded to the high-scoring single-operator station in each ARRL section. In addition, the high-scoring multi-operator station will receive a certificate in each section from which three or more valid multiple-operator entries are received.

9) Disqualifications: See January, 1976, *QST*, p. 73

27th Annual Armed Forces Day Communications Tests

This year's observance of Armed Forces Day marks the 27th anniversary of an annual event reflecting the long-standing good relations between the amateur radio fraternity and our military radio stations. As in years past, events scheduled for Saturday, May 15, emphasize the continuing climate of mutual assistance and warm esteem.

A featured highlight of the nationwide 1976 celebration will be the traditional military-to-amateur communications tests. Special commemorative QSL cards will be awarded to amateurs achieving a verified two-way contact with any of the participating military stations. Special certificates also will be sent to amateurs who receive and accurately copy the Armed Forces Day message from the Secretary of Defense, as transmitted in both cw and RTTY during the receiving tests. Interception by SWL is not acknowledged by QSL cards.

The military-to-amateur crossband operations will be conducted from 15/1300 UTC to 16/0245 UTC. The military stations WAR, NAM, NPG and AIR will transmit on military frequencies and listen for amateur stations transmitting in those portions of the amateur bands indicated above. The operators at the military stations will specify that portion of the amateur subband they are tuning.

Cw Receiving Test

The cw receiving test will be conducted at 25 wpm for any person capable of copying International Morse Code. The cw broadcast will be a special Armed Forces Day message from the Secretary of Defense to all participants. A ten-minute CQ call for tuning purposes will begin at 16/0300 UTC. The Secretary of Defense's message will be transmitted precisely at 16/0310 UTC from the following stations on frequencies listed.

WAR (Army Radio Washington, DC)

FREQ. kHz	*BAND UP FROM (MHz)*
4001.5	3.5 cw
4020	3.775 lsb
4030	3.65 RTTY
6997.5	7.0 cw
14405	14.0 cw
20994	21.25 usb

NAM (Naval Communications Station, Norfolk, VA)

3385	3.5 cw
4012.5	3.65 RTTY
4040	3.775 lsb
6970	7.15 lsb
7301	7.0 cw
7380	7.1 RTTY
7385	7.05 cw
13827.5	14.1 RTTY
14385	14.2 usb
14400	14.0 cw
148,410	fm voice
150,900	

NPG (Naval Communications Station, San Francisco, CA)

4001.5	3.775 lsb
4005	3.5 cw
4010	3.65 cw
6989	7.0 cw
7301.5	7.15 lsb
7347.5	7.0 RTTY
7365	7.075 cw
13922.5	14.0 RTTY
14356	14.2 usb
14375	14.0 cw
14389	14.275 usb
20983	21.0 cw
20998.5	21.27 usb
49995*	50.0 a-m/usb/cw
143,995*	144.0 a-m/usb/cw
148,410**	145.0 a-m/RTTY
148,950**	146.0 fm
222,000*	221.0 a-m/usb/cw

*To be operated from Mt. Vaca
**To be operated from Mt. Diablo

AIR (Air Force Radio, Washington, DC)

4025	3.775 lsb
7305	7.15 lsb
7315	7.0 cw
13997.5	14.0 cw
14397	14.2 usb

TRANSMITTING STATION	*FREQ. (kHz)*
WAR – Army	4030, 6997.5, 14405
NAM – Navy	4012.5, 7385, 14386
NPG – Navy	4005, 6989, 14375, 49.995 MHz, 143.995 MHz
AIR – Air Force	7315, 13997.5

RTTY Receiving Test

The RTTY receiving test will be transmitted at 60 wpm. A ten-minute CQ call for tuning purposes will begin at 16/0335 UTC. The special Armed Forces Day message from the Secretary of Defense will be transmitted at 16/0345 UTC. This test is to exercise the technical skill in aligning and adjusting of equipment by the operator, and serves to demonstrate the growing number of amateurs becoming skilled in this method of rapid communications. Transmission will be from the following stations on frequencies listed.

TRANSMITTING STATION	*FREQ. (kHz)*
WAR – Army	4030, 6997.5, 14405
NAM – Navy	4012.5, 7385, 14385
NPG – Navy	4010, 7347.5, 13922.5, 148.410 MHz
AIR – Air Force	7315, 13997.5

Submission of Test Entries

Transcriptions should be submitted "as received." No attempt should be made to correct possible transmission errors.

Time, frequency and call sign of the station copied as well as the name, call

sign (if any) and address, including zip code of the individual submitting the entry must be indicated on the page containing the test. Each year a large number of acceptable copies are received with insufficient information or the necessary information is attached to the transcription and was separated, thereby precluding the issuance of a certificate.

Entries should be postmarked no later than 25 May 1976 and submitted to the respective service copied. Stations copying NAM and NPG should send their entries to: Armed Forces Day Test Chief, Navy-Marine Corps MARS Building 17, 8th Street & South Courthouse Road, Arlington, VA 22204. Stations copying WAR should send their entries to: Armed Forces Day Test Commander, United States Army, Communications Command, ATTN: CC-OPS-OM Fort Huachuca, AZ 85613. Stations copying AIR should send their entries to: Armed Forces Day Test, Air Force Communications Service /DOYF, Richard Gebaur Air Force Base, MO 64030. QST

Field Day Rules

Take a little time out from your planning for Field Day *now* and read these rules. Next, send a large s.a.s.e. to ARRL Headquarters so you may obtain "dupe sheets" and a summary sheet for FD. Last year a number of clubs did not have the standard summary sheet and, as a result, left vital bits of information out of their entries. In addition, please note the mailing deadline for entries: August 2. Due to the tremendous number of FD entries and a tight *QST* deadline, that mailing deadline cannot be bent.

Cw contacts count double again this year, on a trial basis. A final recommendation will be made by the Contest Advisory Committee after the 1976 Field Day, based on *your comments.*

If you intend to use the Oscar satellites on Field Day, ask for a schedule of passes when you request entry forms. Good luck!

Rules

1) *Eligibility*: The Field Day is open competitively to all amateurs in the ARRL Field Organization (plus Yukon and N.W.T.). Foreign stations may be contacted for credit but are not eligible to compete.

2) *Object*: For portable and mobile stations, to work as many stations as possible. For home stations, to work as many portable and mobile stations as possible.

3) *Conditions of Entry*: Each entrant agrees to be bound by the intent as well as the provisions of these rules, the regulations of his licensing authority and the decisions of the ARRL Awards Committee.

4) *Entry Classifications*: Entries will be classified according to the number of transmitted signals simultaneously on the air at any one time during the FD period, followed by the designation of the nature of the individual or group participation. Once a transmitter makes a contact on a band, it must remain on that band for at least 15 minutes. During this 15-minute period, the transmitter is considered to be transmitting a signal, whether it is or not, for purposes of determining transmitter class. Class A: Club group (or non-club group with three or more licensed amateurs) set up specifically for operation in the FD and using portable identification. Such stations must be located in places which are not regular station locations and must use no equipment or facilities installed for permanent station use, nor any structures installed permanently for FD use. Stations must be operated under one call (except when a Novice position is used, as provided by miscellaneous rule (c) and under control of a single licensee or trustee for each entry. All equipment (including antennas) must lie within a circle whose diameter must not exceed 1000 feet. All contacts must be made with transmitter(s) and receiver(s) operating from a power source independent of commercial mains. Entrants who, for any reason, operate a transmitter or receiver from commercial mains for one or more contacts, will be listed at the end of their class. Class B: Non-club stations set up and operated by not more than two licensed amateurs. Other provisions same as for Class A. Class C: Stations located in vehicles capable of operation while in motion and normally operated in this manner, including antenna. Class C stations may operate stationary, but no stationary equipment or facilities may be used. A Class C station may not be used as a station in any other class. The operator of a Class C station may also operate from another station during the FD period but scores for his mobile operations must be submitted separately. Class D: Stations operating from permanent or licensed station locations, not portable or mobile, using commercial power. Class E: As above, but using emergency power for transmitters and receivers.

5) *Field Day Period*: FD operation starts at 1800 UTC the fourth Saturday of June and lasts until 2100 UTC the following Sunday, a period of 27 hours. Class A and Class B entries who do not begin any setting-up operations until 1800 UTC on Saturday may operate the entire duration of the FD period. Others may operate no more than 24 consecutive hours; i.e., once FD operation has started it must cease 24 hours from that point.

6) *Bands*: Each phone and each cw segment is considered as a separate band. All voice contacts are equivalent and RTTY is counted as cw. A station may be worked once on each band. Cross-band contacts are not allowed. The use of more than one transmitter at the same time in a single band is prohibited, except that a Novice position may operate on any Novice band segment at any time. Contacts made by retransmitting either or both stations do not count for scoring purposes.

7) *Exchanges*: Stations in the U.S., possessions and Canada must exchange ARRL section (see page 8 in any *QST*) and signal report. Valid contacts with stations outside of a section consist of sending a signal report and section and receiving a signal report and country from the foreign station.

8) *Valid Contacts*: A valid contact is defined as a two-way exchange (see above) between stations. Class A, B or C stations may contact any station. Class D or E stations may contact any Class A, B or C station.

9) *Miscellaneous Rules:*

a. Operators participating in the FD may not, from any other station, contact for point credit the FD portable station of a group with which they participated. This is intended to outlaw any kind of manufactured contacts.

b. A station used to contact one or more FD stations may not subsequently be used under any other call during the FD period. This rule is intended to outlaw multiple contacts on the same band with the same station, using different calls. It is not, however, intended to prohibit the use of jointly-owned stations which are normally used under different calls by members of the same family.

c. Any Class A group whose entry classification is three or more non-Novice transmitters may also use one Novice operating position (to be set up and operated only by Novice Class licensees) without changing their basic entry classification. The Novice position must use a Novice call sign and must keep their own logs and check sheets. The Novice-position, QSO total may be added to the group QSO total before multiplying.

10) *Scoring*: Scores are based on the number of valid contact points times the multiplier corresponding to the highest power used at any time during the FD period, plus bonus points. Phone contacts count one point each, and cw contacts count two points each. Power multipliers. If all contacts are made using a dc input power of 10 watts or less AND if a power source other than commercial mains or motor-driven generator is used (e.g., batteries, solar cells, water-driven generators, etc.), multiply by 5. If any or all contacts are made using a dc input power of 200 watts or less, multiply by 2. Multiply by 1 if any or all contacts are made using a dc input power over 200 watts and up to 1000 watts. Over 1000 watts multiply by ZERO! Dc power on ssb

phone is considered to be half the peak envelope power. Batteries may be charged while in use for Class C entries only. For other classes batteries charged during the FD period must be charged from a power source independent of the commercial mains.

11) *Bonuses*: The following bonus points may be added to the score (after the multiplier is applied) to determine the final score. Only Class A and B stations are eligible for bonuses. Do not add bonuses to your final score – all applicable bonuses will be added at headquarters.

a. 100 points for 100% emergency power per transmitter classification. ALL equipment and facilities at the FD site must be operated from a source independent of the commercial mains.

b. If one or more contacts are made using equipment that is totally powered by a source of energy that is derived from "natural" power, such as wind, solar or water power, the FD group will get a 100 point bonus. Oil, coal, natural gas, nuclear fuels or any other fossil fuels or their derivatives are not allowed. The energy source must be described. Commercial electric mains or batteries may not be used for this bonus.

c. 50 points for public relations. Publicity must be obtained or a bona fide attempt to obtain publicity must be made. Evidence must be submitted in the form of a clipping, a memo from a BC/TV station stating publicity was given or a copy of material sent to news media for publicity purposes.

d. 50 points for message origination. A message must be originated by the club president or other FD leader, addressed to the SCM or SEC, stating the club name (or non-club group), number of operators, field location and number of AREC members participating. The message must be transmitted during the FD period and a fully serviced copy of it must be included with the FD report. The message must be in standard ARRL message form as explained in *Operating an Amateur Radio Station*. The message must be correct in all respects or no credit will be given.

e. 5 points for each message received and relayed during the FD period, up to a maximum of 50 points. Copies of each message, properly serviced, must be included with the Field Day report.

f. 50 points can be earned by completing at least one QSO via the Oscar satellite during the FD period. The repeater provision of rule 6 is waived for Oscar QSOs as is the 15-minute provision of rule 4. An Oscar station does not count as an additional transmitter. On the summary sheet show Oscar as a separate "band."

12) *Club Aggregate Mobile Score*: Entries under Class C may be combined to form an aggregate score for their club, having no connection with the club's portable entry, if any. Individual reports must include the club name. The club secretary or other designated club official must submit the club aggregate mobile score claim. Only bona fide members of a club operating in the club territory (175-mile radius from the club headquarters address) may contribute to this aggregate mobile score.

13) *Reporting*: Entries must be postmarked no later than August 2. The proper summary sheet, plus a list of stations worked on each band and appropriate proof(s) for bonuses constitute an entry. *An entry that does not include a check sheet or any other list of QSOs made will be classified as a check log.* A copy of your FD log is not required unless specifically later requested by ARRL. This does not, of course, relieve you of the responsibility of keeping a log as required by FCC/DOC. Send a stamped addressed envelope to ARRL Hq. for FD forms which include a summary sheet and a sample of suggested check sheet.

14) *Disqualifications*: See January, 1976, *QST*, p. 73. QST

Silent Keys

It is with deep regret that we record the passing of these amateurs:

W1BOS, Sidney L. Gardner, Voluntown, CT
WA1FWP, Edward E. Hawkins, West Medford, MA
WA1RKH, Michael Blandin, Bethlehem, NH
EX-1SN, William E. A. Dodge, Beverly, MA
W1VNH, Harold C. Atwater, Agawam, MA
W1WS, Herbert A. Wells, Sr., New Ipswich, NH
K2BP, Frank J. Hack, Rochester, NY
W2IH, Richard Stewart, Congers, NY
W2KFA, Eugene H. Lombardi, Port Chester, NY
W2KKL, Frank Heinfling, Bronx, NY
W2MZ, Harvey F. Wannenmacher, Lancaster, NY
W2QXX, Carl T. Young, Binghamton, NY
WB2RQH, David Haviland, Montclair, NJ
W2RSR, J. Fred Chichester, Conesus, NY
WB2WRK, Willie W. Larsen, Osbornville, NJ
W2YUE, John F. Egan, Rochester, NY
K3AWD, Hobart A. Hill, Philadelphia, PA
W3AQR, Park H. Cassady, Hummelstown, PA
W3NRX, Vincent L. Kish, Point Marion, PA
WN3VEB, John Bordone, Philadelphia, PA
W3ZC, Charles W. Thumm, Philadelphia, PA
W4CRI, Andrew S. Mitchell, Jamestown, TN
K4DEI, Charles F. Finney, Sr., Memphis, TN
K4EGN, James I. Goldstein, Pembroke Pines, FL
W4EQQ, Kilbourne E. Brookes, Hollywood, FL
W4FH, R. W. Freitag, Boynton Beach, FL
K4FQV, Frank Bolden, Tarpon Springs, FL
K4JZJ, Coleman W. King, Sandston, VA
K4LTE, George D. Everest, Greensboro, NC
W4OES, Harold F. Walter, Louisville, KY
W4OS, Henry A. Selby, Ormond Beach, FL
W4PF, Howard R. Miller, Miami, FL
WB4TRI, Edward L. Farmer, Tampa, FL
K4TT, John D. Bay, Hollywood, FL
W4ZRR, William R. Henegar, Jr., Virginia Beach, VA
W5AG, William Schmitz, Carrollton, TX
K5CBG, Jesse W. Hines, Cache, OK
W5CZB, Jerry J. Soukup, Mountain Park, OK
W5DJW, Lewis B. Wimberly, Borger, TX
WB5ELS, James F. Wright, Throckmorton, TX
K5EOE, Walter A. Mickle, Jr., New Orleans, LA
W5FSR, Gladys M. McCrary, Brownwood, TX
W5IYG, Myron D. Bentley, Maplewood, LA
W5TBN, Leonard E. Wyrick, Idabel, OK
KH6AX, Freeman Lang, Honolulu, HI
EX-W6DFJ, Walter M. Hicks, Bakersfield, CA
W6GNS, Robert G. Gemmel, Ontario, CA
EX-W6KBD/Ex-K7GOM, Arthur B. McBride, LaHabra, CA
K6LL, Leonard C. Tate, Lakewood, CA
KH6LM, Glenn Ramey, Honolulu, HI
WA6MDX, Kenneth E. Royer, Santa Barbara, CA
W6MYO, Fred T. Gember, San Leandro, CA
W6NRR, Richard W. Gorom, Gardena, CA
K6QKG, A. B. "Jack" Jackson, San Diego, CA
WA6RDG, Andrew W. Carey, Sonoma, CA
W6SPI, Clarence F. Feldman, Pasadena, CA
W6TTS, Eugene S. Darlington, Albany, CA
WN7CQY, Kenneth L. Brule, Puyallup, WA
W7GEK, Charles V. Lovett, Hoquiam, WA
W7KFR, Leland C. Hahn, Darby, MT
W7MSD, Kenneth G. Randahl, Central Point, OR
WA7OOJ, Donald C. Wright, Yuma, AZ
W7OYO, William A. O'Neill, Seattle, WA
W7SLC, Erwis Isgitt, Salt Lake City, UT
W7TMO, Charles W. Jacobson, Las Vegas, NV
EX-8ADT, Howard V. Mills, Fremont, OH
Ex-KN8AII, Fred W. Fischer, Ruskin, FL
W8AU, Eldridge J. Dickerson, Muskegon, MI
WB8DJY, Louis F. Davis, Detroit, MI
K8EAT, Erwin M. Datz, Hinton, WV
Ex-W8EOT, Martin L. V. Merchant, Ilion, NY
W8GF, Robert M. Carter, Grandville, MI
W8JGV, Maynard J. Moynahan, Munising, MI
W8KKW, James A. Eberhart, Cincinnati, OH
W8KRU, Frederick A. Schade, Bridgeport, OH
W8RPM, George C. Prescott, Detroit, MI
WN8VXL, Robert S. Fain, Massillon, OH
WA8ZON, Gary J. Nolan, Southfield, MI
W9AFF, Albert T. Frier, Mauston, WI
Ex-W9BDV, Peter Clark, Lombard, IL
WB9CFN, John L. Ritzinger, Chippewa Falls, MI
W9DDI, Matthew R. Weirich, Aurora, IL
WB9EBY, Raymond H. Johnson, Rockford, IL
W9GUJ, Robert F. Stricker, Freeport, IL
W9HGQ, Arthur A. Johnson, Rockford, IL
W9HUH, Dr. Ralph R. Seidl, Park Ridge, IL
W9IMQ, William H. Juhre, DePere, WI
W9KDV, When G. Hochstetler, Martinsville, IN
W9NSQ, Clarence L. Wilson, Caledonia, WI
W9WUT, James C. Chapel, Kenosha, WI
WA9ZOT, Wallace E. Brainard, Vista, CA
KØSPQ, George H. Ratcliff, Pueblo, CO
WØUXN, William R. Tucker, Pueblo, CO
VE6AMV, Gerald K. Shook, Edmonton, AB
VE6EB, Lloyd L. Marcy, Brooks, AB
VE7AJ, Isaac Glover, Rossland, BC
VK3OG, G. S. Samways, Mt. Eliza, Australia
VK5CE, Alfred R. McRitchie, Whyalla, S. Australia
G6TA, C. Douglas Abbott, London, England
G8PL, L. A. Kippin, Lincolnshire, England

Strays

STOLEN EQUIPMENT

□ 22 Motorola Motrac Model U54HHT-3100 with the following serial numbers were taken from trucks on Feb. 7 or 8: G26398, A01710, G26400, A01733, A01720, A01727, A01716, A01735, A01718, A01730, A01731, A01707, K22114, A01722, A01724, A01729, H29851, A01726, G12473, A01714, G26399, G26401. American Builders Supply Company, 1044 East Chestnut Street, Louisville, KY 40204.

□ GTX-10, Serial No. 13-56; Drake AC-3; Drake MS-4 with AC-3, stolen at High Point Howard Johnson's motel on Nov. 10. Wolcott M. Smith, 212 Locust Street, Vienna, VA 22180.

Operating News

Conducted by George Hart,* W1NJM

Operator Training

Now, wait a minute. Isn't training supposed to be in another department, now? Maybe so, but operating belongs in this department, and that's what we're going to talk about – what kind of operating provides the best training to produce the highest skills in operator proficiency. This isn't something you pick up in a classroom or out of books. Operator skill is something you acquire by operating, spending time at it, hacking away at an operating pursuit that requires you, for whatever reason, to constantly improve yourself. Through the many decades of amateur history, the argument has raged: What kind of operating produces the best operators?

Our kind, say the contesters. There is nothing so sharpening of operating skills as the zest of competition. In the fray of a contest one must dig out signals buried under inconceivable QRM, brain-scrambling to the uninitiated. In the cw competition, speeds run high, resulting in higher code proficiency. The young veterans with their already-sharp reflexes become even sharper. The old timers set the example and pace. Others merely catch the fever, rise to the challenge. The adrenalin flows. Yes, contest operating is a skill-builder, no doubt about it.

But we do something really worthwhile, say the traffic net operators, and provide operator training at the same time. In a traffic net, one learns discipline and procedure and efficiency and experiences a high degree of self satisfaction at the same time. A public service is provided and public relations are achieved through contact in originating and delivering messages. How can you beat that for training value, or just plain value?

All that is just a lot of fooling around, say the emergency organizers. Operating in a communications emergency is what it's all about, and if you aren't trained to do that, all your experience in other kinds of operating isn't worth a nickel. So the best kind of operator training is to be found in emergency preparedness nets and drills – in the AREC, RACES and independent emergency preparedness organizations. Let's stop playing games and get down to business.

Don't overlook DXing as a skill-builder, remind the DX hounds. Snagging the rare one out of a pileup is an operating skill all its own, with an application to many other kinds of operating. Stalking DX requires sharpness in detecting weak signals, knowledge of propagation, and more technical skill than you might think. This is all a part of operating skill; you can't get away from it. It isn't just a matter of being able to wiggle a key or use prosigns. Besides, it promotes international good will. Competition? Name an amateur activity more competitive than DXCC.

In the direst emergency, we're all going to be working for the military; everybody knows that. Therefore, the thing to do is get training in military operating. Those who don't have it will be useless when the ultimate balloon goes up. And the place to get this is in the MARS programs.

RTTY can do it all, say the RTTY enthusiasts. It takes little more bandwidth than cw, not so much as voice, and equipment is readily available. If we'd all go RTTY, we would have it made insofar as reliable communication is concerned.

"Where do we come in?" asks the Novice contingent. Operator training begins in the Novice segments, and therefore the Novice nets are of paramount importance in creating skilled operators. You have to crawl before you can walk, and it's important to get started on the right foot; therefore, more attention should be devoted to Novice training.

Phooey and balderdash, say the casual rag-chewers. All you people are trying to make work out of a hobby. None of it is really necessary. Gaining operating skill comes naturally once you get on the air, and then it can be quickly and easily applied to any situation. Meanwhile, let's stop all the pressure and enjoy ourselves. Life is so short.

Space communication is the coming thing, say the Oscar enthusiasts. Once we get satellites at the proper configurations operating the way we want them, communication at all distances is going to be possible on vhf and above. But special operating skills are required, and we'd better start acquiring them. Some day it may be all we have.

And so the debate goes 'round and 'round. Which kind of operating provides the best operator training depends in part on what kind of operating you are talking about. In general, however, the inevitable conclusion has to be that all kinds of operating experience provide training, and the "best" operator is the one who has experienced the most different kinds – the versatile operator. He may not be the best cw operator, or the best phone operator, or the best contester, or the best DXer, but he will be comfortable in any of these operating pursuits, and therefore he will be the best *all-around* operator. Let each shine in his own specialty. We'll nominate the all-around operator for the highest award of all.

W1AW OPERATING SCHEDULE

Operating-visiting hours are Monday through Friday 1 P.M. to 1 A.M., Saturday 7 P.M. to 1 A.M. and Sunday 3 P.M. to 11 P.M. (all local Eastern time). The station address is 225 Main St., Newington, CT 06111 (about 7 miles south of Hartford). Maps with local street details and the general contact schedule are available upon request. All frequencies shown are approximate. If you wish to operate, you must have your original operator's license with you. Please note that the station will be closed May 31. *Staff*: Chief Operator/ARRL Asst. Communications Mgr. C. R. Bender, W1WPR; Alan Bloom, WA3JSU; Chris Schenck, WB2SEZ.

Code Practice

Approximate frequencies: 1.805 3.58 7.08 14.08 21.08 28.08 50.08 and 145.588 MHz. For practice purposes the order of words in each line may be reversed during the 5-13 wpm transmissions. Each tape carries checking references. Details on Qualifying Runs appear monthly in *QST* Operating News. The 0130Z practice is omitted four times a year on designated nights when Frequency Measuring Tests are sent in this period.

Speeds	*EDST*	*UTC*
5-7½-10-13-20-25		
	9 A.M. MWF	1300Z MWF
	9:30 P.M. TThSSu	0130Z MWFS
10-13-15	4 P.M. M-F	2000Z M-F
	7:30 P.M. Dy	2330Z Dy
35-30-25-20-15		
	9:30 P.M. MWF	0130Z TThS
	9 A.M. TTh	1300Z TTh

To improve your fist by sending in step with W1AW (but not over the air!) and to allow checking the accuracy of your copy on certain tapes, note the UTC dates and *QST* text to be sent in the 0130Z practice from the March issue of *QST*.

5/3	It Seems to Us	5/25	Public Service
5/6	Correspondence	5/28	World Above
5/14	League Lines	6/2	YL News

Bulletins

Columns indicate times in EDST-PDST-UTC(Z).

Phone Bulletins (1.82 3.99 7.29 14.29 21.39 28.59 50.19 145.588 MHz):

2100 Dy	1800 Dy	0100Z Dy
2330 M-S	2030 M-S	0330Z T-Su

CW Bulletins at 18 wpm (1.805 3.58 7.08 14.08 21.08 28.08 50.08 145.588 MHz):

1630 M-F	1330 M-F	2030Z M-F
2000 Dy	1700 Dy	0000Z Dy

CW Bulletins at 10 wpm (same frequencies as above):

0000 M-S	2100 M-S	0400Z T-Su

RTTY Bulletins at 170 Hz shift are repeated at 850 Hz shift when time permits (3.625 7.095 14.095 21.095 28.095 MHz):

1730 M-F	1430 M-F	2130Z M-F
2300 M-S	2000 M-S	0300Z T-Su

Oscar Bulletins (18 wpm on cw frequencies):

0840 M-F	0540 M-F	1240Z M-F
1400 M-F	1100 M-F	1800Z M-F
1600 Su	1300 Su	2000Z Su

Oscar RTTY:

1700 Su	1400 Su	2100Z Su

In a communications emergency monitor W1AW for special bulletins as follows (times in UTC):

Phone: On the hour.
RTTY: At 15 minutes past the hour.
CW: On the half hour.

*Communications Manager, ARRL

Operating Events

MAY

1-2: Ten-Ten QSO Party, Massachusetts Bicentennial QSO Party, Connecticut QSO Party, p. 62 April.

5: West Coast Qualifying Run, W6OWP prime, W6ZRJ alternate, 10-35 wpm at 0400Z (Universal Coordinated Time, abbreviated UTC; Z used as a designator), on 3590/7090 kHz. This is 2100 PDST the night of May 4. Please note that dates are always shown at least 2 months in advance and times are always the same local "clock time," i.e. 9 P.M. local Pacific time. Underline one minute of the highest speed copied, certify copy made without aid, and send to ARRL for grading. Please include your full name, call (if any) and complete mailing address. A legal size stamped address envelope will help to expedite your award.

8: Frequency Measuring Test, open to all, p. 62 April.

8-9: Bermuda Contest, cw, p. 71 March. **Maine Bicentennial QSO Party,** p. 62 April.

8-10: Georgia QSO Party, Vermont QSO Party, p. 62 April.

11: WIAW Qualifying Run, 10-25 wpm at 0130 UTC transmitted simultaneously on 1.805 3.58 7.08 14.08 21.08 28.08 50.08 and 145.588 MHz. This is 2130 EDST (9:30 P.M. local Eastern time) the night of May 10. Underline one minute of top speed copied, certify copy made without aid, and send to ARRL for grading. Please include your full name, call (if any), complete mailing address (and an s.a.s.e.!).

14-16: YL International SSBers QSO Party, p. 62 April.

15: Armed Forces Day, this issue. **World Telecommunication Day Contest,** phone, p. 62 April.

15-17: Michigan QSO Party, p. 62 April.

22: World Telecommunication Day Contest, cw, p. 62 April.

22-23: New York State QSO Party, p. 62 April.

23-24: Wisconsin State QSO Party, sponsored by the Neenah-Menasha Amateur Radio Club. Phone and cw are considered separate bands. The same station may be worked on each band and mode and WI amateurs may work in-state stations for QSO and multiplier credit. Exchange RS(T) and QTH (county for WI participants, ARRL section or country for others). Scoring: U.S. and VE contacts count 1 point, DX counts 3 points. WI amateurs multiply total QSOs by the no. of ARRL sections contacted (max. of 74), KP4, KH6, KL7, KZ5 count both as a 3-point QSO and a section multiplier. Out-of-state stations multiply WI QSOs by the WI counties worked (maximum of 72). Suggested freqs.: 1810 3550 3735 3900 7050 7135 7235 14050 14280 21050 21135 21300 28050 28600 50-50.5 144-146. Awards. When logging, indicate each multiplier the first time it is worked. Include a summary and usual info. Logs must be received no later than June 15 (DX logs July 1): Send to the club, c/o Mark Michel W9PJT, 700 Kinzie Court, Menasha, WI 54952. **Nostalgia Radio Exchange,** sponsored by the Southeast Amateur Radio Club, K8EMY, Cleveland, Ohio, open to all. Object is to restore, operate, and enjoy older equipment with like-minded hams. A nostalgia radio is any equipment built since 1945 but at least ten years old – an advantage, but not required in the exchange. NX period is 1800 UTC Sun. May 23 to 0100 UTC Mon. May 24. Exchange your name, RST, state-province/foreign country, transmitter type (homebrew send p.a. tube, i.e. "807"), and other interesting pleasantries. The same station may be worked on each mode on each band. No a-m phone below 21 MHz. Cw call CQ NX, phone call CQ Exchange. Non-contestants may be worked. Suggested frequencies: cw up 70 kHz from the low band edges; phone, 3910 7280 14280 21380 28580; Novice, 3720 7120 21120 28120. To score, add the numbers of different transmitters, states-provinces/foreign countries for each band. Multiply by the total no. of QSOs (non-contestant QSOs count one, NX QSOs count three). Multiply that total by the Nostalgia multiplier: Total years of your transmitter and receiver (if transceiver, multiply years by 2). Different equipment combinations may be used: Figure scores separately for each and combine for total score. Certificates are not awarded for the highest score – rather for unusual and ingenious experiences, circumstances, achievements, etc. Send logs, comments, pictures, anecdotes, etc. to W8KAJ, 2386 Queeston Road, Cleveland Heights, OH 44118. **CQ-M Contest,** sponsored by the Radio Sports Federation of the USSR, from 2100Z Sat. to 2100Z Sunday, 80-10 meters; cw and ssb (crossmode contacts not valid). Call CQ-M. Categories: single op. single band, single op. multiband, multi-multi. Exchange RS(T) and serial contact no. The Soviet stations will transmit RD(T) plus number region (oblast). The same station may be worked only once on each band during the contest irrespective of the mode. Contacts between stations in the same continent count 2 points; contacts between stations on different continents count 5 points. Contacts between Soviet stations count only one point, irrespective of the continent. Contacts between stations in the same country count only for multipliers (not for QS points). Each country counts as a new multiplier per band. Total multiplier is the sum from all bands. Awards plus special notation for those working more than 50 Soviet stations during the CQ-M period. If your log confirms the conditions of the popular USSR awards (R-150-S, R-100-0, W-100-U, R-15-R, R-10-R and R-6-K) certificates will be issued upon request. The committee requests all those participating to mail no later than July 1 to the Krenkel Central Radio Club of the USSR, CQ-M Contest Committee, P. O. Box 88, Moscow, USSR. CQ-M!

JUNE

2: West Coast Qualifying Run.

5-6: Minnesota QSO Party, sponsored by the Heartland Amateur Radio Club from 0001Z June 5 to 0500Z June 6. (Remember, this starts the *evening* of the 4th, local time.) No restrictions as to mode or operating time: 160-2 meters (repeater contacts not allowed). Only one transmitter permitted in operation at one time, no crossband. Suggested freqs.: phone, 1850 3950 7235 14330 21365 28525 51000 (and 2-meter simplex); cw, 1810 3535 7035 14035 21035 28035 50050 and 144050; Novice, 3725 7125 21125 28125. Exchange: MN stations send RS(T) and county; others send RDS(T) and ARRL section; send DXCC country. Score one point per QSO; Novice QSOs worth 3 points. MN stations multiply points by no. of sections and DX countries (USA and Canada excluded). Others multiply points by no. of MN counties QSOd (maximum 87). Stations using 250 watts or less multiply final score by 1.5. Phone and cw are separate contests and must be scored as such. Stations making 50 or more QSOs must include a check sheet for each band and mode used. Logs must include date, time (Z), band, mode, exchange. Usual disqualification criteria. Logs must be postmarked by July 2 and received by July 9 to be eligible for awards. A special events station is planned (call unknown at this writing). Contacts will be worth 5 points for each QSO on separate bands/modes. Please do not interfere with nets/traffic sessions. Awards. Mail to: HARC, c/o WBØMAO, Steven J. Gardner, Box 261, Staples, MN 56479. Please include rig description and your s.a.s.e. **SOWP Bicentennial CW QSO Party,** sponsored by the Society of Wireless Pioneers (SWOP), from 1200Z June 5 through 2400Z June 6. All stations will exchange signal reports, QTH (city and state or country) and SOWP membership numbers. Suggested frequencies are 55 kHz up from the low end of each band. Members with Novice licenses should use the mid-frequency of each Novice band. Call CQ SOWP. A special certificate to members who contact at least 10 member stations. Members desiring a certificate should submit their list of contacts, showing calls of stations worked and SOWP membership numbers. Mail entries by June 15 to Bill Willmot, K4JPF, V.P.-P.R., 1630 Venus St., Marritt Island, FL 32952.

12-13: VHF QSO Party, rules this issue. Note the special rule change concerning fm operation in League Lines this issue!

12-14: West Virginia QSO Party, sponsored by the WV State Radio Council, from 0100Z June 12 to 0059Z June 14. No time limits. The same station may be worked on different bands for additional points. Only one contact per station per band for scoring. Exchange QSO no., report and county (if in WV), state or country. WV stations may work each other. Non-WV stations multiply eligible WV QSOs by no. of different WV counties worked. This total multiplied by 1.5 if dc input 200 watts or less (only multiplier). WV stations multiply eligible QSOs by sum of different WV counties, states, and countries worked. Then apply foregoing power multiplier. To be eligible for an award, a station may have only one unassisted operator. Suggested operating frequencies are 35 kHz inside each cw band and 10 kHz inside the general portion of each phone band. Awards. Logs must be received no later than July 17 and include date/time, QSO numbers, calls, reports, and county, state, or country of station worked, mode, bands. Send to WV QSO Party, Box 299, Dunbar WV 25064

15: WIAW Qualifying run (plus 40 wpm!).

23: WIAW Morning Qualifying Run.

26-27: FIELD DAY, rules this issue.

JULY

1: British Virgin Islands QSO Party.

3: Straight Key Night.

3-4: VHF Space Net Roundup.

6: West Coast Qualifying Run.

14: WIAW Qualifying Run.

17-18: Independence of Colombia Contest.

17-19: CW County Hunters Contest.

24-25: The ARRL Bicentennial Celebration (rules, p. 45 March.).

SEPTEMBER

11-12: VHF QSO Party (note this is a date change).

NOVEMBER

6-7: Sweepstakes, cw.

20-21: Sweepstakes, phone.

Strays

NEW A-1 OPERATORS

W2YS WB2EDW K5MAT W5ZWX W6JTG WB8ITT WB9OMX WB9TKR WBØEJJ VE6AMM VE6OB VE6WV I3CRW I5IZ IØZS ISØAEW ON4GK VP9BK

1975 160-METER CONTEST HIGH-CLAIMED SCORES (W/VE ONLY)

K1PBW 101,136, W8LRL 90,470, W3IN 89,343, W3GM (W3JSX, opr.) 85,092, WA8IJI 83,360, WA9MCC/9 81,822, K4PUZ 77,996, K8CCV/8 76,226, WA9BWY 71,188, WB9RFN 63,261. *Multi-Operator*: WA2SPL 90,320.

5-BAND WAS AWARD

(Updating the February, 1976, listing, starting with number 234) K4GRD W6OKX WØPRY W4CZU W5OB WB4ASV W3RFL W5CPI W1SP K2SHZ WB6ZVC.

Station Activities

SCM ≤ AREC ≤ ORS ≤ OVS ≤ SEC ≤ OBS ≤ TCC ≤ OO ≤ NTS ≤ WAC ≤

CP ≤ A-1 OPR ≤ EC ≤ DXCC ≤ CLUBS ≤ RM ≤ OPS ≤ RCC ≤ PAM ≤ WAS

CANADIAN DIVISION

ALBERTA: SCM, Don Sutherland, VE6FK — Asst. SCM: John Wilkinson, VE6ALR. SEC: VE6XC. OPSs: VE6VS VE6ASL VE6AXH VE6FS. OOs: VE6MJ VE6XO VE6TY. OBS: VE6MJ. OVSs: VE6MX VE6FM. I regret to report VE6AUL and VE6AXV as Silent Keys. Congrats to VE6XO on his OO appointment. Quite a number of VE6s helped in communications during the Guatemala Quake. VE6XC planning a traffic education tour of Alberta. Surprisingly few VE6s are familiar with written message traffic and proper methods of routing. ARRL pamphlet Operating an Amateur Radio Station deals thoroughly with this. PAM VE6AFO pleased that APSN is able to continue through the trying long-skip condition and wishes to thank the many VE7s and VE5s who have assisted. Traffic: VE6FK 141, VE6FS 76, VE6AMM 22, VE6XC 22, VE6AVV 15, VE6AAT 12, VE6CE 4, VE6WN 4, VE6FU 4, VE6AFW 3, VE6BBU 3, VE6YW 3.

BRITISH COLUMBIA: SCM, H. E. Savage, VE7FB — BCENet 3650 kHz meets 0300Z each night, RM VE7CDF, Net Mgr. VE7DFY. VE7HQ has been appointed ORS/OPS/OBS/OO. The big tower you see in Burnaby is VE7LL. our Asst. Vice Director. The maker of the tower is VE7KL and he will make you one. British Columbia's QCWA are progressing favorable for their own Chapter. I am pleased to hear quite a bit of chate because I missed a month's report to QST. Traffic: VE7CDF 116, VE7ZK 105, VE7DFY 44, VE7BLO 22, VE7FB 8.

MANITOBA: SCM, Steve Fink, VE4FQ — Members of WARC provided communications for the St. John's School Snow Shoe race in Selkirk Feb. 28. Band conditions on the 80/75 have been their worst in months with resultant low QNI and traffic. VE4UL passed his Advanced. The 1976 executive of the Winnipeg Repeater Society: VE4LU, pres.; VE4FQ, vice-pres.; VE4FH, secy.; VE4QS, treas.; VE4RE, tech. chmn.; VE4NI, past pres. MTN mgr. VE4PG has suspended the late session for the summer months. Plan now for Field Day June 26-27. MTN(3660 kHz at 1830 CDST): 47 sessions, 233 QNI, 104 QTC in 847 minutes. MEPN (3765 kHz at 1900 CDST): 29 sessions, 757 QNI, 2 QTC. Traffic: VE4PG 120, VE4UL 81, VE4OW 24, VE4XP 23, VE4UM 10, VE4FQ 6, VE4JA 5, VE4LU 4, VE4RO 3, VE4AP 3.

MARITIME: SCM, Aaron D. Solomon, VE1OC — Asst. SCM: Maurice Gladden, VO1FG. SEC: VE1ACA. RM and APN Mgr.: VE1AAO. It is with deep regret to report VE1GK VE1AQS and WI1SZB/VE1 as Silent Keys. Recent hospitalizations include VE1MA VE1NZ and VE1RA. Groundhog '76 worst wind storm SW Nova Scotia and New Brunswick in 100 years, saw VE1UN and VE1XG set up EMO net to handle emergency traffic. Net in operation over 24 hours and over 40 VE1 VE2 and VE3s assisting. SCONRA and HARC went all out to host W1ICP as guest speaker. VE1AZX and VE1FQ passed Guatemala health and welfare traffic. Make reservations now for ARRL Convention, Halifax, N.S. Aug. 20-22, 1976. Following stations reported antenna and tower damage in recent storm VE1PV VE1AGU VE1AI VE1FQ VE1XG VE1AAO VE1ATG. VE1KG worked 1U2EF via Oscar satellite. 1st. African/Canadian Oscar contact. Congrats. VO1LU awarded Pippy Memorial Award for outstanding Newfoundland handicapped citizen of 1975. Congrats. St. John's repeater, VO1GT has all new equipment. Very active white canary in VO1 are VO1FF VO1MD VO1LU. VO1CC runs Swap Shop 2200Z Sun. 3785 kHz. Traffic: (Feb.) VE1AAO 86, VE1BDT 46, VE1RO 23, VO1GW 22, VE1AMR 15, VE1OC 10, VE0NEB 4. (Jan.) VE1AMN 18.

ONTARIO: SCM, Holland H. Shepherd, VE3DV — Asst. SCM: N. Nimmons, VE3GOL. New Canadian Vice-Director, ARRL, VE3AR introduced guest speaker Lew McCoy, W1ICP at recent Scarborough ARC meeting. A fine speaker, Lew's talk on new concepts in Quad antenna patterns; division and allocation of frequencies with a view to the future, plus CB/licensed hams etc., was enjoyed by the large audience in attendance. Toronto Metro ARC and SARC joined forces and presented a unique give-away of 352 pieces of donated, used, VHF mobile gear. Metro club members continue their fine work with the handicapped at Sunnybrook and Riverdale hospitals. Oakville Extendicare hospital on the air with newly built FT K Multi 7 fm rig. Ken Cross and Al Lucas operating the station: VE3XSC. VE3FRG is the man behind the scenes here. Congrats to all and good luck with your HF gear project. The writer enjoyed a 2-meter QSO with VE3BVU during his hospital stay. Chuck was using his TR22C, running one watt into a 5/8 whip antenna. VE3GXM patched Chuck thru to his friends on the Oatmeal Net (3.782 kHz) at 6 A.M. local. VE3EKQ is leading 25 people thru her current code and theory class. Good luck to all. Congrats to VE3GT who just became a member of the Old Timers Club. VE3ECV, acting asst. PAM of NWOPN during VE3AYZ's six week sojourn to AZ. We extend our sympathy to the family and friends of Bill Allen, former VE3XY who became a Silent Key, Feb. 13. After watching the operation of the MK II QSK unit, now no longer manufactured, VE3GFN holed up in his lab and produced his own highly successful QSK vacuum relay. New presidents in office: VE3CRX Ottawa ARC; VE3ARV Toronto FM Communications Society. 55 mobile units and 5 base stations effectively coordinated Amateur Radio communications during recent Winter Car Rally. 2-meter fm, mainly simplex channels, supplied coverage of the 950 mile route. 35 Hams assisted organizer VE3CRX in the annual Canadian Ski Marathon. 3,000 skiers' progress data was transmitted on RTTY. 30 VHF/UHF rigs were manned during the two day event with 200 formal and 200 informal messages handled during 34 hours of net time logged. The use of RTTY this year proved to be highly successful. Amateur Radio received publicity during the Guatemala disaster when the activities of VE3GW were reported in the London Free Press; VE3FQZ in the Brampton Daily Times. VE3CJG and HBR have joined the Fast-Scan TV experimenters of the Quinte ARC. Traffic: (Feb.) VE3GOL 400, VE3SB 219, VE3FQZ 217, VE3DPO 160, VE3GJG 153, VE3GFN 128, VE3FRG 88, VE3GT 84, VE3AWE 77, VE3EWD 71, VE3GCE 64, VE3HJA 58, VE3CYR 56, VE3BZB 53, VE3HGJ 27, VE3CDK 26, VE3ATR 25, VE3GNW 25, VE3FGV 20, VE3EBC 18. (Jan.) VE3FHQ 18, VE3DZK 7.

QUEBEC: SCM, Larry Dobby, VE2YU — K2HI/VE2 and VE2WT appointed as ORSs. Both of these gentlemen have been giving their strong support to the Que. Section Net on 3545 nightly at 7 PM. VE2BPT informs me of the Canadian QRQ Club recently formed. Class A is 80 wpm and Class B is 70 wpm! Please contact Noel for more details. The gang at RASO still hard at work preparing for the Olympics. Conditions on the LF bands have been anything but great yet the BERU saw a number of stalwarts hanging in there VE2WA VE2WW VE2AYY VE2LY. Sure hope conditions improve during the spring. VE2DKK and VE2QO already hard at work on FD for Westminster Club. Congrats to VE2BEN newly elected pres. at VE2RM. (Hope the mop is not used too often Ian.) There are plans to reactivate the operation from Rigaud for the June/Sept. VHF contest. Hope it is a big success. Traffic: K2HI/VE2 97, VE2CTA 62, VE2DRC 43, VE2BP 38, VE2APT 34, VE2WT 30, VE2UY 26, VE2EC 24.

SASKATCHEWAN: SCM, P. A. Crosthwaite, VE5RP — With the availability of equipment I think the time is long over due and all amateurs should own and use a Dummy Load. We have used antennas long enough for a loading device. Help us eliminate QRM on the Net frequencies. Amateur radio has a lot going for its hobbyist with the development of the computer. Yes, you can build your own computer to rotate your antenna for satellite tracking plus many other fine things. Remember your month end traffic count, we don't want to miss anyone. Traffic: VE5NJ 14, VE5RP 8, VE5XY 3, VE5HE 2, VE5SM 2m VE5KS 1.

ATLANTIC DIVISION

DELAWARE: SCM, Roger E. Cole, W3DKX — SEC: K3KAJ. PAM: WA3DUM. RM: W3EEB. PSHR: WA3DUM 49, AD3YHR 49, K3KAJ 44, WA3WPY 44. AA3GAY scored less than 1 part-per-million error in the latest FMT. BI-Cen WAS No. 16 to K3HBP and No. 49 to WA3PCC. New Delmarva ARC officers: WA3VPJ pres.; W3TBG, vice-pres.; KJ4KAJ, secy-treas. AD3YHR and WA3WUL were among DE Amateurs active in handling Guatemala Emergency traffic. WA3GSM's 400-ft. tower, the tallest structure in Sussex Co., supports antennas for ham activities as well as his commercial pager-radio phone service. Top State winners in the DE QSO Party were WN1UYU, YT 325; W1TEE CT 225; WA2VYA, NJ; WA3KFT PA; WB4AJA KY; WB8TNC MI; JA2HLX had 25 pts. DE winners by county were K3YHR WA3UUN and WN3WIY/3. DTN: QNI 345, QTC 75, DEPN: QNI 65, QTC 12. Traffic: K3KAJ 80, WA3DUM 77, WA3WPY 76, AD3YHR 60, W3EEB 49, W3DKX 37, WA3UUN 17, AA3GAY 16, W3WD 9, W3HGA 6, W3YAH 5, AA3GSM 2, WA3WIY 1.

EASTERN PENNSYLVANIA: SCM, George S. Van Dyke, Jr., W3HK — SEC: W3FBF. PAMs: WA3PZO W3AVJ. RMs: W3EML K3MVO WA3PHQ WA3OGM WB2FWW/3. Net reports: EPA QNI 228, QTC 119; PTTN QNI 169, QTC 43; PEN QNI 505, QTC 409. BPLs: W3COL W3VR K3NSN WA3UKZ WA3ATQ WA3THT. PSHR: W3IPX WA3UKZ WA3OGM WB2FWW/3 WA3PHQ K3OIO. OVS reports from WA3KFT W3VOI W3GOA K3TRM. OBSs WA3KFT W3AVJ WA3PHQ W3ID. OOs K3RDT W3KEK W3NNC K3OIO K3FBA W3KCM. W3CUL and W3VR heavy in disaster traffic. WA3THT tried to raise his output by moving rig to second floor. WA3OGM reports EPA doing better as condx improve. WA3ATQ away on convention. W3EML reports condx have to get much better and stay for awhile to get traffic up. Reading repeater now operational. Reading ARC breaking down barriers and getting good PR for Ham Radio. W3ID reports RTTY boys like to sit on EPA freq. at net time. Guess net will have to QSY a bit if they won't. W3ID reports hearing tactical stations on 80. Not much we can do about that either! WA3MVP has new antenna and it works! W3AXA quiet due to wedding plans for his daughter. AA3QLG back at school. W3VOI found bugs in his rig now getting out OK. Hazleton hopes to have their repeater on by Apr. New officers RF Hill ARC: WA3LNM, pres. W3RUR, vice-pres.; W3DYE, secy.; WA3YLQ, treas. WA3QNC just graduated 18 new novices. Now he has a new class with 35 in it, many CBers. K3AWY spent his vacation treating the injured in Guatemala! The Conestoga river gave the local boys a chance to work together. WR3ACE and 35 members coordinated all activities with a wall done from Civil Defense Director. Note to NCS stations: Try to spread traffic around to members. While regular outlets are a good deal we gotta give the new members a hand or they will leave us. Again some reports are late, mark the calendar. Traffic: (Feb.) W3CUL 3132, K3NSN 1000, W3VR 926, WA3UKZ 517, WA3THT 319, WA3OGM 278, WA3ATQ 231, W3EML 139, WB2FWW/3 116, W3IPX 113, K3MVO 90, W3WRE 75, K3OIO 65, WA3VUE 61, K3BFA 46, W3AVJ 26, WA3QYY 23, K3GTL 22, K3BHU 21, W3BUR 19, WA3PHQ 19, W3ID 18, WA3REY 16, W3ADE 15, WA3MVP 10, WA3YMV 10, W3AXA 9, WA3VDQ 8, W3HK 5, K3HXS 5, WA3ZRE 4, AA3QLG 2, K3TRM 2, W3KEK 1, W3VOI 1, W3GOA 1, W3EU 1, W3KCM 1, WA3TMA 1, W3LC 1, WA3BSV 1, WA3BJQ 1. (Jan.) K3OIO 113, W3KEK 1.

MARYLAND — DISTRICT OF COLUMBIA: SCM, Karl R. Medrow, W3FA — RM MDD W3FZV 3643 kHz at 7 and 10 PM local time daily. PAM MDCTN WA3EOP 3920 at 6 PM TTSS. NCM MEPN W3LDD 3920 at 6 PM MWF and SS at 1 PM. WR PON W3DFW 3905 at 5:15 PM daily. WA1VMV/3 made 33 PSHR

points for Feb. With the nets it's sessions/Tfc/QNI avg. MDD 59/163/8.1. MDCTN 17/46/17.4. MEPN 21/60/25.0. WR PON 12/36/18.9. The MEPN toppers were W3ADQ and W3DKX. MDD Top Brass WA3WPY W3FA and W3FZV. MDCTN top honors to WA3ZEE WA1VMV/3 and WA3EOP. AC8BZY/3 and AA3QIA are giving the bicentennial prefix a good workout. W3CVE leads with TG9 traffic, and made it on local TV for good PR. WA3SJY did yeoman service for TG9, and was not too happy with contest QRM. WA3ZEE and WA3UYB are breathing new life into 3RND from MDC. Contact W3FZV for details on the MDD bulletin. WA3EOP works nights and keeps W3CWC active days. WA3UYF is awaiting power supply parts to complete that new amplifier. W3MWD and WA1VMV/3 are candidates for NCM for the MEPN. W3LDD's new goal, all counties mobile! WB3AJQ still gloating over that good performance in the CD party. WA3YKK operates with an indoor antenna. W3FCI sports all new Drake line. WA3PRW is busy lining up NM skeds for the summer Boy Scout campers. W3ZNW has the big rig back in operation. W3EBK and WA3JSZ make OO reports. EC reports have been received from WA3SWS WA3RSG W3HJH K3ORW W3FZV and WA3EOP. W3CDQ was in the QCWA parting having fun. W3ABC and WA3ZAS did duty at W3FA in the DX tests. W3BHE has pictures of the MEPN gang with one unknown! K3WAS at the Aberdeen Proving Ground is being reactivated by WN8RJE/3 WN5PWN/3 and WN3AJM. WA3THD says the District of Columbia is being slighted for the bicentennial. W3DFW and the WR PON cover all the way into FL with relative ease. W3CVE made BPL this month. WA3ELL vows to do likewise soon. WA3IHW is back from a winter FL vaction. Traffic: (Feb.) W3CVE 515, WA3SJY 213, WA1VMV/3 93, AC8BZY/3 89, WA3ZEE 87, W3FA 86, W3FZV 80, WA3EOP 71, WA3UYF 48, W3MWD 30, W3LDD 23, WB3AJQ 22, WA3YKK 21, AA3QIA 20, WA3UYB 17, W3FCI 10, WA3PRW 8, W3ZNW 4. (Jan.) WA3ZEE 107.

SOUTHERN NEW JERSEY: SCM, Charles E. Travers, W2YPZ — VHF activities have increased greatly as evidenced by impressive total score, submitted by SJRA; 179,584 with 35 stations taking part, reporting 25 sections. DVRA reports a Hamfest and Flea Market on Sun. May 2 at the Ewing Fire Co. on Pennington Rd., just south of the Trenton State College. WA2JZF working veyr hard with his committee in perfecting the operation of the repeater 07-67. Bob is station director and doing an excellent job. The NJSN continues to do well under the direction of WB2RMK who reports 31 sessions for Feb. with QNI of 140, QTC 40, QSP 33, percentage 83%. WB2VTT continues with excellent support on the NJPN reporting 29 sessions daily, 453 traffic/391 with 650 QNI. The Sun. sessions 5 with 64/57 traffic, 124 QNI. WB2LCV mgr. or NJN supplies the following activity — early sessions QNI 429, QTC 166/130; late sessions QNI 149, QTC 94/40 in 29 sessions. Stations desiring appointments please submit request on QSL card addressed to your SCM. Send certificates for endorsement now. Traffic: W2ZQ 407, WB2LCV 274, WB2LCC 38, WB2OSQ 14, WB2SFX 8, W2IU 5.

WESTERN NEW YORK: SCM, Richard M. Pitzeruse, K2KTK — SEC: WB2EDT. Don't forget the NY State ARRL Convention (Rochester hamfest to us old fogeys) to be held May 21-23 at Rochester. Details from RARA, Box 1388, Rochester, NY 14603. WA2DRC summarizes winter traffic efforts with one word — washout. Those miniscule sunspot numbers indeed are taking their toll. K2KWK continues to operate as OBS, sending ARRL and other code practice information as well as bulletins through Rochester repeaters on 28/88 and 19/79. Butetins are sent Sun. evenings at 8:45 P.M. local time. WA2AIV took a lightning hit and is now repairing the damage. New swap/shop taking place on the Syracuse 31/91 repeater Sun. at 6:30 P.M. local. WA2EAJ built an electronic digital clock in a few hours and was pleased to see it run first shot. WA2ICB busy with the nets, planting gardens, and laughing at K2KIR and K2KTK while the latter call CQ night after night on 2 cw. That is all the info I received this month. A new SCM will undoubtedly have taken office in May. Please give him all the support you can and be sure to supply him with info for this column. These columns are as interesting as you want to make them. Traffic: (Feb.) W2FR 194, W2MTA 170, WA2UYK 145, WB2VND 109, WB2VRJ 72, W2PZL 61, WA2UBW 58, WA2TPC 53, WA2ICB 46, W2RQF 37, WB2QIX 24, K2OFV 21, W2UYE 17, WA2ZDP 16, W2EAF 15, K2KTK 14, K2IMI 9, WA2EAJ 7, WA2AIV 6, WB2QDN 4, WA2DRC 2. (Jan.) WA2DRC 7.

WESTERN PENNSYLVANIA: SCM, Donald J. Myslewski, K3CHD — SEC: W3ZUH. Asst. SECs: K3SMB WA3LJW. PAM: K3ZNP. RMs: W2KAT/3 W3NEM W3LOS W3KUN. WPA CW Traffic Net meets daily on 3585 kHz at 7:00 PM local time. PA Phone Net meets Mon. thru Fri. on 3960 kHz at 5:00 PM local time. PA Traffic Training Net meets daily on 3610 kHz at 7:00 PM local time. Western PA RACES Net meets every Sun. on 3990.5 kHz at 9:00 AM local time. New appointment: WA3TPM as OO. WA3TMR received the Extra Class license and is employed at the National Radio Astronomy Observatory. The Crawford Amateur Radio Society is conducting a novice class. W3FVU upgraded to Advance Class. WA3UGW acquired a new Genave 2-meter fm rig. Get well wishes to K3MQW. If you are interested in 6-meter operation, check 50.150 MHz every Tue. at 7:30 PM in the Pittsburgh area. The South Hills Brass Pounders & Modulators set up an Amateur Radio display during community days in Baldwin, Brentwood and Whitehall. WA3ZNP received the General Class while WN3BGH is a new Novice. WA3SOQ is running a new GLB-414. Congrats to WA3YQP who passed the Extra Class exam and WN3AGZ who passed the Advanced Class. Cumberland Valley ARC handled communications during the local Cancer Drive. WA3WXR has been doing a good job in demonstrating Amateur Radio in school. Remember to submit your monthly report to me by the 5th of each month. A record session was set on Feb. 12, 1976 on the WPA CW Traffic Net during which 77 messages were dispatched by W3KUN (NCS) with K3CR WA3PXA W3UT and WA3VBM assisting. The WPA CW Traffic Net had 29 sessions in Feb., 353 stations checked in, and handled 316 messages. BPL K3CR. PSHR credits WA3VBM 46. Traffic: K3CR 704, WA3VBM 382, W3KAT/3 319, W3UT 226, K3MIY 82, K3CHD 61, K3HCT 34, K3SMB 32, W3KJN 31, W3SN 27, W3SAY 16, W3GQJ 15, W3ATQ 11, WA3AHP 9, W3YD 7, W3IDO 6, W3TTN 6, K3OYB 4, K3SJN 3, K3VQV 1.

CENTRAL DIVISION

ILLINOIS: SCM, Edmond A. Metzger, W9PRN —

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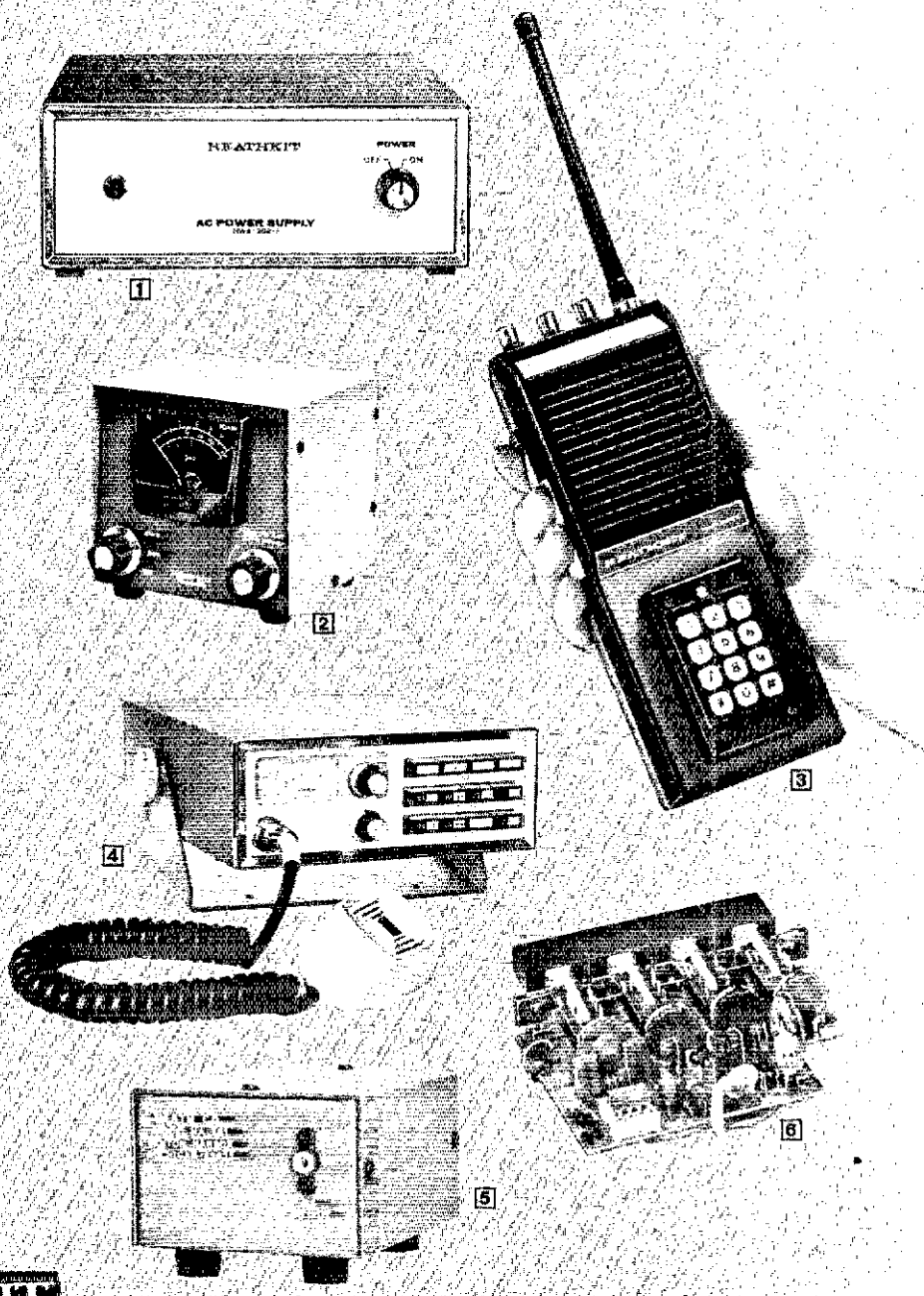

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NCPN — 3915	1800 M-S		573	181

This column's sympathy to the family and friends of K9DHZ who has joined the ranks of Silent Keys. The Sterling Rock Falls Amateur Radio Society's Hamfest was the largest ever and many an eyeball QSO was held. This was also true with the Wheaton Hamfest. W9LBQ WB9MKL WN9RZW and WB9MYN are new officers of LAMARS. WB9SMD has passed his Advanced. The Starved Rock Radio Club's annual Hamfest will be held Sun. June 6th at Princeton, IL and ARRL First Vice-President, Victor Clark, W4KFC will be guest of honor. WA9GBW and his XYL are proud parents of twin boys. WB9NMP WA9ZXT K9GOX WB9PJZ K9GNH WB9IPA WA9SHE WA9YET WA9JBD WA9SQK WB9LII K9IEY WB9JIO K9OXQ K9AHT K9LLW W9KH W9IRA WB9IHV WB9RAS WB9JIP WB9NMP K9SYB WA9VXX and W9ERI participated in a Telethon fund drive for Cerebral Palsy in an 18 county area in Southern IL. K9KMX operated as G5BPL from London for two weeks. He has just received his Advanced ticket. W9MCH received his Old Timers Club membership and is only 34 years young. The Egyptian Radio Club Hamfest is scheduled for Sun. June 13. Plan to attend the Central Division Convention in Milwaukee, WI on July 9 and 10 at the Red Carpet Inn. The newly elected officers of the SEIH are WA9SQK K9RZP WB9HPG and Earl Walters. Congratulations to WA9OBP and his XYL on the birth of their first child. An SSB Ragchew net is being inaugurated on 3890 at 1730Z Sun. mornings. Check in and get a roundtable started. Traffic: (Feb.) WA9VGW 371, W9NXG 199, WB9NOZ 175, WB9NVN 146, W9HOT 126, WA9OBP 118, WA9KFK 116, K9ZTV 115, WA9JJE 104, W9NJP 97, W9JXV 70, W9KR 67, W9LNQ 65, WA9AQN 58, W9QYL 52, K9KHI 40, WB9PHM 39, WB9NIO 29, AB9DED 22, AC9PRN 20, W9HPG 14, W9VEY 8. (Jan.) W9NXG 304.

INDIANA: SCM, M. P. Hunter, WA9EED — SEC: W9UMH. Congrats to WB9PIR for cw WAS. A note from WA1UZE requests that officers or members of college or university radio clubs contact him for a monthly column in Worldradio News. FWRC members are planning a club QSL with a picture of the old fort. WB9MDS had a good article on traffic handling in the FWRC Ham Splatter. WA9KWA advises he has a new S-line, Wilson 203, and DXCC. Conditions were not particularly good for the first DX Test weekend. Michiana ARC and St. Joseph Co. CD are co-sponsoring amateur radio courses which started Mar. 1. W9SWH was quite active with the Guatemalan relief traffic. Congrats to WB9OUX for his new DXCC (without the aid of a KW). I want to thank K9DCX for his hospitality at our recent eyeball. Tri State ARS announces its annual hamfest on May 16. Lake Co. ARC reports that its annual banquet was a huge success — my apologies for not being there. Ham of the Year was WB9KBV. Net traffic: ITN 484; AREC 12; Hoos. VHF 43; Marshall Co. 4. Traffic: W9ENU 209, W9QLW 145, W9IOH 96, K9DCX 92, WB9FOT 92, WB9KTR 92, W9HUF 80, WA9TJS 72, W9UMH 65, WB9IHR 65, K9TKE 59, WB9FTK 55, W9SWH 52, WA9OKK 36, AB9MDS 35, K9YBM 31, K9CBY 29, WB9KGR 29, WA9OHX 27, W9BUQ 25, WB9DIX 24, WB9NAQ 20, K9EQT 20, K9RWQ 20, W9MCJ 14, W9PMT 14, K9RPZ 14, W9OZW 13, W9LTU 12, W9JGE 11, WB9BPB 10, W9CMT 10, K9DIY 9, W9GGW 9, WB9GHS 9, K9JQY 9, WA9QCF 9, WA9HVP 7, K9RGF 7, WB9GHA 6, W9EGV 4, WB9HCH 4, K9HMC 4, W9YB 4, W9FWH 2.

WISCONSIN: SCM, Roy A. Pedersen, K9FHI — SEC: K9PKQ. PAMs: W9AYK WA9LRW K9UTQ. RMs: WB9ICH W9MFG K9LGU K9KSA. Nets, Freq, Time, QNI, QTC, Mgr.: BWN, 3985, 1245Z M-S, 471, 350, W9AYK; BEN, 1800Z, 3985 Dy, 728, 193, WA9LRW; WNN, 3725, 2315Z Dy 48, 11, WB9ICH; WSBN, 3985, 2330Z Dy, 1075, 223, K9UTQ; WIN-E, 3662, 0100Z Dy (267 Jan.), 262, 137, W9MFG; WIN-L, 3662, 0400Z Dy, 166, 74, K9LGU; WSSN, 3662, 0030Z M-W-F, 27, 1, K9KSA; EX-PO, 3925, 1801Z M-F, 659, 55, WA9NIX. Win-L cert. to WB9LSS. OPS to WB9LIW. I regret to report W9NSQ and W9AFF as Silent Keys. Welcome to the new Novices WN9SYO WN9TIG WN9TFJ WN9TDV. Thanks for cards and condolences to all from the Pedersen's. Oshkosh ARC banquet had 49 present. Charley Banks reports they had 11 Novices passing the code and 5 the theory since Nov. Don't forget Central Division Convention in Milwaukee July 9-10, also WNA picnic July 25 at Baraboo. Yellow Thunder Hamfest at Lake Delton May 22. Congrats to those who have WAS for Bicentennial. K9KGA made high claimed CW & Phone SS (Mar.). FLARC starting up Novice and General class in Mar. Club meeting attendance 30-45 per meeting. New officers for FLARC: K9KGA, pres.; WB9NOV, vice-pres.; WB9KFL, secy.; WB9DKS, treas.; W9LAA WN9RNF W9TYO, board. WN9ROE passed General in Chicago in Feb. WB9NME an Extra Class licensee; WB9QXO WB9LSS Advanced Class. WA9QVT has 2nd harmonic. Congrats to all. Two Portage members of the YTARC recently received the WAC award, namely Robert Johnson and Henry Schroeder. Traffic: (Feb.) K9CPM 797, W9DND 230, W9PVH 209, WA9QVT 138, WB9KPX 122, WB9NME 102, WB9ICH 97, K9FHI 87, W9MFG 72, W9AYK 69, W9SFL 68, WB9PYG 51, K9LGU 45, W9IEM 43, WA9PKM 41, W9ZBD 38, W9IHW 29, K9UTQ 28, WB9JSW 27, K9KSA 24, K9ANV 23, WB9HLS 23, WB9LKC 22, WB9LIW 17, K9JPS 15, WB9QXO 13, K9MZO 12, WB9LSS 11, W9CFS 10, WN9OEC 7, K9GSC 4, WB9IDU 3, WB9NKC 2. (Jan.) WB9KPX 252, WB9IDU 90, K9JPS 22, K9ASC 7.

DAKOTA DIVISION

MINNESOTA: SCM, Frank Leppa, KØZXE — SEC: WAØOFZ. PAMs: KØZBI WAØGLI ABØHOX WAØYVT. RMs: KØCVD KØRYU WRØOAG. Chief OBS: WBØLOR. Chief DO: WAØPRS. The MN calling freq. is 3925 kHz. WAØCFL summoned help for two injured semi drivers pinned in a wrecked truck via W1FAB who called MN authorities long distance. This occurred on the 20-meter CHC net. The Heartland ARC is sponsoring the MN QSO Party this year. June 4 will be the date, see WBØMAO for info. The Twinports FM club is having a statewide swaptest on May 8 in Duluth. More info in future QST hamfest column. WAØBJY is chmn. New Novices are WNØSCB WNØSCE graduates of Mesabi ARC and WNØSCM WNØSCN likewise of the Mankato ARC. New Generals

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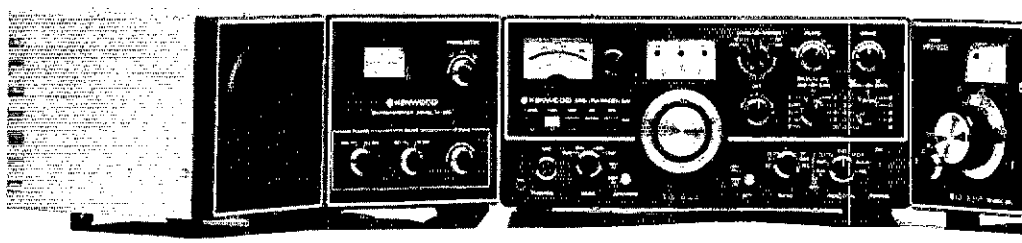

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DC input on CW
ANTENNA IMPEDANCE: 50-75 Ohms,
unbalanced
CARRIER SUPPRESSION: Better than -45
UNWANTED SIDEBAND SUPPRESSION: Be
than -40 dB
HARMONIC RADIATION: Better than -40
AF RESPONSE: 400 to 2600 Hz (-6 dB)
AUDIO INPUT SENSITIVITY: 0.25μV for 10
(S+N)/N
SELECTIVITY: SSB: 2.4 kHz (-6 dB), 4.4 k
(-60 dB) CW: 0.5 kHz (-6 dB), 1.5 k
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FREQUENCY STABILITY: 100 Hz per 30
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IMAGE RATIO: Better than 50 dB
IF REJECTION: Better than 50 dB
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RATED OUTPUT: 8W (AC operation)
ANTENNA INPUT/OUTPUT IMPEDANCE: 5
UNWANTED RADIATION: Less than -60 dB
RECEIVING SENSITIVITY: More than 1μV at
S-N 10 dB
IMAGE RATIO: More than 60 dB
IF REJECTION: More than 60 dB
FREQUENCY STABILITY: Less than ±2.5 k
during 1 60 min after power switch is
and within 150 Hz (per 30 min) therea
POWER CONSUMPTION: AC 220/120V, Tra
mission 50W max., Reception 12W ma
DC 13.8V, Trans-
mission 2A max., Reception 0.4A max
POWER REQUIREMENT: AC 220/120V, DC
16V (standard voltage 13.8V)
SEMI-CONDUCTOR: FET 5, Transistor 15,
Diode 10
DIMENSIONS: 6⅝" W x 6" H x 13¼" D
WEIGHT: 11.5 lbs.
SUGGESTED PRICE: $249.00

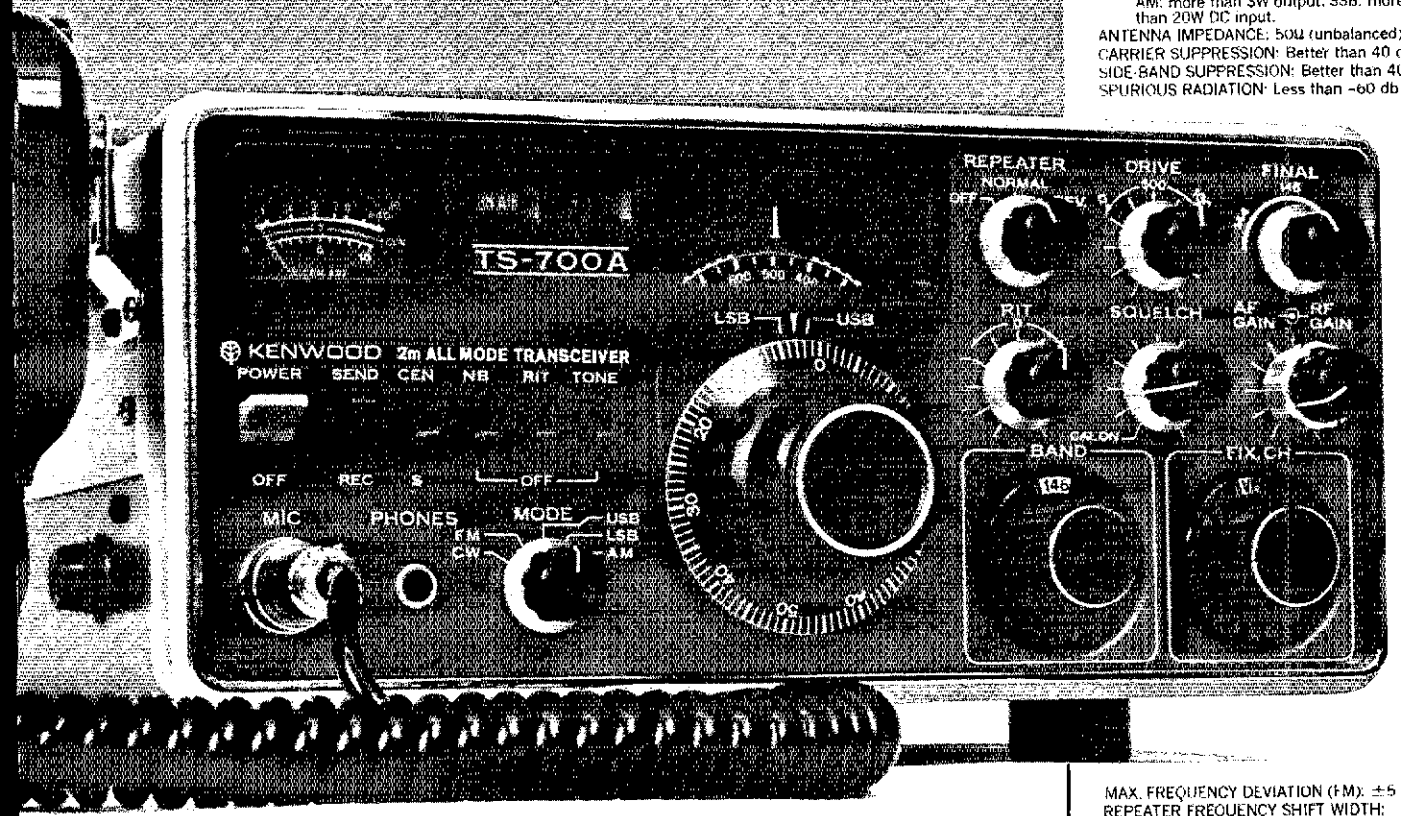
CW-520
500 Hz CW Crystal Filter: $45.00.

Prices subject to change without notice

KENWOOD
...pacesetter in amateur radio

TRIO-KENWOOD COMMUNICATIONS INC. 116 EAST ALONDRA/GARDENA, CA 90248

When you get tired of compromises...



KENWOOD'S TS-700A finally fulfills the promise of 2-meters...more channels, more versatility, tunable VFO, SSB-CW and, best of all, the type of quality that has placed the Kenwood name out front.

- Operates all modes: SSB (upper & lower), FM, AM, and CW
- Completely solid state circuitry provides stable, long lasting, trouble-free operation
- AC and DC capability. Can operate from your car, boat, or as a base station through its built-in power supply
- 4 MHz band coverage (144 to 148 MHz) instead of the usual 2
- Automatically switches transmit frequency 600 KHz for repeater operation. Just dial in your receive frequency and the radio does the rest... Simplex repeater reverse
- Or do the same thing by plugging a single crystal into one of the 11 crystal positions for your favorite channel
- Outstanding frequency stability provided through the use of FET-VFO
- Zero center discriminator meter
- Transmit/Receive cabability on 44 channels with 11 crystals
- Complete with microphone and built-in speaker
- The TS-700A has been thoroughly field-tested. Thousands of units are in operation throughout Japan and Europe

The TS-700A is available at select Kenwood dealers throughout the U.S. For the name of your nearest dealer, please write.

TS-700A Specifications

TRANSMIT/RECEIVE FREQUENCY RANGE: 144-148 MHz
MODE: SSB, FM, CW, AM
RF OUTPUT: CW, FM: more than 10W output. AM: more than 3W output. SSB: more than 20W DC input.
ANTENNA IMPEDANCE: 50Ω (unbalanced)
CARRIER SUPPRESSION: Better than 40 dB
SIDE-BAND SUPPRESSION: Better than 40 dB
SPURIOUS RADIATION: Less than -60 db
MAX. FREQUENCY DEVIATION (FM): ±5 kHz
REPEATER FREQUENCY SHIFT WIDTH: 600 kHz
TONE BURST TIME: 0.5-1.0 sec.
MODULATION: Balanced modulation for SSB. Variable reactance frequency shift for FM. Low power modulation for AM.
MICROPHONE: Dynamic microphone, 500Ω
AUDIO FREQUENCY RESPONSE: 400-2600 Hz, within -9 db
RECEIVING SYSTEM: SSB, CW, AM: Single-superheterodyne. FM: Double-superheterodyne.
INTERMEDIATE FREQUENCY: SSB, CW, AM: 10.7 MHz. FM: 1st IF: ... 10.7 MHz. 2nd IF: ... 455 kHz.
RECEIVING SENSITIVITY: SSB, CW: S/N = 10 dB or better at 0.25μV. 20 dB noise quieting = Less than 0.4μV. AM: S/N = 10 dB or better at 1μV.
IMAGE RATIO: Better than 60 dB
IF REJECTION: Better than 60dB
PASS-BANDWIDTH: SSB, CW, AM: More than 2.4 kHz at -6 dB. FM: More than 12 kHz at -6 dB.
RECEIVER SELECTIVITY: SSB, CW, AM: Less than 4.8 kHz at -60 dB. FM: Less than 24 kHz at -60 dB.
SQUELCH SENSITIVITY: 0.25μV
AUDIO OUTPUT: More than 2W at 8Ω load (10% distortion)
RECEIVER LOAD IMPEDANCE: 8Ω
FREQUENCY STABILITY: Within ±2 kHz during one hour after one minute of warm-up, and within 150 Hz during any 30 minute period thereafter.
POWER CONSUMPTION: Transmit mode: 95W (AC 120/220V), 4A (DC 13.8V), max. Receive mode (no signal): 45W (AC 120/220V), 0.8A (DC 13.8V).
POWER REQUIREMENTS: AC 120/220V, 50/60 Hz. DC 12-16V (13.8V as reference).
DIMENSIONS: 278 (W) x 124 (H) x 320 (D) mm
WEIGHT: 11 kg
SUGGESTED PRICE: $700.00

Prices subject to change without notice.

EAST ALONDRA/GARDENA, CALIFORNIA 90248

KENWOOD
...pacesetter in amateur radio

ANNOUNCING!

The ARRL Southeastern Division Convention and Atlanta HamFestival 1976

WHEN: Saturday and Sunday, June 12th and 13th!

WHERE: Dunfey's Royal Coach Motor Hotel
I-75 at Howell Mill Road
Atlanta, Georgia 30318

Contact the Hotel directly for room reservations at special HamFestival rates: $16 single, $21 double!

- Airconditioned Exhibit Hall with nearly 100 manufacturers, distributors, and other exhibitors!
- Saturday Night Awards Banquet and Dance!
- Forums and meetings galore:

  ARRL—DX—RTTY—VHF/UHF—Microprocessors—Digital Circuits —Antennas—Slow and fast scan TV—73 Forum with Wayne Green —Contests—Novice/beginner—Mars—and many more!
- FCC Exams! Free Bus to FCC from Hotel Saturday Morning!
- Outdoor (but mostly covered) Fleamarket; space for more than 100 cars. $5 per space, first come, first served!
- Activities for the wives and kids, too!
- See Six Flags Over Georgia, the Cyclorama, Stone Mountain, Lion Country Safari, Braves vs Pirates and more!

PRE-REGISTRATION: Individual $3.00, at the door $4.00
Family $5.00, at the door $6.00

You must be pre-registered to attend the Banquet.

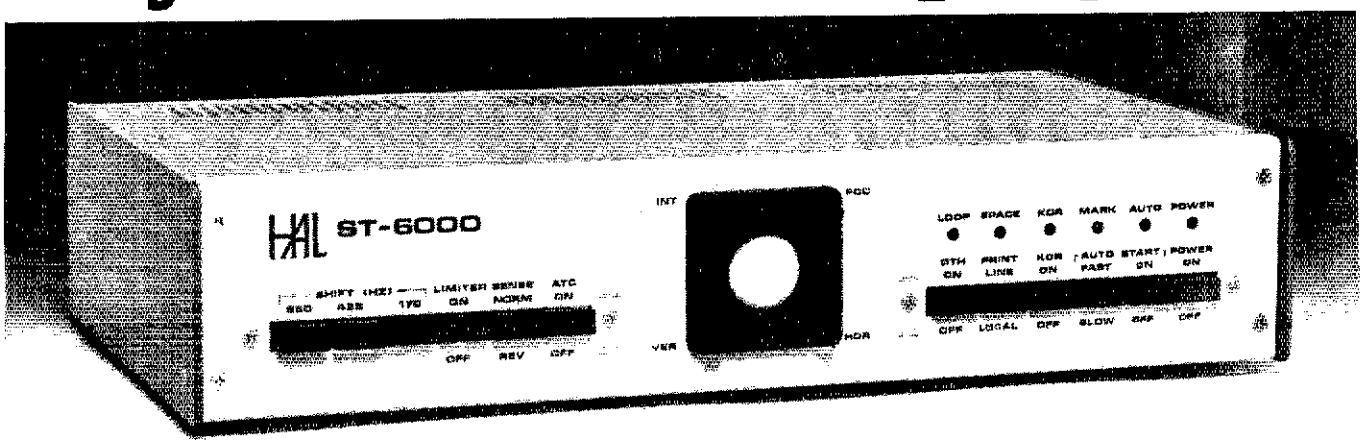
You must be registered to attend Forums, Meetings, and the Indoor Exhibit Hall.

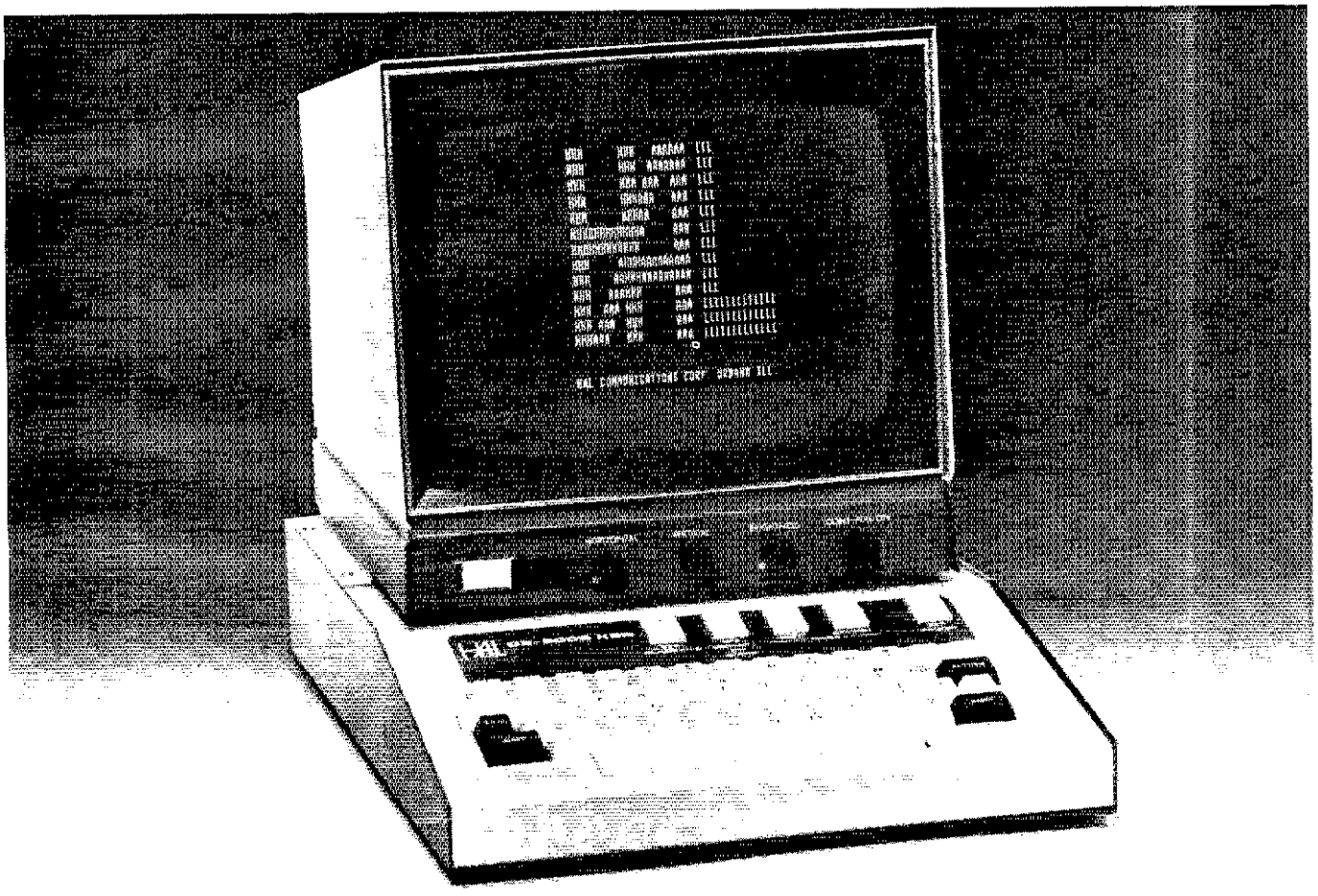
For pre-registration forms and additional information, send your name and address to:

Atlanta HamFestival 1976
53 Old Stone Mill Road
Marietta, Georgia 30062

or call Area 404/971-HAMS day or night. See You There!!

Stay tuned for future programs.





The HAL ST-6000 demodulator /keyer and the DS-3000 and DS-4000 KSR/RO series of communications terminals are designed to give you superlative TTY performance today —and in the future. DS series terminals, for example, are re-programmable, assuring you freedom from obsolescence. Sophisticated systems all, these HAL products are attractively priced—for industry, government and serious amateur radio operators.

The HAL ST-6000 operates at standard shifts of 850, 425, and 170 Hz. The tone keyer is crystal-controlled. Loop supply is internal. Active filters allow flexibility in establishing different tone pairs. You can select AM or hard-limiting FM modes of operation to accommodate different operating conditions. An internal monitor scope (shown on model above) allows fast, accurate tuning. The ST-6000 has an outstandingly high dynamic range of operation. Data I/O can be RS-232C, MIL-188C or current loop.

The DS-3000 and DS-4000 series of KSR and RO terminals provide silent, reliable, all-electronic TTY transmission and reception, or read-only (RO) operation of different combinations of codes, including Baudot, ASCII and Morse. The powerful, programmable 8080A microprocessor is included in the circuitry to assure maximum flexibility for your present needs —and for the future. The KSR models offer you full editing capability. The video display is a convenient 16-line format, of 72 characters per line.

These are some of the highlights. The full range of features and specifications for the ST-6000 and the DS series of KSR and RO terminals is covered in comprehensive data sheets available on request. Write for them now—and tune in to the most sophisticated TTY operation you can have today...or in the future.

HAL Communications Corp., Box 365, 807 E. Green Street
Urbana, Illinois 61801 • Telephone: (217) 367-7373

Wilson Electronics Corp.

"FACTORY DIRECT ONLY"

WILSON "WE-224" MOBILE

SUMMER SPECIAL

$199.95

90 Day Warranty

10 Day Money Back Guarantee

FEATURES

1. 24 Channel Operation
2. One priority Channel
3. Selectable 1 or 10 Watts Out
4. 10.7 Monolithic Filter Installed
5. 455 KHz Ceramic Filter
6. .3 Microvolt Sensitivity for 20 dB Quieting
7. Numerical Read-out on each Channel
8. Built-in Adjustable "Tone Burst" Generator
9. Front Panel "Tone Burst" Control
10. Accepts Wilson 1402 & 1405SM Xtals
11. Individual Trimmer Capacitors for both TX/RX
12. Mosfet Front End
13. Helical Resonator
14. High VSWR Protection Circuit
15. Reverse Polarity Protection Circuit
16. NBFM - 15 KHz Channel Separation
17. Built-in Speaker
18. External Speaker Jack
19. Dynamic Microphone Included
20. Mobile Mounting Bracket Included
21. Quick Disconnect Power Cable
22. Frequency Range 144-148 MHz
23. 6½"W x 2¾"H x 9½"D
24. Weight: 5½ lbs.
25. Power Requirements:
    Source: 13.5 VDC ± 10%
    Receive: .45A
    Transmit: 2.6A (10W), .7A (1W)

SPECIAL INCLUDES:

A. WILSON "WE-224"
B. MOBILE MIKE
C. MOUNTING BRACKET
D. 146.52/52 SIMPLEX CRYSTALS

SUMMER SPECIAL on Wilson Hand Held 220 and 450

2202 SM

FREQUENCY RANGE 220 - 225 MHz

- 6 Channel Operation
- Individual Trimmers on all TX/RX Crystals
- All Crystals Plug In
- 12 KHz Ceramic Filter
- 10.7 and 455 KC IF
- .3 Microvolt Sensitivity for 20 dB Quieting
- Weight: 1 lb. 14 oz. less Battery
- Battery Indicator
- Size: 8 7/8 x 1 3/4 x 2 7/8
- Switchable 1 & 2.5 Watts Output @ 12 VDC
- Current Drain: RX 14 MA, TX 500 MA
- Microswitch Mike Button
- Unbreakable Lexan® Case

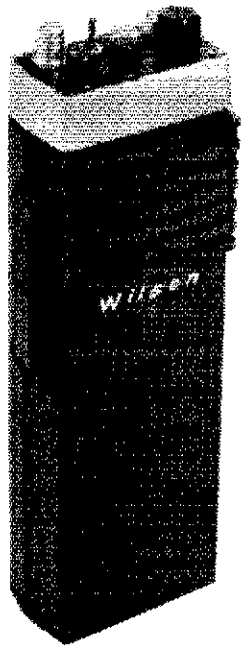
USES SAME ACCESSORIES AS 1405

SUMMER SPECIAL

$239.95

INCLUDES

1. 2202 SM
2. Flex Antenna
3. 223.50 Simplex Installed



4502 SM

FREQUENCY RANGE 420 - 450 MHz

- 6 Channel Operation
- Individual Trimmers on all TX/RX Crystals
- All Crystals Plug In
- 12 KHz Ceramic Filter
- 21.4 and 455 KC IF
- .3 Microvolt Sensitivity for 20 dB Quieting
- Weight: 1 lb. 14 oz. less Battery
- Battery Indicator
- Size: 8 7/8 x 1 3/4 x 2 7/8
- Switchable 1 & 1.8 Watts Output @ 12 VDC
- Current Drain: RX 14 MA, TX 500 MA
- Microswitch Mike Button
- Unbreakable Lexan® Case

USES SAME ACCESSORIES AS 1405

SUMMER SPECIAL

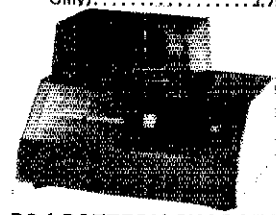
$279.95

INCLUDES

1. 4502 SM
2. Flex Antenna
3. 446.00 Simplex Installed

ACCESSORY SPECIALS

DESCRIPTION		SPECIAL PRICE
BC1	BATTERY CHARGER	$34.95
BP1	10 EA. AA GOULD NICAD BATTERIES	14.95
BT1	EXTRA BATTERY TRAY	6.00
LC1	LEATHER CASE 1402	9.95
LC2	LEATHER CASE 1405, 2202, 4502	9.95
SM1	SPEAKER MIKE FOR EARLY MODEL 1402 9 PIN CONNECTOR	24.95
SM2	SPEAKER MIKE FOR ALL NEW HAND HELDS WITH ROUND 6 PIN CONNECTOR	24.95
TE-1	SUB-AUDIBLE TONE ENCODER INSTALLED	34.95
TTP	TOUCH-TONE PAD	49.95
	INSTALLATION AT TIME OF RADIO PURCHASE	FREE
	INSTALLATION AT LATER DATE, ADD	15.00
XF-1	10.7 KC MONOLITHIC XTAL FILTER	9.95
CRYSTALS	TX or RX (Common Frequency Only)	3.75



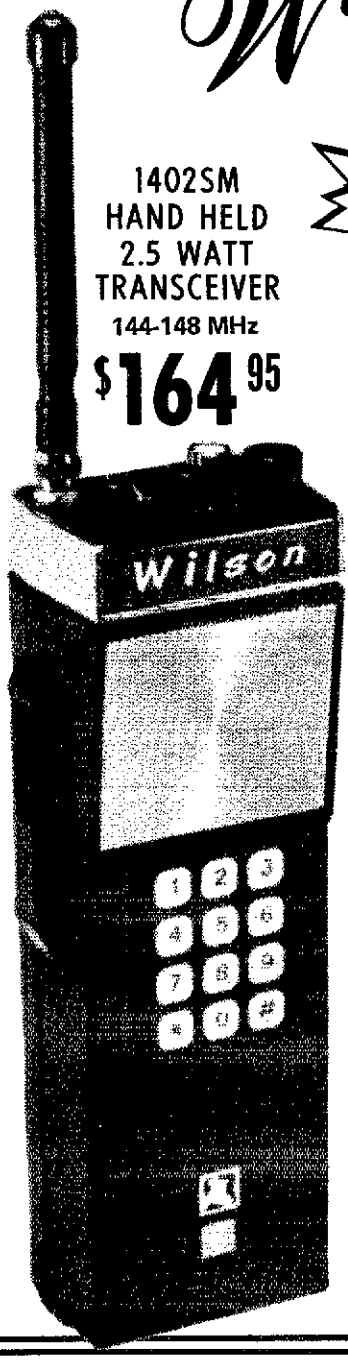
BC-1 BATTERY CHARGER

Wilson Electronics Corp.

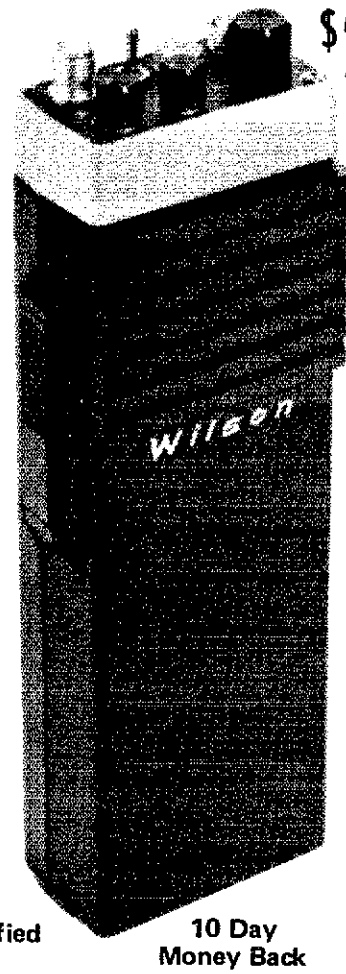
FACTORY DIRECT ONLY

SUMMER SPECIAL

1402SM
HAND HELD
2.5 WATT
TRANSCEIVER
144-148 MHz
$164.95



1405SM
HAND HELD
5 WATT
TRANSCEIVER
144-148 MHz
$239.95



FEATURES

1402 SM

- 6 Channel Operation
- Individual Trimmers on all TX/RX Crystals
- All Crystals Plug In
- 12 KHz Ceramic Filter
- 10.7 IF and 455 KC IF
- .3 Microvolt Sensitivity for 20 dB Quieting
- Weight: 1 lb. 14 oz. less Battery
- S-Meter/Battery Indicator
- Size: 8 7/8 x 1 7/8 x 2 7/8
- 2.5 Watts Minimum Output @ 12 VDC
- Current Drain RX 14 MA TX 500 MA
- Microswitch Mike Button
- High Impact Plastic Case

1405 SM

- 6 Channel Operation
- Individual Trimmers on all TX/RX Crystals
- All Crystals Plug In
- 12 KHz Ceramic Filter
- 10.7 and 455 KC IF
- .3 Microvolt Sensitivity for 20 dB Quieting
- Weight: 1 lb. 14 oz. less Battery
- Battery Indicator
- Size: 8 7/8 x 1 3/4 x 2 7/8
- Switchable 1 & 5 Watts Minimum Output @ 12 VDC
- Current Drain: RX 14 MA TX 400 MA (1w) 900 MA (5W)
- Microswitch Mike Button
- Unbreakable Lexan® Case

Shown With Optional Touch-Tone Pad

SPECIAL ON EACH RADIO INCLUDES:

Flex Antenna
52/52
Simplex Xtal

Can be Modified for MARS or CAP

10 Day Money Back Guarantee

90 Day Warranty

TO: WILSON ELECTRONICS CORP., 4288 S. POLARIS AVE., LAS VEGAS, NEVADA 89103, (702) 739-1931

SUMMER SPECIAL DIRECT SALE ORDER BLANK

____ 1402SM @ $164.95
____ 1405SM @ $239.95
____ WE224 @ $199.95
____ 2202SM @ $239.95
____ 4502SM @ $279.95
____ BC1 @ $34.95
____ BP1 @ $14.95
____ BT1 @ $6.00
____ LC1 @ $9.95
____ LC2 @ $9.95
____ SM1 @ $24.95
____ SM2 @ $24.95
____ TE1 @ $34.95
(SPECIFY FREQUENCY ____)

____ TTP @ $49.95
____ XF1 @ $9.95
____ TX or RX XTALS @ $3.75 ea.
____ FACTORY XTAL INSTALLATION/ NETTING @ $7.50/Radio

EQUIP TRANSCEIVER AS FOLLOWS:

XTALS	TX	RX	XTALS	TX	RX
A.	52	52	G.		
B.			H.		
C.			I.		
D.			J.		
E.			K.		
F.			L.		

ENCLOSED IS ____ ☐ CHECK ☐ MONEY ORDER ☐ MC ☐ BAC

CARD # ____

EXPIRATION DATE ____

NAME ____

ADDRESS ____

CITY ____

STATE ____ ZIP ____

SIGNATURE ____

SHIPPING & HANDLING PREPAID FOR SUMMER SPECIAL
NEVADA RESIDENTS ADD SALES TAX
QST VALID ONLY MAY 1 THRU 31, 1976

are WB9NZB WB9QCW and WN9OFQ waiting at the mailbox. New ECs are K9GNI and WA9GLI. Congrats to all of you. Oscar interest is high in NE MN. Many are monitoring Oscar and building equipment under the guiding hand of W9MJS. The Paul Bunyan ARC becoming active with possibilities of a Brainerd repeater soon. I regret to report W9IPN as a Silent Key. AB9HOX and others proved helpful in handling welfare and medical traffic during the Guatemala earthquakes. WB9NGX is forming a statewide group of public relations people willing to do small PR projects. The Mankato ARC picnic tentatively July 25 at Spring Lake Park. BPL: AB9HOX. Traffic: AB9HOX 615, WA9GLI 272, W9QMY 196, WA9VYT 141, K9CVD 126, WB9DAG 73, K9CSE 72, K9ZBI 65, K9ZXE 59, WB9JFZ 52, WB9LDW 52, WB9MAO 51, WA9URW 51, WA9TFC 46, WB9FMI 38, WB9CPC 36, WB9OCT 31, K9RMX 24, K9GNI 22, W9HZU 21, WB9NGX 19, WA9JPR 18, WB9AYT 18, WA9YAH 17, WB9KTH 14, K9FLT 13, WA9ADX 6, WA9WOV 6, WA9IAW 4, W9KLG 3.

NORTH DAKOTA: SCM, Mark J. Worcester, WA9WLP — OBS: K9PVG, WB9CIY/9 giving code classes at Rugby. WA9QBN has new antenna on 75 meters and doing FB job. K9PYZ has returned from Chicago. K9GCC again back on 75 meters. W9HNV hospitilized in Cavalier. WA9SDQ was called to MI for funeral of his brother. The Amateur Picnic at Mayville scheduled for June 6, 1976. At the Feb. 2 meeting of the Midwest Can-AM Repeater Assn. K9PVG was elected pres. and new Repeater freq. assigned. W9ZTL's brother W5MFH was visiting in Glen Ullin. Our thanks and gratitude to the retired SCM W9DM for his services the past 10-1/2 years. Job well done "Prof."

Net — Freq. Manager	CDT/Days	Sess.	QNI	QTC
Goose River — 1990.0 W9CDO	0900 Su	5	65	—
RACES — 3996.5	1700 S-S	49	500	226
WB9ATJ — WA9SUF	1800			
YL WX — 3996.5 WA9RWM — WA9GRX	0730 S-S	29	566	581

Traffic: WA9RWM 1047, WA9SUF 178, W9CDO 114, K9ATK 40, W9DM 37, W9WWL 30, W9MXF 28.

SOUTH DAKOTA: SCM, Ed Gray, WA9CPX — The SD Evening Net meets at 6:30 PM daylight time starting the last Sun. in Apr. when we go on Daylight Saving Time. This would be 2330Z. This will continue to the last Sun. in Oct. when the net will change to 6:00 PM Central Standard time or 0001Z for the winter session. K9ZBJ will be the Summer Session mgr. and W9NEO, the Winter Session mgr. WA9VRE the NJQ net mgr. WB9LJM has a new Drake TR-22C. The SD Picnic will be June 12 and 13 at the fairgrounds in Sioux Falls. The picnic is being hosted by the Sioux Falls ARC and The Sioux Valley Repeater Assn. Net Reports: Morning Net, 444 check-ins and 289 formals; NJQ, 640 check-ins and 53 formals; Evening Net, 1456 check-ins and 37 formals; YL Net, 45 check-ins. SDN CW active. Traffic: WA9VRE 147, W9HOJ 114, WA9UEN 94, W9IG 44, WB9EVQ 20.

DELTA DIVISION

ARKANSAS: SCM, S. M. Pokorny, W5UAU — PAMs: W5POH WA5ZWZ. RM: W5MYZ. Net, kHz, Time/Day, QNI, QTC, Mgr.: ARN, 3995, 0030/Dy, 388, 15, W5UAU; OZK, 3760, 0100/Dy, 122, 30, W5MYZ; APN, 3937, 1200/M-S, 756, 39, W5POH; M-Bird, 3927, 2230/M-F, 524, 14, WA5ZWZ. W5RXU has resigned as AR SEC. We need someone in the Little Rock area to take that position, please contact your SCM so that we may have contact at the state capitol. Greene Co. ARC code class at community center Paragould Mon. & Thur. 7:30 PM, contact WA5YJL for info. Welcome to AR newest hams WN5s QVE QVU QWA QWH QWN QXM QXP QZN RDO REF RHD RHE RHF RHG RHK RHP; WB5s QQV RCN RCS RDN RHH RGP RGE. The Feb. meeting of OZARC was ladies' night with special guest speaker Maxine Doub Jensen, author and journalist, followed by AR SCM, Ft. Smith ARC new officers: WA5WMC, pres.; WA5VWH, vice-pres.; WA5SOG, secy.; W5FFY, act. chmn. Washington Co. Red Cross chapter has alloted space for NWAARC in the new building. The annual banquet meeting of NWAARC had 96 in attendance. New PAM, WA5ZWZ. WB5OHD new mgr. for ARN. W5KL reports lightning struck again. PSHR: W5POH 39, W5UAU 24, W5EIJ 19. Traffic: WA5HNN 86, W5UAU 37, W5MYZ 27, W5POH 23, WB5GWU 15, W5KL 2, W5EIJ 1.

LOUISIANA: SCM, Robert P. Schmidt, W5GHP — Asst. SCM: John Souvestre, WA5NYY. SEC: W5IRI. RM: WA5PRI. PAM: WB5EKU. VHF PAM: WB5KAX. New Orleans VHF Club awarded certificates to WB5CUQ and W5VUH for their efforts in publicity with a Hollywood film crew, using 2-meter equipment. The VHF Club also announces that code practice will be transmitted on their 16/76 repeater. Congrats to the Lafayette ARC on a very successful dinner Mar. 13. Baton Rouge ARC classes for Novices and Generals progressing well under direction of W5OVV. New officers of the Twin Cities ARC (Monroe) are: WB5IKT, pres.; WA5QVN, vice-pres.; WA5YKD, secy-treas. Their new Novice classes have started. W5WMU very active in all contests. New appointments WA5VQE ORS; WA5ZZA OBS. Ozone ARC donated complete sets ARRL books to Slidel High School as well as the Public Library. W5YN, OBS doing excellent job with the bulletins. Air Force MARS Region Four convention will be held in New Orleans June 18 thru 20. For details contact WB5EKU.

Net — kHz	Time/Days	QTC	QNI	Manager
LAN — 3615	7 & 10 PM Dy	172	379	WA5PRI
LTN — 3910	6:45 PM Dy	105	288	WB5EKU
LSN — 3703	8:30 PM M-F	34	107	K5TTC
LRN — 3587.5	7:00 PM Su	6	15	W5GHP

WA5ZZA 753, W5GHP 561, WA5IQU 238, K5TTC 189, W5MI 148, WA5VQE 71, WA5PRI 59, WB5KQJ 33, WB5EKU 31, WB5NVB 31, WA5TQA 29, WB5JZQ 28, W5YN 26, WB5IKT 12, WB5NWO 8.

MISSISSIPPI: SCM, W. L. Appleby, WB5DCY — Asst. SCM: C. E. Gibbs, W5LL. WB5MTQ now into Oscar 6 & 7. Please support the MS Slow Net MWF 6 PM local, 3733 kHz 5-7 wpm! Welcome new MS amateurs WN5s QWS QFR RAS RIN RAH RFV RFD RGD RGC RHQ RHR; WB5RGG, WB5RHV. MSBN Net Cert issued to WB4GZV WA5ZLX WA5BNH WB5MDR. K5RRG now on with new wall-to-wall Heath. Big doin's at K5TYP Keesler AFB. Facility greatly improved,

NEW!
FM144-10SXR-II

All Solid State-PLL digital synthesized — No Crystals to buy! 5KHz steps — 144-148 MHz-LED digital readout.

Introducing the standard of comparison for years to come. No other unit begins to compare with the superb engineering and superior commercial avionics grade quality and construction of the FM144-10SXR-II

FM144-10SXR-11

$419.00

VALUE $599.00

Price subject to change without notice

Regulated AC/PS
MODEL FMPS-4R . . . $49.00
NEW! Touch-Tone Pad $59.95

- **FREQUENCY RANGE:** Receive: 144.00 to 148.995 MHz, 5KHz steps (1000 channels). Transmit: 146.00 to 147.995 MHz, 5KHz steps (400 channels).
- **FULL DIGITAL READOUT:** Six easy to read LED digits provide direct frequency readout assuring accurate and simple selection of operating frequency.
- **AIRCRAFT TYPE FREQUENCY SELECTOR:** Large and small coaxially mounted knobs select 100KHz and 10KHz steps respectively. Switches click-stopped with a home position facilitate frequency changing without need to view LED'S while driving and provides the sightless amateur with full Braille dial as standard equipment.
- **FULL AUTOMATIC TUNING OF RECEIVER FRONT END:** DC output of PLL fed to varactor diodes in all front end R-F tuned circuits provides full sensitivity and optimum intermodulation rejection over the entire band. **No other amateur unit at any price** has this feature which is found in only the most sophisticated and expensive aircraft and commercial transceivers.
- **TRUE FM:** Not phase modulation — for superb emphasized hi-fi audio quality second to none.
- **FULLY REGULATED INTEGRAL POWER SUPPLIES:** Operating voltage for all circuits, i.e., 12v, 9v and 5v have independently regulated supplies. 12v regulator effective in keeping engine alternator noises out and protects final transistor from overload.
- **MONITOR LAMPS:** 2 LED'S on front panel indicate (1) incoming signal-channel busy, and (2) un-lock condition of phase locked loop.
- **DUPLEX FREQUENCY OFFSET:** 600KHz **plus** or **minus**, 5KHz steps. Plus simplex, any frequency.
- **MODULAR COMMERCIAL GRADE CONSTRUCTION:** 6 unitized modules eliminate stray coupling and facilitate ease of maintenance.
- **ACCESSORY SOCKET:** Fully wired for touch-tone, phone patch, and other accessories.
- **RECEIVE:** .25 uv sensitivity. **9 pole filter** as well as monolithic crystal filter and **automatic tuned** LC circuits provide superior skirt selectivity.
- **AUDIO OUTPUT: 4 WATTS**
- **HIGH/LOW POWER OUTPUT:** 15 watts and 1 watt, switch selected. Low power may be adjusted anywhere between 1 watt and 15 watts.
- **PRIORITY CHANNEL:** Instant selection by front panel switch. Diode matrix may be owner re-programmed to any frequency (146.52 provided).
- **DUAL METER:** Provides "S" reading on receive and power out on transmit.
- **OTHER FEATURES:** Dynamic microphone, mobile mount, external speaker jack, and much, much, more. Size: 2⅛ x 6½ x 7½. All cords, plugs, fuses, mobile mount, microphone hanger, etc., included. Built in speaker.

Manufactured by one of the world's most distinguished Avionics manufacturers, Kyokuto Denshi Kaisha, Ltd.

AMATEUR-WHOLESALE ELECTRONICS

8817 S.W. 129th Terrace, Miami, Florida 33176
Telephone (305) 233-3631
U.S. DISTRIBUTOR

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It's the Swan Mark II, an amateur radio standard for top power single sideband rigs. One-hundred watts of drive is all you need to go all the way on all bands from 10 to 80 meters. And with the Mark II, the price includes the separate, matching power supply. Both RF deck and power supply are forced-air cooled with high-volume, low-RPM, low-noise blowers.

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Mark II 2000-watt linear amplifier with 120/220V power supply. $849.95

Cygnet 1200X 1200-watt linear amplifier complete with built in 110/220V power supply. $349.95

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Novice classes, repeater relocated. WA5SUE heard on vhf-fm. Heard on MSBN WB5OAV WA5BCT. Heard on MTN WB5NJZ W5YTN WB4GZV. K5TYP officers WB5MMB, pres.; WA@VNY, vice-pres.; WB@MUK, secy. W5UCY W5RUB WB5HVY active in DX Contest. WB5RPH rec'd Tech ticket. Enjoyed FB visit with Hattiesburg's active club. FD should be a real winner in this section this year. Tombigbee ARC Novices all now on the air. Jackson Co. ARC officers WA5DVV, pres.; WA5MIP, vice-pres.; WB5OHN, secy.; WA5RMS, treas.; WB5OAV, pro. dir. Delta ARC WB5FDI, pres.; K5UBL, secy. WA5TMC reports NE MS FM Net 07-67 1830 daily. WB5LXX W5QDC W5EDT WB5BKM active in DRN5. WA5ZLT PAM-OPS; WB5MOR RM & co-mgr. MS Slo Net with WB5MTQ. Novice classes in session in Biloxi Pascagoula Greenville Hattiesburg. WB5OES now Extra Class, K5HCI WB5FDI WB5PKS Advanced. MSBN Cert issued to W5EPW WB5OES WB5PKS W5EMS. MTN Feb. 221 check-ins, 95 msgs; MSBN 1077 check-ins, 75 msgs; MSN 38 check-ins, 7 msgs; CGCHN 1868 check-ins, 64 msgs. Traffic: W5EDT 149, WB5FHA 125, W5SBM 70, WB5KUJ 68, WB5DCY 53, WB5LXX 41, K5OAF 41, WA5YZW 33, W5YTN 37, W5WZ 27, WB5BKM 15, W5BW 9, WB5HVY 4, WB5EIN 3, W5LL 2, WB5NSC 1.

TENNESSEE: SCM, O. D. Keaton, WA4GLS — SEC: WB4DYJ. PAMs: WB4PRF K4LSP. RM: WB4DJU.

Net — Freq.	Time(Z)/Days	Sess.	QNI	QTC
Manager				
TPN — 3980	1040 M-F	80	3494	264
WA4EWW				
W4PFP	1145 M-F			
WB4YPO	0000 M-S			
	1400 SSuH			
TCN — 3980	0030 M	4	73	3
WB4MPJ				
ETVHFN — 50.4	1900 MWF	12	83	1
WA4WZJ				
ETVHFN — 145.2	1900 TTh	8	35	1
WB4DZG				
ETTMN — 28.7	0100 WF	9	98	2
WB4NFI				
MTTMN — 28.8	0100 TF	8	66	0
W4EAY				
WTVHFN — 146.37	2000 S	10	205	28
WA4VVX				
146.97	0130 F			
TN — 3635	0000 Dy	29	167	116
K4YFC				

SET exercises lasted 15-1/2 hours with QNI 393, QTC 329, very good operation. WA4DPF had 139 phone patches. DARC r ports 232 enrollment in radio class. The Knoxville Hamfest is to be held on May 29, 30, 1976 and the Humboldt Hamfest to be held on May 30, 1976, everyone try to attend one of these. Traffic: K4CNY 447, WB4DJU 233, WB4DYJ 211, W4OGG 123, WB4ZSZ 65, K4JSF 50, WA4DPF 42, K4KCK 40, WB4GZF 36, K4WWQ 32, W4CYL 22, WB4DDV 22, WB4PRF 21, W4RUW 21, WB4GBI 15, WB4BKF 13, WB4YPO 13, K4VVE 12, K4UMW 11, WB4WHE 11, WB4FGT 9, WB4MPJ 8, WB4ANX 7, WB4YXC 6, K4MZE 1.

GREAT LAKES DIVISION

KENTUCKY: SCM, Ted Huddle, W3CID — SEC: WA4GHQ.

Net	QNI	QTC	Net	QNI	QTC
KRN	302	26	KYN	240	131
MKPN	935	64	KPON	78	4
KTN	1240	180	8DAREC	87	13
6DAREC	64	13			

WB4SIJ now has his WAZ on 20 meters. BGARC has 110 in Novice and General classes! WB4TPU, WB4RVO and WB4ZKC are instructors. Some hamfest notes: No. KY Ham-O-Rama is on May 30, while KRC Louisville fest is Sept. 26. I'll list others as dates are firm. WB4OFK has a new harmonic. Traffic: K4DZM 83, WA4IGS 77, K4TXJ 73, WB4EOR 57, WB4AUN 50, W4CID 48, WB4EXQ 37, W4CDA 26, WA4AVV 23, WA4AGH 22, WA4KVR 22, WA4RCD 22, K4YZU 21, WA4FAF 20, WN4JAV 17, K4UNW 11.

MICHIGAN: SCM, A. L. Baker, W8TZZ — SEC: W8MPD. RMs: W8JYA W8YIQ K8KMQ K8AMU WA8RXI. PAMs: K8LNE WB8JIX. VHF PAM: WA8WVV.

Net — Freq.	Time/Days	QNI	TFC	Sess.
MACS — 3953	1600 Dy	1044	465	33
QMN — 3663	2300/0300 Dy	1096	363	83
BRMEN — 3930	2130 Dy	765	153	29
MNN — 3720	2230 Dy	268	108	30
WS6N — 3935	0001 Dy	714	66	29
UPEN — 3922	2230 Dy	616	50	34
GLETN — 3932	0130 Dy	249	41	21
Mi6M — 50.7	0000 Dy	234	26	24
MAREC — 3932	2300 S	87	23	5
VHF PAM Rpt.		282	5	13

Low sun spot numbers having effect on local nets with new 15M nets on 21.4 in Washtenaw and 21.375 for the gang at SEMARA. Election results: DARA: W8PEQ, pres.; W8HBL, vice-pres.; W8FBH, secy., K8DYI, treas. Farmington ARC: WA8ESP, pres.; W8BQJW, vice-pres.; WB8FXY, secy.; W8NBN, treas. Jewish Community RC: WB8BYC, pres.; WB8SBI, vice-pres.; WN8VWE, secy.; WN8WID, treas. Stu Rockatellow ARS: K8DME, pres; WB8JPQ, vice-pres.; K8DMR, secy.; WA8OOE, treas. Big Rapids ARC: WN8RUV, pres.; W8OWN, vice-pres.; WB8TVD, secy.; John Yax, treas. Amateur of the month for MNN is WN8VOM. Amateur of the year for MACS net is K8JED. Received word from Copper Country ARA that FCC Commissioner James Quello will be speaker at UP Hamfest in July. New appointments: ECs WB8AIN WB8FBJ WB8PRN WA8WWM W8LCU; ORS W8HIX; OBS W8BPQ. Congratulations. K8AMU has been present on QMN every day for the past 2 years. If your club or emergency or repeater group holds a weekly net on VHF, send a report of your activity to VHF PAM WA8WVV. A VHF PAM report will be a regular feature of the column in the coming months and we want to include your group in the totals. WN8UXD is on the air with an HW 16. First QSO with a VP9 on 40M, not bad for starters. New licensees: Novice WN8WIA; General WB8TVD; Extra K8YRV. Congrats. Delta County ARC awarded subscriptions as prizes for club QSO party. Regrettully I report W8PRM and W8DXH as Silent Keys. Don't forget the MI QSO Party May 15-17. Traffic: WB8ITT 364, K8LNE 316, WB8WKQ 313, WB8DKQ 311, K8DYI 239, W8MO 159, K8KMQ 156, W8TZZ 124, WB8POL 122, W8JYA 101, W8GLC 98, W7KQU/8 92, WN8VOM 76, WA8TBL 71, WA8WZF 68, W8OW 61, K8AMU 60, W8DC 59, K8JED 54, WB8NCD 47, K8WRJ 42, W8YIQ 42, WB8EEU 39, WA8RXI 36, WB8BYB 34, W8IUC 34, WA8OIE 34, WB8JIX 31, WB8FBG 30, W8LOU 30, W8NOH 30, WB8DJS 27, K8VOA 24, WB8LWW 23, WB8RVG 21, W8JUP 19, W8VIZ 19, WB8OBR 18, W8SCW 15, W8DCN 14, W8DT 14, W8EU 14, WB8RFK 14, WN8RMH 14, WA8WWM 14, K8GXV 13, K8ZJU 13, WB8APN 11, WA8CUP 11, W8CUP 10, W8LDS 10, W8SDB 9, W8VFM 9, WB8AXI 8, W8FZL 8, K8TAK 8, W8UFS 8, WA8YPY 8, WB8DUB 7, WA8AXF 6, WA8MTI 6, W8TXM 6, WA8UPB 6, WA8WVV 5, WB8IMI 4, W8TBP 4, K8TLT 3, W8WVL 3, WB8GKB 2, K8KIC 2, W8LUE 2, K8WLE 2, W8KGK 1.

OHIO: SCM, Hank Greeb, AC8CHT — Asst. SCM William K. Shaeffer, WA8MCR. SEC: WA8KPN. RMs: K8IKD WB8JGW WA8WAK. PAMs: W8DIL, WA8SSI.

Net — Freq.	Time(Z)	Sess.	QNI	QTC
ONN — 3708	2330	12	63	41
BNR — 3605	2300	29	128	139
BN — 3577	2345/0300	48	320	157
OSSBN — 3972.5	1530/2100/2345	87	2421	861
OSN — 3577	2310	25	111	43
O6N — 50160	0200	29	259	59

Congratulations to W8DIL on election as OSSBN Mgr. and appointment as PAM. Many thanks to W8MOK for a stellar job as previous OSSBN Mgr. Current roster of net managers: ONN K8IKD; BNR K8NCV; BN WA8WAK; OSSBN W8DIL; OSN WB8JGW; O6N WA8SSI. Recently appointed ECs include WB8ONY, Athens & Vinton Counties; WB8TEM Ashtabula County; WA8WMW Williams County. Are you signed up in AREC? See your local EC or contact WA8KPN or AC8CHT for information. NOSTALGIA RADIO EXCHANGE QSO party May 23 & 24. Contact W8KAJ for details or see Operating Events Section. Defiance County Amateur RAdio Club organized Feb. 25; K8OTO, pres.; K8EWP, vice-pres.; K8ZKP, treas.; WB8PGO, secy.; W8KUZ, pub.; K8VYY, act. K8ZUA & W8BQV passed Extra Class exam. Central OH AREC has repeater on 222.46/224.06 WR8AIL. Traffic: W8PMJ 374, WA8MCR 337, WA8HGH 327, W8PTT 240, WA8RQG 224, W8DIL 164, WB8OMQ 134, W8IBX 101, WB8KKI 98, WA8SED 71, K8LGA 64, WB8TRK 54, K8LXA 51, W8QZK 42, WA8VWH 41, WB8UIN 39, WA8SSI 37, WB8JGW 35, AC8CHT 31, K8MLO 31, W8DE 30, W8CXM 29, W8TH 28, W8JD 26, WB8MRL 26, W8CJU 25, W8QCU 25, W8ALS 22, K8QYR 22, W8KAJ 20, K8BYR 18, WN8UJM 18, W8QXQ 17, W8UQY 17, W8WEG 17, W8BGGR 12, WB8ORR 12, W8LT 10, WN8UJL 10, K8CKY 9, W8DCX 9, WB8TEM 9, W8GOE 8, WA8MAZ 8, WB8JXS 7, WB8LQU 7, W8BQV 6, W8DPW 6, AA8BOV 5, WN8UNE 4, WB8IBZ 3, WA3BGE 2, WB8AYC 2, W8BHL 1.

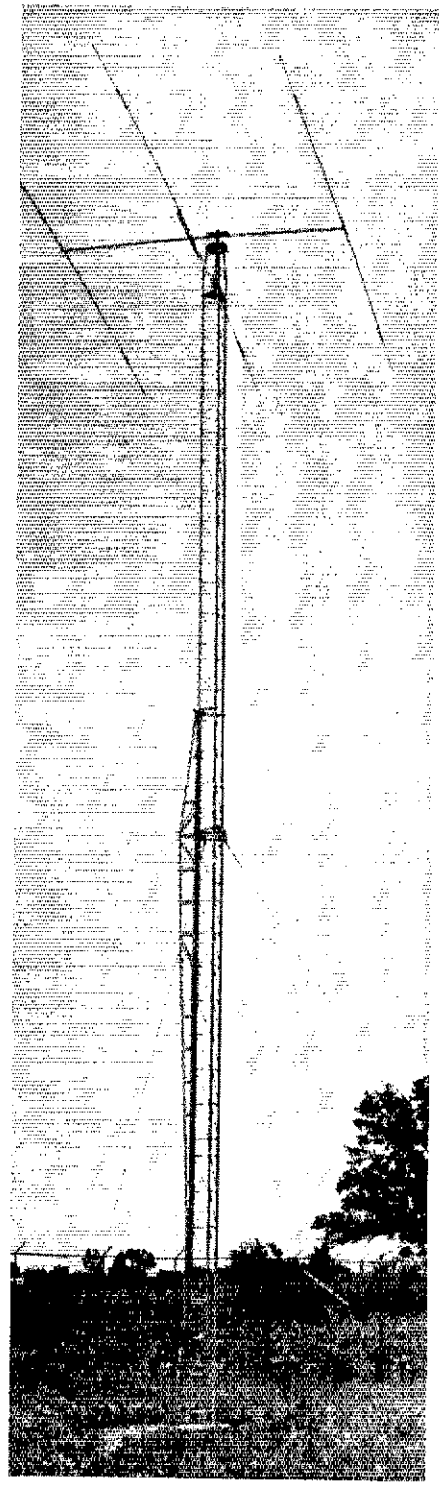
HUDSON DIVISION

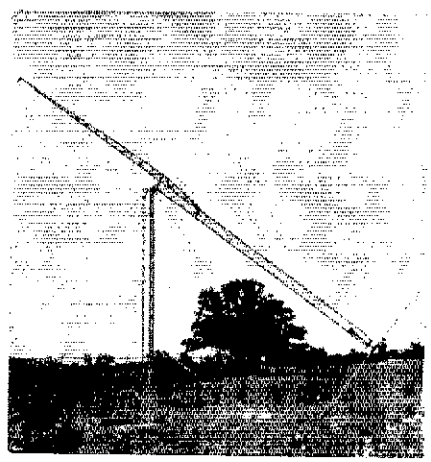
EASTERN NEW YORK: SCM, Gary J. Ferdinand, WA2PJL — SEC: K2AYQ. RMs: WB2IXW K2OYG. PAM: WB2QEI. New appointments went to K2AYQ as SEC (ECs please note); K2OYG as RM and manager of the NYR RTTY net, and WA2UYT as OBS. Many clubs report Novice classes beginning, with Albany Club enrolling 95! Congratulations to WN2EBV on the new ticket. At least those in the TV viewing area of Albany saw FB coverage of W2APF at work with Guatemala traffic. Bet that PR helped out the Novice class enrollment. Other PR efforts being done by Maple Hill H.S. (Castleton) by giving demos to local Kiwanis and Rotary organizations. Very few SET reports received as yet, but Albany Co. AREC reports a good turnout with 12 communities covered by direct fm communications. The New Rochelle club notes that the CD net meets on 145.38 (am) Tue. at 8 PM. As an added inducement there's good info on recent DX happenings to be had there. The Schenectady Museum ARC reports the dedication of memorial station W2IR. The station is open to the public. Prospective Novices: WA2MRI is giving code practice on 50.91 Thur. 7–8 PM. WN2WBO, who just passed the General, reports that his Junior High club is looking for equipment donations. WA2CJY hopes 80-meter local conditions return. PSHR to: WB2EMU WB2RUZ WA2PJL. Net totals: NYR QNI 110, QSP 22; NYS QNI 662, QSP 271. Traffic: (Feb.) WA2PJL 258, WB2WZL 179, WB2EMU 136, W2BIW 106, WB2RUZ 87, K2OUA 60, WA2PAU 55, WB2TGL 52, WB2TDX 44, WA2YBF 34, K2DN 31, WB2VVS 24, WB2IXW 23, K2OYG 23, WB2GOJ 22, WB2ELA 10, WB2EKM 8, K2HNW 8, W2OOJ 2. (Jan.) WA2UYL 79, WB2NKN 40, WA2PAU 21.

NEW YORK CITY — LONG ISLAND: SCM, John H. Smale, WB2CHY — Asst. SCM: Art Malatzky, WB2WFJ. SEC: K2HTX. RM: WB2LZN. PAM: WB2PYM. The following are major AREC/RACES nets: Join one.

County	MHz	MHz	MHz
Bronx	28.64	50.35	146.88 fm
Kings	28.64	50.35	146.88 fm
Richmond			146.88 fm
New York	29.5		146.88 fm
Queens	29.5	50.52	145.62 am/fm
Nassau	28.72		145.68 am
W. Suffolk	28.73 (Hunt.)		145.59 am
	28.65 (Smith)		147.21 fm
	28.610 (Babylon)		146.94 fm
E. Suffolk			146.82 fm

Note: Net times between 2000 and 2100 local on Mon., new faces are always welcome. Congratulations to The Hall of Science ARC on FB job they did handling traffic during the Guatemala emergency, the station (WB2JSM) was featured in area newspapers and also made National TV. It is with deep regret that we list WN2BIV as a Silent Key. WA2HGG home from the hospital and doing nicely. Hope everybody is getting their final plans made for Field Day, such as antennas and operating gear, sources of power, and don't forget to orginate a message to the SCM (me) and the SEC as the instructions call for those bonus points do add up, and it gives people a chance to handle traffic for good experience. WN2YYL has passed his Advanced. Welcome to new Novice WN2CFL. WB2YKG has passed his Extra, and has put up an inverted Vee on 80 thru 10. Recipients of Babylon AREC Public Service Achievement Awards for 1975 are WB2RQF WA2CZY WB2RKH WB2PUE W2TE WA2JZX WA2FGB K2REC WB2CHY WA2TQT WA2MGS. I received a nice QSL card from AB6APK/DA1PK/LX. Rich plans to make several trips over to Luxemburg during the year, especially over the 4th of July weekend, look for him. Rich also reports that the American Amateur RC of Germany is going again. DL5AY did well in spite of conditions on the first DX test ssb weekend. For those wanting to try checking in to a public service net on 2 m (besides the AREC/RACES) should try the LIMARC Net, every Mon. night on WR2ADM (25/85). Its now official, WB2CHY is still the SCM. There's still a lot to be done and I would appreciate everybodys help in accomplishing what has to be done. Citibank ARC





(WA2BTC) celebrated their 1st anniversary in Mar. Congrats to WA2MIO who passed her Advanced. WB2LZN is trying the Satellite and Fax end of ham radio for a school project. W2PF attended 51st annual banquet of VWOA in Feb. He also reports Fred M. Lind got his old call W2ALU of over 40 years ago. WB2WRT has passed his Extra. Traffic: (Feb.) W2EC 424, WB2WRT 213, WB2LZN 179, WA2WKH 87, W2MLC 84, WA2YAY 55, WB2YKG 48,W2HXT 37, WB2HIM 30, WN2YYL 23, WA2USJ 11, K2JFE 9, W2PF 8, WN2ZPV 7, WA2YEI 5, WA2JZX 4. (Jan.) WB2WRT 332, W2GLE 113, AB2SJG 47, WA2USJ 15.

NORTHERN NEW JERSEY: SCM, William S. Keller, III, WB2RKK

Net — Freq. Manager	Time(PM)/Days	Sess.	QNI	QTC
NJN — 3695 WB2LCV	7:00 Dy	29	429	138
NJN — 3695 WB2LCV	10:00 Dy	29	149	40
NJPN — 3950 WB2VTT	6:00 Dy	29	650	391
NJPN — 3950 WB2VTT	9 AM Su	5	124	57
NJSN — 3730 WB2RMK	8:15 Dy	31	140	33
PVTEN — 145.71 WA2OPY	8:00 Dy	29		

SEC: WB2PBO. PAMs: WB2VTT (HF), WA2OPY (VHF). RM: WB2RMK. OO reports received from K2EK K2JFJ W2TPJ and WB2ZBI. New appointments: W2DOR as EC Toms River & vicinity; WA2WIW EC Ringwood & vicinity; AA2WXM OPS. The Knight Raiders VHF Society held another successful flea market during Mar. Newly elected officers of the Nutley ARS are K2IXE, pres.; WN2YUR, vice-pres.; WN2ANK, treas.; WB2UAM, secy. New officers of Delmont RC are WA3RMA, pres.; WA3VEA, 1st vice-pres.; WA3NLT, 2nd vice-pres.; W3UI, treas.; W3FB, secy. Add the New Providence ARC to the growing list of clubs in NNJ sponsoring Novice classes. Contact WA2QIR for further information. Speaking of Novices, we welcome WN2FBY WN2EAL and WN2EAK to our ranks. Congrats to the following amateurs on their recent accomplishments: WA2SLF on becoming an Extra Class licensee, AB2ZYR and AK2ASC on receiving their Advanced tickets, AK2ASD WN2ZQS and WA2UGI on receiving their General Class licenses, and W2EQK in placing first place in the U.S.A. in the PACC contest. K2JFJ getting his Ranger QRV for some 160-metertype work. Jack has recently been working two meter simplex fm. K2QBW reports making three QSOs via an Oscar 7 to Oscar 6 relay. FB! Ray also reports working three new countries on 80 meters. WA2QHN promises us that the Sussex county repeater (WR2AHV) will soon be operational. NNJ was well represented in emergency communications efforts during the recent Guatemala earthquake crisis. Much good PR for amateur radio resulted from the tremendous job done by those amateurs involved. Want to know how to help in an emergency like this?Contact your SEC, WB2PBO, or myself — now, not during the emergency! Keep those Field Day plans going. The big day will be upon us before we know it! Traffic: (Feb.) AB2VTT 538, WB2RKK 456, AA2RMZ 338, WA2DSA 193, K2BHL 117, AA2SZW 110, WA2WIW 100, WB2RMK 97, WA2PCF 91, W2SWE 77, AK2ASD 58, W2BLM 46, WA2DIW 45, W2WHB 34, K2ZFI 32, WA2NPP 30, AB2CLW 28, WB2HSG 28, W2CTJ 23, WA2RYD 22, AA2WXM 20, W2SHM 14, WB2UJD 14, WA2RGV 10, WA2CCF 8, AK2ASC 7, WA2SRQ 7, WA2TZM 7, W2CVW 6, WB2VFT 6, W2ODV 5, WA2QJU 5, WA2SLF 5, W2WOJ 5, W2ZEP 4, WB2ZPM 4, WA2FIB 3, WB2YVC/2 3, WA2FUI 2. (Jan.) W2EQK 3.

MIDWEST DIVISION

IOWA: SCM, Max R. Otto, WØLFF — SEC: WØIYW. PAM/HF: WBØAVW, PAM/VHF: KØLKH. A very special "thank you" to WAØAUX WAØDMM and WBØENL for getting the news and traffic to me here in Southern TX. The Storm Lake ARC hosted the 3900 Club quarterly eyeball meeting with over 100 in attendance, and I was fortunate to be one of them. The tragic earthquake in Guatemala brought many IA amateurs into emergency session. WØGQ and WBØGUU in Cedar Rapids area; WAØVBX WNØQPG KØUAA WAØKVB WØIYW WAØLEW and WAØKHF in Des Moines and Ames area. WØLFF ran several medical phone patches. Congrats to WBØJYF on making PSHR. WAØQXG reports U of I station WØIO getting organized for better traffic activity. The 16/76 repeater in Ames now WRØAKC. ISU station WØYI will get some good PR as a special events participant in Veisha on May 7-8. WAØODK pres. of Mississippi Valley ARC reports novice classes with 16 students in Davenport area doing well. The Davenport club making plans for PR during the Bick Beiderbecke Jazz Festival in July. Story County AREC net now on 52/52. The IA 75 Meter Net is in session on 3970 at 1730Z and 2300Z during daylight saving. Traffic report for this net not received due to ice storm.

Net — Freq. Manager	Time/Days	Sess.	QNI	QTC
Tall Corn — 3560 KØAZJ	2330/ 0300 Dy	58	330	105

Traffic: WAØAUX 247, KØAZJ 118, WØYLS 104, WAØKHF 89, KØUAA 67, WBØJYF 41, KØLVH 38, WBØAVW 26, WØOMV 24, WBØRWN 19, WØMOQ 13, WØIO 11, WØLFF 10, WAØLKM 10, WBØHUS 3.

KANSAS: SCM, Robert M. Summers, KØBXF — SEC: KØJMF. RM: KØMRI. PAMs: WAØSEV WBØBCL. VHF PAM: WAØEDA. The year of '76 has seen a lot of our fine radio ops on the sick list, and the latest to be confined to a hospital is our SEC, KØJMF. Traffic net reports for the month of Feb. are: KWN QNI 638, QTC 180; QKS QNI 363, QTC 140; KPB QNI 161, QTC 18; KSBN QNI 965, QTC 49; CSTN QNI 846, QTC 59. Overall summary indicates traffic is down and more participation is needed on the cw frequencies. Are we really amateur radio operators or just another form of communicators?Any one interested in reviving the Novice and/or slow speed cw traffic net please contact your SCM. NCS for Sat. Morn KPN is WBØKDE, 8 AM on 3920 kHz. WBØHBM OO reports listen' good, keep up the fine operating. WØPB states all activity is low in NE KS. Band conditions appear to be taking its toll of operating hours by many of us. Perhaps by the time you read this, things will be back to normal. Hamfest time is nearing hope to see you all out this year. Why not bring a newcomer with you this year each time you attend a ham radio event? Traffic: WBØHBM 188, WØFIR 121, WØCHJ 91, KØMRI 83, WØINH 79, WØHI 68, WØOYH 45, KØBXF 38, WAØSEV 37, WØPB 36, WAØLBB 33, WBØKDE 29, WAØMLE 23, KØFPC 17, WØMCH 17, WBØOCK 14,

Four great ways to get the most from 10, 15 and 20 meters.

The Hy-Gain Thunderbirds. Hy-Gain Thunderbirds are mechanically and electrically superior. They are developed on our own 35-acre, antenna test range and engineered for brilliant, DX performance on 10, 15, and 20 meters using phone or CW.

TH6DXX. This is the super Thunderbird, the undisputed 6-element king of the tri-banders. It utilizes separate Hy-Q traps with extra large coils and exceptional L/C ratios for each band. These superb Hy-Gain traps offer long term stability and exceptional band isolation. Hy-Gain traps come factory pre-tuned for peak performance and can be adjusted according to factory supplied charts for optimum results.

The TH6DXX has Hy-Gain's exclusive Beta Match for optimum matching and positive DC grounding to eliminate most precipitation static. Impedance is 50 ohms. Of the 6 elements, 3 are active on 20 and 15 meters and 4 are active on 10. VSWR is 1.5:1 at resonance and the TH6DXX is rated for maximum legal power.

All construction is of heavy gauge, taper swaged, slotted aircraft quality aluminum tubing for light weight and easy adjustment. Mechanically and electrically superior full circumference compression clamps are used throughout. The TH6DXX is supplied with a heavy duty, cast aluminum boom-to-mast bracket that accomodates masts from 1-1/4" to 2-1/2" and provides mast feed-through for antenna stacking. Extra heavy gauge, machine formed, boom-to-element brackets are used, with plastic inserts for insulation only. The high strength boom is 24', the longest in the industry.

Without a doubt, the Hy-Gain TH6DXX is the ultimate tri-band antenna, head and shoulders above all the rest. **Order No. 389**

TH3MK3. The 3-element Thunderbird, offering outstanding performance on all three bands. Lighter and smaller than the TH6DXX, yet it has Beta Match, separate traps, DC grounding, taper swaged tubing and cast mast bracket. Takes maximum legal power. **Order No. 388**

TH3JR. The Thunderbird Junior, a compact, high performance, 3-element antenna for great tri-band action in a small space. Ideal for rooftop or lightweight tower mounting. Has Beta Match, DC ground, separate traps, taper swaged tubing and a high strength formed aluminum mast bracket. Rotates with heavy duty TV rotator. **Order No. 221**

TH2MK3. This is the popular, light-weight, and low cost 2-element Thunderbird. Again, an ideal choice for cramped locations, rooftop or light tower installation. Has separate traps, Beta Match, DC ground, taper swaged tubing and a high strength, formed aluminum mast bracket. Maximum legal power rated. **Order No. 390**

THUNDERBIRD SPECS.

Electrical	TH6DXX	TH3MK3	TH3JR	TH2MK3
Maximum power input	1 kW AM, 2 kW PEP	1 kW AM, 2 kW PEP	300 watts AM, 600 watts PEP	1 kW AM, 2 kW PEP
VSWR (at resonance)	1.5:1	Less than 2:1	Less than 2:1	Less than 2:1
Impedance	50 ohms	50 ohms	50 ohms	50 ohms
Mechanical				
Longest element	31.1'	27'	24.2'	27.3'
Boom Length	24'	14'	12'	6'
Turning radius	20'	15.7'	14.3'	14.3'
Wind load at 80 MPH	156 lbs.	103.7 lbs.	87 lbs.	96 lbs.
Maximum wind survival	100 MPH	100 MPH	80 MPH	100 MPH
Net weight	61.5 lbs.	36 lbs.	21 lbs.	22 lbs.
Mast diameter accepted	1-1/4" to 2-1/2"	1-1/4" to 2-1/2"	1-1/4" to 1-5/8"	1-5/8"
Surface area	6.1 sq. ft.	4.03 sq. ft.	3.4 sq. ft.	3.75 sq. ft.

Note: For best results, always use a Hy-Gain BN-86 Balun.

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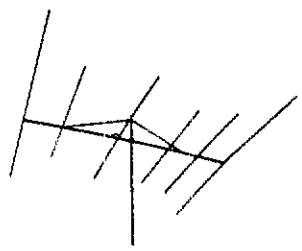
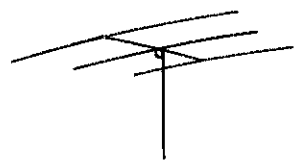


TH6DXX



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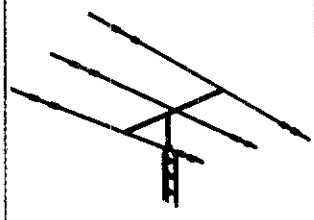
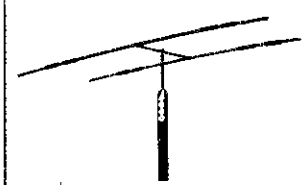


TH3JR



TH2MK3

W@GCJ 13, W@RBO 10, W@BLI 9, WA@GSG 8, W@OWH 2.

MISSOURI: SCM, L. G. Wilson, K@RWL — Asst. SCM/SEC: Cliff Chamney, K@BIX. New appointments: WB@MEO and WB@LMW as ORSs. New general WA@QQD, congrats. Increased participation on all MO nets is urged. Let's hear from some of those out of the way places. Many thanks to WA@FMD, for two fine years under his leadership. I only hope that I might do half as good as he did during his tenure of office. He was sure right about the paperwork. Special thanks to the PHD ARC and the Warrensburg ARC for fine meetings attended. Remember the PHD ARC Hamtest, May 2 in North Kansas City; MOSSBN picnic in Jefferson City on June 13; and the Washington Hamtest in Washington on Aug. 1. Hope to see all of you at these functions. W@NUB will soon have a factory repaired rig back on the bands. Guess that traffic handling is not too good on them. All stations are urged to prepare for upcoming storm season. It is better to be ready then get caught by surprise. Clean up the emergency power supply and get to checking into the area nets, so you know where and when they operate.

Net	QNI	QTC	Net	QNI	QTC
MOSSBN	1274	94	MSN	223	79
SCEN	42	3	PHD	61	9
MON 1	206	122	MEN	630	52
MON 2	90	23			

Traffic: (Feb.) K@ONK 479, W@HH 137, WB@HSP 133, WB@MEO 101, K@RWL 95, WA@FMD 88, W@BV 70, WB@DBW 64, W@OTF 47, W@EPI 42, W@OUD 42, W@NUB 34, WB@LMW 30, WA@UPA 27, WA@EMX 21, W@GBJ 15, WB@ERI 14, WB@FND 13, WB@NXX 9, WB@NPC 8, WB@IUN 6, WA@KUH 6, K@AHL 3, WB@FKY 2. (Jan.) WB@MEO 38, WB@NPC 35, W@RTO 30.

NEBRASKA: SCM, Dick Dyas, W@JCP — W@YWK and W@KCK are Silent Keys. WN@ROY and WN@ROX are new amateurs in Minden. WB@GMK & WB@GMJ are new amateurs in McCook and WB@PRH is new in Kearney. W@CCR now on 75 M. WB@LYU and WB@MNK have been very busy handling Guatemala traffic. Omaha Big Brother/Big Sister program now tutoring 31 prospective hams.

Net — Freq.	GMT/Days	Manager	QNI	QTC
Neb I — 3659	0100Z/Dy	WB@MNK	53	7
NSN I — 3982	0030Z/Dy	WA@LOY	918	15
NMN — 3982	1330Z/Dy	WB@GWR	1261	22
WNN Wx — 3950	1400Z/M-S	W@NIK	467	5
AREC — 3982	1430Z/SU	W@IRZ	241	7
CHN — 3980	1830Z/Dy	WA@GHZ	1162	89
SHN Wx — 3950	1930Z/M-S	WB@JWQ	289	13
NAN — 3980	2100Z/M-F	WA@AUX	387	15
QCWA — 3980	1500Z/S	W@FQB	96	
NSN II — 3982	0130Z/Dy	WA@LOY	359	10
160m WX — 1995	0130Z/Dy	WA@CBJ	392	214

(Z — 1 during daylight saving time)

Keith Co. amateurs and CB operators recently held a joint meeting to lay plans for both groups to actively participate in weather watches and local emergencies. Traffic: WB@LYU 163, WB@MNK 132, W@VLA 92, WA@CBJ 57, W@HTA 42, WB@EVS 28, W@FQB 28, WB@JWQ 25, WA@QCI 24, W@YFR 24, WB@FRG 19, K@BRS 16, WA@QEX 16, W@CSW 15, W@JCP 15, WB@GMQ 14, K@SFA 14,W@GEQ 13, W@MW 13, K@FJT 8, WA@HAL 6, K@HNT 6, W@UFZ 6, W@VYX 6, W@NIK 5, WA@GHZ 4, W@DMY 3, WA@EEI 3, W@LCE 3, WB@FYB 2, WB@GAK 1.

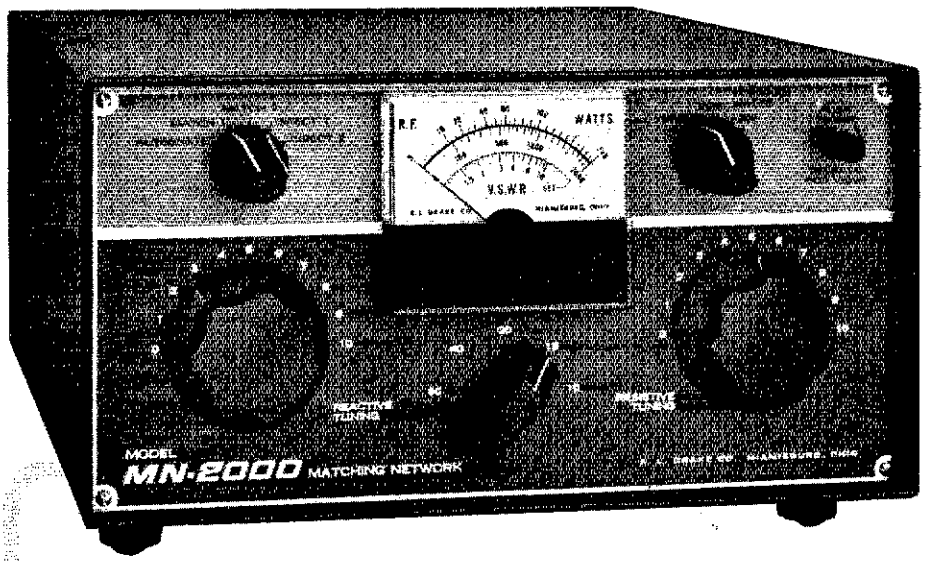
NEW ENGLAND DIVISION

CONNECTICUT: SCM, John McNassor, W1GVT — SEC: WIDGL. RM: K1EIR. PAM: K1EIC. VHF PAM: WA1ELA.

Net — Freq.	Time/Days	Sess.	QNI	QTC
CN — 3640	1900/2200 Dy	53	383	306
CPN — 3965	1800 M-S	29	504	223
	1000 Su			
VHF-2 — 28/88	2130 Dy	29	391	118

High QNI: CN — W1CTI W1EFW K1EIR W1KAM and WA1RUR. CPN — W1NQO WA1RUR WA1FFA WA1SPW and WA1UOU. SEC WIDGL continues his club visits to explain the values of EC work. Director W1HHR requests clubs make use of all ARRL Training Aids in our effort to increase the total number of Amateur radio operators. CN Bulletin notes the problems for late CN due to band conditions. K1QGC Civil Preparedness Comm. officer stresses the importance of Message Handling Procedures. WA1UAX invites all to join the Conn. Training Net at 2230Z on 3735 kHz. Stamford ARA "Squelch Burst" notes new officers for Norwalk Club: WA1SXO, pres.; WA1TFA, vice-pres./secy.; WA1QBQ, treas. WN1VIX is new Editor for Tri-City ARC Bulletin. ICRC/WR1ABM Bulletin new editor W1BGD notes another new repeater to be added soon. Hamden ARA amateur radio class includes 61 for Novice and 26 for General! Southington ARA adds 28.8 Net to the long going 145.4 Net for weekly sessions. Shoreline ARC had W1HHR W1DGL & W1QV as speakers at meeting. W1EFW returned from hospital and still made High QTC for the month! Contact W1NQO if interested in tape of WTIC special SE.I program. Congratulations to: WA1UHN for General Class; W1EFW for Feb. High QTC; and WA1RUR for High QNI on CN and CPN. Feb.! Invite local Citizens Banders to Field Day — they may see the light! Traffic: W1EFW 300, W1AW 166, WA1GFH 154, WA1WEM 152, WA1UAX 129, WA1HLP 95, WA1RUR 86, AA1RYL 74, W1CTI 71, WA1TGE 67, WA1UDB 55, AA1SPW 54, W1GVT 53, W1DGL 42, WA1RUF 40, W1BDI 29, WA1RZA 25, W1KV 18, WA1SFH 18, WA1UOU 18, WA1UHN 18, W1BDN 16, WA1TZK 14, WA1UOT 12, WB4HGD/1 10, WA1OPB 8, WA1VPE 8, W82EDW/1 8, W1KAM 6, W1QV 5, WA1UNE 4, W1CUH 3, WN1VPG 1.

EASTERN MASSACHUSETTS: SCM, Frank Baker, W1ALP — WA1TOW new EC for Andover; W1AUQ OBS; W1GUD OVS. Endorsements: W1YYZ W1ALP as ECs; W1AUQ W1NF OOs. W1FEK-G5ADX-F@CHD says he operates from G5YC most of the time. WA1FNM working on his antennas. W1NF handled one msg. to Guatemala. AA1MYK active at W1PUO. WN1WMW new in Lincoln. NEEPN 87 QNIs, 21 QTCs. EMRION has 128 QNIs, 543 QTCs. Clearing House Net had 468 QNIs, 1295 QTC, may add Sun. to net says W1UX. W1ICO heard on 75. W1GUD looking for activity on 2-meter a-m on 145.15 MHz; lets not forget fellows on the other part of this band. T9 Club met at W1MNK's. Lexington ARC applying for affiliation with ARRL. WA1TWD waiting for crystals for 432 and busy at school. Lexington HS ARC officers are WA1STJ, pres.; WA1TZO, treas. WN1TYX says EASN has 92 QNIs, 56 QTCs; NENN had 142 QNIs, 75 QTCs says K1PNB. WA1WHN is North Reading Jr. HS WA. K1MRH now in Randolph. W1AUQ says the Ten Traders meet on 3963 at 10 AM on Tue., Wed.,



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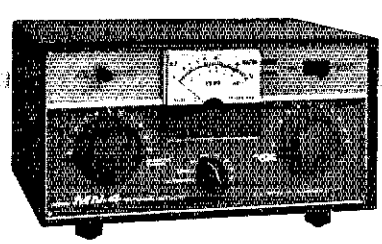

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Thur. WA1MKP is still ill. W1CT spoke at the Quannapowitt RA on HF Radio Propagation. New officers of Norwood ARC WA1OMM, pres.; WA1GSB, vice-pres.; K1HRV, secy.; WA1DLU, treas.; K1HRV, trustee. W1FPR has his HR2B fm rig stolen in Harvard Sq. WA1TLX and K1BRD have SB-200 linears. DL2AA/W1 and K1HRV building 450 MHz repeaters. Middlesex ARC sponsoring Explorer Post No. 510 to aid individuals thru age 21 to get a Novice license, contact WN1UXS at 244-8247. We are very sorry to have to report the death of W1AYN and his brother in an airplane crash. WA1QOO has his Advanced. Chelmsford ARA had the multi-medic program "Africa Calling." Officers of "PART" of Westford are WA1QYM, pres.; K1TIH, vice-pres.; WA1EMN, treas. They are using the call WA1EMN/1. WA1QAA back on the low bands. W1MV gave a talk at the Massasoit ARA, "Amateur Radio — What it was like 50 years ago." The Club repeater WR1ADF has been overhauled and good reports heard. EM2MN had 77 QNIs, 32 QTC. EC reports received from: W1PEX K1PAD WA1QKD WA1RTR W1BHD K1NFW K1ZUP K1LEP WA1QQV K1CCW. WA1QKD had 47 PSHR in Jan. Net certificates for EMRIPN have been issued to WA7ETN/1 WA1VQR WA1RLP WA1RFT WA1MSK WA1TAM WA1SXU WA1QKD W1DMH W1MX WA1QJU WA1UMU W1EQH by K1PAD net mgr. W1UX has Clearing House Net rosters, send SASE to him. W2OE still at Tripp Island, SC. Save your pennies for New England Div. Convention in Boston on Sept. 10-12. Thru the efforts of the Mass. Chapter, CHAC, June 20-26 has been proclaimed as MA Amateur Radio Week by our Governor. Ex-WA1DDO is a Silent Key. K1BXZ and W1OSN passed their Extra class. Traffic: (Feb.) WA1MHJ 368, W1PEX 206, K1PAD 172, W1UX 168, W1OJM 122, W1DMS 79, WA1QKD 65, W1EIH 60, W1FEK 52, WA1OWQ 48, W1EMG 46, W1AUQ 37, W1DMH 25, WA1TAM 14, WA1EYY 11, WA1IFE 9, W1LE 9, W1BUF 4, WA1TWD 4, WA1PAZ/1 3, WA1FNM 2, W1NF 1. (Jan.) WA1QKD 82, AA1MYK 40, WA1PAZ 1.

MAINE: SCM, Ed Bristow, WA1MIX — New ORS WA1UOY, OVS WA1TRE. Nets: NE Barnyard QNI 372, QTC 16; PTN QNI 163, QTC 125; MSSN QNI 46, QTC 12; MSSN meets at 2130Z, M-W-F on 3726 kHz. WA1UOY, Net Mgr. working hard to get MSSN going & needs your cooperation & participation. PSHR WA1FCM. New hams: WN1WHB WA1WIJ (T) WN1WIK WA1WJB(T) WA1WJP(T) WN1WJI. /1 in ME: KH6IAC W8SWN. Welcome all. New rptrs.: WR1AFN, Robinson (May) Mtn., Island Falls, 28/88, K1FLO & WA1MDA spons. filling gap for northbound travelers, WR1AGW, Musquash Mtn., Topsfield, 07/67, W1OCU & Int'l Rptr Club, spons., up abt. May 1, will link Presque Isle & Bangor. Hosstraders' Net 3rd Annual Tailgate Swaptest, Seabrook, NH, Sat., May 8, 11 A.M. Portland AR Wireless Assn. sponsor 1976 Maine QSO party 2nd weekend in May, also Annual Auction & Banquet, May 22 at Ramada Inn, Portland, Feb. Section meeting discussed help for Novices & prospective hams, how to help sick hams & families of Silent Keys. 15 present. Novice instruction by K1CLF. WA1QIK who also is forming school club. W1KA back on the air. W1HDC has ssb rig & has been on 75M. PAWA working on local Portland repeater with assist from K1YFY. K1PXF's XYL making fine recovery. FB. Yankee ARC planning up-dating of WR1ADS. Traffic: WA1FCM 225, WA1UOY 91, W1JHT 54, W1ERW 43, K1MZB 44, WA1MUX 28, W1GU 20, KH6IAC/1 18, W1RWG 16, WA1VAI 7, WA1JCN 4, WA1NMW 2.

NEW HAMPSHIRE: SCM, Robert C. Mitchell, W1SWX — SEC: K1RSC. PAM: K1YSD. RM: WA1GCE. Endorsements: W1JB W1BYS and K1SHR as OPSs; W1ALE W1JSM K1SHR OVSs; W1JB W1SWX OOs; W1JB OBS and EC for Merrimack Co. W1EHT vacationing in FL while rig is being repaired. The NHEPN report shows 34 QNI, 3 QTC in 4 sessions. WA1PSI helped in recent earthquake disaster. K1LMS repaired his Quad in time for the 1st weekend of ARRL DX contest. The GSPN has 406 QNI, 88 traffic. OO WA1JSD is off on a Mexican assignment. AA1RQT/1 has moved to Merrimack from NY. WA1PSI answered an SOS and notified the Coast Guard. Welcome hams WA1WJC WN1WJE WA1WHD WA1WGJ WA1WHY WA1WIC WA1WGN WN1WGR WN1WHW WA1WGH WN1WKF WA1WLY WA1WLJ. WA1GCE reports the NHVTN had 132 check-ins, 59 traffic. Jim requests more help on the net from cw men. K1PQV has a new Midland 13-505 on 2-meter fm. W1DXB back on 40 chasing DX. Traffic: (Feb.) K1BCS 127, WA1PSI 58, K1LMS 45, K1PQV 39, WA1GCE 35, WA1RQT/1 5, WA1PVN 5, W1SWX 5, W1EHT 2. (Jan.) WA1GCE 28, WA1PVN 17.

RHODE ISLAND: SCM, Ron Simonton, K1GMW — NCRC auction May 17, at the Seaman's Institute Newport 1900. WA1POJ received Oscar DX achievement award. WN1UZK in Saunderstown is looking for ground wave QSOs on 15 meters evenings. W1AM is on the CQ Mag. DX Advisory Committee and also newly appointed associate editor of the Long Island DX Bulletin. W1AM also programming an 8080 microprocessor. W1OP club house was robbed, missing gear includes HW-101 minus cabinet, bottom plate and cord, also Johnson Ranger s/n 63725. Still looking for help with Tall Ships program in Newport check with K5FPW/1 or K1GMW. 147.36 Traffic Net QNI 139, tfc. 43 in 29 sessions. Traffic: K1GMW 42, WA1RFT 33, WA1POJ 10, K1QFD 2.

VERMONT: SCM, J. Breakstone, WA1PSK — SEC: W1VSA.

Net — Freq. Manager	Time(Z)/Days	Sess.	Qnl	QTC
VTSSB — 3909 WA1SVS	2300 M-S 1300 Su	29	548	111
VTRFD — 3909 K1BQ8	2300 Su	5	76	9
Carrier — 3935 W2DSK	1400 M-S	24		
Vt Fone — 3932 W1KKM	1430 Su	5	133	7
Grn Mtn — 3932 W1JLZ	2230 M-S	24	568	32

Congrats to WA1SVS on his election as VTSSB Net Mgr. Welcome new amateurs WA1WHO WA1WHP WN1WHG WA1WIF WN1WJH WA1WLM (IBM ARC) WN1WLK. Yours truly has been busy on Mt. Mansfield working for WCAX-TV. WR1AFL (01-61) almost ready at higher ant. location on UVM campus. W1LMO almost QRV on RTTY with Super-Pro, 32V-1, Homebrew AFSKer, etc.

WESTERN MASSACHUSETTS: SCM, Percy C. Noble, W1BVR — SEC: WA1DNB. CW RM: W1DVW. PAM (HF): WA1MJE. PAM (VHF/UHF): W1KZS. Pick your activity and get in touch! We need more in all categories. During contests we hear many of our West. MA cw ops in full bloom sending excellent code (then

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we hear them again in the next contest). FB, but how about some of you joining our West. MA CW Net (every night on 3562 at 7:00 PM)? We welcome slower ops also. Our Net Control will welcome you with open arms, and be glad to transmit at any speed you wish. I just cannot understand why many Novices drop cw completely after getting a higher license. They have worked hard to get their code up to 13 wpm. At about 18 wpm, the work part of it goes away, and it is then fun. Just think of what you want to say, and your brain and hand do the rest (and that is true). WMPN (3955 Mon. — Fri. 4:30 PM) sessions 20, QNI 226, traffic 31, WMN sessions 29, QNI 119, traffic 65. WMEN (3935 Sun. 8:30 AM) sessions 5, QNI 122 (including 56 by liaison from repeaters) traffic 6. West MA AREC Repeater Assn. sessions 20, QNI 195, traffic 6. Traffic: W1TM 197, AA1MJE 131, AA1RLP 89, W1DVW 54, W1BVR 49, WA1OUZ 27, W1DWA 26, W1KK 25, K1ICM 7, WA1DNB 5, WA1PLS 2.

NORTHWESTERN DIVISION

ALASKA: SCM, Roy Davie, KL7CUK — The Anchorage ARC KL7AA provided communications for the Fur Rendevous World Championship Sled Dog Race. Seventeen stations participated using 2-meter fm and UHF RTTY. PAM KL7HOV reports ASN had 29 sessions with 648 check-ins. KL7JDO busy with Public Service and SEC. KL7HMK busy preparing an emergency plan for his area of responsibility. KL7IGE called in an emergency for a pair of 17 month old twins who were overcome with carbon monoxide while their parents were watching the dog race. There were over 100 stations participating in recent SET. The SEC issued the AREC bulletin and mailed it to all members. Please advise me if you desire more nets, include all data relative to the proposed net. We are now facing the longest sled dog race in the world over 1000 miles from Anchorage to Nome and amateurs of AK will furnish communications along the trail. Traffic: (Feb.) KL7JDO 29, W8ZDE/KL7 9, KL7HMK 2. (Jan.) KL7JDO 64.

IDAHO: SCM, Dale A. Brock, WA7EWV — SEC: W7JMH. PAM: WA7HOS.

Net — Freq.	Time/Days	Sess.	QNI	QTC
Manager				
FARM — 3.935	0200 Dy	27	940	41
WA7VOH				
IMN — 3.635	0230 M-F	20	166	48
W7GHT				
RACES — 3.99	1415 M-F	20	228	15
W7KDB				
Id. Silver — 3.93	0100 MWF			
W7IY				

WB7AEK has been transferred to MN. Boise has a new repeater, 146.07/.67. W7YUX elected pres. of Boise's Southern ID RAC. K7UBC on an extended vacation in CA. W7NPO WA7FDR WB7CCS and K6ZKI had a narrow escape while returning from servicing WR7AFH; but, thanks to amateur radio, they were rescued and suffered only minor frostbite. They had a snowmobile accident on the mountain; but were able to get help as they were carrying a 2-meter walkie-talkie. Traffic: WA@KKR/7 222, W7GHT 116.

MONTANA: SCM, Harry A. Roylance, W7RZY — Asst. SCM: Bertha A. Roylance, K7CHA. SEC: WA7IZR. PAM: WA7PZO. WA7OBH has 10 in a Novice class in Hardin. K7CHY is NCS on Wed. for the IMN. W7LZY also has a Novice class in progress in Hysham. MTN had 775 check-ins, 20 sessions and 31 pieces of traffic handled. Traffic: WA7KMP 20, W7NEG 16, K7CHY 12, WA7PZO 2.

OREGON: SCM, Dwight J. Albright, W7HLF — SEC: WA7UHC. RM: K7OUF. PAM: K7RQZ.

Net — Freq.	Time(Z)	QNI	QTC
Manager			
BSN — 3908	0130	465	66
WA7MHP			
OSN — 3585	0245	169	111
WA7TXV			
AREC — 3993.5	0300	211	2
WA7NEQ			
NSN — 3702	0300		
WA7UJO			
AREC — 147.06	0315 WF	21	0
W7UGE			
AREC — 146.64	0330 M-F		

In the 44th annual Linfield College speech tournament WA7USW teamed with Jim Baversock and placed 1st. PARC dinner well attended to hear W7PGY updating info on proposals. Mid Willamette Radio Club received ARRL Membership Certificate, Medford Sr. High Club likewise. Lane Co. Hamfair July 31, Aug. 1, Astoria Hamfest July 24, 25. WA7GCE Picnic Aug. 14, 15 at Black Canyon Campground. OEN Picnic Aug. 7th. Aug. 8th K. Falls. W7GUH EC for Multnomah Co. WA7UHC now our SEC. WA7GMP kept his fingers off the mike button while monitoring TG9HS. Bela Russ in Guatemala City. W7JZV was co-net control handling Medical Emergency traffic with Bela. Prepare for Field Day now. Try out your gear see if it will work. There is need for more QNI on CSN. Let's give W7JWJ a run for his "steak dinner" in the cw contest. Monitors for W7HLF W7JWY W7VSE WA7OFK W7UGE WA7GMP. Looking forward to seeing Mr. Clark (ARRL) and Mr. Thurston in July or Aug. as they travel OR. Traffic: (Feb.) K7IWD 110, W7VSE 94, K7OUF 86, K7KFG 83, K7NTS 76, WA7UJO 62, WA7MHP 41, W7DAN 34, WA7QDC 32, W7HLF 28, W7LT 15, WA7YEU 10. (Jan.) W7GUH 50.

WASHINGTON: SCM, Mary E. Lewis, W7QGP — PAM: K7YRQ. VHF PAMs: W. E. K7GWE, E. E. K7LRD. RM: K7OZA. Asst. ECs: WA7EBH, W7PWP, E. K7VAS.

Net — Freq.	Time	QNI	QTC	Sess.
Manager				
WSN — 3590	19:30	290	90	29
W7LG				
NWSSB — 3945	18:30	568	60	29
W7VDR				
NTN — 3970	11:30	1840	73	29
W7PWP				
WARTS — 3970	17:30	1950	121	29
W7QGP				
NSN — 3702	0200	216	89	29
ESN — 3920	1600	375	100	25
WA6GUK/VE7				

New officers of ESN mgr. WA6GUK/VE7 and secy. WA7ZTN. Thanks for report Mike and keep sending them. W7YH, WA State Univ. has a new station thanks to W7PV and Dean Carl Hall (WSU) a Kenwood TS-520, and soon a TH6-DXX plus HAMM-M. If you are also an alumnus of a high school, a Community College or Univ. your help for an Amateur station would be appreciated. K7WMC departing for KL7-Land and WA7BBJ/MM is radio op for NOAA

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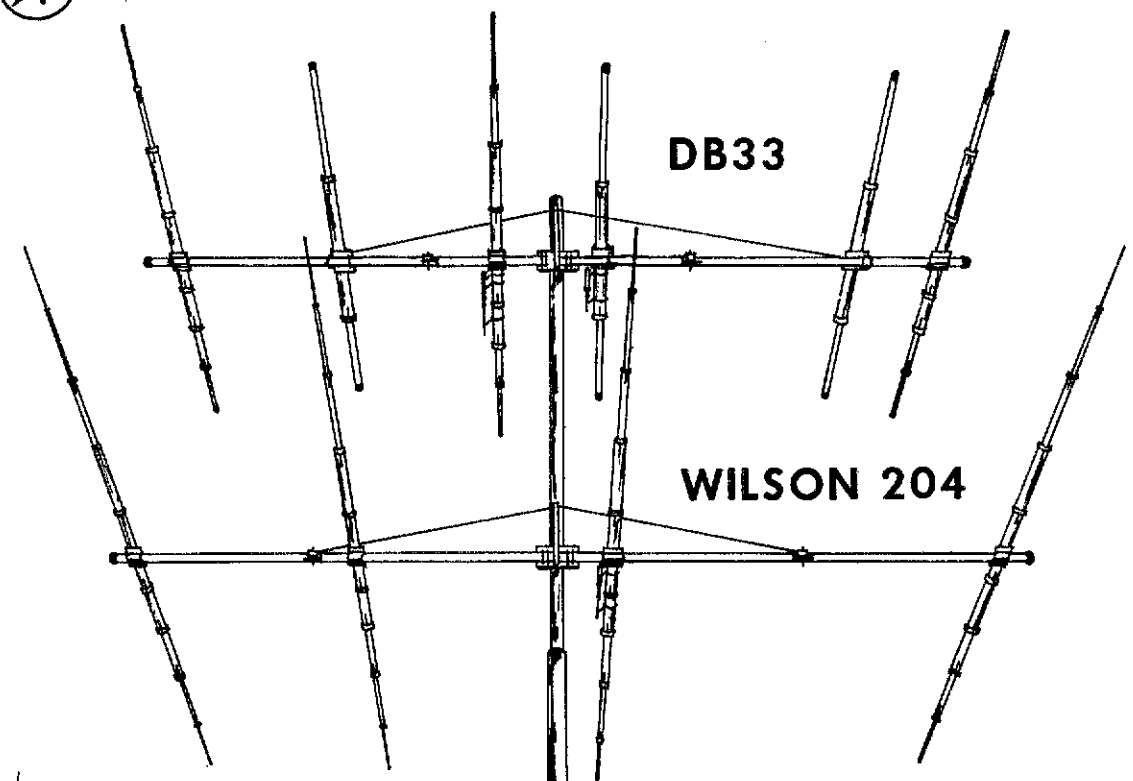

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M520	40	5	27'0"	5.0	125	90	96	269.00
M204	26	4	22'6"	3.8	100	46	49	139.00
M155	26	5	18'0"	3.7	93	41	44	139.00
M154	20	4	15'9"	3.0	75	30	32	89.00
M106	31	6	16'1"	2.9	73	34	36	99.00
DB54(20)	40	5	27'0"	7.9	198	105	119	299.00
(15)		4						
DB43(15)	19	4	15'8"	4.3	108	36	38	119.00
(10)		3						
DB33(15)	17	3	12'2"	3.8	95	31	33	89.00
(10)		3						

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PACIFIC DIVISION

EAST BAY: SCM, Charles R. Breeding, K6UWR — Asst. SCM: Ronald Martin, W6ZF. SEC: WB6RPK. Asst. SEC: WB6DSI. The following members of the Mt. Diablo ARC participated with on-the-air assistance of the Guatemala earthquake. W6QEN WB6FEU WN6AEO WN6FAX WB6HWT VE2AQV/W6 WA6HQB WA6WGB WN6HLA K6JZR WB6BIX WA6AGP ex-WN6WGC WA6ENS WA6IPI and WN6KNU. I would very much like to hear from others who took part in the Guatemala operation. From the Northern CA Net the following were listed on the activity Honor Roll. WA6BMV WA6IPI W6JXK K6JZR K6PMG W6TYM WB6UZX WB6VEF. WB6CUA has been appointed OO. W6ZF did his usual fine job as master of ceremonies at the installation of the 1976 North Bay ARA. WA6BGW having a grand time with a new Atlas. W6DNY has a fine new quad up. W6SNJ now teaching at Napa Jr. College. At the Washington Day Breakfast of the Mt. Diablo ARC, your Dir. was the main speaker. At the regular MDARC Feb. meeting, W6OAT gave a fine talk on his operation from Kingman Reef. CCRC report following new calls: WN6GQO WN6HDW WN6HLO WN6GYC WN6HEI WB6GUB WN6GXU WN6GYA WB6GUM. Be sure to work NPG on Armed Forces Day. Traffic: K6HW 452, W6TYM 288, K6JZR 216, WA6IPI 198, AA6VEF 56, WA6CAZ 5, WB6MSU 4, WB6WBG 3.

PACIFIC: SCM, Pat Corrigan, KH6GQW — EC for Big Island, Hawaii Co. is KH6EJ. SEC, KH6GMP still seeks additional EC help. SET was big success due to participation of 32 hams. We will lose WIZPB/KH6 from Kamuela this summer, back to W1. Walt has done a yeoman job on section traffic. Sorry to hear KG6JES suffered a back injury in accident on Guam. Lots of KH6 activity in ARRL DX Contest. West Pacific Novice Traffic Net meets on 21120 kHz at 0830 UTC Fri. and Sun. and 2100 UTC Fri. and Sat., mgr. is WG6JFK. WH6INE, her OM,WH6IOP, daughter, WH6QK hold up Hawaii end of net. KIGUC visited from New England. I urge you to write both Senator Fong and Senator Inouye in support of Senate Bill S3033 the Goldwater sponsored bill to require home entertainment system manufacturers to provide RFI protection or disclaimers. It is similar to Rep. Vanik's bill in the House. Don't forget '76 Hawaii Hamfest July 4 weekend. High school clubs on Oahu are getting more active. Traffic: WIZPB/KH6 244, KH6IQU 157, KC6DK 147, KG6JAQ 119, KH6GQW 34, KH6BZF 14.

SACRAMENTO VALLEY: SCM, Norman Wilson, AA6JVD — SEC: W6SMU. The El Dorado County ARC has become an ARRL affiliated club. AA6JVD had the pleasure of speaking at their last meeting. The Golden Empire AR Society's project has 25 two meter transceivers under construction. That's one way to populate their repeater (AF6AJI, 146.25/.85). WB6GZI is a new call in Los Molinos. The Pioneer Radio Club is working on the development of beeping balls for blind golfers and talking dolls for emotionally disturbed children. FB! K6SJN gave a talk on printed circuit boards to the Jan. meeting of the El Dorado club. K6JQD represented amateur radio on a recent talk show on cable TV ch. 4 in Chico. WA6FBI is again active with new QTH near Placerville (Hangtown to you old timers). AC6NJU has opened a CB store but was forgiven when he promised to push ARRL publications. Traffic: WA6ORW 10.

SAN FRANCISCO: SCM, Rusty Epps, W6OAT — The Redwood Empire Radio Amateurs is a new club formed by Mendocino Cty hams; WB6EUG was elected RERA's first pres. W6RQ had zero Hertz error on both 80-meter readings in the Feb. FMT. WB6UPV now sports a new Drake R4-C as a replacement for the old NC-300. WB6NHF K6KGA W6SLX WA6ICB and WB6DOD are instructors at the Novice license classes being run at the College of the Redwoods. WA6STS is now settled in his new QTH outside Santa Rosa. The Am. Comm. Soc. provided communications for a United Cerebral Palsy Assn. Walk-a-Thon on Marin County on Apr. 3. The North Peninsula Electronics Club planning an amateur radio exhibit at SF's Serramonte Mall the weekend of May 15-16. Both WB6UPV and members of Geo. Ladd Pioneer RC were active in handling Guatemala earthquake ttc. W6KQG looking to fire up again on 6 and 2m with antenna bigger than ever. Feb's 28 inches of rain has W6EAJ's waterwheel spinning again and generating enough electricity to power Bob's stn. W6RNL made PSHR in Feb. Traffic: (Feb.) W6RNL 216, W6IPL 197, K6TP 99, W6NL 64, WB6UPV 18, W6EAJ 8, W6GGR 3, W6OAT 2. (Jan.) WB6ITN 12, WB6JEO 10, W6GGR 6.

SAN JOAQUIN VALLEY: SCM, Ralph Sarovan, W6JPU — K6ZMW is on 2-meter ssb with an FT221. W6FEE heard on 2-meter ssb. W6DPD mobile with an Atlas 215 on all bands. W6JPS on 2-meter fm also WA6MRP. New officers of the Tulare County ARC are WB6LXA, pres.; WB6GTI, vice-pres.; W6AYV, secy.; W6ARE, repeater trustee; EC, WB6MGG. WA6NRV has an FT221. W6FEE a Gonset 2-meter Sidewinder. The call of the Wanona Jr. High School is WB6HIG. They are known as the Wildcat Amateur Radio Society. WB6JDG has a 500 watt amplifier on 2 meters, with a sixteen-element beam. Southern San Joaquin Valley FM radio Net meets on Tue. at 1930, on WR6AIM, 146.28 - 146.88 MHz. WA6HEZ heard on 2-meter fm. W6PEL has an Icom 230. WB6CFI handled over 500 messages to and from Guatemala, and received excellent press coverage. W6QKP on all bands with a KW. W6JXY has a KWM-2. The Central CA Amateur Teleprinters Society Repeater (146.10-146.70) is on the air. Those responsible for the repeater are W6YEP WA6BUH WA6SLS WB6SHI WB6QWE K6YDW and W6EJQ. The Fresno Amateur Radio Club meets on the 2nd Fri. of every month on the 10th floor of the PGE Bldg. Traffic: WA6RXI 86, WA6JDB 13, W6DPD 4, AA6CPP 2, WB6MGG 2.

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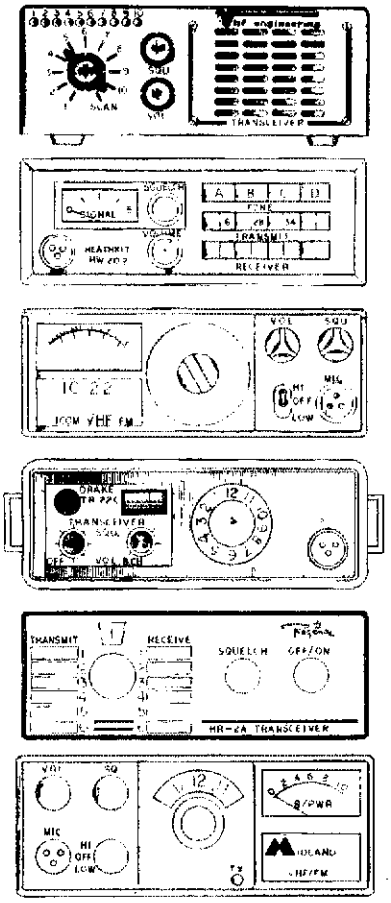

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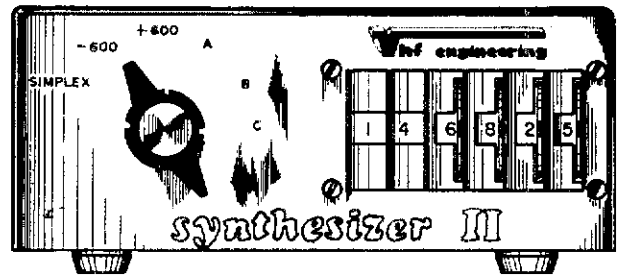

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SANTA CLARA VALLEY: SCM, Jim Maxwell, K6AQ — W6QIE W6RFF made PSHR. W6QIE ably assisted by WA6DDM and WN6HQO, handled mounds of tfc. into Guatemala during the recent earthquake. Also heard were W6HJP WB6OOO WB6OZJ K6AQ W6RUS W6RFF W6NW W6YBV and K6LM. Please QSP to your SCM or to League Hq. details of your support of the Guatemala emergency. WA6NZY now deep into the mysteries of microprocessors. The West Coast VHF will take place May 1, 2 at the Ramada Inn in Santa Clara. Two weeks later the annual International DX Convention will be held at the Fresno Hilton. The Sept. 4 weekend (Labor Day) is the date for the Pacific Division Convention, at the San Jose Hyatt House. NARC, the Northern Amateur Relay Council, going great guns, with a new bulletin ably published by K6HHD. Contact NARC via K6HHD for membership info. The Lockheed ARC will be guided thru 1976 by new pres. WA6GYT; WB6EPG, vice-pres.; WN6VIQJ, secy., W6HJP, treas. PAARA EC K6FS reports a highly successful SET with eleven mobile teams in action. W6RNU has a new 40/80 vertical going with super results. The SCV VHF Repeater Soc. (ADE) gearing up for the May Diabetes Bike-A-Thon, after a successful March of Dimes Walk-A-Thon, according to pres. WB6CDN. W6OII filling up some leisure time with four daily net schedules. The Santa Cruz ARC will hold their annual auction at their May meeting. WA6WCG arranged to have a full set of ARRL pubs with the Santa Cruz County Library, courtesy of the SCCARC gang. Field Day coming up June 26-27 — none too soon to start planning right now. Traffic: (Feb.) W6YBV 259, W6QIE 122, W6RFF 107, K6AQ 75, W6AUC 72, W6KZJ 36, W6NW 35, W6OII 22, WA6HAD 15, W6QNB 10, W6ZRJ 8, W6BVB 7. (Jan.) W6ZRJ 12, W6RNU 4.

ROANOKE DIVISION

NORTH CAROLINA: SCM, Chuck Brydges, W4WXZ — SEC: W4EHF. RM: K4MC. PAM: W4OFO. VHF PAM: K4GHR. EC of the Month is W4OFO active in Carteret Co. since 1971 and only slightly slowed down with a recent hospital bout so welcome back OM. CW nets are on the move as shown by Jan. CN with 65 sessions, 649 check-ins and 340 msgs. Jan. CNN (Carolinas Novice Net 3718 kHz daily at 5:30 EST) 31 sessions, 157 check-ins and 340 msgs. For Feb. CN hit 58 sessions, 617 check-ins and 303 msgs. Feb. CNN hit 29 sessions, 157 check-ins and 56 msgs. Thanks to WB4OBZ for CN reporting and WN4UKU for CNN info and who says cw is dead? Congrats to W4FJF new net mgr. for Tarheel Emerg Net and to WB4MXG asst. Net Mgr. K4VHO is outgoing THEN Mgr. and all of these gents have worked hard to keep THEN moving. Publicity has been explosive with WB9IBN/4 in Fayetteville paper, W4WXZ/K4CDZ and WB4JGZ on WSJS radio, WB4VKK on Chn 12 TV Greensboro, the W4CQ crew on Chn 19 TV Charlotte in Guatemala emergency, the Alamance ARC in Burlington paper on receiving public service awards for life saving, K4CJZ and K4DQ in the Greensboro Daily News and W4WXZ and K4DQ on Chn 18 TV High Point/Triad area with the latter regarding Guatemala. WXZ also had two newspaper runs. The Charlotte ARC W4CQ with cooperation from WSOC-TV9 started a drive for Guatemala and had a local trucking line volunteer seven rigs for hauling goods to Miami where Guatemalas National Airlines picked up. A bank chain and a super-market chain also allowed their locations to be collection points for goods and if a person was not able to reach one of these a mobile station made the pick-up. A real fine public relations job on the part of the W4CQ crew, congrats. An Amateur Radio Display was part of an American Engineering Soc. Bicentennial Display appearing in Greensboro, Burlington and High Point over a five-week period, thanks to W4DGE for his efforts through Bell Laboratories. Officers for the Buncombe Co. ARC are WA4KWC, pres.; WB4RPG, vice-pres.; K4IGC, secy.; W4DPF, treas. Sympathy to the families and fellow amateur's of Silent Keys W4COJ and WB4TRI, both will be greatly missed. Traffic: (Feb.) K4FTB 157, W4RWL 98, WA9NEW/4 59, W4OFO 54, WB4MXG 52, K4EG 48, W4WXZ 42, WB4FFX 35, WB4OXT 34, K4MC 33, WB4TNB 29, WA4CBB 28, K4EZH 27, W4ACY 20, WA4KFT 18, WB4JMG 18, WB4VHE 13, WA4EGH 9, W4EHF 4, K4TTN 4, W4FMN 3. (Jan.) WB4CES 6, K4DJ 2.

SOUTH CAROLINA: SCM, R. H. Miller, WA4ECJ — SEC: W4ZMZ. RM: WB4OBZ. PAM: (still looking). Whoever heard of a phone net going cw? That is the preferred mode for Sun. session of Palmetto Traffic Exchange. Rules: NCS remains on phone; for all others cw is encouraged but not mandatory at not over 15 wpm. Results? Hilarious! After 8 years with Air Force K4FPF/KL7ICL will return to Columbia in June looking for old friends on 75 and 2. WB4NBK and W4EGH continue outstanding service as OVS and OBS respectively. Greenville hamfest May 2. Governor Edwards proclaims May 10 thru 16 as Bicentennial Amateur Radio Week in SC. Details elsewhere in this issue.

Net — Freq.	Time(Z)/Days	Sess	STNS	TFC
CN — 3573	0000/0300 Dy	58	617	303
CNN — 3718	2230 Dy	29	160	56
PX — 3900	2330 Dy	29	258	97
SSBN — 3915	0000 Dy			
SCPN — 3930	1700 Dy			
QCWA — 3930	1800 S			

Traffic: WB4OBZ 339, WB4ARJ 198, WB4PDQ 107, W4NTO 97, WB4CGH 40, WN4UKU 37, W4APK 32, WA4ECJ 28, W4FMZ 20, K4JLM 17, WB4NBK 2.

VIRGINIA: SCM, Robert L. Follmar, W4QDY — SEC: WA4YIU. Asst. SEC: WA4PBG. PAM: WB4YKM VSBN 3947. RMs: K4IAF VN 3680, WB2VYK/4 VSN 3680 (6:30 PM), W4SHF 4RN 3567. Plans for the ARRL Division Convention (being held in Norfolk July 31/Aug. 1) are completed and flyers in the mail to the entire Roanoke Division. Club papers were received from Lynchburg ARC; Hampton Roads RA; VA Beach AREC and VA Beach ARC (VBARC). Your SCM had a fine visit with the VBARC and spoke to them re the ARRL organization, appointments & traffic handling. W4YZC had another BPL month, that's 3 in a row. Congrats on your Medallion. K4MLC working on his Advanced. WA4KKP sporting a new 50-ft. tower (oops, I mean antenna support) HI. W4TZC raised his dipoles. W4SUS changed QTH to Orlean. Asst. SEC says he is back in shape and operating. A new Heath walkie-talkie is in the works for WA4AJF. EC WB4WUX put on a great SET drill with excellent reporting. Don also finds the time to check into 4 traffic nets daily, nice going. K4ITV making trip to FL. W4LXB (displaced from NJ) says its nice to be here and that we have a good bunch of fellers. John is an ole' UTL buddy of mine. W4TMN put up a 4-band vertical so now has 3 antennas to

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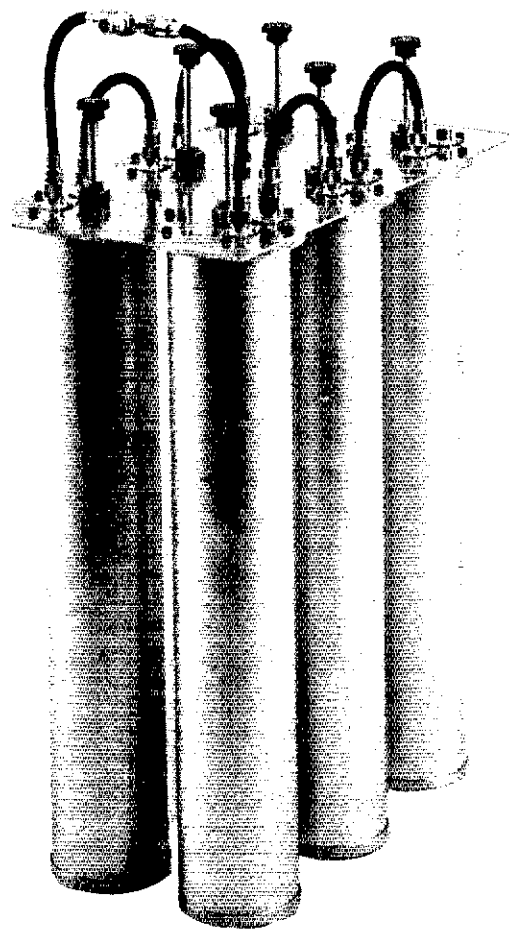

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choose from. He also reports sending a H&W msg to Guatemala, got a return answer in 5 min. on net freq. How's that for quick svc? Ye SCM and 1st VeePee W4KFC had an impromptu QSO on 2 meters on Mar. 3, when they both happened to be in Richmond. Nice surprise! Vic visited Northern VA RC, Arlington ARC. Showed Hams Wide World to Lions Club; attended AMSAT & ARRL Foundation board meetings. Oh yes, also operated in CW DX. Don't know where that feller finds all the time! EC WB4ZNB was hospitalized for a couple of weeks & now doing fine. Former SCM W4KX got his 50-year certificate from QCWA. Congrats. County Hunter W4JUJ sez biz at new low (afraid that would happen), so he spent some time in QCWA QSO & YL/OM Phone QSO parties. OO W4HU active in H&W tfc 6 days with Guatemala; Novice Roundup; ARRL DX test and SE Orlando Conv. The VA gang have favorable comments about the hand-lettered certificates being issued by the SCM, tnx. Because of undue number of late monthly reports your SCM must remind the Section members that their reports are supposed to be sent to the SCM no later than the 1st or 2nd of the month (some arrive 2 weeks late) (and from the same people!). The deadline for the SCM is the 7th of the month. Thanks. Traffic: (Feb.) W4YZC 322, WA4EPJ 170, K4KNP 156, K4MLC 147, K4GR 134, W4QDY 133, WB4FLT 102, WA4KKP 96, K4JM 94, W5VZO/4 90, W4UQ 75, WA4JVO 73, K4IAF 73, W4SHJ 66, W4TZC 45, W4SUS 39, WA4PBG 35, WA4AJF 31, W2TPV/4 24, WA4WUX 24 K4ITV 17, WA4CLK 15, W4LXB 13, W4TMN 11, W4KFC 9, W4LGM 9, K4VWK 8, WB4ZNB 6, W4MK 5, K4VIG 4, W4KX 2, W4JUJ 2, W4DM 1. (Jan.) K4KDJ 314, WB4YKM 286, WB4KIT 37, WA4AJF 33, W4ZDN 24, K4FEL 17, W4BKY 15, WB4FDT 6, WA4HHG 3.

WEST VIRGINIA: SCM, Kay Anderson, W8DUV — Have you sent in your nomination for West VA 1976 Amateur of the Year. Check with WB8DQX, chmn, to see if you still have time. WB8PKF WB8MAV and WB8DQX, all YLs upgraded to Advance. Congrats. West VA State Amateur Radio Council received call, W8WVA with W8JM as the Trustee. K8LQU appointed Asst. Director for West VA. Remember, West VA QSO Party, weekend of June 12-13. Also State Council Bicentennial QSO Party contest, bring logs and cards to Jackson's Mill State Convention, July 3rd and 4th. W8MIS confined to Gratton Hospital with broken hip. W8CCN W8CKX W8CWY and W8JM report being active in QCWA party. Huntington annual Hamfest, Camden Park on June 6. K8OFQ and K8CHW running SSTV tests. WVN CW Net in 29 sessions, 182 stations passed 55 messages. Novice Net with 101 stns in 27 sessions passed 6 messages. WVN Mid-day Phone Net, 29 sessions, 738 stations and 128 messages. WVN Phone Net, 29 sessions, 901 stations and 120 messages. Traffic: WB8DQX 91, W8HZA 47, WB8QYN 37, W8CKX 27, W8FZP 22, W8EUE 17, W8JM 15, W8DUV 9, K8LSN 8, K8QEW 7, WB8SAW 7, WA8LFW 7, WB8CNN 5, WA8RUZ 4, WA8POS 4, W8ETF 3, WB8III 3, WB8LAI 3, W8DYB 3, K8MSP 2, W8GSN 2, K8BCF 2, WA8YLW 1, WA8YIP 1, WB8IHA 1, WB8UCH 1, WB8QZR 1, WB8SCG 1, K8ZPR 1, K8VNL 1, K8IXO 1, WB8SQX 1, WB8NXV 1, WB8CPU 1, K8CFT 1, WB8MAV 1, WB8NSL 1, WB8WNO 1, K8ZDY 1, WA8RDX 1, W8AKG 1, WB8TRK 1, WN8TDA 1, WB8TJN 1, WB8VOM 1.

ROCKY MOUNTAIN DIVISION

COLORADO: SCM, Clyde O. Penney, WAØHLQ — SEC: KØFLQ. RM: WBØHCK. PAMs: KØCNV WAØYGQ. The CO Code Net (CCN) will change its name effective Apr. 1, 1976, to the CO WY Net (CWN). The CO Ten-Ten Chapter of Ten-Ten International reports membership now stands at 65 local, 74 out-of-state, total 139. Congratulations to ABØCGJ who received his Bicentennial WAS No. 22, having worked all 50 states on Jan. 15, 1976. It is with deep regret that we add to the list of Silent Keys, the calls WØEOQ WØAPZ and WØGUC. All will be sorely missed by CO Section amateurs, as well as others throughout the amateur fraternity. Congratulations to WØERR who recently became a member of QCWA. Congratulations also to newly licensed YLs WNØRTF WNØRNE WBØRQT and WBØQSM. Further congratulations to WRØFQD who is the 5th CO amateur to win membership in the International 500 club of ten-ten International, by earning VP No. 254. Newly elected officers of RMRL for 1976 are WØACD, pres.; WAØYOJ, vice-pres.; WBØBAE, secy.; WAØIDQ, treas. Net Tfc. for Feb.: Columbine QNI 1001, QTC 101, informals 268, time 1560 min.; Silver State, QNI 147, QTC 23, 25 sessions, 356 min.; Hi Noon, QNI 1317, QTC 40, informals 230, 29 sessions, 1480 min. Traffic: (Feb.) WØWYX 1932, KØZSQ 543, WBØMTA 581, KØYFK 466, WBØQOT 384, WBØNOH 320, WAØYNP 164, WØHXB 121, WØRE 64, WØETT 63, WBØPVT 51, WØLAE 36, WAØYGQ 33, KØOTU 31, KØQIX 31, KØRTO 21, WØMYB 20, WNØMCL 19, WØPT 18, WØGW 16, KØFLQ 15, WAØYNQ 13, KØSPR 10, KØCNV 9, KØSIX 8, WAØTMA 7, WAØYED 6, WBØIZO 5, WBØLFQ 4, WAØWWO 2, WØDQN 1. (Jan.) WBØMTA 593, WØETT 51.

NEW MEXICO: SCM, Edward Hart, Jr., W5RE — Asst. SCM: Joe T. Knight, W5PDY. SEC: W5ALR. RM: K5KPS. PAMs: W5PNY W5DMG. NMRRN meeting daily on 3940 kHz at 1800, this month had 875 check-ins, and handled 59 tfc. SWN meeting at 1930 on 3585 kHz had the best checkin record in three years, with 296 stations reporting and handled 229 messages. RM appointment of W5UH has been cancelled at his request. WN5OLA new ORS II. New station in Bloomfield, W5PSL. We sure had a lot of activity this month, but very little of it was reported to your SCM. Let's have a little news with your reports! W5DAD had a large traffic report, and to make it more impressive, most of it came from the disaster in Guatemala. Traffic: W5DAD 492, W5UH, K5KPS 196, W5ENI 195, WB5KSS 155, K5MAT 119, WBJOV 107, W5RE 86, WA5YTX 69, W5DMG 35, W5TWZ 25, WB5MSW 23, W5YQ 22, WA5OHI 19, WØPSL/5 18, WA5MIY 5.

UTAH: SCM, Ervin Greene, W7EU — SEC: WA7ZBO. RM: W7OCX. K7CLO WA7FGU WB7AYN and WA7MEL have been active on Bicentennial WAS. K7CLO No. 28 to complete, WA7MEL very close. UCN picking up more activity this month. Sorry to hear W7WKF lost his 70-foot tower and antenna array in the high winds. A local group is writing a script for a ham movie tentatively to be called "The Ides of Ophir." Sounds like it should be award material. WA7GWU planning autopatch for the Hidden Peak repeater. WA7VNQ planning a 40-foot tower and beam when weather permits. Congrats to WA7HOI for FB article in Feb. QST. Layne participated in the Novice roundup and was surprised to hear so many proficient cw fists on the band. W7BE passes along a

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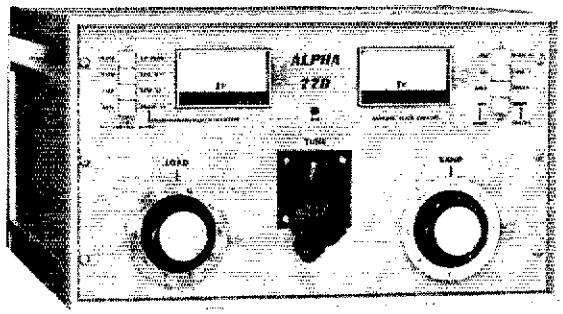

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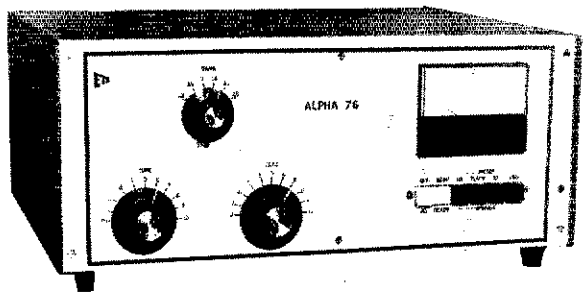

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good suggestion which bears repeating. "If you would like a QSL, what with today's postage rates, include an SASE with yours." Net Certificates have been issued to WA7MEL WA7JRC W7OCX WA7KHE WA7LGX K7HLR K7GXZ and WA7TEH for devoted activity in UCN. Thanks guys you're greatly appreciated. Thanks to all who participated in the best SET ever. Traffic: K7HLR 135, WA7MEL 105, WA7JRC 64, W7OCX 39, W7BE 33, WA7QAU 27, W7DKB 21, W7UTM 7, WA7VNQ 7, W7EU 5.

WYOMING: SCM, Joe Ernst, W7VB — W7CQL's XYL passed away Sun. Feb. 29th in Casper, WY. W7CQL was WY SCM for over ten years. WN7BTH of Cody finally received official notice that his license had been granted; apparently lost in the mail, it took concerted action by WA7NHP, the Casper RC and Sen. Hansen to get results. The Cody repeater has been tested in downtown Cody, working W7SDA in Powell, with full quieting. The repeater on 25-85 will soon be in operation. The former Cheyenne 28-88 repeater being rebuilt by Rawlins amateurs for 16-76 on Nine Mile Hill north of Rawlins should be installed by this time. The Rock Springs-Green River repeater on 34-94 having problems. The Laramie Peak 28-88 Repeater Club has ordered a four bay antenna, some heliax and a duplexer. Traffic: K7VWA 446, W7TZK 250.

SOUTHEASTERN DIVISION

ALABAMA: SCM, Jim Brashear, WB4EKJ — K4JK reports his six-element 2-meter beam was stolen (while he was listening yet!); he found the beam about a week later in a ditch. Congrats to new grandparents W4OBV and WA4KMA and their XYLs. Officers of the Burnt Corn Creak Wireless Assn. are K4KMG, pres.; WB4ARU, vice-pres.; W4SVM/4, secy-treas. Their repeater WR4ALR is on 28/88; K4KMG waiting for license to put his on the air on 31/91. Brewton working on one for 37/97. Officers of Muscle Shoals ARC are WA4EEC, pres.; K4CUU, vice-pres.; WA4JQZ, secy-treas.; K4OXU K4ARD and WB4FIR, trustees. WA4ZDW WB4KKV WB4FIR WA4EEC K4CUU WA4HUJ K4LGF K4ODU WB4GIW and WB4JNY provided communications for CD Nat'l Guard exercise Lab Mate II. Regret to report W4DEO a Silent Key. W4HHU assisting with traffic into TN. WB4SVH reports moving their repeater (22/82) to the Veterans Hospital and gained about 150 ft. in elevation. W4YFN gave a talk to the Huntsville ARC on the history of the club. Congrats to WN4RMP on passing the General exam, to WB4OCU and WA4RUH on passing the Extra. Standing room only was the word recently at the Birmingham ARC when that club started new amateur radio classes; cooperation of the media and a good PR program created all the interest. Gov. Wallace has proclaimed AL Amateur Radio Week June 21 through June 27, 1976. Appointed W4MVM as EC Mobile Co; K4UMD OBS. Traffic: (Feb.) WB4EKJ 220, WN4JDH 162, W4RQS 112, WA4ZDW 66, WA4TMG 48, WB4RCF 40, K4AOZ 38, K4GUU 33, WA4EUD 29, WN4RND 28, WA4MLK 24, K4LYY 16, WB4CQA 7, K4CUU 5, WB4TVY 4, WB4SVH 1. (Jan.) WB4CQA 10.

CANAL ZONE: SCM, Roderick J. Isler, KZ5PI — The Annual Crossroads of the World Hamfest was held Mar. 27, 1976 at the Civic Center, Gamboa, CZ. This year's Hamfest was a hugh success and many thanks are extended to KZ5FB and his planning committee for making this Hamfest the best ever. Congratulations to KZ5AS for his outstanding ticket sales for the door prize, which helped make the Hamfest *successful* economically. The Sat. morning coffee meetings at the Balboa cafeteria is increasing and a huge success. All CZ and prospective hams are invited. Recently, at the monthly CZARA meeting, raffles have been established and were met with huge success. Future prizes should be even greater. KZ5VV was voted "Ham of the Year" by the CZARA and a plaque was presented for his many achievements in amateur radio. Plans are underway for this years Field Day, with the intention of exceeding last years results.

GEORGIA: SCM, A. H. Stakely, K4WC — Though dozens of GA hams were active in Guatemala disaster WA4BZY and WA4OQO deserve great credit. WA4BZY was assisted at his station by WB4FGG WA4AJY WB4FXX WB4GFI K4LLN WB4ILR WA4MHS WA4SSU and WA4VWV. Guatemala government and Salvation Army expressed their thanks by giving a tour of the disaster area to WA4BZY and WA4OQO. WA4AJY flew there to install and operate a repeater. Our congratulations to all for a fine public service. Ask Quent about his CSC uniform experiences and Joe about his plane crash in Guatemala. WA4BZY makes BPL. Making PSHR are WA4BZY K4VHC K4YRL and K4FLR. GSN doing great. W4SHL made GSN Honor Roll with crystal control and straight key. NW GA ARC going for solid state emergency powered repeater. GSBN made 2505 points in SET. GSN Feb. QNI 394, QTC 185, total stns 59. GSBN QNI 1470, QTC 106. WB4AEG monitoring 6 meters. WN4NFN passed General. K4QSW passed Advanced. K4VHC now on RTTY. K4LRO gets CW-DXCC No. 29. WA4OQO gets Bicentennial WAS No. 7. Remember GA QSO party May 8-10; details from AD4BAI. Columbus hamfest May 9 and Atlanta Hamfestival June 11-13. Traffic: (Feb.) WA4BZY 3314, K4VHC 165, WB4QGN 154, WA4BAA 113, WB4IGX 111, K4JJQ 41, K4YRL 30, W4AAY 24, WB4SPB 22, AD4BAI 18, K4NM 17, WB4ACV 12, AC4HON 8, K4WC 7, W4BTZ 3. (Jan.) WA4BAA 115, AC4HON 48, W4REI 14, WB4SPB 11.

NORTHERN FLORIDA: SCM, Frank M. Butler, Jr., W4RKH — New NTS affiliation requirements were agreed on by FL SCMs at Orlando meeting. Nets must meet daily & provide rep. to next higher net at least 45 times/month. NFPN QNI is up, 33/session in Feb. D5RN meets daily 7290 kHz at 2130Z, needs more reps from FL Panhandle. Appointments: WA4JNC EC, Seminole Co.; K4IEX ORS. WB4GZV earned SNC for FAST Net. 6m fm again getting popular with stations on 52.525 in several NW FL towns. A mobile rig left on accidentally for 4 hours prompted a 2m transmitter hunt in Fort Walton. WA4BII a new ham in Bonifay. Panama City clubs jointly sponsoring new licensing course at GCJC; K4AHV and WB4IXK instructors. W4JJ new call of St. Andrews Bay ARS. WA4UVX/4 has plans for 450/220 cross-band repeater, with micro-processor control. W6DSD/4 very active in Guatemala disaster. WA4ZPI works all bands, 160 thru 2m. WN4TAW & son, WN4UBI are new hams in Madison. W4TSU & WA4LVX are total ham pop. of Hamilton Co. WA4FLJ bought 6m ssb rig. WR4ALV will give you the time in cw on request! Gainesville amateurs WA4UFO WA4PWF and WA4YPY received recognition for Guatemala disaster activity. New call Santa Fe JC ARS WB4IJR. Jax. has a new 6m SSB Net Wed. on 50.2 MHz. A new QCWA chapter formed in NE FL, with W4BRZ, pres.; W4SZ, secy-treas.

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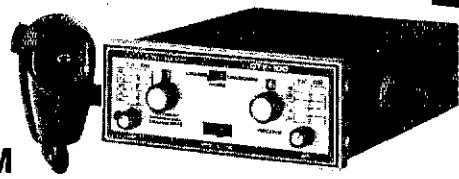

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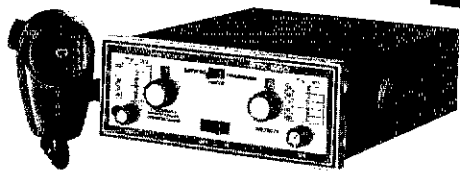

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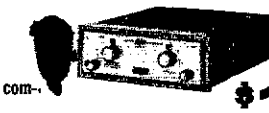

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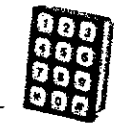

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W4UJL's Orange Co. SET report a masterpiece! WB4GHU put up new ant; now QNI's phone nets. WB4NMU passed Extra Class. WB4NJI new NM for VEN. W4IA back on GN. Traffic: (Feb.) WA4FBI 321, WB4SKI 203, WB4TPR/4 142, WB4HKP 138, W4WNY 124, WB4GHU 121, WB4DXN 87, W4KIX 80, WA4WBM 76, W4LDM 70, WB4DTS 67, W4RKH 53, WA4EYU 52, WB4NJI 51, WB4OMG 44, W4JL/4 40, WB4GZV 37, WA4BAX 26, WB4FJY 25, WB4VDM 24, WA4IWW 23, K4OER 19, WB4RVW 19, WB4DAD 18, K4RZM 18, WA4TXM 15, WB4VAP 14, WA4MYF 11, WA4ECY 9, WB4TVQ 9, WA4EYW 8, K4IEX 8, WA4CRI 6, WB4TZR 6, WB4WYX 6, WB4VMP 5, K4RNS 5, W4IA 2. (Jan.) WB4NMU 75, WB4DAD 55, WA4CRI 3.

SOUTHERN FLORIDA: SCM, Woodrow Huddleston, K4SCL — SEC: W4IYT. Asst. SEC: W4SMK. RM: K4EBE (RTTY). PAMs: WA4NBE (40M) W4OGX (75M). New appointments this month: WB4OSN OVS. Endorsements: W4LEP EC Indian River Co.; W4OGX PAM 75 OPS OBS; WA4UQQ ORS OPS. OOs reporting: K4CFV K4DAS K4JPF WA4UVG. Many Southern FL stations were active and handled lots of information in connection with the Guatemala earthquake disaster, but much of this was not reported as traffic because it was not in ARRL form. W4IYT reports about 2800 messages processed through K4IWT, Red Cross Miami, for Guatemala, but most were carried in by mobiles and sent out by aircraft. Again, indications are that we should develop mobile emergency communication units that could be moved quickly to a distressed area. Those who have been hit by a catastrophe are not likely to be in condition to take care of themselves and also handle thousands of messages by radio. They are likely to need help from outside. WA4DHR is now active on the 6M RTTY auto-start net in St. Petersburg. The Microprocessor Society of FL is now formed and active in Tampa Bay area. WB4ARN has "SWTPC 6800 Computer" and WA4CTM is building one. WA4DHR working on 8080 system. WA4KKE working lots of DX with new quad. K4CFV reports two new Novices. WN4IBW and WN4IBV whom he trained in Tampa. WA4GNI reports a new Novice WN4FYA in Kissimmee. WA4UVG received good newspaper and TV coverage of his efforts with Guatemalan traffic. Traffic: (Feb.) W4WYR 531, WA4SCK 498, K4SJH 464, K4SCL 432, W4MEE 311, W4EH 305, K4TH 291, WB4AID 244, WA4IJH 196, WB4ZSO 187, WA4JPV 161, W4DVO 141, WA4UVG 128, WA4NBE 112, WB4ALH 88, W4QM 80, K4IWT 78, WA4KKE 72, K4GYF 71, WA4EIC 67, WA4CTM 63, K4CAG 56, WB4WYG 45, W4EEB/4 44, W4GDK 33, K4BLM 32, W4IYT 31, W4IRA 22, K4CFV 21, W4ILE 21, W4SMK 20, WB4CDQ 16, W4MML 14, K4QCG 14, K4YSN 14, K4EIK 12, WA4UQQ 12, K4DAS 6, W4KGJ 6, W4LK 6, K4MV 6. (Jan.) WA4GNI 45, K4YSN 43, W4MML 8, K4DRH 3.

WEST INDIES: SCM, David Novoa, KP4BDL — New appointments KP4ZC OO, KP4EHF OVS. Again amateur radio communications were vital in an emergency. Many local hams helped after the Guatemala earthquake. KP4EGO has a new SB-104 waiting for his Advanced ticket. KP4s EFP ZC DJE MO EBQ and AN are very active on 80 ssb. KP4s EAT BBI AZA AZV AOI MW WL AYX and DRF all heard on 40 ssb almost daily. KP4s DAL EAJ and EJE working lots of DX with the AJ4 prefix. New calls heard on two meters: KP4s EHS EJZ and EKJ. A repeater in El Yunque is being installed by KP4s DPA MC MQ CKY DAL and others and will be on 146.01-61. W4LQO/KP4 active on 20 ssb. KV4s BV and AQ have strong signals on 80 ssb. Get ready for the next CD Party and Field Day. Let's work hard and win this year. Traffic: TI2PTS/KP4 92, KP4BSQ 47, KP4HG 44, KP4BRI 24, KP4EBQ 6, KP4BBK 3, KP4BDL 2.

SOUTHWESTERN DIVISION

ARIZONA: SCM, Marshall Lincoln, W7DQS — RM: K7NHL. PAMs: WA7KQE and W7UQQ. K7RDG K7NTG W7JYG W7HXM and W7KEY report handling large amounts of messages in and out of Guatemala during the Feb. earthquake there. K7NTG also submitted an excellent detailed report of the SET exercise in Pima County. WA7NIY is new pres. of the AZ Repeater Assn., succeeding WA7TGB, who is moving away. WA7PNY is the new vice-pres. WA7ILG, OM of WA7ESA, and K7KAW former resident of Scottsdale are reported as Silent Keys. A frequency study by the ARA recommends statewide coverage by overlapping repeaters on 16/76, 34/94, 22/82, 28/88 and 04/64. AZ ARC meetings will include time for selling and swapping of gear between the business portion of the meetings and the program. WA7GEQ, ARCA chmn., recommends clubs over the state put on theory and code classes to get more persons into amateur radio. ARRL Hq. is working on new training programs which should assist such efforts. K7NMQ is a new OBS. Net traffic (Feb.): Cactus Net QNI 1,178, QTC 281; ATEN QNI 645, QTC 36; SWN QNI 295, QTC 229. ATEN certificates to K7NMQ, W7RQ, K7GLA and K7NTG. Traffic: K7NTG 312, K7NHL 277, K7RDG 112, W7UQQ 56, WA7VTM 44, WA7KQE 34, K7UJV 33, WA7YKM 21, W7DQS 18, WA7EXL 7, K7CC 4, WA7JCK 3, K7GLA 1.

LOS ANGELES: SCM, Eugene H. Violino, W6INH — SEC: W6SPK. RMs: K6UYK WB6PKA WB6ZVC. I would like to mention that I am now checking all my appointments and those who have been inactive I plan to terminate. It seems that lots of fellows want appointments and start out fairly well and after a while we don't hear from them anymore. I have several ORS appointments that have not been active as relay stations for many months and I have not received reports from them for some time. WB6MKA reports of a rescue in the mountains of two hams who had a serious accident during the recent rains. The rescue was effected by the San Gabriel Valley Emergency Corps, with the help of WB6SNU WB6MKA WA6CYY WB6JBL and several others. You will probably read this in other parts of QST. The Southern CA Net had a brunch meeting in No. Hollywood with 33 members attending; here were gathered the best cw operators in the Los Angeles Section. The meeting was conducted by WB6OYN and WB6AIT. Many serious discussions ensued regarding net operations and traffic. W6SPK was also in attendance, coordinating the group into AREC affairs. Let's not forget the LERC Hamfest in May, this is still one of our best yearly attractions, with increased activity and now larger swap tables. Congrats to WB6VID for helping to set up the first radio contacts between Los Angeles Area Hams and TG9MP in setting up for emergency traffic. W6VH has been checking into the Sun. QCWA Net with a new Atlas. WA6MQM has upgraded his ticket to Advanced and he is now working on his Extra. Attention is called to the Official Bulletin transmissions by WA6FEJ on 7060

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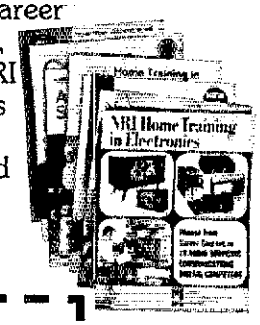

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kHz at 0330 and 2430Z every Thur. This is one easy way to keep up with the latest news on the FCC. One of the most popular 2-meter buffs WA6DUC recently had a motorcycle accident, but recovering in fine shape, it has curtailed his 2-meter activities. New free radio classes will be given Tue. nights at the Ramona Radio Club at 546 W. Broadway, San Gabriel. Classes will include basic electric and radio theory, Morse Code and rules and regulations governing radio station operation. Classes will start at 7 PM. No radio experience is required. Estimated duration will be approx. 10 weeks. Traffic: WB6YID 624, WB6PKA 311, W6INH 286, W6HUJ 185, W6OEO 152, W6QAE 85, WB6ARP 59, WB6ETB 44, AB6AIT 43, K6EA 23, WA6EWY 16, K6CL 14, WB6JFD 14, W6USY 10, WA6ZKI 9, W6BRO 8, WA6TCH 6, W6NKE 6, WB6EPS 4.

ORANGE: SCM, William L. Weise, W6CPB — Asst. SCM: Dick Birbeck, K6CID. SEC: WA6TVA. RM/PAM: WB6AKR. Palm Springs, College of Desert has an impressive amateur radio licensing class. It is reported that 45 students are enrolled. Congrats to WA6BJD and WA6BJB instructors. Also W6WLU has his third class in Amateur Radio at the Palm Desert Campus. How about classes being conducted in other clubs? Please send me the dope. OPS has been renewed for W6BUK. He says that he has had an appointment since about 1938. One of the oldest in the area. Band conditions for most traffic nets have been very poor. Look for some improvement as summer comes. Do not forget the League Officials meeting on June 5 at the Rumble Seat in Riverside. Take the Adams St. Offramp from Hiway 91. We will meet for lunch, meeting follows. Mark your calendar. Congrats to all who participated in handling traffic for the Guatemala earthquake. A job well done. WA6TVA is very active on the 2-meter RTTY nets. Steve is pres. of the group and meets regularly to firm up operations. PSHR: WA6TVA 58. Traffic: WB6EIG 331, WA6TVA 58, W6WRJ 32, W6CPB 28, WA6YWS 6, W6QBD 4. (Jan.) WA6YWS 28.

SAN DIEGO: SCM, Arthur R. Smith, W6INI — SEC: W6GBF. New Asst. EC for 2-meter fm: WA6HJJ. New ORS is WB6HCF. North Co. YL ARC has new constitution and officers: K6AYJ, pres.; W6PJU, vice-pres.; W6YZV, secy-treas. New officers for SANDRA: W6GIC, pres.; WA6HGK, vice-pres.; WA6ENU, secy.; WB6LXG, treas. SD Co. amateurs provided extensive county-wide fire coordination system as major objective of SET 1976. Twenty-one fire departments represented. Dearth of activity can spell doom for 10 meters! Generate activity with club nets following lead set by QCWA, Pt. Loma ARC, SOBARS and Poway ARS. Ten is great for local code practice. Palomar RC's flea marts, 1st's Sat. each month, continue to be popular. Held in SWAN parking lot. Palomar repeater on 146.13/73 better than ever with new Stationmaster. Join fellow hams for pancake breakfast, 2nd Sat. each month, at Normal Heights United Methodist Church, 4650 Mansfield, San Diego. Novices are invited to participate in AREC Novice Net each Sun. at 0830 on 3725 kHz. K6SCY is net manager. Stranded motorist was aided by WA6NQZ and W6PZU thru WR6AII. New hams: WN6HGA WN6IYR. Traffic: W6BGF 145, WB6HCF 122, W6PZU 66, W6DEY 24, WA6UFY 6.

SANTA BARBARA: SCM, D. Paul Gagnon, WA6DEI — SEC: WB6HJW. RM: K6QPM. PAMs: K6YX W6KPS. W6KPS appointed PAM for the VHF net activities. The VHF Section Net meeting on WR6AFI on Wed. at 2030. Another new appointee is W6SMJ an OBS active with the TRICAR Bulletin Network on RTTY. If you are on RTTY, please contact me. We need RTTY stations to help relay information. Stations upgrading are WA6CZV to General, WB6WGE and WA6CYA Advanced. WB6CHI has produced WN6EIO WN6EIW WN6EIP WN6EIZ from his Code classes for the Canejo Valley ARC. WB6CWE board on the SCN CW net and WA6VBS trying his hand at Net Control. WB6MXM and K6QPM helped with the multi-op of K6BCE during DX Contest. W6ITW received several commendations from the Navy for his many patches to Antarctica. W6SMJ has completed a computer runoff for all hams in the northern part of the section. WA6BLS now editing Key Klix for SBARC and doing an excellent job. WA6SZC presented a humorous satire at SBARC and WB6JKM and WB6DHW making the rounds of clubs with their new microprocessors. The Central Coast ARC has frequent pot lucks in the Arroyo Grande area. W6QMV a new tower in the works. K6YHK continues counter building. WN6ASY completed an Accukeyer, WA6BRW K6LOV and K6TOD have new TS-700A vhf rigs. We regret to note WA6MDX is a Silent Key. WB6MXM used WR6AFI to call for ambulance while camping in the mountains to assist a burn victim. W6POU W6PN and WA6EJO were among those assisting Guatemala emergency. WA6WYD handled 111 msgs on MARS. Traffic: (Feb.) WA6MBZ 111, WB6MXM 67, WA6VBS 44, WA6LBO 43, W6JTA 31, W6POU 15, WA6DEI 6, K6QPH 2. (Jan.) WB6HJW 91, W6JTA 60, WA6LBO 56. (Dec.) WA6LBO 81. (Nov.) WA6LBO 44.

WEST GULF DIVISION

NORTHERN TEXAS: SCM, L. E. Harrison, W5LR — Asst. SCM: Frank E. Sewell, W5IZU. SEC: W5DWL. PAM: W5GSN. RM: W5QU. RM needed. See SCM 265-3296 Arlington. W5ARV replied in kind to SCM request for suggestions on VHF/HF fq. coordinator problem. WB5JLG Midland ARC sked mtg WG officials included SCM's 1300 Mar 20th. Kilocycle ARC rpts good activity plus plans for upcoming FD. WB5LSK made Advanced, WB5FGN retired, as did W5KSX. W5JAX in Caruth Memorial Dallas. PAM W5GSN rpts Abilene ARC 30 in Novice class, Brownfield Hamfest May 2nd & 7290 crowd set for Summerville State Pk Apr. 24, 25. No. TX top tfc man one trouble noted with TX tfc net is "minute" amt "time allowed" to pass RN5 tfc (is 20 min). Contact W5TI for details. SEC rpts good SET. FB. W5QPX NoTx SR OO completed tour of duty Dalhart with FAA troops. Even so, Gil made eleven observations showing T9C discrepancies sent in six 2-letter calls. The XYL and yours truly returned to Arlington after sojurn in Valley. Winter Texans boosted population by 200% during period Nov. to Mar. Houston QCWA Feb. mtg at Sharpstown (Wyatts) gave 50-year awards to W5AIR K5AV and W5TPR. Also discussed Nat'l. QCWA mtg slated Houston Oct. 8,9,10. Dallas QCWA mtg Wyatts, Mkg-bd/Abrams per W5KNY and Dallas ARC OT Nite Apr. 6. W1NJM's 00 report covers reimbursement for mailing notices on infringement. Also listed in report were the nation's 10 top OOs including K6KA W9KO K4MZE and others. TX VHF/FM Society mtg held in Aggieland this year. We now read where the Mid-Summer mtg sked for Austin.

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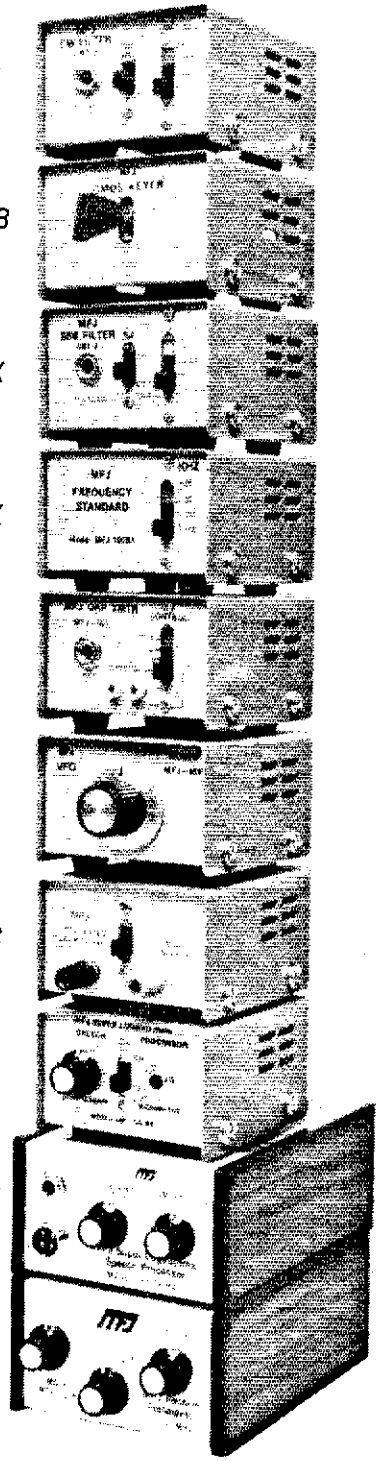

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W5NSQ moves to League's Advisory Board (Rptr5) effective Dec. '75. SMU's W5YF reported. WA5IKU advises Sporadic "F" noticable on 6 meters. He also worked Oscar via WA8CKI. K5SOR wants into AREC. SEC take note. Dallas ARC announces classes started Feb. 16, attendance 170 people, 112 for Novice, 52 for General and 6 Advanced. Per WB5LWB pres. DARC, Lafayette ARC, Inc. Banquet held Mar. 13 & the Panhandle ARC says K5IBI active on 2 meters with borrowed rig. FD appointens include WA5PEO and K5KNA. Arlington ARC says 6 Flag Shopping Center demonstration Apr. 24 per K5GMY & his co-chmn. W5CEG. Channel 8 recently gave us FB publicity. Richardson WK meets on 10 meters Mon. nights 28.649 kHz. Join with club meeting at TPL Bldg Monthly 8:PM Tue. NC W5KHP. Traffic: (Feb.) W5TI 346, WB5DXB 59, WB5MFQ 56, W5GY 52, W5DWL 41, W5YK 6, W5LR 4. (Jan.) WA5BXH 15, WA5GSN 12, WB2DXC/5 4. (Dec.) WB2DXC/5 7.

OKLAHOMA: SCM, Leonard Hollar, WA5FSN — Most repeaters have their storm warning plans all made and ready to put in operation. Hope they are not needed this spring. The Elk City 16/76 machine giving excellent coverage of West Central OK. Ardmore should be moved from 46/94 to 37/97 by the time this is published. March winds in Feb. (no less) took their toll of antennas. W5REC newest OPS. WN5RJS new call in Enid with several more waiting on tickets. Oklahoma City working hard on Ham Holiday III scheduled for Aug. 7-8. All Net reports show excellent participation and considerable traffic handled. The Sooner Traffic Net covering 5 states on a regular basis. OC needs more weather reporting stations on the traffic and weather net at 5:45 P.M. My hat is off to the many unsung volunteers conducting Code and Theory classes. Enid and Miami have classes in session at this time. Traffic: WB5NKD 190, WB5KGP 129, W5RB 129, W5REC 126, WB5ELG 47, WB5AZS 40, WB5NKC 36, W5PML 36, WB5OYU 30, WA5FSN 29, WB5PVL 17, W55UG 16, WA5OUV 15, WB5EAY 8, K5CAY 4, W5JJ 3, W5FFW 2.

SOUTHERN TEXAS: SCM, Arthur R. Ross, W5KR — SEC: W5TQP. RM: W5UGE. PAM: WB5AMN. OOs reporting this month: WB5CIT W5NGW K5BSZ. OVS reporting: WB5CIT. Big news this month is earthquake in Guatemala. K5GDX and WB5GTB (who also is W@AIG) were extremely active in an official business and emergency-only traffic net; they put in many hours helping to pass the traffic but have not been able to come up with any sort of actual traffic count. OPS WB5GVO was quite busy with H & W traffic; he ran one emergency phone patch between two doctors; he made TV news when a reporter and camera crew stopped by. OPS WA5VBM was "on-the-spot" active, almost while the quake was still quaking, with emergency traffic; she took care of some H & W traffic later. OPS WA5RKU was also active in the H & W nets. The Guatemala quake efforts of WB5MNR and WN5MNQ received news media attention in Corpus Christi. Corpus Christi Club's radio school going strong with 25 studying in the General category and 35 in the Novice group; WA5PJE W5OOQ WB5OLT and WA5SRX are running the show. RM W5UGE finally got some "vanity plates" and is putting an FT-101E in his car. EC W5TFW says that classes going good there. WB5PSC passed the Advanced class exam. WN5QPX went to Houston and passed the General. "Tis nice to get reports, but 'tis nicer to also receive remarks to help fill this column." OO/OVS WB5CIT reports 20-meter RTTY has been generally pretty good; TIRS between Blanco and Austin now operating; the two will be interconnected in few weeks. Traffic: (Feb.) K5HZR 421, W5KLV 354, WA5VBM 344, W5UGE 286, W5UJJ 239, WB5GVO 157, WB5AMN 93, W5KR 69, WA5YEA 63, WB5NUM 62, WB5QDW 57, WB5FMA 50, W8RTN/5 49, WB5IJR 37, WA5RKU 36, W5BGE 32, W5QO 31, W5TFW 22, W5HNS 20, WB5PSC 10, K5RVF 11, K5ROZ 7. (Jan.) WB5LTW 50, WB5GZG 6.

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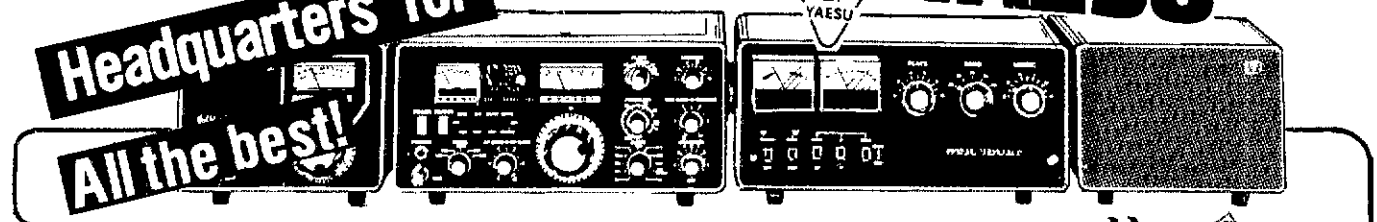

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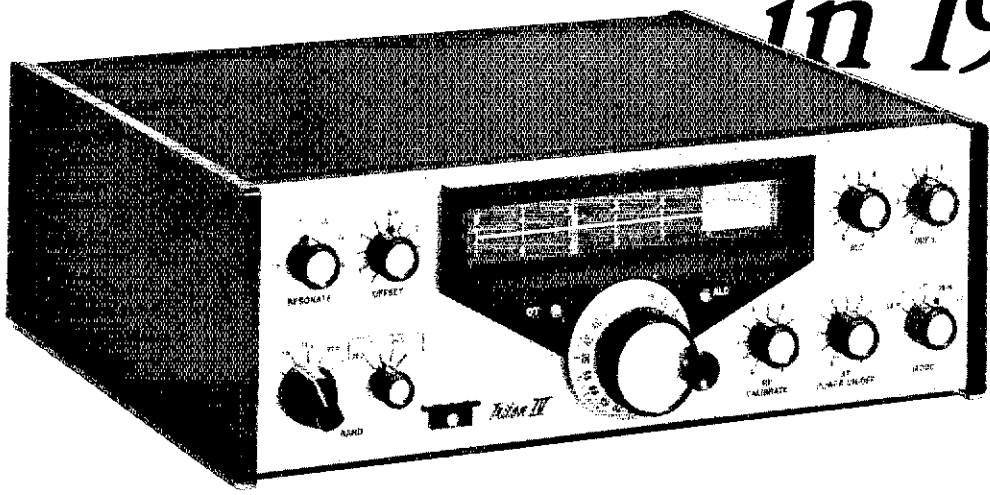

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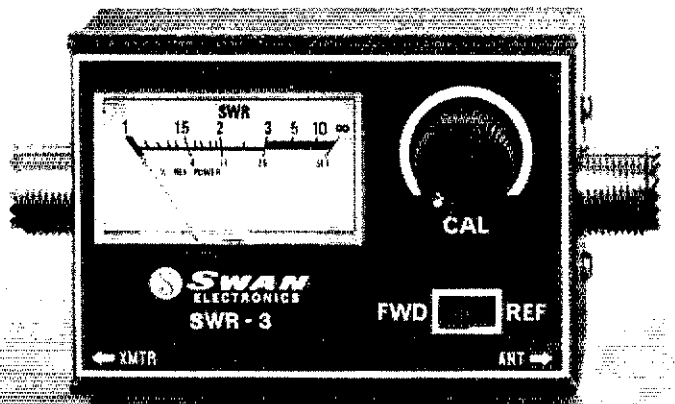

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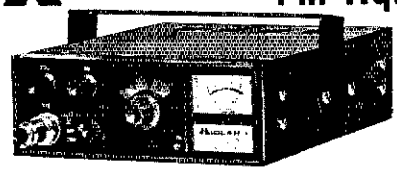

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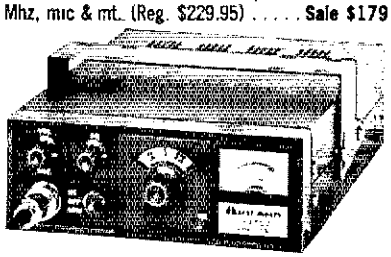

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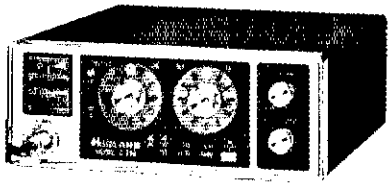

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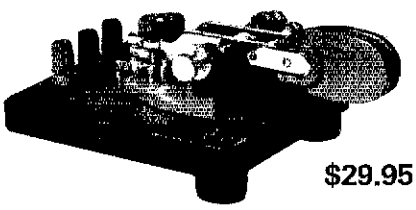

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- For use with all electronic keyers
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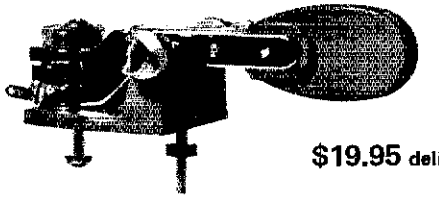
- Paddles reversible for wide or close finger spacing



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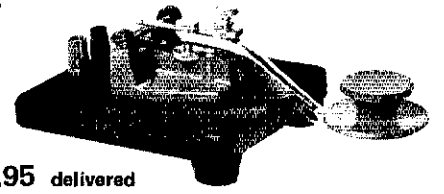

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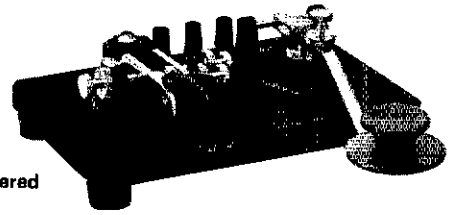

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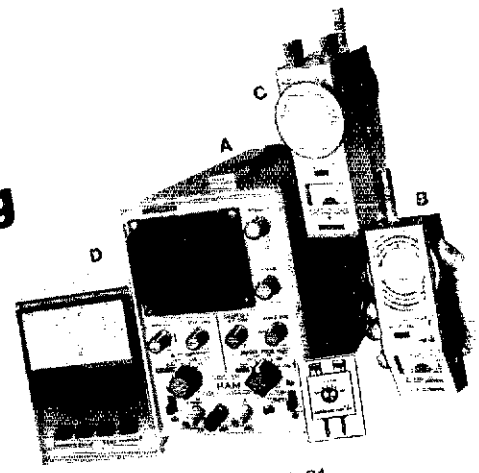

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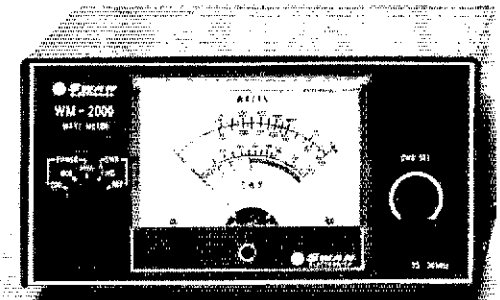

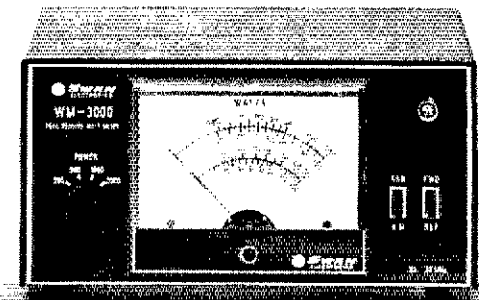

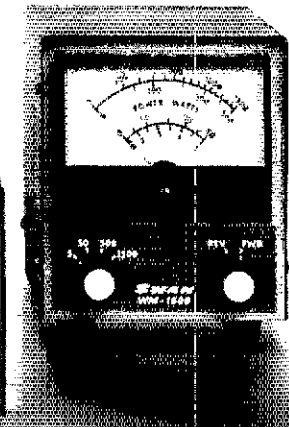

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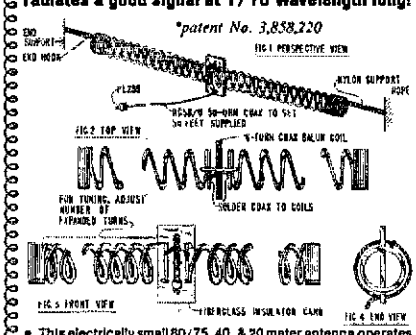

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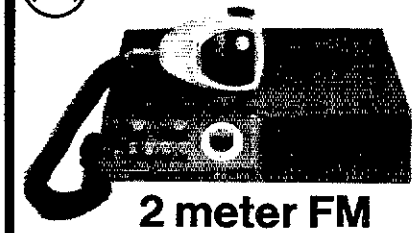

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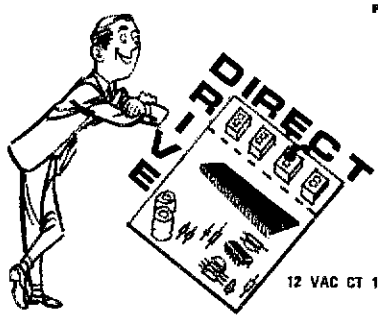

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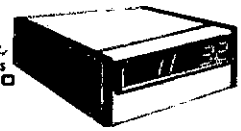

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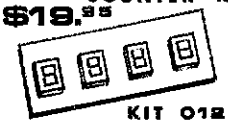

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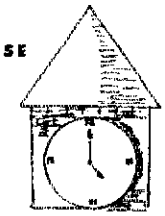

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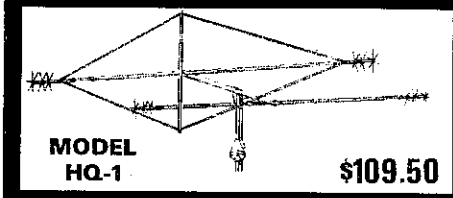

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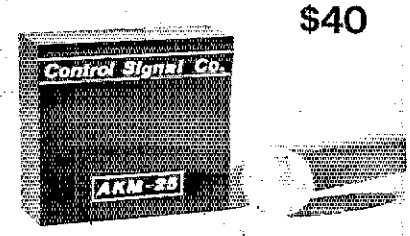

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A complete course of instruction is on the tape. Practice material at 5, 7 and 9 WPM. Includes code groups and punctuation. Prepares you for the Novice examination.

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Tapes are 2-Track Monaural

7" Reel Cassette
(7½ IPS) (C-120)
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Mini red	.12
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Fully multiplexed, common cathode. Goldplated. Ideal for mini 6 digit clock.

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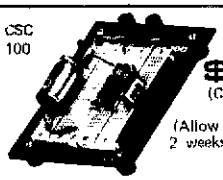
Kit No. 70250-3R (DL747 readouts)	....$28.50

All kits include Components, PC Boards, Transformer, and Case.

CSC 100



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7437	.39
7438	.35
7440	.16
7442	.69
7447	.89
7448	.89
7453	.16
7473	.37
7474	.37
7475	.65
7476	.39
7483	.85
7490	.69
7492	.75
7493	.75
7495	.75
7496	.75
74121	.38
74123	.75
74151	.75
74153	.89
74154	.95
74161	.99
74163	1.19
74164	1.89
74165	1.49
74174	1.29
74175	1.39
74181	2.75
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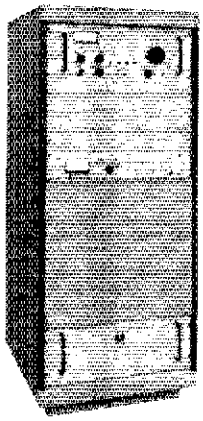

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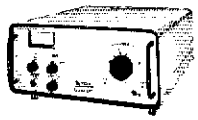
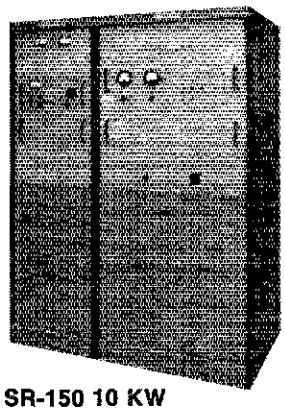


SR-216
150 Watt



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SSB/ISB TRANSMITTER

SR-130 AN/FRT-91 1 KW
ISB TRANSMITTER

Users include: U.S. ARMY, NAVY, AIR FORCE, COAST GUARD, ATOMIC ENERGY COMM., NAT'L. WEATHER SERVICE, NASA, FAA, FCC, AC of E, NOS, USGS, etc.

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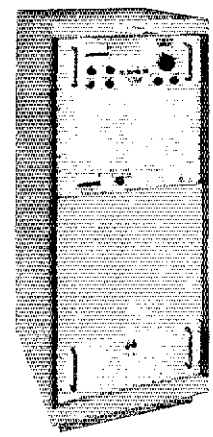
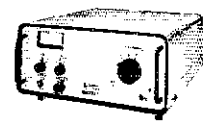


SR-130 MF



SR-216 MF

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Chart showing uH per 100 turns

CORE SIZE	MIX 2 .5-30MHz u=10	MIX 6 10-90MHz u=8.5	MIX 12 50-200MHz u=4	SIZE OD (in.)	PRICE USA $
T-200	120			3.00	3.25
T-106	135			1.06	1.50
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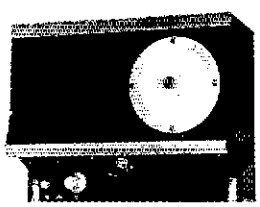
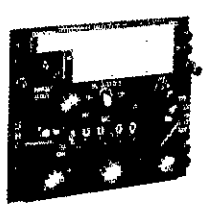
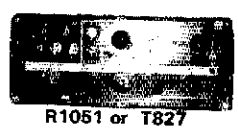


490-T Ant. Tuning Unit
(Also known as CU1658 and CU1669)

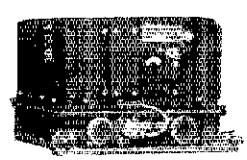


ARC-51 Control Box

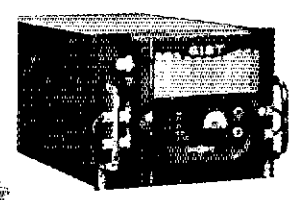


R1051 or T827

RT-794/PRC-74



ARC-51 Transceiver



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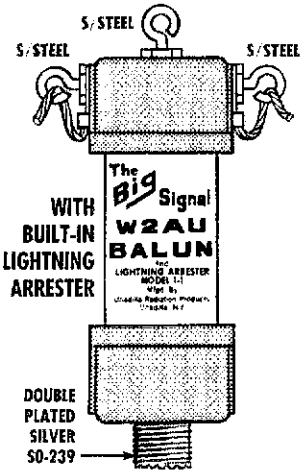

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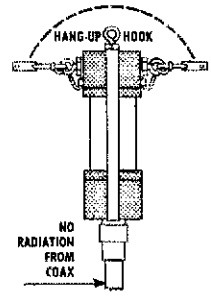

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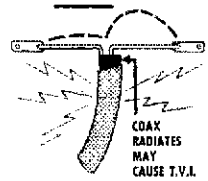

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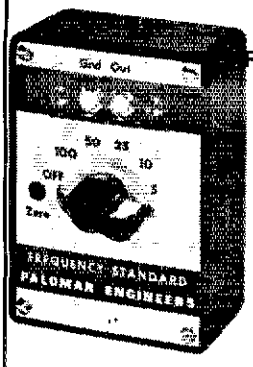

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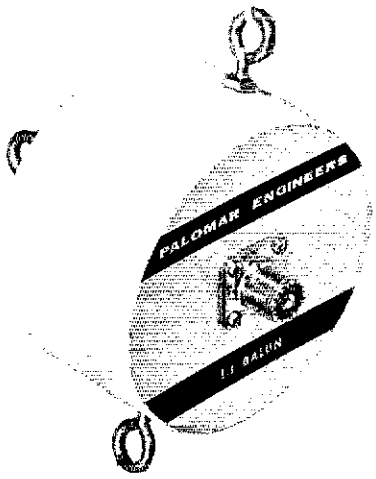

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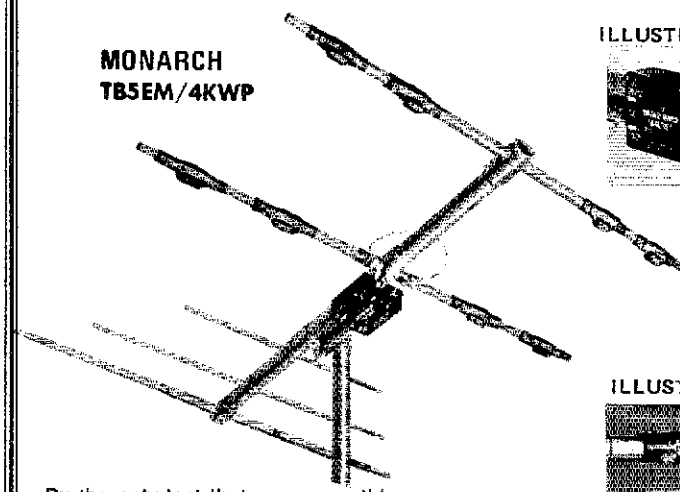

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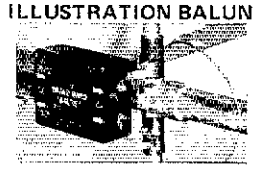

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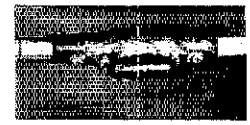

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- ★ Hybrid 10 to 2 Transverter – LI-13, RFC1-3 QST June '75 p. 26. . . . . $13.00
- ★ Preselector 80 to 10 M LI-20 – '75 & '76 Handbook p. 265. . . . . $15.00
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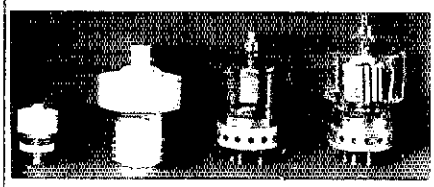

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(1) Advertising must pertain to products and services which are related to amateur radio.

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The publishers of *QST* are unable to vouch for the integrity or for the grade or character of the products or services advertised except those obviously commercial in character.

Clubs/Hamfests

QCWA Quarter Century Wireless Association is an international non-profit organization founded 1947. Any Amateur Radio Operator licensed 25 or more years is eligible for membership. Members receive a membership call book and quarterly news. Write for information. Q.C.W.A. Inc., 2012 Rockingham St., McLean VA 22101.

PROFESSIONAL CW operators, retired or active, commercial, military, gov't, police, etc. invited to join Society of Wireless Pioneers — W7GAQ/6 Box 530, Santa Rosa CA 95402.

FREE sample copy Long Island DX Assn. bulletin. Latest DX news. Business size s.a.s.e. to the L.I. DX Assn., P.O. Box 73, Westbury NY 11590.

EDITING a club paper? Need public relations help? You should belong to the Amateur Radio News Service. For information write: Sybil Allbright, W6GIC, 8658 Encino Ave., San Diego CA 92123.

LIMARC runs the largest NYC area Flea Market. Sunday June 6, NY Institute Technology, Old Westbury. Talk-in 25/85 — W2KPQ.

HAMFEST! Indiana's friendliest and largest Spring hamfest. Wabash County Amateur Radio Club's 8th Annual Hamfest will be held Sunday, May 23, 1976, Rain or Shine, at the 4-H Fairgrounds in Wabash, Indiana. Large flea market (no table or set-up charge), technical forums, bingo for XYL's, free overnight camping with AC hookup, plenty of parking. Lots of good food at reasonable prices. Admission is $1.50 for advance tickets, $2.00 at the gate. For more information or advanced tickets, write Bob Mitting, 663 Spring Street, Wabash IN 46992.

W6LS 11th Burbank California Hamfest. Saturday and Sunday, May 15 & 16. Flea Market, Prizes. 2814 Empire Avenue, Burbank CA 91504.

SAROC Second Hawaiian Convention, Kullima Hotel, August 28, 1976, exhibits, technical sessions, banquet. SAROC Twelfth annual convention Hotel Sahara, Las Vegas, NV, January 6-9, 1977. Details from SAROC, POB 945, Boulder City NV 89005.

NEW YORK CITY Third Annual Hall of Science Radio Club Auction Flea Market Saturday June 5 at Worlds Fair Grounds, Flushing L.I. Admission $1.00 Sellers $2.00. No sellers commission but 10% fee on auctioned items. Zoo, boating, childrens farm, art and science museums adjacent. Field Day goodies galore. Box 1032, Flushing NY 11352.

JUNE 6 — SRRC Hamfest — Same place as last year. Send long s.a.s.e. for info and advance registration. See display ad this issue of QST. SRRC, W9MKS, RFD No. 1 Box 171, Oglesby IL 61348. Phone (815) 667-4614.

The 4th annual Des Moines Hawkeye Hamfest will be held on Sunday, June 13th, 1976 in the Varied Industries Building at the Iowa State Fair Grounds, Des Moines, IA. Plenty of free parking. Flea Market, display booths available. Dealer displays, XYL activities. Camping available, small charge. Registration, $2.00 advance, $2.50 at the door. 8:00 A.M. to 4:30 P.M. Write Des Moines Radio Amateur Association, Box 88, Des Moines IA 50301.

SPRING Picnic/Hamfest. NW Arkansas ARC, Inc. Fayetteville, AR. Hosting Razorback Chapter QCWA. Prizes. Family affair. 16/76, 3995 kHz. May 2. Y'll come. W5TXA, Secy.

KENTUCKY Ham-O-Rama — Sunday May 30 (Memorial Day Weekend) at Boone County Fairgrounds, Burlington, Kentucky. 10 minutes south of Cincinnati, Ohio near I-75. Prizes, forums, XYL program, exhibits, flea market. Tickets $1.50 advance. Info: NKARC, P.O. Box 31, Fort Mitchell KY 41017.

FLEA MARKET. Tri County Radio Association, Inc. Nick's Grove, 318 William Street, Piscataway NJ, June 6, 1976. For information call (201) 725-0778 or (201) 752-4307 or write to TCRA, Post Office Box 412, Scotch Plains, NJ 07076.

BIGGEST ever! 24th annual Rome family day, Sunday, June 6, 1976 in historic Rome, NY. 5000 square feet of air conditioned display area. Flea market, commercial displays, technical talks, ladies and children's programs. Function will be held at the Beeches Resort Motor Lodge and Restaurant. For info write PO Box 721, Rome NY 13440.

TURKEY Run Hamfest has moved! New day and new place. Come Sunday July 18, 1976 to the Vigo County Fairgrounds, Highway 41 south of Terre Haute, Ind. Watch this space next month for more details.

MISSOURI: Antique Aircraft and Amateur Radio show Saturday and Sunday July 24 and 25, 1976 at the Slater Memorial Airport. Registration $1.00 in advance; $1.50 at the door. Buffalo burger feed Saturday night and Sunday noon. Talk-in 3963 kHz, 146.94 and 146.28/.88. For additional information and advance tickets write Dale Bellsmith, WØKNF, 807 North Broadway, Slater MO 65349. (816) 529-2173.

HAMFEST — Northwest Ohio ARC Lima, Ohio, Sunday Oct. 10 at the Allen Co. Fairgrounds. Advanced tickets or information write N.O.A.R.C. P.O. Box 211, Lima OH 45802.

SHANGRI-LA '76 ARRL Hudson Division Convention, November 13-14, Great Gorge Resort Hotel, McAfee, New Jersey. Full program, Flea Market, Exhibits, Banquet. A vacation for the family and a hamfest for the ham. For information write to Al Piddington, WA2FAK, 4 Acorn Drive, East Northport NY 11733.

WARREN, Ohio Hamfest, August 22, 1976. Moved to Trumbull Expo Center, north of city, for bigger flea market and plenty of close-in parking. Displays, talk-ins, $2 door prize registration. Family recreation at nearby State Park. Arrowsigns lead from Interstates and highways. For details: QSL WARA, Box 809, Warren OH 44483.

QSL Cards

TRAVEL-PAK QSL Kit — Send call and 25c; receive your call sample kit in return. Samco, Box 203, Wynantskill NY 12198.

QSLs, samples 20c. Fred Leyden, W1NZJ, 454 Proctor Av., Revere MA 02151.

DELUXE QSLs, Samples 25c. Petty, W2HAZ, P.O. Box 5237, Trenton NJ 08638.

DON'T buy QSL cards until you see my free samples. Fast service, economical prices. Little Print Shop, Box 9848, Austin TX 78766.

QSLs — Variety, value, quality, custom. Samples and catalog 20c. Alkanprint, Box 3494, Scottsdale AZ 85257.

QSLs catalog. Samples 35c. Ritz Print Shop, 5810 Detroit Ave., Cleveland OH 44102.

PICTURE QSL cards of your shack, etc. from your photograph or art work. 500 — $14.00, 1000 — $19.25. Also unusual non-picture designs. Generous sample pack 35c. Half pound of samples 65c. Raums's, 4154 Fifth Street, Philadelphia PA 19140.

DISPLAY and protect your QSL's with 20 frame plastic holders. Seven for $3.00, prepaid. TEPABCO, Box 1987, Gallatin TN 37066.

QSLs. Second to none. Same day service. Samples 50 cents. Include your call for free decal. Ray, K7HLR, Box 331, Clearfield, Utah 84015.

QSL's, Amateur Radio Commemorative Cup, Stein, Plate, Belt Buckle, Key Chain, Ladies Pendant, free catalog, Rusprint, Box 7575, Kansas City MO 64116.

QSLs "Brownie" W3CJI, 3035A Lehigh, Allentown PA 18103. Samples with catalog 50c.

BICENTENNIAL QSL Catalog! 36 pages, new designs, stock & ink samples. Twenty sample QSLs 25c. Cornellson's 321 Warren St., N. Babylon NY 11704.

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QSL's??? "America's Finest!!!" Samples 75c. Bicentennial 75c. DeLuxe $1. Religious 75c. Sakkers, W8DED, Box 218, Holland MI 49423.

General

CANADIAN Surplus Catalog and flyers $1. Etcox Electronics, Box 741, Montreal Canada H3C 2V2.

WANTED SB-610 Signal Monitor good condition complete manuals VE7BMZ 20970 Newlands Drive Langley BC V3A4M2 Phone 604-534-4675.

WANTED 2 New 4D (Donald) 32. Also NC300 high freq. converters, S. Waskeba, 44 Massey S.I.W. Toronto MGJ2T4, Canada.

CX7 Serical 00265 updated to 7B with manuals at W1NXY, best offer over $1100. KV4CK. Box 1755, Frederiksted St. Croix 00840.

WANTED: KINEPROJ. Tubes, pref. flat scr. like RCA types or sim. C24009,-24268,-24295,-24137A,C 24214 or -24324. VIDICON 4542 or sim. Multipl. tubes 931/A, 8571 or sim., Info Schreinemachers, Hosp. 9 Pasterulaan Oosterhout (NB 4390) Netherlands.

CASH paid for your unused tubes vacuum variables and good ham and commercial equipment. Send list to Barry, W2LNI, Barry Electronics, 512 Broadway, NY NY 10012.

CALL toll-free (800) 327-7798. Ask for Bob Hoffman (Jaro Electronics Corp.) We buy all types of tubes. Top prices paid for Varian, Eimac, Amperex. Address: 412 27th Street, Orlando FL 32806. In Florida call collect (305) 843-9551.

SPIDERS for boomless quads. Heliarc welded aluminum. Al's Antennas, 1339 South Washington Street, Kennewick WA 99336.

TRANSFORMERS rewound, Jess Price, W4CLJ, 507 Raehn, Orlando FL 32806.

WE buy electron tubes, diodes, transistors, integrated circuits, semiconductors. Astral Electronics, 150 Miller Street — Elizabeth NJ 07207. (201) 354-2420.

MOBILE Ignition Shielding gives more range, no noise. Kits and custom systems. Literature. Estes Engineering, 930 Marine Dr., Port Angeles WA 98362.

TELETYPEWRITER parts, manuals, supplies, equipment. Toroids. S.a.s.e. for list. Typetronics, Box 8873, Ft. Lauderdale FL 33310. W4NYF. Buy parts, late machines.

WANTED: An opportunity to quote your ham needs. 37 years a ham gear dealer. Collins, Drake, Ten-Tec, Swan, Kenwood, Tempo, Regency, Icom, Hy-Gain, etc. Trades, terms. Request catalog. Chuck, W8UCG, Electronic Distributors, 1960 Peck, Muskegon MI 49441. (616) 726-3196.

BUILD your own radio desk/console cabinet. Design drawings, photographs, $4.75. Bill Morris, WA5RSC, P.O. Box 411 Lubbock TX 79408.

TOROIDS — 44 and 88 mHy 5 — $3.00 P.P. M. L. Buchanan, P.O. Box 74, Soquel CA 95073.

TELETYPE Equipment for beginners and experienced operators. RTTY machines, parts and supplies. Beginners special: Model 15 Printer and TH5-TG demodulator $125.00. Atlantic Surplus Sales Co., 3730 Nautilus Ave., Brooklyn NY 11224. Tel: (212) 372-0349.

SIGNAL/ONE Repairs. K6BE (415) 548-1889.

HAM Radio Repair. Expert repair and alignment in our new Lab. Prompt, reasonable. "Grid" Gridley, W4GJO, 3824 Malec Circle, Sarasota, Florida 33581.

TEFLON Stock. W9TFY Frank Wirt. Alpha IL 61413.

WANTED: SP-600-JX, SG-3/U, AN/URM-25, TS-588A/U TS-173/U, TS-174B/U TS-723/U. Please give your lowest price. John Waskowitz 35-30 73rd St Flushing NY 11372.

WANTED: 1-meter fm rig in good condition. WA1WHU Normand R. Piette 1281 Woonsocket Hill Rd. Woonsocket RI 02895.

SERVICE by W9YKA. Professional grade lab, FCC commercial license. Amateur and commercial SSB-FM equipment. Repairs, calibration, modifications, consultation. Low overhead, reasonable rates. Write or call Robert J. Orwin, Communications Engineer, P.O. Box 1032, La Grange Park IL 60525. (312) 352-2333.

PC Board negatives made photographically from your or magazine's artwork. Now obtain professional results quickly, simply 4 X 5 — $3, or s.a.s.e. for information. 10139 Apache Road, Richmond VA 23235. (804) 272-8403.

ICOM, KLM amps for Icoms, CushCraft & Larsen, 2-meter antennas. WØNGS, Bob Smith Electronics, 1226 9th Ave., North, Fort Dodge IA 50501. (515) 576-3886.

CRYPTOGRAPHY devices, machines, books, related material wanted. German Enigma machine especially sought. Leads appreciated. WN2TSD, 17 Alfred Road, Merrick NY 11566. Call collect (516) 378-0263.

CW Sendin' machine electronic keyer with memory. Write for complete info: Alan Harp, 718 Magnolia Dr., Lake Park FL 33403.

W2ONV — Wants your tubes - Will pay highest prices - (201)-279-7528.

WANTED: National SW-3, SW-5 or AGS receiver with power supply. State condition and price. WB7CTM, Box 3368, Sunriver, OR 97701. (503) 593-1161.

INSTRUCTOGRAPH code machine for sale with 20 tapes. Two years old and like new. $50.00. WB7CTM, Box 3368, Sunriver OR 97701.

UPGRADE Your Ham Ticket Now! Use Posi-Check — original, expertly devised, multiple choice questions and diagrams covering all areas tested over in FCC exams. IBM sheets for self testing. Keyed answers with explanations. Novice Class $3.50; General Class (including latest rules and regulations), $5.30; Advanced Class $4.90; Extra Class, $5.15. Postage prepaid U.S.A., first class only. Also newly revised Radiotelephone Third Class, Elements 1, 2, and 9, $10.15. Send check or money order to POSI-CHECK, P.O. Box 3564, Urbandale Station, Des Moines IA 50322.

MOBILE OPS. Tired of Ignition Noise? Please send SASE for info on shielded ignition systems. Summit Enterprises, 20 Elder Street, Yarmouthport MA 02675.

TRANSMITTING Type Variable Capacitor Kit Self-Addressed Stamped Envelope for catalog Airway Products Princeton MN 55371.

RUBBER stamps $2.50 includes postage. NJ residents add tax. Clinton Hoar, W2UDO, 32 Cumberland Ave., Verona NJ 07044.

WANTED: Radios, parts, books, magazines of the 1920s. W6ME, 4178 Chasin St., Oceanside, CA., 92054.

MANUALS for ham gear before 1967. Large SASE for quote on specific manuals. WØJJK, HI-Inc., Box Q864, Council Bluffs, IA 51501.

RADIO Museum now open. Free admission. 15,000 pieces of equipment from 1850 telegraph instruments to amateur and commercial transmitters of the 1920's. Amateur station W2AN. Write for information: Antique Wireless Assn. Main St., Holcomb, NY 14469.

QST Collection: Volumes 1 through 55; excellent condition; approx. 40 ARRL binders; very few issues missing; $2,500; $250. Deposit for summer shipment. W4UCH.

WANTED: Tower, 70' plus. W2UGM, 415 Demarest, Closter NJ 07624 (201) 767-0123.

LOOKING for used gear? Buyers & Sellers radio brokerage has the equipment you want at the prices you want to pay. Call our Ham Gear Hotline: (617) 536-8777, weekdays 9-5 EST.

NOVICES: Need help for General or Advance Ticket? Complete recorded audio-visual theory instruction. Easy, no electronic background necessary. Write for free information. Amateur License Instruction, PO Box 6015, Norfolk VA 23508.

MOTOROLA HT220, HT200, Pagebox, etc. Service and modifications performed at reasonable rates. Hatfield, WA4FRV (804) 272-8403.

WANTED: ASR-28 and 33 give your lowest price. John Waskowitz, 35-30 73rd St., Flushing NY 11372.

DX Awards Log Requirements and addresses for over 100 awards. 150 pages to log QSLs. $3.95 (foreign $4.95) W7IKM-9940 E. Yucca, Scottsdale, AZ 85254.

FILTERS, low pass, 0-3.5kc. 600Ω. $2.00. Other goodies. S.A.S.E. for list. Jacobs, Box 205 Eagar AR 85925. WN7CMZ.

RTTY — NS-1A PLL TU (RTTY Journal 1/76) FSK/AFSK. Wired/tested $29.95 ppd. Boards, parts kits available. Stamp for info. Nat Stinnette Electronics, Tavares FL 32778.

COMPLETE Heath station. SB102, SB200, SB600, HM2103, HD15, Mosley vrt. ant., cable, mike, Sears cassette recorder, mint condition, all manuals, $1,000. Jim Coffey WA4VIG, St. Pete, (813) 581-7336.

SURPLUS telephones — standard commercial modern dial desk phones. Excellent condition. Cost $30. — extension for ham shack or bedroom. Special to hams $6.95 prepaid U.S.A. only. Surplus Center, Box 82209, Lincoln NE 68501.

CRYSTALS Air-1st-cl: Novice, active FT-243, all frequencies, minimum five — 40M, 15M, 10M — 99c each, 80M $1.95. Less than five $1.50, 80M $2.50. Novice band — Edge Marker QSO combination package, 80M, 40M, 15M — three bands, six crystals — EBM-QSO-6 — $9.95. Same plus 10M pair — EBM-QSO-8 — $11.95. Both novice packages for QSO just inside HI-LO band edges and calibration of receiver or VFO. Novice — Alignment kit — 7030, 3500, 3750 — $5.95. 160M FT-243 pins $2.95, four for $9.80. Sockets 25c. "Crystals Since '33". Postage 20c per crystal. Bob Woods — W0LPS. C-W Crystals, Marshfield Missouri, 65706.

NEARLY invisible ham or SWL hertz antenna. 130 foot long stranded stainless steel wire with insulators $12.80 ppd. Wilcox Electronics, Box 1331, S.L.C., UT 84110.

CLEANING house — Quality xistors, signal diodes, rectifiers, meters, 6146's - 6883's — Test equipment etc. — s.a.s.e. for list K2JSO — 2043 E. 52 Street, B'klyn NY 11234.

WHOLESALE Prices — on Antenna Specialists, Mosley, Hy-Gain, Regency, Tempo products. S.a.s.e. brings quotation. Tated Electronics Pine Tree Hill Road Newtown CT 06470.

ICOM for vhf, Swan for hf are my specialties. Use your Master Charge or BankAmericard. Call or write W0NGS for the best deals at Bob Smith Electronics, 1226 9th Ave. North, Fort Dodge Iowa 50501. (515) 576-3886.

WILL Pay $100 for a Atwater Kent "breadboard" radio to complete my collection. Parsons, 22 Forest St. Branford CT 06405. Tel. (203) 488-4267.

FOR SALE, Drake R-4-C and MS4 speaker. One year old and slightly used due to serious illness. Mint condition. $400. Edward M. Cholerton (609) 263-8533.

TOURING Europe this summer? Have an "eyeball" with DA1VH when in vacinity Heidelberg, Luxembourg, Paris and NE France, Black Forest area, Weinstrasse, and Rhein River area south of Koblenz. All HF bands plus 2-meters. Write Vandegrift, A/C Div, USAMMAE, APO NY 09052.

FOR SALE: Singer Metrics Panoramic analyser SSB-3B freq 55 kHz — 40 MHz. Good Condx. $600 or trade for any Collins S-line equipment. P. Jay Spivack, 8 Madelyn Ave., Wilmington DE 19803. Tel. 302 764-8957.

HEATH Apache, HW-16, Hallicrafters SX-99, SX-62A, Westinghouse stereo recorder. Best offers. C. Mann, Round Pond ME 04564.

WANTED, Motorola HT220 any condition. WA2HQD, 105 18 131 St., Richmond Hill NY 11419. (212) 641-2559.

SALE: 75A-4 serial 5,429 vernier knob $325 fob. K4THA, 1201 Seminole No. 108, Largo FL 33540. (813) 581-7938.

BOSTON and suburbs — Boston University graduate student and XYL need apartment starting in August. Quiet neighborhood. Would like to have a ham station and put up a vertical or dipole. Reasonable rent. Very responsible tenants. Larry Kahaner WB2NEL, 4259 Bedford Ave. Brooklyn NY 11229.

QSTs from 1927. $1. per copy. Also CQs. Kay Sandlin/WN4JQY 601 T. Pecan Dr., Martinez GA 30907.

ALPHA 17-late model. Two years old. Less than 40 hours on the filaments. $1650. Pick-up only. Wilbur Rimer, 456 Dippold Ave., St. Mary's PA 15857.

CUSTOM embroidered emblems, your design, low minimum. Informational booklet, Write Emblems Dept 708, Littleton NH 03561.

TV — RCA Military Image Orthicon system; camera, sync unit, power supply, 7" monitor; for info write Peter Gerry 34 Newcomb Dr., New Providence NJ 07974.

IDENTIFICATION badges with pin. State color and two or three lines wording $2.50pp, two or more $2.00pp. Post 211, c/o WA3RCA, Glenside PA 19038.

2-M SYNTHESIZER boards for WB2MBI/K1ZJH article in June-July 1973 QST. Computer-grade 2-oz. copper on G-10 fiberglas. Covers 144 to 148 MHz in 5-kHz increments. $15.50 postpaid. Parts kits also. Synthesizer, Box 17, Marlow NH 03456.

NEED amateur & regular license plates for my personal W.A.S. collection. Will reimburse postage. K4ADT, Box 6, Morganton NC 28655.

HEATH HR10B Ham Band Receiver with HRA-10-1 Calibrator; also Conar Model 400 Novice Transmitter and Knight General Coverage Receiver, Nussbaum, 19617 CR-2, Bristol IN 46507.

WANTED — all kinds ham publications/magazines. Buy or swap. Erickson, 6059 Essex, Riverside CA 92504.

FREE Literature Catalog; Theory, Practice; Littleton Hobby Circuits, Box 453, Littleton MA 01460

MOHAWK recvr. RX-1 with 6M Ameco converter - fine condition. Complete with all manuals. Price $135. (215) 466-2337. W. R. Freas. 402 So. Manoa Rd., Havertown PA 19083.

DRAKE TR4 with RV3 remote VFO ac supply & speaker $450. Pickup San Jose CA. W6NWA (408) 267-2793.

FOR SALE: One Model 70 Robot camera with TV lens, one model 80 Robot monitor both in mint condition. $400. W1FUQ.

VHF 64el colinears, Cush-Craft, unopened, 144 MHz, $110; 432 MHz, $60. QST, CQ, 73, HR, others, collection, $50. Heathkit 50 MHz RC system GDA-405D, subminiature servos; unassembled Porche-Dynamics car, two unused engines, Kavan starter, plus, $325 all. Consider trades for fm. W4AAU, Rt. 2, Box 131A, Bluemont VA 22012. (703) 554-8285.

EICO No. 460 Scope $125. SX 38 Panadapter $110. You ship UPS. 6 & 2 Transceivers — test equipment. S.a.s.e. for list. Want: Mobile Hustler, tri-band quad, Atlas, & Hybrid Heath Phone Patch. Th6, Pair 8122. K7LMN.

WANTED: HT 33-B linear in good cond'n. WB9RAU, 935 Ashland, River Forest IL 60305. (312) 369-7836.

FOR SALE Clegg 66er plus mike $85. Wanted HW32 plus power supply. Milton Lederman, 60 West 66th Street, New York NY 10023. (212) 874-4815.

COLLINS rig: KWS1 Serial No. 313 and 75A4 No. 459 $750. Miller, (904) 763-2420.

MOTOROLA HT220 UHF 4 watt $325. HT200 UHF $150. N11o6C 5 Watt solid state rptr hi-band $350. K6UZP James Stephens, 4741 Mt. La Palma Dr., San Diego CA 92117. Tel. 714-278 9832.

NEEDED — Owners manual for HQ160 recvr. K3VUM, 6802 Trexler Rd., Lanham MD 20801.

SELL 1976 Japanese SSB Handbook $15. W6BLZ, 528 Colima St. LaJolla CA 92037.

FOR SALE: Ek-logictrol LRB 6 meter four channel remote control transmitter with airplane, receiver, four servos, nicad, plus extras. Used twice, but no interest. Asking $250. Dick Raley, WB6AFH, P. O. Box 452, Soquel CA 95073.

SBE-33 80-15 meter ssb transceiver. $100. You Ship. WA1JMO, 11 Fieldstream Drive, Waterbury CT 06704. (203) 756-6058.

SWAN 270 ssb-cw transceiver 260 W PEP build in ac & dc pwr sup, all you need is mike and ant. $350. W5DZL, 2284 Hillsdale, Baton Rouge LA 70808.

QST - My personal subscription 1931 through 1971 good condition none missing. $150 or best offer. W3PYW Frank C. White, 2706 Harmon Road, Silver Spring MD 20902.

HW101 $260; HP23 $53; SB600 $21 or all for $315 all perfect all manuals. Horwath (603) 434-5223 RFD 4, Derry NH 03038.

NOVICE Station — DX-40, VF-1, RME-4350A, 10-40 vertical, Vibroplex bug. $180. W6GHR. (415) 697-4300.

FOR SALE — HQ170 receiver with Q-multiplier, $168. V. J. 1132 West 124 St. Los Angeles CA 90044.

FOR SALE: Model 19 teletype. Free delivery S. F. Bay area. Also MR-20 Microwave $650.00 extras. Alan, WA6DNR, 86 Valley Rd., San Anselmo CA 94960.

ROBOT oscilloscope F.S. converter $7; Shure ceramic microphone $10; Triplett freq meter $7.50; Heath GDM $5.50; CDE control box $8; Heath HW-202 $148. Use s.a.s.e. W2WHK, 210 Utica St., Tonawanda NY 14150. (716) 692-5451.

TRADE? My complete SBE SSTV for Triton II w/pwr or FT101B, Also need Gonset Twins, any condition. WA6WJV, 518 Aurora, Claremont CA 91711. (714) 621-3330.

FOR SALE: Two meter Pawnee a-m/cw $25. Pick up only W2EPZ 80-44 259 St., Floral Pk. NY 11004.

HEATH HW-202 2 meter fm transceiver. Has tone burst option. Crystals 19-79 31-91 37-97 49-49 52-52 94-94. Mint, with manual. $175. Marty Barrack WB4JUK 200 S. Lincoln Avenue, Sterling VA 22170. Phone (703) 437-9061.

SCOPE — Industrial rack panel with chrome handles - three inch; By Kearfott. Good condition. $40 plus shipping. WB2GRB, Lynbrook NY 11563. LY 9-3440 (516).

SELL: HW-101 $235; HP-23B $45; Shure 201 $11; Speaker $5; Speedex Key $3. WBØJVZ, R No. 2, Osage IA 50461.

SB102, filter, HP23A, SB600 will demonstrate, perfect $475. W2GNN Gary Ollaro, Box 100A RD I, Cranbury NJ 08512. (609) 799-2865.

GONSET Comm IV, 2 meter, Gonset VFO, both $180. Mint condition. WN1USS, 2 Fifers Lane, Ledyard CT 06339. (203) 536-1340.

2 MTR fm bargains. HT 220 board with 94/94 xtals $125. GLB synthesizer $150. VHF Eng. 2-25 watt amplifier $70. This eqpt is working to full rated specs. manuals incl. WB6GYO, 4816 Westminster Pl., Santa Roas CA 95405.

DRAKE 2B, 2BQ, very late serial number (11,000), clean $150. J. Cain, RFD 5, Box 23, E. Hampton CT 06424.

WANTED — Mosley Classic-33, Ham II rotator. W1AGA.

SELLING make offer all Heath SB-301 receiver with added cw filter; SB 401 transmitter with xtal accessory kit; HD 15 phone patch; SB 620 spectrum analyzer; all mint condition with cables and manuals. Tom Ewing, W7TKD, 3289 Cheyenne CT., N.W., Salen OR 97304. (503) 378-1779.

HALLICRAFTERS SR-2000, P-2000 ac p.s., $695 w/HA-20 $795. Galaxy V Mk II ac p.s., Cal., RV-1, F-3 Filter $325. WB5OSS Terry Wells, 540 Dover Rd., Lexington KY 40505. (606) 299-6402.

DRAKE TR-4, mint, high serial; $395 prepaid US. Ray (405) 262-6303.

WANTED cw mechanical filter for Collins 7553 receiver type FL1-455-200 preferred. WA3IIJ.

WANTED Swan Mark II linear with power supply. W1BBC, Pritchard, 75 Allerton Road, Naugatuk CT 06770.

WANTED: Amplex KW62 or similar high power 2 meter amp. Jeff Pohl, WB2GDZ, 174 Wetherill Road, Garden City NY 11530. (516) 741-4860.

CLEGG ssb transceiver 6 meter-venus model, Apollo linear amplifier, ss booster type A Heath monitor scope H-10 Venus ac pwr supply 416A, 6 meter conveya beam antenna, factory sealed ctn. Best offer for the package. H. Jacobson, P. O. Box No. 436, Vails Gate NY 12584.

DX-60A 39.00, Sixer w/dc $35. Odds & ends (s.a.s.e.) Smith, Box 132, Oak Ridge TN 37830.

HOMEBREW fully regulated dc supply. 20 amps at 14.0 V dc. Adjustable 2 — 30 V dc 115 V ac input. Suitable for Atlas, SB104, Triton, etc. $65. ppd. WA9NSY, Box 728, Huron SD 57350.

WANTED: Lafayette, Micro P-100A (150-174 MHz). Must be in like new condition without any modifications. Advise price and condition. V. D. Monroe, Route 1, Box 147, Walker WV 26180.

UNUSED: Drake T4XC in carton untouched. New $580., sell $475. John Mathis 2412 Pierce 310E, Nashville TN 37212.

NCX-500, AC-500 PS, new finals, $225, SX-110, $75. All excellent. Need any Lysco equipment, any condition. W8KAJ, 2386 Queenston, Cleveland OH 44118.

SELL — Palomar frequency standard $30, Swan 405X crystal oscillator $35. Heath reflected power meters (two), Model AM-2 $6. Model HM-11 $9. WB5GYJ, 5146 Gawain, San Antonio TX 78218.

FOR SALE — new Realistic DX-150B receiver, never used $115. Swap — swap 10-47-047 cont. eng. parts for ham radio equipment. Jim Baker, 208 Cherry Ln, Ozark AZ 36360. (205) 774-6770.

SELL Swan 350C with p/s 117XC crystal calibrator. Factory installed VX-2 500 W input. Mint. $300. Henry Vander WA2SIX, 66 Meridian Rd, Levittown LI NY 11756. (516) 735-5804.

YAESU FT-101 Owners. Add fast-slow-no agc easily. For complete details send dollar (creditable towards dues) for April issue of Newsletter. International Fox-Tango Club, 248 Lake Dora Drive, W. Palm Beach FL 33411.

SELL: 3253 serial-13332, power supply, mike dummy load, all Collins. $750. firm. K2HY P. O. Box 45, Harvey Cedars NJ 08008.

SELL: Telrex heavy duty rotator, B. T. series, housing, heater, control panel, some cable. Pick-up deal only $250. K2HY P. O. Box 45 Harvey Cedars NJ 08008.

SELL five digit Nixie freq counter $40. Heath scope voltage calibrator Eico GDO. S.a.s.e. for details. W3HZJ 4523 Ashburner Ct, Phila PA 19136.

SELL: Many IRCs cheap. WA5WUJ, 1119 Penn Slidell LA 70458.

QRP Classic — HW-7, Heath p.s., $69. Eico 717 Keyer, $69. All mint. WA2OVG (212) 796-8617.

HOOSIER Electronics — Your ham headquarters in the heart of the Midwest. Factory-authorized dealers for Kenwood, Collins, Drake, ICOM, Ten-Tec, Regency, Atlas, Tempo, Swan, Midland, Alpha, Standard, Genave, Hy-Gain, Cush Craft, Mosley, Antenna Specialists, Curtis, CDE, and others. For the best deal around on HF or VHF gear, see us first or see us last, but see us before you buy! Write or call today for our low quote and become one of our many happy and satisfied customers. Hoosier Electronics, P. O. Box 2001, Terre Haute, IN 47802. (812) 238-1456.

WILL Trade: 75A4 rx xlent condx plus Ranger II and HW-7 for TS-520 or TR4 xcvr. Write Bruce Gordon Box-G Moundsville WV 26041.

YAESU YO-100 monitor scope (never used) $175. Speech processor MC-701 (see p. 152 Jan 75 QST) $25. Both FOB. K4HLJ, 710 W. Holly Ave, Sterling VA 22170.

SELL — Sencore FE-14 FET VOM - shielded input A-1 — $50. Heath IO-17 scope 3" to 5 MHz unused $75. Knight TR-106 transceiver plus Hb VFO clean — $50. W3KBR D. Klingler, 801 S 60th St. Harrisburg PA 17111.

ANYBODY out there ever heard of an Eldico S-119 ssb communications system? I need manuals, copies, or leads to information. Fred Shuman, 112 Freeman, Starkville MS 39759.

TEST Equipment for sale — surplus oscilloscopes, signal generators, recorders, counters, scalers, and miscellaneous HP, Tektronix, Moseley, Marconi, etc. Want to buy HP spectrum analyzer and accessories. Models 8553B, 8552B, 140T and 8443B. Call or write for list. Piezo Technology Inc, P. O. Box 7877 Orlando, FL 32804 (305) 425-1574.

WANT to buy Collins KWM-2A or Kenwood TS-520 transceiver, or S-Line. Also want amplifier, such as Alpha 374, Henry 3KA, BTI-LK2000 or York 5000. Richard Schark 417 North Ferry Ottumwa IO 52501. Ph. (515) 682 5741.

FOR SALE! Drake TR-4C, MS-4 speaker w/ac power supply. Good. $450. Neil Holloway, Box 65, Crossville TN 38555.

QUAD Kits from $15. to $27. Send s.a.s.e. for information. WAC, 404 Sanders Rd. SW Huntsville AL 35802.

FREQUENCY counter, used three times — cost $300. Take best offer. C. Harvey Haas — W6EAH 715 No Orchard Drive, Burbank CA 91506.

TECH Manuals — $6.50 each: SP-600JX, URM-25D, OS-8B/U, BC-348JNQ. Thousands more available. Send 50c (coin) for large list. W3IHD, 7218 Roanne Drive, Washington DC 20021.

WANTED: 9 MHz filter, 500 Hz bandwidth. Box 205 Eagar AZ 85925. WN7CMZ.

SIGNAL/One CX7B with new LED readout, fantastic equipment, all manuals, will ship in original carton, $1800. Collins mechanical filter F-455 J 1.5 kHz $75. Raytrack Auto-level speech processor $50. D-104 crystal mic & stand complete $50. BTI LK-2000HD console amplifier with dummy load unit attached, $750. Loudenboomer Mark 3 antenna rotator system, heavy duty $250. 4 element 20 meter beam modified 204BA 38' boom $150. WA9FHK Wes Minear 10807 Cemetery Rd Capron IL 61012. Tel (815) 569-2178.

ICOM IC-210, fm transceiver, VFO continuous 143.95 through 147, variable .5 to 10 watts, duplex up/down, phase lock circuitry, 12 and 117 volts, 9x10-1/2x4-1/2, with mobile mount $510. SB-101, cw filter all new tubes, SB600, HP-23 — $350. Motorola U43GGT - $75. U53GKT - $145. (Cables all accessories and manuals with units) Motorola homebrew test set - $20, Ham M - $80, SB 200 - $250, Pair 572 Bs - $17. ea. Postage extra. James DeMott, 12240 E Arkansas Ave, Aurora CO 80012 (303) 751-0525.

FOR SALE: 51S1, $1295. 30L1, $400. KWM2, $600. 312B4, $250, HRO-500, spkr, $895. CX7A $1195. HQ215, spkr, 0.5, $325, KWM2 (Late!), PM2, $1095. NCX 5, (MK-II), NCX4, Cal., $425, HQ170C, $175. HR212, $195. ACPS, $45. SRC826MA, $195. SW140, $65. "Mohican" $75. Alternator: 28V/100A, $200. HW12A, $85. KW-1, $1400. Viking-KW, $700. 32V3, $150, TR4, AC4, RV4 $495. TR3, AC3, RV3, $385. VFO's, new (51J4) $100. Filter module (51S-1), $125. IC230, IC3PA, $489. IC60, IC3PA, $359. IC30A, IC30PA, $459. Craig, (207) 439-0474 / (603) 436-2884 (nites).

HALLICRAFTERS SX-117, HT-44, P-150-120 supply, extras galore, $395 or will split, trade, haggle. Carpenter, 4 Westwood Drive, Belchertown, MA 01007. (413) 323-4088.

SB-102, cw filter, HP 23A with SB600, station mike, manuals, flawless $450. WA2OLH, Jim Pasquale, 9 Fawn Drive, Matawan NJ 07747. (201) 566-8467.

WANTED: QST magazines 1920 and earlier. Have duplicates in the 20's, 30's, and 40's. What do you need? W2AO, 163 Bedford Center Road, Bedford Hill NY 10507.

SIGNAL-ONE CX7A, both cw filters, works up to all specifications. With complete service manual, spare final tube, spare broadband trimmers, and other miscellaneous spares. $1300. Jim Cain, WA1STN, RFD 5, Box 23, East Hampton CT 06424.

C.E. 100 V 200. (No shipping), Heath HW-7 40. p.p., Heath AM-2 SWR bridge 8. p.p., Ten Tec AC5 low power ant. tuner 10. p.p., Omega TE7-01 ant noise bridge 10. p.p. Dow key DK60-GCZ relay 10. p.p. All units excellent condx. W2CZE — 6 Stickle Pond Rd., Newton NJ 07860.

TRADE-Motorola H.B. Twin V's & dual squelch T-Powers plus 450 MC tube type bases for 1 KW Linear & Collins KWM-2. Payne (505) 327-9234 after 1900.

RECEIVER: Hammarlund HQ-180, $275. W6BKY, Box 1633, Palo Alto CA 94302.

FOR SALE — SB220, little use — Atlas 180 w/power supply — make offer. John Sheffield, WB4WHQ, 206 Patton Drive, Americus GA 31709.

CASH for Ranger and/or Collins transmitter, each in good condition. Phone (305) 647-0992, F. K. Shield (K4KL), 151 E. Fawsett, Winter Park FL 32789.

HAM and surplus gear — send for list. WBØMAO, Box 261 Staples MN 56479.

"DON and Bob" New guaranteed buys. CDE HAM2 Rotor 129.00; CD44 104.00; Belden 8448 rotor cable 14c/ft; Hygain TH6DXX 192.00; 18AVT/WB; 204BA 153.00; 402BA 170.00; Mosley classic 33 179.00; Belden 8214RG8FOAM 23C/ft; 8237 RG8/U 19c/ft; Amphenol PL259 59c; No. 14 stranded antenna wire 4.95/100 ft; 22GA/7STD. Phosbronze longwire 2.50/1000ft; Raytheon RK811A, sealed, 15.00/pair; Centralab 100pF/15kV transmitting cap 5.95; CDE .001/10kV doorknob 1.95; Call TS520, TS700A, 210X; Midland 13505 30W2MFM 250.00; Collins. Prices FOB Houston. Good until June 1. Madison Electronics, 1508 McKinney, Houston TX 77002 (713) 224-2668. Nite (713) 497-5683.

PUBLIC Sale: Texas Inst. chart recorder, 1 MA full scale, serviced & calibrated. Excellent condition. Instruction manual. Minimum bid $385. Also — 6 Motorola fixed channel VHF-FM mobile transceiver, 6/12 VDC input, approx 156 MC - less xtals. Some with control heads, no cables. Minimum bid $120. For viewing appointment & information contact Policw Property Unit. Sealed bids sent Attn: City Clerk, 6th Floor. Bids must be in by: 2 PM, Friday, May 28, 1976. City of Newark, 37101 Newark Blvd., Newark CA 94560 (415) 793-1400. The city has right to reject any and all bids.

COLLINS accessories available now at reduced prices. Items are new, 351 DE mobile mount, reg. $487., now $329.; 516F2 ac supply reg. $265., now $220.; PM2 power supply reg. $267., now $198.; CC-2 carry case reg. $160., now $121.; MP-1 dc supply reg. $440., now $329. Write for list of used gear. HCJ Electronics, 8214 E. Sprague Spokane WA or phone (509) 924-2343.

WANTED: Good working used Ham band and ssb transmitters and receivers, receivers should not be older than 1955, will pay cash or trade. Write HCJ Electronics, 8214 E. Sprague, Spokane WA 99030 or phone (509) 924-2343.

WANTED: General Radio type 1330A bridge oscillator. Will pay top dollar for a perfect instrument. WØEG, George Collier, 1816 3rd Ave. South, Anoka MN 55303.

KNIGHT R-55A receiver, Excellent condition. .55 to 54 MHz. BFO and avc. Bandspread on 6 ham bands, 80 thru 6 meters. Tuning meter, xtal calib., manual. Pat Murray, 12 Redbud, Conway AR 72032. $45.

DRAKE, 2C receiver, mint condition, $175. Rulon WA6SCA (213) 927-0243.

SB101, HP-20 ac supply, HP-13/B, mobile mount — $320. Jim, W5UFI, 700 Kentwood Cr., Bedford TX 76021 (817) 268-0664.

FOR SALE - Brand new Leader 5" scope. 10 MHz bandwidth model LBO-505 — dual trace, triggered — with two probes and manual, less than one year old — mint condition (price new - $799.) asking $450. Collins R-390-A recently calibrated and overhauled .-0 to 30 MHz-digital readout, navy rack model with manual $795. You pay shipping, Richard Matassa, 941 Army Trail Addison IL 60101 (312) 543-2186.

KILOWATT homebrew final on 6 and 2 meters includes 600 watt plate modulator and all power supplies with variac control, $200. S.a.s.e. for details. Daskam, 206 Hillspoint Road, Westport CT 06880.

SWAN 500 CX and 117 XC supply $400. Swan 250 $175. All in good condition. Phillip Schwebler W9GCG 4536 N 50 St. Milwaukee WI 53218.

HEATH SB-104 — Factory aligned and updated. Complete with HP1144 power supply and SB60X speaker. You pay shipping $475. WB4QPH 1549 Findlay St., Deltona FL 32763.

WANTED: Plans to make QRP rig or VFO. Glen Klaver Ellsworth IA 50075 WN0RBI.

Noise blanker NB-500 for Swan transceivers. Mint. $45. W6NIU.

"HOSS-Trader, Ed "Says" "We Refuse to be undersold: If you didn't buy it from the Hoss you paid too much. Shop around for the best price then telephone the hoss last. New Atlas 210 transceiver $499.; Demo TR-4C, $479; New display Swan 700CX, $519.; Demo T-4XC, $469. Special - New regency HR-212, 2 meter transceiver, $189., Icom 230 Demonstrator, $419.; New Rohn foldover tower prepaid $365. Demo Ham-2 Rotor, $119.95; New display atlas 210X $539.95. Hoss-Trader, specials" R-4C, $489.; New display L-4B Linear, $749. on sale" New Collins at 10% below old prices, factory sealed, or make offer. Moory Electronics Company, P. O. Box 506, DeWitt Arkansas 72042. Tel. (501) 946-2820.

ARMY Signal Corp transmitter BC-669-A, tuner and antenna match cay-47153A, and two power supplies PE-112-A, sell or trade on transmitter, transceiver or receiver, Van Gudmundson, 2365 W. 5300 S, Roy UT 84067.

SELL: Robot 70A monitor (new condition) $210, Model 28KSR Teletype (excellent) $225, W7KPA, 1240 West San Lucas Drive, Tucson AZ 85704.

WANTED, one filter assembly, International Crystal Mfg. Co. type ACF-4, John R. Greenwood, 225 W. Broad St. Bergenfield NJ 07621.

COLLINS 62S-1, Mint, $895. Dick Shideler, 3731 Evergreen, Visalia CA 93277.

CIRCUIT Boards. Artwork, negatives, etching. S.a.s.e. for details. Karl Raup, WB4OXG, Box 498, Springfield, VA 22150.

COLLINS 75S3B or 75S3C wanted, must have 200 Hz cw filter. Sell 75S1 with 300 Hz, 2.1 kHz filter, $295. W4YUU, 4260 Middlebrook Ln, Orlando FL 32806. Ph (305) 855-3826.

GOING to school — Selling Heath IT-28 capacitor checker $35, Leader signal generator $30, Hickok scope $35, 40 M ARC-5 xmtr. $15, RME ham rcvr. $75 (w/spkr.). All in good shape, most manuals. You pay shipping. C. Hiatt, Orion IL 61273.

STAINLESS Threaded, washer, hardware! List 20c! Walt, W8BLR, 29716 Briarbank, Southfield MI 48076.

DX-60B, Dowkey, both new, unused-$100. WN2AVO (212) 761-7622.

MOBILE 50 watt Bendix 2 mtr transceiver 52/52 - 34/94 - 28/88 - 16/76. $100. Multi-Elmac PMR 7 ssb receiver. AF67 transmitter, ac/dc supply. $100. Consider selling units separate. Band switches for linears $6. Pp48. Bill Collier K4VCP, Rt. 4, Box 119-A1, Jonesville VA 24263.

COLLINS 30S1 with spare 4CX1000A (new) $995. Excellent Hickock VTVM with probe good to over 200 MHz $49. Ralph Thomas W2UK, Juniper Pl, Colts Neck, NJ 07722.

WANTED: Expired ham automobile license plates for my private hobby collection. Please write Bill Carr, 9024 Kathleen, St. Louis, MO 63123.

51S-1 $800 military version edge lit front panel (115V 60Hz). R-390A $500. Both mint and just aligned. D. Ross, Box 1502 San Luis Obispo CA 93406 (805) 541-0794.

COLLINS 136B2 noise blanker $40. SS1S noise blanker $30, Drake SCC-1 crystal calibrator $15, Peter Meachan reciprocating detector $12. Thomas W2UK Juniper Place Colts Neck NJ 07722.

WANTED Swan ac power supply. W2SHT.

HW-101 w/speaker, HP-23B, first offer over $230. SB-220, first offer over $300. HW-22A, $70. WA9GAM, Mike, 2701 — 20th, Zion IL 60099. Phone (312) 872-8124.

SELL — Hallicrafters SC-24, good condition needs alignment, also earlier SX model. Best offer either or both. All replies acknowledged. G. Roberts 2020 Himrod St. Brooklyn NY 11237 (212) 366-4845.

FOR SALE: Good Hallicrafter H.T. 40 tx $35; Dentron 80-10 ATV as new $30; Matric Model 50 tx good $35. Write R. Marris, No. 219, 7360 Gallagher Drive, Edina MN 55435.

NEW powerful 3 output regulated power supply, plus 900 parts worth $400. list. Solid state electronic TV recorder. Schematics, parts cross reference. Free brochure. $17.95 plus $3.50 S&H. Madison Electronics Company, Inc., Box 369, D66, Madison, AL 35758.

MINT SB-220 — $375. — pickup WA1TNI A.R.C.

HENRY 3K-A Linear. Cool running with electronic bias switching, like new — $950. Pick up only, Boston area. Lee WA1TWH (617) 926-1739.

WANTED: 2KW linears, cheap Novice gear. WB5FXI.

WANTED receiver R-1084/GRC equals hallicrafters SWE sell Gen. Radio 224 wavemeter coils charts range 13 kH thru 50000 kHz transport cased $100. FOB W3AW 9406 Evans Phila. PA 19115.

WANTED: HW-101; HW-100; good condition WN1UYZ 79 Butternut Lane Stamford CT 06903.

LOOK: Heath SB-300 (3 filters) and SB-400 Combo in very good condition, will transceive with either LMO. $410, you pick-up Alan Davis WA2URT, Syosset NY (516) 921-6188.

HAVE unopened Regency HR-2B and HR220 will sell each or consider old hf a-m gear in trade. Full warranty s.a.s.e. Merrill See W8BGZ, 7337 South 12th St. Kalamazoo MI 49002.

LINEAR for sale! Very clean Hallicrafters HT-33B kW amplifier, great condition. Only $160. WB2ZCH, 63 Benedict Avenue, White Plains NY 10603.

MAGAZINES: Ham Radio, Mar 68 thru Dec 70, "Radio" (in binders) 1940-39-38-37, "Radio" Handbook 4th-6th-9th editions. ARRL Handbook 38, 42nd editions. Make offers. Ralph Thomas W2UK, Juniper Pl, Colts Neck NJ 07722.

SSB SPECIAL: Hallicrafters HT-37 10-80 meter xmtr-excellent condition, pick-up deal only $125. Contact K2AWA P. O. Box 568 Boro Hall, Jamaica NY 11424. Phone (212) 224-2448.

WANTED — 40 feet or more Rohn 45 tower. W1GQO. (203) 224 4603.

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10 KW Rating! Yep, this 4 el 20 M Yagi is rugged, 116 lbs, stainless hardware, tilting boom, 125 mph rating. Hy-Gain 204B listed $395 in 1970, only $275 unused. You ship. Wanted 5+ elements 15/10M Yagis. KIVTM, (203) 621-6392.

SELL: HW-7 $60; DX60B $55. Both excellent. W8KUX, 638 First Street, Romney, WV 26757.

WANTED: National AGS receiver junker or restorable; 1945 issues CQ; issues 7-8, "Modern Radio;" issues 1-2 "Amateur Radio Defense;" Junker Tektronix 512 oscilloscope with good CRT/HV transformer. Nagle, 12330 Lawyers, Herndon VA 22070.

WANTED: Elco 752 power supply. WA9HEG, 302 N. Maple Grant Park IL 60940.

NOVICES: Heathkit HR10b rcvr, DX60B xmtr, HG10B VFO, HM102 SWR meter. All mint with manuals. New price 330, Ur price 175. WN9PIQ Ted, 22 Tillman St. Danville IL 68132. (217) 443-2407.

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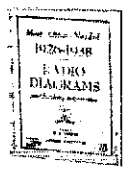

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WANTED Gonset VFO. Roth, 114-67 223rd Street, Cambria Heights NY 11411.

NEW — Decorative call sign plaques — individually handicrafted Polymer glossy finish — 5 X 12 gold with 1-1/2 in. raised gold letters $12.95. ppd USA satisfaction guaranteed — K6CH, 1204 N. Atamo St., Anaheim CA 92801.

FOR SALE — HW16 and HG-10B. Still in kit form in original boxes. No missing parts. $165. J. Nonnast WB5NMY, 419 East Kenedy, Kingsville TX 78363.

FOR SALE Collins Noise Blanker and antenna. Bill Levy, 349 Old Roaring Brook Road, Mt Kisco NY 10549.

KENWOOD TS-520 transceiver for sale, $525. cw filter, $40. Also Collins 75S-3, very clean. $475. Heath SB620 Scanalizer, $125. R. Myers, 221 Long Swamp Road, Wolcott CT 06716.

OSCILLOSCOPE, Lectrotech TO-50, solid state, 10 MHz-bw, triggered sweep, 5 inch display, w/probe, excellent $219. WA2EKE (716) 223-4500.

SELL QST, 1930 through 1975 complete, good condition. "The Milliwatt," 1970 and 1971 complete. Make offer. Want 5th edition ARRL Handbook. W9KV, 706 N. Elmhurst, Mt. Prospect IL 60056.

SELL Swan 500-C with power supply fine condition now on air, $350. firm, operate and take. K2BHL NJ (201) 545-8458.

HEATHKIT HW101, H 23, cw-filter, Mike and custom RIT - $370. SB650 Display — $140. WN2ZQS, Warren NJ (201) 561-4137.

WANTED STU-1B plug-in for Polrad Spectrum analyzer. Advise price. W0OZG Rt 5 Box 113 St. Charles MO 63301.

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SELL very fine ham station. Call/write for details. WA2QEK (212) 444-6073, 9204 Rost Pl. Bklyn NY 11236.

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WANTED hf mobile rig and antenna — SBE 34, Hustler or similar, state condition and bottom price (516) 757-2574, WB2FEK Jim Teeple 17 Grand Ave. Northport NY 11768.

SELL HW-101, HP-23B, like new. Checked and aligned by Heath. Used very little. $350. firm. WB4KXW 623 Grandview Drive, Griffin GA 30223.

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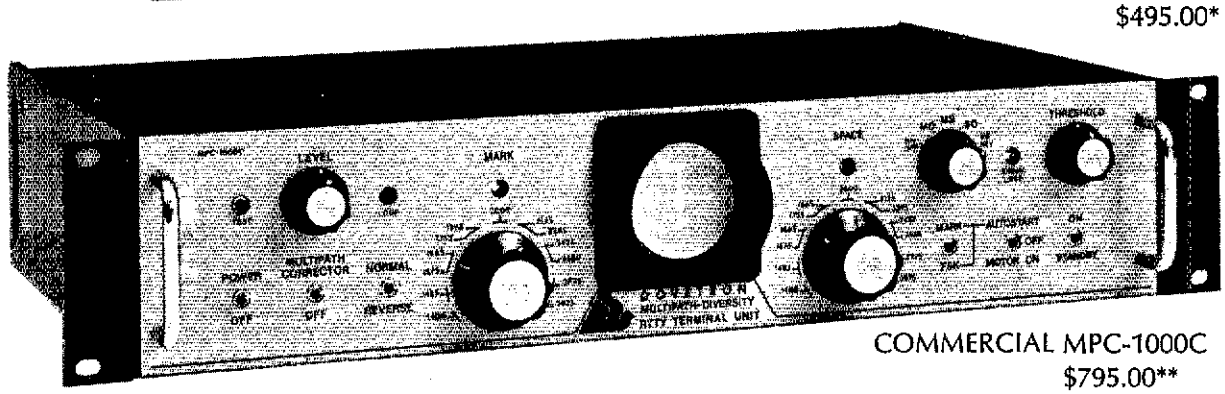

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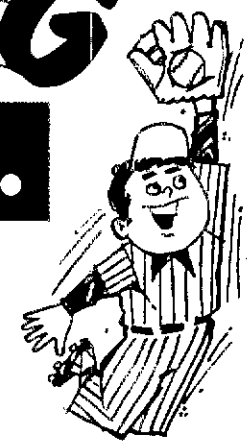

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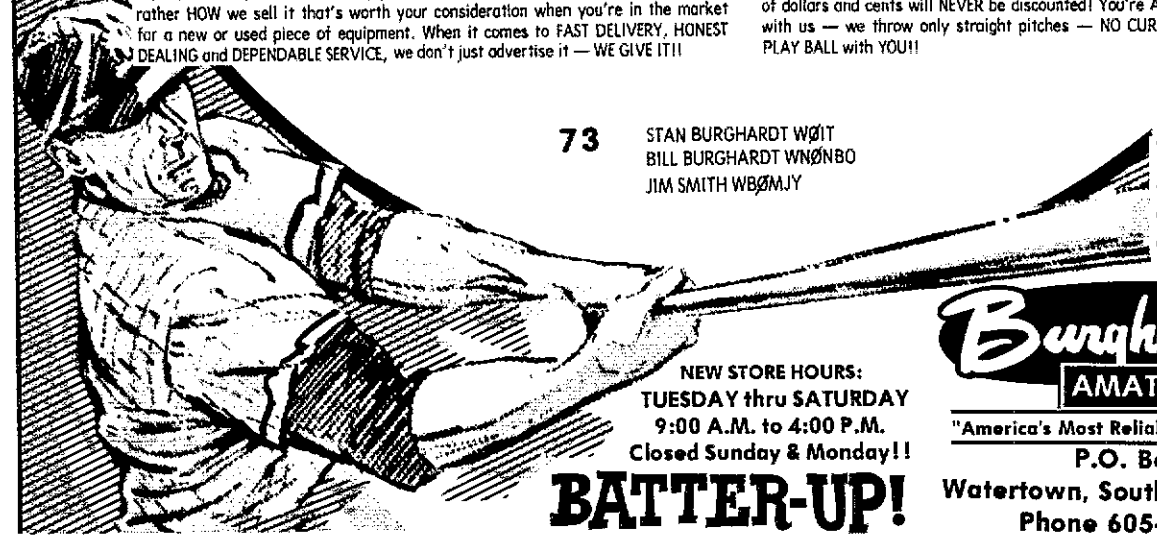

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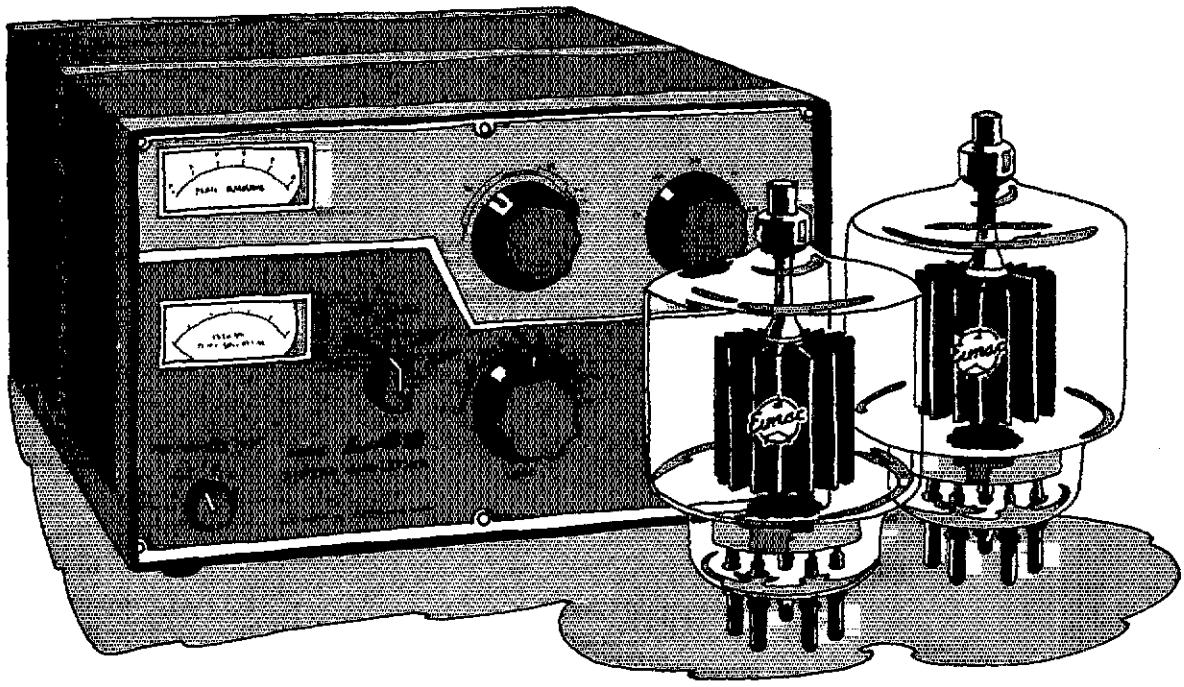

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