

# Worldradio

Year 18, Issue 11

May 1989 • \$1

## Homeward bound

Dear Friends,

We have just concluded our operation as W6QL/5N0 in Lagos, Nigeria, with a total of 3000 QSOs with Amateurs in 124 countries, operating both CW and SSB on 10, 15, 20 and 40M.

We stayed and operated from the QTH of Cal, KH6HSS/5N0, who helped us in many ways.

Before that we went to the country of Niger, but did not receive a license. There is no direct airline between the countries of Niger and Nigeria. You cannot legally buy and sell Nigerian money in Niger.

We flew from Lagos to Sokoto, in Northern Nigeria and then took a 10 hour trip by car to Niamey, Niger. It was a rough car trip. We carried all our 400 pounds of equipment and belongings.

During the last four months, we had successful operations at 5B4KG (Asia), ZC4ZR (Asia), 9H1JN (Europe) and W6QL/5N0 (Africa).

We hope to return to the USA in a few days, and are planning a visit soon to all 15 Republics in the USSR.

Lloyd Colvin, W6KG

Iris Colvin, W6QL

□

## Sunspot cycle

The 11-year sunspot cycle is gearing up for its peak in December 1989, and researchers predict it will be one of the most violent in 250 years.

According to researchers at National Oceanic & Atmospheric Administration (NOAA), the intensity of sunspot activity is expected to increase between now and next December. Already, they report, the average number of flare-ups (51.3/month over a 13-month period) is greater than that observed in a similar period in 1957 (40.7), the previously strongest sunspot cycle ever recorded.

NOAA researchers predict that the present cycle will peak at 100 to 200 sunspots/month. Massive magnetic storms on the sun, which have played havoc with radio communications and electric power transmission, are expected to continue throughout this period. —Six Meter Club of Chicago □



Doug Loughmiller, KO5I

## AMSAT OSCAR update

*The following is a transcript of the speech given by Doug Loughmiller, KO5I, President of AMSAT NA, to the Oscar satellite enthusiasts assembled at the 1989 Annual Meeting of Project Oscar at the Electronics Museum, Foothill College, Los Altos Hills, CA on Jan. 28.*

I recognize that this group in the Bay Area is in the forefront of the Oscar Satellite program. I remember reading about how these folks got Oscar One off the ground. I am very happy to be here today and would like to see a continuation of the cooperation between our two organizations. That's why I thought it would be important to come out and share a few things with you as to what's going on in Amsat NA.

I hope that most of you have seen *Amsat Satellite Report (ASR) 186*, in which there are a number of articles concerning what occurred in the meeting at Atlanta, GA. As reported in that publication, I replaced Vern Riportella, WA2LQQ, as Amsat President.

One of the things we're working on is the decentralization of a lot of the activities that were being taken care of by basically a few people. Our organization has grown and is sufficiently complex that it requires the efforts of a

unified management team. To this end we now have on our management team a Vice President of Operations, and we have dispersed our management functions, which had been done primarily in the Washington, D.C. area. They are now scattered literally across the country, to Texas, Colorado and here in California. This will make for a different approach to things.

Conceptually, the goal is to get more people involved. Amsat — and when I use that term, I mean all the Amsat organizations — are probably the most volunteer intensive organizations in Amateur Radio. We don't have large staffs to work on problems. The work is exclusively volunteer. All of us work at full time jobs, and then turn around and spend about an equal amount of time on our OSCAR activity. That's why I felt we wanted to get more people on line, to handle some of these functions.

The kind of things I hope we will be able to improve upon will be, first of all, the responsiveness to members. I feel that in the past the needs of the members were not being met. We're headed in the right direction for a change. I'm not speaking critically of what has gone on in the past, but there was definitely room for improvement.

(please turn to page 6)



# HENRY RADIO IS THE PLACE ...THE BEST PLACE to fill all your data communications needs

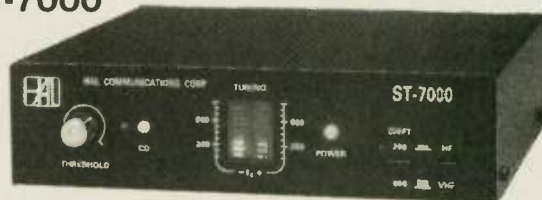


## The TEMPO MPP1

... a unique new mobile data printer, includes a packet controller and a 13.6 VDC printer that interfaces with any mobile radio. In a recent user test it proved to have about twice as much audio level range tolerance as other TNCs. It is also an ideal unit for emergency work and a commercial version is perfect for dispatching service, emergency and police vehicles.

## HAL Communications' ST-7000

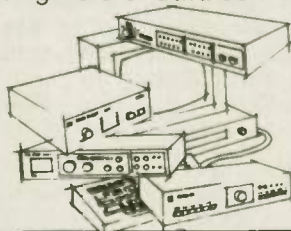
HF-Packet Modem... a high performance modem designed specifically for 300 baud HF-Packet. It offers no-compromise performance to assure optimum operation under the most demanding signal conditions. Techniques developed for government and military use are used in the ST-7000. AGC-controlled AM signal processing provides a wide dynamic range. All filters and detectors are optimized for 300 baud HF-Packet. It offers the 200 Hz shift mode and a wider 600 Hz shift mode, each supported by separate 6-pole input filters and a 40 db AGC system.



## The PK-232 by AEA

... the only controller offering Morse Code, Baudot, ASCII, AMTOR, Packet, and facsimile Transmission & Reception plus the ability to monitor the new Navtex marine weather and navigational system... 7 modes in one controller. The PK-232 makes any RS-232 compatible computer or terminal the complete amateur digital operating position. All decoding, signal processing and protocol software is on ROM. Only a simple terminal program (like those used with telephone modems) is required to interface the PK-232 with your computer. **Watch for the new and exciting AEA FSTV-430. Have fun on amateur TV!**

*Obviously, we can fill in a system that you have already started. Or we can furnish a complete system to fit your needs and budget. For example, here's some suggestions for the amateur just entering the exciting field of data communications, or for the amateur who wants the best available.*



**NO. 1** For the fun (and very affordable) mode, VHF Packet, AEA PK-88 with personal mailbox, 8K programmable memory and TCP-1 P compatibility.

For serious 20 M world-wide DXing on Packet, 200 or 600 Hz shift... add the superb HAL ST-7000.

**NO. 2... top of the line!** The HAL ST-8000 or HAL ST-6000 and AEA's PK-232... the winning combination. You can't do better for all-mode, all-band enjoyment of hi-speed data communications.

**If you have any questions concerning these units, or would like to discuss your requirements with a knowledgeable specialist, please call and ask for George Sanso, AB6A. We also carry a large selection of excellent commercial products for data communications and emergency systems as well as a complete inventory of amateur equipment and linear power amplifiers.**



# Henry Radio

2050 S. BUNDY DR. • LOS ANGELES, CA 90025 • (213) 820-1234

Toll free order number: (800) 877-7979 TELEX: 67-3625(Henradio) FAX (213) 826-7790



## A sad passing:

# William Eitel, W6UF 1908-1989

Amateur Radio has lost one of its great pioneers.

Bill Eitel died on Feb. 26 in Palm Springs, CA.

It was Bill who, in 1934, with \$5,000 of borrowed money and partner Jack McCullough, W6CHE, founded vacuum tube manufacturer Eitel-McCullough, later to be known as EIMAC.

The first display of their new tubes was at the Fresno Hamfest. They then branched out to aircraft, commercial and military applications.

Their company was engaged in the early research on the new RADAR for US Navy ships.

The company's ceramic tubes were a great step forward and highly used in FM and TV transmitters. Bill and FM inventor, Major Edwin Armstrong, collaborated on that, then new technology.

An avid Amateur, Eitel made the first 10M transcontinental QSO and was among the first to do the same on 20M. He delighted in telling the story about his high school teacher who told him that if he didn't quit playing with his radios and attend to his schoolwork, he would never amount to anything.

W6UF mastered the bonding of glass to metal while industry giants were unable to perfect the process; he manufactured TV picture tubes which were distributed under the RCA name.

While other major electronic firms turned away from the Amateur market, Eitel never forgot his roots and EIMAC supported the Amateurs through advertisements in the Amateur Radio magazines and wide distribution of technical literature.

More than any other single in-



Bill Eitel in 1941 (Photo courtesy of Dave Atkins, W6VX)

dividual, he is responsible for the OSCAR program. His personal financial support was crucial and massive in the early years. His enthusiasm was the ramrod which pushed volunteers to spend innumerable hours in the evenings and on weekends.

He leaves his widow, La Neil, whom he met at a hamfest. He said he was attracted by her prowess with the bug. Bill was a devoted high-speed CW operator and could copy at 80 wpm.

W6UF was truly an inspiration to all who knew him and he will be greatly missed. □

## Amateur film wins award

The *New World of Amateur Radio* videotape has won a major award.

The video has been judged a Gold Medalist in the Science and Technology Category of the 1988 International Film and Television Festival of New York.

The show was produced with funding by the ARRL and the Icom America, Kenwood USA and Yaesu USA corporations.

Roy Neal, K6DUE, was executive

producer/writer/host; Forrest "Frosty" Oden, N6ENV, served as producer/editor and Bill Pasternak, WA6TIF, was field producer/technical director.

What makes this award significant is that it was made by non-hams and, therefore, indicates that the message that *The New World of Amateur Radio* tries to deliver is easily understood by those outside of the Amateur Radio community.

—The Westlink Report □

## CONTENTS

### FEATURES

All About Electricity — 6  
"No Code" Pro and Con — 11  
OSCAR Speech — 1

When will AMSAT OSCAR  
13 be in range? — 13  
Yagis and reality — 47

### COLUMNS

Advertisers' Index — 63  
Aerials — 46  
Amateur Hi — 19  
Amateur Radio Call Signs — 8  
Contests — 54  
Digital Bus — 41  
DX Prediction — 34  
DX World — 29  
FCC Highlights — 8  
Hamfests — 53  
MART Classifieds — 61  
Mobile — 39  
New Products — 58  
Off The Air — 23

Old Time Radio — 51  
Product Review — 56  
Public Service — 20  
Publisher's Microphone — 4  
QCWA — 26  
QRP — 49  
Silent Keys — 17  
Six Shots! — 43  
Special Events — 15  
Subscription, **Worldradio** — 9  
10-10 International News — 28  
Traffic — 35  
VE Exams — 14  
Who's Who — 27

## ANTENNAS

- Assembled & Ready to Use
- Full Legal Power
- No Traps
- Matches 52 Ohm Coax
- Space Limited (AP Models)
  - Use as Inverted "V"
  - Use in "U" Shape

### MULTIBAND ANTENNAS

- Model AP-1 . . . . . \$48.00 ppd.  
• Covers 80, 40, 20, 15 & 10 Meters  
• 102 feet long
- Model AP-2 . . . . . \$43.00 ppd.  
• Covers 40, 20, 15 & 10 Meters  
• 51 feet long
- Model AP-3 . . . . . \$38.00 ppd.  
• Covers 20, 15 & 10 Meters  
• 26 feet long
- Model AP-4 . . . . . \$58.00 ppd.  
• Covers 160, 80 & 40 Meters  
• 204 feet long

### LOOP, TRIANGLE OR QUAD LOOP Built to frequency of your choice

- Model TP-1 80 or 75 Meters \$58.00  
Model TP-2 40 Meters . . . . . \$44.00  
Model TP-6 30 Meters . . . . . \$42.00  
Model TP-3 20 Meters . . . . . \$40.00  
Model TP-4 15 Meters . . . . . \$36.00  
Model TP-5 10 Meters . . . . . \$33.00

SHIPPED POSTPAID USA  
SEND FOR FREE BROCHURE

**RUDY PLAK — W6TIK**  
PO Box 966 • San Marcos, CA 92069





# Worldradio

May 1989  
Vol. 18, No. 11

is published monthly by  
**Worldradio, Inc.**  
2120 28th Street  
Sacramento, CA 95818  
(916) 457-3655

TM  
Subscription Dept.  
Worldradio  
1779 Tribute Rd., Ste. L  
Sacramento, CA 95815  
1-800-365-SUBS

Second class postage paid at  
Sacramento, CA & additional offices.  
**POSTMASTER:** Send address changes  
to **Worldradio Inc.**, P.O. Box 189490,  
Sacramento, CA 95818.

**Worldradio** (USPS 947000) is an inter-  
national conversation. You are invited to  
participate.

Our goal is to be a valuable resource of  
ideas and experiences beneficial to the  
Amateur Radio Community. We publicize  
and support the efforts of those who bring  
the flame of vitality to this avocation.

You readers are participants — an alli-  
ance of active radio amateurs concerned  
with reality, using radio as a communica-  
tions tool to develop the skill, quality and  
full potential of Amateur Radio.

We emphasize the positive aspects of  
this great activity, and desire your contribu-  
tions dealing with dramatic, personal and  
humanitarian uses of Amateur Radio.

**Worldradio** is an independent newspaper  
not affiliated with any other firm, group or

organization. Its pages are open to all.  
Permission is hereby automatically granted  
to reprint from this publication with appro-  
priate source credit. If there is something  
useful, we wish to share it.

Subscription rates: \$12 per year, \$23  
for two years, \$33 for three years and  
\$120 for life; \$10 extra per year for  
surface mail delivery outside the U.S.  
Please remit international postal money  
order. IRCs will be accepted.

## STAFF

Editor and Publisher..... Armond Noble, N6WR  
Managing Editor..... Marra McElroy  
Assistant Editor..... Kaye Schwartz  
Assistant Editor..... Christine Toppenberg  
Associate Editor..... Norm Brooks, K6FO  
Consulting Editor..... Lou Ann Keogh, KB6HP  
Advertising Director..... Helen Noble  
Ass't Adv. Director..... Rosalie Hernandez  
Graphics Director..... Dianne Dunning  
Circulation Mgr..... Dorothy Campini

## PUBLISHER'S MICROPHONE

The first item before the house is the  
recognition of the latest **Worldradio**  
Super Boosters (Lifetime Subscribers):  
Arthur Hendricks, K4CTZ, Carson Ci-  
ty, NV; Leon Streng, N3BOB, North  
Wales, PA and James Ory, WD9ATJ,  
Naperville, IL.

A letter from Richard Barrett,  
KK4NQ, thanking us for sending  
subscriptions as prizes for the Sky  
High ARC of Lecanto, FL Hamfest  
reminds me to mention the fact that we  
do. So, Hamfest Chairmen, write in to  
us.

By the time you read this, it will be  
less than three months until that great  
event — **FIELD DAY!** If your club  
does NOT go on Field Day ... find  
another club to join.

There are many folks running about  
saying that if Amateur Radio had more  
licensees, we would not be faced with  
the perennial challenges to our frequen-  
cies such as the recent 220 MHz at-  
tempted grab by UPS.

(We told the UPS driver who stops at  
our office that if the reallocation is  
made, we will refuse all packages sent  
by UPS and won't use their outgoing  
services either.)

Do we need more Amateurs to ward  
off attacks? How many more? Or,  
perish the thought, do we have to get  
those that we do have off the *Worked*  
*All Zip Codes Net* long enough to write  
a letter?

Will 440,000 Amateurs write to their  
Congressman? (No, not signatures on a  
petition gathered at a club meeting or  
signatures on pre-printed postcards.)

Hey, if a Congressman gets 1,000  
separate letters on a topic, he starts  
counting votes from those families.  
That's even more important than cam-  
paign contributions.

So the question is, will 440,000  
Amateurs write letters? Well, the ques-  
tion now is will 44,000 Amateurs write  
letters? OK, the question is now will  
4,400 Amateurs write letters? Actual-  
ly, will 440 Amateurs write letters?  
Will each Congressman get even one  
letter on the subject? Don't bet your  
amplifier on that one.

Will every lawyer who is an Amateur  
dictate a letter and sign it? Will every  
doctor who is an Amateur (please Doc,  
no handwriting, we want them to know  
what the letter is about) write a letter.  
Will executives write such a letter on  
their letterhead? Don't bet a fuse.

What if all our policeman Amateurs  
told the drivers they know, "I'll be  
looking at your tires to see if there is  
enough tread, let me see that the brake  
lights work."

What if we all wrote to UPS and said  
something like, we'll do our best to bad  
mouth you to everybody we know.

## Where's the Beam?

Unobtrusive DX Gain Antennas for 80 thru 10  
• Easily hidden • Install Fast • Fixed or Portable •

There's a 20 meter antenna with real DX Punch  
hidden in this picture. You can't see it, and your  
neighbors can't either. But it works DX barefoot  
anyway. How about a low profile 80/40/30 m-  
bander? Or a 2 element monobander for the attic?  
All easily fit the pocketbook—Priced \$29 to \$99.

Work DX without telling the neighbors

Infopack \$1 **AntennasWest**  
Box 50062-W, Provo, UT 84605 (801) 373-8425

I imagine every Amateur has at least  
one (civilian) non-ham friend. Now  
we've got a million people on our side.

Plus, think about all the SWLs who  
listen to the Amateur bands. All of a  
sudden in all the ragchews everyone is  
saying, "We certainly get such good  
service from Federal Express at our of-  
fice." And there are Purolator and  
some others.

Let us let UPS know that they have  
taken on a group that can be very  
vocal. "OK, Bob, nice QSO, see you  
later down the old log book, 73, and  
don't forget don't use UPS."

"Yep, Ralph, when you hear me on  
give me a shout. And, I've given all my  
packages back to the Post Office."

United Parcel Service is owned by  
the management. How far could we  
drive down their dividends?

It is better to fight back in a way that  
UPS would feel.

The NO-CODE element is now seiz-  
ing upon the UPS issue as a reason to  
abandon the CW requirement. While I  
may personally disagree with such a  
position, in the masthead above it says  
about **Worldradio**, "Its pages are open  
to all." So as to truly be an open forum  
we're printing elsewhere in this issue  
the thoughtful position of the Zawlocki  
family.

Also, there is an article titled *Dis-  
tress System at Sea*. I recommend  
reading both.

Some say we should make the entry  
to Amateur Radio "as painlessly as  
possible." There is a phrase, "No pain,  
no gain."

You give people self-esteem by hav-  
ing them overcome obstacles. The  
argument used to be if we had more  
Amateurs we'd beat Japan in the elec-  
tronics game. A big Japanese in-  
dustrialist was quoted in the *Los*  
*Angeles Times* as saying they would  
win because Americans are (we quote)  
"lazy."

Is he right?

—Armond, N6WR

## HI-Q BALUN

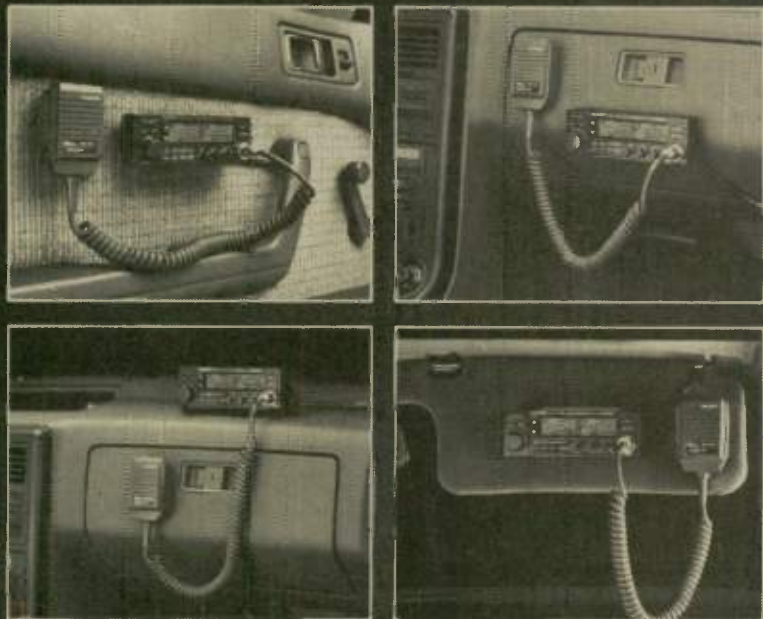
- For dipoles, yagis, inverted vees, doublets & quads
- For full legal power & more
- Puts power in antenna
- Broadbands 3-40MHz.
- Small, light, weather-proof
- 1:1 Impedance ratio
- Replaces center insulator
- Helps eliminate TV!
- Fully Guaranteed \$14.95



**Van Gorden Engineering**  
PPD U.S.A.  
BOX 21305, S. EUCLID, OHIO 44121



# YAESU'S DUAL BANDER GOES PLACES OTHER MOBILES DON'T.



**FT-4700RH control head**  
(1<sup>15</sup>/<sub>16</sub>" x 5<sup>7</sup>/<sub>8</sub>" x 1")

**Introducing Yaesu's FT-4700RH dual-band mobile.** Choose Yaesu's FT-4700RH, and you open the door to a lot of tight spaces.

While other dual banders just won't fit in today's small cars, the FT-4700RH utilizes a versatile "remote head" design. So you can mount the "brains" on your dash, visor, or door, and hide the "muscle" under your seat.

**High-performance package.** Packing a solid 50-watt punch on 2 meters (40 watts on 70 cm), the FT-4700RH includes Dual-Band Watch for simultaneous monitoring of both bands, with independent squelch settings on the main and secondary bands. When you transmit, opposite band monitoring goes on in a full-duplex mode.

You can adjust the relative volume of the two receive channels with the balance control, too. And with Yaesu's bright LCD display, transceiver status is clearly visible in sunlight or shade.

**Convenience on the road.** Human engineering, long a Yaesu specialty, is an important aspect of the FT-



4700RH design. The ten-button front panel keypad includes a "do-re-mi" audible command verification, and all important controls are backlit for night operation. Plus you get extended receive coverage of 140-174 MHz (MARS/CAP permit required for transmit on 140-150 MHz), or 430-450 MHz on 70 cm. Nine memory channels on each band. High/low power selection (low power: five watts). One-touch reverse repeater shift button. Optional CTCSS module. And 16-key DTMF microphone.

**Optional accessories.** FTS-8 CTCSS unit. MH-15D8 Autodialer Microphone with 10-telephone number memory. SP-3 or SP-4 External Speakers. And YH-1 Headset/Boom Mic or MF-1A3B Flex-Arm Boom Mic, both with SB-10 PTT Switch Unit.

**Discover Yaesu's FT-4700RH today.** And see what "high performance" really means. For dual-band mobile operation, Yaesu's FT-4700RH really fits!

Yaesu USA 17210 Edwards Road, Cerritos, CA 90701  
(213) 404-2700. Repair Service: (213) 404-4884.  
Parts: (213) 404-4847. Prices and specifications subject to change without notice. Specifications guaranteed only within amateur bands.

# YAESU



# Talk of OSCAR

(continued from page 1)

We want to improve communications. We want to follow through with an environment of cooperation and camaraderie. I am impressed with the eagerness with which we help one another to work on the Oscars. I want all the groups and organizations to similarly work together closely.

I see Amsat NA as one element of the overall satellite program. I want to see an effort, internationally, bringing us together in this context. I believe the Amateur satellite program can best be served by our all working together, seeing the same big picture.

In our goals for 1989, I see the completion of our Microsat project, which was wrapped in mystery for the first six months, and I'm not sure at this point how widely known the elements of that project are.

Amsat NA's specific payload on that project is PACSAT — packet radio satellite, a store and forward payload. There are four groups working on this — Amsat NA, Amsat LU, the Brazilian Amsat and Weaver State College at Ogden, UT.

Weaver is also working on two small projects, that are a continuation of the Uosat series. At least one of those will have a store and forward system on it as well, but at higher data rate. We expect to have a launch in the July-August time frame.

This is a remarkable program when you stop and consider that this project is conceptually not yet 18 months old. The idea of miniature spacecraft didn't really come together until the 1987 meeting we had in Detroit. The information will be put out to Amateur Radio in general very shortly.

We've created the *Amsat NA Journal*. We've opted to do away with the ASR publication. I think the members will be better served by the new publication. Joe Kasser, G3ZCZ, who served as the original Amsat newslet-

ter editor and on *Orbit* magazine, has agreed to come on line with us. He has a good group of articles for the first issue, which will be published soon.

One thing we heard from members not renewing ASR was that they were getting the same information off packet bulletin boards, and three weeks sooner. Here is a case where improved technology has made a publication obsolete in just two years. This ties in with my comment about improving communications.

Another goal is to increase Amsat NA membership. Our membership right now represents about one percent of the Amateur Radio operators. People in the industry say this may represent about 10 percent of the active Amateurs. But I would like to see that number increase significantly. We have so much to offer Amateur Radio that we have to work harder getting people into the fold.

Our office manager tells me that we have had 40,000 radio Amateurs who, at some time in the last eight years, had belonged to Amsat, but have not

renewed their membership. This concerns me greatly. Where are we not doing a good job? We'd like to know. We want to work on that.

We're going to have a budget crunch with our Microsat project. We'll have a big job to do in fund raising. I'd like to encourage financial contributions — right now they would be very, very helpful to us. We're working with the League, trying to get some money from the ARRL Foundation.

We'd like to work on the utilization of the Oscar satellites. They are somewhat under utilized right now. I know a lot of you are involved in education to stimulate Oscar activity across the country.

I'm interested in your thoughts as individual members. This is a genuine interest. If you have ideas to share, get them to me however you can.

I appreciate the good work you Area Coordinators have done, getting out to the hamfests and local club meetings and answering Amateur questions.

*Editor's note: KO5I's address: P.O. Box 27, Washington, D.C. 20044.* □

## All about electricity

JOE STROLIN, K1REC

I have been fiddlin' with electricity for 50 years! While I'm still able, I'd like to pass along some of my vast knowledge about this stuff.

1. Electricity is manufactured in power plants where it is fed into wires and wrapped around large drums that hang on poles.

2. Some electricity does not need to go through wires, like that used for lightning, for example, and portable radios. This kind of electricity is not manufactured, but just hangs around in the air, loose.

3. Electricity makes a low humming noise. This noise may be pitched differently for use in telephones, doorbells and electronic organs.

4. Electricity must be grounded before it can function — except in airplanes, which have their own arrangements.

5. Although electricity does not leak out of an empty socket, if you put your finger in the socket you can tell it's there. So if it is not leaking out, what

else is it doing?

6. Electricity is made of two ingredients, negative and positive. One ingredient travels along a wire covered with white plastic, the other ingredient along a wire covered with black plastic. These two wires connect to a device called a plug. There the two ingredients are mixed to form electricity.

7. Electricity may be stored in boxes, called batteries. Big batteries do not necessarily hold more electricity than small ones. In big batteries, the electricity is shoveled in, while in small batteries, it is packed in flat.

8. The electric switch contains a sort of vise grip that squeezes the wire very hard so the electricity can't get through. Opening (turning 'on') the switch releases the vise grip and the electricity can flow.

9. Electricity goes into a light bulb where for the first time we can see it! It is enlarged many times by the curvature of the bulb, which is made of magnifying glass.

10. Why does the light bulb blow out? 'Cause as any schoolboy knows, heat converts oxygen into moisture. When all the oxygen in the bulb becomes moisture, then the water quenches the spark.

Join other Amateurs - help the physically handicapped be Licensed Amateurs



Courage HANDI-HAM System  
Courage Center  
3915 Golden Valley Road  
Golden Valley, Minnesota 55422

### RFI KIT

Use ferrite beads and toroids to keep RF out of your TV, stereo, telephone, etc.



Free catalog and interference tip sheet on request.

## PALOMAR ENGINEERS

Box 455, Escondido, CA 92025  
Phone: (619) 747-3343

### Short Broadband Dipoles & Slopers

Trapless 3-conductor legs create short antenna with broad 2- & 3-band resonance.

FB Dipoles		Tower-Mount FB Half Slopers	
FB 80/40/15	62'	FB 160/80/30 CW	70'
(+ CW - Center - LSSB - HSSB)	\$79.95	FB 160/75 SSB	62'
FB 40/20	31'		
FB 20/10	16'		

When ordering add \$5 P&H Info pack \$1

Box 5062-W, Provo, UT 84605 (801) 373-8425

\*No Caps or Coils  
\*Fully wx sealed & insulated  
\*Efficient  
\*Coax Fed  
\*Ready to Use

Antennas West



11. Colored electricity lights red and green bulbs and stoplights.

12. Negative electricity runs refrigerators.

13. Some people who don't understand electricity wire their fuse boxes to hold little glass things with fuse wire in them. I find chicken wire better, and it won't blow out, even if the dryer goes up in flames.

Despite all this vast knowledge, I still don't understand a few things about electricity, like how a computer that speaks English can be programmed to speak French, which is a different voltage? Also neon signs are a mystery. How is the electricity trained to spell out things? How does the electricity know when the toast is ready?

P.S. Most of what I have learned was from *Readers' Digest*. —From the Column "Sam Sez," North Haven Island, ME. The QRA News, Quannapowitt (ME) Radio Association. Reported by Norm Brooks, K6FO. □

## Amateurs assist after plane crash

Amateur Radio played a key role in relief efforts following the bombing of Pan Am flight 103 over Lockerbie, Scotland last December.

According to the RSGB, several Raynet groups were called out to assist in the search for clues as to the cause of the disaster. They set up stations at a local Lockerbie school and at the Emergency Communications Center in nearby Dumfries, and then fanned out to search.

As a result, both the Prime Minister and the Regional Emergency Planning Officer for Dumfries thanked the Raynet crews for helping untangle the mystery surrounding the downing of the Pan American flight. —*Westlink Report* □

## Identify yourself

with our custom engraved call pins

1 line 1"x3" ...\$1.00  
2 lines 1"x3" ...\$1.25  
3 lines 1 1/2"x3" ...\$1.75

DAVE W2CFP  
TOMPKINS CO. ARC

Any color • (Add 25¢ per tag for postage.)

Logos for MARS, ARRL, CD, most Lodges, OH, IN, IL, MI, PA, SMIRK, can be engraved on badges for \$.75 extra per badge. Special logos can be made at a reasonable cost; write for quotations.

## FALLERT'S ENGRAVING

27 Verlynn Ave. • Hamilton, OH 45013

# Technical learning project



On Dec. 16, 1988, members of the Tonto ARA Inc. put on an Amateur Radio demonstration at Payson Elementary School in Payson, AZ with a combined sixth grade class. The primary purpose of the program was to introduce these children to the world of technology. Over a period of two days, the students were taught Morse Code, the phonetic alphabet, call district divisions and "Q" signals. Each student also received kits for radio construction and took part in mounting the parts, soldering the components, installing wiring and winding the inductor. Some of the Amateurs who participated in the demonstration were: (seated) Pete Pedersen, W7KTK; (standing, left to right) Pete Peterson, K7DRI, and Kip Aslin, KD7ACD.

## INTERNATIONAL RADIO AND COMPUTERS, INC. . . . OUR 10TH YEAR

It all started in 1979 with the publication of the ICOM Newsletter!!  
You've tried the Rest!!! Now go with the BEST!!  
For the lowest price and highest quality!!



### ★ SALES

- Kenwood, ICOM and Yaesu Equipment and most other Amateur Radio Products!
- ICOM Authorized Dealer!

### ★ SERVICE

- Optimized Alignment Service
- Installation of IRCI 8-Pole Crystal Filters, Enhancement Kits
- Tuning Upgraders
- Bank Controllers
- We Service Everything We Sell

### 8-POLE and 10 POLE CRYSTAL FILTERS ★ For Kenwood, ICOM and Yaesu

### ASK YOURSELF THESE QUESTIONS. . . . .

- Are you continually being interfered with during a QSO?
- You can't seem to pull out a weak signal in the QRM?

If your answer is "YES" to either one of these. . .purchase our SSB or CW Crystal filters without DELAY!

### ★ NEWSLETTERS AND PUBLICATIONS

ICOM, Kenwood and Yaesu Newsletters available for just \$10.50 each, per year. Years of back issues available. . .Back Issue Index \$4.00

USER'S SUPPLEMENTS AND ADDENDUMS for the TS-430, TS-830, TS-930 and TS-940, IC-701, IC-751, IC-730, IC-735, IC-720(A)



### INTERNATIONAL RADIO AND COMPUTERS, INC. • (407) 879-6868

RADIO DIVISION — 751 South Macedo Blvd., Port St. Lucie, FL 34983

FAX No. (407) 878-8856 Business Hours: 9:00 AM to 5:00 PM, Monday through Friday

COMPUTER DIVISION — 2806 S. U.S. #1, Ft. Pierce, FL 34982 • (407) 489-5609

Business Hours: 10 AM to 6 PM, Monday through Friday, 11 AM to 3 PM, Saturday

### ★ IBM COMPATIBLE COMPUTERS



COME SEE US IN BOOTH 432 AT THE "DAYTON" HAMVENTION!!!!

HAM SPECIAL NO. 1 — \$429.00 — Turbo XT 4.7/8 MHz, 256K RAM (expandable to 640K), one 5 1/4" floppy drive, Mono or Color Video Board with Parallel printer port, 150 Watt power supply, AT style Keyboard, extra heavy duty slide-in shielded case, FCC approved. One year Warranty on parts and labor. Free Software with purchase, includes DOS Tutor, 3 Ham Software disks, or choose any 3 disks from our Public Domain Catalog. Add \$29.00 for a 4.7/10 MHz Turbo Computer; Add \$39.00 for an Enhanced Keyboard

HAM SPECIAL NO. 2 — \$899.00 — Same as Ham Special No. 1 but with Seagate 20 Meg Hard Disk Drive and controller card, 12" Amber monitor with tilt/swivel base. FREE software as above. Add \$49.00 for a 30 Meg.

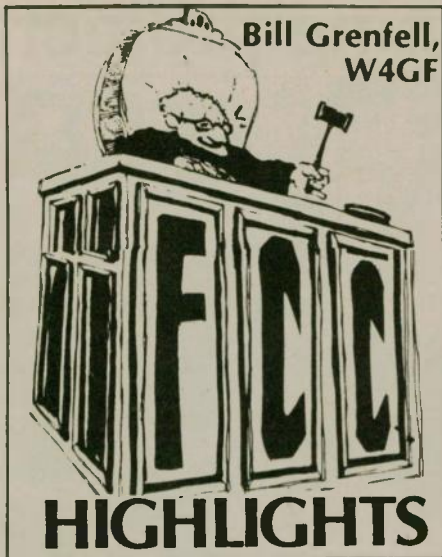
### ★ IBM PUBLIC DOMAIN SOFTWARE

\$5.00 Per Disk — All Major Titles  
Send SASE (45¢) for our FREE Public Domain Catalog

We are an authorized Zenith dealer.  data systems

Send SASE (45¢) for our FREE Expanded Amateur Radio Product Catalog.






"The FCC has opened the 18 MHz band for Amateur operation. . . Stations with General, Advanced and Extra class operator's licenses began using the . . . band as of 0001 UTC on Jan. 31.

"A1A (CW) emissions may be used in the whole band from 18.068 to 18.168 MHz; digital emission F1B, used for direct printing, telemetry, telecommand and computer communications, is permitted below 18.110 MHz and analog emissions such as FAX, SSTV and phone may be used from 18.110 on up.

"The normal power limit of 1500W output applies, but Amateur operations must not cause harmful interference to U.S. government Fixed Service operations. . . The authorization is contained in a Report and Order in PR Docket 88-467. . . under its terms and those of WARC-79, the band becomes exclusively Amateur on July 1." (*Westlink Report*, 02/17/89).

"In its news release the FCC said that the Department of Defense was still utilizing major portions of the 17M band and would continue to do so until July 1. . . However, DOD had agreed to allow secondary use of the band by U.S. Amateur stations, subject to immediate termination if interference is caused to government operations."

A letter was sent to the FCC by ARRL thanking them for ". . . their timely handling of the opening of the 17M band to Amateur use prior to July 1." (*ARRL Letter*, 02/11/89).



**WINDOW CALL SIGN**  
Suction-cup mounted  
Transfer Car to Car  
Sign is 2" x 8"

Your call in white lettering. Choose black, blue or red background. Also available as a Magnetic Sign with lettering black, blue or red on white background. \$8.50 ea. or 2 for \$15.00 ppd.

**SIGN-ON**  
1923 Edward Lane • Merrick, NY 11566

A Frequency Spectrum chart published by ICOM, dated Aug. 1988, is in error in that it ". . . shows the Advanced portion of the 15M phone band beginning at 21.220 MHz. . . It actually begins at 21.225 MHz. ICOM has taken steps to correct it. (*ARRL Letter*, 02/28/89).

On Feb. 3, the FCC ". . . issued an Order of Revocation and Affirmation in the case of a group of 11 Amateurs from Puerto Rico who, according to the FCC, committed fraud in obtaining Amateur licenses or upgrades, or who fraudulently certified that others had passed examinations for Amateur licenses.

"The Order says that the violations arose in connection with three W5YI VEC sessions held in . . . Puerto Rico on 08/16, 08/30 and 10/04, 1986. The FCC found that the six examiners: ". . . had assisted others in obtaining Amateur licenses by fraudulent means and had misrepresented material facts to the FCC.

The five candidates: ". . . were found to have obtained Amateur licenses by fraudulent means." Two of the 11 Amateurs had surrendered their licenses for cancellation. "Three of the examiners. . . had their operator licenses suspended for six months. . ." The remaining six Amateurs had their operator licenses suspended for the remainder of the license term and their station licenses revoked. (*W5YI Report*, 02/15/89; *ARRL Letter*, 02/28/89; FCC PR Docket No. 88-214).

"Since Uniden and Radio Shack began advertising their respective 'affordable 10M radios,' there has been a lot of Amateur concern about the rig being purchased and used by unlicensed persons.

"The Tandy/Radio Shack has notified potential purchasers and purchasers of the equipment of the FCC licensing requirements in at least four ways: in their advertising, on the box, on the equipment and in the instruction manual.

"There is no legal requirement that a potential customer prove he/she is licensed before a transmitter is sold." The ARRL has long supported a point-of-sale proof-of-licensing requirement for obtaining transmitting equipment.

"In the deregulatory environment of the past decade, and with the budgetary constraints under which federal agencies like the FCC are now operating, there has been no reasonable possibility of promoting such legislation." (*ARRL Letter*, 02/11/89; *W5YI Report*, 02/01/89)

"Ham Radio now faces another double-edged sword in Washington as a result of a Dec. 19, 1988, Order that has given the Chief of the Private Radio Bureau additional authority to make "non-substantive changes and minor clarifying and conforming changes" to the rules relating to the private radio services without going

(please turn to page 10)

## Amateur Radio call signs

Amateur Radio operators often ask the FCC what call signs have been assigned lately. This list shows the last call sign in each group to be assigned for each district, as of March 1, 1989.

For more information about the call sign assignment in the Amateur Radio Service, see Section 97.51 of the FCC Rules, or write to the FCC, Consumer Assistance Branch, Gettysburg, PA 17326.

Radio District	Group A Am. Extra	Group B Advanced	Group C Tech./Gen.	Group D Novice
0	WR0T	KF0BD	N0KGH	KB0EAQ
1	NV1M	KC1NT	N1GIL	KA1TID
2	WN2R	KE2LT	N2JBS	KB2HHC
3	NT3W	KD3LQ	N3GXE	KA3UFQ
4	AB4NG	KM4OV	N4VDB	KC4JCA
5	AA5KQ	KG5SE	N5NZS	KB5ION
6	AA6MW	KJ6RK	N6UMN	KC6BZK
7	WX7Y	KF7RV	N7MJU	KB7GZA
8	WO8Z	KE8WT	N8KLI	KB8GOV
9	WF9Z	KE9OY	N9IFH	KB9CDV
North Mariana Is.	AH0H	AH0AE	KH0AM	WH0AAI
Guam	KH2K	AH2CE	KH2DR	WH2ALY
Johnston Is.	AH3B	AH3AC	KH3AB	WH3AAC
Midway Is.		AH4AA	KH4AD	WH4AAF
Palmyra, Jarvis Is.	AH5A			
Hawaii		AH6JQ	NH6SQ	WH6CBV
Kure Is.			KH7AA	
American Samoa	AH8C	AH8AD	KH8AH	WH8AAX
Wake Wilkes Peale	AH9A	AH9AD	KH9AD	WH9AAH
Alaska		AL7KW	NL7QT	WL7BTX
Virgin Is.	NP2E	KP2BO	NP2CV	WP2AGP
Puerto Rico		KP4PV	WP4UC	WP4IHF



# Subscription form

If you received this copy of Worldradio and you aren't yet a subscriber . . . this was your sample copy.

We sent it to you to acquaint you with our reporting on this great activity. Amateur Radio is exciting, challenging, stimulating, satisfying and very rewarding.

You are cordially invited to subscribe to, and be a part of Worldradio.

**Yes..I want to know even more about the wonderful world of Amateur Radio.**

TO FACILITATE FASTER HANDLING OF YOUR SUBSCRIPTION, PLEASE USE THIS BLANK (SOURCE)

--	--	--	--

(59-60)

**Name** \_\_\_\_\_

**Call** \_\_\_\_\_

**Address** \_\_\_\_\_

**City** \_\_\_\_\_

**State** \_\_\_\_\_ **Zip** \_\_\_\_\_

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> <b>NEW</b><br>12 issues<br>24 issues<br>36 issues<br>Lifetime | <input type="checkbox"/> <b>Renewal</b><br>(\$1 per issue)<br>(96¢ per issue • Save \$1)<br>(92¢ per issue • Save \$3)<br>(Be a WR super booster) | <input type="checkbox"/> <b>Gift</b><br>\$12.00<br>\$23.00<br>\$33.00<br>\$120.00 |
|--|---|---|

**Overseas Readers!** Prices quoted are U.S. funds. Please include \$10 extra/year for surface mail delivery outside the U.S. Subscriptions may be paid in U.S. funds drawn on U.S. banks, by International Money Order, VISA or MasterCard. Canadian Postal Money Orders (in U.S. funds) are also acceptable.

- Check enclosed**                       **MasterCard**                       **AmEx**                       **VISA**

**Card #** \_\_\_\_\_ **Exp. date** \_\_\_\_\_

**Signature** \_\_\_\_\_

Please clip and mail to . . .

**Worldradio™**

1779 Tribute Road, Suite L  
Sacramento, CA 95815

Thank you!

For Subscriptions  
(charge cards only)

**TOLL FREE 1-800-365-SUBS** 8 a.m. to 5 p.m. Pacific Time

Subscriptions received by the 20th of the month will begin with the issue dated two months from the month of receipt, i.e., if we receive the subscription by April 20, your first issue will be June, and will be mailed to you in early May.

Worldradio is a two-way communication. Send in Amateur Radio information and news. Share your knowledge with your fellow amateur and Worldradio reader. We are most interested in your comments and suggestions. We would appreciate being placed on the mailing lists of amateur club bulletins.



# DIAMOND ANTENNA

KNOWN WORLD-WIDE FOR PREMIUM QUALITY ANTENNAS AND METERS  
POWER/SWR METERS



- Forward & Reflected Power & SWR
- Selectable RMS or PEP switch
- 3 Power Ranges:  
5/20/200 Watts  
30/300/3KW (SX-100 only)
- Power Meas. Accuracy 5% (typ.)
- Insertion Loss: 0.2 dB Max.
- Wideband Performance

### FIVE MODELS TO CHOOSE FROM

SX-100	1.6-60 MHz	\$119.95
SX-200	1.8-200 MHz	\$89.95
SX-400	140-525 MHz	\$99.95
SX-600	Dual-Band 1.8-200 & 140-525 MHz	\$149.95
SX-1000	4-Band 1.8-160, 430-450 800-930, 1240-1300 MHz	\$219.95

### DUAL-BAND ANTENNAS

We believe that DIAMOND Dual-Band Antennas are the best antennas on the market today!

BASE	2m	70cm	Net
X-50	2.8dB	5.8dB	\$94.95
X-200	5.5dB	8.0dB	\$139.95
MOBILE	2m	70cm	
NR-770S	unity	3.0dB	\$34.95
NR-770R	3.0dB	5.5dB	\$47.95
NR-790	4.5dB	7.2dB	\$76.95
MX-72D	Duplexer (opt.)		\$37.50
PO-K	Mtg Kit, 17' cable		\$20.00
PO-MM	Magnetic Mount		\$22.00
PO-TLM	Trunk Lid Mount		\$22.00

"We guarantee each DIAMOND antenna and wattmeter sold by us to meet your satisfaction or return it to us within 10 days for a full refund.

Quantity Pricing Available • Dealer Inquiries Invited  
Orders received by 1 PM PST shipped UPS same day.  
Next day UPS delivery available

No Extra Charge for C.O.D. or VISA/MC Orders  
ORDERS ONLY — NO TECHNICAL

(800) 854-1927

ORDER LINE and/or TECH HELP  
(619) 744-0700

FAX 619-744-1943

"QUALITY NEED NOT BE EXPENSIVE"



## RF PARTS

1320 Grand Avenue  
San Marcos, CA 92069

(continued from page 8)

through the issuance of either Notices of Inquiry or Notices of Proposed Rule Making.

"Matters raising either novel questions of law, fact or policy will still be reserved for full Commission action under the Administrative Procedures Act... This order is bound to bring many requests for rulings directly to PRB Chief Ralph Haller, without the constraints of public notice, comment and lengthy Commission review.

"On one level it means that minor changes in the rules sought by Amateurs can now be expedited, but it also opens the door to those individuals and groups who are anti-Amateur Radio or who want to dilute the Amateur Radio Service with the same result." (Federal Communications Tech News/Westlink Report, 02/04/89).

Calling attention to an editorial in the July 1987 issue of *QST*, ARRL's Executive Vice President noted in the Feb. 1989 *QST* editorial ("No Safe Harbor for Indecency") that the FCC recently was given (in Public Law 100-459) an explicit mandate to enforce the prohibitions against broadcast obscenity and indecency on a 24 hour-per-day basis.

He wrote: "It is reasonable to assume that the same standard applies to us... Section 97.119 as presently written prohibits the transmission of 'communications containing obscene, indecent or profane words, language or meaning,' so no new rule is necessary; it is simply a question of the extent to which the Commission will enforce the existing one."

The July 1987 editorial had noted that "...while there was a blanket prohibition on obscenity, indecent material broadcast during the 'wee hours' (when, presumably, children are asleep) would not be subject to sanctions.

Expansion of the 6M repeater sub-band to include 51-52 MHz has been proposed by the FCC in PR Docket 88-527. Expansion was proposed by two southern California clubs in order to accommodate growing numbers of repeaters there. The FCC had expressed concern "...for the effect the expansion may have on the present users of that segment."

The comment period has ended. However, the FCC's disposition of this rule making was not available as this was written. (Westlink Report, 02/03/89)

In Docket 85-301 the FCC subjected cable system terminal devices (CSTDs) to field strength emission limits of Part 15 of the rules, rather than the more stringent Part 76, thus permitting RF leakage at higher levels than previously allowed. The National Cable Television Association (NTCA) suggested that internally generated cable signals be subject to the more stringent Part 76 limits, whereas externally generated signals that enter the cable system through cable terminal devices be subject to Part 15 standards.

Noting experience with cable ready TV receivers or VCRs, the FCC advised that it would be unnecessarily burdensome and costly to require manufacturers of CSTDs to comply with tighter emission standards when their devices pose no greater threat than cable-ready television receivers or VCRs. Therefore the FCC will continue to apply Part 15 limits to CSTDs. (Westlink Report, 02/03/89).

An Iowa Extra Class Amateur licensee, AK0Q, has petitioned the FCC to change the Extra class title to: "Master of Communications," a title "...which may be more widely recognized as having the highest rank among all Amateur Radio licenses." The FCC assigned file number RM-6648 and a 30-day public comment period ending Feb. 23. (W5YI Report, 02/01/89).

### END-OF-MONTH LICENSE TOTALS

December 1988		January 1989
46,885	Extra	47,221
98,681	Advanced	99,164
113,082	General	113,823
101,495	Technician	102,931
80,168	Novice	81,028
440,311	Totals	444,167

**DOUBLE BAZOOKA HF ANTENNAS**

80 METER.....	\$45.95
40 METER.....	\$35.95
10 METER.....	\$25.95
6SRV HF ANTENNA.....	\$39.95

**MOBILE HF BUG CATCHERS**

80-10M 250W	\$40.00
40-10M 250W	\$34.50
80-10M 1kw	\$54.50
40-10M 1kw	\$40.00

**STAINLESS STEEL MAST**

2FT 3/8-24	\$9.95
3FT 3/8-24	\$10.95
4FT 3/8-24	\$11.95

**VHF 2METER SSB MOBILE**

2 METER SQUARED	\$45.00
-----------------	---------

WE STOCK BUTTERNUT, DIAMOND AND OTHER ANTENNAS  
SHIPPING WORLD WIDE VISA/MC/COD

**Mission Communications**  
11903 Allet-Clodine, Ste. 500  
Houston, TX 77082  
(713) 879-7764  
FAX (713) 879-9341  
Telex 166872 MCON UT

ANTENNAS





# "No Code" opposition

The following is part of an article entitled "Distress system at sea," by Richard J. Monjure, which appeared in the Jan. 16 edition of the New Orleans Times-Picayune. It was sent to us by Frank R. Kollatt, Jr., W5BPT, who said he supports the views stated 100 percent.

My recent experience will demonstrate why the Morse system should not be eliminated and the requirement for a radio officer who is a Morse telegraph operator should be maintained.

In Nov. 1988 I was radio officer of a ship on a voyage from Scotland to the US East Coast. About 100 miles off of Florida, my ship went dead in the water, slowly taking on water through a damaged rudder system.

My ship is equipped with a high-technology satellite terminal, but it was useless because the ship's main power was down. Satellite systems cannot operate without a ship's main power.

An urgent message had to be transmitted to request assistance from another ship. All I had was the stan-

dard 40W emergency Morse transmitter that could run for six hours on my emergency 12-volt battery system.

I transmitted my message using the Morse system and received a prompt reply from another vessel. I was easily able to get my message through.

If the satellite system had been the only system on board, or if there had been no radio officer on board who knew the Morse system, what could have been done? We were way out of VHF-FM range. Tropical depression Keith was approaching our area.

Even when satellite systems are working as designed, many times all circuits are busy. The satellite is not a dedicated distress system. The Morse system has frequencies strictly for distress communications.

The satellite system is supposed to receive the distress message and transmit it to all ships in the area of the distress. Much time is required in this process. The Morse message is transmitted immediately to all ships within at least 100 miles of the ship. Any radio officer can understand Morse messages no matter what language he speaks.

In an effort to increase profit margins by eliminating the radio officer, many shipping companies are endangering their vessels, their investments

and the safety of their seagoing employees. But shipping executives are not experts in communications. Maybe they have been listening to the salesmen from the satellite companies too much.

They should get another point of view from the professionals in the field of distress communications — the radio officers.

I think satellite communication definitely has marine applications, but not as a total replacement for a proven system all countries are familiar with.

## In support of "No Code"

The following is a letter from the Zawlocki family, Bill, N7HWJ; Nancy, N7HWK, and Mike, N7KLX, of Gig Harbor, WA.

Our family wants to encourage you to support a no-code entry level license. We truly believe that this type of license is essential to prevent the extinction of our hobby.

An unfortunate but true fact of life is that numbers count. Amateur Radio will continue to lose radio spectrum as our numbers dwindle, simply because

## ARRL SOUTHWESTERN DIVISION CONVENTION

August 25, 26, & 27, 1989

**HAMCON 89**  
International Goodwill

Sponsored by the Los Angeles Area Council of Amateur Clubs, Inc.



### REGISTRATION DATA

Name: \_\_\_\_\_ Call: \_\_\_\_\_

Name: \_\_\_\_\_ Call: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

How Many?

\_\_\_\_\_ Advance Registration ('til Aug. 11)  
(\$12.00 at the Door) @ \$10.00 ea. \_\_\_\_\_

\_\_\_\_\_ Banquet @ \$25.00 ea. \_\_\_\_\_  
(\$30.00 at the door if available)

\_\_\_\_\_ Ladies Luncheon @ \$10.00 ea. \_\_\_\_\_

\_\_\_\_\_ Sunday Breakfast @ \$10.00 ea. \_\_\_\_\_

Total Enclosed: \$ \_\_\_\_\_

Make Checks Payable to: HAMCON INC.

P.O. Box 18201 • Encino, CA 91416-8201

Check here if you plan to stay at the Hilton Hotel.

## Hamcon '89

Final plans have been made for Hamcon '89. This year's location will be the Los Angeles Airport Hilton Hotel. The dates are Aug. 25-27.

This year there will be both Saturday and Sunday Tech sessions, with the exhibits open both days. On Friday night there will be no-host cocktails, possibly dancing to a big band sound quartet and even strolling magicians. The exhibits will also be open for a two-hour preview.

Our registration prices have even been held to the same as last year.

For more information contact Gary W. Gabrick, P.O. Box 18201, Encino, CA 91416-8201.



the FCC is charged with allocating the frequencies to do the most good for the greatest number of citizens. Regardless of public service or national defense, the federal government counts citizens.

We are not advocating that we increase the number of Amateurs without control, indeed we need to be actively involved in the techniques used to widen the scope of Amateur Radio.

We are convinced that the only way to get people to know about our hobby is to get them into it as painlessly as possible. Once in Amateur Radio, the majority will want to upgrade to enjoy the other facets. If you can keep the interest alive, folks will upgrade.

Let me quote a letter from the Feb. 1989 QST, where George Schnepf, KE2IV, says, "Those of us in this great hobby called ham radio know what a good thing we have going. The problem is that our avocation is viewed at large as an arcane one that is difficult to master. For many it is made even more so by our insistence on Morse code knowledge in order to take part. . .let us concentrate on the fact that the loss of 220-222MHz is a clarion call for self-preservation. If we do not start doing something now to substantially increase our ranks, we may find one day that the only bands left to us are CB and cellular telephones."

The reason we are seeking your support is to encourage you to become actively involved in the process of building the requirements for the no-code license. The no-code entry license needs to address the non-code issues that are essential to Amateur Radio. Issues such as proper radio techniques, identifying, profanity, electrical theory and the self-governing aspect of Amateur Radio. We want to prevent the kind of uncontrolled mess that currently ex-

ists on Citizens Band.

I would suggest that the no-code license allow VHF/UHF band operation, certainly with the capability of satellite and packet operation. These kinds of items will keep the interest alive long enough to demonstrate the other facets of Amateur Radio. □

## Call sign fun

Some day when you think life has jammed its finger in your eye up to the second knuckle, whip out the Callbook and ponder the suffixes you *could* have received from the Gnomes of Gettysburg. Every one of these is real in the 3rd call area.

BAD (to worse), (old) BAT, DIP, ICK, BAG, FAT, DUM, NUT, (zoologically) DOG, COW, OWL, ROO (as in Kanga-), MOO, BAA. Or you could have been SAD, SAK, REK (ramblin' or otherwise), or SOT. You'd maybe prefer to ROT, GAG, MOP, NAG? Your name, old darlin', could have been MUD.

Some of these lucky ducks are probably among the nicest folks on the bands, too. Perk up — if they don't upgrade away from these monickers, they must have a sense of humor about life's little gotchas — so what's your problem?

—Mid-Atlantic ARC, Villanova, PA □

## Puget pirates

WAYNE RANKIN, WA6MPG/7

Seattle area Amateurs have been plagued recently by bootlegging fishermen in the nearby Puget Sound. Now, in an apparent replay of previous unsuccessful attempts at catching these seagoing radio pirates, the FCC is working with the Seattle Harbor Patrol in a joint effort to apprehend them.

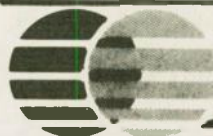
The Seattle FCC Field Operations Bureau is equipping at least one harbor patrol boat with radio direction finding equipment.

The first attempt at locating these offenders has been unsuccessful, but an FCC spokesman indicated they are monitoring the affected frequencies and hope to have a solution to the problem shortly.

As reported more than a year ago, the radio bootlegging fishermen in Puget Sound use the amateur 2M band for point-to-point communications, and have also shown up on local area repeaters.

Hams in the area reported them to be abusive to the Amateurs living near Puget Sound and surrounding areas. —Westlink Report □

**Check your license expiration date.**



**PacComm**

- Advanced Technology
- Enduring Value

## 9600 Baud Packet System

**Introducing the next generation in packet performance:** A complete line of affordable 9600 baud packet equipment to support both network nodes and local packet users. The modem is based on PacComm's successful 9600 baud commercial modem design (exclusively licensed from James Miller, G3RUH). It is a high performance FSK design using innovative signal processing techniques to comply with FCC bandwidth limitations on the 6 and 2 meter amateur bands as well as higher frequencies. The modem connects to the radio internally and may not be suitable for use with all existing radios.

Other packet manufacturers plan to offer equipment compatible with the PacComm 9600 Packet System.

We accept major credit cards. Order Toll Free:

**1-800-223-3511**

Technical support line:  
(813) 874-2980

**MODEM CARD** - Add on internal modem card for TNC-2 and clones, and all PacComm TNCs... \$99.95 fully tested and ready to install. (Avail. Now)

**EXTERNAL MODEM** - Encased 9600 baud modem with front panel LED displays and cabling for most popular packet controllers including the PK-232... \$159.95. (Avail. late April)

**HIGH SPEED DIGITAL RADIO** - Digital transceiver consisting of digital 2-5 watt RF deck and 9600 baud modem. \$329.95 to \$399.95 (Avail. in May)

**COMPLETE HIGH SPEED PACKET UNIT** - Integrated digital transceiver, packet TNC, and 9600 baud modem ready to attach to your computer or terminal and antenna... \$449.95 to \$519.95 (Avail. in June)

**PacComm • 3652 West Cypress Street • Tampa, Florida 33607**

Please send info on:  \_\_\_\_\_  **FREE Catalog**

Name \_\_\_\_\_ Call \_\_\_\_\_

Address \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_ Card# \_\_\_\_\_ Exp. Date \_\_\_\_\_

**MONEY BACK GUARANTEE!** Add \$4.00 shipping handling per order. FL residents add 6% sales tax. Major Credit Card give number, expiration and signature. FAX: 813-872-8696

**Discover**  
**CAROLINA WINDOW**

80-10M  
Use transmatch  
132' overall  
Matching XFMR  
Line Isolator  
Vert Radiator  
Coax fed  
Assembled  
\$69.95

High performance  
Proven results  
\$70 Beam?

Your  
Passport  
To a world  
Of new ideas  
And exceptional  
HF wire antennas

Rugged new baluns  
Full range of HF, VHF  
mobile antennas, dunks, wire,  
coax, parts, line, accessories.

**SEE WHAT WE'RE DOING NOW!**

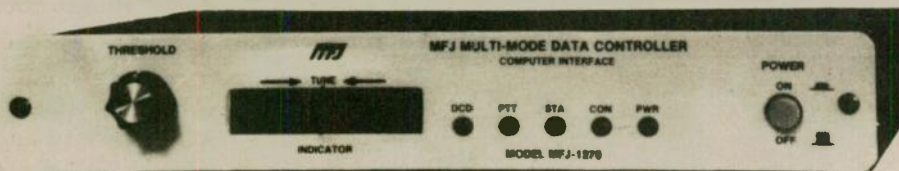
Contact Jim, W4THU — free discount  
catalog Send \$1 for catalog by 1st  
Class mail, Box 8159, Portsmouth, VA  
23703 (Dealer Inquiries Welcome)

**804-484-0140**

**CAROLINA WINDOW**  
SEE THE REVIEW IN JUNE '88 WORLD RADIO  
MAGAZINE. Enthusiastic users say it's the best  
wire antenna. Outperforms wire antennas previously  
used. Knock-your-socks-off performance on 80-10.  
A \$70 beam?  
If you hear one, you'll want one.  
Made with pride by The RADIO WORKS in VAJUSA



# MFJ multi-mode data controller



## 9 modes for only . . . \$249.95

Amateur radio's most versatile multi-mode data controller - the MFJ-1278 lets you join the fun on Packet, AMTOR, RTTY, ASCII, CW, Weather FAX, SSTV, Navtex and gives you a full featured Contest Memory Keyer mode . . . you get 9 modes . . . for an affordable \$249.95.

Plus you get MFJ's new **Easy Mail™** Personal Mailbox so you and your ham buddies can leave messages for each other 24 hours a day.

You'll find it the **most user friendly of all multi-modes**. It's menu driven for ease of use and command driven for speed.

A high resolution 20 LED tuning indicator lets you *tune in signals fast in any mode*. All you have to do is to center a single LED and you're *precisely tuned in to within 10 Hz* -- and it shows you which way to tune!

Plus you get 32K RAM, KISS for TCP/IP, high performance HF/VHF/CW modems, software selectable dual radio ports, AC power supply and more.

All you need to join the fun is an MFJ-1278, your rig and any computer with a serial port and terminal program.

You can use the MFJ Starter Pack to get on the air instantly. It includes computer interfacing cable, terminal software and friendly instructions . . . everything you need. Order MFJ-1282 (disk)/ MFJ-1283 (tape) for C-64/128/VIC-20; MFJ-1284 the IBM or compatible; MFJ-1287 for Macintosh, \$24.95 each.

### Packet

MFJ's new generation packet mode gives you genuine TAPR software and hardware plus many MFJ enhancements like the **Easy Mail™** Personal Mailbox.

A new KISS interface makes the MFJ-1278 TCP/IP compatible.

**Extensive** tests published in *Packet Radio Magazine* ("HF Modem Performance Comparisons") prove the TAPR designed modem in the MFJ-1278 gives better copy with proper DCD operation under all tested conditions than the other modems tested.

### New AMTOR mode!

Now MFJ-1278 has a new AMTOR mode, making it the only controller to feature **nine** digital modes.

MFJ-1278 transmits and receives AMTOR and includes all AMTOR modes: ARQ (Mode A), FEC and MODE S (Mode B).

### Baudot RTTY

You can copy all shifts and all standard speeds including 170, 425 and 800 Hz shifts and speeds from 45 to 300 baud. You can copy not only amateur RTTY but also press, weather and other exciting traffic.

You can transmit both narrow and wide

shifts. The wide shift is a standard 850 Hz shift with mark/space tones of 2125/2975 Hz. This lets you operate MARS and standard VHF FM RTTY.

### ASCII

You can transmit and receive 7 bit ASCII using the same shifts and speeds as in the RTTY mode.

### CW

You get a Super Morse Keyboard mode that lets you send and receive CW effortlessly, including all prosigns -- it's tailor-made for traffic handlers.

A huge type ahead buffer lets you send smooth CW even if you "hunt and peck".

You could store entire QSOs in the message memories, if you wanted to! You can link and repeat any messages for automatic CQs and beaconing. Memories also work in RTTY and ASCII modes.

A **tone Modulated CW mode** turns your VHF FM rig into a CW transceiver for a new fun mode. It's perfect for transmitting code practice over VHF FM.

An AFSK CW mode lets you ID in CW. You also get a random code generator that'll help you copy CW faster.

### Weather FAX

You'll be fascinated as you watch WEFAX signals blossom into full fledged weather maps on your Epson or IBM graphics compatible printer.

**Automatic sync and stop** lets you set it and leave it for no hassle printing.

You can save FAX pictures and WEFAX maps to disk if your terminal program lets you save ASCII files to disk.

**Pictures** and maps can be saved to disk or printed to screen in real time or from disk if you have an IBM or Macintosh with the MFJ Starter Pack.

You can transmit FAX pictures right off disk and have fun exchanging and collecting them.

### Slow Scan TV

The MFJ-1278 introduces you to the exciting world of slow scan TV.

You can print slow scan TV pictures on any IBM or Epson graphics compatible printer. If you have an IBM or Macintosh you can print to screen and save to disk with the MFJ Starter Pack.

You can transmit slow scan pictures right off disk. If your terminal program lets you save ASCII files you can save pictures from over-the-air QSOs.

# MFJ

MFJ ENTERPRISES, INC.  
Box 494, Miss. State, MS 39762  
601-323-5869 Telex: 53-4590 MFJSTKV

**MFJ . . . making quality affordable**

You can transmit and receive 8.5, 12, 17, 24, and 36 second black and white format SSTV pictures using two levels.

### Contest Memory Keyer

*Nothing beats the quick response of a memory keyer during a heated contest.*

You'll score valuable contest points by completing QSOs so fast you'll leave your competition behind. And you can snag rare DX by lipping in so quickly you'll catch everyone by surprise.

**Message memories** let you store contest call, name, QTH, rig info -- everything you used to repeat over and over.

You get iambic operation, automatic incrementing serial numbering, weight control to penetrate QRM and more.

### More Features

Turn on your MFJ-1278 and it sets itself to match your computer baud rate. Select your operating mode and the correct modem is automatically selected.

Plus . . . printing in all modes, threshold control for varying band conditions, tune-up command, lithium battery backup, RS-232 and TTL level serial ports, watch dog timer, FSK and AFSK outputs, output level control, speaker jack, key paddle jack, test and calibration software, Z-80 at 4.9 MHz, 32K EPROM, and socketed ICs. FCC approved. 9x1 1/2 x 9 1/2 in. 12 VDC or 110 VAC.

Get yours today and join the fun crowd!

### New Firmware Update

A new KISS/AMTOR/Navtex Firmware update is available to MFJ-1278 owners.

MFJ's powerful update is the most reasonably priced multi-mode upgrade by any manufacturer. Contact your dealer or MFJ for yours today!

## MFJ Packet Radio



MFJ-1274  
**\$149.95**  
MFJ-1270B  
**\$129.95**

MFJ-1270B super clone of TAPR's TNC-2 give you more features than any other packet controller -- for \$129.95.

You can double your fun by operating both VHF and HF packet because you get **high performance** switchable VHF/HF modems.

You get the **Easy Mail™** Personal Mailbox with soft-partitioned memory so you and your ham buddies can leave messages for each other 24 hours a day.

In MFJ's new WeFAX mode you can print full fledged weather maps to screen or printer and save to disk using an IBM compatible or Macintosh computer with an MFJ Starter Pack.

A new KISS interface lets you run TCP/IP. They also come **NET ROM** compatible -- **no modification needed!**

You also get 32K RAM, a one-year unconditional guarantee and you can use 12 VDC or the included 110 VAC power supply.

For dependable HF packet tuning, the MFJ-1274 gives you a high resolution tuning indicator that's accurate to within 10 Hz -- and it's only \$20.00 more. Add \$5 each shipping/handling.

**FOR YOUR NEAREST DEALER**  
or to order call toll free  
**800-647-1800**

**One Year Unconditional Guarantee**



# VE exam schedules

As a service to our readers, Worldradio presents a feature listing those VE exams, times and locations which are sent to us. Please remember that our deadline for publication is two months in advance. For example, if your VE group is scheduling an exam for September, please have the information to us by mid July. Worldradio, 2120 28th St., Sacramento, CA 95818.

Please mark the envelope "VE Exams."

List the location, and information examinees should have (advance registration, etc.) and the name and telephone number of a person to contact for further information.

p/r = pre-register

w/i = walk-in

Date	City	Contact	Notes	Date	City	Contact	Notes
<b>Arizona</b>				<b>Iowa</b>			
May 6	Tucson	K7OPX (602) 886-7217	w/i OK	May 21	Des Moines	NA0R (515) 964-0900	w/i
<b>California</b>				<b>Kansas</b>			
May 6	Burbank	W6JEP (805) 948-8493	w/i OK	May 6	Topeka	NQ0S (913) 273-3328	w/i OK
	Van Nuys	(818) 702-0246	p/r pref; ltd w/i	<b>Kentucky</b>			
May 13	Apple Valley	WB3KMZ (619) 240-2025; or	w/i	May 20	Louisville	Otis Herron (502) 969-7332	
	Los Altos Hills	K6BET (619) w/i 244-8080	w/i	<b>Maryland</b>			
	San Marcos	(408) 255-9000	w/i	May 6	College Park	NF31 (301) 963-4008	
	San Pedro	(619) 465-EXAM	p/r by 5/3	May 13	Frederick	N3RO (301) 845-2670	ltd. w/i
	Santa Barbara	N6DYZ (213) 325-2965	p/r; ltd w/i	<b>Massachusetts</b>			
May 17	Eureka	KB5AH (805) 682-2665	p/r pref; w/i OK	May 19	Holyoke	William C. Sample (413) 567-7301	w/i
May 18	Fountain Valley	N6ISY (714) 775-6095	p/r	May 20	Melrose	NC1V (617) 665-6061	w/i
May 20	Cupertino	AE6Z (408) 243-8349; or	w/i		Wellesley	ND1Z (508) 533-6822	w/i
	San Diego	K6VIP (408) 294-3575	w/i	May 24	Cambridge	Nick Altenbernd (617) 437-0320	2-day p/r
May 21	Sunnyvale	(916) 465-EXAM	w/i	<b>Michigan</b>			
May 25	Long Beach	KA6HOQ (714) 897-6331; or	w/i	May 6	Saginaw	KO8M (517) 793-9636	w/i OK
May 27	Chula Vista	NF6X (213) 434-8278	p/r by 5/17	<b>Minnesota</b>			
	Eagle Rock	(619) 465-EXAM	w/i	May 13	Bloomington	Emery Mehl (612) 529-6638	
	Hawthorne	KB6RXE (818) 791-1779; or	p/r pref. ltd w/i	May 20	Duluth	KA0SYN (218) 879-4010	w/i
May 28	Santa Cruz	AA6HE (213) 256-2904	w/i		Robbinsdale	Ron Schultz (612) 920-9473	p/r pref
June 3	El Cajon	WS6T (213) 600-4160	p/r by 5/24	<b>Nevada</b>			
	Riverside	WD6EHL (408) 255-9000	p/r by 5/27; ltd w/i	May 6	Henderson	NK7N (702) 565-0242	w/i
June 10	San Marcos	(619) 465-EXAM	p/r by 5/31	<b>New Jersey</b>			
June 17	San Diego	(619) 465-EXAM	p/r 5/7	May 1	Sayreville	K2FD (201) 442-9215	w/i
<b>Colorado</b>				May 13	Cranford	N2XJ (201) 635-7686	w/i OK
May 4	Denver	W0IJR (303) 366-9689	p/r pref		Trenton	AA2F (609) 737-1723	p/r pref; ltd w/i
May 8	Boulder	NO8BWS (303) 530-1872	w/i	May 19	Bellmawr	WA2VQG (609) 546-7710	w/i OK
May 20	Westminster	N0HNR (303) 451-1231; (303) 278-4280	p/r or w/i	<b>New York</b>			
<b>Connecticut</b>				May 10	Bethpage	W2QUV (516) 354-6861	w/i OK
May 13	Gales Ferry	KY1F (203) 536-0187	w/i OK	May 13	Greenvale	W2NL (516) 541-2450	w/i OK
	Stamford	W1LUH (203) 625-3680; or (203) 322-3156	p/r pref; ltd. w/i		Selden	George Sintchek (516) 751-0894	w/i OK
<b>Florida</b>				May 18	New City	Robert Douglas (914) 623-5551	w/i OK
May 2	New Port Rchy.	AA4FG (813) 849-1224	w/i OK		White Plains	Sanford H. Fried (914) 285-3029	w/i OK
May 13	Crestview	W4DTV (904) 678-7181	w/i	May 28	North Babylon	KA2RG1 (516) 957-5726	w/i
May 20	Fort Myers	WV4F (813) 481-4880	p/r	May 29	New York City	KD2IZ (212) 838-5995	
	Melbourne	AA4NP (407) 768-1954; WB9IVR (407) 724-6183	w/i	<b>Ohio</b>			
	W. Palm Beach	W4SS (407) 967-1477; KG4U (407) 582-7617	w/i	May 13	Cincinnati	Bill Simpson (606) 341-3952	p/r; ltd. w/i
<b>Illinois</b>				May 27	Canton	WB8VUN (216) 453-5896	p/r pref; w/i OK
May 9	Macomb	Joe Rossmiller (309) 837-4277		<b>Oregon</b>			
May 13	Oak Forest	KA9HDN (312) 247-0650	w/i	May 6	Portland	Randy (503) 649-5066	w/i only
	Quincy	Ron Rose (217) 224-9238		May 27	Newport	W7NNE (503) 547-3083	ltd. w/i
May 20	Bolingbrook	NW9K (815) 886-5135	w/i	<b>Pennsylvania</b>			
<b>Indiana</b>				May 6	Erie	W3CG (814) 665-9124	w/i OK
May 6	Fort Wayne	Mark Bell (219) 493-8316		<b>South Carolina</b>			
	New Castle	Peggy Coulter (317) 288-0481		May 20	N. Charleston	AA4IX (803) 873-9465	w/i
May 20	South Bend	NI9Y (219) 255-4455	w/i OK	<b>Tennessee</b>			
	Columbus	Richard Shelton (317) 763-6090	w/i	May 6	Memphis	Maxine Balentine (901) 386-4375	p/r by 5/4
May 21	Rushville	N6RS (317) 763-6090		<b>Texas</b>			
May 27	Kokomo	Will Puranen (317) 453-6542		May 7	Princeton	NW5W (214) 736-2397	w/i
	Lebanon	K9DFK (317) 249-2020; or		May 13	Midland	KT5G (915) 694-9450	
June 4	Terre Haute	NX9Q (317) 482-1866			San Antonio	NS5I (512) 681-0702	w/i
		K9EBK (812) 466-2122	p/r 30 days prior; ltd w/i				



# SPECIAL EVENTS

## Armed Forces Day 1989

In recognition of the 40th Annual Armed Forces Day celebration, the Amateur Radio station W4ODR, located Northside aboard Naval Air Station *Memphis*, in Millington, TN, will be operated for the 7th consecutive year by sailors and marines on Saturday, May 20 from 1300Z to 2300Z. Active duty, reserve and retired military personnel will combine efforts for this exciting event for Armed Forces Day recognition.

Plans call for operation on SSB at 7.230 MHz, 14.280 MHz and 21.3780 MHz (+/- 10 kHz). CW frequencies will be 21.145 and 28.145 MHz. 2M frequency will be 146.52 simplex. It is hoped that operation will be continuous on all bands, but check all frequencies to be sure.

Special red, white and blue certificates will be available to those who work "Whiskey Four Old Dusty Rebel." No SASE is required.

Calls not in the callbook should QSL to Military Club Station W4ODR, P.O. Box 54278, Naval Air Station *Memphis*, Millington, TN 38054. Provide frequency and contact number. Special attention will be given to those amateurs stationed at Millington over the years.

Requests for additional information may be directed to: Station Custodian — Lieutenant Robert D. Alley, WA4WFJ, at 901/873-5306; Station Chief Operator — AX2 David A. Holding, KB5BXJ, 901/873-5134; Special Events NCO — Sergeant Major Jim Moffatt, WD4SMW, 901/363-0778 or Military Club Station W4ODR/Navy — Marine Corps MARS Station NNN0NIF, Bldg. N-100, NAS *Memphis*, TN 38054, 901/873-5134. □

The annual Armed Forces Day Communication Test is set for Saturday, May 20, and marks the 40th anniversary of this event, which emphasizes a continuing climate of mutual assistance and warm esteem between the military and Amateur Radio communities. The traditional military-to-Amateur cross band operation and broadcast of the Secretary of Defense message are the featured highlights and include operations on CW, SSB, RTTY and packet radio.

These tests give both Amateur Radio operators and SWLs the oppor-

tunity to demonstrate their individual technical skills.

Special commemorative QSL cards will be awarded to those Amateurs achieving a verified two-way radio contact with any of the participating military radio stations. Interception of these contacts by SWLs are not acknowledged by QSL cards; however, anyone who receives and accurately copies the Armed Forces Day CW and/or RTTY message from the Secretary of Defense can qualify to receive a special commemorative certificate from the Secretary.

For more information contact Navy-Marine Corps, MARS, Naval Communication Unit, Washington, D.C. 20397-5161. □

## Submarine celebration

The Maryland Mobileers ARC will operate station WA3PJQ aboard the submarine *USS Torsk* (SS-423) from 1400Z to 2100Z on May 20 to honor the submarine service.

Frequencies, +/- QRM will be: SSB — 7240, 14240, 21340 and 28340 kHz and FM — 146.805 (repeater output).

For a certificate send a legal size SASE to MMARC, P.O. Box 784, Severna Park, MO 21146. □

## Steam trains

The California State Railroad Museum will operate WB6RVR/6 on May 6 from 1500-2400Z, to commemorate the 6th consecutive year of steam train operations at this site.

Suggested frequencies are: *phone* — 7.270, 14.270, 21.370 and 28.370; *CW* — 7.125, 21.150 and 28.150.

For a commemorative QSL send your QSL and a No. 10 SASE to: California State Railroad Museum, ATTN: Steam Trains, 111 I St., Sacramento, CA 95814. □

## Golden spike

The Ogden (UT) ARC will operate station W7STB from Promontory Summit, UT to commemorate the

120th year of the driving of the Golden Spike.

Time of operation will be from 0001Z to 2100Z on May 10.

Frequency will be on one of the following: 3.970 MHz, 7.270 MHz, 14.280 MHz, 21.375 MHz and 28.415 MHz.

Send a QSL and a SASE to Ogden ARC, P.O. Box 3353, Ogden, UT 84409. □

## Load 'em up

From May 10 to Sept. 4, South Dakota Amateurs will be operating a special event station from a wagon train traveling in the state. Many of you have seen part of this wagon train from McCrossen Boys Ranch of Sioux Falls on TV, as it was in the Inaugural Parade for President Bush.

For the States Centennial Celebration, there will be an eastern section and a western section. McCrossen Boys Ranch will furnish a covered wagon for the eastern section to be used as a radio wagon. Burghardt Amateur Supply of Watertown will furnish radio equipment for this wagon and the Sioux Falls Radio Club will install the equipment. There will be HF equipment for special event contacts and 2M equipment for local and emergency contacts. The eastern section will cover 1,764 miles and the western section will cover 800 miles. There will also be many horseback riders accompanying the wagon train.

The Centennial Wagon Train Committee will have Centennial Wagon Train QSL cards printed. ARCs will put radio operators on the wagon train as it goes through their area.

The eastern section wagon train will leave from Elkpoint, SD on May 10 and arrive at the State Fair Grounds at Huron on Sept. 4 during the South Dakota State Fair. The western section will leave Phillip, SD on June 4, and arrive at Fort Pierre on Aug. 14. The Black Hills ARC is working on arrangements to equip a wagon with radio in the western division.

For information contact South Dakota Centennial Wagon Train, P.O. Box 91, Sioux Falls, SD 57101. □

## Emergency Response Institute

As mentioned in our last issue, the 3rd annual Northern California Emergency Response Institute will be held May 6-7 at Apple Computer in Cupertino.

Presented by the Training Department of the Santa Clara Valley section of the ARRL, the program will include

**Sparky J Antennas**

- Install Fast • Extend Range • Improve Reception

The Sparky J-Antenna is a flexible half wave radiator fed by 1/2 wavelengths of low loss coax through an efficient linear matching transformer. Sparky J's beat duckies, 1/4, & 5/8 wave antennas, need no ground plane. Low flat SWR cueve gives edge to edge band coverage. Great portable—rolls up to fit in pocket. Completely assembled with connector.

- Easily hidden • Effective indoors or out. • Money-back guarantee

Available for every band from 14 to 440 MHz

\$29.95	\$39.95	\$49.95	Add \$5.00 H
---------	---------	---------	--------------

Info 51 50-40MHz 21-49MHz 14-20MHz Antennas West  
Box 50062-W, Provo, UT 84605 (801) 373-8425



a management and training workshop, ATV workshop, RACES 29 Series seminar, packet workshop, working with the media, stress management, Incident Command System, 49er fire resource management, computer demonstrations and a steak BBQ.

Registration is \$20, which includes the BBQ dinner. Make checks payable to Emergency Response Institute and send them to Dave Larton, N6JQJ, 766 El Cerrito Way #D, Gilroy, CA 95020-4149. For more information call 408/847-3605. □

## "Astronomical" celebration!

The W/K ARC of Greater Milwaukee will operate AE9K (Astronomical Exploration) to commemorate National Astronomy Day from the dedication ceremonies of the Nichols Astronomical Observatory.

Operation will be from 1400Z May 13 to 0600Z May 14 on these suggested frequencies: CW — 30 kHz up from the bottom of the band; Phone — 1.850, 3.850, 7.250, 14.250, 21.350 and 28.450 MHz and packet — 145.09 MHz.

Send a SASE for a special QSL to: Nichols Observatory, 3885 Pioneer Rd., Richfield, WI 53076. SWL reports are welcome. □

## South Dakota Centennial

The Pierre ARC will operate station W0HVY from the State Capitol Rotunda, from 1100Z to 2300Z, Saturday, May 13, and 1500Z to 2300Z on Sunday, May 14, to commemorate 100 years of statehood.

Suggested frequencies are 28.400 kHz USB, 14.287 kHz USB and 7.267 kHz LSB.

For a commemorative certificate send QSL and business size 9 × 12 SASE to QSL mgr. Gary Wallace, KA0AHI, P.O. Box 1261, Pierre, SD 57501-1261.

Deadline mailing for requests for certificates is June 10. □

### PORTA-LINK™ For All ICOM® Handhelds

The PORTA-LINK can easily be plugged into an ICOM Handheld. Simple VOX design uses only the speaker jack and microphone input.

- Use SINGLE as low power hamfest or emergency repeater.
- Use DUAL as two-way crosslink or one side as repeater.

**PORTA-LINK  
SINGLE — \$29**

**PORTA-LINK  
DUAL — \$65**

IL deliveries, 6.5% sales tax. C.O.D. add \$4.

**M. BOHNHOFF**

P.O. Box 1243 • Wheeling, IL 60090  
(312) 298-LINK • (312) 298-5465

\*ICOM reg. ICOM U.S.A. not M. Bohnhoff



Use as one-way crosslink or repr. Handle Talkies not included.

## Special station

The DuPage ARC will operate station W9DUP, May 20-21, 1600-2300 UTC each day, at the Chicago Museum of Science and Industry.

Suggested frequencies: phone — 7.250, 14.300, 28.400 and 145.65/25.

For a certificate send a No. 10 SASE to DARC, P.O. Box 71, Clarendon Hills, IL 60514. □

## Lewis and Clark commemorative station

The St. Charles ARC will operate WB0HSI on Saturday, May 20 and Sunday, May 21, from 1300Z to 2100Z, as part of the Lewis and Clark Rendezvous.

This special event station will transmit near 7.250, 14.325, 21.350, 28.410 and 146.67, as propagation and QRM permit.

For certificates send a large SASE to the St. Charles ARC, P.O. Box 1429, St. Charles, MO 63302-1429. □

## Railroad mobile!

Help celebrate the Alabama Reunion by working a special event station operating from the Alabama Reunion Train!

Jointly sponsored by the Heart of Dixie Railroad Museum, Birmingham ARC and Alabama section ARRL, the train will make a 7-day expedition, criss-crossing the state.

WA4ZIO will be operating phone and CW on 80 through 10M.

For certificate, send QSL and 9 × 12 inch SASE to Birmingham ARC, P.O. Box 603, Birmingham, AL 35201. □

## MOVING?

Call 1-800-365-SUBS 8 a.m.-5 p.m. Pacific Time, and give our subscription house the change of address. Please have your label handy when you call, and give them your subscriber number from the top of the label.

Remember, we need instructions for any change by about the 20th of any month for the issue dated two months later.

Example: We'd need notification by Oct. 20 to get your December **Worldradio** to you at your new address, because we mail the December issue in early November.

## Bon voyage

The Grays Harbor ARC will operate the club station to commemorate the maiden voyage of the tall ship, *Lady Washington*. The 105 ft. replica of one of Captain Robert Gray's two ships, in which he explored the west coast of the United States and for whom Grays Harbor was named, was launched March 7 and is having finishing touches applied.

Starting at 1600 UTC May 6 to 2400 UTC May 7, look for W7ZA on the lower 50 kHz of the General phone bands on 15 through 80 and on 28.310 plus or minus QRM. We also hope to work some CW bands.

For a special QSL card send a SASE and your QSL card to: W7ZA, c/o ARS: KA7AIR, Joe Ladesma, 516 6th St., Hoquiam, WA 98550. □

## Scholarships available

The Foundation for Amateur Radio Inc., a non-profit organization with headquarters in Washington, D.C., plans to award 32 scholarships for the academic year 1989-1990 to assist licensed radio Amateurs.

The Foundation, composed of 50 local area ARCs, fully funds four of these scholarships with the income from grants and its annual hamfest.

It administers, without cost to the donors, seven scholarships for the QCWA, five for the Baltimore (MD) ARC, three for the Radio Club of America and two each for the Dade (FL) Radio Club, the Amateur Radio News Service, the 10-10 International Net and the West Allis RAC of Milwaukee. The Foundation also administers one each for the Richard G. Chichester Memorial, the YLRL, the Columbia (MD) ARA, the Frederick (MD) ARC and the Vienna (VA) Wireless Society.

Licensed radio Amateurs may compete for these awards if they plan to pursue a full time course of studies beyond high school and are enrolled in or have been accepted for enrollment at an accredited university, college or technical school. Some of the scholarships require the holding of at least a FCC General Class license or equivalent.

The awards range from \$500 to \$2,000, with preference given in some cases to residents of specified geographical areas or the pursuit of certain study programs.

Additional information and an application form may be requested by letter or QSL card, postmarked prior to May 31, from: FAR Scholarships, 6903 Rhode Island Ave., College Park, MD 20740. □



# Silent Keys

## John F. DeBardeleben, W4TE

John F. ("Tex") DeBardeleben, (9/12/1904-11/24/1988), became a Silent Key on Thanksgiving Day after an extended illness.

First licensed in 1925 as 5XAU, he held calls 5PK, W5PK, W5GR, W3CN before becoming W4TE.

Tex had been well known in the local Amateur community since the late 1950s, and was former Chief of Emergency Communications Resources Branch of the FCC. He was president of the Foundation for Amateur Radio in 1966 and 1967 and served as Advertising Manager and/or Circulation Manager of the *Auto-Call* for 14 years — from late 1961 to July 1975.

He was a founder and first president of Chapter X of the Society of Wireless Pioneers, Life Member of QCWA and ARRL, an avid Traffic Hound and active in a number of clubs and organizations up until his illness in 1977. He was a 32° Mason and Shriner and past

Patron of Faith Chapter of Eastern Star.

In the early '30s Tex operated as "Sparks" aboard the SS Bessemer City and spent several years in broadcasting in Houston. At the beginning of WWII, he went to work with the famous Radio Intelligence Division of the FCC, serving under George Sterling, W1AE.

The exploits of the RID have been publicized in a number of magazines and books and were dramatized on a *Gangbusters* radio program. Some of Tex's experiences were highlighted in these reports.

He retired from the Commission in 1967, after 27 years of service.

He is survived by his wife, Ethel Smith DeBardeleben, K4LMB, and his son Frederick, of Virginia Beach. □

## Phil Ashcraft, N5DD

Amateur Radio lost one of its best ambassadors...and finest operators on Dec. 30, 1988, when Phil Ashcraft, N5DD, succumbed to a high voltage shock he received while working on one of his amplifiers.

Phil is generally considered to be the father of the big multi-band/multi-operator DX station. He had the first

one in North Texas in the late 1960s.

It was also Phil, then WB5DTX, who put up the first stacked 40M beams anywhere in the country.

He also started the North Texas Contest Club. His contest station attracted worldwide attention.

N5DD did not get started in Amateur Radio until he was 62. After the ham bug bit him, he set about building the strongest station he could assemble.

In recent years Phil DXpeditioned several times from Belize. He went with Mike Rosenfeld, KE5CV. Mike became V31CV...Phil was V31DX.

A chaplain, who was also an Amateur, gave the eulogy at the funeral. It ended with "73 Phil." He is survived by his wife Dee-Dee and daughter Nancy. —W5YI Report □

## Clarification

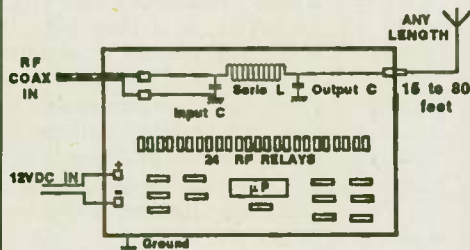
In our February issue, page 36, we mistakenly referred to a fuel fund for certain Amateurs on Pitcairn Island as "Pitcairn's fuel fund." It is actually the "VR6TC/VR6YL fuel fund."

We apologize for the mistake and any inconvenience it may have caused.

## AT LAST! 'WET STRING'\*

AN ANTENNA COUPLER THAT  
WILL LOAD THE PROVERBIAL

And, the *Smartuner* (tm) is fully automatic. It requires nothing more than RF from your rig and 12 VDC from the intelligent switch CPU. When it "sees" a new frequency it takes 2-3 seconds to find a low SWR for your transmitter. How? During this time, it switches 64 input and 32 output capacitors plus 256 inductance combinations in a pi-network. That's over a half-million different ways to ensure a perfect match for your ham rig. Even more important, it remembers the frequency and the tuning values. The next time you transmit on this band, the *Smartuner* re-selects these values in less than 10 ms.



Still skeptical? Write Gordon West, WB6NOA, for his "Best Coupler Ever Tested" review of the SGC Model SG-230 *Smartuner* and the name of your nearest dealer. Or, better yet, send \$10 (refundable with purchase) for a copy of the instruction manual.

# SGC

\*salt water please!



SGC Inc. SGC Building 13737 S.E. 26th St. Bellevue, WA. 98005 USA  
P.O.Box 3526, 98009. Telex: 328834. Fax: 206-746-6384 Tel: (206) 746-6310

## Sliding paddle?

Bud Asche, W9NIF

Having trouble keeping your keyer paddle from moving around on the operating table? Apply a small amount of bathtub grout sealant to the rubber feet of the paddle. Smooth it with a wet finger and let it dry overnight.

A word of caution: do not use the grout if your operating table has a fine furniture finish that you want to keep.

—Tri-Town RAC, Hazelcrest, IL □

## N6KW QSL Cards

The finest QSL Cards at reasonable prices. Basic cards, map cards, cartoon cards, photo cards and more. Your idea converted to ink, or use standard designs. 525 ink colors, any type of card stock. Photos in b/w or beautiful color. Have a card that fits your style. Call or write for free samples and details. Postage appreciated.

Chuck Miller N6KW  
KW Litho - Dept. WR  
P.O. Box 17390  
Ft. Worth, TX 76102  
(817) 332-3658



# When will AMSAT-OSCAR-13 be in range?

ROSS FORBES, WB6GFJ

Those just starting out in the world of OSCAR communications would like to know when they can hear a satellite. The following charts are produced to give you a rough idea as to when OSCAR-13 will be within range of your location. The three charts as printed are centered on the following geographic locations: East = New York City; Mid = St. Louis, MO; West = Reno, NV.

As you read the chart nearest your location, keep in mind the following details — all dates

and times are given in UTC. The date is printed on the left hand column and the UTC hour along the top.

A dash mark indicates the satellite is out of range and therefore not able to be heard. The letter "B" indicates OSCAR-13 is audible at that location and signals should be heard between 145.810 and 145.880 MHz (SSB and CW). A letter "O" indicates the satellite is audible, but the only signal you will hear is the telemetry beacon on 145.810 MHz. The letter "L" indicates the satellite is audible but you

will hear signals between 435.650 and 436.000 MHz (SSB and CW).

Remember, if a letter is printed on the chart, you should be able to hear OSCAR-13.

For more information about OSCAR, please send a SASE to either of the following: Project OSCAR, P.O. Box 1136, Los Altos, CA 94023-1136; AMSAT-NA, P.O. Box 27, Washington, D.C. 20044.

*Editor's note — If you would like for us to run this information regularly, please write and let us know by the end of May. Send comments to Marra McElroy, Managing Editor, Worldradio, 2120 28th St., Sacramento, CA 95818.*

Station: East	
DAY	HOUR - UTC
	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
5/01	BBBBBBBBB-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/02	BBBBBB-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/03	BB-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/04	-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/05	-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/06	-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/07	BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/08	BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/09	LLLLLLLLBBBBBBBBBB00-----BBB
5/10	LLLLLLLLBBBBBBBBBB00-----BBB
5/11	BBBBBBB-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/12	BBBBBBB-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/13	BBBBBB-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/14	B-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/15	-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/16	LLLLLLLLBBBBBBBBBB00-----BBB
5/17	BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/18	BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/19	BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/20	LLLLLLLLBBBBBBBBBB00-----BBB
5/21	LLLLLLLLBBBBBBBBBB00-----BBB
5/22	BBBBBBB-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/23	BBBBBB-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/24	BB-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/25	-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/26	-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/27	BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/28	BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/29	BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
5/30	LLLLLLLLBBBBBBBBBB00-----BBB
5/31	LLLLLLLLBBBBBBBBBB00-----BBB
20 21 22 23	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
HOUR - LOCAL	

Station: East	
DAY	HOUR - UTC
	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
6/01	BBBBBBBBB-----BBB00-----LLLLLLLLBBBB
6/02	BBBBBB-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----LLLLLLLLBBBB
6/03	BBB-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBBBBBBBBB
6/04	-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBBBBBBBBB
6/05	-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BB-----B
6/06	BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BB-----BBB
6/07	BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
6/08	BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
6/09	LLLLLLLLBBBBBBBBBB00-----BBB
6/10	LLLLLLLLBBBBBB-----BBB
6/11	BBBBBBB-----BBB
6/12	BBBBBB-----BBB00-----LLLLLLLLBBBB
6/13	BBBBBB-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----LLBBBBBBBB
6/14	BB-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBBBBBBBBB
6/15	-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
6/16	-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
6/17	BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
6/18	BBBBBBBLLLLLLLLBBBBBB-----BBB
6/19	LLLLLLLLBBBBBBBBBB00-----BBB
6/20	LLLLLLLLBBBBBBBBBB00-----BBB
6/21	BBBBBBB-----BBB
6/22	BBBBBBB-----BBB00-----BBB
6/23	BBBBBB-----BBB00-----LLLLLLLLBBBB
6/24	BB-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----LLLLLLLLBBBB
6/25	-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
6/26	-----BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
6/27	BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
6/28	BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
6/29	BBBBBBBLLLLLLLLBBBBBBBBBBB00-----BBB
6/30	LLLLLLLLBBBBBBBBBB00-----BBB
6/30	LLLLLLLLBBBBBBBBBB00-----BBB
20 21 22 23	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
HOUR - LOCAL	



AR-3500

## In a Class by Itself.

Ranger AR-3500 mobile, all-mode transceiver is the *only* user programmable 10 meter amateur radio in its price class. And America's most popular. It's a star performer, in a class all by itself. Because other transceivers just don't have these features and specs:

- Excellent Sensitivity: .15µV / 10dB SN typical
- Programmability: true 100 cycle resolutions steps
  - Selectable scan increments & high/low limits
  - Repeater compatible: program any frequency split
  - Five memory channels: fully programmable
- Direct Frequency Entry: for ease of channel hopping
- Amber LED Display: for better visibility from all angles in high light
- SSB Selectivity: 2.6 KHz / 2:1 shape factor, 8-pole crystal filter
- All-Mode: LSB, USB, CW, FM & AM
- Advanced Performance Options:
  - Scanning Microphone: 100 Hz increments for scanning VFO type operation
  - Speech Processor: produces a 3+dB improvement for enhanced DX intelligibility
  - CW Break-in Board: with variable power control

- Full 10 Meter Continuous Coverage: 28.000-29.999 MHz
  - Warranty: One full year — the best backed in the industry
  - 2 Models: 30 watt PEP output: Sale Priced \$299.95
  - 125 watt PEP output: Sale Priced \$399.95
- Clear Channel Corporation manufactures the Ranger AR-3500 in Japan and performs final assembly and quality checks in the U.S. No Extra Charge for C.O.D. or VISA MC Orders

ORDERS ONLY — NO TECHNICAL (800) 854-1927  
ORDER LINE and or TECH HELP (619) 744-0700



**RF PARTS**  
1320 Grand Avenue  
San Marcos, CA 92069







# PUBLIC SERVICE

## Iowa railroad accident

JIM SNAPP, NA0R

On Saturday, July 30, 1988, around the noon hour, a train accident was reported near the northeast part of Altoona, IA. Two freight trains found themselves on the same track and collided head-on. Right behind one of the diesel engines a fire broke out on two tank cars filled with denatured alcohol, creating the possibility of a tremendous explosion and fireball.

There were two fatalities from one train crew, while the other crew jumped clear.

Altoona Amateurs, William Moller, KA0NNS, Gwendolyn Moller, KA0YXY, Dennis Doggett, N0JAQ, and Michael Miller, N0JAS, were the first hams to respond to the critical situation. After conferring with the Polk County Emergency Director, Bob Plath, he asked that an Amateur Radio



The scene of the freight train collision

Station be activated in the Command Post in case phone lines became overloaded if an explosion occurred.

It was decided to let the fire burn itself out and evacuate the Northeast part of Altoona and the surrounding countryside. Fifteen hundred to 2000 residents were asked to vacate their homes, and the area was sealed off by local authorities about three hours after the accident was reported. This

evacuation was to extend over two days.

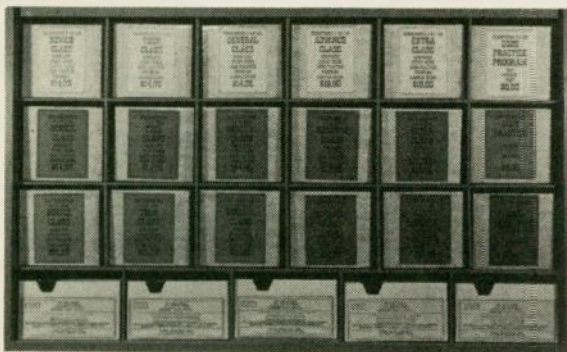
Shelters were opened by the Red Cross, but most people stayed with relatives or at motels.

Don Boyvey, KD0BG — SEC for Iowa — was notified shortly after the accident and recorded the calls of local Amateurs who could be of assistance.

The Polk County EC — NA0R — was kept abreast of the situation while finishing up an afternoon at work. After having a conference with Plath at the command post in Altoona, a two-hour schedule was drawn up and filled immediately with area Amateurs.

With the exception of early morning hours on Sunday and Monday, the ham station at the CP was manned on a continuous basis.

Sunday morning, officials from the National Traffic and Safety Board surveyed the scene and declared it a major disaster. The decision to let the fire burn itself out was reaffirmed and the evacuation remained in effect. The safety features on the two burning tanks were working and the situation seemed under control, but was still



## INSURE SUCCESS

Commodore C-64/128

OR

IBM-Compatible Owners

Complete Study Guide Code Program

Includes:

- Updated FCC questions
- Multiple choice answers
- Formulas
- Schematic symbols
- Diagrams
- Simulated (VE) sample test

(available on 5¼" disk)

Novice \$14.95

Tech \$14.95

General \$14.95

Advance \$19.95

Extra (new pool) \$19.95

(add \$2 for 3½" disk)

Available on VCR/VHS tapes (no code) ..... add \$5

Set (all classes) 5¼" disk ..... \$75.00

Set (all classes) 3½" disk ..... \$85.00

Personal cks., M.O., C.O.D.

KY res. add 5% tax. (ppd.)

Dealers invited.

Write or call for info.

**The Lanz Company**  
**3523 Dayton Ave.**  
**Louisville, KY 40207**  
**(502) 895-1377**

## COMPUTER SOFTWARE



**Ham Radio & Electronic Software Specialists**

Featuring Ham, Business and Educational Programs for:

• Commodore 64 • Commodore 128

• IBM-PC • Apple • TI99/4a

• VIC-20 • Plus/4

**Sold Worldwide since 1983**

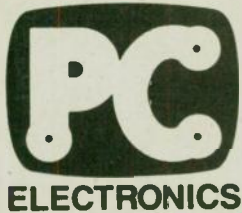
Send a legal size SASE for your FREE catalog & 20% discount coupon



**EPO SOFTWARE**

7805 Northeast 147th Ave.  
 Vancouver, WA 98682 U.S.A.  
 (206) 892-1679





P.C. ELECTRONICS 2522 PAXSON LANE ARCADIA CA 91006-8537 USA  
 TOM (W6ORG) & MARYANN (WB6YSS) O'HARA (818) 447-4565



**\$329\***

Designed and built in the USA  
 Value plus quality from over 25 years in ATV

**AMATEUR TELEVISION**

**TC70-1 TRANSCEIVER**



# SMILE YOU'RE ON TV!

WITH OUR TC70-1 ALL-IN-ONE BOX ATV TRANSCEIVER, YOU TOO CAN EASILY TRANSMIT LIVE ACTION COLOR VIDEO & SOUND JUST LIKE BROADCAST TV TO OTHER AMATEURS, SO SMILE FOR THE CAMERA!

**TC70-1 SPECIAL FEATURES:**

- \* Sensitive UHF GaAsfet tuneable 420-450 MHz downconverter
- \* Two frequency >1 watt p.e.p. transmitter. 1 crystal included
- \* 4.5 MHz broadcast standard sound subcarrier
- \* 10 pin VHS color camera and RCA phono jack video inputs
- \* PTL (push to look-same as push to talk for video) T/R switching
- \* Transmit video monitor outputs to camera and phono jack
- \* Small attractive shielded cabinet - 7 x 7 x 2.5"
- \* Requires 13.8 Vdc @ 500 ma. + color camera current

Just plug in your camera, VCR, camcorder, etc. composite video and audio (10 pin jack on front or phono jacks on back), 70cm antenna, 12 to 14 Vdc, and you are ready to transmit live action color or black and white pictures and sound to other amateurs. Sensitive downconverter tunes the whole 420-450 MHz band down to input to your TV set on channel 3. Specify 439.25, 434.0, or 426.25 MHz transmit frequency. Extra transmit crystal add \$15.

\*Transmitting equipment sold only to licensed radio amateurs verified in the Callbook for legal purposes. If newly licensed or upgraded, send copy of license. Receiving downconv. available to all starting @\$49 (TVC-2G).

**WHAT ELSE DOES IT TAKE TO GET ON ATV?**

Any Tech class or higher amateur can get on 70cm, novices now on 23cm ATV. Any video camera, camcorder, VCR or computer with a composite video output can be plugged into the front panel 10 pin VHS jack or rear panel phono jacks for both audio & video.

DX with TC70-1s and KLM 440-27 antennas line of sight and snow free is about 22 miles, 7 miles with the 440-6X normally used for portable uses like parades, races, search & rescue, damage assessment, etc. For greater DX or punching thru obstacles add either the ATV compatible 15 or 50 watt amplifiers listed below.

The TC70-1 has full bandwidth for color & sound, like broadcast. You can show the shack, home video tapes, computer programs, repeat SSTV, weather radar, or even Space Shuttle video if you have a home satellite receiver. See the ARRL Handbook chapt. 20 & 7 for more info & Repeater Directory for local ATV repeaters.

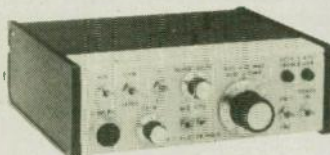
**PURCHASE AN AMP WITH THE TC70-1 & SAVE!**  
**50 WATT WITH D24N-ATV..... \$529**  
**70 WATT WITH D100ATVN..... \$629**

**COMPLETE 70CM ATV STATION**

5/89

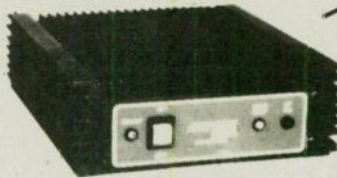


YOUR TV SET

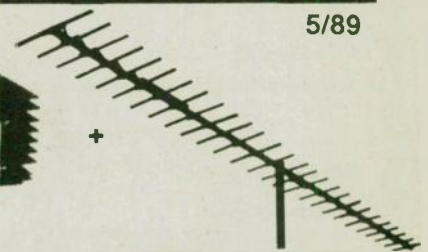


**TC70-1...\$329**  
**ATV Transceiver**  
 >1 WATT P.E.P.

13.8Vdc  
 Pwr. Sup.



**Mirage D15N.....\$149**  
 (optional) 15 watts RF out.  
**RF Concepts RF4-32..\$155**  
 (opt) typ 15W pep, GaAsfet preamp.  
**Mirage D24N.....\$209**  
 (optional) 50 watts RF out



**KLM 440-27 14dBd \$107**  
**KLM 440-10X 11dBd \$65**  
**KLM 440-6X 8.9dBd \$51**



YOUR HOME TV CAMERA

\*All prices include UPS surface shipping in cont. USA

**NEW D100ATVN....\$309**  
 (opt) 70 watts RF out.

**CALL (818) 447-4565 or write now for our full catalog of ATV gear for the 70, 33 & 23 cm bands!**



dangerous.

Monday morning a professional crew experienced in cleaning up train wrecks arrived. It was decided to bring in the National Guard foam truck from the local airport to douse the remaining fire and bring the situation to a close. This was accomplished early Monday afternoon.

The tank cars were righted and checked over. At 6 p.m. Monday evening the area was declared safe and the townspeople were allowed to return.

The command post was closed after 54 hours. Area Amateurs manned the CP for over 40 hours.

Amateurs serving time at the CP or offering their stations if needed included: KB0CFO, N0COJ, N0COL, N0JAQ, N0JGB, KA0FTO, W0SMS, KA0VBA and XYL, KA0YXY, KA0NNS, KC0KZ, N0HZK, KB0CFP, N0JAS, W0QAM, KA0TLJ, KD0BG, WA0ATI and N0GCO. □

**When submitting photos, please DO NOT write on the backs of them - they often stain the fronts of other photos, making them unusable.**



JUNIOR, YOU'RE A BAD BOY--- DIDN'T I TELL YOU THAT YOUR FATHER'S LITTLE HANDHELD WOULDN'T FLOAT ?

# ICOM

# KENWOOD

# YAESU



**IC-781**

**HF Equipment**

	List	Juns
IC-781 Super Deluxe HF Rig	\$5995.00	Call \$
IC-785 New, Loaded with Features	TBA	Call \$
IC-781 Loaded With Extras	2699.00	Call \$
IC-735 Gen. Cvg Xcvr	1099.00	Call \$
IC-751A Gen. Cvg. Xcvr	1699.00	Call \$
IC-725 New Ultra-Compact Xcvr	949.00	Call \$
IC-575A 10m/6m Xcvr	1399.00	Call \$

**Receivers**

IC-R7000 25-1300 + MHz Rcvr	1199.00	Call \$
IC-R71A 100 kHz-30 MHz Rcvr	999.00	Call \$

**VHF**

IC-228A New 25w Mobile	509.00	Call \$
IC-228H New 45w Mobile	539.00	Call \$
IC-275A All Mode Base w/PS	1299.00	Call \$
IC-275H All Mode Base 100w	1399.00	Call \$
IC-28A FM Mobile 25w	469.00	Call \$
IC-28H FM Mobile 45w	499.00	Call \$
IC-2GAT, New 7w HT	429.95	Call \$
IC-900 Six Band Mobile	639.00	Call \$

**UHF**

IC-475A All Mode 25w	1399.00	Call \$
IC-475H All Mode 75w	1599.00	Call \$
IC-48A FM Mobile 25w	509.00	Call \$
IC-4GAT, New 6w HT	449.95	Call \$
IC-4AT FM HT	349.00	Call \$
IC-04AT FM HT	449.00	Call \$
IC-448A, 25w Mobile	TBA	Call \$
IC-32AT Dual Band Handheld	629.95	Call \$
IC-3210 Dual Band Mobile	739.00	Call \$

**220 MHz**

IC-375A All-Mode, 25w, Base Sta.	1399.00	Call \$
IC-38A 25w FM Xcvr	489.00	Call \$
IC-37A FM Mobile 25w	499.00	Call \$
IC-3AT FM HT	349.00	Call \$
IC-03AT Deluxe HT	449.00	Call \$

**1.2 GHz**

IC-12GAT Super HT	529.95	Call \$
-------------------	--------	---------



**TS-940S**

**HF Equipment**

	List	Juns
TS-940S/AT Gen. Cvg Xcvr	\$2499.95	Call \$
TS-440S/AT Gen. Cvg Xcvr	1449.95	Call \$
TS-140S Compact, Gen. Cvg Xcvr	949.95	Call \$
TS-680S HF Plus 6m Xcvr	1149.95	Call \$
TL-922A HF Amp	1649.95	Call \$

**Receivers**

R-5000 100 kHz-30 MHz	1049.95	Call \$
R-2000 150 kHz-30 MHz	799.95	Call \$
RZ-1 Compact Scanning Rcvr.	599.95	Call \$

**VHF**

TS-711A All Mode Base 25w	1059.95	Call \$
TR-751A All Mode Mobile 25w	669.95	Call \$
TM-231A Compact FM 45w	459.95	Call \$
TH-215A, 2m HT Has It All	399.95	Call \$
TH-25AT 5w Pocket HT NEW	369.95	Call \$
TM-721A 2m/70cm, FM, Mobile	729.95	Call \$
TM-621 2m/220, FM, Mobile	729.95	Call \$

**UHF**

TS-811A All Mode Base 25w	1,265.95	Call \$
TR-851A 25w SSB/FM	771.95	Call \$
TM-431A Compact FM 35w	489.95	Call \$
TH-45AT 5w Pocket HT NEW	389.95	Call \$
TH-55 AT 1.2 GHz HT	524.95	Call \$
TM-531A Compact 1.2 GHz Mobile	569.95	Call \$

**220 MHz**

TM-3530A FM 220 MHz 25w	519.95	Call \$
TH-31BT FM, 220 MHz HT	299.95	Call \$
TM-321A Compact 25w Mobile	469.95	Call \$
TH-315A Full Featured 2.5w HT	419.95	Call \$



**FT-767GX**

**HF Equipment**

	List	Juns
FT-747 GX New Economical Performer	\$889.95	Call \$
FT-757 GX II Gen. Cvg Xcvr	1129.95	Call \$
FT-767 4 Band New	1929.00	Call \$
FL-7000 15m-160m Solid State Amp	1995.00	Call \$

**Receivers**

FRG-8800 150 kHz - 30 MHz	759.95	Call \$
FRG-9600 60-905 MHz	699.95	Call \$

**VHF**

FT-411 New 2m "Loaded" HT	399.95	Call \$
FT-212RH New 2m, 45w mobile	459.95	Call \$
FT-290R All Mode Portable	599.95	Call \$
FT-23 R/TT Mini HT	344.95	Call \$

**UHF**

FT-712RH, 70cm, 35w mobile	499.95	Call \$
FT-711RH FM Mobile 35w	449.95	Call \$
FT-2311R 10w, 1.2 GHz, FM	559.95	Call \$

**VHF/UHF Full Duplex**

FT-736R, New All Mode, 2m/70cm	1749.95	Call \$
FEX-736-50 6m, 10w Module	259.95	Call \$
FEX-736-220 220 MHz, 25w Module	279.95	Call \$
FEX-736-1.2 1.2 GHz, 10w Module	539.95	Call \$
FT-890R MKII, 6m, All Mode, port.	569.95	Call \$

**Dual Band**

FT-4700RH, 2m/440 Mobile	889.00	Call \$
--------------------------	--------	---------

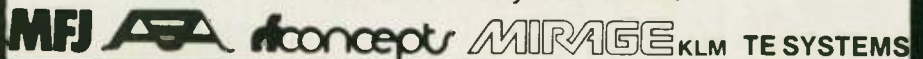
**220 MHz**

FT-312 RM, Mobile	TBA	Call \$
-------------------	-----	---------

**Repeaters**

FTR-2410 2m Repeaters	1269.95	Call \$
FTR-5410 70cm Repeaters	1289.95	Call \$

Call For These Quality Brand Names



**KENWOOD**  
TH-315A  
TM-321A  
TH-3815A

**JUN'S BARGAIN BOX**  
OVERSTOCK SALE LIMITED QUANTITIES

**ICOM**  
IC-37A \$299.95  
regularly \$499.95  
limited quantity

**YAESU**  
FT 747 GX only \$699.95  
regularly \$889.95

**SPECIAL SALE PRICES**

• AMATEUR • TWO WAY • MARINE • SE HABLA ESPANOL  
• Free UPS Cash Order • (Most Items, Most Places)

**(213)390-8003**

3919 Sepulveda Blvd.  
Culver City, CA 90230





## Tired of stereotype

I am a SWL, a UTE and scanner listener and (Oh my God!) a CBer. I just read an article in the December issue of Worldradio, page 11, about "Unscrupulous Scanners" ripping off a repeater. I'm upset because the article offered no proof that it was scanner listeners, but just intended to defame scanner listeners as lowlives.

In the absence of any stated proof, it seems to me that maybe it was an Amateur with access to transmitting equipment that can utilize the repeater that ripped it off.

What I'm really upset about is the general prejudice that Amateurs have to other radio enthusiasts. After the Calaveros Fire a couple of years back, Amateurs were quoted as saying one of the advantages of using Packet Radio

is that scanner listeners couldn't eavesdrop on the communications. GREAT PR GUYS!

This is not the way to treat potential Hams! Have you ever heard the phrase "United we stand, Divided we fall." For years I've heard responsible Amateurs ask, "What can we do to enlarge our ranks?". The future of a viable Ham radio depends on growth.

I'm sure I don't have to remind you about the recent attacks on radio spectrum assigned to Amateurs. There are businesses that look upon the radio spectrum assigned to Hams as a waste of BIG \$\$\$.

Do you think this grab of Ham radio spectrum would have occurred as easily as it did if there were 3 or 4 million Hams in the United States?

What I'm saying is, don't discourage those of us who haven't seen the "Light" and upgraded to Amateur status. Welcome us, encourage us, yes, even the CBers! The responsible ones will study and upgrade, the irresponsible won't bother to.

We will join you only if we know we are welcome.

**GREG REID**  
San Jose, CA

## Further explanation

While generally correct, the article in the March 1989 issue "PMs and FM's" (page 26), misses the most relevant factor in a discussion of the difference between Phase Modulation (PM) and Frequency Modulation (FM). If I am correct, the only true FM transmitter ever used by Amateurs was the Gonset Communicator IV with an optional external VFO. All others known as FM are really PM.

The deviation produced by a FM modulator is proportional to the modulating signal amplitude. The deviation produced by a PM modulator is proportional to the dv/dt of the modulating signal, or proportional to the product of the modulating signal amplitude and frequency.

PM transmitters filter the audio input signal to attenuate the higher frequencies at approximately 6dB per octave to achieve deviation nearly proportional to modulating signal amplitude.

In an effort to improve readability by cutting the lows and improving noise immunity with the inherent pre-emphasis of PM, manufacturers often design for less than the desired 6dB per octave. The distortion is subtle and of little consequence in simplex service or

VISIT YOUR LOCAL

## RADIO STORE

### ARIZONA

**Ham Radio Outlet**  
1702 W. Camelback  
Phoenix, AZ 85015  
(602) 242-3515

### CALIFORNIA

**A-Tech Electronics**  
1033 Hollywood Way  
Burbank, CA 91505  
(818) 845-9203

**Ham Radio Outlet**  
2620 W. La Palma  
Anaheim, CA 92801

**Ham Radio Outlet**  
999 Howard Avenue  
Burlingame, CA 94010

**Ham Radio Outlet**  
2210 Livingston St.  
Oakland, CA 94606

**Ham Radio Outlet**  
5375 Kearny Villa Road  
San Diego, CA 92123

**Ham Radio Outlet**  
6265 Sepulveda Blvd.  
Van Nuys, CA 91401

**Henry Radio**  
2050 S. Bundy Dr.  
Los Angeles, CA 90025  
(213) 820-1234

**Jun's Electronics**  
3919 Sepulveda Blvd.  
Culver City, CA 90230  
(213) 390-8003

**The Radio Place**  
2964 Freeport Blvd.  
Sacramento, CA 95818  
(916) 441-7388

**COLORADO**  
**Rocky Mountain Amateur/**  
**Shortwave Specialists**  
4253 So. Broadway  
Englewood, CO 80110  
Orders (800) 831-7305  
Info (303) 761-7305

**CONNECTICUT**  
**Rogus Electronics Inc.**  
250 Meriden-Waterbury TPK.  
Southington, CT 06489  
(203) 621-2252

**FLORIDA**  
**Elf's Amateur Radio, Inc.**  
1351 State Road 84  
Fort Lauderdale, FL 33315  
(305) 525-0103 or 944-3383

**GEORGIA**  
**Doc's Communication &**  
**Electronics, Inc.**  
702 Chickamauga Ave.  
Rossville, GA 30741  
(404) 866-2302 or 861-5610

**Ham Radio Outlet**  
6071 Buford Hwy.  
Atlanta, GA 30340  
(404) 263-0700

**Omar Electronics**  
Rt. 1, Hwy 81 South  
Loganville, GA 30249  
(404) 466-3241

**IDAHO**  
**Ross Distributing Co.**  
78 South State St.  
P.O. Box 234  
Preston, ID 83263  
(208) 852-0830

**ILLINOIS**  
**Erickson Communications**  
5456 N. Milwaukee Ave.  
Chicago, IL 60630  
Orders: (800) 621-5802  
Info (IL): (312) 631-5181

**MICHIGAN**  
**H.R. Electronics**  
722/24 Evanston Ave.  
Muskegon, MI 49442  
(616) 722-2246

**MISSOURI**  
**Henry Radio**  
211 N. Main Street  
Butler, MO 64730

**NEVADA**  
**Radio World**  
1656 Nevada Hwy.  
Boulder City, NV 89005  
(702) 294-2666

**NEW JERSEY**  
**Gilfer Associates**  
P.O. Box 239  
52 Park Ave.  
Park Ridge, NJ 07656  
(201) 391-7887

**NEW YORK**  
**Hirsch Sales Co.**  
219 California Dr.  
Williamsville, (Buffalo) NY 14221  
(716) 632-1189

**OHIO**  
**Universal Amateur Radio, Inc.**  
1280 Aida Drive  
Reynoldsburg (Columbus), OH 43068  
(614) 866-4267

**TEXAS**  
**Mission Communications**  
11903 Alief-Clodine Suite 500  
Houston, TX 77082  
(713) 879-7764



### SAVE TIME and MONEY with THE HAZER

**Bring things down for safety and convenience.**

Never climb your tower again with this elevator system. Antennas and rotator mount on HAZER, complete system trams tower in vertical upright position. Safety lock system operates while raising or lowering. Never can fall.

Complete kit includes winch, 100 ft. of cable, hardware and instructions. For ROHN 20 and 25 G Towers.

Hazer 2-Heavy duty alum. 12 sq. ft. load	\$311.95 ppd.
Hazer 3-Standard alum. 8 sq. ft. load	\$223.95 ppd.
Hazer 4-Heavy galv. steel 16 sq. ft. load	\$291.95 ppd.

**NEW for ROHN 45 and 55 Towers**

Hazer 8-Heavy duty galv. steel 16 sq. ft. load	<b>Call \$</b>
Ball Thrust Bearing TB-25 for any of above	

Send for free details of aluminum towers specifically engineered for use with the Hazer. Two sizes; M-13 (13" wide) and M-18 (18" wide). All bolted construction, no welds. Easy to install hinge base, walk up erection. Complete tower UPS or air freight shippable. Pre-assembled or kit form.

Satisfaction guaranteed. Call today and charge to Visa, MasterCard or mail check or money order.

**GLEN MARTIN ENGINEERING INC.**  
Rte 3, Box 322  
Boonville, MO 65233  
(816) 882-2734 FAX 816-882-7200



when a single repeater is involved.

Consider the case of linked repeater system. The distortion in the originating transmitter is raised to the power of the number of transmitters in the circuit.

Unfortunately, most Amateur transmitters and repeaters are operated at or over 5 kHz deviation, and with most of the errors on the side of low cut, over deviation of the highs can result in linked repeater systems. A precise adjustment of the linearity, i.e., relationship of modulating signal to deviation, of each element of linked repeater systems is required to minimize this exponential rise in distortion.

Further information on this subject can be found in the *ARRL Handbook* or any text covering communications theory.

**JACK FROST, NF7V**  
Minden, NV

## A satisfied customer

It is apparent from the letters I have read that most people are very quick to complain when an equipment vendor does not provide good service. I see very few, however, praising the good merchants. This letter is a tale of exceptional service.

I went to the Jacksonville (FL) hamfest in August in search of a multi

mode data controller for packet, RTTY and other modes. Previous experience with MFJ products made me consider and purchase their 1278 computer interface. It did everything and seemed to be terrific. After a couple of days at home and operating, an intermittent memory problem showed up.

I wrote a letter to MFJ requesting information about a possible solution.

After a week or so, and expecting a letter in reply to mine, I was totally astounded when my wife informed me that a man from MFJ was on the phone. Mr. Stevan Pan introduced himself as an MFJ engineer and acknowledged receipt of my letter. He spent almost a half hour discussing the problem and what I had done to remedy it.

During this time, he gave me several good operating tips and also reviewed an idea I had presented for future updates. Since the intermittent problem could not be solved on the phone, he replaced my unit at his cost. His biggest reason for doing this, in addition to keeping a satisfied customer, was to determine what was causing the problem and prevent it in later models.

I hung up the phone and sat at my operating position in a state of shock. Mr. Pan had totally satisfied my every problem. In my 31 years of association with ham radio, I had never been

treated this well. That statement probably pertains to almost as many years in the business world.

The remarkable thing about this whole episode is that Mr. Pan indicated that this was the way MFJ does business. They believe in getting their problems cleared as soon as possible. Isn't this a wonderful idea? Too bad others don't feel the same way.

**JOE BUSHHELL, KI4BI**  
Jacksonville, FL

## Animated Amateur

Li'l Abner, Daisy Mae and other Dogpatch, U.S.A. characters are headed for TV animation. Producers Dave Bell, W6AQ, and Herbert Krosney have picked up the motion picture rights from Capp Enterprises, and in addition to two animated TV series and related TV specials, they're developing a project based on the life of cartoonist Al Capp. — *This information was found in the Jan. 23, 1989 edition of the Los Angeles Times, and submitted to us by Archie Willis, W6LPJ*

**Worldradio** will trade a paper for a copy of your monthly bulletin or newsletter. Send us the name of your editor. In exchange for your monthly bulletin, your editor will receive a monthly issue of **Worldradio**. Send bulletins to: P.O. Box 189490, Sacramento, CA 95818.

# BASE STATIONS



**FT-757GXII.** Hard-to-beat HF performance at a hard-to-beat price. Includes 100-watt output. 10 memories. Memory storage of operating mode. Dual VFOs. Slow/fast tuning selection. IF notch filter. Iambic electronic keyer. 600-Hz CW filter. AF speech processor. Receive coverage from 500 kHz to 30 MHz. Transmit coverage from 10 to 160 meters, including WARC bands. All-mode coverage. QSK operation. Duct-flow cooling for continuous RTTY operation up to 30 minutes. Much, much more.



**FT-767GX.** The world's first HF/VHF/UHF base station. 160 to 10-meter transmit standard. Plug-in modules for 6-meter, 2-meter and 70-cm options. Receiver covers 100 kHz to 30 MHz. AM, FM, SSB, CW, AFSK modes built in. 10 memories store frequency, mode, and CTCSS info. Dual VFOs. And these are just a few highlights!

# YAESU

## The Radio Place

2964 Freeport Blvd., Sacramento, CA 95818  
(916) 441-7388



## ESTABLISH A HAM TESTING CENTER IN YOUR AREA

As of 1984, all ham radio license testing is handled by the amateur radio community itself. Teams of three Extra Class volunteer examiners (VE's) can now conduct all ham license upgrade examinations.

W5YI-VEC, the initial national VE Coordinator approved by the FCC, oversees the largest alternative (to the ARRL) testing program in the U.S. You can be a part of it by following the simple testing instructions provided.

Administering Technician through Extra Class examinations is no harder than administering Novice examinations — which VE's have done for decades. We offer...fastest VE accreditation, complete instructions, immediate testing...with testing fees (expense reimbursement) shared with the VE team.

Send an SASE today for a VE application if you are an Extra Class amateur and serious about conducting periodic amateur radio examination sessions in your area so that others may upgrade.



**W5YI-VEC**  
P.O. Box #10101  
Dallas, TX 75207  
(817) 461-6443

Let's get Amateur Radio growing again!





# ALINCO ELECTRONICS INC.

20705 South Western Ave., Suite 104 Torrance, CA 90501 • (213)618-8616

## Tiny, Tough & Terrific

The **NEW** Generation of T.T.& T. Hand Held Transceivers From Alinco Are Just Around the Corner!

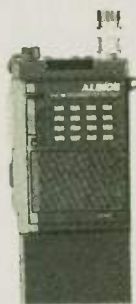
### Introducing The DJ-100T 2 Meter Hand Held Transceiver

- **Tiny** = 1-3/16" D x 2-3/8" W x 6-5/8" H
- **Tough** = 6.5 Watts (With Optional EBP-8NAZ Nicd Battery Pack)
- **Terrific** = Features and Benefits

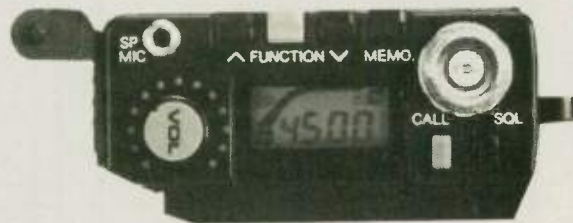
**Suggested  
List Price  
\$299.00**

- LCD with Switchable Backlighting
- 10 Memories
- BNC Antenna Connection
- 16 Button DTMF Pad
- Easily Accessible Dip Switches For Encoding Sub Audible Tones
- Battery Save Draws 15mA For Extended Battery Life
- .20uV Sensitivity
- 144.00 MHz to 147.995 MHz
- CAP and MARS Modifiable - Simplex only
- Standard Battery, EBP-9NAZ Has DC/DC Converter Built In
- Stores Standard Repeater Offsets In Memory
- Full Range of Accessories
- 220 MHz and 440 MHz To Follow Shortly

**NOW AVAILABLE  
220 MHz  
"DJ-200T"**



(Optional EBP-2NAZ Ni-Cd battery)



### Alinco's products are carried by these fine dealers

A-Tech - Burbank, CA  
 Amateur & Advance Comm. - Wilmington, DE  
 Amateur Comm. ETC. - San Antonio, TX  
 AES - Milwaukee, WI  
 AES - Orlando, FL  
 AES - Clearwater, FL  
 AES - Las Vegas, NV  
 Austin Amateur Radio Supply - Austin, TX  
 Barry Electronics - New York, NY  
 Burghardt Amateur Center - Watertown, SD  
 Colorado Comm Center - Denver, CO  
 Delaware Amateur Supply - New Castle, DE  
 Doc's Communications - Rossville, GA  
 El Original Electronics - Brownsville, TX  
 EEB - Vienna, VA  
 EGE, INC. - Woodbridge, VA

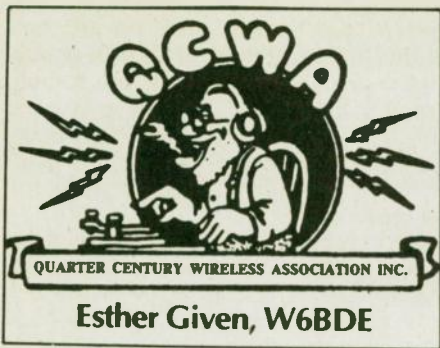
EGE, INC. - Salem, NH  
 Erickson Communications - Chicago, IL  
 F&M Electronics - Greensboro, NC  
 Floyd Electronics - Collinsville, IL  
 The Ham Station - Evansville, IN  
 The Ham Hut - Amarillo, TX  
 Hatry Radio - Hartford, CT  
 Henry Radio - Los Angeles, CA  
 Hirsch Sales Co. - Williamsville, NY  
 HR Electronics - Muskegon, MI  
 HRO - Anaheim, CA  
 HRO - Atlanta, GA  
 HRO - Burlingame, CA  
 HRO - Oakland, CA  
 HRO - Phoenix, AZ  
 HRO - San Diego, CA  
 HRO - Van Nuys, CA

HSC - Santa Clara, CA  
 HSC - Sacramento, CA  
 HSC - Sunnyvale, CA  
 International Radio Systems - Miami, FL  
 Jun's Electronics - Culver City, CA  
 Kennedy Associates - San Antonio, TX  
 K.J.I. Electronics - Houston, TX  
 Madison Electronics - Houston, TX  
 Maryland Radio Center - Laurel, MD  
 Memphis Amateur Electronics - Memphis, TN  
 Michigan Radio - Mt. Clemens, MI  
 Mission Consulting - Houston, TX  
 Missouri Radio Center - Kansas City, MO  
 N&G Electronics - Miami, FL  
 Omni Electronics - Laredo, TX  
 Quement Electronics - San Jose, CA  
 RF Enterprises - Merrifield, MN

R&L Electronics - Hamilton, OH  
 Reno Radio, Reno, NV  
 Rivendell Associates - Derry, NH  
 Rogus Electronics - Southington, CT  
 Rosen's Electronics - Williamson, WV  
 Ross Distributing Co. - Preston, ID  
 Satellite City - Minneapolis, MN  
 Tel-Com Electronic Comm. - Littleton, MA  
 Texas Comm. Center - Houston, TX  
 Texas Towers - Plano, TX  
 VHF Communications - Jamestown, NY  
 Williams Radio Sales, Colfax, NC

**CANADA:**  
 Canadian Distributor  
 Texpro Sales Inc. - Burlington, Ontario  
 (416) 332-5944





Esther Given, W6BDE

F. Worth Gruelle, W4ZG, was the honored star on Feb. 6 when three of QCWA's four officers visited Spaceport Florida Chapter 66. His first license was issued in 1912 and is almost as old as his birth certificate.

On the day he was born, June 28, 1912, his proud dad, 7JG, applied for one of the new fangled Amateur Radio licenses for his baby son. The Bureau of Navigation, Department of Commerce, which in those days did not test applicants, complied with the request issuing 7FG to the infant. It became instant "wall paper" in the Gruelle nursery in Bremerton, WA.

In the early 1920s papa Gruelle became very interested in 10M phone activity, which also fascinated the 10-year-old son. Upon "reactivating" his 7 land license, young Gruelle became one of the youngest operating Amateurs of those times in the United States.

Gruelle's dad originated the Raggedy Ann and Raggedy Andy dolls, stories and books, and it was he who established the Raggedy Ann award for 10M (K7UGA, Barry Goldwater, holds "Raggedy" #4 of some 3,000 issued).

7FG's first QSL cards were designed by his talented dad and bore the phonetic spelling "Gruwell," for his surname. Papa Gruelle became a silent key in 1937, leaving his son to carry on the family traditions of Amateur Radio and Raggedy Ann and Andy promotion.

Worth Gruelle, now 77, finds he is unique in having been licensed since birth. DX phone activities have been his greatest interest in Amateur Radio. Gruelle notes he was never much of a CW man, but somehow managed to pass 5 or 6 code tests over the years.

In addition to 7FG he has held various calls in 1 and 4 land. His YF, Sue, and one of his sons, also held Amateur licenses at one time. QCWA salutes this youngest/oldest licensee!

QCWA members in the vicinity of Portland, OR and Vancouver, WA, formed QCWA Oregon Trails Chapter #168 and applied for chapter charter in early February. President of the new

group is Bill Blaumer, K7ZED, and secretary/treasurer is Dale LeBarrons, W7FBP.


Their first meeting was held on an evening when the "Siberian Express" brought ice, snow and the coldest temperature recorded in 100 years for that area. In spite of these hazards, 14 prospective members showed up.

Charter membership will be held open for a short time to accommodate QCWA members wishing to affiliate with the new chapter.

QCWA chapter formation is currently being instituted in the Sacramento, CA area. QCWA members in that region may contact the spark plugs of this activity, Paul Wolf, W6RLP, or Bill Hendrick, NS6D, for further information.

All that's needed to establish a QCWA chapter is a member or two who will serve as the "power supply" to contact QCWA Headquarters for instructions on establishing a chapter, obtain a charter application, round up 10 or more QCWA members in good standing interested in forming the new chapter, hold a meeting and elect officers willing to serve the fledgling group and mail the completed application back to QCWA Headquarters.

The spring meeting of QCWA's governing board normally held near its headquarters in Irving, TX, has been postponed from the usual April session to June 5 and 6. This will enable QCWA's officers and directors to attend the ARRL National Convention scheduled for June 3 and 4 in Ft. Worth.



**IMRA**  
People Helping People

Service to Missioners  
(all denominations)

**Missionary Net • 14.280 MHz, Mon. thru Sat.**  
1:00-3:00 Eastern Time  
(1700-1900 Z DT, 1800-2000 Z ST)  
Annually 20,000 check-ins, 11,000 traffic

**Membership • 1,000 amateurs in 40 countries • Directory & bi-monthly newsletter**

If monitoring the net, please come in and join us. You will be cordially received.

For further information, write:

**Rev. Thomas Sable, S.J.**  
University of Scranton  
Scranton, PA 18510

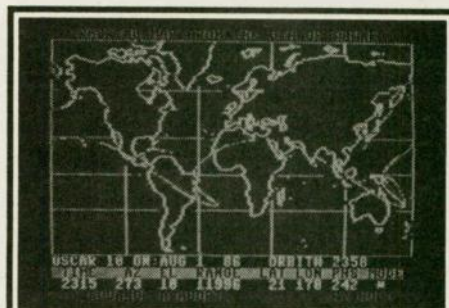


Call signs were so rare in 1912, prospective Amateurs were issued their initials.

QCWA Washington, D.C., Chapter #23 and Vic Clark Chapter #91, co-sponsored an Old Timers' Dinner for Amateurs in the greater D.C. area on Saturday, April 8, at the Officers' Club of the Naval Medical Center in Bethesda, Maryland. Featured guest speaker was Leland Smith, W5KL, Brigadier General USMC Retired and currently National President of QCWA.

QCWA Chapter 9 will hold its annual Dayton/Cincinnati banquet in conjunction with the Dayton Hamvention. The event will be held April 28, at Neil's Heritage House in Dayton with COD bar at 6:30, followed by dinner at 7:30. Bob Dingle, KA4LAU, 657 Dell Ridge

(please turn to page 28)



## SUPER VR-85

A Satellite Tracking Program  
For the Commodore 64

VR85 is the most popular software tracking aid in use for the C-64, and now SUPER VR-85 continues the tradition of bug-free operation, strong user support, and ongoing development. New features include graphical and tabular representation of the mutual acquisition zone, and user port output for automatic antenna steering when using an AUTOTRAK™ board. Much of the program is now in machine code and operates with a more professional feel.

### FEATURES:

- Map oriented color graphics include moving satellite and footprint sprites and sub-orbital trace—looks great in monochrome too.
  - Room for 20 satellite element sets.
  - Orbit no., date, time, AZ, EL, range, phase and mode display.
  - User friendly data entry.
  - Extensive, readable instructions.
- But if you have a problem just give us a call.

For more details send an SASE.

Super VR-85: \$35.00 ppd.

Send check or M.O. to:

**RLD Research**  
McCloud, CA 96057

California residents add 6% sales tax.  
AUTOTRAK™ is a trademark of NH Enterprises.







# 10-10 INTERNATIONAL News

Chuck Imsande, W6YLJ  
10-10 19636

10-10's immediate past president, Howard Bowman, W6QIR, 10-10 #4509, became a Silent Key on Feb. 17. Howard was born on Dec. 15, 1910, in Los Angeles and lived his life in the greater Los Angeles area. He was educated in the Los Angeles city school system and received his doctorate from the University of Southern California in 1956.

Howard was employed, until his retirement, by the Los Angeles School District and was, for the 16 years prior to his retirement, the Director of Measurement and Evaluation.

He was first licensed in 1938 and joined 10-10 in 1972, which accounts for his low 10-10 number. Since his retirement, Howard spent most of his time on 10-10 business. In addition he checked into the daily net and several other nets each week, spending at least 10 hours a week on the radio, mostly on 10M, his favorite band.

He first began serving as a 10-10 volunteer as the roster manager in 1977 and continued in this capacity until 1980, when he was elected president the first time.

He was president in 1980, 1981 and 1982. He then served on the Board of Directors in 1983 and 1984. He again was elected president in 1985 and served through 1988.

As immediate past president, he was serving on the Board of Directors at the time he became a SK.

Howard was a staunch supporter of 10-10 and traveled to Australia and New Zealand to meet with our "down under" members and also traveled to Europe to meet with many of our members there. He had many friends around the world and will be missed by all. Howard leaves his XYL Edith, two children and two grandchildren, none of whom are Amateurs.

As Howard spent his entire working life in the field of education, the family has asked that donations be made to the 10-10 Scholarship Fund in his name. This certainly would be a way of saying "thank you" to a great gentleman who so willingly gave much of his time to our organization. Any donations should be sent to Gerry Gross,

WA6POZ, 10-10 Treasurer, 8145 Cozycroft Ave., Canoga Park, CA 91306. Make your check payable to "10-10 Scholarship Fund." Please do it right now while it is fresh on your mind. Chapters, let Gerry hear from you.

## 10-10 club station W6OI/9 is on the air

The 10-10 club station, W6OI, is on the air from Milwaukee in celebration of the upcoming 10-10 Convention to be held in Milwaukee from Aug. 11 to 13. Be on the lookout for W6OI/9.

QSLs can be obtained from Duane Riel, 501 Mackinac Ave., South Milwaukee, WI 53172.

Joe Williams, WA9TSG, has taken over the 10-10 Convention due to the poor health of our former convention chairman, Henry Hiatt. Henry got us off and running for the 2nd 10-10 Convention, and now Joe will keep the progress moving ahead at full steam. Watch for more details in the next few issues of Worldradio.

## New bar manager for 100-900 bars

Applications for 100 through 900 bars should go to our new bar manager, Wayne Childress, KJ6HP, 4455 Harding Ave., Los Angeles, CA 90066. Our previous bar manager for 100-900, Bobbie Vaughn, WB7NUU, has done an outstanding job and we all thank



Dr. Howard A. Bowman, W6QIR, 10-10 #4509

her for her dedicated work and the time spent to "keep those bars coming."

The bar manager's job is one that takes a heck of a lot of time and gets very little publicity or thanks. It's easy for us to send in our bar lists, but it's not easy to keep track of all of us and just where we stand on the Bar Program. It's just a heck of a lot of paper work.

## Finally

If you are interested in 10-10 and would like to receive a copy of the latest issue of the *10-10 International News*, the official magazine of 10-10, and an information package about 10-10, send me a "green stamp," along with an address label (if you have one) to 18130 Bromley Street, Tarzana, CA 91356-1701.

73 es cu next month.

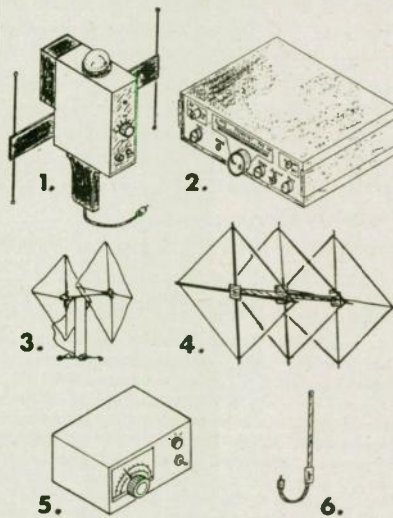
## QCWA

(continued from page 26)

Dr., Dayton, OH 45429, is handling reservations. Dinner tickets are \$13 per person. QCWA membership is not required for attendance.

QCWA members should begin planning to attend the organization's annual convention scheduled for October 20-21 in Baton Rouge, LA. A busy committee is planning an exciting schedule of events. Watch this column for more information.

## RF PRODUCTS



1. VHF DIRECTION FINDERS \$124.95
2. O'SCOPE SPEC. ANLY'SR \$795.00
3. 2-MTR PORTABLE QUAD \$ 73.95
4. FIXED VHF QUAD ANTS. \$ 73.95
5. O'SCOPE RANGE EXTN'DR \$ 69.50
6. 2MTR PORTABLE J ANT. \$ 29.95

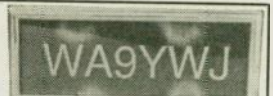
CALL/WRITE FOR DATA - SHIPPING AND CA TAX EXTRA

### RADIO ENGINEERS

3941 MT. BRUNDAGE AVE.  
SAN DIEGO CA. 92111

619-565-1319

## Photo Engraved Callsign Plaque



Gold-colored metal frame; choice of burgundy, blue, black or green velvet background; measures 7" x 2 3/4". Send \$24.95 plus \$2 S/H to:

WA9YWJ Products • 907 Baxter Ave.  
Superior, WI 54880 • (715) 394-4418





# DX WORLD

John F.W. Minke III, N6JM

6230 Rio Bonito Drive Carmichael, CA 95608

## Activities Calendar

- 13-14 May RSF CQ-M Contest
- 27-28 May URE Ibero-America Contest (SSB)
- 27-28 May LABRE World Telecommunications Day
- 27-28 May CQ Worldwide WPX Contest (CW)

## W-100-N

The following DXers received certificates for Worldradio's Worked 100 Nations Award:

- 355. YB0HZL Leo Ihsan Jusuf Tanud (All 15M SSB)
- 356. N3CRN David Van Der Weele

## Northwest DX Convention

If you are planning a trip to the west coast this summer, why not take in the annual Northwest DX Convention. Sponsored this year by the Western Washington DX Club, the event will be held in July on the 28th, 29th and 30th, at the Renton Holiday Inn, formerly the Renton Sheraton, at 800 Ranier Ave. South. The hotel is just around the corner from the Seattle-Tacoma Airport.

Prices and convention program are not available at this time. As for the chairman this year, we suspect it is Morris Shepherd, W7LVI.



Alex Razuvaev, UM8MIG, is active from Frunze, Kirghiz, and has handed many a DXer a brand new one. Here Alex takes time out for his photo. That looks like homebrew gear there, OM. (Photo courtesy of UM8MIG).

## Mozambique (C9)

Mozambique continues to be in de-

mand with only C9MKT on the air at present. 15M appears to be a good bet to find this one. Try the following frequencies: 21.260, 21.295, 21.310 and 21.335 MHz. He has been reported at various times of the day. He was also reported on 14.266 MHz at 0500 UTC on February 19th.

## Cuba (CM/CO)

Realistically, Cuba shouldn't be considered DX since it is less than 100 miles from the United States. But then DX is relative. Also, Cuba isn't rated as garden variety DX either. As it isn't included in *The DX Bulletin* most wanted, some DXers might argue this.

Recently, there has been an increase in activity from this one and a lot of it on 10M. Not too long ago a station signing CO7JC was knocking them off contest style on 28.469 MHz around 2200 UTC. A week later we worked Santiago, CO5GV, on 28.541 MHz at 1945 UTC and four hours later we worked Bert, CM3EF, on 28.434 MHz. Bert is located in Bauta, in the province of Havana.

Other calls reported on 10M include CM6CG on 28.495 MHz at 1600 UTC, CO5DD on 28.514 MHz at 1715 UTC and CO6ER on 28.189 MHz at 1600 UTC.

30M brings us CO2VG, found on 10.108 MHz at 0530 UTC on Feb. 3rd by a Kentucky DXer.

15M revealed some activity of Cuban stations being reported in Europe, such as CO2HQ on 21.180 MHz at 2000 UTC and CO5RCC on 21.232 MHz at 2230 UTC.

Other reports include a 75M contact on 3.800 MHz at 0615 UTC with CO5DD and a RTTY contact with CO2BB on 28.094 MHz at 1600 UTC.

## Liberia (EI)

We have a few calls reported active from Liberia during the month of February. They include the following by band:

EL7X	3.505 MHz	2230 UTC
EL5E	7.040 MHz	2200 UTC
EL2CI	14.208 MHz	2130 UTC
EL2EF	14.001 MHz	0130 UTC
EL2JM	14.054 MHz	0400 UTC
EL2LM	14.053 MHz	0100 UTC
EL2LMP	14.008 MHz	0215 UTC
EL7X	14.015 MHz	2245 UTC
EL1J	21.335 MHz	1815 UTC
EL2BA	21.286 MHz	0115 UTC
EL2BY	21.330 MHz	1745 UTC

EL2PEL	21.024 MHz	0100 UTC
EL8BS	21.250 MHz	1730 UTC
EL2CI	28.524 MHz	1600 UTC
EL2EY	28.389 MHz	1100 UTC
EL7X	28.010 MHz	2100 UTC

Some of the times given are those for reports made by European stations and may not be workable from North America at those times.

## Mayotte (FH)

Mayotte ranks 72nd on the "Top 100 Most Wanted List" and should drop further down due to much activity of just a few stations. One very active station reported is FH4EE, who has been worked numerous times on 21.335 MHz after 1700 UTC. He also has been reported on 3.512 MHz around 0300 UTC and on 28.576 MHz at 1845 UTC working into Texas on Feb. 16th.

On Feb. 12th FH8CB was worked by many DXers on 14.253 MHz around 0415 UTC. For a 10M contact with this one, look around the 28.580 to 28.595 MHz segment after 1700 UTC. We also had a report of a FH3RB on 28.552 MHz at 2045 UTC on Feb. 12th. However, we have never heard of a FH3 prefix from Mayotte.

*Inside DX* reports that FH5EF will be on until the end of the year and promises much activity on both CW and SSB, 80 through 10M with an emphasis on 80 and 40M. We only received one report for this one so far, that being 14.185 MHz at 0400 UTC on Feb. 11th.

## Isle of Man (GD)

This one, of course, is garden variety DX, depending on your point of view. Most often this one goes unreported. There were at least five calls listed in the reports this last period:

GD3ESV	24.896 MHz	1600 UTC
GD3FXN	10.120 MHz	0900 UTC
GD4WBV	28.568 MHz	1330 UTC
GD5UG	28.538 MHz	1800 UTC
GD0IOM	28.575 MHz	1830 UTC

## Mongolia (JT)

Partly due to its remote location Mongolia continues to remain in *The DX Bulletin* Most Wanted List, although it ranks 82nd. One of the more active stations is JT1BG. *Inside DX* notes that Bator oftens works from a list on 14.198 MHz around 0145 UTC taken by Alex, UA9YAB. Check also near 14.212 MHz from 0230 UTC, or up on 10M near 28.490 MHz when the band is open.

Several other stations have also been reported, including the following:

JT1AS	28.020 MHz	0200 UTC
JT1BJ	14.160 MHz	0045 UTC
JT1BQ	14.193 MHz	1530 UTC
JT1BR	14.015 MHz	1145 UTC

**NextDay** **QSLs**  
Two-Color  
Rainbow Assortment

Call Today & We Ship NextDay 2nd Day ASAP

100	\$29.95	\$24.95	\$19.95
200	\$39.95	\$34.95	\$29.95
400	\$49.95	\$44.95	\$39.95
500	\$54.95	\$49.95	\$44.95
1000	\$99.95	\$89.95	\$79.95

Info 51  
**AntennasWest**  
(801) 373-8425

All orders paid 2nd day air / priority mail. For overnight air delivery add \$10.  
Box 50062-W, Provo UT 84605



JT1BS	21.246 MHz	0230 UTC
JT1BU	14.179 MHz	0400 UTC
JT1BV	21.249 MHz	0115 UTC
JT1KAA	21.048 MHz	0245 UTC
JT1KAI	21.025 MHz	0100 UTC
JT1QW	21.010 MHz	1315 UTC
JT2AB	14.012 MHz	1230 UTC
JT8KFM	14.014 MHz	0145 UTC

### Paupa New Guinea (P29)

This country formerly was two territories of Australia, Territory of New Guinea and Papua Territory (VK9 prefix). There always is a fair share of the DX on the bands from this one. The problem is usually when we are all asleep, unless you are working 10M.

If you are looking for a YL contact with this one, look for P29RE, who was worked from eastern Canada on

15M SSB. This was a reasonable time — 2300 UTC. She was also worked on 28.453 MHz from New Jersey about the same time.

Several others have also been recorded, such as:

P29HS	7.009 MHz	1130 UTC
P29KH	14.222 MHz	0800 UTC
P29KN	28.527 MHz	0230 UTC
P29NBC	28.492 MHz	1100 UTC
P29PF	28.525 MHz	0315 UTC
P29PL	28.013 MHz	2045 UTC
P29RA	14.012 MHz	1030 UTC
P29SB	28.600 MHz	2315 UTC
P29ZL	18.140 MHz	2200 UTC

### Sao Tome (S92)

Luis, S92LB, often makes an appearance in the DX nets (we worked

him on the ET Net a couple of years ago on 14.160 MHz). He has been reported on 15M near 21.283 MHz from 2000 UTC.

*Amateur Radio Action* reports that Luis has been very active in Jim Smith's (VK9NL) 14.222 MHz net.

### Belize (V31)

This one is a sure thing in the DX contests. During the last ARRL DX Contest, KE5CV was busy signing V31C and racking up a big score. If you don't care for contests, then check 15M for V31PC on 21.165 MHz at 1600 UTC where Don was working into western Canada or V31BB on 21.006 MHz around 2345 UTC. V31BB was also worked on 7.007 MHz at 0715 UTC in Europe.

### Revillagigedo (XF4)

The Mexican DXpedition to Revillagigedo has been scheduled for this month beginning on April 11th and running until the 19th. The call sign is reported to be XF4L, although on Mexican soil the team will include operators of several other nations. The list of calls presently includes: OH2BH, OH2BU, XE1OH, XE1L, XE1XA, W6RGG, N7NG and JH4RHF.

The *DX Bulletin* reports that although this one ranks 89th in the most needed survey, it does rank as high as 21st in Europe.

With the DXpedition ending the 19th, most likely the next stop will be that great gathering of DXers at Visalia.

### Banks and Torres Islands (YJ8)

The dates have been confirmed for this one according to the latest information received from Mike, N4EVS. The Vanuatu ARS DXpedition, led by Norman Shackley, YJ8JS (formerly YJ8NJS), will operate from Banks Island beginning on or about May 8 for about five days of operation. The call YJ1BKS has been assigned for this operation. The location chosen for the site is Mota Lava.

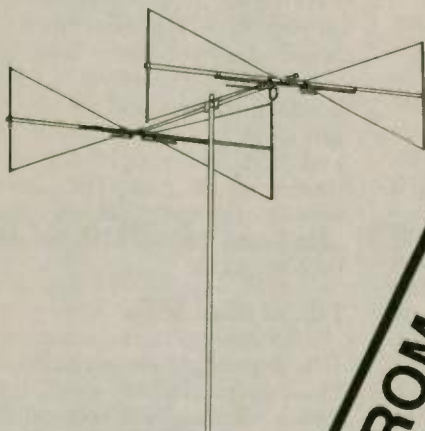
Then the team will proceed to Loh Island, in the Torres Group, where they will sign YJ1TRS beginning on or about May 15 for about four days.

### Nicaragua (YN)

According to Jim Smith, VK9NS, in his DX column in *Amateur Radio Action*, Jose, YN3CC, and Carlos, YN3CB, have been very active with signals

## The HF5B "Butterfly"™

A Compact Two Element Beam  
for 20-15-12-10 Meters.  
Operates as a dipole  
on 17 meters.



- Unique design reduces size but **not** performance.
- No lossy traps; full element radiates on all bands.
- Only 19 lbs.

BUTTERNUT

FROM

ANTENNAS

### Butternut Verticals

Butternut's HF verticals use highest-Q tuning circuits (not lossy traps!) to outperform all multiband designs of comparable size!

#### Model HF6V

- 80, 40, 30, 20 15 and 10 meters automatic bandswitching.
- Add-on kit for 17 and 12 meters available now.
- 26 ft. tall

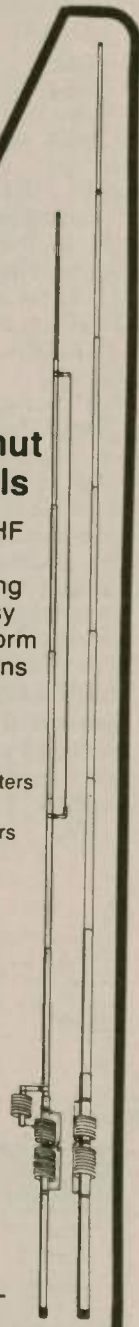
#### Model HF2V

- Designed for the low-band DXer
- Automatic bandswitching on 80 and 40 meters
- Add-on units for 160 and 30 or 20 meters
- 32 feet tall - may be top loaded for additional bandwidth.

For more information see your dealer or write for a free brochure

**BUTTERNUT ELECTRONICS CO.**

405 East Market Lockhart, Texas 78644



**Field Day Antenna Installation System**

One Person  
Installs  
in minutes

Info \$1.00

Reusable  
Ready for Action  
Fast & Easy to Use  
Eliminates Climbing

**ANTENNA LAUNCHING MADE EASY**

\$29.95  
add \$6 Alt Smp

1-801-373-8425

**AntennasWest**

Box 50062 W. Provo, UT 84605



into Australia. Jim says that Carlos has a better signal and answers QSL requests promptly. However, stateside reports indicate that Jose is the active one here. The reports show that YN3CC was worked all on CW near 14.003 MHz around 0530 UTC, 21.017 MHz at 2215 UTC and 28.004 MHz at 1400 UTC. YN3CB was reported only once at 2030 UTC on 21.345 MHz into eastern Canada.

*Inside DX* reports that reciprocal station SM0OIG/YN has been very active working both CW and SSB, 20 through 10M. Look for this one between 1900 and 2300 UTC near 28.010 MHz. You might also try 21.009 MHz.

### Paraguay (ZP)

Most DXers already have this one. But, for those of you who may still need it you might take a listen for the following:

ZP5JCY	21.279 MHz	0430 UTC
ZP5LRA	14.220 MHz	0115 UTC
ZP6EM	7.072 MHz	2230 UTC
ZP9CL	7.067 MHz	0030 UTC
ZP0PX	14.220 MHz	0130 UTC

All of the above are SSB contacts. If you were in the ARRL DX Contest you might have come across ZP5ZCY, who was quite active in the bash.

### Lesotho (7P8)

Lesotho isn't listed as one of the most wanted. However, many DXers still need this one. Only a handful have been reported in February and all on 15M.

7P8CI	21.350 MHz	1800 UTC
7P8DP	21.247 MHz	1745 UTC
7P8DR	21.090 MHz	1900 UTC
7P8DX	21.235 MHz	2030 UTC
7P8EG	21.240 MHz	2030 UTC

Next question is does anyone over there operate CW? That report for 7P8DR is for a RTTY contact.

### DDFM

We recently applied for the DDFM Award (Diplome des Departements Francais de la Metropole) that is sponsored by REF. The object of this award is to work French Departments — a maximum of 95. These departments are subdivisions of the 22 provinces.

There have been some changes in this program, although the award still requires a single mode of operation (no mixed modes). At one time the restriction also included single bands, but that is no longer the case. Now, any combination of high-frequency bands may be used. However, now 40 different departments are necessary for the basic requirement, where the old requirement was just 20 departments on

a single band.

If interested in working at this award, you must collect a minimum of 40 different French departments on any combination of high-frequency bands and they must be either all SSB or all CW. Endorsements will be issued in increments of 10 departments confirmed. You must have QSL cards to confirm the contacts, although they need not be sent. Prepare a list and have it certified by two other licensed Amateur Radio operators. The fee for this award is 10 IRCs. Include this with your application to: DDFM Award Manager, Coupas Christian, FE6EDW, B.P. 83, F-63307 Thiers, Cedex, FRANCE.

If you wish to obtain a set of the rules and list of departments, send me a SASE and I'll send you a copy.

### CQ and ITU zones guide

A list of the DXCC countries in each ITU and CQ zone has been prepared by Geoff Watts, the former editor of *DX News Sheet*. The countries are listed in alphabetical order of prefix.

Geoff also has three other lists available: Prefix-Country-Zone List, DXCC Countries Guide and USSR Oblast Guide + Maps.

Each list is \$3 (6 IRCs) for double (please turn to page 34)

# The 1989 Worldradio DXathon

**ELIGIBILITY** — All licensed Amateur Radio operators, worldwide.

**DATES** — Start: 0000 1 January, 1989. End: 2359 31 December, 1989.

**Exceptions:** No contacts made during the time frame of any DX Contest will be valid. This is to be a prestigious award program, made so by its difficulty.

**BANDS** — 80, 40, 20, 15, 10 meter bands, plus satellite/moonbounce frequencies.

**MODES** — Phone, CW, Digital (includes RTTY, AMTOR, packet), Visual (SSTV), and Satellite (includes moonbounce).

Five Bands/Five Modes equals DXathon.

**CATEGORIES** — There is only one category — Single Operator.

**OBJECTIVE** — Contact as many NATIONS on as many modes as possible. A NATION is defined as an entity with enough sovereignty to issue its own postage stamps.

**VALID CONTACTS** — A NATION may be worked but once, on each mode, regardless of the frequency band. This is not a five-band per mode contest.

**SCORING** — Final score will be the total number of NATIONS contacted on the various modes. Contact with your own NATION does not count. The highest possible score would be about 900.

**SUBMISSIONS** — Entries must be received by 1 February, 1990. No QSL cards need be submitted or received by the entrants. Send signed log extracts to:

### WORLD RADIO

2120 - 28th Street

Sacramento, CA 95818 USA

Award winning logs will be published in *Worldradio*. Decisions of the DXathon committee will be final. The committee has the right to disqualify entries for violation of the letter or the spirit of the rules. By submitting an entry, the participant agrees to abide by the decision of the DXathon Committee.

### AWARDS

**World Champion** — The World Champion will receive a trophy significant enough to honor the effort.

Gold, Silver and Bronze Medals will be awarded for the highest scores on each continent.

Certificates will be awarded for:  
A.—The highest score in each NATION.

B.—The highest score in each USA call area.

C.—The top single-band score in A. and B. above.

D.—Technician/Novice scores as warranted.

E.—High scoring 4 mode, 3 mode, 2 mode participants.

Nations with the highest participation (weighted vs. Radio Amateur population) will be honored.

In case of ties, duplicate awards will be made.

A certificate of participation will be awarded each "radio athlete."

It would be appreciated if monthly scores were sent in for publication.

**RULE CHANGES** — Rules may be modified over the years to reflect feedback from the participants. Please send copies of this page to your DX friends.

1989  DXathon



**WORLDWIDE DISTRIBUTION**

**Ham Radio Outlet has joined the Nationwide Team**



# HAM RADIO OUTLET

**LARGEST HAM OUTLET IN THE WORLD**

**NOW**

**9**

## STORE BUYING POWER

### ICOM IC-761



**HF SUPERIOR GRADE TRANSCEIVER**

**SALE! CALL FOR PRICE**

### ICOM IC-781



**THE ULTIMATE 150 W, ALL BAND HF TRANSCEIVER**

**GREAT PRICE!**

### ICOM IC-900 MULTI-BAND MOBILE



**YOU CAN OPERATE SIX BANDS WITH ONE CONTROLLER!**  
2 MTR 25/45W, 440 MHz 10 MTR, 6 MTR, 220 MHz & 1.2 GHz 10 MEMORIES

**ARE YOU READY FOR 1.2 GHz OPERATION?**



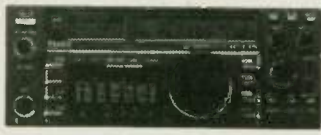
A Models 25W, H Models 100 W

**IC-275A/275H, 138-174 MHz**  
**IC-375A SALE \$799.95**  
**IC-475A/475H, 430-450 MHz**



**LOW PRICE!**

### ICOM IC-735



**100 W, 100 KHz-30 MHz Dual VFO Receiver**

**CALL FOR LOW, LOW PRICE**

**BULLETIN**

**Ham Radio Outlet has joined the**

## HAM RADIO OUTLET NATIONWIDE TEAM



**NOW LOCATED IN SALEM, NH WOODBRIDGE, VA**

**THIS GIVES YOU EVEN BETTER RESPONSE WITH LOW-LOW OUTLET PRICES & RAPID DELIVERIES COAST TO COAST.**



**HAND-HELD VHF/UHF**



**IC-03AT REG. 449.95 SALE 269.95**

**IC-02AT IC-2AT 2MTR**  
**IC-03AT IC-3AT 220 MHz**  
**IC-04AT IC-4AT 440 MHz**

### ICOM IC-3210

**2M/440 MHz 25/5 WATT EXTENDED RX RANGE**



**DUAL BAND FM TRANSCEIVER GREAT PRICE**

## All Major Brands in Stock Now!

**FREE SHIPMENT**  
Most items over \$100 UPS surface



**Bob Ferrero W6RJ**  
President/Owner  
**Jim Rafferty N6RJ**  
VP-National Sales Manager

**ANAHEIM, CA 92801**  
2520 W. La Palma  
(714) 761-3033, (213) 860-2040  
Between Disneyland & Knotts Berry Farm

**ATLANTA, GA 30340**  
6071 Buford Hwy.  
(404) 263-0700  
Larry, Mgr. WD4AGW  
Doraville, 1 mi. north of I-285

**BURLINGAME, CA 94010**  
999 Howard Ave.  
(415) 342-5757  
George, Mgr. WB6DSV  
5 miles south on 101 from SFO

**OAKLAND, CA 94606**  
2210 Livingston St.  
(415) 534-5757  
Rich, Mgr. WA9WYB  
IS-880 at 23rd Ave. Ramp

**PHOENIX, AZ 85015**  
1702 W. Camelback Rd.  
(602) 242-3515  
Bob K7RDH, Gary WB7SLY, Mgr.  
East of Hwy. 17

**SALEM, NH 03079**  
224 N. Broadway  
1-800-444-0047  
Curtis, Mgr. WB4KZL  
28 miles north of Boston exit 1 I-93

**SAN DIEGO, CA 92123**  
5375 Kearny Villa Rd.  
(619) 560-4900  
Tom, Mgr. KM6K  
Hwy. 163 & Claremont Mesa Blvd.

**WOODBRIDGE, VA 22191**  
14803 Build America Drive  
1-800-444-4799  
John, Mgr. WB4GJZ  
Exit 54, I-95 South to US RT 1

**STORE HOURS 10 AM-5:30 PM**  
**CLOSED SUNDAYS**  
**VAN NUYS, CA 91411**  
6265 Sepulveda Blvd.  
(818) 988-2212  
Al, Mgr. KG1RA  
San Diego Fwy. at Victory Bld.

**CALL TOLL FREE**  
IN CALIFORNIA CALL STORE NEAREST YOU

Call any time zone 800 number during business hours from coast to coast.

<b>MID WEST/WEST</b> ANAHEIM, 9 to 5:30 PST <b>1-800-854-6046</b>	<b>SOUTHEAST</b> ATLANTA, 9 to 5:30 EST <b>1-800-444-7927</b>	<b>MID-ATLANTIC</b> WOODBRIDGE, 9 to 5:30 EST <b>1-800-444-4799</b>	<b>NEW ENGLAND</b> SALEM, 9 to 5:30 EST <b>1-800-444-0047</b>
---	---	---	---



Toll free including Hawaii. Phone Hrs: 7:00 am to 5:30 p.m. Pacific Time. California, Arizona and Georgia customers call or visit nearest store. California, Arizona, Georgia and Virginia residents please add sales tax. Prices, specifications, descriptions subject to change without notice.



WORLDWIDE DISTRIBUTION

BULLETIN

EA • CUSHCRAFT • COMHY • GAIN • BIRD • US TOWER • BUTTE • TEC • BIRD •



# HAM RADIO OUTLET

LARGEST HAM OUTLET IN THE WORLD

NOW

9

## STORE BUYING POWER

### EFFECTIVE MARCH 1, 1989

# ege HAS JOINED THE

# HAM RADIO OUTLET

## NATIONWIDE TEAM

For a copy of our New 36 page Buyer's Guide, send \$1.00 for shipping & handling to any one of our 9 Nationwide locations



### COAST TO COAST

HAM RADIO OUTLETS NOW LOCATED IN SALEM, NH WOODBRIDGE, VA

This gives you even better response with low-low outlet prices & rapid deliveries coast to coast.

SEE OUR TOLL FREE NUMBERS BELOW

## All Major Brands in Stock Now!

FREE SHIPMENT Most items over \$100 UPS surface



**Bob Ferrero W6RJ**  
President/Owner  
**Jim Rafferty N6RJ**  
VP-National Sales Manager

**ANAHEIM, CA 92801**  
2620 W. Palma  
(714) 761-3033, (213) 860-2040  
Between Disneyland & Knotts Berry Farm

**ATLANTA, GA 30340**  
6071 Buford Hwy.  
(404) 263-0700  
Larry, Mgr. WD4AGW  
Doraville, 1 mi. north of I-285

**BURLINGAME, CA 94010**  
999 Howard Ave  
(415) 342-5757  
George, Mgr. WB6DSV  
5 miles south on 101 from SFO

**OAKLAND, CA 94606**  
2210 Livingston St.  
(415) 534-5757  
Rich, Mgr. WA9WYB  
IS-880 at 23rd Ave Ramp

**PHOENIX, AZ 85015**  
1702 W. Camelback Rd.  
(602) 242-3515  
Bob K7RDH, Gary WB7SLY, Mgr.  
East of Hwy 17

**SALEM, NH 03079**  
224 N. Broadway  
1-800-444-0047  
Curtis, Mgr. WB4KZL  
28 miles north of Boston exit 1 I-93

**SAN DIEGO, CA 92123**  
5375 Kearny Villa Rd  
(619) 560-4900  
Tom, Mgr. KM6K  
Hwy 163 & Claremont Mesa Blvd

**WOODBRIDGE, VA 22191**  
14803 Build America Drive  
1-800-444-4799  
John, Mgr. WB4GJZ  
Exit 54, I-95 South to US RT 1

STORE HOURS 10 AM-5:30 PM

CLOSED SUNDAYS

**VAN NUYS, CA 91411**  
6265 Sepulveda Blvd.  
(818) 988-2212  
Al, Mgr. K6YRA  
San Diego Fwy at Victory Blvd

Call any time zone 800 number during business hours from coast to coast

### CALL TOLL FREE

IN CALIFORNIA CALL STORE NEAREST YOU

MID WEST/WEST  
ANAHEIM, 9 to 5:30 PST

1-800-854-6046

SOUTHEAST

ATLANTA, 9 to 5:30 EST

1-800-444-7927

MID-ATLANTIC

WOODBRIDGE, 9 to 5:30 EST

1-800-444-4799

NEW ENGLAND

SALEM, 9 to 5:30 EST

1-800-444-0047

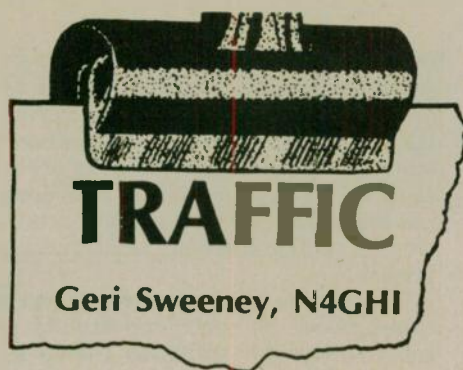


Toll free including Hawaii. Phone Hrs: 7:00 am to 5:30 p.m. Pacific Time. California, Arizona and Georgia customers call or visit nearest store. California, Arizona, Georgia and Virginia residents please add sales tax. Prices, specifications, descriptions subject to change without notice.









ciation course. Everyone can do it.

One last point. If portions of bands are given to Amateurs who are not required to learn code, they will (as expansion at any means is expounded) quickly fill up and need more room. I'm reminded of the "Little Shop of Horrors" — Feed Me. This expansion can only come at the expense of the CW portion of the band. Those using CW, who are the fewest in number, will suffer this loss, as they will have the weakest voice.

### Procedures

Do you question why you do things the way you do when on a net or passing traffic? Procedures are the essence of any traffic system. If everyone did it "his/her" way, chaos would develop. Due to human nature, everyone deviates slightly.

Do you ever question how far you may have wandered from the correct procedure? Do you know where to find the correct procedure? NTS procedures are well published and used by many nets which are not part of the National Traffic System. I should like to review procedures in each column.

Net control frequency should be used for net management and not passing traffic. Managing the net requires checking people in and out of the net as well as sending them off frequency to pass their traffic. Nothing so bogs down a net as passing traffic on frequency.

It is suspected that this started because NCS needed a moment to think. How frustrating to return to the net and wait several minutes while two stations keep everyone else waiting. You can divide your net time by how many pieces of traffic you passed to see how fast your net moves.

While speed should never take priori-

ty over quality, it is a consideration. Passing traffic on frequency cuts down on moments NCS should be exchanging meaningful comments with net members. The only time traffic should be passed on frequency is when propagation is bad and everyone's ears are needed for a relay, the band is very busy (it's Field Day) or NCS is receiving or transmitting traffic (hopefully toward the end of the net when most have secured and don't have to listen).

**Fills.** The very reasons that make fills necessary seem to make people want to expand on why they are needed. The question for a fill should not include a statement as to why the fill is needed. You should not point out where in the message the fill is to be found, such as "In the text" or "in the phone." You are not expected to show that you are polite by prefixing your request with pse (please).

If you are not working with QSK and will need fills, underline anything which you intend to question. Questions on fills should start at the top and work toward the bottom. Only WA, WB and BN are needed. . . honest! The shorter the question, the easier to answer.

If you don't question how and why you do things, whether it's sending or

### No code license?

Do Amateur Radio operators still need code in these days of high tech systems? I think the answer is yes. Times occur when all other communications fail. Our day to day activities keep us ready for these occasions, but do Amateurs need to have studied code?

As an Amateur Radio operator, you are extended special privileges (use of radio bands) in return for assistance to society in the form of advancement of the art and community service.

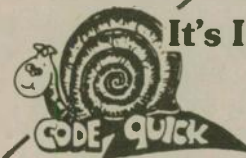
You are also expected to know something more than the average Joe Citizen — a body of knowledge. You are not expected to be more educated, smarter or wiser. You are expected to know something of radios and their modes of operation.

From time to time it's suggested that we could do away with knowledge of one mode — CW (currently, packet bulletin boards in my area are full of "no code" comments).

We are not expected to use all the knowledge that we may learn when studying for a test. While our theory tests have expanded to include information on digital systems, it is still felt that we need to know about tubes. Why do some feel that because new modes may be used instead of code by some, they need not bother to learn of it.

If we allow the argument that some will never use CW and thus should not be made to learn it; we must also allow that because some of us will only operate radios and never build or fix one, we need not struggle with silly formulas and notions about E equaling IR. It does tax some minds connected to nimble fingers.

For the present many radio operators use CW and it's not only a part of Amateur Radio, it's a high art form when done correctly. We must fight the urge of those who wish Amateur Radio to grow by diluting what makes it what it is. We have long been challenged to learn about things in which we may not wish to participate, but which are part of the hobby. Learning CW at its most primitive level of 5 wpm could be likened to taking an art or music appre-



It's Incredible!

Now You Can . . .

Master code or upgrade in a matter of days. **Code Quick** is a unique breakthrough which simplifies learning Morse Code. Instead of a confusing maze of dits and dahs, each letter will magically begin to call out its own name! Stop torturing yourself! Thousands have proved **Code Quick** to be the fastest way to master code. Your amazing kit containing 5 powerpacked cassettes, visual breakthrough cards and original manual is only **\$39.95!** Send check or money order today to:

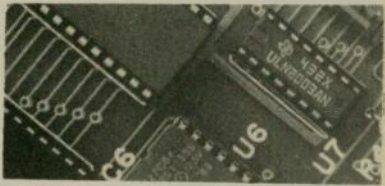
**WHEELER APPLIED  
RESEARCH LAB #104  
P.O. Box 3261  
Industry, CA 91744**

(CA add 6%.)

Your success guaranteed  
or money back!

Just released **Code Quick** for IBM  
PCs and Compatibles, **\$49.95.**


**SRC-10  
REPEATER/LINK  
CONTROLLER**



DTMF muting  
Intelligent ID'er  
Auxiliary outputs  
Easy to interface  
Alarm monitor input  
Telemetry response tones  
Low power CMOS, 22ma @ 12v  
Detailed application manual  
Programmable COS polarities  
Repeater & link courtesy tones  
Synthesized link/remote base capability

**\$149.00** Assembled & Tested

**CREATIVE CONTROL PRODUCTS**  
3185 Bunting Avenue  
Grand Junction, CO 81504  
(303) 434-9405





receiving a message or running a net, you have stopped challenging yourself to strive for the best.

### Data's place in traffic

Since packet and other digital modes are on the increase, some time should be devoted to them in each column. While they seem, in theory, to be of great use in passing traffic, in practice they are still unreliable.

An example. Last week I received a message for Mexico 10 days after the preamble date. I initiated inquiries and finally got this response: "Message number 115 to Mexico taken from (call) PBBS March 5. It had a Massachu; setts zip code on it and was sent back to

(call) at (call) PBBS. It bounced up and down the east coast x 73." Evidently, someone finally looked at it, and took it off the PBBS. It then continued to Mexico via traffic nets.

PBBS and existing traffic systems must recognize that in the long run, it's the traffic that will be the mainstay of the future. Packet must be viewed as a mode and not the system. As such data managers may need to be appointed by each STM to coordinate this effort.

### Traffic personalities

Many of you must have passed on or delivered a message from the Handi-Hams in Minnesota (WB0WNJ). They

regularly send out birthday greetings. Another station one can expect to deliver traffic from is W1PEX in New Hampshire. He likes to send messages to everyone on the SOWP roster several times a year. It's harder delivering his messages because people wonder why a stranger would send them a greeting.


Most of the time when we deliver a message, we have the opportunity to talk to a stranger and make friends for Amateur Radio. My favorite personality is K9GDF. He sends birthday greetings to everyone he has ever worked. Since most of his messages are directed to hams, it gives one an excuse to invite them to join the local nets and just make a new friend.

It's fun to sing the birthday messages and I look forward to getting them. One year, as a practical joke, traffic handlers in Virginia were asked to send K9GDF a birthday message. He really enjoyed this exchange. So...now that there is a wider audience...why don't we all send him ARL Forty Six on June 8. But beware, you can then expect to get a birthday message yourself for the rest of your life. Smile.

### What's happening?

Field Day is approaching — last full weekend in June. Whether you go by for a few minutes or set up a tent for the entire 24 hours, you will enjoy participating.


Each FD station gets 100 points for originating a message to their SM. You can originate this message on 2M and send it via packet or use HF and a net. FD involves all modes, most bands and could give you a chance to meet interesting people and see and hear about what's happening in the world of Amateur Radio. I hope no one passes this once a year opportunity to watch an emergency station/s set up and join in on the fun. □



# THIS IS IT!

## ...an affordable high quality masthead preamplifier

### HEAR SIGNALS THAT YOU'VE NEVER HEARD BEFORE



- ★ Negligible losses on transmit, the SWR is  $\leq 1.1:1$ , with a 50 Ohm load at input.
- ★ Professional HF-VOX and PTT for short switching time between receive and transmit.
- ★ Because of the matched 50 Ohm output, a modern receiver with a GaAsFET-input-transistor will not oscillate.
- ★ VOX operation is possible up to 150 Watts PEP.

## Now available... three models!

<b>145 MHz</b> 144-148 MHz F < 0.7 db typ. 0.6 db 18-20 db 150 Watt 750 Watt Type N	<b>432 MHz</b> 430-450 MHz F < 1.1 db typ. 0.9 db 17-19 db 150 Watt 350 Watt Type N
--	--

**SPECIFICATIONS**

Frequency Range

Noise Figure

N GAS xxx MA

Gain

Maximum Switchable Power (PEP) VOX Operation

Maximum Transfer Power (PEP) PTT Operation

Connector

*the Landwehr masthead preamplifier, available only from Henry Radio*

...in fact, we have it all! We are OSCAR specialists. Give us a call — ask for Jack (WA6VGS).

answer your questions and help you with your needs.

# Henry Radio

2050 S. Bundy Dr. Los Angeles, CA 90025

TOLL FREE ORDER NUMBER: (800) 421-6631

(213) 820-1234

For all states except California.

Calif. residents please call collect on our regular numbers.



## GO MOBILE WITH YOUR H.T.!



★ A unique battery eliminator ★ HANDI-TEK Regulator allows constant hand-held operation from auto DC or base supply with no nicad drain and WITHOUT RADIO MODIFICATION! FULLY GUARANTEED. \$24.95 PPD in USA. Calif. add \$1.50 Sales Tax.

★ ATTENTION TH21/31/31 Series Owners!!!

★ KENWOOD - Order Model L for TH-21/31/41AT. Model KI for TR-2500,3500,2600 series. Slides on bottom of radio. Model K for TR-2400. Thru battery plug.

★ YAESU - Order Model Y for FT-207R, Wilson. Fits in battery compartment. Model N for FT-203R, 208R, 209R, 727. Powered thru plug on radio bottom.

★ ICOM - Order Model I for all Icom (2AT/02AT). Slides on bottom of radio.

★ TEMPO, SANTEC - Order Model T (Simple mod). Write for spec sheet/info on other radios.

**HANDI-TEK**

P.O. BOX 357 • PINON HILLS, CA 92372



## Visit Your Local RADIO CLUB

For information on how to get your club listed in "Visit Your Radio Club," plus receive many other benefits, write to Club Liaison, Worldradio, 2120-28th Street, Sacramento, CA 95818.

### ALABAMA

**Montgomery Amateur Radio Club (W4AP).** Alabama State Trooper Dist. Office. Intersection of Coliseum Blvd. & Federal Dr. Randy Smith, N4LZK, (205) 832-4598. Meets 3rd Monday/monthly, 7:00 p.m.

### ALASKA

**Arctic Amateur Radio Club.** Geophysical Institute West Ridge U of A, P.O. Box 81389, College, AK 99708. 1st Friday/monthly, 7:30 p.m.

### ARIZONA

**Arizona Amateur Radio Club.** Meets: 2nd Thursday/monthly, 7:30 p.m., 1510 E. Flower St., Phoenix, AZ. Club info on W7WGWIR 147.88/147.28 Rptr.

**Old Pueblo Radio Club.** Meets: 2nd Wednesday/monthly, 7:30 p.m. Location: Franklin Bldg., University of Arizona. N.E. corner of 5th St. & Park.

**Tucson Repeater Assoc.** P.O. Box 40371, Tucson, AZ 85717-0371. 2nd Sat./monthly, 7:30 p.m., Pima Co. Communications Bldg., 2545 E. Ajo. Net Thurs. 7:30 p.m. 146.28/88 (146.22/82, 147.68/08, 147.70/10-PKT).

**Western Arizona Radio Club.** 2nd & 4th Thurs./monthly, 7:30 p.m., at the fire station, Hancock Rd., Bullhead City, AZ. Local net on 147.12 Tues. eve., 7 p.m. (local rptr.).

### CALIFORNIA

**Amador County Amateur Radio Club.** P.O. Box 1094, Pine Grove, CA 95665. Senior Citizens Center, Jackson, CA. Meets: first Thursday/monthly, 7:30 p.m. WA6WYI Rptr., 146.835, 146.235. Net Tues. 7:30 p.m.

**Associated Radio Amateurs of Long Beach, W6RO.** P.O. Box 7493, Long Beach, CA 90807. Meets: 1st Friday/monthly, 7:30 p.m. Signal Hill Recreation Hall, 1708 E. Hill St., Signal Hill, CA.

**Butte Amateur Radio Club.** Meets: 3rd Thursday/monthly, 8 p.m., Chico Community Hosp. Conf. Center on Rio Lindo off Cohasset Rd. Net: 28.330 Wednesdays, 8:30 p.m. For info: 893-5208, KE6EP or KB6COH.

**Caltrans RACES Club.** Meets: 1st Mon./monthly, 8:30 a.m., State Transportation Bldg., 1120 N. Street, Rm. 4123, Sacramento, CA. Info, Jim West, (916) 445-1757.

**Citrus Belt Amateur Radio Club.** 777 East Rialto Ave., San Bernardino, CA. P.O. Box 3788, Zip - 92413-3788. Meets: 1st Friday/monthly, 7:00 p.m.

**Clairemont Repeater Assn.** P.O. Box 7675, Huntington Beach, CA 92615. Meets for breakfast 3rd Sat., 8 a.m. odd months. W5YI Broadcast Sundays 2000. Net last Tuesday 2000. WB6HUL/R 145.220- 1A PL.

**Contra Costa Communications Club WD6EZR.** P.O. Box 661, San Pablo, CA 94806. Meets 2nd Sunday at 9:00 a.m. Hickory Post Restaurant/Lucky Lanes. For info call Don K6DPQ, (415) 222-2449.

**East Bay Amateur Radio Club.** P.O. Box 1393, El Cerrito, CA 94530. Meets: 2nd Fri./monthly 8 p.m., Salvation Army, 4600 Appian Way, El Sobrante. Nets: Slow CW, Wed., 8 p.m. & SSB Net, Wed., 9 p.m., 21.395. Info, Bob Fields, KC6AOH, 415/237-3761.

**Fullerton Radio Club, Inc. W6ULL.** P.O. Box 545, Fullerton, CA 92632. Meets: 3rd Wed./monthly, 7:30 p.m., Sr. Citizens Center, 340 W. Common Wealth, Fullerton. Net: ea. Tues., 8 p.m. 147.495 simplex. Info, Gracie Hastings, N6FSL (714) 990-9203.

**Gabilan Amateur Radio Club GARC.** P.O. Box 2178, Gilroy, CA 95020-2178. Meets: South Valley Jr High School, 385 I.O.O.F. Ave., Gilroy. 2nd Thurs./monthly. 7:30 p.m. Talk-in 145.47/144.87.

**Golden Empire Amateur Radio Society (VEC).** P.O. Box 508, Chico, CA 95927. Club call W6RHC, Repeater 146.25/85. Meets: 3rd Friday/monthly, 8 p.m. at 1528 Esplanade, Room 110B, Chico.

**Hilltop Amateur Mastertie System (HAMS).** Informal mtgs. weekly/Mon. 5 p.m. at Shakey's Pizza, 12924 Washington Blvd., Mar Vista, CA. Meets 3rd Mon./monthly at Bicycle Shop Cafe, 12217 W. Wilshire Blvd., W. LA. Info, N6FD 213/823-0767.

**Kern River Valley Amateur Radio Club.** P.O. Box 2611, Lake Isabella, CA 93240. Meets 4th Sat./monthly at 4 p.m. (Port Luck). Veteran's Hall, Lake Isabella WA6UYW Rptrs. 146.085/146.685 224.22/Down 1.6 WB6ODZ Rptr.-224.58 Down 1.6 Low-Level.

**Lee DeForest Radio Club of Hemet.** 1930 Local each Third Thursday at 625 Pico, San Jacinto, CA.

**Livermore Amateur Radio Klub (LARK).** First Presbyterian Church, 5th & L St. Bill Richards, WD6J, (415) 829-5229. Net Mondays 1900 on 147.12 +. Meets 3rd Saturdays/monthly, 9:30 a.m.

**Marin Amateur Radio Club (MARC) W6SG.** Box 1231, San Rafael, CA 94901. Meets 1st Fri./8 p.m.; MARC Clubhouse Bldg. 549, HAFB, Novato, CA (415) 883-9789 (Summer exceptions; contact Pete N6IYU, 924-1578). Sunday AM Club at Red Cross, San Rafael.

**Moreno Valley Amateur Radio Assoc.** P.O. Box 1304, Moreno Valley, CA 92337. Meets: 4th Monday/monthly, 7 p.m., Moreno Valley Unified Sch. Dist. offices, 13911 Perris Blvd., Moreno Valley. Net Tuesdays, 8 p.m. 146.655/055

**Mount Diablo Amateur Radio Club.** P.O. Box 23222, Pleasant Hill, CA 94523. Meets: 3rd Fri./monthly, 8 p.m., Grace Presbyterian Church, 2100 Tice Valley Blvd., Walnut Creek, CA. Net Thurs., 7:30 p.m. 147.06 +. Info, Vicki, (415) 458-4527.

**North Hills Radio Club.** P.O. Box 41635, Sacramento, CA 95841. 3rd Tuesday/monthly, 7:30 p.m., Carmichael Elks Lodge, 5631 Cypress Ave., Carmichael, CA. Net 145.19 Thur. at 8:00 p.m.

**North Shores ARC.** (619-275-1495) So. Clairemont Recreation Center, 3605 Clairemont Dr., San Diego, CA. 1st Tuesday/monthly, 7:30 p.m. Club net each Monday, 7:00 p.m. 28.485 MHz.

**River City A.R.C.S.** Meets: 1st Tuesday/monthly, 7 p.m. SMUD Bldg., Room B & C, Elkhorn & Don Julio, Sacramento, CA. For info: (916) 483-3293.

**Riverside County Amateur Radio Assoc.** c/o County Emergency Services Div., 4080 Lemon St., Ste. 8, Riverside, CA 92501. Meets: 2nd Thur./monthly, 7:30 p.m., bsmnt., County Adm. Bldg., 4080 Lemon St., Riverside. Nets: Mon., 7:15 p.m., 222.860/224.460 and 7:30 p.m., 146.28/88; Tues.—YL Net, 7:30 p.m. 224.460. Bkfst., 3rd Sat., By You Bob's Rest., Riverside.

**Sacramento Amateur Radio Club.** Contact: Gary Bryant, KB6KZZ, (916) 646-1171. Meets Sacramento Blood Bank, 32nd St. & Stockton Blvd., Sacramento, CA, 2nd Wednesday/monthly, 7 p.m.

**Sacramento "Old Timers" Ham Radio Brkfst Club.** Meets 2nd Wednesday/monthly, 8 a.m., Carrows Restaurant near Watt Ave. and Hwy 80 exit. For info contact Paul Wolf, W6RLP (916) 331-1830.

**San Fernando Area Radio Club, W6SD** P.O. Box 3151, Van Nuys, CA 91401. Meets: 3rd Fri./monthly, 7 p.m., Red Cross Van Nuys, 14717 Van Nuys Blvd., Van Nuys, CA 91401.

**San Gabriel Valley ARC.** Bowling Green Clubhouse, 405 S. Santa Anita Ave., Arcadia, CA 91006. Meets: 1st Tuesday/monthly, 7:30 p.m., except Dec. W6QFK, Repeater 147.165/765.

**San Mateo Radio Club.** Beresford Park Recreation Center, 28th Ave. and Alameda de las Pulgas, San Mateo, CA 94403. 3rd Friday/monthly, 7:30 p.m.

**Santa Clara County Amateur Radio Assoc. (SCCARA) W6UW.** P.O. Box 6, San Jose, CA 95103. (408) 249-6909. Meets: 2nd Mondays/monthly, 7:30 p.m. Net other Mondays, 7:30 p.m. W6UU 146.385 + /442-425 +.

**Santa Clara Valley Rptr. Society (SCVRS).** P.O. Box 2085, Sunnyvale, CA 94087. (408) 247-2877. 146.76 (-600 kHz), 224.26 (-1.6 MHz), 444.60 (+5 MHz). 2 meter/220 net Mon. 9 p.m. Mtgs.-3rd Fridays.

**Shasta Cascade Amateur Radio Society (SCARS) P.O.** Box 664, Anderson, CA 96007. Meets: 3rd Wed./monthly, 7 p.m. at the C.D.F. Conf. Rm., Grape St., near Parkview Ave., Redding, CA. Net 146.64 Wed., 8 p.m.

**Sierra Foothills Amateur Radio Club.** P.O. Box 3262, Auburn, CA 95604. Meets: 2nd Friday/monthly at Auburn Fire Station, 226 Sacramento St., Auburn, CA. Nets 7:30 p.m. Tues. 28.443 MHz, Thurs. 145.43 MHz link with 223.86 MHz.

**Simi Settlers Amateur Radio Club.** P.O. Box 3035, Simi Valley, CA 93063. Meets: 2nd Thurs./monthly, 7:30 p.m., at Seventh-Day Adventist Church, 1636 Sinaloa, Simi Valley. Rptr. 147.93/33

**Solano County Amateur Radio Society.** P.O. Box 457, Fairfield, CA 94533. Meets: 3rd Wed. 7 p.m., Vanden High School. 441.150 + 5 (Remote 145.69 simplex) PL 77Hz, (707) 448-1461.

**Southern California Six Meter Club.** P.O. Box 448, Cypress, CA 90630. USB Net Tues., 8 p.m., 50.150 and 8:30 p.m., 28.400. FM Rpt. Net Wed., 7 p.m., 52.18/98 and Thurs., 8 p.m., 52.28/88. FM Smlpx call freq. 50.300.

**Stanislaus Amateur Radio Assoc. (SARA).** P.O. Box 4601, Modesto, CA 95352. Stanislaus Co. Administration Bldg., 12th & H Streets, 3rd Tues./monthly, 7:30 p.m. 145.39 MHz WD6EJF, 223.68 MHz.

**Stockton-Delta Amateur Radio Club.** Meets: 2nd Thurs./monthly 7:30 p.m., Red Cross Bldg., 747 N. Pershing, Stockton, CA (Hwy 5, Pershing off-rmp). Net 28.450 SSB 8 p.m. Wed. Visitors welcome. Club Rptr. W6SF receives 147.165 MHz.

**The Trinity County ARC.** P.O. Box 2283, Weaverville, CA 96093. Meets 2nd Wednesday/monthly, at the CD Hall in Weaverville, 7:30 p.m. WD6FHX Rptr. 146.13/73.

**Tri-County Amateur Radio Assoc.** P.O. Box 142, Pomona, CA 91769. Meets: 2nd Monday/monthly, 7:30 p.m. Pomona First Federal S&L, (basement), 399 N. Garey, Pomona, CA.

**United Radio Amateur Club K6AA.** L.A. Maritime Museum, Berth 84. Foot of 6th St., San Pedro, CA 90731. Meets: 3rd Friday/monthly except Dec., 8:00 p.m. Talk-in 145.655 Simplex.

**Victor Valley Amateur Radio Club.** P.O. Box 869, Victorville, CA 92392. Meets: Victor School Board Room, 6th & "A". 2nd Tuesday/monthly, 7:30 p.m. WA6EFW Rptr. 146.34/146.94.

**Western Amateur Radio Assoc.** Cerritos Park East, 166th St. and Carmenita Ave., Cerritos, CA. Meets: 1st Tuesday/monthly, 7 p.m. Rptr., N6ME 145.40/224.18 MHz.

**West Valley Amateur Radio Assoc.** 18011 Saratoga — Los Gatos Road, Los Gatos, CA 95030. Meets: 3rd Wednesday/monthly, 7:30 p.m. W6PIY/R. Net Tuesday, 8:30 p.m., 147.39 +, 223.96.

**Yolo Amateur Radio Society.** Meets: 1st Thursday/monthly, 7:30 p.m. 1207 Sycamore Lane, Davis, CA 95616.

**Yucaipa Valley Amateur Radio Club (YVARC).** Gibraltar Saving's Community Room, 34880 Yucaipa Blvd., Yucaipa, CA 92399. Pres: Jack Prather W6KJP (714) 797-1276. Meets: 3rd Monday/monthly, 7:30 p.m.



## FLORIDA

**Indian River ARC, Inc. (IRARC).** 597 Capri Rd., Cocoa Beach, FL 32931. Martin Andersen Senior Center, 1025 S. Florida Ave., Rockledge, FL. Meets: 1st Thurs./monthly, 7:30 p.m.

**Platinum Coast Amateur Radio Society, Inc. (PCARS).** P.O. Box 1004, Melbourne, FL 32902. Meets: American Red Cross Bldg., 1150 S. Hickory St., 2nd Monday/monthly, 7:30 p.m. Talk-in on 146.850 rpt.

**Sarasota Amateur Radio Ass'n, Inc.** Meets: 3rd Tues./monthly, 8 p.m. on the 6th floor (board rm.) of the County Admin. Bldg., corner of 301 & Ringling Blvd. Club Rptr. W4IE, freq. 146.91/31, open to all. Phone patch \*Up #Down. Welcome.

**South Brevard Amateur Radio Club.** P.O. Box 2205, Melbourne, FL 32902. Meets 1st Tuesday/monthly, 7 p.m., Melbourne Library, 2275 S. Babcock St., Melbourne, FL.

**West Palm Beach Amateur Radio Club, Inc.** P.O. Box 6834, Southboro Station, W. Palm Beach, FL 33405. Meets: 2nd Tues./monthly, 7:30 p.m., Palm Beach Emergency Op. Cntr., 3723 Bevedere Rd., W. Palm Beach. Info: H. Felton, 655-4632 or H. Logan, 848-0513.

## HAWAII

**Big Island Amateur Radio Club.** P.O. Box 1938, Hilo, HI 96721-1938. Meets: 2nd Tuesday/monthly, 7:00 p.m., Helco Auditorium, 1200 Kilauea, Hilo. Talk-in on 146.76(-).

## ILLINOIS

**Bolingbrook Amateur Radio Society.** Meets: 3rd Mon./monthly, 7:30 p.m., Annerino Rec. Cntr., Recreation Dr., Bolingbrook, IL. Info net Thursdays, 8 p.m., WA9DPIR 224.54/222.94 and WD9AKO/R 147.33/147.93.

**Dupage Amateur Radio Club W9DUP.** Mid-America Savings & Loan, 55th & Holmes (55th St. near RT 83), Clarendon Hill, IL. 4th Monday/monthly, 7:30 p.m. Club rptr. 145.250 — 600 kHz.

**Elgin Amateur Radio Society.** P.O. Box 1351, Elgin, IL 60120. Meets in EOC Rm. of Elgin Municipal Bldg. 2nd Friday/monthly, 8:00 p.m.

**Fox River Radio League.** Valley National Bank, Lower Level, Northgate Shopping Ctr. & RT. 31, Aurora, IL (312) 584-4925 for more info. Meets: 2nd Tuesday/monthly, 7:30 p.m.

**North Shore Radio Club.** Meets: 2nd Monday/monthly. Net 8 p.m. Tues. Karger Center, 1850 Green Bay, Highland Pk, IL. WB9FRM Rptr. 147.345 + 600 (PL 1B). Info: NSRC, P.O. Box 1066, Highland Pk., IL 60035.

**Northwest ARC/W9LM.** Meets: 2nd and 4th Tuesday/monthly, 7:00 p.m., Oehler Funeral Home downstairs community room, Lee & Perry Street, Des Plaines, Illinois.

**Schaumburg ARC (SARC).** Meets: Schaumburg Park District Community Rec. Cntr. at Bode and Springinguth Roads, Schaumburg, Illinois. Third Thursday/monthly, 7:30 p.m. Net 28.350 8:00 p.m. Thursdays.

**Six Meter Club of Chicago K9ONA.** Bank of Lyons, Lower Level, 8601 West Ogden Ave., Lyons, IL. 2nd Friday/monthly, 7:30 p.m. Club Rptrs: 146.371/97, 448.30/444.30.

**York Radio Club.** Meets: 3rd Fridays/monthly, 8 p.m., Elmhurst College (Science Bldg.), Elmhurst, IL. Net Mondays, 8 p.m. W9PCS/147.42 simplex.

## KANSAS

**Kansas City Heart of America Radio Club.** Red Cross Building, 211 West Armour Blvd. Meets: 3rd Tuesdays/monthly, 7:30 p.m.

## MARYLAND

**The Peninsula Radio Operators Society (PROS).** Family oriented activities, training and exams held throughout the year. PROS Rptrs. 146.925 and 146.625. PROS, P.O. Box 2315, Salisbury, MD 21801.

## MASSACHUSETTS

**Mohawk Amateur Radio Club.** Meets: 4 Wed./monthly, 7:30 p.m., American Legion Hall, 325 Pequoig Ave., Athol, MA. (One block north of downtown traffic lights, past the bridge)

## MICHIGAN

**Hazel Park Amateur Radio Club.** Hoover Elementary School-Hazel Park, P.O. Box 368, Hazel Park, MI 48030. 2nd Wed./monthly, 7:30 p.m. Sept. thru May. 147.51 Simplex Call-In.

**Oak Park Amateur Radio Club.** Oak Park Community Center, 14300 Oak Park Blvd. (same as 9½ Mile Rd., west of Coolidge). Oak Park, MI 48237. 2nd Monday/monthly, 7:45 p.m. Talk-in on our 224.36 MHz or 146.64 MHz.

**South Eastern Michigan A.R.C.** Meets: 1st Friday/monthly, 7:30 p.m. Grosse Pointe North High School, Bldg. C, Cafeteria Commons. For info contact: AK8I (313) 372-1252. W8FWC Rptr. 146.740/146.140.

## MISSOURI

**PHD Amateur Radio Assn. Inc.** P.O. Box 11, Liberty, MO 64068. Meets last Tuesday/monthly, 7 p.m. Red Cross Bldg. (816) 781-7313, Volunteer Examiner Coordinator.

## NEBRASKA

**Pioneer Amateur Radio Club (PARC).** P.O. Box 445, Fremont, NE 68025. Meets: 4th Friday/monthly, 7:30 p.m. at Keene Memorial Library, 1030 North Broad. Wed. ARES net 146.67 19:30 CDT/19:00 CST.

## NEVADA

**Frontier Amateur Radio Society (FARS).** Meets: 3rd Monday/monthly, 7 p.m., Denny's Restaurant across from Nevada Palace, 5318 Boulder Hwy. Net Mondays 7:30 p.m., 145.39 rpt. on Black Mountain. Club info, Jim Frye, NW70, 456-5396.

**Nevada Amateur Radio Assoc. (NARA)** 2333 Rodney Cir., Reno, NV 89509. Meets: 3rd Tuesday/monthly, 7:00 p.m. at First Federal Savings & Loan Bldg., 2330 So. Virginia St., Reno, NV.

**Sierra Intermountain Emergency Radio Assoc. (SIERA).** P.O. Box 2348, Minden, NV 89423. (702) 782-8266. Meets: 2nd Tuesdays/monthly, 7:30 p.m., Douglas County Lib., Minden, NV. Talk-in: 147.270 +.

## NEW HAMPSHIRE

**Great Bay Radio Assn., WB1CAG.** P.O. Box 911, Dover NH 03820. (603) 742-0130/755-2600. 2nd Sunday/monthly, 7:00 p.m. Dover Dist. Court. Talk-in 147.57.

## NEW JERSEY

**Bayonne Emergency Mgt. ARC (BEMARC).** 16th St. & Ave. A Firehouse, Bayonne, New Jersey 07002. Rptrs: 145.430 & 224-280. Meets: 2nd Tuesday/monthly, 7:30 p.m.

**Delaware Valley Radio Assoc. (DVRA).** Our Lady of Good Counsel Church, 137 W. Upper Ferry Rd., West Trenton, NJ 08628. Meets: 2nd Wednesday/monthly, 8:00 p.m.

**Gloucester County Amateur Radio Club (GCARC).** Woodbury V.F.W. 1st Wednesday/monthly, 8:00 p.m., Woodbury, NJ. Talk-in 147.18/78. For info call K2JF (609) 589-2318.

**South Jersey Radio Assoc. (SJRA).** Pennsauken Sr. Hi Sch. at Hylton Rd. & Remington Ave., Pennsauken, NJ 08109. Jan.-Oct. 4th Wed./monthly, 7:30 p.m. Nov.-Dec. 3rd Wed. due to Thanksgiving and Christmas. Talk-in 145.290 rpt. Club call K2AA.

## NEW YORK

**Communications Club of New Rochelle, NY.** Harrison Street Firehouse. Bill McCarran, K2LV, (914) 738-0768. Meets: 1st Monday/monthly, 8 p.m.

**Genesee Radio Amateurs (GRAM).** N.Y.S. Civil Defense Center, State St., Batavia, NY 14020. Meets: 3rd Friday/monthly, 7:30 p.m. 147.285 + W2RCX.

**Hall of Science Amateur Radio Club.** P.O. Box 131, Jamacia, NY 11415. HOSARC, 2nd Tuesday/monthly, Hall of Science Bldg., 47-01 111 St., Flushing Meadow Park at 7:30 p.m. The tristates' only 3-band linked rpt. system 144.300 S/223.600 - /445.225 -.

**Orleans Amateur Radio Club (WA2DQL).** Meets: Office of Disaster Preparedness (CD), West County House Rd., Albion, NY 14411, 4th Wednesday/monthly, 7:30 p.m., 147.527-WA2DQL.

**PROS, Pioneer Radio Operators Society.** Meets: 1st Wed./monthly (except July/Aug.), 7 p.m., Masonic Temple, Rt. 78, Java Village, NY. Other Wednesdays, 8 p.m. 145.170/144.57. Repeater KC2JY.

**The Radio Club of J.H.S. 22, N.Y.C., Inc.** WB2JKJ, P.O. Box 1052, New York, NY 10002. 24-hr. hotline, (516) 674-4072. Non-profit org. uses Amateur Radio to enhance education of young people, nationwide. Join us — "Classroom Net", 7.238 MHz, 7 a.m. E.S.T. PSE QSL!

## Suffolk County Radio Club.

3rd Tues./monthly, 8 p.m., Bohemia Rec. Ctr., Ruzicka Wy. W2DQ/R 144.610/145.210, 223.080/224.680 rpt. Info Call Jim Heacock (516) 473-7529.

## Westchester Amateur Radio Assoc. (WARA).

Scarsdale Village Hall, Scarsdale, New York. Meets: 1st Wednesday/monthly, 8:00 p.m. For info call Dan Gabel, N2FLR, Pres., (914) 723-8625.

## NORTH CAROLINA

**Raleigh Amateur Radio Society, Inc.** P.O. Box 17124, Raleigh, NC 27619. Club net nightly, 8 p.m., W4DW, 04/64. Meets: 1st Wednesdays/monthly, 7:30 p.m., YMCA. 18th Annual Hamfest, April 9, 1990.

## OHIO

**Amateur Radio Fellowship (ARF).** Keith Melvin, KA8TKE, Sec. P.O. Box 2486, Streetsboro, OH 44241. Meets: 1st Sat./monthly, Kent Wally Waffle. KA8YKT rpt. 147.675/075.

**Ashtabula County ARC.** Ken Stenback, A18S (964-7316). County Justice Center, Jefferson, OH. 3rd Tuesday/monthly, 7:30 p.m. County Rptr., 146.715.

**Clyde Amature Radio Society (C.A.R.S.).** Meets: 2nd Tuesday/monthly, 7:30 p.m., Municipal Bldg., Clyde, OH 44811. NF8E Repeater 144.75/145.35. Net Sunday 9 p.m.

**Dayton Amateur Radio Assoc.** P.O. Box 44, Dayton, OH 45401. Meets 1st & 3rd Fri./monthly (Sept. thru June) 8 p.m., Career Academy on River Corridor Dr. Info on W8BI 146.34/94 & 222.34/223.94.

## PENNSYLVANIA

**Butler County Amateur Radio Assoc.** Meets: 1st Tuesday/monthly, 7:30 p.m. at Red Cross Bldg., 312 Mercer St., Butler, PA 16001. Call-in 147.96/36

**Mercer County Amateur Radio Club W3LIF.** P.O. Box 996, Sharon, PA 16146. Meets: 4th Tuesday/monthly at 7:30 p.m. at Shenango Valley Medical Center, Farrell, PA. Net, Thursdays 8:45 p.m. on 147.75/15 W3LIF/R.

**Warminster Amateur Radio Club.** Meets: 1st Wednesday/monthly 8 p.m., St. John's Lutheran Church, York Rd., Hatboro, PA. Nets: WA3DFU/R info. Net Wed. 8:30, 147.09/147.69.



## RADIO CLUB *continued*

### CONNECTICUT

Tri-City ARC, Groton Public Library, Route 117, P.O. Box 686, Groton, CT 06340.  
Meets: 2nd Tuesdays/monthly, 7:30 p.m.

### VIRGINIA

**Southern Peninsula Amateur Radio Klub (SPARK).** Meets: 1st and 3rd Tuesdays, Salvation Army Community Bldg., Hampton, VA. Operates 148/13 146.13 /73 Rptr., VEC Information (804) 851-5573.

**Virginia Beach Amateur Radio Club (VBARC).** Open Door Chapel, 3177 Virginia Beach Blvd., Va. Beach, VA. Meets First Thursday/monthly, 7:30 p.m. For info (804) 497-1235.

### WEST VIRGINIA

**Jackson County Amateur Radio Club.** D. General Bailey, NK8P, Sec.-Treas. 113 Winters Dr., Ripley, WV 25271. First National Bank of Ripley. Meets: 1st Thursday/monthly, 7:30 p.m.

**Tri-state Amateur Radio Assn.** Meets: 3rd Tues./monthly, 7 p.m., Green Valley Vol. Fire Dept., Norwood Rd. & 16th Street Rd., Huntington, WV. ARES net Thurs. 9 p.m. on 146.76/16 W8VA/R. Info N8IKP 523-5264.

### WASHINGTON

**Mike & Key Amateur Radio Club.** 3rd Sat./monthly, 10 a.m., Tukwila Com. Ctr., 4101 So. 131st St., Seattle, WA. Net. Wed. eve., 7:30 p.m. 146.22/146.82 rpt.

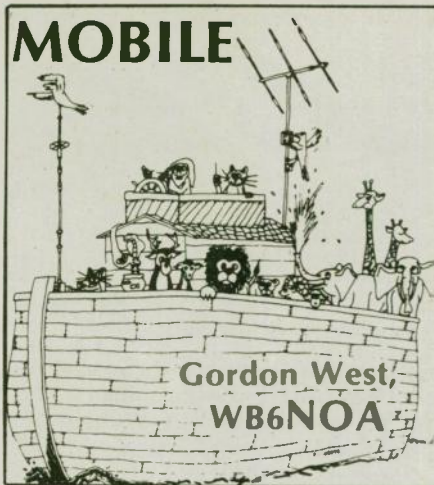
**North Seattle Amateur Radio Club (NSARC).** Meets: 3rd Tuesday, 7:30 p.m., (except Jul. & Aug.) at the First Interstate Bank, 30th Ave. NE and NE 125th St. (Lake City) in basement. Info: Mike Jr., W7WHT, (206) 282-1438 or P.O. Box 20279, Seattle, WA 98102.

### WYOMING

**University ARC.** 146.01/61 Meets: 1st Tues., 7:30 p.m. Sept.-May. U.W. Physical Plant Bldg., 15th & Lewis St., P.O. Box 3625, Laramie, WY 82070. June-Aug: Bernie Club picnics Wednesdays.

### WEST GERMANY

**Wiesbaden Amateur Radio Club (WIESARC), DA1WA.** Meets 2nd Tuesday/monthly at Stadion Restaurant, Wiesbaden. Steve Hutchins, DA2HS, Box 4205, APO NY 09633. PH: (011) (49)-6725-3462. American and German members.



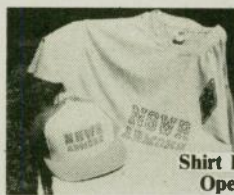
### Low-cost weather fax rigs

Most mariners wouldn't be caught out at sea without one — a weather facsimile chart recorder. This equipment is small enough to go in your mobile home, too. Yes, they run on 12-volts and turn off and on automatically.

So what do you get? Weather charts!

- Satellite imagery superimposed on US maps
- Current surface weather analysis charts
- Weather forecast charts — 12 hour, 24 hour and 48 hour
- Surface weather prognosis charts
- 5-day outlook charts
- Special hurricane watch charts

For mobile operation a laptop computer you may already own could also display this information, too. In fact, there is even a TV interface box that receives weather FAX signals and



Only one person in the world has your call . . . YOU!

Shirt letter style is "Ivy Open", & cap "Sportswear."

You can wear & display your call, name & club name on a high-quality T-shirt — \$12.00. Name & ARRL logo (if desired), printed on shirt front with club name printed on shirt back. Shirts (S,M,L,XL) available in light blue, light yellow, beige (tan) or white. Red ARRL logo comes in 2 1/4" x 5" or 1 3/8" x 3" sizes. Lettering comes in two styles, Ivy Open or Sportswear, & the following colors: black, royal blue, maroon, brown, green, red or orange. For individual orders please add \$1.75 each item for shipping & handling.

Cap printed with your call & name has foam front, mesh back, adjusts for size & costs \$6.50 ea. + \$1.75 s/h each.

High quality golf shirts, printed one side, \$15.50, both sides, \$16.50.

Make checks or M.O. payable to

**Anne Wright, N6BOP**

2272 Kellogg Park Dr.  
Pomona, CA 91768

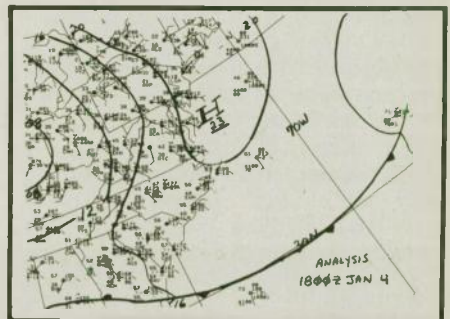
CA residents add 6% sales tax.

displays them on your regular television.

How facsimile works. That TV in your mobile home or boat consists of many fine horizontal lines. TV transmission systems are actually frames of pictures, sliced into narrow strips and sent out on the airwaves serially. The strips are reassembled by your TV to reconstruct the original picture.

Radio facsimile systems operate on high frequency SSB and use the same principle as TV broadcasting; however, the band width is much narrower. Due to this limited band width, it takes several minutes for the facsimile transmitter to send a frame of a picture or weather chart.

Most radio facsimile signals come from US Navy or Coast Guard transmitters. The information they transmit is provided by the National Weather Service (NOAA). The Weather Service supplies the transmitting station with an original picture that is fitted on a drum rotating at 120 rpm. A photo cell is mounted on the threaded shaft and moves slowly along the drum. The cell converts black-and-white information, plus 20 shades of grey, into an electrical signal. Black is 1,500 Hertz and white is 2,300 Hertz and everything in between are shades of grey.



**Surface analysis.** Broadcast every 12 hours, this chart provides land, ship and buoy observations analyzed for highs, low and fronts.

**AXM Incorporated**  
Serving the radio amateur who needs more than an amateur radio.  
11791 Loara St., Suite B  
Garden Grove, CA 92640  
Tel: (714) 638-8807  
FAX (714) 638-9556

**Larsen Antennas** **ASTRON** POWER SUPPLIES  
**Repro** COMMUNICATIONS SPECIALISTS, INC.  
**RITRON** COMMUNICATIONS SPECIALISTS, INC.  
**Standard Communications** **MOBILE MARK** COMMUNICATIONS SPECIALISTS, INC.  
**JOB COM**  
**TRILETRIC** MOBILE AMP CHARGERS & PLUGS & ADAPTS  
**uniden**  
**TAD** COPIES OF THE NEWSLETTERS  
**TRIP DUCKS**



You receive the weather facsimile signal on a SSB receiver. Any Amateur rig with a general coverage receiver will pick up weather FAX signals clearly. They sound like a twice-per-second rhythmic sweeping sound. Use upper sideband (USB) to receive white pictures with black lines. Use LSB if you want a black picture with white outlines.

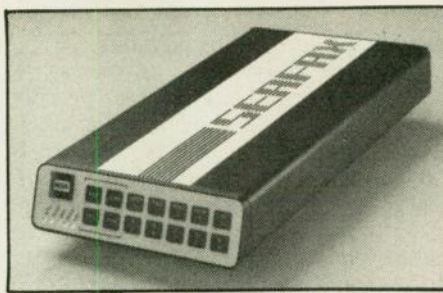
Contact your local National Weather Service office or NOAA in Silver Springs, MD, for a government booklet describing the actual frequencies and charts showing the area covered by local FAX transmitting stations. Also try the following frequencies for the unmistakable sound of a weather FAX transmission:

10536 kHz	Halifax, Canada "CFH"
16410 kHz	Norfolk, VA "NAM"
4223 kHz	Lewes, DE
9157.5 kHz	Mobile, AL "NWS"
12125 kHz	British Columbia
8682 kHz	San Francisco, CA "NMC"
14826 kHz	Honolulu, HI "NPM"
16135 kHz	Honolulu, HI "KVM70"

There are hundreds of other weather facsimile frequencies, all serving the USA and surrounding waters. There are also 30 other weather FAX transmitting stations throughout the world transmitting on about five channels each with their weather FAX information.

NOTE. Try tuning 1.9 kHz lower on some of these listed frequencies to hear the transmission clearly. For instance 8682 in San Francisco is best received USB at exactly 8680.1 kHz.

Your equipment. You probably already own a high frequency transceiver. You can even use the tiny Sony



### SEAFAX weather FAX converter — no computer needed.

2010 portable shortwave radio that offers USB/LSB reception. This radio sells for under \$325 and works quite nicely with an external antenna on high frequencies, 1-30 MHz.

The output of your receiver is fed into the audio input jack of your weather facsimile "decoder box." These black boxes, described below, have tuning indicator LEDs to assist you in dialing the station for the clearest possible receiver.

The output of your "FAX box" goes into a common printer or to a TV monitor. Just tune in the signal, press the start button and in a matter of minutes, a weather facsimile chart will unfold before your eyes!

### Weather Facsimile Decode Boxes AEA PK-232 (the popular packet controller)

MFJ #1278 multi-mode data controller

Universal Shortwave (Reynoldsburg, OH) FAX decoder

SEA (Mount Lake Terrace, WA) SEA-FAX interface

SEA-Lutions (San Diego, CA) TV FAX

Software Systems PC FAX (Disk!)

These controllers run around \$300 and tie in to any printer. The Kodak Diconics printer using an ink jet head will work on 12-volts, just like these interface boxes, for a perfect mobile FAX station.

You could also spend big bucks (\$2,000-\$3,000) and get a complete one-piece facsimile system with built-in PLL receiver from the following manufacturers:

- Alden Electronics, Westborough, MA
- Furuno, South San Francisco, CA
- Raytheon, Manchester, NH
- Koden, Norwell, MA
- Taiyo, Seattle, WA

If you already own a complete PC computer system, consider the \$80 weather FAX program from Software Systems Consulting, San Clemente, CA 714/498-5784. Everything is on the disk and in the interface plug. Audio out from the Amateur goes into the comport input and you are on the air.

Try tuning in a weather facsimile signal right now. Imagine a detailed weather chart pouring out of your tiny computer. Think of the possibilities of knowing what the weather is going to be, mobile, all around you. The information is out there on high frequency SSB just waiting to be tuned in and printed out. □

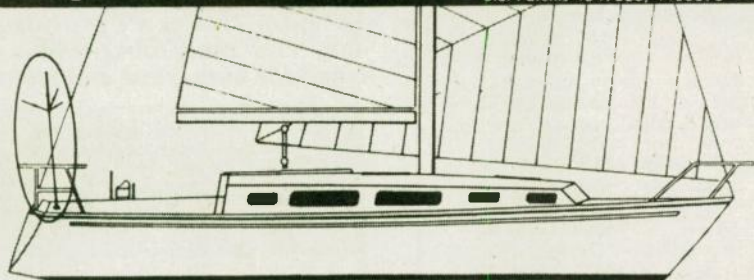
## Another idea

On page 17 of our February issue, John Young, WA8KNE, told us how to "Create a weak link" with cotton in antenna support ropes to keep them from breaking. Harry Church, W0-KXP/9, wrote and said something that works that he's been doing for years is putting a screen door spring in the line.

You know you are really hooked on Amateur Radio when you become the center of attention at your Condo Committee Meeting, explaining RFI and how nobody really wants to watch *The Late Show* on Channel 2 anyway. — Western ARC, Cerritos, CA □

## The Spider™ Maritimer™ Antenna

U.S. Patents 4349825, 4460896



The only amateur radio antenna made specifically for use on the ocean. Non-magnetic stainless steel mast and nickel-chrome plated bronze fittings make it virtually corrosion-proof. Operate on 10, 15, 20 and 40 meters without making any antenna changes. A resonator for 75 meters is available as an accessory. A special marine mounting fixture for deck use is also available.

For use on commercial marine frequencies add our Maritimer™ Adapter Collar and three special resonators. Choose from 8, 12, 16 or 22 MHz.

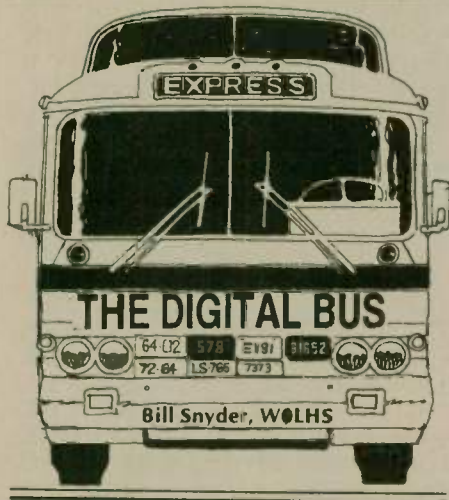
**MULTI-BAND ANTENNAS**  
7131 OWENS MOUTH AVENUE, SUITE 163C  
CANOGA PARK, CALIF., 91303  
TELEPHONE: (818) 341-5460

## Field Day All-Band Antenna

Ready to Use	Tough	Full Legal Power
Fastest Install	Flexible	No Lossy Traps
Coax Feed	Kink-Proof	Low Noise
3000 V Insul		Never Corrodes

<b>QRV- \$49.95</b> 80-10 51 ft. long Includes 40-page Tech Manual Infopack \$1	<b>QRV- \$59.95</b> 160-10 102 ft. long Add \$5 Post & Handling
<b>Antennas West</b>	
Box 50062-W, Provo, UT 84605 (801) 373-8425	





A number of years ago the RTTY portion of the 20M band was a hot bed of RTTY bulletin boards (MSOs) that cluttered up the band by operating on any random frequency. Please don't get me wrong, I am not against RTTY BBS operating on any band; they serve a very useful purpose and are an integral part of our hobby. I am, however, against some of the practices that we see popping up again.

My battle with the BBS/MSO group started years ago when I was writing the DX column for the *RTTY Journal*. I took a few verbal swipes at certain MSO operators. I wrote to all the directors of the ARRL and complained about the operators and, in general, managed to get all the MSO system operators mad at me. I don't know if it improved the circulation of the *Journal* or not, but it did fill my post office box with hate mail. Actually, it was fun and I enjoyed the battle.

My first combatant was Dick Uhrmacher, K0VKH, who operates a BBS on the 20M National Autostart Frequency. Dick, who lives in South Dakota, and I had a few lively exchanges. I really can't remember what epithets we tossed back and forth, but whatever they were, they prompted me to suggest to the editor of the *RTTY Journal* that we have a MSO column in the publication and that Dick would be the logical man to write it. I then suggested the same thing to Dick, and by golly, the MSO column became a reality. It is still in full swing, and I suggest people who operate BBS on HF 20M read Dick's column each month.

Dick and a number of the MSO SYSOPS and users gather at the Dayton Hamvention each April for a festive RTTY dinner (take it in if you can. You'll have a great time). When Bob Stanek, W0HAH, and I first went to Dayton, I was apprehensive about going to the dinner. I didn't know whether to toss my calling card in first

and see if it stayed, or go home.

With Bob in the lead, we barged in and met the "enemy": Dick and the other occupants of the National Autostart Frequency. No problem. They are a great bunch of guys, lots of fun. So, if you go to Dayton and you like RTTY operations, be sure and ferret out that group. They hang out in the Radison Hotel. You'll double your enjoyment of Dayton if you do.

Now that I have rambled on about my background, let's get down to the meat of this harangue. The 20M band now has a rash of new MSO units popping up again, and they are loaded with junk messages that should never be on a ham radio BBS.

For example: I recently watched a user station read a message out of a mailbox that laid out a diet for Amateurs to follow. It was supposed to be funny. First it showed a nutritious breakfast and then a lunch menu that allowed one Oreo cookie. For supper the message said to eat the rest of the bag of Oreos, drink beer and so on. I'm sure it was funny when it was passed around the office secretary pool, but on the Amateur bands five minutes of QRM did not seem too funny to me.

The next user called up the message file from the MSO computer. I watched 70 message titles parade down my screen. The list featured bathroom humor, games, quizzes and junk like a "wind-chill chart." Who needs that on ham radio? I live where the wind chill reaches 70 and 80 below. The weather bureau issues those warnings when needed.

And the message list contained "for sale" and "wanted" messages, too. The MSO is a great place for personal messages, DX tips and information to enhance our hobby, but please keep "junk mail" off of the ham bands.

One other annoying thing that happened in those days of "way back

when," was MSO stations automatically calling CQ to generate user traffic. Nothing made a DXer madder than to have an automatic CQ wreck a QSO with a rare one. One software program that was popular in those days called CQ every three minutes day or night. It didn't take long before the screams of non-MSO fans on 20M caused the offending SYSOPs to turn the CQ option off.

I thought that packet would cause the HF MSO to diminish in popularity because packet is such a fine way to move traffic, but I was wrong. We have "junk mail" boxes to contend with again.

So, dear SYSOP newcomers, if you wish to operate a BBS/MSO, I suggest you join the National Autostart Frequency (14.085,626 Hz mark) group, adapt their policies, and eliminate the want-ads, joke files and "junk mail" from your message list. In addition read Dick's column in the *RTTY Journal*.

### RTTY DX calling practice

In the seven years since I started writing for Amateur publications, I have spent many hours batting out harangues on the subject of rare DX calling practices. Why is it CW ops can call a DX station once or twice, the phone guys can yell the last two letters

### CMOS KEYS KIT

ONLY  
\$9.95



- MEASURES ONLY 2.3 x 3.5 INCHES
- SPEED RANGE FROM 5-50 WPM
- VOLUME AND SPEED CONTROLS
- COMPATIBLE WITH GRID BLOCK, CATHODE KEYS, AND SOLID STATE TRANSMITTERS.
- COMES WITH PCB AND ALL PARTS NEEDED TO COMPLETE THE BOARD.

### MEMORY KIT FOR CMOS KEYS

ONLY  
\$14.95



- STORE TWO MESSAGES OF UP TO 50 CHARACTERS EACH
- MESSAGES CAN BE PROGRAMMED AND PLAYED BACK AT ANY SPEED
- POWERED BY THE SAME BATTERY AS THE CMOS KEYS
- COMES WITH PCB, WIRE, SWITCHES, AND ALL PARTS NEEDED TO COMPLETE THE BOARD
- MEASURES ONLY 2.5 x 3.5 INCHES

PLEASE ADD \$1.50 POSTAGE TO YOUR ORDER  
WISCONSIN RESIDENTS ADD 5% SALES TAX  
SEND FOR FREE INFORMATION

**BEL-TEK**  
P.O. BOX 125  
BELOIT, WI 53511

A publication  
for the Radio Amateur  
especially covering  
VHF, UHF  
& Microwaves

**VHF  
& Microwaves  
communications**

The world's best magazine on the  
subject, published in Germany  
and printed in English,  
with articles and circuitry by  
world-renowned circuit designers  
NOW available in U.S.A. & CANADA  
Subscription only \$19.95/year

**TIMEKIT**

PO Box 22277 • Cleveland, OH 44122



of their call signs but the RTTY DXer seems to call and call and call and call and call.

To be the last one to call seems to be the key to getting the rare one. I recently watched one pile-up where a special event station in a middle east country — long winded with the "rig here," etc. being broadcast in each QSO — was holding forth on 20M. One tenacious W6 RTTY fan called the DX op by sending RYRY for about two thirds of a line, the DX call five times, his own call for at least one line and then, after listening for five seconds, repeat it all over again.

The "lid masters" were tossing in their usual "W6\*\*\* is a lid" to no avail. He kept right on calling and calling and calling. Sure enough, he finally broke the pile and nailed the rare one. Long calls do work, but only when the pile is full of long callers. I'll bet that day 30 hams were cheated out of working that special event station simply because of the delay caused by all the long calling and the long-winded chatting of the DX station.

**rfconcept**



RFC 2-317

144 MHz Amps			
RFC 2-23	2W	IN =	30W OUT
" 2-217	2W	IN =	170W OUT
" 2-117	10W	IN =	170W OUT
" 2-317	30W	IN =	170W OUT
" 2-417	45W	IN =	170W OUT

220 MHz Amps			
RFC 3-22	2W	IN =	20W OUT
" 3-211	2W	IN =	110W OUT
" 3-112	10W	IN =	120W OUT
3-312	30W	IN =	120W OUT

440 MHz Amps			
RFC 4-32	3W	IN =	20W OUT
" 4-310	3W	IN =	100W OUT
" 4-110	10W	IN =	100W OUT

All Amplifiers have GaAsFET receive preamps and high SWR shutdown protection.

5-year warranty, 6 mo. on final transistors.

Call your favorite dealer for updates

**rfconcept**

Inquiries: 2000 Humboldt St. Reno, NV 89509 (702) 827-0133  
 Factory: 8911-A Murray Ave. Gilroy, CA 95020 (408) 847-7373

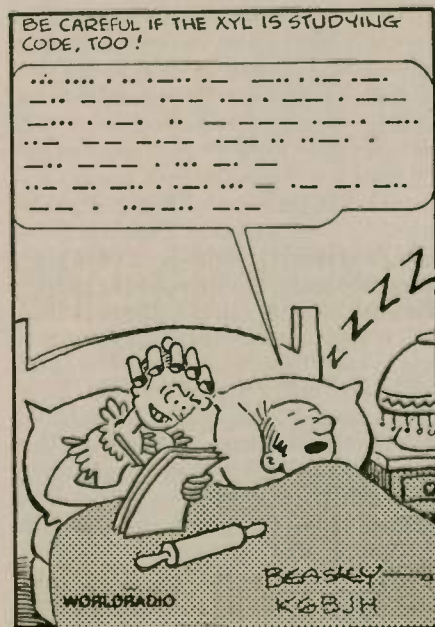
Can't RTTY fans use short calls — three times at the most? We'd all work a lot more DX if they would. End of harangue.

### EAVESDROPPINGS

"I'M VERY NEW TO RTTY, ONLY BEEN ON TWO YEARS... I WISH I KNEW HOW TO GET THE RF AND AF BUGS OUT OF MY SOUL... MY ANTENNA IS AN IMPORTED VEE... I DON'T SWIM IN OUR OCEAN ANYMORE CAUSE IT'S NOW CALLED THE HYPODERMIC SEA... I'M IN MINNESOTA, THE LAND OF 10,000 FAKES... HOPE YOU HAVE A NICE WEAKEND THERE... HAD TROUBLE READING YOU THAT TIME BECAUSE OF NO QRM... HOW ABOUT THE GUY THAT SPREAD THE NASTY ROOMER... AFTERWARDS WE FOUND THE WINDOW GLASS WAS BROKEN ON BOTH SIDES... THAT'S A GREAT BIG HI HI HI AND HAR HAR HAR... SAW A BUMPER STICKER TODAY THAT SAID 'THE MORE PEOPLE I MEET THE BETTER I LIKE MY DOG'... MY WIFE IS A TECHNICIAN BUT A LOUSY COOK... I HAVE BEEN HAMMING WITH THE SAME CALL BOOK FOR 55 YEARS... MY POWER SUPPLY BEGINS TO BOIL WHEN I TYPE TOO LONG... THE BEST WAY TO WORK A LOT OF RTTY DX IS NEVER LEAVE THE SHACK... ANYTIME YOU HEAR A RARE ONE, CALL ME AT MY OFFICE AND I'LL COME DOWN WITH THE RTTY-DX FLU... YOUR SIGNAL IS SOLID AS A SOCK... YOU CAN WATCH MY PICTURE ON THE FRONT OF THE RTTY JOURNAL... I HOPE YOU ARE GOOD FOR TO DECIPHER MY VERY POOR ENGLISH... MY CONGRATULATIONS TO YOU FOR WORKING ME... I DEFINITELY WOULD WORK IN MORE CONTESTS IF I DIDN'T HAVE TO FIGURE OUT THE SCORE... YOUR ASKED ME WHAT I DO HERE IN HAWAII — WELL NOT MUCH EXCEPT MOW THE LAWN AND WASH THE CAR... SAW A BUMPER STICKER THAT SAID 'THANK GOD I'M AN ATHEIST'... MUST QRT BECAUSE I'VE GOT ONE FOOT IN BED... THOUGHT I HAD WORK-

ED GU88FD UNTIL I DISCOVERED IT WAS A BRITISH ZIP CODE... I'M NOT MUCH ON VALVES, I'M A TRANSISTOR MAN... I'M VERY GOOD AT TAKING RADIOS APART, BUT VERY POOR AT GETTING THEM BACK TOGETHER AGAIN... THIS BBS OPERATES 53 WEEKS A YEAR... I HAVE A BIG LIST, NO BREAKERS... YOUR SIGNALS ARE RST 599 AND REALLY Q-5... YOU HAVE TO ACT LIKE A LID ON RTTY TO COMPETE WITH ALL THE KIDS FOR DX... WE HAVE THREE HAMS IN OUR HOUSE ALL FIGHTING OVER USING THE HAM GEAR... I HAVE A NICE BUNCH OF STORIES THAT GO BACK A FEW YEARS — I HAD A GLOBE KING THAT RADIATED MORE IN THE TV SPECTRUM THAN IT DID ON THE HAM BANDS... YOUR SPELLING HAS CERTENLY IMPROVED... IS YOUR COMPUTER A CLONE OR THE REAL MCCOY?... YOU HAVE A WIMPY SIGNAL — I GOT A HERNIA IN EACH EAR FROM STRAINING... IN THE GOOD OLD RTTY DAYS I HAD FIVE MODEL 28 MACHINES LINED UP IN THE SHACK LIKE A ROW OF SLOT MACHINES IN LAS VEGAS... DOESN'T THE PRO SIGN 'KN' MEAN ANYTHING ANYMORE?

Thanks to all those who unwittingly contributed to my eavesdroppings, and also to W0HAH, W7VFR, W0ML, K0OEM, K0TMH and KT7H. My packet address is W0LHS @ W0LHS.ND.U.S.A.N.A, and my mail QTH is good in any callbook for 35 years: 1514 So. 12th St., Fargo, ND 58103. DITDIT. □



### PACKET PRICE BREAK! FOR COMMODORE 64/128 USERS

Full HF & VHF Packet Operation  
 Featured in 73 Magazine, August 1988  
 Parts kit with PC board ..... \$49.95  
 Assembled/tested unit ..... \$79.95  
 (Both include FREE Digicom 64 software)  
 Terms: Check or M.O. add \$2.50 shipping (USA). SASE for info.  
 BARRY KUTNER, W2UP, 614-B Palmer Ln., Yardley, PA 19067



Ray Clark,  
K5ZMS



## SIX SHOTS!

7158 Stone Fence, San Antonio, TX 78227  
Home: (512) 674-5781

### 6M DXCC

On Jan. 25, while in Miami on business, Donald Murden, PY5ZBU (G3MWM), SMIRK #5276, submitted his application and QSLs (104 countries) for 6M DXCC to the ARRL. His cards were sent by special delivery, and they have been lost by the agency that forwarded them. As of March 6 they had not arrived at ARRL. More as I learn about it!

A word to the wise — send your QSLs via registered mail, or if in the United States, by US mail overnight service or UPS overnight service, for the best protection. You worked 10-40 years or more for 6M DXCC, why risk losing the QSLs just to save a few dollars?

**This time it's true. Sweden is on six!**

Kjell, SM7BAE, informed us on 10M that 25 Swedish Amateurs were finally granted 6M privileges. There is no restriction on their times of operation, although there is no operating authorized within 150km of a TV transmitter.

From 150-200km there is a 3W ERP authorization. From 200-250, 10W ERP. Beyond 250km, 50W ERP. Kjell has the 50W authorization.

Congratulations to Sweden's Ama-

### Personalized Skywave Propagation Programs

- Skywave Hourly Predicts SKYCOM 1.1 . . . \$45.00  
Apple Macintosh or IBM-PC's and compatibles
  - World day/night Maps DX WINDOW . . . \$60.00  
Apple Macintosh
  - Beam Headings . . . \$5.00  
Skycom Theory . . . \$5.00
- For more info call (703) 255-6600 or SASE to:

ENGINEERING SYSTEMS INC.  
P.O. Box 939 • Vienna, VA 22180

teur Radio Society and its Amateurs on obtaining this permission.

### Luxembourg denies 6M access to its Amateurs

The Luxembourg government recently denied its Amateur Radio operators access to the 6M band. It is too bad that their operators won't be able to join the Swedes. They are being denied the opportunity for involvement with the study of 50 MHz propagation and solar activities to which other European countries are already contributing.

### DX news

All times UTC. On Feb. 1, 1989, Flux = 189: at 1430, the eastern half of country had HC, HC8/B, FY and HK4EB in. W400 worked HC2FG, FY5AU, HC5T and HC5K. We worked HK4EB here. 1550-1630, ZD8MB QSOs Gs. J52US/B was heard. 1623, the No. East had HP3XUH in.

2nd, Flux = 175: W7KNT, MT, reports third night of aurora, with this the best night. He worked OR, WA, VE5s, 6s and 7s. The band was loaded to 50.2. 3rd, Flux = 197: 1230, VE1YX QSOd J52US, who was reported to have worked TU2MA! FY5, FY7/B and ZD8/B reported in.

4th, Flux = 192: 0730, JAs work Tom, AH9AC, Wake Island. 1432, K3MLD, PA, reports GB3SIX/B in, 1434, he works G4ANT. 1440, W1s, 2s and 3s work Gs. 1608, K8MMM getting Gs. 1608, VE1s have F2 to W6s. 1930-2030, W6UXN reports hearing/working LUs and CX8. 2017, he heard VP8PTG calling a PY!

5th, Flux = 201: 0000-0100, W6UXN works VKs and ZLs and heard FK. 1530, W5OZI, in Cen. TX, OK and NM have HCs in. 1615, HC8/B into W5FF. 6th, Flux = 208: 0020, W6s getting ZL TV audio. 0730-0900,

KH6IAA had a very good ZL TE opening. 1415, W1s, 2s, 3s, 8s and 9s work HC5K/P (8W and 3 el quad on top of an Andes mountain!). 1452, HC5K/P QSOs K5ZMS. 1530, W6UXN heard HP3XUH on CW. 1625, EA8s have FY7/B.

Feb. 8, Flux = 248: Atze, 8R1AH, gets first 6M QSOs as he works HC5K, HC and PY. 1300, VE1YX QSOs J52US, as do Fs, Gs and PAs. 1400-1530, W1s have FY5. 1425, 8R1AH QSOs KB3QM, DEL, for first US QSO! FY5DG heard 9/1/B!

9th, Flux = 277: 2350-0230, W6UXN reports working/hearing FKs and many VKs on very good TE opening. VKs reported worked as far east as AZ. 0018, HP3XUH hears FY5AU and PZ1AP (both on .110) and ZD8/B and FY7/B 1420, HC5K into No. East. 1427, 8R1AH works W1s, 2s, 4s, 8s, 9s and 0s and VE1YX and VE3 for about 22 QSOs. 1505, J52US/B heard in OZ land.

10th, Flux = 279: VE1YX has W. Coast F2. 2245, WA6BYA has ZL audio. 11th, Flux = 264: 0130-0230, W6UXN reports ZL audio in. 1400, VO1DI got 2 OHs. 1440, No. East has Gs. 1448, VE1s are very strong to Gs. 1958-2037, ZS3E QSOs 9H1AB, 9H1BT, SZ2DH and five Fs.

12th, Flux = 263: 0640-0740, KH6IAA has VK2, 4s and 5s. 1500, VE1YX and No. East have HC8 in. Z23JO had 1st QSO with 9H1CG and 9H1GB. 5H1HK, Tanzania, has also been heard by 9H1CG.

13th, Flux = 263: 1400-1530, WB5QBV, W3XO/5 and W5VY here get 9Y4VU. W5VY gets FY5AU and HC5. These stations are also into the



## MORSE CODE

Morse Tutor (c) will take you from beginner through Extra Class in easy self-paced lessons

"Uncomparable computer-based code course . . . a very well thought out program. Morse Tutor is, quite simply, a superb value." Bryan Hastings, Editor, 73 Amateur Radio, July 1988

"Some of the measures of good Morse code software include user-friendliness, flexibility, . . . accuracy in code speed and character spacing and good teaching techniques. GGTE's Morse Tutor program provides all of these attributes." Rus Healy, Asst. Tech. Editor, QST, July 1988

" . . . a great program and the best code software we have seen . . . We strongly recommend this software for learning or increasing your code speed to any level." Fred Mala, W5YI Report, July 1, 1988.

- Teaches letters, numbers, punctuation marks and FCC required procedural symbols
  - Provides random character and word drills
  - Features over 1 billion random QSOs
- AND MUCH, MUCH MORE  
Over 1500 copies sold.

For IBM, PC, XT, AT, PS/2 or compatibles. For more information send SASE. Available at your dealer, through the QST Bookshelf, or send \$19.95 + \$2.00 S&H (CA Residents add \$1.20 Tax) to

GGTE, 21881 Summer Cr., Dept MW,  
Huntington Beach, CA 92646.

### SMIRK/Worldradio subscription combo

The Six Meter International Radio Klub is proud to announce that members whose dues are current (check your address label) are now eligible for a combined SMIRK membership and subscription to Worldradio magazine. Here is the deal!

Send SMIRK \$15 to cover both your SMIRK dues and a one-year Worldradio subscription — only single year subscriptions, please. Current Worldradio subscribers renew through SMIRK. (We are working on an automatic renewal procedure through Worldradio's computer service.) Be sure to include your name, callsign, SMIRK number, and current address. If you currently subscribe to Worldradio, please include your Worldradio subscriber number also.

Put the \$3 savings in your piggy bank for that new rig!



No. East, as are HK4EB, HC8/B, TI2, HC and K8WW/VP9. PJ9JT was working as far west as Colorado. 1632, 8R1AH got W5NZS, OK. 14th, Flux = 258: 1340, FY7/B into No. East, 6s work Caribbean, 9Y4, HC5 and others. ZD7CW got 1st QSOs with SMIRK rig as he contacts 9H1BT, SV1AB and SZ2DH! QSL to N4CID.

Feb. 16, Flux = 240: 0100-0445, W5, NM, W6, W7 and W0s in on Es. At 0316, K6GMV, K6ODV and other W6s work OA8ABT on TE! First So. American TE there in years I am told. 1330, 9H1s work the Caribbean, J52US into Gs, G3GJQ/5N0 into Gs Z23JO too. 1400, VE1YX is into W4s. 1443, 9Y4VU works W5s, 8s and 9s. 1500, W2s into W5s. Es around here on and off all day to various parts of the United States. 1500, TU2MA reported into Gs.

17th, Flux = 239: 1025-1200, VK30T has Moscow TV! JAs work DU, P29BL, VK3, 4, 5 and 6s. 2023, EA3BTZ hears ZS beacons. 2200, ZD7CW QSOs 9H1BT, 9H1FL, G3GJQ/5N0, CT1BYC and ZD8MB and hears PY and LU beacons. TR8CA heard ZD7CZ work 9H1s! He also heard the ZD8 beacon and 5H1HK keyer every evening from 2030-2230.

18th, Flux = 214: 2259, K8UNV heard a JA1 on .110 for a few seconds. 8R1AH gets LU5EZT/MM between So. America and Africa! 19th, Flux = 216: 0000-8R1AH continues opening by working FY5AU, PYs, CTs and CXs. 0948, GJ4ICD hears the VS6/B. 0950, 9H1BT QSOs VS6EL! 1447, W8HXT/4 is heard by CO2KK.

20th, Flux = 210: 1230, J52US is into Gs. 21st Flux = 222: 0100, LU3EX QSOs PZ1AP and PYs and hears HC/B and FY7/B. 1311, Gs QSO J52US.

TR8CA works GJ4ICD. W1s have Es to W4s. 1800, ZS3E, ZS6WB into Gs. 1901, VP5D QSOs 8R1AH.

Feb. 22, Flux = 218: 0000, LU3EX QSOs FY7, YV5, PYs. 1200-1300, J52US QSOs TR8CA and LA2PT for 29th and 30th country. He also got VE1YX and K1TOL. 1300, W2IDZ, WA2QCE, W2HRW, W3GUF and K8XNI all work CO2KK on CW. VE1YX got 9H1BT and 9H1CG for 90th country. He also worked KP4A. Gs into the Caribbean. CO2KK was heard by Gs. W2s into FLA. CT1 into W2, W3 from So. East. FY7/B in also. LU5EZT/MM off So. America worked by Gs. HH7PV QSOs 9H1. 1440, PA3EUI hears ZSs. 1600, WB2MAI has W4, FLA and W5, LA. ZS6, J52US, LU5EZT/MM, PA2CXQ and a YL on SSB were worked by G2ADR.

23rd, Flux = 222: 1149, J52US gets into Europe. 1211, G3JVL and G4IGO QSO TR8CA. 1245, VE1YX QSOs CT1DTQ and France. 1400, VE1YX QSOs ZS3AT. J52US/B was heard in No. East United States and by Gs and PAs. 1840-1940, KH6IAA QSOs LUs. 2050, I work HC2FG and HC5K, who are both into WA, OR, CA, AZ, NM, TX and OK! 2110, HC5K QSOs KL7NO! It's the first KL7 for Ted and the first So. American contact for Al. 2225, 9H1s again QSO PY5ZBU.

24th, Flux = 221: 0040, WP4G says he has LU, CX8BE and PYs on both 6M and 2M! 1342, VE1YX QSOs CT1DTQ. 1535, 4X1IF hears ZS3E. 1815, VE1YX works W. Coast F2.

Feb. 25, Flux = 211: 0100, HC5K, HC2BI and HC2FG work many JAs, with HC5K said to have QSOd 100+ alone. JAs reported heard in NM during this period. 0100, JAs heard KL7CDG. 5H1HK reported he heard a

JR6 — Okinawa. 0815, LA3EQ QSOs most every VS6 there is for first LA to VS6 QSOs ever on 6M. He got VS6OR, VS6HK, VS6XW and three others. 0817-0934, SM6PU works 10M to 6M and QSOs VK6WD, VK6HK, VK6KXW and heard VK6PD and VK6RO, for the first SM/VK QSOs this cycle. VK6WD confirms QSOs later in the day.

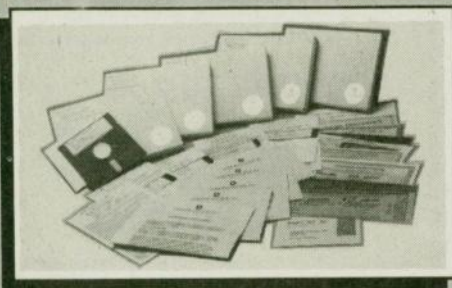
It has been reported to me that some operators who worked French stations have had their QSLs returned stamped "Illegal Operation." If you want to know which French stations are legal, ask me. I have the list.

0941-1005, Olaf heard JH4IUO, JA4MBM and JR1FWR/DU1! He did not hear the VS6s. 1100, PAORDY becomes the first PA ever to work DU on 6M, to my knowledge, when he worked JR1FWR/DU1. 1125, 5H1HK into Gs. 1300, Gs have ZS3 and ZS6s in. J52US. 1548, PT9FH heard in the FLA Keys. 2242, JAs into W6s. Gs say Chinese TV video was overwhelming during their opening to VS6.

Feb. 26, Flux = 200: 0000, JAs into MT. 0000, JAs QSO W5FF, NM and AZ. 0925-1046, Gs have JA opening again. G4JJC got JA3GUG, JA6IML, JA3OPA and others. 1100, PAs hear JAs. 1130, Gs QSO ZS6BTL. 1300, HB9QQ QSOs J52US. TU2MA QSOs Fs. 1310, VE1YX working much of Europe. He also QSOs J52US. 1330, OHs into ZSs. 1348, J52US QSOs LA. 1416, ZS6LN QSOs VE1s. 1420, ZS/B into W3s, PA. 1645, N5JHV, NM heard in UK. 1653, VE1YX into the W. Coast. W6XJ has strong European TV video. 1700, KY, WVA into UK. 1720, ZS/Bs into Os. 1720, ZS3AT and ZS3E QSO a number of US operators. 1825, ZS3E into ND, SD, MN. ZSs heard by ZLs briefly. 2140, 9H1CG hears the VS6/B long path.

27th, Flux = 173: KL7s work JAs, as does N5JHV, NM. 0700, ZLs into KH6IAA and FO8DR is still on 6M. 1330, PAs get ZS3. 1500, OH, IL, MI and WI have J52US/B. 2030, 9Y4VU

## Now! THEORY, cw & regs on IBM!



It's EASY! Just purchase a **DIAMOND SYSTEMS** Amateur Radio License Course. All study materials needed for FCC exam—Code, Theory, Regulations—are included. Join the ranks of newcomers and licensed Amateurs using Diamond Systems course material.

### Written Courses (Book)(\*Book & Tape)

DSI-W-N (HDP-1611)	*24.95	<i>Novice</i>	DSI-IBM-N (HDP-1601)	39.95
DSI-W-T (HDP-1612-T)	19.95	<i>Technician</i>	DSI-IBM-T (HDP-1602-T)	34.95
DSI-W-G (HDP-1612-G)	*24.95	<i>General</i>	DSI-IBM-G (HDP-1602-G)	34.95
DSI-W-A (HDP-1613)	19.95	<i>Advanced</i>	DSI-IBM-A (HDP-1603)	49.95
DSI-W-E (HDP-1614)	*24.95	<i>Extra</i>	DSI-IBM-E (HDP-1604)	49.95

### Software—IBM® Compatibles

Order from these  
Authorized Dealers:

Erickson (order)800-621-5802, (in Ill.)312-631-5181  
Heath Company 800-253-0570 • Ham Radio Book Store

For more info about the "100%" Club, call Diamond Systems at: 312-763-1722

## NEW • NEW • NEW

811A's for Collins, \$16.95 ea.  
6146B's, \$11.95 ea.  
813's, \$23.95 ea.

**Wanted:** We pay cash or trade for all types of transmitting or special purpose tubes.

## M&S COMMUNICATIONS ENGINEERING

160 S. Auburn St., Ste. 200  
Grass Valley, CA 95945

(916) 272-5500



works W6s. 2300, CO2KK heard LUs. 28th, Flux = 164: 0003, W6s have ZL audio. 0730, KH6IAA works TE to VK and ZL. FO8DR, H44/B heard. 1800, WA7KHO has HC2FG/B in. 1800, TI2 and HH7PV into W6s. 2000, CO2KK QSOs WP4G, TI2HL, TI2KV, TG9AWS, HI8DAF and VP8PTG! 2047, HC2FB/B, HC1BI and HC5K in here. 2110, HH7PV heard KH6IAA, TI2KD and VP8PTG but could not work them because of serious drift problems with the SWAN 250. 2115, KH6IAA in here on F2 BS. 2128, G3JVL/EA8 heard TR8CA. 2140, LUs and VP8PTG QSOd by much of W4 and W5 land, including me, at 2207! 2320-2350, ZL 50.740 TV audio in here.

### The International Six Meter 50.110 DX calling frequency

I get a lot of comments about this. People complain that there is still non-international DX activity happening on this frequency. Others say that there are still too many DX stations, all sitting on 50.110 during band openings, QRMing each other.

One operator, Ed DiYorio, K6ODV, has provided some solutions. He thinks we should have North, South, East and West calling frequencies. These frequencies are dictated by the direction of your antenna. If you are pointing west, 270 degrees, +/- 45 degrees, use 50.105; pointing east, 90 degrees, +/- 45 degrees, use 50.110; pointing north, 0 degrees, +/- 45 degrees, use 50.115 or pointing south, 180 degrees, +/- 45 degrees, use 50.120. In all cases, when you make contact, move away from the four calling frequencies.

Local Amateurs will have to control the situation by reminding violators of the Antenna Direction Calling/Listening Frequencies. If you have worked a DX station on 6M recently, don't call him again and cause some station hearing him for the first time in his life to miss the contact. If the DX station calls CQ three or more times without an answer, have at him, but don't tie him up too long.

Stations outside the United States should be encouraged to call by area in order to break through the East Coast/West Coast/Gulf Coast Iron Curtains. "QRZ W7 Only" or "W0s Only" are examples.

K6ODV is interested in your com-

### G5RV All-Band QuickKits™

<ul style="list-style-type: none"> <li>• Fast &amp; Easy to Build</li> <li>• Foolproof visual instructions</li> <li>• No measuring or cutting</li> <li>• Everything included</li> <li>• Finish antenna in minutes</li> </ul> <p><b>Quality Components</b></p> <ul style="list-style-type: none"> <li>• Presoldered Coax Fittings</li> <li>• Kinkproof QuickFlex wire</li> <li>• Fully insulated, wax sealed, no-corrode, low noise design</li> </ul> <p>Fastest Antennas in the West</p> <p><b>Antennas West</b> (801) 373-8425 Box 50062-W, Provo, UT 84605</p>	<ul style="list-style-type: none"> <li>• Double Size G5RV 204 ft 160-10 Dipole \$59.95</li> <li>• Full Size G5RV 102 ft 80-10 Dipole \$34.95</li> <li>• Half Size G5RV 51 ft 40-10 Dipole \$24.95</li> <li>• Quarter Size G5RV 26 ft 20-10 Dipole \$19.95</li> <li>• Marconi Adapter kit converts any dipole to Marconi 200' Dacron 250# line \$11.95</li> <li>• Add \$3 Post &amp; Handling Info \$1</li> </ul>
--	--

ments, as am I. If you want to put these suggestions into effect, you will have to do it locally and encourage others to do the same.

### Technical tips

A friend of mine recently had RFI problems regarding his neighbors home security system. When he operated on HF, if the security system was armed, his signals would activate the alarm.

After much checking it seems there is a filter that can be installed in the alarm system to prevent this. I am told that Arrowhead Enterprises of New Milford, CT, makes a filter #IR202 that will do the trick and keep him out of the security systems. Hope this helps anyone else who may have the same problem.

I am told it is possible to get more output from the Kenwood TS-680S 6M module. Open the top cover and loosen the two screws that hold the top board in place. Lift up that board, and you will have access to the bottom board. By adjusting pot VR15 I am told that you should be able to raise the 6M output to about 35W. If you do this when the rig is in warranty, be aware that this adjustment might void your warranty. It might also cause you to lose your ALC action.

For years HI-MANUALS, P.O. Box 802, Council Bluffs, IA 51502-0802, has been putting out a catalog of manuals for over 2,000 different pieces of Amateur gear available through them. Catalog J was updated at the first of this year and is available for \$1 in the United States, \$2 surface and \$3 via air.

### Hustler ends 6-MB3 and 10-MB4 monobander production

Cliff Jones, customer service representative of Hustler Antennas, informed me recently that their line of HF monobanders and the 6M 3-element Yagi have been dropped from their product line, due to increased production

(please turn to page 52)

**WD4BUM'S  
1/4 WAVE MAG. MOUNT  
ANTENNAS  
ONLY \$13.00**

Complete with strong chrome plated magnet & 15 RG58 coax a PL259 is installed.

ORDER M300 for 2 Meters  
M301 for 220 MHz  
M302 for 440 MHz


Send Check, M.O., VISA or M.C. to:

**MOBILE ANTENNAS  
and ACCESSORIES  
LAKEVIEW CO.**

P.O. Box 5706 • Anderson, SC 29623  
1-803-226-6990

Catalog available - Dealers welcome

## TUNER-TUNER™



- Tune your tuner without transmitting.
- Save those finals!
- Operate easier, faster.

Do you use an antenna tuner? Then you need the new Palomar Tuner-Tuner to tune up your tuner without turning on your transmitter. The Tuner-Tuner connects between your tuner and your rig.

Here's how it works:

1. Turn on the Tuner-Tuner. You'll hear a loud S9+ noise.
2. Tune your tuner until the noise drops out completely.
3. Turn off the Tuner-Tuner.
4. Start transmitting. SWR will be 1:1.

What could be simpler? You can tune up while listening to the other station call CQ. No need to move off frequency to tune up. No need to cause interference while tuning. No need to operate your rig into anything but 1:1 SWR.

Users say:



"My new PT-340 Tuner-Tuner is fabulous!"—W9DXP (Illinois)

"The Tuner-Tuner is really a nice piece of equipment. It does everything you said it would do. FB OM."—K5JDF (Texas)

"This is a record as far as speed in deliveries go, and I have been extremely happy with the Tuner-Tuner's performance."—9V1XH (Singapore)

"I have to make a comment on your Tuner-Tuner - one word only - FANTASTIC."—W310T (Pennsylvania)

Order yours today! If you use a tuner you need a Tuner-Tuner.

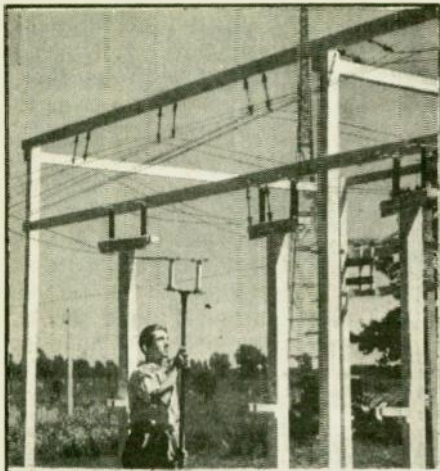



Model PT-340 Tuner-Tuner only \$99.95 + \$4 shipping in U.S. & Canada. Calif. residents add sales tax. FREE catalog on request.

## PALOMAR ENGINEERS

BOX 455, ESCONDIDO, CA 92025  
Phone: (619) 747-3343





# AERIALS

## KURT N. STERBA

For a variety of reasons many Amateurs need hidden antennas. There is the pressing question, however, can an antenna that can't be seen be heard?

Let's find out. As you know trees are bad for radio waves. Especially for waves coming from vertical antennas. So, let's hide the antenna by putting it IN the tree.

You can hide a 10M vertical in a small tree. It takes a bigger tree for 15. This episode will be about a tree and a 20M antenna.

Quarter-wave vertical on March 4-5. ARRL International DX Contest. My pea-shooter against the howitzers. I look at papers on the wall from long ago: Contest Achievement Award, #1 Phone, First Place. Others are in file folders dating back to my old "K" call. But now my effort is not aimed at self, but to offer some hope to those who, for one reason or other, must maintain a low profile.

An antenna in a tree is about as low as you can get.

Let's see. The Amateurs with towers so high they have to take oxygen up with them when they work on the

antenna, they contact that airplane P40, so do I.

ABBC: Argentina, Bolivia, Brazil, Chile. The Equator country, Mexico and Belize too. Who you say? UZ and UB. A long one way out in the Pacific and then Hawaii. There's KH6FKG. While some contest types are like a machine, not a spare word or breath (they wouldn't even slow down to tell you that your house was on fire), FKG can wish you an Aloha from the islands in a most pleasant manner.

VP5T, possibly the smoothest on the air. Very fast rate without sounding like a robot.

Unlike those who didn't read the rules closely, I know that Alaska counts as DX and there's another in the bag. I can barely make out some weak JAs, but they pop right back to my call. Amazing.

No, I'm not chugging along at a hundred an hour but I see contacts at :27, :29, :31, :33, :35, :37, :38. For those who might sneer at such a rate, remember, wrapped around my antenna is the RF cookie monster saying "feed me, feed me."

Those who were on in this contest on 14 MHz know well that propagation has seen much better days. But even yet a UL, G, YU and UP, UQ, OH, CT1, F and I, HG, ZL.

I'm honor bound to tell you that there were some calls that resulted in nothing. There were long periods of effort with nothing to show. There were pileups I just avoided. A masochist I am not.

But eventually I worked almost everything I heard. I had runs, if such can be called "runs" of :33, :35, :37. Another went :16, :17, :20, :21, :23. Later a KP4, NH2, VP2 and UA3, just zooming about the planet. There was some barking into the wind but there was also a lot of snap, snap.

Looking at my ARRL World Map on the wall, I've worked Brunei way up at the upper left and ZS6 down at the lower right. Kazah up at the top and South America at the bottom and 9Q5 over there.

I also read a book, some newspapers, left the house for awhile, sat down to real meals, and, unlike some contest nuts, got a full night's sleep both nights.

I think I proved the point that the minimally antennaed station can go in-

to a contest and have fun. Yes, FUN. The chase can be exhilarating. I might even put in for the Worked All Continents certificate earned over the weekend.

Just wanted to give a little hope and show that you don't have to be King Kong to have a good time.

Further adventures of the antenna in the tree. QCWA QSO Party March 11-12.

On 20M — Alaska to Florida, New York to California. And, while tuning the band a UQ1 on first call.

Had some other things that I had to get done but while I was paying attention to the radio, contacts at :42, :44, :46. There was a :51, :53, :54, :56. And a :40, :41, :43. I also had a :51, :52, :54, :56, :58, :01, :03. Was so pleased with myself I left to go have a pizza.

I was called by stations so weak that I couldn't make them out until I turned on my Palomar preamp. OK, I guess I've proved that you could load up and work out with about anything, so try the railing on the balcony at your condo.

Now let's try something silly. I'm going to get on 10M with my quarter-wave co-ax fed 20M antenna!

Using the MFJ 949C Deluxe Versa Tuner II, I put the feedline into Coax 1 connector. My V beam is on Coax 2. That's how I keep them straight. Vertical is on 1, which is vertical and the two-wire antenna goes into 2.

So now we're going from a quarter-wave antenna on 20 to a halfwave antenna on 10. "Oh, Boy," you are saying. End-fed halfwave have mucho impedance. You are right.

However, twist knobs until, with maximum forward power going that way, reflected needle lays flat without even a twitch when transmitting. Work stations. Do the same thing on 15.

The nice thing about this tuner is that you can compare, with but a flick of the wrist and a knob, Direct (no tuner in circuit) and through the tuner. BIG difference!

To another subject. Back in November I mentioned the names of writers on antenna subjects that I respected. And I said there was one other, but I couldn't think of his name. I got a letter from Missouri calling me lazy. Well, bub, all I have to say is, your turn is coming. In time you'll have those short circuits too.

I never thought such would ever occur to me. That was for other people. I remember the days on the basketball court, baseball diamond, boxing ring. Now a couple of trips up and down the steps to the cellar and I'm winded. What happened to that ramrod who looked so sharp in his khakis? On D-Day 1944 I was in Washington, the Pentagon was feeding my face. Later I

**SCANNER/HAND HELD EMERGENCY STAND-BY**  
Battery Back-Up & Power Supply  
with Auto Battery Switchover

- Up to ¼ AMP. Continuous AC applied.
- 1.2 AH gel-cell battery.
- 3 LED indicators.

• 8 hours for most scanners or hand holds.  
\$69.00 + \$4.00 shipping & handling or \$5.00 C.O.D.

Distributed by: **M. BOHNHOFF**  
P.O. Box 1243 • Wheeling, IL 60090  
(312) 298-LINK • (312) 298-5465

**H.F. MOBILE OPS  
LET'S START OPERATING!**

Mobile	Call frequencies	
10 meters	28.045	28.445
15 meters	21.045	21.345
20 meters	14.045	14.245
40 meters	7.045	7.245
80 meters	3.545	3.845
160 meters	1.845	1.845

**73, WD9IIX**



would see London, Paris, Munich (did you drink a beer at the Red Ox in Heidelberg) and Tokyo. Three up and two down. The BC-610, the BC-342, great days.

For oh so many years on 20 I'd pride myself on being able to make out call signs by heavily accented DX stations. I'd make them out when others couldn't. Now, all their English is better and my hearing is worse.

Anyway, we have the oaf from Missouri on one hand and on the other was a letter from a gentleman — Walter Maxwell himself. Class tells, as they say. Of course that was who I meant. I mentioned he had been with RCA, now lived in Florida, etc.

I'll share his letter and letters from others with you next month. And maybe when things go "blink" for Missouri and he starts locking his keys in his car and other missteps, he will become more charitable.

*(The identity of the writer must remain behind an I.Ron Curtain. Deep cover is the only way he will pen his reports. He leaves a silver bullet and rides off into the night. Upcoming will be more puncturing of the balloon of antenna mythology.)*

## Yagis and reality

BRUCE A. RAY

One of my close friends, a principal engineer, who has worked decades in designing TV and FM antennas for broadcasting stations, says that his firm is coming out with a complete line of Amateur HF and VHF type antennas. Not just ordinary antennas mind you, but (according to him) superior to any now available.

Utilizing broadband TV antenna technology, which requires a minimum of 6 MHz of bandwidth, the new patented feed system incorporates a natural built-in balun. This produces VSWR values under 1.9:1 at the band edges and much lower, of course, in the middle of the band.

In addition to much VSWR, the front-to-side ratio is greater than 50dB due to the unique balanced feed system. The transmission line, he says, is absolutely cold.

Best of all, structural engineers

### Field Day Solar Power

The \$289.95 Bullet-Tested QRV Solar Power Supply keeps your repeater on the air round the clock or powers your 100w HF station 60 hrs a month. Control circuit speeds charge, protects gel cells & sealed batteries. Fully assembled, QRV, portable. Easily expanded.

Add \$10 S&H info \$1

**Antennas West**  
 (801)373-8425 Box 50062-W Provo UT 84605

designed the physical construction so it exceeds Electronic Industry Association (EIA) specs for 87 mph winds. His VHF antennas meet the wind requirements with ¼-inch ice coating and the maximum wind, occurring at the same time! So if your VHF antenna came down this past winter, you may want to wait a couple of months for this new rugged line of antennas.

My friend's firm will also make a complete line of HF and VHF monobanders, as well as a log periodic covering all five Amateur bands between 14 and 30 MHz.

Which brings me to this problem of advertised amateur antenna gains. His company has been measuring broadcast antenna gains for the FCC, and he is very concerned by what he sees in the Amateur magazines.

Our hobby's largest-circulation magazine does not accept advertised antenna gain figures in their periodical. Doesn't this concern you? They're not published simply because they're not true and outrageously high!

This practice of salesmanship has gotten so out of hand that there is considerable confusion within our Amateur ranks. Fellow hams tend to believe advertised values because the Federal Trade Commission, which governs such things, has done a pretty good job of policing advertising for commercial products.

Evidently the FTC has not looked into deceptive advertised Amateur antenna gains — yet!

The primary reason for buying a directive antenna of the Yagi variety is its gain over-a-dipole. We then wonder why some antenna firms state gain over-an-isotropic. Every Novice knows isotropic gain is 2.15dB less than our reference dipole.

If we had an even lower efficiency radiator, such as a wet noodle, we would have more dipole gain. The isotropic gain is 2.15dB less than a dipole. A wet noodle could be arbitrari-

ly described as -15dB under a dipole. This then makes the dipole-gain over a noodle to be 15dB! The theory boys says a reference dipole, ½-wavelength long, has 2.15dB over an isotropic.

The lower the gain of the reference, the higher the gain of the compared antenna. So to make the gain number at least 2.15dB higher than a dipole, some unscrupulous companies reference the antenna gain over an isotropic. If they referenced it to the noodle, the gain would be 15dB higher than its true value!

An isotropic radiator, which has not

Only the genuine has these trademarks

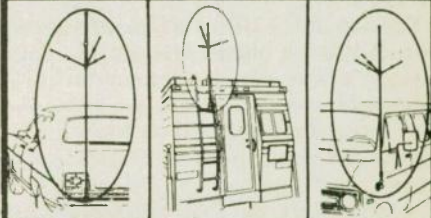
# Spider Antenna

U.S. Patents 4349825, 4460896

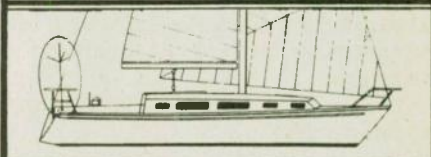
They are your assurance of quality and performance

*Wherever you may roam, on Land or Sea . . . or even at Home*

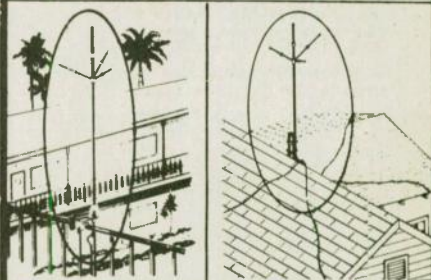
The Spider™ Antenna will help you keep in touch with your ham friends around the world. Four bands—10, 15, 20 and 40 (or 75) meters. Needs no antenna tuner. Custom made with highest quality workmanship and materials.



*On Land . . . Suitable for use on any motor vehicle from a compact automobile to a motor home. Work four bands without stopping to change coils.*



*Or Sea . . . The Spider™ Maritimer™ is for use on or near the ocean. Highly polished non-magnetic stainless steel and nickel-chrome plated brass.*



*At Home . . . If you live in an apartment, condominium or restricted area, the Spider™ may well be the answer to your antenna problems.*

**MULTI-BAND ANTENNAS**  
 7131 OWENSMOUTH AVENUE, SUITE 163C  
 CANOGA PARK, CALIF., 91303  
 TELEPHONE: (818) 341-5460

ALL BAND

## SUPER TENNA

Proven design  
 Stainless Steel  
 Commercial Construction  
 Manual switching -- no resonator changing  
 Large, air wound coil  
 500 watts PEP

\$99.50 plus 5.00 shipping

**Gene Hansen Co.**

1000 Hansen Road  
 Corrales NM, 87048-0419  
 (505) 898-3251





been invented yet, radiates equal energy in *all* directions, therefore a dipole which has some directivity, radiating more broadside than at its ends, has some gain. This turns out to be 2.15dB more in the dipole's peak direction, than the isotropic in any direction. In practice commercial antennas are rated with reference to a halfwave dipole.

A long time Amateur, John Kraus, W8JK, author of *Antennas*, says in his first edition (1950, page 25 and 1988 second edition, page 26-27) that the antenna gain ratio over an isotropic reference is simply 41,253 divided by the horizontal half-power beam width times the vertical half-power beam width, less IR and undesired side lobe losses.

For example a very popular 2M Yagi is advertised as having a horizontal beam 60 degrees wide, while the vertical is 83 degrees. Well, 41,253 divided by  $60 \times 83$  is a power gain ratio of 8.232 over an isotropic. This power ratio is equal to 9.155dB.

Now we subtract 2.15dB to convert isotropic to dipole reference and we have 7.005dB over a dipole. This figure assumes there is no IR loss in the antenna, or undesired side lobes.

We would think a 2M wide-spaced Yagi with a halfwave balun and four

elements would have an IR loss of nearly 1dB and some side lobe loss. Let's be conservative and say the loss is only 0.500dB. Subtracting 0.5dB from the 7.005dB gain over a dipole, we have a net antenna input gain of 6.505dB.

Guess what? This well known manufacturer claims in his advertising and catalogs that the antenna gain is 10.2dB over a dipole, 3.695dB more than its probable true value!

What's an honest manufacturer to do? Nearly all of them have been caught up in this advertising hyperbole. These gain exaggerations are difficult to pin down because the average Amateur does not have the facilities to measure the patterns and gains. If the antenna beamwidths are unknown or difficult to measure, he cannot apply simple theory as we just did. Unlike RF power output from the transmitter into a wattmeter, a commercial antenna range is hard to come by.

Please write to me in care of Worldradio and indicate your thoughts about exaggerated antenna gains and VSWR. Your comments would be welcomed, and we promise to include your thinking in a future column. Please include a SASE if you wish for a reply.

Another serious matter is that American Amateur antenna manufacturers do not meet any engineering standards, although such standards as EIA and National Electrical Code (NEC) have in fact been in existence for many years. Insurance companies are just becoming aware of this and some city/county building departments are requiring compliance with EIA structural standards prior to issuance of building permits for towers with antennas.

Thus, we have shoddy merchandise that fails in the first real windstorm or comes down when icing occurs, because they are not properly designed by EIA minimum standards. I'm always amazed that our Amateur antenna firms do not meet any industry standard specifications, when in fact, two very important standards do exist. The most pertinent one covers Amateur antennas — EIA RS-409. The other, RS-222-D, covers towers. The RS-409 antenna specs may be purchased for \$5, including postage, by sending a check to Electronic Industry

Association, Engineering Department, 2001 Eye St., NW, Washington, D.C. 20006.

We suggest that the next time you buy a Yagi antenna, be it a tri-bander or a monobander, you insist the antenna meets RS-409 minimum standards. If the dealing clerk at the 800 number doesn't know what you are talking about, perhaps you should phone someone else. The RS-409 spec clearly and in simple English states just how antenna gain must be measured and stated in dB/d along with VSWR, safe input power rating and, of course, radiation pattern measurement. Mechanically, it is specific about wind speeds, safety factors, corrosion and resistance to weathering.

I was therefore pleased to learn from my colleague that his firm will soon be making and marketing a complete line of HF and VHF antennas for Amateurs that exceed the requirements set forth in RS-409, along with honest forward-gain values. □

## No big deal?

Tom Hanbrick, N6QJM

While sitting in my radio shack the other day, just pursuing and collecting 10-10 numbers, I contacted a station in Albany, Georgia. His call sign was KB4FEA. During our QSO he stated that he had a son stationed aboard the USS *Constellation*, a ship that is home ported here in San Diego. He wanted to leave a message for his son. I agreed and wrote down the message.

I went to the telephone and I was unable to make the contact with his son. I had learned from the QSO that his son was a Signaller and contacted a friend of mine who is a General Class ham, and an active-duty Chief Quartermaster in the U.S. Navy: Rick Julin, KB6HT.

Rick agreed to send the message via flashing light. The only problem here was that he could not send directly to the *Constellation* because they were not in view of each other, so another ship was brought into the action. At this point, a message had traveled almost 3,000 miles and flashed from one end of San Diego Bay to the other and back again.

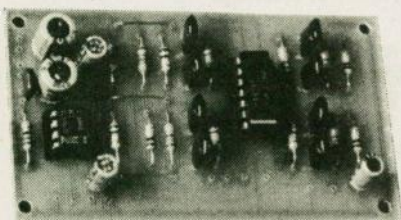
The message was received in good time, and four days later I received a card from Albany saying THANKS.

Oh, the message — LOVE YOU AND MISS YOU - DAD.

— South Bay ARS News □

**NEW!**

### CW AUDIO FILTER KIT



- CLEAN UP THOSE CW SIGNALS. ELIMINATE QRM.
- EASILY CONNECTS BETWEEN YOUR TRANSCEIVER AND SPEAKER.
- 90, 130, 200 Hz SELECTABLE BANDWIDTHS. 800 Hz CENTER FREQUENCY.
- BUILT-IN AUDIO AMPLIFIER DRIVES A SPEAKER.
- COMES WITH PCB, WIRE, SWITCH AND ALL PARTS NEEDED TO COMPLETE THE BOARD.
- OPERATES ON A 9 VOLT BATTERY.
- SIZE: 2 x 3.4 INCHES.

**ONLY \$19.95**

PLEASE ADD \$2.00 POSTAGE TO YOUR ORDER  
WISCONSIN RESIDENTS ADD 5% SALES TAX  
SEND FOR FREE INFORMATION

**BEL-TEK**  
P.O. BOX 125  
BELOIT, WI 53511

### C. A. T. S.

Rotor Parts and Repair Service  
Reconditioning Large or Small  
American Made Rotors  
Repairs - \$15.00\*  
Rebuilds - \$35.00\*

All parts in stock for immediate delivery.  
Reconditioned units for sale.

### C. A. T. S.

7368 S.R. 105 Pemberville, OH 43450  
Call N8DJB at (419) 352-4485 11:00-7:00

\*LABOR ONLY - PARTS & SHIPPING ADDITIONAL

R  
O  
T  
O  
R

P  
A  
R  
T  
S

**Pass it on ... WORLD RADIO**





QRP operation is a fun mode. The fun reaches epic proportions when you pursue the low power operating side of the hobby using home built equipment. In past columns I have featured a couple of simple QRP construction projects. This month we are going whole hog and build up a single band QRP CW transceiver. Now this is going to be a bare bones rig with no frills. So let's get started.

Chris Hethorn, KM8X, runs the Small Parts Center in Lansing, MI. Chris is a dedicated QRPer who has taken it upon himself to bridge the gap between the homebrewer and the parts houses. In addition to the massive array of small parts provided by The Small Parts Center, Chris has undertaken an effort to provide quality kits based upon several tried and true designs. His version of the QRP ARCI Two-Fer transmitter kit is accompanied by a Two-Fer receiver kit (designed by John Collins, KN1H). These two kits couple together to make a single band transceiver with about 3W output, VXO control and, with the addition of the optional T/R board, semi-break in, side tone oscillator and antenna/Vcc switching.

The boards measure approximately 2 x 3 in (TX), 3 x 3 in (RX) and 2.5 x 3 (T/R). No attempt at miniaturization was made, so the boards are quite a bit larger than really necessary. This is nice, however, because it makes construction quite easy. Each kit (transmitter, receiver, T/R switch) almost builds itself. Instructions are quite clear and the parts overlay provided with each kit is very explicit in parts placement.

The transmitter is the basic Two-Fer design using four transistors. A 50 pf air variable cap is used in series with the crystal to warp it below the crystal frequency to achieve some VXO action. I can achieve about a 3.3 kHz

### Field Day AntennaPacks

EmergencyPacks contain QRP All Band kink-proof wx-sealed multi-band Dipole-V-Sloper antenna, 70' coax feedline, Quick Launch system, rotproof dacron support braid, 40 p Tech Manual. Complete. Ready for Action. One person installs in 15 minutes. Infopack \$1.



Fastest Antennas in the West

AntennasWest (801) 373-8425

Box 50062-W, Provo, UT 84605

swing in my 40M version of the transmitter. Power output was measured at 3.2W output into a 50 dummy load on 7030 kHz. The rig fired up first time and no troubles were encountered.

The receiver uses a SLB-1 double-balanced mixer to perform the direct conversion chores. This is then fed through a high gain IC audio amp into the earphones. T and C performs as an audio filter prior to AF amplification. VFO injection is obtained from the transmitter board crystal oscillator, which runs continuously. Construction of the receiver board went well but a bad bypass capacitor caused some headaches until it was replaced.

The T/R board provides antenna and Vcc switching between the RX and TX boards, along with sidetone for the transmitter. While not essential to the operation of the Two-Fer transceiver (you can use a DPDT toggle switch to perform Vcc and antenna switching), the T/R board provides semi-QSK in addition to a sidetone output to monitor your keying. Being able to hit the key and immediately have the transmitter key-up without throwing any toggle switches is worth the extra investment. The side-tone is a nice touch, too.

After the initial construction phase, I fired the little transceiver up on 7030

kHz (that was the only 40M crystal I had) and listened around on the ANT Farm Skyraider antenna. The receiver performed very well and, while tuning around 7030 at 0205Z (Dec. 12), I heard Frank, WA2KOS, in Rye, NY, calling CQ. A quick call using the two wires for the key (I couldn't find my J-38 straight key) to make the dots and dashes yielded my first QSO with the Two-Fer. I got a 559 RST with only 3W output into a 50 ft. end-fed wire only 30 ft. off the ground! Success!

Chris also offers a keyer module and an AF active filter which will make this little QRP rig really perform. However, I approach the single signal reception idea a bit differently. Since I have the Datong FL-3 active AF filter in the shack, by feeding the audio output of the Two-Fer transceiver into the FL-3, single signal reception is way of life. The output of my MFJ Grandmaster keyer is connected to the keying line and provides quality keying for the Two-Fer transceiver.

In all, the Two-Fer transceiver kit offered by The Small Parts Center is very good value for money. These kits offer a worthwhile project for the beginning or advanced QRPer. The tremendous sense of accomplishment derived from using homebrew equipment to pursue the QRP hobby has to be experienced

**JANUARY 4, 1983**  
 \* \* \* \* \*  
**A CURE WAS FOUND**  
**FOR THESE DISEASES :**

1. REFLECTED POWER-ITCH
2. KNOB-ITUS
3. QRM-DEAFNESS
4. BUTTON-PHOBIA
5. SWITCH-CANKER
6. SUPER TUNER-BLUES
7. CROSS NEEDLE-EYES

\*  
**THE CURE IS:**



# MAXCOM

**AUTOMATIC ANTENNA MATCHER** ®  
 FOR ALL S.S.B. RADIOS

\* **ONE SHOT GUARANTEED TO LAST**  
**AT LEAST FIVE YEARS!**

\* \* \* \* \*

Sonny Irons • P.O. Box 502  
 Ft. Lauderdale, FL 33302 • (305) 523-6369

\* MAXCOM is a registered trademark and is owned by Maxcom Electronics, Inc.

**THE BOTTOM LINE: "MAXCOM WORKS"**



to be believed. The Two-Fer transceiver kits are a very inexpensive way to discover what the homebrewing side of the hobby has to offer.

Two-Fer kits are available from The Small Parts Center, 6818 Meese Dr., Lansing, MI 48911. A complete catalog and price list is available from

Chris. It details the offerings of his company. For my money, I'll take the Two-Fer transceiver kit from Chris' Small Parts Center any day.

Questions/comments, SASE to Rich Arland, K7YHA, 25 Amherst Ave., Wilkes-Barre, PA 18702. 73s es gud DX. □

## Did YOU work OX5JJ?

The September 17 issue of *Stamp Collector* details how an Amateur Radio operator in Greenland ("the world's largest island with only 50,000 inhabitants") became part of the country's stamp collecting history.

A thick book of cards (QSLs to/from OX5JJ) has recently been published by *De Greonlandske Posthistorikere* (Greenland Postal Historians) in Copenhagen, Denmark. The cards are from the collection of Jorgen Chr. Jorgensen, OX5JJ, a Danish citizen working in Greenland from 1946 to 1948 at the Cape Cort Adelaer weather station, population 6.

The station was operated by the United States during the war to pro-

vide correct weather information to planes operating between England and North America. The Germans apparently broadcast phony weather reports to prevent the flights. Jorgensen used his time off-duty to talk to other Amateur operators throughout the world. His outgoing QSL cards apparently were returned from the bureau and he couldn't mail them direct since Greenlandic stamps were not available.

The Jorgensen QSLs are now very valuable collectors items! If you worked OX5JJ, The Greenland Postal Historians (Rosaagard 7, 3.th, DK-2300 Kobenhavn S, Denmark) would like to hear from you! You might even get to see your QSL card . . . and the one that you never got in return!  
—Wichita ARC, Wichita, KS □

## ARRL works for Armenia

Six donated complete packet VHF stations were sent to the USSR at the request of Leonid Labutin, UA3CR, who was put in charge of radio communications in support of the Armenian earthquake relief effort by the Radio Sports Federation of the USSR.

Leo had requested assistance in the form of portable packet-radio stations to help the Soviets develop their fledgling packet-radio network in response to the emergency.


Leo is well known to North American Amateurs through his long involvement in the amateur satellite program and in the joint Canadian-Soviet ski trek earlier this year.

Thanks to *QST* columnist Vern Riportella, WA2LQQ, donations of equipment were lined up from the Tandy Corporation (six Model 102 laptop computers), Yaesu USA (six FT-23R transceivers) and AEA (six PK-88 TNCs, a PK-232 data controller and six Hotrod antennas).

The donations were shipped to ARRL HQ, and employees of the ARRL lab spent two days making up cables to integrate the donated equipment as six complete, separate packet stations. The ARRL added a supply of batteries and some other accessories to the shipment.

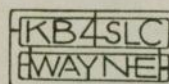
The completed stations were packed and given to Vern, who delivered them to Kennedy Airport, where they were flown to Moscow on Dec. 21, 1988.  
—The ARRL Letter □

**A**



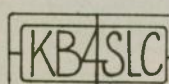
13" Wall Plaque  
\$65 plus \$5 shipping

**B**




7" x 11" Wall Plaque  
\$45 plus \$5 shipping

**C**



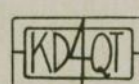
7" x 11" Wall Plaque  
\$35 plus \$5 shipping

**D**




4" on 2" Stand  
\$25 plus \$5 shipping

**E**



3" x 4" on 2" Stand  
\$20 plus \$5 shipping



advanced concepts  
DEVELOPMENT  
PO BOX 32214 LOUISVILLE, KY.  
ZIP 40232-2214  
Phone 502 456 5699

**GO AHEAD!**

**BRAG  
A LITTLE!**

**YOU  
EARNED IT!**

Each call plaque is handcrafted and made of highly polished #6 and #10 copper wire. The completed sculpture is shaped to form by hand. No jigs or patterns are used to create this custom made sculpture. Then each piece is encapsulated in a clear colored (black or red) plastic resin base . . . suited for a life-time, eye appealing display.

Please check the model you wish to order.

A     B     C     D     E

MAIL TO  
**ADVANCED CONCEPTS DEVELOPMENT**  
 P.O. Box 32214 • Louisville, KY  
 Zip 40232-2214 • Phone 1-502-456-5699  
 Color: \_\_\_\_\_ Your Call: \_\_\_\_\_

Allow 2 weeks for crafting and shipment.  
 Personal checks and COD accepted with mail orders.

**CUSTOM EMBROIDERED  
QUALITY HAM HAT**

**SUMMER**  
\$7.95 ea.

**CORDUROY**  
\$9.25 ea.



Display your NAME, CALL and HOMETOWN on a RED or ROYAL BLUE summer mesh back cap with matching bill and white foam front. Emb. matches cap color.

FULL CORDUROY available in RED or NAVY with GOLD embroidery.

Note — NAME (max. 14 ltrs.); CALL (max. 6 ltrs.); HOMETOWN (max. 14 ltrs). Send CK or M.O., plus \$2.50 S&H; add 25¢ ea. add'l cap. MD residents add 5% tax. Del. 3-5 wks.

**EMBROIDERY WAREHOUSE**  
 P.O. BOX 1476  
 SEVERNA PARK, MD 21146





## A look back

ROBERT BEASLEY, K6BJH

Hallicrafters, Hammarlund, National, E.F. Johnson — those are names to evoke memories. While having a little memory exercise the other day (we old-timers have to exercise our memories, otherwise we lose it; I forget what else goes), it dawned on me that in the old days we had an enormous choice in the manner in which we hams wished to tailor our shacks. We could set up a functional station for anywhere from \$70 to \$7000, depending upon the financial status and seriousness of the Amateur involved.

As an example if you were not a builder, Allied Radio offered a complete station for \$87.50. This package included a Hallicrafter's S-38 all wave rcvr.; Hallicrafter's HT-17 xmtr.; (80 thru 10M) handkey; double headset; 40M xtal; two antenna insulators; 200 ft. coil of no. 14 antenna wire; a call book and a logbook.

On the other hand, if you wanted to go first-cabin, you could choose a Collins KW-1 transmitter running a cool kilowatt, all bands AM phone, for \$3850 or a Collins 75A-3 rcvr. with mechanical filter for \$530. What with

the required accessories, converter, pan adapter, towers, rotators, beams, rhombics and any other goodies that any respectable DXer would require, you've ruined an \$8000 bill. To put that in proper perspective, that would buy you a couple of pretty good houses in that time frame.

Most Amateurs, however, set their sights somewhere in that vast middle ground between the two examples mentioned above. There were klunks, and then there were pretty fine pieces of equipment, at fairly reasonable prices. You have to remember that in those days a dollar was closer to being worth a dollar and most of us sought to get the most value for the dollar spent.

An example of a good receiver in the mid-price range was the Hallicrafter SX-71 with crystal phasing for \$224.50. Another was Hammarlund's HQ-129-X, and an outstanding, but somewhat expensive (at \$483.50) receiver, National's HRO-60. This one was peculiar in that National's designers apparently felt that total bandswitching was inefficient, so they provided a separate set of plug-in coils for each band. To change bands, the operator had to open the lid, remove the existing coil and insert the desired one in the socket.

A much wider range of transmitting equipment was available, with many well-known, as well as off-breed, names and garage-type industries in the business. For example, Lettine, Sonar, World Radio, Millen, Harvey Wells, Subraco, Micamold, Meissner, Lysco, Gonset, Electro-Comm, Morrow, Elenco, Tecraft, Hart, Elmac, Lakeshore, Eldico, Central Electronics, Marmax, Babcock, Deltronics, Black Widow and probably many others of which this author is not aware.

Few of the above manufacturers provided a transceiver, especially in the HF bands. You had to build up your station from separate units, with

## R-X Noise Bridge



- Learn the truth about your antenna.
- Find its resonant frequency.
- Adjust it to your operating frequency quickly and easily.

If there is one place in your station where you cannot risk uncertain results it is in your antenna.

The Palomar Engineers R-X Noise Bridge tells you if your antenna is resonant or not and, if it is not, whether it is too long or too short. All this in one measurement reading. And it works just as well with ham-band-only receivers as with general coverage equipment because it gives perfect null readings even when the antenna is not resonant. It gives resistance and reactance readings on dipoles, inverted Vees, quads, beams, multiband trap dipoles and verticals. No station is complete without this up-to-date instrument.

Why work in the dark? Your SWR meter or your resistance noise bridge tells only half the story. Get the instrument that really works, the Palomar Engineers R-X Noise Bridge. Use it to check your antennas from 1 to 100 MHz. And use it in your shack to adjust resonant frequencies of both series and parallel tuned circuits. Works better than a dip meter and costs a lot less.

The price is \$69.95 in the U.S. and Canada. Add \$4.00 shipping/handling. California residents add sales tax.



Send for FREE catalog describing the R-X Noise Bridge and our complete line of SWR Meters, Preamplifiers, Toroids, Baluns, VLF Converters, and Loop Antennas

# Palomar Engineers

Box 455, Escondido, CA 92025  
Phone: (619) 747-3343

## GEM QUAD PRODUCTS (1987) LTD.

Chosen By Amateurs For Over 15 Years.  
Winner of the Manitoba Design Institute  
Award of Excellence.  
Will Accommodate New Bands From  
2 To 20 Meters.

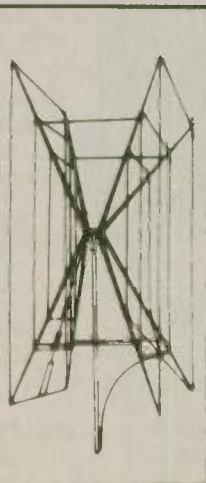
*Fiber Glass Quad Antenna For 10, 15, and 20 Meters*

2 Element \$235.00  
3 Element \$399.00  
4 Element \$563.00

Price is F.O.B. Boissevain.  
Includes U.S. Customs Duty.

Kit Includes: Spider, Arms, Wire, Balun  
Kit and Boom Where Needed

Boissevain, Manitoba, Canada R0K 0E0  
P.O. Box 291, Telephone (204) 534-6184





a separate co-ax and power relay, usually mounted externally on the wall, hammering away (keep your foot off the B+!).

Prior to WWII Meissner offered a portable transceiver for the old 2½M band (batteries, mike and earphones not included!). It utilized a superegen receiver and measured 12 inches square by 6 inches deep. It weighed in at 12½ pounds (hang THAT one on your belt!).

Incidentally, we didn't refer to them as "HF" bands in those days, but rather as "DC" bands, for the simple reason that FCC regulations stated that those frequencies in the HF category of 160 through 10M shall utilize a power supply providing "pure filtered DC current." With respect to the VHF bands, the sky was the limit and you could modulate raw AC if you wished.

Most Amateurs used manufactured receivers, but an appreciable number built their own transmitting gear. If you were one of these, you used components made by such manufacturers as Millen, Cornell-Dubilier, Sprague, IRC, Stancor, Eimac, Thordarson, Mallory, B&W, Shurite, Bud, Centralab, Amphenol, RCA, GE, E.F. Johnson, etc.

If you were a builder, you could get

on the air with a fairly respectable signal using a single 6L6 crystal oscillator on 80 or 40 C.W.

Some of the guys went "high power" by using a metal can 6L6 mounted upside-down in a tomato can full of water to dissipate the extra heat. You had to use a little caution with this method otherwise the extra grid current might fracture the crystal.

Other than the nostalgic little excursions which I have made, I have been trying to make a point — of all of the aforementioned manufacturer's names, there are no Japanese names or aliases. We were entirely self-sufficient. I suppose there is also a message that somewhere along the line we dropped the ball and the Japanese picked it up and ran with it.

While some or most of the technology of today's radio gear is ours, the Japanese were able to pick up on it and, as a result, have been able to market some pretty fantastic looking and operating gear. Set an old Lettine Model 240 alongside a Kenwood TS-940S and you'll see what I mean.

Ah well, maybe all this Japanese stuff is just a passing fancy. Maybe someday our guys will be on top again. Maybe they'll be able to put an 807

modulated by a pair of 6L6's on a chip and I'll be able to stick it in my horn button and go AM mobile again. Maybe Amateur Radio will become simple enough that I can start building my own gear again.

If you believe that, I have some good old AM gear that I will sell you quite reasonably. □

## Interesting facts Department

ROBERT BEASLEY, K6BJH

*Didju know that*

Located between television channels 6 and 4 are the following:

- The FM broadcast band?
- The VHF aircraft frequencies, both commercial and private?
- The entire 2M band?
- The high VHF emergency services, including police, fire, ambulance dispatch, forestry and other US governmental frequencies. Plus mobile operator, marine operator, Coast Guard and certain military frequencies? □

## Six Shots!

(continued from page 45)

of other antenna products and lack of space to continue their marketing.

As many of you know, I replaced my old tribander with a Hustler 10-MB4 10M monobander, and find it to be an excellent antenna. I am extremely happy with it and unhappy that I can't get a 15M version of it. I never knew Hustler had HF monobanders and a 6M Yagi in their product line until recently. I know them for their fine mobile antennas. Cliff said that if there is sufficient support, it might be possible to re-instate the HF monobander line. Write to him at Hustler if interested.

See you on The Magic Band all of a sudden! □



IF YOU BUY, SELL OR COLLECT OLD RADIOS, YOU NEED...

**ANTIQUE RADIO CLASSIFIED**

Antique Radio's Largest-Circulation Monthly Magazine

Articles - Classifieds - Ads for Parts & Services Also: Early TV, Ham Equip., Books, Telegraph, 40's & 50's Radios & more...

Free 20-word ad each month. Don't miss out!

Free Sample. 6-Month Trial - \$11.

1-Year: \$19 (\$28 by 1st Class). Foreign - Write.

A.R.C., P.O. Box 2-N4, Carlisle, MA 01741

**N**ow receive or leave messages with other local hams using the 16K Bulletin Board featured on the smallest TNC available — the Heath® HK-21 Pocket Packet.

The BBS operates under your call with simple commands like Send or Write a message, Kill a message and read the File messages currently on the system. And the HK-21 Pocket Packet is fully TNC-2 compatible.

Hookup is easy. Plug in supplied cables instantly to most

HT's, or wire a separate cable into your mobile or base VHF or UHF rig. Connect your

Get your message across... even when no one is listening.

computer via RS-232 and you're ready to call a fast-growing number of packet hams.

The HK-21 Pocket Packet requires only a single 12 VDC@40mA power source or as little as 29mA from an optional HKA-21-1, internally mounted 4.8 volt, 120 mAh, NICAD battery.

The Heath® HK-21 Pocket Packet — \$219.95 (Amateur net price)  
To order, call 1-800-253-0570

For information on Heath's complete line of amateur radio products call 1-800-44-HEATH for your FREE Heathkit® catalog.

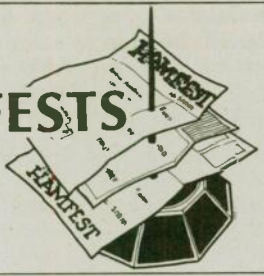
Best to start with. Best to stay with.

**Heath Company**  
Benton Harbor, MI 49022

A subsidiary of Zenith Electronics Corporation. ©1989, Heath Company



# HAMFESTS



## California

The NORTH HILLS RADIO CLUB will sponsor a hamfest Sunday, May 21, at the Folsom Community Clubhouse in Folsom. Hours are from 8 a.m. to 3 p.m.

Featured will be a HAMSWAP, food and refreshments, club auction, inside tables, tailgating, free parking, a park and kids' rides.

Admission is free, tables are \$6 (no advanced sales).

Talk-in on 145.19 and 224.78.

For information contact NHRC, P.O. Box 41635, Sacramento, CA 95841; or phone Bob, WA6ULL, at 916/983-2776. □

## Illinois

The 32nd annual hamfest sponsored by the SIX METER CLUB OF CHICAGO will be held on June 11 beginning at 6 a.m. in Willow Springs.

Advanced tickets are \$3, \$4 at the door.

Featured will be a large swapper's row, picnic grounds, plenty of parking space, displays in the pavillion, refreshments and an AF-MARS meeting. Overnight camping will not be permitted.

Talk-in on K9ONA 146.52 or K9ONA/R 37-97.

To purchase advance tickets contact Mike Corbett, K9ENZ, 606 S. Fenton Ave., Romeoville, IL 60441. □

The CHICAGO ARC will hold its annual Mini-Hamfest on Sunday, May 21, from 9 a.m. to 3 p.m., at the "North Park Village" in Chicago.

Admission is \$2 at the door. Indoor facilities will be used if it rains.

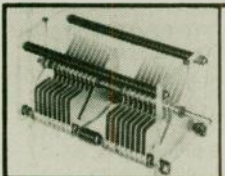
Talk-in on 146.52.

For information write CARC, 5631 W. Irving Park Rd., Chicago, IL 60634; or call 312/545-3622. □

The KNOX COUNTY RADIO CLUB INC. will hold its annual Knox County Hamfest on Sunday, May 21 at the Knox County Fairgrounds in Knoxville. There will be a large commercial display building and acres of outside fleamarket space available at no charge.

The gates open at 7 a.m. and the commercial building at 8 a.m.

Talk-in will be on 147.001/146.40.



### HV Variable Capacitors

for Antenna Tuners/  
RF Amplifiers

- Roller inductors
- Counter dials
- Antenna tuners & Kits. Reasonable prices!

#### KILO-TEC

P.O. Box 1001•Oakview, CA 93022  
To order call: (805) 646-9645

As in the past the Knox County Pork Producers will be serving their famous Butterfly pork chops and other goodies. VE testing will be given near the hamfest site.

For table reservations, pre-registration of testing and advanced tickets, write Keith L. Watson, WB9KHL, 119 South Cherry St. #3, Galesburg, IL 61401-4527; or call 309/342-3885 in the evenings. □

## Michigan

The WEXAUKEE ARA is sponsoring its annual Swap and Shop from 8:30 a.m. to 2:30 p.m. on Saturday, May 20 at the Cadillac Middle School in Cadillac.

Admission is \$3. Tables are \$6.

Talk-in on the 146.377.97 repeater.

For more information contact John Craddock, KX8Z, at 616/797-5491; or write Wexaukeee ARA, P.O. Box 163, Cadillac, MI 49601.

The CHELSEA ARC INC. will hold its 12th annual Swap 'N Shop at the Chelsea Fair Grounds in Chelsea on June 4. Gates will open at 5 a.m. for sellers.

Admission is \$2.50 in advance, \$3 at the door. YLs, XYLs and children under 12 are free. Table space is \$8 per 8 ft. Trunk sales are \$2 per space.

There will be a talk-in on 146.980, the Chelsea repeater.

Campgrounds are available in the area, as is plenty of parking and special handicapped parking. Breakfast and lunch will be available in the service center.

For more information call Robert Schantz at 313/475-1795; or write 416 Wilkinson t., Chelsea, MI 48118. □

## Minnesota

The PAUL BUNYAN RADIO CLUB will hold its annual hamfest on Saturday, May 6 at the new VFW Club in Bemidji. The hours will be 8 a.m. to 4 p.m.

Breakfast and lunch will be served by the VFW. Talk-in on 146.13/73.

Dealers, exams and flea market will be featured.

For more information write to Robert W. Bitz, KR0KTB, 401 Roosevelt Manor, Bemidji, MN 56601; or phone 218/751-8748. □

## New York

The 30th Annual SOUTHERN TIER hamfest will be held at the Tioga County Fair-

grounds (Marvin Gardens) in Owego on May 6.

Talk-in on 146.16/76 and 146.52.

Gate admission is \$4; under 14 free. Dinner and gate ticket combined is \$15 in advance.

ARRL VEC exams, vendor displays and an all day flea market are some of the features.

For more information or ticket orders, please send a SASE to STARC, P.O. Box 7082, Endicott, NY 13760. □

The PUTNAM EMERGENCY AND REPEATER LEAGUE is sponsoring the Pearl-pear from 9 a.m. to 4 p.m., Saturday, May 6, at JFK Elementary School in Brewster. Doors will open at 8 a.m. for setup.

Admission is \$3 per person. Tailgate space is \$5 — this includes one admission. Tables are \$8 — this also includes one admission. Additional tables are \$5 each.

For registration or further information, contact Terri Cullum, N2GWF, 40 Mile Hill Rd., Highland, NY 12528, 914/691-6809; or Jim Morgan, KA2FIQ, 39 Overlook Rd., Ossining, NY 10562, 914/762-0061. □

## North Carolina

The DURHAM FM ASSOCIATION will hold its 10th annual DURHAMFEST 1989 Saturday, May 27 from 8 a.m. to 4 p.m. in the lower rear deck South Square Mall in Durham. The festivities will take place indoors, rain or shine.

Talk-in on 147.825/225, the Friendly Repeater WA4WTX/R.

Vendors, plenty of free tailgating space and table rental will be featured.

Admission is \$4 at the gate. AC power is available for equipment testing.

FCC exams may be taken by pre-registration only.

Contact Mick Rankin, W4ZUS, 1001 Wedgewood Lane, Durham, NC 27712 for further information on the hamfest. □

## South Carolina

The BLUE RIDGE ARS will sponsor the 50th annual Greenville Hamfest and Electronic Flea Market on May 6 and 7 from 8 a.m. to 5 p.m. Saturday, and 8 a.m. to 3 p.m. Sunday at the American Legion Fairgrounds in Greenville.

Amateur Radio license exams (walk-in), 25,000 square ft. of indoor dealer displays, indoor/outdoor electronic and computer flea market, food, concessions, free parking, camping and prizes are some of the features.

Early dealer/flea market setups are available with advance registration.

Admission is \$4 in advance and \$5 at the gate.

For advance tickets or additional information, send a SASE to: Blue Ridge ARS, P.O. Box 6751, Greenville, SC 29606. □

## Washington

The YAKIMA ARC, W7AQ, announces Hamfest '89, which will be held May 20 and 21 at the Central Washington State Fairgrounds in Yakima.

This annual event features VE exams, commercial exhibits, swap and shop tables, lectures and lunch and breakfast both days. A no-host dinner will be held Saturday night.

The admission price is \$5 and S&W tables are \$5.

The talk-in frequencies are 146.66/06 and

## Call Sign Mugs

Your amateur radio call sign on a distinctive 10 oz. ceramic coffee mug or a 15 oz. beer mug, with the ARRL or QCWA logo on the flip side. Get one for the shack and one for the office. Mug pairs can have the same or different call signs. Coffee mugs are \$5.95 each, or two for \$10.95. Beer mugs are \$7.95 each, two for \$14.95. S/H \$1.50 for one, plus \$0.50 for each additional mug. NC residents add 5% sales tax. State your logo choice.

**CALL SIGN CUPS**  
P. O. Box 17062  
Raleigh, NC 27619



146.84/24.

Please contact Dick Umberger, N7HHU, at 509/453-8632 days and 509/453-3580 evenings for information; or for the early bird special mail to: Yakima ARC, W7AQ, P.O. Box 9211, Yakima, WA 98909. □

## West Virginia

The 11th Annual TRIPLE STATES RAC Wheeling Hamfest/Computer Fair will be held Sunday, May 21, at Wheeling Park in Wheeling from 8 a.m. to 3 p.m.

There is 35,000 sq. ft. under the roof and six acres of free flea market area.

Women and children 14 and under are free. Admission is \$3 in advance, \$4 at the door.

To reserve space contact Sandi Williams, WC8P, 9 East High St., Flushing, OH 43977; or phone 614/968-3652. For tickets contact TSRAC, P.O. Box 240, RD 1, Adena, OH 43901; or phone 614/546-3930. □

## Wisconsin

The OZAUKEE RADIO CLUB INC. will sponsor its 11th Annual Swapfest on Saturday, May 6, from 8 a.m. to 1 p.m., at the Circle B Recreation center.

Admission is \$2 in advance, \$3 at the door. Four ft. tables are \$2 each, in advance only.

Door prizes, food and refreshments will be available.

Sellers will be admitted at 7 a.m. for table setup.

Talk-in on 146.55 MHz and 146.371/97 Repeater.

For tickets, tables, maps or more information, send a business size SASE to ORC SWAPFEST, N5415 Crystal Springs Court, Fredonia, WI 53021. □

**A CLASSIFIED AD PLACED IN  
WORLD RADIO** will reach the most active, involved Amateur Radio operators. Your ad will be seen here before it will be seen in any other Amateur Radio publication. We get the news out first. Get results from  
**WORLD RADIO**



**Toroid Cores.  
Iron Powder  
& Ferrite.  
Ferrite Beads.  
Ferrite Rods.**

Free catalog and winding chart on request.

**PALOMAR  
ENGINEERS**

Box 455, Escondido, CA 92025  
Phone: (619) 747-3343



## Crooked Stick and Rat's Nest

This event, sponsored by the Issaquah ARC, is designed to encourage elmering of new Novices and participation by handicapped Amateurs and other interested persons. It will be held on May 13 from 2000 to 2300Z.

**Exchange:** Signal report, QTH and serial number of contact.

**Suggested frequencies:** CW — 28.100-28.200 and SSB — 28.300-28.500. Power is limited to 200W PEP output.

**Scoring:** SSB contacts — 1 pt. and CW contacts — 4 pts. Multiply by 2 if working with an apprentice or if using an antenna constructed especially for this contest. No part of this antenna may be more than 20 ft. above the ground and it must be constructed of no more than 100 ft. of wire.

**Bonus points:** Add 100 pts. for a newly licensed Novice making first ever contact or if operator or apprentice is physically handicapped. Add 50 pts. for working all US call areas. Add 25 pts. for a description of the contest activity or a photograph of your antenna, contest operation or contest group.

**Awards:** Certificates will be issued for first, second and third places for SSB and CW. Certificates will also be issued to all entries with an unlicensed or handicapped participant.

**Logs:** Submit log copies and summary sheet to Martha Stedman, N7IVX, 15423 SE 7th Pl., Bellevue, WA 98007, by May 25. Specify names of individuals for special participation certificates. □

## Michigan QSO Party

The 1989 Michigan QSO Party will be sponsored by the Oak Park ARC, May 20-22. Operation times will be: 1800Z, Saturday, May 20 to 0300Z, Sunday, May 21; and 1100Z, Sunday to 0200Z, Monday, May 22.

Phone and CW are combined into one contest. Michigan stations can work Michigan counties for multipliers. A station may be contacted once on each band/mode. Portable/mobiles may be counted as new contacts each time the county changes.

**Exchange:** RS(T), QSO#, QTH, county for Michigan; state or country for others.

**Scoring:** Multipliers are counted only once. Michigan stations — 1 pt. per QSO × (states

## DX Helper

Macintosh Software W7-F

MUF Map • MUF Plot

Gray Line • Great Circle

Prefix, Zone, Obsolete

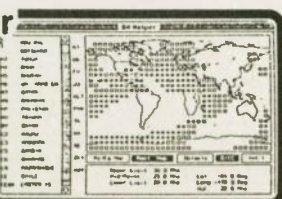
WWW Alert • CW Drill

**\$39.95** Info \$1

Antennas West

Box 6002-W, Provo, UT 84605

(801) 373-8425 See band openings on the map before they happen!



+ counties + Michigan counties) on phone. Each CW contact is 2 pts. per QSO. Alaska and Hawaii count as states. VE counts as a county. Maximum multiplier is 85.5 pts. for each W8MB contact. *Non-Michigan stations* — QSO points × Michigan counties. 1 pt. for each club station contact with W8MB/W8MB/Mobile. Maximum multiplier is 83. *VHF-only entries* — Same as above, except multipliers per VHF band are added together for total multipliers. No repeater contacts are allowed.

**Suggested frequencies:** CW — 1810, 3540, 3725, 7035, 7125, 14035, 21035, 21125, 28035 and 28125; Phone — 1855, 3905, 7280, 14280, 21380 and 28580; VHF — 50.125, 145.025 and 146.52.

**Awards:** Michigan: Plaques — high Multi-operator/single transmitter score, high Michigan score, high VHF-only entry (minimum of 100 QSOs), and high Michigan Mobile score. Certificates — high score for each county (min. 50 QSOs). Out-State: High Out-State plaque and certificates for high score in each state and country.

A log and summary sheet is requested showing the scoring and other pertinent information, name and address in BLOCK LETTERS and a signed declaration that all rules and regulations have been observed.

Michigan stations include club name for combined club score. Party contacts do not count toward the Michigan Achievement Award unless one fact about Michigan is communicated. Members of the Michigan QSO Party Committee are not eligible for individual awards.

Decisions of the Contest Committee are final. Results will be final on July 31 and will be mailed to all entries that have sent in a SASE. Mailing deadline is July 1. Send logs to: Mark Shaw, K8ED, 27600 Franklin Rd., #516, Southfield, MI 48034. □

## MARAC County Hunters CW Contest

The Mobile Amateur Radio Awards Club will sponsor the 21st Annual County Hunters CW Contest from 0000Z Saturday, May 6 to 2400Z Sunday, May 7. Mobile, portable and fixed operation from every county in the United States is welcome and operation from less active counties is encouraged.

**Rules:** Fixed stations may be worked only once on each band. Mobiles and Portables may be worked each time they change counties. Mobiles operating on a county line give and receive one QSO number, but each county is a separate multiplier (mobiles and portables must identify by signing /M or /P after their call). To be eligible for an award, a station must not operate more than one transmitter at any one time.

**Exchange:** QSO Nr, Category (Mobile, Portable or Fixed), Sig Rpt, County and State for United States, Province or Country for others.

**Scoring:** QSOs with fixed US/Canadian stations are worth 1 pt.; mobiles and portables are worth 3 pts. US/Canadian contacts with DX stations are worth 3 pts. Contacts with stations operating under "Net Control" are invalid. Final score = total QSO points times the total number of US counties worked.

**Frequencies:** 3,575; 7,055; 14,060; 21,060 and 28,060. Fixed stations and portables should work above the suggested frequencies and allow low power mobiles to operate below the suggested frequencies.

**Awards:** Certificates to winning stations as



follows:

**F** — Fixed in each state, province and country with 1000 or more points;

**P** — Portable in each state operating from a county other than its normal location with a score of 1000 or more points;

**M** — Mobile in each state operating in three or more counties with a minimum of 10 contacts from each country.

MARAC plaques to the highest scoring: mobile and portable station in the United States, North American fixed station and DX station scoring at least 50,000 total points.

Mobiles and portables who change states should calculate their scores 1. for individual state certificates and 2. for total score for the overall plaque. Total overall score must not count a county as a multiplier more than once regardless of the state from which it was worked.

Sample log and summary sheets are available for a SASE to the address below. A check list of counties is required for entries with 100 or more counties worked. Completed logs, summary sheets and check sheets must be received by June 5 to Jerry Burkhead, N6QA, 7525 Baltic St., San Diego, CA 92111. Include a SASE for a personal copy of results.

## Nevada QSO Party

The Frontier ARS announces the Nevada QSO Party, to be held from 0000Z, May 13 to 0600Z, May 14.

**Bands:** 6M through 160M

**Modes:** SSB, CW, FM, RTTY, Packet and SSTV

**Frequencies:** CW — 15 kHz up from bottom of General band; Phone — 25 kHz up from bottom of General band; Novice/Tech. — CW and

SSB portion of band.

**Exchanges:** Nevada — RS(T) and county; Others — RS(T), state, province or ARRL country.

**Scoring:** Nevada — Count 1 pt. for each contact per mode. Multiply points by number of Nevada counties worked. No cross-mode or repeater QSOs allowed.

**Awards:** Certificate to highest scoring station in each state or DXCC country; also to highest scoring Novice/Tech in each state.

**Logs:** Send logs and score sheets — by June 1 — to Jim Frye, NW7O, 4120 Oakhill Ave., Las Vegas, NV 89121. □

## DX World

(continued from page 34)

J79ROJ	—JG1OUT	PJ2J	—K1CPJ
J8W5PWG	—W5PWG	PJ9J	—W1AX
J80A	—W5PWG	PY0FF	—W9VA
JG1OUT/V2	—JG1OUT	RA3YF/RJ0R	—RA3YF
JH1ROJ/V2	—JG1OUT	RA0BB	—RB5CB
JQ1XAQ/JD1	—JG2CLS	RT0U	—UT4UWV
JY8KL	—G4KLP	S79MC	—AK3F
K1DRN/YV6	—K1DRN	SP9PEY	—SP6CXX
KC6MS	—JA2NQG	SU1EE	—WA9INK
KC6VW	—JA6BSM	SV1RP/SV2	—SV1RP
KE9A/DU3	—WB9YXY	T78U	—I2ZGC
KH8/DK1CE	—DJ9ZB	TG9ASA	—JA2BDR
KH8/DL5UF	—DL5UF	T12DU	—KC7YN
KP2A/KP5	—N6CW	TL8JL	—K4UTE
KP2Z/KH6	—JA5DQH	TL8RLA	—NV7J
LJ3K	—LA2QCA	TL8WD	—DL8CM
LU1EZK	—LU6EF	TO5TSE	—FD6ITD
LU12C	—LU1ONZ	TO7TSE	—FD6ITD
LY2ZO	—UP1BZO	TO7TSE	—FD6ITD
N3JT/HK0	—W2GHK	TU4CO	—TU3KC
OD5LX	—SM0DJZ	UA1OT	—UB5KW
OY3QN	—OZ1ACB	UA3YEE/UJ-2R	—RA3YF
P29VOX	—DF5UG	UA3YEG/UJ-3R	—RA3YF
P40GD	—N2MM	UG7GWO	—UG6GAT
P40P	—N1CIX	UZ3YWA/UJ-	
P40T	—KB2HZ		
PA6CC	—PA3BAG		

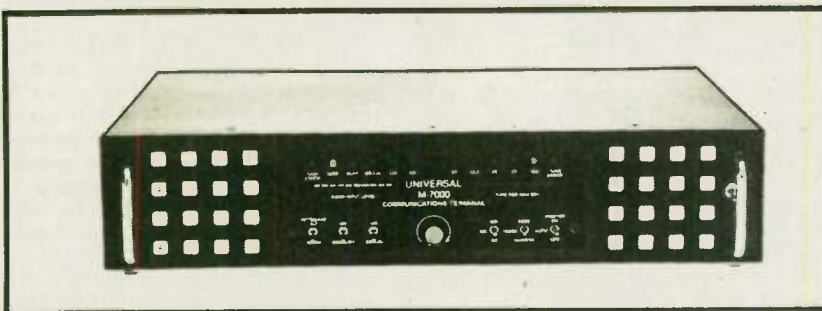
1R	—RA3YF	YN/SM0IG	—SM0CKR
V21AJ	—WB2TSL	YV3AGT	—YV3AJ
V29C	—W2GBX	YZ1U	—YU1ABH
V31BB	—K3FEN	YZ2S	—YU2AKL
V31C	—NA5S	ZC4AP	—G0IHK
V31ZJ	—NN7A	ZC4BS	—G4KIV
V44KQ	—WB2LCH	ZC4DX	—G0IHK
WKOMP	—VK6AGC	ZD8JP	—G3ATK
VP2EXX	—AA4FS	ZF2CM	—K0BJ
VP5T	—NM2Y	ZF2HM	—K9QVB
VP5U	—NM2Y	ZF2KE	—K9QVB
VP5V	—WD4JNS	ZK1XE	—W9GW
VP5/KN2N	—KN2N	ZK1XH	—JR1FYS
VP8BRT	—G2WFZ	ZK1XH	—SM7PKK
VP8BUY	—G4GCK	ZK1XP	(See Note 2)
W6CDR/WP5	—W6CDR	ZK1XS	—SM4DHF
W8KKF/WP5	—W8KKF	ZL0AAH	—HB9CUY
XE0DX	—KD5GY	ZV5A	—W0RPK
XF4T	—XE2TCQ	ZY0FX	—PY5EG
	(See Note 1)	3D2BW	—W9VA
XQ3DPD	—CE3DPD	3D2EW	—DK7UY
XX9CT	—KA6V	3D2W	—DK7UY
YB3ASQ	—W7TSQ	3D2EW	—HB9CUY
YJ8JS	—N2EVS	3D2HO	—G0GLJ
YL2RG	—UQ1GXX	3DA0BD	—3D6BD

### Notes:

1. Please include a SASE. US postage is OK.
2. Not via NA5U — this is a reissued call.

Many thanks to the following contributors: N2BSA, N0JTE, K4TX, WB9YXY, N4EVS, W9LNL, UM8MIG, W6EL, OE2DYL, RA9YD, W7FIV, W3PLI, N7RO, Geoff Watts, Western Washington DX Club (K7ZR), Southern California DX Club (WB6PSY), Redwood Empire DX Association (VP2ML), Salt City DX Association (KB2G), Amateur Radio Action, Long Ship (VE3IPR), DX News-Sheet (G4DYO), The Long Island DX Bulletin (W2IYX), Inside DX (N2AU), QRZ DX (W5KNE) and The DX Bulletin (VP2ML).

## Monitor More With the New Universal M-7000!



If you are monitoring only voice shortwave stations, you are missing half the action! Thousands of shortwave stations transmit in non-voice modes such as Morse code, various forms of radioteletype (RTTY) and facsimile (FAX). The Universal M-7000 will permit you to easily intercept and decode these transmissions. Simple connections to your shortwave receiver and video monitor will enable you to monitor with the most sophisticated surveillance decoder available. No computer is required. See the world of shortwave excitement you have been missing. Requires 115 or 230 VAC. Six month limited warranty.

### FULL CATALOG AVAILABLE

Universal offers a comprehensive shortwave catalog covering all types of shortwave monitoring equipment including receivers, antennas, RTTY and FAX equipment plus books and accessories. Send \$1 (refundable) to receive your copy today.

### Universal M-7000 Introductory Pricing:

Standard M-7000 .....	\$ 999.00
With Real Time Clock Option .....	\$1059.00
With Video FAX Option .....	\$1089.00
With Clock & Video FAX Option ..	\$1129.00
Shipping/Handling (USA) .....	\$ 11.00

UNIVERSAL...Serving Radio Enthusiasts Since 1942

### Partial List of Modes & Features

- ◆ Morse Code (CW)
- ◆ Regular Baudot RTTY
- ◆ Variable Speed Baudot
- ◆ Bit Inverted Baudot
- ◆ ASCII Low Speed
- ◆ ASCII High Speed
- ◆ ASCII Variable Speed
- ◆ Sitor Mode A (ARQ)
- ◆ Sitor Mode B (FEC)
- ◆ Auto
- ◆ ARQ 2&4 chan. (TDM)
- ◆ VFT Modes (FDM)
- ◆ Russian 3rd Shift Cyrillic
- ◆ Facsimile (FAX) AM
- ◆ Facsimile (FAX) FM
- ◆ Packet AX.25
- ◆ Literal Mode
- ◆ Databit Mode
- ◆ Diversity Reception
- ◆ Dual Metering
- ◆ Low Tone & High Tone
- ◆ Variable & Standard Shift
- ◆ Option: Real Time Clock
- ◆ Option: Video Display of Facsimile (FAX)
- ◆ Option: Rack Mounting Brackets (For 19")
- ◆ Speed Readout
- ◆ 4 TTY Alphabets
- ◆ Ten Memories
- ◆ Automatic Tuning
- ◆ Video Squelch
- ◆ Audio Squelch
- ◆ Split Screen ARQ
- ◆ Self Diagnostics
- ◆ Screen Print
- ◆ Screen Saver
- ◆ Input Gain Control
- ◆ MSI, UOS, ATC
- ◆ User Programmable Sel Cals
- ◆ Serial & Parallel Printer Ports
- ◆ Remote Terminal Operation
- ◆ Direct Entry of Baud & Shift
- ◆ Auto-Start

### Universal Radio

1280 Aida Dr. Dept. WR  
Reynoldsburg, OH 43068  
Toll Free: 800 431-3939  
In Ohio: 614 866-4267



## Product Review

# Mobile accessories

**RICH ARLAND, K7YHA**

Accessories can often make or break a radio installation. There hasn't been a rig made that cannot be improved in some way or other by the addition of an accessory or two. Creature comfort is the name of the game. We have two accessories to look at which will greatly enhance your mobile/portable station.

Electron Processing, Inc., P.O. Box 708, Medford, NY 11763, has a couple of neat after-market add-ons which will make life a little easier while on the road. I am speaking of the Vak-Tenna and the Ultimate Mobile Speaker.

Having spent a lot of time on the road, in the past, for the U.S. Air Force, I have come to learn a few tricks of the trade when it comes to operating out of a suitcase for an extended period. My new job has me on the road, too. I was very thankful that I obtained the Vak-Tenna, as it provides welcome relief from trying to use a 1/4-wave whip on the old HT from the motel room.

You can always tell the guys who use their 1/2- or 3/4-wave telescoping whips in motels. These guys have

antennas that, when extended, look a little ragged, considering all the bends, kinks and dents in the whip.

The scenario goes like this: Joe Ham checks into the motel room and promptly drags out the HT, places the 3/8-wave whip on top and proceeds to try to find some local 2M action. The phone rings.

Joe Ham spins around (forgetting that the HT and looong whip are in his hand) to pick up the telephone handset, and promptly catches the whip in the window drapes. This, in turn, bends the whip at a 30° angle to the loading coil.

Several expletives later, and after hanging up the phone, Joe Ham unbends the whip, leaving a nice kink in the antenna. Then he sets the rig down on the dresser while he mixes a drink (he needs one after the repair exercise on his favorite HT antenna!) Joe hears a muffled "thunk" and turns to see that his HT and favorite antenna have just nose-dived onto the floor. (Seems the antenna was a bit long and the HT a bit small.)

This latest "ding" has left a kink in the top two sections of the whip, and another bend where the whip meets the loading coil. Joe Ham is starting to get frustrated!

### Vak-Tenna

Enter Vak-Tenna. This little gizmo is a telescoping dual-whip antenna that functions like a dipole. Two large suction cups hold the antenna onto any smooth flat surface — preferably a window. The frequency is adjusted by varying the length of the two whip sections. Fully extended, the whips telescope out to 79".

For 2M operation, each whip is extended 19.5" to form a 1/2-wave dipole antenna. Since you can use it either vertically or horizontally polarized,

the Vak-Tenna will work well with either FM or SSB portable transceivers.

Give the two large suction cups a lick and then press them onto the center of the window in your room, being sure to orient the antenna for vertical or horizontal polarization. The feedline is high-quality RG-58 (about 15 feet of it), which is then run to the HT or small portable rig. All that is left to do is sit down and start enjoying portable VHF communications from your temporary location.

The Vak-Tenna should find a place in every emergency communications kit. Even though you may have your favorite gain antenna (J-pole, 3/8-wave mobile with mag-mount and a steel pizza tin for groundplane, etc.), the compact size and versatility of the Vak-Tenna makes it a perfect accessory for the emergency communicator.

I use my Vak-Tenna in my portable packet radio station. It takes up far less room than a J-pole or 3/8-wave mag-mount and is very easy to install. The J-pole and the mag-mount antennas also require mounting hardware and extra coax, which must be packed and transported in addition to the actual radio equipment.

The Vak-Tenna has its coax and mounting hardware included. Traveling hams will enjoy the convenience of this highly portable antenna. When both whips are collapsed, the total length of the Vak-Tenna is only 12" long! By coiling the coax up and tying it off to the whips with rubber bands, a very compact and easily transportable antennas system results.

Another application for the Vak-Tenna is the scanner buff. Those of you who are into scanners know what a kick it is to go to another community and start searching for all those frequencies that make your listening hobby so interesting. If you have an antenna that will give you some gain over that pathetic rubber duckie that comes with your portable scanner, you can really start DXing the cities you visit.

The Vak-Tenna comes complete and ready to use with your choice of coaxial connector (BNC, PL-259, Motorola or F connectors). Frequency range is 30-500 MHz on receive and 70-230 for transmitting. Priced at \$29.95, it

## New from AOR

**2000 Channels  
5MHz to 1500MHz**



**AR2515**

- Covers 5MHz to 1500MHz in AM/FM/Wide FM modes
- Continuous coverage
- 2000 Channel Memory
- 1984 Scan Frequencies & 16 Search Groups
- Scan/Search speeds up to 36 channels or increments per second
- Built in RS 232 computer interface
- 25 Day Satisfaction Guarantee Full Refund if not Satisfied
- Size 3"W x 5"H x 5"D Wt 2lb 10oz
- Supplied with AC & DC power cords Telescopic antenna

Total From Freight Prepaid (Express Shipping Optional)  
\*Hydrated and AR2515 is the AOR25 series Available

**\$695.00**



COMMUNICATIONS  
10707 E. 106th St. Indpls., IN 46256

Toll Free 800-445-7717  
Visa and MasterCard  
(COD slightly higher)

In Indiana 317-849-2570 Collect FAX (317) 849-8794

## BLACK DACRON® POLYESTER ANTENNA ROPE

- UV-PROTECTED
- HIGH ABRASION RESISTANCE
- REQUIRES NO EXPENSIVE POTTING HEADS
- EASY TO TIE & UNTIE KNOTS
- EASY TO CUT WITH OUR HOT KNIFE
- SIZES: 3/32" 3/16" 5/16"
- SATISFIED CUSTOMERS DECLARE EXCELLENCE THROUGHOUT U.S.A.

LET US INTRODUCE OUR DACRON® ROPE TO YOU • SEND YOUR NAME AND ADDRESS AND WE'LL SEND YOU FREE SAMPLES OF EACH SIZE AND COMPLETE ORDERING INFORMATION.

In Australia contact  
ATN Antennas, Birchip, Victoria

MANUFACTURED BY **synthetic**  
**textiles, inc.** 2472 Eastman Ave. Bld. 21  
Ventura, CA 93003  
(805) 658-7903

DACRON® IS A DUPONT REGISTERED TRADEMARK

WRIGHTAPES: (Since 1976) Unconditionally guaranteed Morse Code Practice on 60 min cassette tapes. Beginners 2-tape set 5 WPM \$7.90. Also 3, 4, 5, 6-8, 10, 9-11, 12-14, 14, 16-20, 22, 24-28 WPM. Specify Plain Language or Code Groups. Also plain lang. only 30-35, 35-40, 45-60. FCC type tests: 5-6, 11-12, 11-17, 13-14, 20-24. Call signs: 12-15, 20-24. Nos.: 5-22, 13-18, 18-24. Check, M/C, Visa \$3.95 ea. PPD 1st class USA, Can. Printed texts add \$.50 per tape. Call anytime.

Instant Service

PH: 517-484-9794 WRIGHTAPES  
235 E Jackson S-3 • Lansing, MI 48906



makes for some very cheap insurance that you will be able to get a good signal out (or in) from a temporary location.

### Ultimate Mobile Speaker

Electron Processing's Ultimate Mobile Speaker is a welcome addition to the ham who has tried to mount the VHF/UHF transceiver in the family Honda, only to find that he can't hear the rig unless the volume is cranked all the way open.

Today's crop of cars (imported as well as domestic) is becoming a nightmare when it comes to mounting mobile radio equipment. Not only is space at a premium inside the driving compartment, but trying to find a position to mount the rig and still hear the built-in speaker is a real challenge.

I won't go into the grounding and bonding issues presented by the new car "hi-tech" engineering. Suffice it to say that somebody in the auto industry stays up nights thinking of ways to frustrate radio amateurs who want to install mobile radio equipment in their cars.

Trying to install and orient a mobile radio in such a way so as to be able to hear the receive audio, can be a real headache. Most of the time, you must be content with poor audio quality from the radio simply because the speaker is not pointing at you... it's pointed down to the floor. The addition of an external speaker is the accepted fix for this problem.

Electron Processing's Ultimate Mobile Speaker lets you put the speaker where you want it, unrestricted by mounting hardware, brackets, etc. Two very powerful suction cups hold the speaker on any smooth surface. Prime locations for mounting the speaker are on the windshield, side window or overhead on the sun roof (I use the sun roof in my wife's Honda with great success).

Audio reproduction from the Ultimate Mobile Speaker is very good, considering its overall size. One improvement I would recommend would be to make a plexiglass™ bracket that would mount on a sloping windshield or dashboard (with suction cups) onto which the speaker could be mounted. This would position the speaker to shoot the audio straight out into the cabin area rather than at an angle,

down into the front seat area.

Second improvement: add about 6 more feet of audio cable to the speaker for a total of about 10 feet. The cord is not quite long enough for either of my two mobile applications. Additional cable would be a boon, and excess could be coiled up and stuffed out of sight. Price of the Ultimate Mobile Speaker is \$29.95 plus shipping.

There you have it — two accessories that will make life on the road a little easier. Don't forget, if you order from Electron Processing, tell them you heard about it in Worldradio! □

## Scouts and radio

The Hall of Science ARC, WB2JSM, helped to celebrate the "Scouts Jamboree On The Air" on Oct. 16, 1988, by being host to Dick Travis, den leader of Webelos Scout Pack #168, Syosset, NY.

Bill Smith, N2AXY, acted as control operator for HOSARC and gave the opportunity for scouts, or anyone interested in scouting, to get together on the air and exchange greetings and information.

Contact was made with other Amateurs who had invited members of scout units to visit their station to see how Amateur Radio operates. To prove that Amateur Radio has a special appeal for young scouts, many of the scouts of Pack #168 enthusiastically participated in several QSOs.

Bill encouraged many of the attending scouts to continue their eagerness in Amateur Radio by joining a radio club with the thought of becoming licensed operators in the near future.

HOSARC member Alan Serchuk, KD2XM, took several pictures of Scout Pack #168 in action to remember a very interesting and enjoyable day. —Submitted by Charles B. Salzman, WB2JQD □

For the gift that keeps on giving, see p.9.

### HI-PERFORMANCE DIPOLES

Antennas that work! Custom assembled to your center freq. as band • Advise ht. of center and each end • Hang as inverted "V" • Horizontal, vert. dipole, sloping dipole • Commercial quality • Stainless hardware • Legal power • No-trap, high-efficiency design. Personal check, MO, or C.O.D. (\$3)

MPD-5\* 80-40-20-15-10M max-performance dipole 87' long..... \$105ppd  
 MPD-2 80-40M max-performance dipole, 85' long-982..... 95-985ppd  
 HPD-3\* 160-80-40M hi-performance dipole 113' long..... \$75ppd  
 SBD-3\* 160-80-40-20-15-10M space-saver dipole 71' long..... \$125ppd  
 SBD-5\* 80-40-20-15-10M space-saver dipole-specify L 45' \$105-52' \$108ppd  
 SBD-4\* 80-40-20-15M space-saver dipole-specify L 46'-983..... 60'-888ppd  
 \*0-bands with wide-matching-range tuner.

BASE for catalogue of 30 dipoles, slopers, & space-saving, unique antennas  
 W9INN ANTENNAS 312-394-3414  
 BOX 393 MT. PROSPECT, IL 60056

**DX Helper™**  
 DX Tracking for the Macintosh®  
 Bearing • Distance • Sunrise • Sunset • CQ Zones  
 3rd Party Agreements • Time Zones • World Map  
 Great Circle Map • Gray Line • Sun Position • MUF  
 MUF Maps • Band Coverage Maps • DXCC  
 USSR Oblasts • Int'l Call Identifier • \$34.95

**Satellite Helper™**  
 Satellite Tracking for the Macintosh®  
 Maps • Ground Coverage • Views from Space  
 Tabular Data • Antenna Control • \$59.95

And Introducing... **Satellite Pro™**  
 Advanced Features • \$99.95

Please send S.A.S.E. for full details

**MacTrak® Software**  
 P.O. Box 1590 Port Orchard, WA 98366

## PREAMPLIFIER

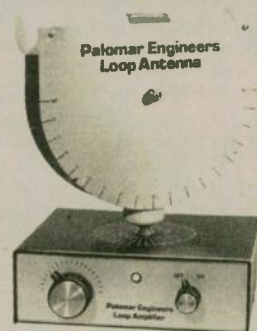


Can't hear the weak ones when conditions are bad? Receiver lacks sensitivity on 20, 15 or 10? Get the world famous Palomar preamplifier. Tunes from 160 to 6 meters. Gives 20 db extra gain and a low noise figure to bring out those weak signals. Reduces image and spurious responses too.

An RF sensing circuit bypasses the preamplifier during transmit. The bypass handles 350 watts.

Model P-410X (for 115-v AC) or Model P-412-X (for 12-v DC) \$149.95. Model P-408 (SWL receive only for 115-v AC) \$129.95. Add \$4 shipping/handling in U.S. & Canada. California residents add sales tax.

## LOOP ANTENNA



Loops pick up far less noise than other antennas. And they can null out interference. Palomar brings you these features and more in a compact desktop package. The wideband amplifier with tuning control gives 20 db gain. Plug-in loops have exclusive tilt feature for deep nulls. Loops are available for 10-40 KHz, 40-150 KHz, 150-550 KHz, 550-1600 KHz and 1600-5000 KHz.

Model LA-1 Loop Amplifier \$84.95. Plug-in Loops (specify range) \$62.95 each. Add \$4 shipping/handling in U.S. and Canada. California residents add sales tax.



Send for FREE catalog that shows our complete line of noise bridges, SWR meters, preamplifiers, loop antennas, VLF converters, baluns, toroids and more.

**PALOMAR ENGINEERS**  
 BOX 455, ESCONDIDO, CA 92025  
 Phone: (619) 747-3343





**NEW PRODUCTS**

Information in "New Products" is supplied by the manufacturers to acquaint *Worldradio* readers with new products on the market.

## Marine/Mobile electronic book

Gordon West, WB6NOA, announces the second edition of his 165-page book, *Straight Shooter's Guide To Marine Electronics*, including several chapters specifically on Amateur Radio mobile/marine installations.

"Mariners like this book because I explain all about the new breed of marine electronics for 1988/1989. Hams love the book because I have several chapters on installing SSB equipment aboard boats, antenna and ground considerations and valuable pictures on how to make these sets work well aboard a boat or in a motorhome," comments Gordon, well-known writer and lecturer. He also points out Amateur Radio equipment modifications to allow "broad-banding" of all Amateur sets for emergency transmit on maritime frequencies. Step-by-step instructions are included for modifying 2M sets to VHF marine and HF sets for worldwide ham.

"Everyone should have the capabilities of going to any frequency to transmit a Mayday during an emergency — and out there on the water, or far out on the desert, ham equipment with broad-band capabilities could really save a life," adds WB6NOA.

Almost every page has an illustration or photograph to further explain West's breezy way of describing marine electronics and how to install them. The back of the book contains a Gordon West exclusive marine electronic



buyer's guide featuring comparison charts of products plus manufacturer's names and addresses. Also included are looseleaf pages of "The Best From West" dealing with new Amateur Radio equipment considerations for the maritime and mobile enthusiast.

Each book is autographed by Gordon West, and no mariner, Amateur or RVer should be without it. For information contact Gordon West Radio School, 2414 College Dr., Costa Mesa, CA 92626. □

## Computers

Radio operators, as well as those thinking about becoming one, will be interested in the new release of IMCT for XT/AT compatible computers.

It is menu driven, with adjustable pitch and speed and capable of 1-20+ WPM. Beginners are guided step-by-step, starting with sound recognition and working through each code character.

For the advanced student, IMCT allows keys to be typed and the code heard. The keyboard can be used as a straight key. Computer tests are generated either by the computer (Random) or from ASC II text files which can be read by IMCT and sent to you as entered or in random order.

A separate Amateur Radio menu option allows testing of oftenheard ham abbreviations and terms, as well as a test to practice amateur call letters. One option even teaches the basics of Ham Talk, explaining those phrases that often confuse the newcomer.

The user is able to define the way he wants

to hear the code by setting the length of each DIT and DAH and the length of the spacing between them. Also the length of the pause between each character is set.

It's not necessary to run out and buy a short wave radio to practice code. IMCT has a built-in onscreen ham radio for the user to tune around and practice copy. Listen to contesters, CQ'ers and full QSO's. If the code is too fast, simply switch the display mode and you'll see what they are sending.

For more information write AC3L Software, Box 7, New Derry, PA 15671.

## Accessories catalog

MFJ Enterprises Inc. brings you their latest 16-page Amateur Radio Catalog free. Simply call or write for your copy.

Over 80 Amateur Radio accessories are featured, including the MFJ-1278 Multi-mode Data Controller, the MFJ-931 Artificial RF Ground and over 10 new MFJ products for Amateur Radio.

Also featured is MFJ's full line of keyers, filters, packet radio controllers, computer interfaces, dummy loads, Amateur software, antenna switches, speakers, wattmeters, R-X noise bridges, antenna bridges, antenna current probes, code practice oscillators, clocks and many other accessories that are available only from MFJ.

To receive your free copy call toll free 800/647-1800 or 601/323-5869; or write MFJ Enterprises Inc., P.O. Box 494, Mississippi State, MS 39762. □

## Mode additions

MFJ Enterprises Inc. announces several new modes, features and enhancements for the MFJ-1278 Multi-mode Data Controller.

The MFJ-1278 was originally released with transmit and receive in 7 modes: Packet, RTTY, WeFAX, SSTV, CW, ASCII and Contest Memory Keyer modes. Recently added were Navtex receiving and AMTOR transmit and receive, giving the MFJ-1278 9 modes.

Also recently added were two features for the MFJ-1278 Packet mode: The new Easy Mail (Trademark) Personal Mailbox and a new KISS Interface for TCP/IP compatibility.

In addition new terminal software for the

### CATALOGS

HAM	SWL
▶ Transceivers	▶ Receivers
▶ HF-VHF-UHF	▶ Antennas
▶ Antennas	▶ Tuners
▶ RTTY-Packet	▶ Heaphones
▶ Receivers	▶ RTTY-FAX
▶ Books & Accs.	▶ Books & Accs.
Only \$1 Postpaid	Only \$1 Postpaid

Send to: **Universal Radio**  
1280 Alda Drive Dept. WR  
Reynoldsburg, OH 43068

## Never PANIC again

after missing a few Morse code letters. Start copying words instead of letter-by-letter. Time-proven, easy-to-learn methods. Money-back guaranteed! Order today!

<input type="checkbox"/> <b>QSO-TRAINER™</b> Code Course. Copy words the very first day! Ideal, moderate speed. \$14.95	<input type="checkbox"/> <b>QSO-MASTER™</b> Practice Tapes. The "plateau" buster! 8, 10, 12, 14 wpm. \$12.95	<input type="checkbox"/> <b>QSO-PRO™</b> Practice Tapes. Go all the way to EXTRA! 16, 18, 20, 22 wpm. \$12.95
---	--	---

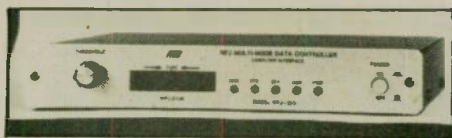
Each set contains two, high-quality 60-min. tapes and complete written instructions.

Shipping & Handling: All orders \$3.00 US and CAN; \$4.00 elsewhere. IL, IN, MI, MN, OH, WI add sales tax. Send Check, Money Order, Visa, or Master Card to:

**AVC INNOVATIONS, INC. Dept. WB**  
P.O. Box 20491 • Indianapolis, IN 46220-0491

BUSINESS SIZE SASE GETS DETAILS





Macintosh computer, the MFJ-1287 Starter Pack with software, interface cable and instructions is available. The MFJ-1287 allows WeFAX printing to screen and has other advanced features.

For more information contact any MFJ dealer or MFJ Enterprises Inc., P.O. Box 494, Mississippi State, MS 39762; or call 601/323-5869. □

## Winter catalog

A 108-page catalog from Heath Company devotes 14 pages to Heath's complete line of fully assembled and kit Amateur Radio gear and includes all of the latest in computers, audio, video, home security and radio control products.

The Amateur Radio section leads off with two full pages that explain what Amateur Radio is, how to enter the hobby, how to obtain QSL cards, and even how to become a member of the ARRL.

In addition, the catalog spotlights several of Heath's latest Amateur Radio products. Heading the list is the SB-1400 100W HF all-mode transceiver.

Featuring 20 memory channels, the SB-1400 covers all nine HF amateur bands, while offering general coverage reception from 100 kHz to 30 MHz. The fully assembled unit includes several accessories such as a module for adding FM transceiver capabilities, hand-held scanning microphone, mobile mounting bracket and even a switching relay for non-Heath linear transceivers.

Other key products include the new HW-24-H 50W VHF/UHF transceiver/repeater, the HWS-24-HT VHF/UHF 5W dual band hand-held transceiver and the HWS-2M and HWS-4 450 MHz hand-held transceivers.

For Amateur Radio operators who "have it all," the catalog features a full line of accessory kits and assembled products, including packet radio TNCs, multi-mode SSB/CW/RTTY active audio filters, CW code oscillators, QRP wattmeters, active antennas, noise bridges and VLF converters.

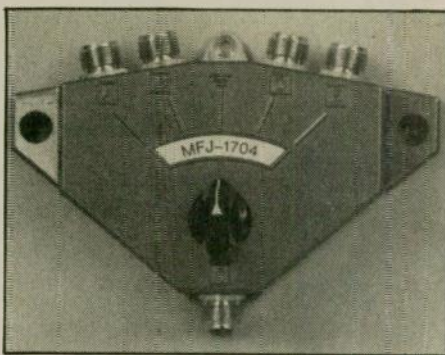
To obtain a copy of the Winter 1989 Heathkit catalog, call 1-800-44-HEATH or write Heath Company, Benton Harbor, MI 49022. □

## Antenna switch

MFJ's new four position coax antenna switch gives you the convenience of instantly selecting one of four antennas and the peace of mind you get from its built-in lightning protection with replaceable protector cartridge.

This sturdy 50 Ohm switch handles 2.5kw PEP and 1kw CW with extremely low SWR. Isolation is rated from better than 60dB at 30 MHz to better than 50dB isolation at 500 MHz. Insertion loss is negligible.

Construction is solid both inside and out. Inside is the lightning protection device that helps take the fear out of thunderstorms. In addition, you get cavity construction and metal strip leads that prevent chafing and shorting problems common to wire leads. Outside is the beautiful heavy steel cavity case



that'll stand up through the years.

You also get convenient mounting holes and a heavy duty spring loaded ball bearing switch.

Unused positions are automatically grounded, or you can select the convenient center ground position.

For more information contact any MFJ dealer or MFJ Enterprises Inc., P.O. Box 494, Mississippi State, MS 39761; or call 601/323-5869. □

## Interesting facts department ROBERT BEASLEY, K6BJH

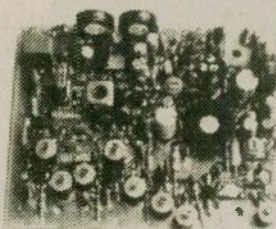
*Didju know that:*

The old 2½M Amateur band (112 to 116 MHz) was given over to make up part of the VHF aircraft band and we were given 2M in exchange? □

# AMATEUR TELEVISION

## SURVIVES 100,000 FT. FALL

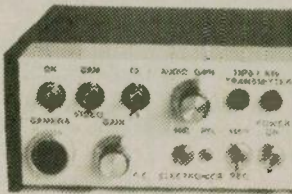
KPA5 1 WATT ATV XMTR ON 434 MHZ WORKED PERFECTLY IN WB8ELK LIVE CAMERA BALLOON THROUGH 100,000 FT AND BACK TO CONTINUE RUNNING EVEN AFTER FREE FALL IMPACT IN THE MOJAVE DESERT! VIDEO SEEN FOR 300 MILES.



### KPA5-E board \$169

Shouldn't your ATV transmitter be as reliable? Weather you want to put one in a balloon, R/C model, Robot, use as portable ATV xmtr, or get one in our ready to go TX70-1 for the shack, with P.C. Electronics you see the best! Companion receiving downconverter board TVC-2G \$49, or ready to go in a cabinet - TVC-4G \$89.

**TX70-1  
XMTR  
\$259**



**TVC-4G  
RECV  
CONV.  
\$89**



### THE ATV TWINS

Hams, Call or Write for our latest catalog of ATV gear! Transmitters sold only to Tech or higher licensed amateurs varified in latest Callbook or copy of new license. 5/89

(818) 447-4565 m-f 8am-5:30pm pst.

Visa, MasterCard

**P.C. ELECTRONICS**

2522 Paxson Ln Arcadia CA 91006

Tom (W6ORG)  
Maryann (WB6YSS)



# THE QSL BOOK!



Continuing a 68 year tradition, we bring you three new Callbooks for 1989, bigger and better than ever! The North American Callbook, the International Callbook, and the new Callbook Supplement bring you accurate up-to-date QSL information on over 1,000,000 amateurs throughout the world.

The North American Callbook lists the calls, names, and address information for over 495,000 licensed radio amateurs in all countries of North America from Canada to Panama, including Greenland, Bermuda, and the Caribbean islands plus Hawaii and the U.S. possessions.

The International Callbook lists over 500,000 licensed radio amateurs in countries outside North America. Its coverage includes South America, Europe, Africa, Asia, and the Pacific area (exclusive of Hawaii and the U.S. possessions).

The 1989 Callbook Supplement is a new idea in Callbook updates, listing the activity in both the North American and International Callbooks. Published June 1, 1989, this combined Supplement will include thousands of new licenses, address changes, and call sign changes for the preceding 6 months.

Every active amateur needs the Callbook! The 1989 Callbooks will be published December 1, 1988. Order early to avoid disappointment (last year's Callbooks sold out). See your dealer now or order directly from the publisher.

- Over 1,000,000 current amateur listings in all countries of the world • Telegraph Codes
- Then & Now call changes • Silent Keys • Census of Amateur Licenses in all countries
- Standard Time Charts • International Postal Information • World-wide QSL Bureaus
- Table of Amateur Prefix Allocations • Prefixes of the World • Plus many other features.

Publication: Callbooks - December 1, 1988  
Supplement - June 1, 1989

	Including shipment to U.S.A. points	Illinois residents, incl. tax & shipping	Including shipment to foreign countries
<input type="checkbox"/> Single 1989 North American Callbook	\$29.00	\$30.70	\$35.00
<input type="checkbox"/> Single 1989 International Callbook	32.00	33.90	38.00
<input type="checkbox"/> Single 1989 Callbook Supplement	13.00	13.65	14.00
<input type="checkbox"/> SPECIAL OFFER: Order both 1989 Callbooks at the same time for shipment to one address.	58.00	61.60	68.00

Name \_\_\_\_\_ Amount enclosed \_\_\_\_\_

Address \_\_\_\_\_

radio amateur  
**callbook**

Dept W  
925 Sherwood Dr., Box 247,  
Lake Bluff, IL 60044, USA

Tel: (312) 234-6600





# THE MART

**Classified**  
• Buy • Trade  
• Sell • Inform

Mart deadline  
20th of the month



Business firms/30¢ a word, prepaid.  
Private individuals/15¢ a word, prepaid.

**THE MART Worldradio**  
2120 28th St., Sacramento, CA 95818

**WORLDRADIO ON CASSETTES** for the blind. For information, contact TOM CARTEN, K1PZU, 1602-Y King's College, Wilkes-Barre, PA 18711.

**LEARN THE CODE** — A course for family members and friends who don't know the difference between a dot or a dash. Monday through Friday, 0630-0700 California local time, 3760 KHz ± A2/A3/LSB, January through December, K6RAU. Starts first Monday of each month.

**EDITING A CLUB PAPER?** Need one for your club? Interested in Amateur Radio public relations? Need some help? Amateur Radio News Service would like to hear from you. For info write FRAN NORRICK, WB9WPS, 4306 N. 23rd St., Waco TX 76708-1107

**QSL SAMPLES** — 25¢. SAMCARDS, 48 Monte Carlo Dr., Pittsburgh, PA 15239.

**WANTED REPLY COUPONS** of all types, IRCs & others. Buy, sell, trade. JIM NOLL, P.O. Box 3410, Escondido, CA 92025.

**POST CARD QSL KIT** — Converts post cards, photos to QSLs! Stamp brings circular. K-K LABELS, P.O. Box 412, Troy, NY 12181-0412.

**RTTY JOURNAL**—Now in our 36th year. Read about RTTY, AMTOR, packet, MSO's, RTTY contesting, RTTY DX and much more. Year's subscription to RTTY Journal, \$10.00—foreign slightly higher. Order from: RTTY JOURNAL, 9085 La Casita Ave., Fountain Valley, CA 92708.

**CHASSIS & CABINET KITS, SASE, K31WK,** 5120 Harmony Grove Rd. Dover, PA 17315.

**SUBSCRIBE TO THE DXers Magazine.** Gus Browning, W4BPD, editor. Only \$15.00 per year. *The DXers Magazine*, Drawer DX, Cordova, SC 29039.

**QSLs. QUALITY AND FAST SERVICE FOR 29 YEARS.** Include call for free decal. Samples 50¢. RAY, K7HLR, Box 331, Clearfield, UT 84015.

**QSLs & RUBBER STAMPS — TOP QUALITY!** States, world maps, USA, key, shuttle, globe QSLs. Report form rubber stamps. More! Samples \$1.00 (refundable with order). EBBERT GRAPHICS D-1, Box 70, Westerville, OH 43081.

**CODE PROFICIENCY DRILLS** are transmitted from WB3IVO Brass Pounders ARC, each Saturday, Sunday, Monday and Thursday on 7060 kHz, starting 2000Z. Each Tuesday and Friday on 14060 kHz, starting 2000Z. Speeds range from 20 to 60 wpm.

**AUTO-CALL MAGAZINE**, official journal of the Foundation For Amateur Radio, a federation of over 50 clubs in the greater Washington, D.C. area. Great coverage of FCC, ARRL, VEC, Public Service and club activities in the area. A must for those even passing through the area. For sample copy write FOUNDATION FOR AMATEUR RADIO, P.O. Box 7612, Falls Church, VA 22046-1452.

**STAMP COLLECTORS!** Send SASE for worldwide Ham Radio stamp price list. WB4FDT, HAMSTAMPS, P.O. Box 833, West Hartford, CT 06107.

**CERTIFICATE FOR PROVEN TWO-WAY RADIO CONTACTS** with amateurs in all 10 USA call area. Award suitable to frame and proven achievements added on request. Send \$2 (USA) or \$3 (DX) to cover certificate cost. W6LS, 2814 Empire Ave., Burbank, CA 91504.

**AMATEUR RADIO REPAIR** — experienced licensed, reasonable. ROBERT HALL ELECTRONICS, W6BSH, P.O. Box 280363, San Francisco, CA 94128-0363. 408/729-8200.

**LEARN CODE THE EASY W6PHA WAY!** Former USAF code champ's unique, simple system allows all ages to learn quickly. No tapes, etc.! Revised booklet \$5.00 ppd. Guaranteed. GLOBALMAN PRODUCTS, Box 400WR, El Toro, CA 92630.

**QSL CARDS** — Look good with top quality printing. Choose standard designs for fully customized cards. Better cards mean more returns to you. Free brochure, samples. Stamps appreciated. CHESTER QSL's, 310 Commercial, Dept. D, Emporia, KS 66801.

**THE SPEC-COM JOURNAL** is now published bi-monthly, 6 times per year. Covers fast and slow-scan TV, facsimile, RTTY, ASCII, AMTOR, Packet radio, satellites, TVRO and lasers. Articles on IBM, C64, Apple, Atari and TRS80 color computers. Software catalog available (SASE). Back/sample issues, \$3.50 ppd. Large video library available. Contact: MEMBERSHIP SERVICES, P.O. Box H, Lowden, IA 52255. Annual subscriptions: USA \$20, Canada/Mexico \$25, foreign surface \$30. MC/VISA. IA residents add 5%.

**HAM LAB PROJECT.** Want several pieces HP G-382A variable attenuator. Will consider any repairable condition. K6GOX, P.O. Box 10, O'Neals, CA 93645, (209) 868-3548 collect.

**14 KARAT GOLD CALLSIGN JEWELRY.** Lapel pins, necklaces, more. Information: KB2MB, H&M JEWELRY, 26 Edgcomb, Binghamton, NY 13905-4017.

**PLASTIC QSL CARD DISPLAY.** 20-card capacity, slip-in packets of 3 - \$5.00. 1520 Jutewood Ave., Hyattsville, MD 20785. 301/773-9383.

Be first to know precisely when and where to work all the choice DX. Bi-weekly LI DX BULLETIN has: Hot DX news — time and frequency of each goodie — QSL info — propagation forecast — and more... Send business size SASE for free sample or \$16.00 for 1-year domestic subscription to:

**LONG ISLAND DX BULLETIN**  
PO Box 173, Huntington, NY 11743

**PHONE 809/855-0238** for more details about an inexpensive tropical vacation featuring 3br newly-furnished house on a hill with 4-element 10-15-20m., Yagi, Ten-Tec driver, 2KW linear, 160 longwire & matchbox included for \$325/week. Great DX! Bring your 2M rig. NP4R.

**YOUR CALL**, city or club imprinted on a nylon satin ball jacket. (Also name and call on front). \$29.00 postpaid. State size and color. (Sizes 2XL to 5XL add \$1.00 per X). Money back if not delighted. ROD WILLIAMS, Box 7486, Toledo, OH 43615.

**WANT "CLEANING OUT MY SHACK LIST?"** LEWALSKI, 3512 Moraga Blvd., #4102 Lafayette, CA 94549.

**SELL RADIO SHACK RECEIVER:** Patrolman SW-60 6-band stock #12779, \$45.00. Transformer 850-0-850 300ma, \$15.00. Beautiful homebrew 40M transmitter 30W, \$75.00. Details h66XM, 619/459-5527.

**TS-940S OWNERS:** Bank Controller I allows front panel memory bank control, eliminating need to go to top to slide open hatch each time to change memory bank. Direct plug-in substitution for voice synthesizer allows using front panel voice button, stepping thru all four memory banks. Easy to install. Only \$24.95 + \$5.00 s/h USA, \$13.00 elsewhere. INTERNATIONAL RADIO & COMPUTERS, INC., 751 South Macedo Blvd., Port St., Lucie, FL 34983. 1-(407) 879-6868.

**TS-940 OWNERS:** The new Bank Controller 11 allows both memory bank control & voice frequency announcement using voice button on front panel. Makes voice synthesizer more useful, making it announce memory bank & frequency. Easy to install. Only \$49.95 + \$5.00 s/h USA, \$13.00 elsewhere. INTERNATIONAL RADIO & COMPUTERS, INC., 751 South Macedo Blvd., Port St. Lucie, FL 34983. 1-(407) 879-6868.

... TALK TO THE WORLD! ...

## HERE, HERE

**Subscribe Now!**

One year.....\$12  
Two years.....\$23  
Three years.....\$33

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State Zip \_\_\_\_\_

**Worldradio**  
P.O. Box 189490  
Sacramento, CA 95818



# More MART

**XCVRS FOR SALE** — Kenwood TS-830S with crystal filters, \$650 firm. Atlas 210X with Shure 404C mic. and mobile mount, \$275. Heath SB-102 with SB-600 power supply and speaker, \$250. All in mint condition. (312) 382-2162, BILL REEVE, WB9DVV.

**ROSS' \$\$\$\$ NEW MAY SPECIALS:** Kenwood TH-215A — \$309.90, TH-25AT — \$299.90, TM-721A — \$609.90, TS-940S/WAT — \$2059.90, TH-315A — \$294.90; Butternut HF6V-X — \$129.00, HF-2V — \$121.90; ICOM IC-228H — \$459.90, U4AT (MICRO) — \$299.90, IC-471A — \$689.99, IC-471H — \$999.90, IC-38A/W-HM14 — \$338.99, O4AT \$329.99; Yaesu FT-270RH — \$304.90, FT-411 — \$338.90, FV-707DM — \$242.90, NC-2 — \$49.90, FT-780 — \$587.99, FT-727R — \$349.90, FT-767GX — \$1645.00, FT-736R — \$1499.90. All L.T.O. (limited time offer). Looking for something not listed?? Call or write. Over 8780 ham-related items in stock for immediate shipment. *Mention ad.* Prices cash, F.O.B. Preston. Open Mon. 9-2, Tue.-Fri. 9-6, closed Sat. & Sun. ROSS DISTRIBUTING COMPANY, 78 South State, (P.O. Box 234) Preston, ID 83263. (208) 852-0830, FAX (208) 852-0833.

**WIRE ANTENNA HEADQUARTERS** — wire, coax, rope, connectors. Discount prices, why pay more? Silver/Teflon(r) PL-259, \$12.95; fresh, MilSpec RG-213 (\$30/100'), 95% RG-8x (\$14/100'), Low-loss 9086 (9913 equivalent) \$40/100'. Ladder Line, \$10/100'. #14 stranded, hard-drawn, \$7/100'; 1/4 mile #18 copperclad \$19.95. Long-lasting UV and abrasion resistant Dacron(r) rope: 3/16" black double-braided \$10/100'; guaranteed MilSpec 3/16" green, 700#, \$9.95/200'. #1 rated 80-10 meter Carolina Window, \$69.95 (December 73, July *Worldradio* reviews). 80-10 meter SuperLoop, \$75; new 'Current-type(c)' baluns, numerous models. 12% S&H (\$4 minimum). Virginians add tax. MC/Visa. *Mention ad,* receive 56 page catalog, free. RADIO WORKS, Box 6159, Portsmouth, VA 23703. (804) 484-0140.

**KENWOOD OWNERS:** Enjoy the versatility of three tuning speeds in your TS-940, TS-930, TS-440 or TS-430. The Tuning Upgrader adds a new, slower, 2.5kHz/revolution tuning rate and automatically selects higher-speed tuning rates when you tune faster. Easy to install. Only \$34.95 + \$5.00 s/h USA, \$13.00 elsewhere. INTERNATIONAL RADIO AND COMPUTERS, INC., 751 South Macedo Blvd., Port St. Lucie, FL 34983. (407) 879-6868.

**SIX ROOM APARTMENT FOR RENT** — INCLUDES TOWER AND BEAM! In Palisades Park, NJ, one of NYC's bedroom communities. Luxury living in modern two family house. Three bedrooms, two bathrooms, formal dining room. Huge rooms. Giant closets. XYL will love it! Includes garage, laundry room, use of back yard, 60' tower with rotor, tribander at 55' and 6 meter beam at 60'. Owner moving to Florida, keeping bldg. Asking \$1500. Call GREG, WB2GMK. 201/944-8334.

**HF MOBILE antennas,** installations, tuners. 100+ page book "40 Years of HF Mobileeering." 2nd edition, 3rd printing, \$11.00 postpaid U.S. DON JOHNSON, W6AAQ, Box 595, Esparto, CA 95627.

**K3UAL PRINT-QSL SPECIALIST.** Send SASE for free samples. 24-hour service. 1520 Jutewood Ave., Hyattsville, MD 20785.

**QUAD SPECIAL** — 2-element 10 & 15 meter quad, light weight fiberglass construction, no tower needed. Can use with a TV rotator. \$149.95, LIGHTNING BOLT ANTENNAS, MIKE'S AUTO ELECTRIC, RD #2, Rt. 19, Volant, PA 16156. 412/530-7396.

**ELECTRONIC KITS & ASSEMBLIES** — For our latest catalog send a large SASE (45¢) to: A&A ENGINEERING, 2521 W. LaPalma, #K, Anaheim, CA 92801.

**WANTED: G.E. MASTR-PRO U.H.F. 250** watt base station, or amplifier and supply, or amplifier alone. Also a A.C.C. 85 repeater controller. TARAS BABENKO, 46859 Ecorse, Belleville, MI 48111, 313/697-8888.

**WRITTEN EXAMS SUPEREASY.** Memory aids from psychologist/engineer cut studytime 50%. Novice, Tech, Gen: \$7 each. Advanced, Extra: \$12 each. Money back guarantee. BAH. 2535-F5 Marietta, Palmbay, FL 32905.

**INFO-TECH M-6000 V.5, RTTY, Packet, CW, TDM, etc.,** — \$600.00; M-800 V.2 FAX — \$250. Excellent condition with manuals and original boxes. ROBERT, WD9IDV, 312/731-1774, 8505 S. Yates, Chicago, IL 60617.

**THE NATIONAL HAM SHOPPER.** A monthly buy, sell, trade publication (starting in April). Ads are quickly answered and published for fast results. \$12/per year, \$24 per 2 year subscription rate. Ad rates: .30/word individuals; .90/word commercial. Send to P.O. Box 10738, Elmwood, CT 06110.

**450 MHz SPECTRUM ANALYZER** — Adapted from Nov. '85 QST article by Al Helfrick, K2BLA. Features three-digit LED center frequency digital readout; 12-position calibrated scan width, 1 kHz - 50 MHz, switchable bandwidth, wide = 300 kHz, narrow = 10 kHz (Use your low-frequency scope for the display portion); switchable 10 kHz video filter; variable IF attenuator, LOG output calibrated in 10dB steps. For complete kit, order #450-KIT, \$459.95 + \$4.50 s/h. CA residents add 6% sales tax. Foreign orders add 15% for shipping. A&A ENGINEERING, 2521 W. LaPalma, #K, Anaheim, CA 92801. 714/952-2114.

**SUPERFAST NOVICE LICENSE.** Pass in 8 hrs. Amazing code/theory techniques. \$15. Money-back guarantee. Free catalog: SASE, BAH. 2535-F5 Marietta, Palmbay, FL 32905.

(1) W-51 TRI-EX TOWER, (1) stainless steel mast, (1) 4-element KT34A antenna, (1) 2-element KLM 40M antenna, (1) 13-element KLM 2M antenna, (1) HAM IV rotor and controls, (1) 80M IN V-V antenna. All cables and attachments. Save \$1500.00. Sale \$1350.00. Call 805/934-2137, Santa Maria, CA.

## SOLVE THOSE LAST MINUTE GIFT PROBLEMS!

Treat an Amateur Radio friend to a year of **Worldradio**.

Call **1-800-365-SUBS**

8 a.m.-5 p.m. Pacific Time and charge it to your VISA, MasterCard or AmEx.

We'll send a gift card in your name. Easy, isn't it?

**HOMEBREW PROJECTS** lists — SASE. WB2EUF, Box 708, East Hampton, NY 11937.

**THE DX MAGAZINE** is your monthly ticket to the DX game: DXpedition reports, QSL managers, propagation, equipment reviews, more. Only \$15/year. Box 50-W, Fulton, CA 95439. (707) 523-1001.

**BEAM HEADINGS — YOUR QTH.** Unfolded NLQ printout. \$8.00. W8JBU, Box 397W, Hinkley, OH 44233.

**FREE** — Ham Radio Gospel tracts. SASE: N3FTT, 5133 Gramercy, Clifton Hts., PA 19018.

**COMPUTERIZE WITH THE "Amateur Radio Operating System."** This MS/DOS based software features auto-logging, QSL management, award summaries, contesting, and more. Base System, \$39.95; Demo disk, \$10.00 (credited). SASE brings details. FUNDAMENTAL SERVICES, 1546B Peaceful Lane, Clearwater, FL 34616.

**TRANSMITTING TUBES WANTED FOR MUSEUM** — Help preserve old amateur and commercial tubes for future and old time hams to see and admire. YE OLDE TRANSMITTING TUBE MUSEUM, K6DIA, P.O. Box 97, Crescent City, CA 95531.

**MANUALS** for most hamgear made 1935/1970, plus Kenwood. No quotes. Our current catalog "J", at \$1.00, required to order. Over 2,000 models HI-MANUALS, Box W-802, Council Bluffs, IA 51502.

**RUSPRINT QSLs.** Working to help you look good and log that hard earned contact. Several card themes. (Cartoon, Patriotic, Mike & Key, Contest, Others). Prices? Some low as 2.5 cents each! Quantities? Start at 100. Plastic card holders. Display 20 cards. 3 - \$3.95. 4 & up \$1.20 each. More information? Business SASE with 45¢ postage. RUSPRINT, Rt. 1, Box 363WR, Spring Hill, KS 66083.

**FREQUENCY DIRECTORIES:** Large selection, SWL and scanner books, frequency guides: SWBC, mediumwave, Utes, Spy, Press, Weather, FAX, RTTY, Military, Federal Agencies, Marine, Aero, Police, Fire, etc. Big FREE catalog! CRB RESEARCH, Box 56-WR, Com-mack, NY 11725.

**PERSONALIZED HOURLY HF SKYWAVE PREDICTIONS** from your city or town: Skycom 1.0 floppy disk for Apple Macintosh or IBM PC and compatible personal computers. Includes complete mathematical description of theory (\$45.00). DX window floppy disk circular projection world radio map centered on your QTH shows sunrise-sunset gray line for any time of interest. Includes feature which displays any of 400 prefixes on world map instantly. For all Apple Macintosh machines (\$60.00). Precise beam headings from your city or town to over 400 worldwide locations. High resolution printout (\$5.00). SASE for more info: ATTN: DX; ENGINEERING SYSTEMS INC., P.O. Box 939, Vienna, VA 22180. Ph 703/255-6600.

**ROPE. ROPE. ROPE.** Putting up an antenna? Tree top? Roof top? Tower? You need Rope. Rope. Rope. Best quality — best price. Current special: factory fresh, guaranteed military specification 3/16" braided Dacron polyester, minimum stretch, olive drab color. Resists: fire, fungus, ultraviolet rays. Super value: \$9.95 per 200', plus \$2.50 postage. Whatever your rope needs contact us. No order too large. Send check or money order to: ROPE. ROPE. ROPE, Box 6601, Portsmouth, VA 23703. Checks held till cleared. VA residents add 4.5% sales tax.



**WANTED: E.F. JOHNSON TRANSMITTERS**  
— All models wanted for my station. Accessories and literature also. Will pick up. **LEN CRISPINO**, P.O. Box 702, Hudson Falls, NY 12839, or phone (518) 638-8199.

**ENGRAVED AWARD PLAQUES** — clubs, contests, individuals, humorous, whatever! Engraved brass plate on beautiful wood plaque — many styles and sizes — from \$10. **WAVELENGTH**, 68 Kathleen Dr., Syosset, NY 11791.

**I PAY CASH** for new and used vacuum tubes. Especially needed are special purpose, vintage and transmitting types by Eimac, Western Electric, etc. **RANDY NACHTRIEB**, WA6GJA, 6392 Park Ave., Garden Grove, CA 92645. 714/897-9351.

**I PAY CASH** for vintage audio gear by Western Electric, Altec, McIntosh, Marantz, etc. **RANDY NACHTRIEB**, WA6GJA, 6392 Park Ave., Garden Grove, CA 92645. 714/897-9351.

**LOW NOISE** preamps., converters and receivers for amateur and other services. Direct from manufacturer. Complete online description. Dial our modem anytime. 718/740-3911. Voice: 718/468-2720.

**G5RV ANTENNA KIT** only \$29.95 + S.H. Plus much more! Catalog available, .45¢ postage appreciated. Kilo-Tec, P.O. Box 1001, Oak View, CA 93022 or call 805/646-9645 to Order!

**MULTI-BAND DIPOLES.** Hi-performance, trapless, full power 80 through 10 meters. **LIGHTNING BOLT ANTENNAS**, 412/530-7396.

**DIGICOM/64** technical operations manual. Painless operations instructions. New edition. \$6. ppd. **FULLER**, N3EFN, RD2, Box 40-31, Guys Mills, PA 16327.

**"REAL RADIOS GLOW IN THE DARK"** — (SM) — It is time to resurrect that old gear and set it up in your shack. We receive many phone calls and letters from hams young and old that are doing just that. Most are working CW, some AM phone and some early SSB gear. It's fun to recapture the good old days!! Join the fun! We are here to help you with your service, technical needs, and parts. **CLASSIC RADIO (SM)**, 340 W. 7th Street, Eureka, CA 95501 — 24 hour telephone 707-444-3911-K6VHP.

**WANTED: HAM EQUIPMENT AND OTHER PROPERTY.** The Radio Club of Junior High School 22 NYC, Inc. is a nonprofit organization, granted 501(C)(3) status by the IRS, incorporated with the goal of using the theme of Ham Radio to further and enhance the education of young people nationwide. Your property donation or financial support would be greatly appreciated and acknowledged with a receipt for your tax deductible contribution. Meet Joe, WB2JKJ, and two of the 22 crew at the Knoxville TN Hamfest on May 5, 1989. Made possible by "The Knoxville Honor Roll." Please write us at: P.O. Box 1052, New York, NY 10002. Round the clock hotline: 516/674-4072. Thank you!

**ICOM, KENWOOD & YAESU OWNERS:** Informative separate newsletters. 10th year. USA bulk (\$10.50) F.C. (\$12.50) Canada (\$13.00) elsewhere (\$14.00 & \$18.00). Free catalog, send (.45¢) SASE. **INTERNATIONAL RADIO & COMPUTERS, INC.**, 751 South Macedo Blvd., Port St. Lucie, FL 34983. 1-(407) 879-6868.

**ROSS' \$\$\$\$ USED MAY SPECIALS:** Kenwood TR-9500 — \$399.90; MC-50 — \$43.90, TM-411A — \$299.90, TM-401A/TU-3 — \$279.90; Collins KWM2 — \$499.90, 312B-4 — \$259.90, PM2 — \$129.90; ICOM 2KL — \$1395.00, IC-27H — \$299.90, IC-471A — \$589.90; Yaesu FT-901DM/W XF8.9HS, XF8.9HCM, — \$599.90, FT-101E — \$499.90, FT-101ZD — \$599.90, YD-148 — \$25.00, NC-8A — \$65.00, FT-208R — \$189.90. All L.T.O. (limited time offer) Looking for something not listed?? Call or write. Over 8780 ham-related items in stock for immediate shipment. *Mention ad.* Prices cash, F.O.B. Preston. Open Mon. 9-2, Tue.-Fri. 9-6, closed Sat. & Sun. **ROSS DISTRIBUTING COMPANY**, 78 South State, (P.O. Box 234) Preston, ID 83263. (208) 852-0830, FAX (208) 852-0833.

**NICAD BATTERY PACS** 500 ma - 2000 ma for Kenwood, ICOM, Yaesu. Gordon West code, theory tapes. **FLORIDA NICAD SPECIALTIES**, 1-800-666-4223; (813) 629-0890.

**HIGH QUALITY TOOLS AND STAINLESS STEEL HARDWARE.** European and American soldering stations, screwdrivers, nutdrivers, cutters, pliers, hex keys, balldrivers. Free catalog. **ROBERT MINK IMPORT-EXPORT**, Box 6437W, Fair Haven, NJ 07704.

**RADIO DESK CONSOLE CABINET.** Build your own. Drawings, photographs, list of materials, \$7.95 ppd. **BILL MORRIS**, WA5RSC, P.O. Box 3, Temple, TX 76503-0003.

**WANTED: ZENITH TABLE MODEL K526** AM bakelite from 1953. **CLARENCE SMITH, JR.**, KA8PJM, 17845 144th Avenue, Spring Lake, MI 49456, phone 1-616-842-8517.

**QSL MGR/BEAM HEADING/PREFIX LOCATOR** for C64/128 & IBM. Over 10000 calls with quarterly updates. Send large SASE to N7CTY, Bx 738, Cornelius, OR 97113.

**GROUND RADIAL WIRE FOR VERTICALS OR SLOPERS:** Improves performance, new #16 bare solid copper. Lowest cost, 1000 foot spool, \$38 includes shipping. **DAVIS RF**, PO Box 230-W, Carlisle, MA 01741. 508-369-1738.

**ANTENNA PARTS CATALOG, LOWEST PRICES:** Dipole/quad/ground radial wire, insulators, center feeds, Open wire feed line coax, relays, etc., Catalog: \$2.00. **DAVIS RF**, PO Box 230-W, Carlisle, MA 01741. 508-369-1738.

**DIPOLE/QUAD WIRE: NEW HYBRID PRODUCT**, 168 strand copper "FLEX-WEAVE", #14, strong, flexible, non-stretch, won't rust/kink like copper weld. \$34 first 275' (minimum) \$.12/ft. thereafter, includes shipping. **DAVIS RF**, PO Box 230-W, Carlisle, MA 01741, 508-369-1738.

**COAX, LOWEST U.S. PRICES:** RG-213 (50 ohm) HD milspec, QPL, .29/ft.; RG-58, .15/ft., both 125 ft. minimum. Hybrid dipole wire; radials, open wire, etc. Catalog \$2.00 (refundable w/o). Copper has soared, our prices low. **DAVIS RF**, PO Box 230-W, Carlisle, MA 01741. 508-369-1738.

**CLASSIFIED ADS FOR JOBS WANTED OR POSITIONS OFFERED** will be run free of charge in **Worldradio's MART**.

**WANTED:** co-sponsor for the proposal of an ambitious prison project. **Project:** Reading for the blind. **Requirements:** Provide blank cassettes with printed material to be read as well as handle duplication and distribution. Other co-sponsor to provide hardware (recorder, microphones, etc.) and N5AAN will read. Prefer radio related topics but open to your needs. May try Spanish language on a trial basis. **Contact:** **JIM CRANFORD**, 107159, PC Unit - WCC - Rt. 2, Box 75, Homer, LA 71040.

## ADVERTISER'S INDEX

Ace Communications — 56	Glen Martin Engineering — 23	Radio Engineers — 28
Advanced Concept Development — 50	Ham Radio Outlet — 32, 33	Radio Place — 24
Alinco — 25	Hamcon '89 (ARRL SW Division) — 11	Radio Works — 12
Anne Wright, N6BOP — 39	Handi-Tek — 36	rf concepts — 42
Antennas West — 4, 6, 15, 29, 30, 40, 45, 47, 49, 54	Heath Co. — 52	RF Parts — 10, 18
Antennas, Rudy Plak — 3	Henry Radio — 2, 36	RLD Research — 27
Antique Radio Classified — 52	ICOM — 64	SCO Electronics — 53
AVC Innovations — 58	IMRA — 27	SGC Inc. — 17
AXM Inc. — 39	Int'l. Radio & Computers — 7	Sign-On — 8
Barry Kutner, W2UP — 42	Jun's Electronics — 22	Spider Antennas — 40, 47
Bel-Tek — 41, 48	Kilo-Tec — 53	Synthetic Textiles, Inc. — 56
Brian Beezley, K6STI — 27	Lakeview Co. — 45	TimeKit — 41
Butternut Electronics — 30	Lanz Company — 20	Todd Skogen — 19
C.A.T.S. — 48	Long Island DX Bulletin — 61	Universal Radio — 55, 58
Call Sign Cups — 53	M&S Communications — 44	Van Gorden Engineering — 4
Callbook — 60	M. Bohnhoff — 16, 46	Visit Your Local Radio Club — 37, 38
Courage Center — 6	MacTrac Software — 57	Visit Your Local Radio Store — 23
Creative Control Products — 35	Maxcom — 49	W5Y1-VEC — 24
Diamond Systems, Inc. — 44	MFJ — 13	W9INN Antennas — 34, 57
Embroidery Warehouse — 50	Mike Forman — 63	WD9IIX — 46
Engineering Systems — 43	Mission Communications — 10	Wheeler Applied Research Lab — 35
EPO Software — 20	N6KW QSL Cards — 17	WRBB — 59
Fallert's Engraving — 7	P.C. Electronics — 21	Wrightapes — 56
Gem Quad Products, Ltd. — 51	PacComm — 12	Yaesu — 5
Gene Hansen Co. — 47	Palomar Engineers — 6, 45, 51, 54, 57	
GGTE Morse Code — 43	QCWA — 19	

## Wanted: TUBES

I pay cash or trade for all types of transmitting or special purpose Tubes.

**MIKE FORMAN**  
1472 MacArthur Blvd.  
Oakland, CA 94602  
(415) 530-8840



ICOM

IC-765 HF Transceiver

# IC-765

## FOR TODAY'S ACTIVE AMATEUR

*ICOM incorporated your most requested features with modern technology's best designs to produce the remarkable IC-765. Its combination of excellent performance and superb reliability truly open a new dimension in HF operating enjoyment. The IC-765 turns your dreams into reality!*

### BUILT-IN AC SUPPLY

100 percent duty cycle rated for cool operation and superb long term performance on all modes!

### FULLY AUTOMATIC ANTENNA TUNER

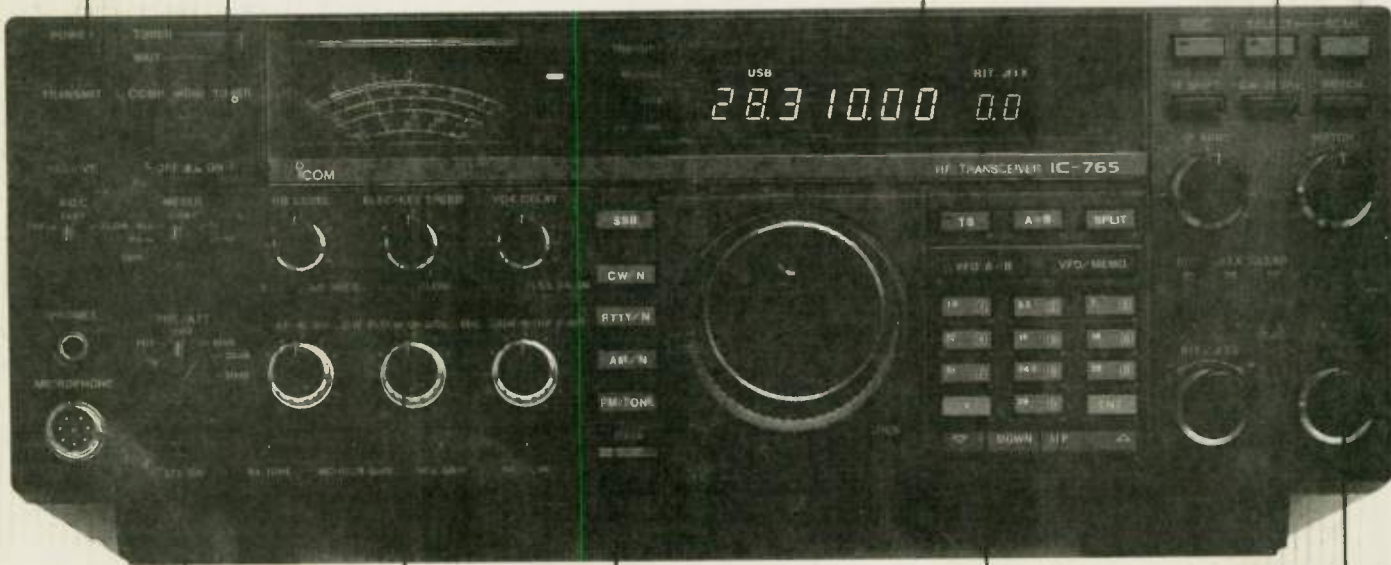
With built-in CPU and memory for extremely fast tuning and one-touch operation. Wide tuning range.

### 10Hz READOUT

Perfect on-the-dot frequency selection for nets, DX skeds and data communication modes. Large, easy-to-read display.

### NARROW 500Hz CW FILTERS INCLUDED

ICOM's FL-32A and FL-52A deliver razor sharp selectivity. A serious DX'ers delight! 250Hz FL-53A and FL-101 optional.



### MAXIMUM OPERATING FLEXIBILITY

Three step attenuator cuts multi-station overloads. RF preamp pulls weak signals right out of the mud!

### CW PITCH CONTROL

Total operating comfort and convenience for successful contesting and DX'ing. An iambic keyer with adjustable speed and weight is also built into the IC-765!

### DIRECT DIGITAL SYNTHESIZER

Assures ultra-fast PLL switching and lock-in for excellent PACKET, AMTOR and CW QSK operations.

### BAND STACKING REGISTERS

Each band's VFO's retain their last selected frequency, mode and filter choice. Produces the equivalent of 20 VFO's; two per band. Great for multiband DX'ing!

### 99 FULLY TUNABLE MEMORIES

Store frequency, mode and filter selections. Each one can be retuned and/or reprogrammed independent of VFO operations. Memories 90-99 also store split Tx/Rx frequencies.

ICOM

First in Communications

ICOM America, Inc., 2380-116th Ave. N.E., Bellevue, WA 98004 Customer Service Hotline (206) 454-7619  
3150 Premier Drive, Suite 126, Irving, TX 75063 1777 Phoenix Parkway, Suite 201, Atlanta, GA 30349  
ICOM CANADA, A Division of ICOM America, Inc., 3071 - 85 Road, Unit 9, Richmond, B.C. V6X 2T4 Canada

All stated specifications are subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. 765189