

Worldradio

February 1991



Happy Valentine's Day

FEATURES

No-code is here
Maine ham keeps calling the Gulf
Seven-year-old Technician
The 760th lives

COLUMNS

Aerials
Amsat-Oscar schedule
Construction
Contests
Continuous Wave
Digital Bus
DX World
FCC Highlights
Hamfests
Mobile
New Products
Product review
Propagation
QCWA
Search & Rescue
Special Events
10-10
Traffic
VE Exams
With the Handi-Hams
YL Roundup

and more.....



If you received this issue and you are not yet a paid subscriber, this is your free sample copy, and you are invited to subscribe. Subscription blanks can be found on page 9 and on the back inside of this protective wrapper.

Sample copies can be identified by the label. If only your call and name appear on the label, it is a sample copy.

W1QSO
Amanda Amateur
PO Box 720
Anytown, ME 04000

Labels similar to the one below are from our regular mailing list. The number in the upper right hand corner designates the last issue of your subscription term.

WR 00-0000000 03/92
Amanda Amateur, W1QSO
PO Box 720
Anytown, ME 04001

Worldradio

Year 20, Issue 8

February 1991 • \$1.25

No-code is here

LOU ANN KEOGH, KB6HP

On December 13 the FCC approved, for the first time, a no-code Amateur Radio license.

The new license will be called the Technician Class and will have all Amateur privileges above 30 MHz. This decision will *not* change the requirements for the current Novice and Technician Class licenses; rather, it will allow for a no-code Technician Class license (though there will be no identifier added to the call sign) in *addition* to the existing Technician Class license which does require knowledge and proficiency of Morse code operation. No one will lose any presently held operating rights; those Amateurs who presently hold Novice and Technician Class tickets will retain their HF privileges.

The new Technician license is expected to be available in February. Candidates for the new ticket will be required to pass a 55 question written exam which will be a combination of the

Novice and Technician question pool material, except that there will be no questions on the history or usage of Morse code. If the new Tech wants to upgrade to attain privileges on the HF bands, a code test will be required. In this case, three VEs will test the applicant, and if successful, a Certificate of Successful Completion of Examination (CSCE) will be filed with the Commission.

In a telephone conversation with *Worldradio*, a spokesman for the Personal Radio Bureau emphasized that this new license creates a second way to enter the Amateur ranks and that no one will lose any presently held privileges; those who wish to follow the traditional route by first becoming a code proficient Novice may still do so.

The Personal Radio Bureau received 1,100 comments concerning the codeless license proposal. Approximately 70 percent favored a no-code ticket (20 percent liked it but had reservations as to the impact on 6 and 2M), and 30 per-

cent of those who commented were flatly opposed to any changes.

When questioned about possible enforcement problems posed by a number of operators with a less than traditional background, the spokesman pointed out that very few citations have been issued to present Novices and Technicians. For example, the 240 citations which were issued during the Bouvet expedition all went to General Class and higher licensees.

The Commission feels that allowing a no-code license will eliminate a barrier which has inhibited access to Amateur Radio. In the past, Amateurs have been responsible for the development of broadcasting, the first Land Mobile use of radio communications, sideband radio and all its uses, all the way up to the present low earth orbital communications. By providing a means of encouraging more potential Amateurs, the Commission hopes to encourage technically inclined individuals to continue the research and development tradition which has been so ably demonstrated by the Amateur community in the past. □



Ralph E. Myra Jr. mans the radio dials this week at his operation in China, Maine. (photo by Ron Stevens, courtesy of the Morning Sentinel, Waterville, ME)

Maine ham keeps calling the Gulf

The following article is reprinted from the 11/29/90 Morning Sentinel, Waterville, Maine.

DARLA L. PICKETT

The Persian Gulf is no further away than a turn of the dial for ham radio operator Ralph E. Myra Jr., who has established an amiable relationship with a handful of servicemen there.

From inside a warm and cozy cabin beside his home in China, Maine, Myra spends eight to 10 hours a day working to establish land-to-sea communications with Amateur Radio operators aboard military ships in the Gulf.

(please turn to page 6)

Finally. . .the amplifier every amateur has always wanted



...the 3K-ULTRA

We are satisfied that this is the finest HF linear amplifier we have ever offered. The 3K Ultra represents a vision and a resolve taken years ago to provide amateurs with the finest amplifier that we could possibly build. It is every amateur's dream.

- ★ All amateur bands 1.8 to 24 MHz (Export models to 28MHz)
- ★ Remote control
- ★ All modes. . .SSB, CW, AM, FM, Amtor
- ★ Full legal power
- ★ Unique, high reliability design
- ★ Export commercial and MARS models available at higher power levels.

It is rugged, reliable, remotely tuned and offers full power and efficiency on all bands between 1.8 and 24 MHz. Frequencies above 24 MHz are available on export models. The amplifier offers 6 memory channels for automatic tuning on your choice of frequencies. A small, light-weight, remote control cabinet sits at the operating position, while the amplifier itself can be across the room, in a closet, or in the next room. We manufacture many other HF, VHF, and UHF amplifiers, all still available as before. All domestic and foreign inquiries are invited. Write for full specifications on the 3K Ultra or for our complete amplifier information packet. Don't wait any longer to own the amplifier you have always wanted.



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

Scouts' Jamboree

Boy Scouts from Troop 73, Springfield, and Troop 94, Hillside, New Jersey, participated in the 33rd annual Jamboree On The Air (JOTA), an annual event sponsored by the World Bureau of the World Organization of the Scout Movement. The Jamboree on the Air was held worldwide on October 20 and 21, 1990. Thousands of Amateur Radio stations around the world invited local scouts to visit their homes and participate in the operation of their stations. The operators established contact with other participating national and international operators who also had scouts visiting their ham shacks. The scouts got a chance to talk to their fellow scouts hundreds or thousands of miles away.

Typical information exchanged consisted of location, scout rank, name, hobbies, etc. A portable generator was used to power the station and scouts gathered around the radio to participate in the Jamboree. Stations were contacted via 10 and 40M SSB in Midland, Texas (KB5NR); San Antonio, Texas (W5JX); New Mexico (KA5SCZ); Cresco, Iowa (WA0AUU); and Minnet, North Dakota (KB0CIR). The scouts talked directly with scouts from the other states as well as to scouts from Canada. Equipment used were a Kenwood TS-430S and a long wire "Windom" antenna. □



At the Watchung Reservation in Mountainside, New Jersey, Springfield Emergency Management Staff Members Scott Seidel, WA2WUX, Ron Scull, WA2QNZ, John Cottage, WA2BAT, Adam Seidel, KB2KOQ, and Marc Marshall, KB2KEC set up a temporary outdoor radio station. Scouts were already present at the site for a two night camp out on the reservation.



Happy Valentine's Day

CONTENTS

FEATURES

Maine ham keeps calling the Gulf — 1
No-code is here — 1

Seven-year-old Technician — 16
The 760th lives — 12

COLUMNS

Advertisers' Index — 59
Aerials — 49
Amateur Hi — 12
Amateur Radio Call Signs — 8
Construction — 48
Contests — 51
Continuous Wave — 24
Digital Bus — 38
DX Prediction — 29
DX World — 26
FCC Highlights — 8
Hamfests — 50
MART Classifieds — 57
Mobile — 32
New Products — 52

Off the Air — 20
Product Review — 18
Propagation — 34
Publisher's Microphone — 4
QCWA — 40
SAR Communications — 44
Silent Keys — 16
Special Events — 19
Subscription, **Worldradio** — 9
VE Exams — 55
When will AMSAT OSCAR-13 be in range? — 56
With The Handi-Hams — 43
YL Roundup — 36
10-10 International News — 46

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 ppd. in USA. Send for FREE brochure.

RUDY PLAK — W6TIK
P.O. Box 966
San Marcos, CA 92079-0966



Worldradio

February 1991
Vol. 20, No. 8

TM

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

Subscription Dept.
Worldradio
201 Lathrop Wy., Ste. D
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 international 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 alliance of active radio amateurs concerned with reality, using radio as a communications tool to develop the skill, quality and full potential of Amateur Radio.

We emphasize the positive aspects of this great activity, and desire your contributions 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 appropriate source credit. If there is something useful, we wish to share it.

Subscription rates: \$13 per year, \$25 for two years, \$36 for three years and \$130 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.....Robin Wortley
Associate Editor.....Norm Brooks, K6FO
Assistant Editor.....Kaye Schwartz
Consulting Editor.....Lou Ann Keogh, KB6HP
Advertising Director.....Helen Noble
Advertising Mgr.....Rosalie Hernandez
Graphics Director.....Dianne Dunning
Circulation Mgr.....Dorothy Campini

PUBLISHER'S MICROPHONE

We often praise our latest **Worldradio** Super Boosters (Lifetime Subscribers) for showing great wisdom. At a recent convention one Amateur came up to the booth and said that if his name just showed up now, it would make it look like he had been asleep all the time prior.

Do not let that dissuade you. Get in now, quickly. Because when the Post Office raises our mailing costs 23 percent, guess what will happen to the subscription price (including lifetimes)!

Another fellow grumbled that he had taken his perpetual subscription out many years ago before we attached fame to the doing. Hmmmm. Well, to be fair, we may do a column in retrospect.

The latest to join the exalted ranks are: John Barrows, W1HCR, East Falmouth, MA; Mark Murphy, KC4HIT, Claremont, NC; Mike Fanning, WA4QHI, Huntsville, AL; Rev. John Robinson, WW9K, Chicago, IL; James Sebastian, Reno, NV; Leo Meyerson, W0GFQ, Cathedral City, CA; Curtis Spangler, W6ECT, San Francisco, CA; and Charlie Carpenter, one of the stalwarts getting his mail at an APO.

We received an appreciative letter from Joe Fairclough, WB2JKJ, regarding the story in our December issue about The Code Boys. He says, "From the moment you hit the street with the 'Boys' our phone, FAX and

mailbox have been working overtime. The response has been better than incredible, not to mention continuous 'on the air' comments. We created excitement, interest and discussion. Thanks for making it possible. **Worldradio** made it happen and we will always be grateful!"

We enjoy doing good things for good people. Even more could be done if more folks would send in their material to **Worldradio**. We're a little sad and perplexed when we see some good item in another special interest publication that wasn't also sent to us. There are a lot of Amateurs who, although their interests are very specific, prefer to read **Worldradio** rather than subscribe to a more narrow-spectrum periodical.

The year 1991 (June, to be exact) will mark the 20th year of **Worldradio**. Over 32,000 Amateurs will have a **Worldradio** in their hands.

Unlike another magazine in this field, we *don't* insist that we must have an exclusive. Instead, we suggest that you send your interesting material to as many publications as will print it.

PITCAIRN ISLAND

Home of the Bounty,
VR6 Land, VHS Tape
Filmed & narrated
on the island by
Kari & Brian Young, VR6KY,
72 minutes —
the hams, the people,
the island.

\$29.96 includes shipping.

TIBI PRODUCTIONS
P.O. Box 129
Medinah, IL 60157

Join other Amateurs - help
the physically handicapped
be Licensed Amateurs



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

Get the word out about what you are doing. Others will find it of interest, especially when appropriate photographs are included!

It is interesting to note that in this day (in many nations) of the movement to do away with the CW requirement, qualification for Israel's Novice Class license requires *six* words per minute.

Ledita David, N6XCF, of Los Angeles, CA says: "We have three licensed operators in our family and two more will be getting their licenses soon."

Back in September when I was in Denmark, I made a return trip to the Resistance Museum. There one could see the transmitters "homebrewed" by the underground in order to contact London during WWII. The keys used with the transmitters are also on display.

Josephine Clarke, WB6ZUC, of Kentfield, CA, sent in an interesting note about operating while in the USSR; it will be in next month's issue.

A nice guy, Lyle Aufranc, AA6DJ, was named the 1989 ARRL Herb S. Brier Instructor of the Year. Lyle was in my class when I was teaching licensing classes 13 years ago. Lyle was gracious enough to mention that when he accepted the award at the Division Convention.

If you're looking for an understandable book that can be given to a non-Amateur in the hopes of sparking interest in this great avocation, *The Wonderful World of Ham Radio* by Richard Skolnik, KB4LCS, might be just the ticket. The radio stores should have it in stock. Thankfully, it is low key. It does not present (like the cover of one recent book) an Amateur station that looks like the Pentagon's master control station, so it doesn't make the prospective Amateur hobbyist's eyes roll as he asks, "How much does all that COST??"

— Armond, N6WR

No Contest.

FT-1000

HF All-Mode Transceiver

To be a truly world-class competitor, you have to have a truly world-class rig. And it's here, now. The versatile FT-1000 from Yaesu.

The FT-1000 will blow away your competition with spectacular combination of power and operation flexibility.

There will be no contest. Just superb performance... Yours and your FT-1000.

Features and Options:

- **Direct Digital Synthesis (DDS):** Two Ten-Bit DDS Plus Three Eight-Bit DDS
- **High RF Power Output:** Up to 200 Watts
- **Dual Receive:** Two Tuning Knobs
- **Automatic Antenna Tuner:** Built-in with 39 Memories

- **100 Memories:** Independent ATU and mode/IF Filter Memory
- **CW Spot:** Provides Audible Tone for Alignment
- **CW Audio Peaking Filter:** Additional Selectivity on CW for Weak-Signal Work
- **High Dynamic Range:** 108 dB
- **Multimode Selection on Packet/RTTY**
- **Front Panel Rx Antenna Selection:** Allows Quick Switching

- **Direct Voice Storage (DVS-2):** Option Provides Instant Playback
- **BPF-1 Module Option:** Allows Crossband Dual Service

Specifications

Receive Range: 100 kHz–30 MHz

Transmit Range: 160-10 meters

Power Output: Adjustable up to 200 Watts (50 Watts AM Carrier)

Emission Types: LSB/USB (J3E), CW (A1A), FSK (J1D, J2D), AM (A3E), FM (F3E)

Antenna Impedance: 16.5–150 Ohms Nominal

Power Consumption: 95 VA (Receive), 1050 VA (Transmit)

Sensitivity: SSB/CW < 0.25 V for 10 dB S/N, 1.8–30 MHz

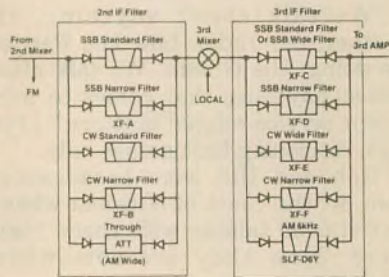
Dynamic Range (Typical): 108 dB (@ 500 Hz BW, Preamp off)

Maximum Audio Power Output: 2 Watts into 4 Ohms with < 10% THD

Audio Output Impedance: 4–8 Ohms

Weight: 56.2 lbs. Standard Version (Deluxe Version slightly more)

IF Filter Structure



FT-1000: XF-A & XF-B included.
FT-1000D: XF-A, B, C, D & E included.



YAESU

Performance without compromise. SM

© 1990 Yaesu USA, 17210 Edwards Road, Cerritos, CA 90701.
Specifications subject to change without notice.
Specifications guaranteed only within amateur bands.

COMET

ANTENNAS FOR THE PROFESSIONAL AMATEUR

MULTI-BAND ANTENNA SYSTEMS

146 MHz

446 MHz

DUAL-BAND

CA-2 x 4Z

Base/Repeater Antenna
GAIN: 146MHz 8.2dB 446MHz 11.5dB
POWER: 200 watts
LENGTH: 15'11"
CONNECTOR: N

CA-2 x 4FX

Base/Repeater Antenna
GAIN: 146MHz 4.5dB 446MHz 7.2dB
POWER: 200 watts
LENGTH: 5'11"
CONNECTOR: UHF type

CA-2 x 4MB

Mobile Antenna w/Fold-over feature
GAIN: 146MHz 4.5dB 446MHz 7.0dB
POWER: 150 watts
LENGTH: 5'
CONNECTOR: UHF type

CA-2 x 4SR

Mobile Antenna w/Fold-over feature
GAIN: 146MHz 3.8dB 446MHz 6.2dB
POWER: 150 watts FM
LENGTH: 3'4"
CONNECTOR: UHF type

CHL-23J

Mobile Antenna
GAIN: 146MHz 2.15dB 446MHz 3.8dB
POWER: 100 watts
LENGTH: 20"
CONNECTOR: UHF type

CF-416

Duplexer w/Coax
POWER: 146MHz 800 watts
446MHz 500 watts
CONNECTOR OUTPUT: N-type
146MHz INPUT: UHF
446MHz INPUT: N-type



CF-41601 CF-4160K

Duplexer w/o Coax
POWER: Same as CF-416
CONNECTOR OUTPUT: UHF
146MHz INPUT: UHF
I MODEL 446 INPUT: N-type
K MODEL 446 INPUT: UHF



Call For Your Nearest
Dealer Or Catalog

1 (800) 962-2611

N.C.S. CO.



NCG Companies

1275 North Grove Street

Anaheim, CA 92806

(714) 630-4541/FAX (714) 630-7024

Maine ham

(continued from page 1)

Myra is organizing a maritime mobile network to assist him in expanding communications with the men.

"I took it upon myself to start this net and help build morale there," says Myra, who notes other Amateurs in the area are helping to share the network.

"Shore stations like mine are bogged down with traffic. There's not enough to handle communications back and forth with the United States."

Of the sailors, Myra says, "They are all in good spirits. However, they are very, very lonely. Some of them haven't received mail for two months."

"And that has nothing to do with the postal service. People are just not writing." Myra says he would be addressing that issue before the Augusta Lodge of Elks this week.

"We talk about anything, the weather, our radio, how the Patriots are doing, the Giants. We talk about almost anything that comes to mind except service-related matters," Myra says, disclosing first names only.

"Bob and Bill were broadcasting from off the coast of Virginia when I first started talking with them," says Myra. Now they are somewhere overseas.

"It's a big ocean out there. The other day we talked about how cold it is here. They say the temperature there was in the 90s outside the ship."

"Happy Thanksgiving, I love and miss you all," was a message passed by Myra to some families in the United States.

He has transmitted messages to other families in North Carolina, Texas, Virginia and other states.

"None in the state of Maine yet. I can't do these all by myself," Myra says, which is why the net is so important.

The first two messages he delivered

directly to the family. "I just did it out of friendship. Most of the messages are passed via the radio."

Myra has become very close to one man. "I feel like he's a brother. I've even invited him, his wife and his daughter to spend the weekend here when he comes home. That's how friendships develop."

Among Myra's 15 to 20 radio acquaintances from the Gulf is a 30-year-old serviceman from Columbus, Ohio, he says, whom he talks to every day.

Myra withdraws an envelope from a nearby drawer that includes a long letter from one of his radio buddies, as well as a picture postcard of a Navy ship.

Myra starts his net at 7 a.m. each morning, sometimes working the radio as many as 10 hours a day, leaving his wife the freedom to enjoy the little log cabin they share nearby.

A disabled Army paratrooper, Myra says he can identify with the servicemen. He knows what it feels like to be away from home during the holidays.

"It's very distressing for our service personnel. For those who have never been away from home, even more so," he says.

A member of the Augusta Amateur Radio Club, Myra says the "first and most important thing is to be cheerful" when conversing with servicemen away from home.

Originally from Massachusetts, Myra says he used to come to Maine deer hunting and met his wife here.

"I'm not looking for a pat on the back. I'm just doing my little part to help my fellow radio Amateurs overseas," he says.

The newly formed 10M Maritime Mobile Net meets daily at 7 a.m. EDT (1200 UTC) on 28.380+ or -. Its sole purpose is to pass traffic and assist maritime mobile units in any way possible. To find out how you can help, contact net control and manager Ralph Myra, N1FJL, China, ME; 207/445-2021. □

FREE SAMPLE COPY!



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 - \$13.
1-Year: \$24 (\$36 by 1st Class). Foreign - Write.
A.R.C., P.O. Box 802-N6, Carlisle, MA 01741

Happy Valentine's Day

Quick Interconnect



POWERPOLE

- Fool-Proof • Fast • Genderless • Color coded • 30A Silver • Reliable • Switch from mobile to shack in seconds. Interchange power supplies and rigs in moments. Interconnect battery, charger, controller, solar panel, generator, backup / conventional power instantly in any combination. Create custom multi-pole connectors in seconds w/ lego-like stacking. Easy crimp/solder, assembly. No special tools required.

Sold in Sets of 2
Red-Black pairs 10 \$19.95 sets
20 \$36.95 sets Add \$5 info Sample \$2 P&H

Antennas West Box 50062, Provo, UT 84605 801-373-8425

Mozambique DXpedition

Dear Friends,

This is a report on one of the rarest DXpeditions that we have ever made. We operated in Maputo, Mozambique from October 16 through November 5, 1990 as C9QL.

Many hams have tried to obtain permission to operate in this country since a war with insurgent forces started some 15 years ago; fighting has not yet stopped. We were extremely lucky to obtain official written permission for our operation. Permission arrived the day after we met with the Vice Minister of Communications, Mr. Rui Jorge Gomes Lousa. We extend our thanks to five women who helped us.

First, we obtained a letter from the American Ambassador to Mozambique, Melissa F. Wells, though she was just departing and very busy. She wrote a nice letter in our behalf to the Minister of Communications.

While in the country of Malawi, we met a lady in the office of the US Ambassador to Malawi. Both she and her husband had previously worked in the Embassy in Mozambique. She suggested that we stay at the Cardoso Hotel in Maputo, which we did. She and her husband gave us a letter with the names of individuals who might help us. We followed up on their suggestions and received wonderful assistance.

One of the people whom we contacted said that there was a lady in Mozambique who often helped business people in their efforts to do busi-



ness here. We met her and found out that she is the daughter of an ex-president of this country. A photograph of her father is on the 100 CEM METICAIS bill. She spent many days contacting many officials of the government in our behalf.

One person whom she knows very well is the Secretary to the Minister of Communications. At first, the Minister was too busy to see us, but these ladies finally talked him into meeting us. At this meeting, he agreed to give us permission to operate Amateur Radio.

In the meantime, we had asked the acting manager of our hotel for permission to install and operate our radio station in the hotel. She consented on the basis that we must also obtain a permit from the government.

We made over 5,000 QSOs with Amateurs in 131 countries. We operated on 7, 14, 21, and 28 MHz on both phone and CW. We could easily have worked twice this number of QSOs if

the bands had been open all 24 hours a day, but they were not. We were lucky when we could hear any signals at all on any band of the four bands for as much as 12 hours a day. There are two big reasons for this. First, the 11 year sunspot height is on its way down and second, radio activity is at its height near the equator and declines as one approaches either the North or South Pole. We just met about 60 Russians who are here on their way to the South Pole!

73 es 88 — Lloyd, W6KG, and Iris Colvin, W6QL. □

QSL Manager Server @ W1NY

The W1NY BBS now provides a new service called the "QSL Manager Server." You can submit a request to the server asking for the QSL manager for a particular station. The server will return a message to you telling you who the QSL manager is for the station you requested.

If the server does not have the information you request, it will store your request and return a message to you when the information is available.

For more information on the QSL Manager Server, send a message to QSLMGR on the BBS. The subject of your message will be ignored, so you can leave it blank. Put the single word **help** in the message. The server will return a message to you with information on using it.

Any questions about this new service can be directed to NQ1C. —Hamp-

den County Radio Association Inc.,
West Springfield, MA □

RFI KIT

Use ferrite beads to keep RF out of your TV, stereo, telephone, etc. Kit includes one dozen beads, one dozen toroids 1/2" to 1 1/4" diameter, three "split beads" and our helpful RFI tip sheet. Everything needed to fix most RFI problems. \$15 + \$4 S&H U.S. and Canada. 7 1/4% tax in CA.

Free catalog and RFI tip sheet on request.

PALOMAR ENGINEERS

Box 455, Escondido, CA 92033
Phone: (619) 747-3343

SHORTY ALL-BANDER

THE PERFECT MATCH FOR ANTENNA TUNERS WITH A BALANCED OUTPUT ONLY 70 FOOT LONG OVERALL

- Completely factory assembled ready to use
- Small, lightweight, weatherproof, sealed shorteners with stainless steel eyelets
- Heavy 14 (7/22) gauge stranded copper antenna wire to survive those severe storms
- Center fed with 100 feet of low loss 450 ohm balanced transmission line
- Includes center insulator with an eye hook for center support
- Includes custom molded insulators molded of top quality material with high dielectric qualities and excellent weatherability
- Complete installation instructions included
- Overall length 70 feet, less when erected as an inverted vee or sloper
- Handles 2 kw PEP & covers 160 through 10 meters
- May be trimmed to fit small city lots

Only \$39.95 PPD

The ALL-BANDER DIPOLE, all-band doublet type antenna is fully assembled, overall length 135 feet with 100 feet 450 OHM leadline

Only \$29.95 PPD

G5RV ANTENNA



The G5RV MULTIBANDER antenna is an excellent all band (3.5-30 MHz) 102 foot dipole. On 1.8 MHz the antenna may be used as a Marconi type antenna when used with a tuner and a good earth ground. The proper combination of a 102 foot flat top and 31 feet of 300 ohm KW twinlead transmission line achieves resonance on all the amateur bands from 80 through 10 meters with only one antenna. There is no loss in traps and coils. The impedance present at the end of the 300 ohm KW twinlead transmission line is about 50-60 ohms, a good match to the 70 feet of RG8X mini-foam coax. It comes completely assembled ready for installation, handles 2 KW PEP and may be used in a horizontal or inverted "V" configuration.

MODEL	BANDS	LENGTH	PRICE
G5RV-MB	80-10	102'	\$49.95 PPD
		(model illustrated)	
G5RV	80-10	102'	\$34.95 PPD
		(no xlmr or cable, with 31' bal feedline)	
G5RV JR	40-10	51'	\$29.95 PPD
		(no xlmr or cable, with 26' bal feedline)	

AT YOUR DEALER, IF NOT, ORDER DIRECT

VG E

VAN GORDEN ENGINEERING
BOX 21305, S. EUCLID, OHIO 44121
PHONE (216) 481-6580 FAX (216) 481-8329



Another alleged radio jammer has been silenced due to efforts of Amateur Radio Operators. On November 6, US marshals and engineers from the FCC's Langhorne, Pennsylvania field office seized radio equipment belonging to Ernest Woods, 30, of Norristown. The equipment is believed to have been used to interfere with Philadelphia area 2M Amateur repeaters as well as frequencies of the Pennsylvania State Police, the Norristown fire department and other public services agencies. Woods could face serious civil and criminal charges as a result. Woods was issued Novice Class Amateur license KA3WHZ in May 1990 and a Technician license in August. In late June users of the Telford (PA) Area Repeater Association (TARA) began to experience persistent and purposeful interference to their 145.190 MHz repeater. Many incidents of interference to the repeater operation were reported, and by Sept. 12 the FCC had stepped in to act on

complaints both from TARA and from the state police. Another search warrant was issued in early November and some of the equipment in operation at the time of the search was confiscated. At presstime, no charges had yet been filed against Woods. (*The ARRL Letter*, 11/29/90).

In response to petitions by the ARRL as well as several individuals, the FCC has proposed changes to its Part 97 Rules for the Amateur Service. The Commission's Notice of Proposed Rule Making in Docket 90-561 was released Nov. 16. Here are the highlights:

- The ARRL asked that the terms "telecommand telemetry" and "space telemetry" be defined in the Rules. The FCC agreed. The terms "tactical call sign" and "digipeater" will not be codified.
- The ARRL sought an increase in the minimum number of club members necessary to apply for a club station license, from two to four. But the Commission noted that no new club station licenses have been issued for some 13 years and "we do not foresee that we will resume doing so, so the point is moot." The League continues to urge the Commission to resume the issuance of new club station license.
- The FCC declined a request to amend its Rule that states an Amateur station must be independent of all other radio apparatus installed on a ship or aircraft. The League's argument in this case was that a regulation is already in place prohibiting an Amateur signal from interfering with other apparatus on board.

• In the matter of prohibition of automatic control of Amateur stations when third party traffic is being handled, the League sought a rule revision to put the responsibility for the content of such traffic on the originating Amateur station. The Commission, however, maintained that traffic content is the responsibility of every station, including those who retransmit communications, and proposed no change.

In a related matter, ARRL sought a clarification of Section 97.109(d), to emphasize that a Commission representative may order an automatically controlled station to shut down because of improper operation or harmful interference only after the alleged offending station had been given the opportunity for a hearing. FCC denied this, saying that "the control operator must cease automatic control of the station upon notification by the engineer in charge that the station is transmitting improperly or causing interference to other stations, and the licensee is not entitled to a hearing before such notification."

• The FCC declined to amend its Rules to permit retransmissions of other services, such as NOAA weather and DOC propagation broadcasts, saying that such transmissions are routinely available over the air with inexpensive receivers.

• The FCC agreed to amend its Rule regarding compensation of club station operators, lowering the number of simultaneous bands on which bulletins and code practice must be transmitted from 10 to six.

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 Dec. 1, 1990.

For more information about the call sign assignment in the Amateur Radio Service, see Section 97.17(f) 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	AA0CW	KF0OI	N0MRS	KB0HUQ
1	WN1M	KC1YL	N1IGM	KA1WSU
2	AA2CN	KE2YH	N2LKZ	KB2LOI
3	WG3V	KD3UY	N3ISG	KA3YBS
4	AC4AY	KN4TI		KC4UJV
5	AA5WC	KI5LS	N5RTK	KB5OFU
6	AA6ZU	KK6TN		KC6PPF
7	AA7GV	KG7KW	N7PXO	KB7MB1
8	AA8CR	KF8KO	N8NCU	KB8LBL
9	WX9M	KF9AG	N9KHY	KB9FSV
North Mariana Is.	AH0J	AH0AG	KH0AM	WH0AAO
Guam	KH2O	AH2CI	KH2EV	WH2AMU
Johnston Is.	AH3D	AH3AD	KH3AE	WH3AAG
Midway Is.		AH4AA	KH4AE	WH4AAH
Hawaii		AH6KT	NH6XY	WH6CJP
Kure Is.			KH7AA	
American Samoa	AH8D	AH8AE	KH8AI	WH8AAZ
Wake Wilkes Peale	AH9A	AH9AD	KH9AE	WH9AAH
Alaska		AL7MP	NL7VP	WL7BZN
Virgin Is.	NP2I	KP2BV	NP2EB	WP2AHF
Puerto Rico		KP4RI		WP4JPM

The GAP

Finally

super DX.



Challenger DX-VI provides total bandwidth less than 2:1 on 2m, 6m, 10, 12m, 15m, 20m, and 40m. On 80m there is 140 kHz of bandwidth less than 2:1. There are NO Traps. Coils, Baluns, Resistors, Transformers or Base Insulators to steal RF power.

GAP DX-VI

for Only \$219 to:
McClaran Sales
P.O. Box 2513
Vero Beach, FL 32961
USA & Puerto Rico (800) 331-6186

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"/> NEW
12 issues
24 issues
36 issues
Lifetime | <input type="checkbox"/> Renewal
(\$1.08 per issue)
(\$1.04 per issue • save \$1)
(\$1.00 per issue • save \$3)
(Be a WR super booster) | <input type="checkbox"/> Gift
\$13.00
\$25.00
\$36.00
\$130.00 |
|--|--|---|

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™

**201 Lathrop Way, Suite D
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.

- A request to ease the FCC Rules regarding third party communications on behalf of someone holding an Amateur Radio license but not eligible to be a control operator of an FCC-licensed station was denied. The Commission said this had already been considered (in the most recent rule rewrite) and denied reconsideration at that time.
- A request by an individual Amateur to require stations to identify at the beginning of communications through a repeater was not included in the proposals, but the FCC asked for comments in the matter.
- The FCC declined to entertain a change in its Rules to incorporate due-

process procedures in cases involving "quiet hours," saying that it was unnecessary.

- In the area of special operations, the FCC agreed to 1) amend its Rules to delete the condition that an auxiliary station can be automatically controlled only when it is part of a repeater system, so that Amateur operators can experiment with new system configurations that use auxiliary links; 2) expand the permissible types of space telemetry transmissions as requested by the ARRL; and 3) make minor changes in wording, including changing "remote control" to "telecommand."

- The FCC once again refused to

change its Rules banning 10M power amplifiers, saying the ban "makes our enforcement procedures more efficient and effective."

- A request that persons whose Amateur station or operator license has been revoked or suspended be allowed to qualify as a volunteer examiner after a 10-year period was turned down.

Interested parties may file comments on or before Jan. 31, 1991; reply comments are due by March 4, 1991. Extensions of time are not contemplated, according to the FCC. (*The ARRL LETTER*, 11/29/90).

The following is the latest list of intruders in our HF bands which the ARRL has asked FCC's Treaty Branch to pursue with other countries as well as our own:

1813-1820 kHz, A2A (beacon transmitters)

7008, F1(TTY idling and traffic)

14221, R7B/F1B (250/500 Hz shift TTY and Mux)

14312, F1 (high speed digital keying, 1 kHz shift)

18090, F1 (140 baud encrypted, 500 Hz shift)

18095.5, F1 (idling signal, 2 kHz shift)

8125, F1 (50 baud, 400 Hz shift, some encryption)

18138.5, F1 (140 baud encrypted).

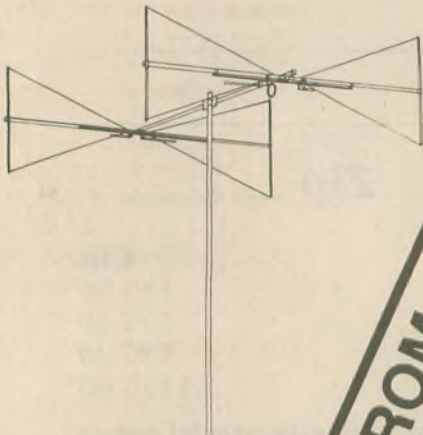
Both new Amateur Radio licensees and license up-grades showed a healthy increase in the past year. FCC statistics for the fiscal year (ended Oct. 1) have been released (statistics actually were compiled through Sept. 25). The total number of Amateur operator licensees grew 6.1 percent, from 464,800 to 493,292. Here is the breakdown by license class:

Extra	52,847
Advanced	104,365
General	119,158
Technician	125,217
Novice	91,705
Total	493,292

(*The ARRL LETTER* 11/02/90) □

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.

HF ANTENNAS FROM BUTTERNUT

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



THAT PACKAGE ISN'T FROM YOUR UNCLE BERTRAM THE BOMBER, IT'S FROM YOUR RICH UNCLE JACK-- HE SAYS "HOPE YOU ENJOY THE NEW YAESU FT1000"

Join MARS!

In the last two issues, you've seen more about MARS and the communication services it provides, especially in recent months with the Desert Shield operation. If you think you may be interested in joining MARS, here are some more details.

What is MARS?

The Military Affiliate Radio System is a Department of Defense sponsored program, established as separate managed and operated programs by the Army, Navy, and Air Force.

The program consists of licensed Amateur Radio operators who are interested in military communications. They contribute to the MARS mission providing auxiliary or emergency communications on a local, national, and international basis as an adjunct to normal communications.

MARS history

In November 1925, the Army Amateur Radio System (AARS) was formed by a few dedicated pioneers in the United States Army Signal Corps. This organization continued until the start of World War II when operations were suspended. Army Amateur Radio was authorized to resume operations in 1946, and the Army Amateur Radio System was reactivated and functioned as such until 1948 when the Army and Air Force established the Military Amateur Radio System, later renamed the Military Affiliate Radio System (MARS). In 1962, the Navy-Marine Corps MARS program was launched, making MARS a joint service program.

MARS mission

- Provide Department of Defense sponsored emergency communications on a local, national and international basis as an adjunct to normal communications.
- Provide auxiliary communications for military, civil, and/or disaster officials during periods of emergency.
- Assist in effecting normal communications under emergency conditions.
- Create interest, and furnish a means of training members in military communications procedures.
- Provide a potential reserve of trained radio communications personnel.
- Handle morale and quasi-official record and voice communications traffic for Armed Forces and authorized U.S. Government civilian personnel stationed throughout the world.
- Conduct an appropriate Amateur Radio program as a part of the annual celebration of Armed Forces Day.

Eligibility to join MARS

The applicant must 1) be 14 years of age or older; 2) be a United States citizen or resident alien; 3) possess a valid Amateur Radio license issued by the Federal Communications Commission or other competent US authority; 4) possess a station capable of operating on MARS HF frequencies.

MARS members must agree to operate in accordance with the rules and regulations governing MARS as follows:

For Army — A minimum of 12 hours per calendar quarter with 6 hours being on HF networks.

For Air Force — A minimum of 12 hours participation per calendar quarter with 6 hours in their primary HF assignment.

For Navy-Marine Corps — A minimum of 18 hours per calendar quarters with 12 of the 18 hours being on area or region HF networks.

Benefits of MARS membership

- Add to the enjoyment of your Amateur Radio hobby through the expanded horizon of MARS.
- Become part of the Army, Navy-Marine Corps, or Air Force MARS worldwide communications system. There are MARS stations in Japan, Korea, the Trust Territories, Philippines, Hawaii, Panama, the Virgin Islands, Puerto Rico, Central America, Alaska, Germany, Africa, and the continental United States.
- Increase your communications skills and capabilities. Selected correspondence courses in communications-electronics subjects are available free to MARS members from their respective affiliated service after completion of six months active membership.

pletion of six months active membership.

- Operate on specially assigned military radio frequencies in voice, teletype, CW, and packet modes of communications.
- Join a group of dedicated fellow radio Amateurs participating in meaningful public service.
- Affiliate with the service branch of your choice and become part of the professional military communications family.
- Gain a feeling of being associated with a military mission and contributing to the welfare and preparedness of the nation.
- Participate in regulated, disciplined radio nets with structured lines of organization and very specific operating rules.
- Participate in the MARS Excess/Surplus Equipment Program after 6 months active membership. Issue of equipment is based on availability of equipment, and possible

25 Years a Ham?



QUARTER CENTURY WIRELESS ASS'N, Inc.

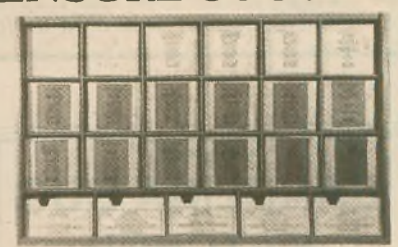
- Preserves and promotes Amateur Radio
- Awards & recognition for members
 - Over 160 local chapters
- CW and SSB nets • QSO parties
- Over \$5,000.00 awarded annually in youth scholarships

You owe yourself the privilege of QCWA affiliation

Membership applications and information available from:

Quarter Century Wireless Assoc.
1409 Cooper Dr. • Irving, TX 75061

ENSURE 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 5 1/4" disk)

Novice (new pool) \$14.95
Tech (new pool) \$14.95
General \$14.95
Advance \$19.95
Extra \$19.95
(add \$2 for 3 1/2" disk)

Available on VCR/VHS tapes (no code) add \$5
Set (all classes) 5 1/4" disk \$75.00
Set (all classes) 3 1/2" disk \$85.00

Personal cks., M.O., C.O.D.
KY res. add 6% tax. (ppd.)

Dealers invited. Write or call for info.

The Lanz Company
3523 Dayton Ave. • Louisville, KY 40207
(502) 897-2468

assigned mission of individual activity. The granting of MARS membership to an individual or activity does not in itself convey an automatic right or entitlement of the recipient to receive or demand MARS property.

Typical MARS frequencies

MARS members stations meet periodically in scheduled networks on military frequencies outside of the Amateur bands. There are various types of networks and each accomplishes a specific goal. For example, administrative networks to take care of much of the day-to-day management of the program; traffic networks which exist solely to pass third party traffic; and of course, emergency networks which are established to provide for communication needs during periods of emergency. There are also technical nets and training nets. MARS nets operate in different modes. Although

high frequency (HF) single sideband (SSB) voice is predominant, there are CW, RATT, VHF, PACKET, and even slow scan TV nets.

How to join MARS

You may join either Army, Navy-Marine Corps, or Air Force MARS but you may not join or belong to more than one MARS service at the same time. To join, send a request for application forms to the appropriate MARS representative as follows:

Army MARS: Chief Army MARS, HQ, US Army Information Systems Command, ATTN: AS-OPS-O A, Fort Huachuca, AZ 85613-5000.

Navy-Marine Corps MARS: Chief Navy-Marine Corps MARS, Naval Communication Unit, Washington, DC 20397-5161.

Air Force MARS: Chief Air Force MARS, HQ, AFCC/DOOCC, Scott AFB, IL 62225-6001. □

The 760th lives

SEAN C. MALONE, N7OUW

Field day was a complete success for us and a unique experience for all. There were about 30 people involved from the Panorama Land Amateur Radio Club and between 400 and 500 confirmed contacts were made in the 24 hour period over Saturday and Sunday.

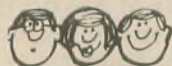
We only had Friday afternoon and Saturday morning to set up the antennas, which consisted of four towers up to 40 feet in height. We operated out of campers and motor homes or trailers and had seven radios going for the 24 hour period. The site was on the very top of a mountain about twenty miles East of Colville; just above Black Lake, and we had a 360 degree horizon for approximately 18 miles.

What was unique about the site was that it was an old radar post, part of the Early Warning System, and was manned by the 760th AC&W in the 50s and 60s. The operation was called "Pine Tree." Though the buildings had been gutted and the brush and pack-rats were taking over, I had the feeling that we were living in the 50s for that 24 hour period. The yellow paint still clung to the edges of the steps from the control building to the site where the radar dome was.

The men were very fortunate that the women cooked and boy, did we eat! The weather cooperated and meals were served from a linen covered table where the old radar dome was. (The linen was replaced by a red & white checkered plastic tablecloth for one meal; you should have heard the comments!) The campers and motor homes were parked in a rough circle around the antenna towers as if they were covered wagons. There were piles of fried chicken and ham, bowls of potato and macaroni salads and lots of desserts — nothing like the club in Kentucky that lived on sandwiches for Field Day. And just to keep morale up, there was a cooler that was kept full of pop on ice and the ladies would bring plates of snacks around to the operators as they slaved away at their radios.



Amateur "Hi"



Ever had a funny or strange experience with Amateur Radio, either on or off the air? If so, type it up (or print neatly) and send it to us for

consideration in our monthly AMATEUR "HI" contest. You could win a free year's subscription to Worldradio!

This month's winner is Cecil Johnson, W5SRQ, of Garland, TX.

During the BCI (Broadcast Interference) days, Steve Finnegan, W0VUA, was heard loud and clear in a neighbor's radio. The neighbor confronted Steve one day and added that the only reason she used the radio was to hear the temperature. After that, Steve always gave the temperature when coming on the air and the neighbor complained no more.

During the early days of TV, Cecil Johnson received a phone call from a neighbor who had heard him on channel 5. But, Cecil explained, there was no TV station on channel 5. The neighbor replied, "No! But if there were, you would be interfering with it." □

WD4BUM'S CAROLINA BUG KATCHER

MOBILE ANTENNA

40 to 10 meters
CAT #CBK - 40

- Combines our famous HAM STICK technology with a very High "Q" air wound coil for unsurpassed efficiency
- Only 7 1/2 ft. long
- Simple band switching
- 1000 watts
- Moderate wind load
- Complete instructions
- Disassembles to 4' sections
- IM-1 INDUCTI-MATCH included
- 09HD Quick Disconnect included

ONLY \$79.⁵⁰

Add \$4.⁰⁰ per order
for shipping & handling

MANY MOBILE MOUNTS AVAILABLE
UHF & VHF antennas available
at bargain prices

Send or call for FREE catalog

LAKEVIEW CO., INC.

Route 7 Box 258
Anderson, SC 29624
(803) 226-6990

8:00 am to 4:30 pm EST
Monday - Friday

MAKE LEARNING FUN with the CODEKEY 1000 Code Practice Oscillator



- Compact and Easy to carry
- Operates on 9V battery included
- Adjustable Volume
- Durable Metal Case
- Variable Sidetone

\$19.⁹⁵ TO ORDER
—CALL—
(718) 983-1416

Media
Mentors
inc.

P.O. Box 131646
Dept. W
Staten Island,
NY 10313-0006

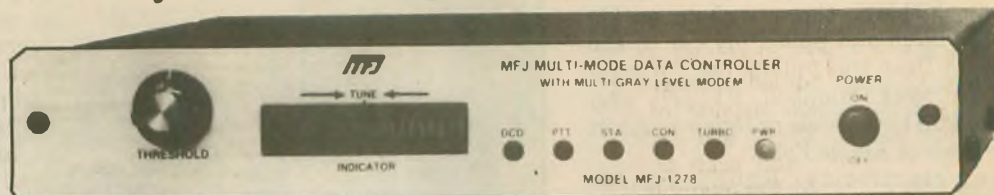
Field Day All-Band Antenna

Ready to Use Fastest Install Coax Feed 3000 V Insul	Tough Flexible Kink-Proof	Full Legal Power No Lossy Traps Low Noise Never Corrodes
QRV- \$49.95 30-10 51 ft. long	QRV- \$59.95 760-10 102 ft. long	
Includes 40-page Tech Manual Infopack \$1		Add \$5 Post & Handling Antennas West Box 50062 W. Provo, UT 84605
(801) 373-8425		

MFJ gives you *all 9* digital modes and *keeps on* bringing you state-of-the-art advances . . . while others offer you *some* digital modes using 3 year old technology!

MFJ-1278

\$279⁹⁵



No 3 year old technology at MFJ!

Using the latest advances, MFJ brings you 9 exciting digital modes and *keeps on* bringing you state-of-the-art advances like new ASA™.

You get tons of features other multi-modes just don't have.

Only MFJ gives you *all 9* modes

Count 'em -- you get 9 fun modes -- Packet, AMTOR, RTTY, ASCII, CW, FAX, SSTV, Navtex and Contest Memory Keyer.

You can't get all 9 modes in *any* other multi-mode at *any* price. Nobody gives you modes MFJ-1278 doesn't have.

The best modem you can get

Tests in *Packet Radio Magazine* prove the modem used in the MFJ-1278 copies HF packet more accurately than all other modems tested.

MFJ-1278 is the *only* multi-mode with a *true* DCD circuit. This dramatically reduces sensitivity to noise and dramatically increases completed QSOs.

Exclusive Built in Printer Port

Only the MFJ-1278 has a dedicated printer port that lets you plug in your Epson or IBM compatible printer.

You don't need to buy a silly \$40 cable just to plug in your printer.

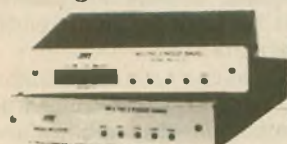
20 LED Precision Tuning Indicator

MFJ's unequaled tuning indicator makes it really easy to work HF packet. Unlike others, you use it the same for all modes -- not different for each mode. Just tune your radio to center a single LED and *you're precisely tuned in to within 10 Hz* -- and it shows you which way to tune!

New Easy Mail™ Personal Mailbox

You get MFJ's new Easy Mail™ Personal

MFJ Packet Radio



MFJ-1274

\$159⁹⁵

MFJ-1270B

\$139⁹⁵

MFJ-1270B super clone of TAPR's TNC-2 gives you more features than *any* other packet controller -- for \$139.95

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

You get the Easy Mail™ Personal Mailbox with soft-partitioned memory so you and your buddies can leave messages 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 most computers.

A new KISS interface lets you run TCP/IP and MSYS. NET ROM compatible.

You also get 32K RAM and a free 110 VAC power supply (or use 12 VDC).

For dependable HF packet tuning, the MFJ-1274 gives you a high resolution tuning indicator -- and it's *only* \$20 more.

New 2400 baud **Turbo** models available: MFJ-1270BT, \$209.95; MFJ-1274T, \$229.95.

Mailbox with soft-partitioned memory so you and your ham buddies can leave messages for each other 24 hours a day.

Multi-Gray Level FAX/SSTV Modem

You'll see tomorrow's news today when you copy outstanding FAX news photos with crisp clear details. MFJ-1278 is the *only* multi-mode with a built-in multi-gray level modem. It lets you transmit and/or receive multi-gray level pictures with an appropriate terminal program.

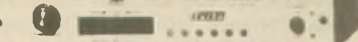
MFJ's new Automatic Signal Analysis™ gives you *exclusive* HF packet identification! MFJ's new ASA automatically identifies HF packet, RTTY, ASCII and AMTOR signals. A

NEW!

New MFJ-1278T Turbo with fast 2400 baud modem

MFJ-1278T

\$359⁹⁵



The new MFJ-1278T Turbo gives you *fast* 2400 baud packet -- *twice* the baud rate of any other multi-mode. By communicating faster you'll reduce chances for error, lessen congestion and more efficiently utilize our ham frequencies. You'll also get 1200/300 baud for compatibility with older TNCs.

The 2400 baud modem is also available separately. Order MFJ-2400, \$69.95, for any MFJ and most other TNCs.

quick "OK" command selects the mode!

One FREE Upgrade!

When you buy your MFJ-1278 *today*, you don't have to miss new modes and features that come out *tomorrow*. Why? Because your 1278 comes with a coupon good for one *free* eeprom upgrade exchange that'll add new features.

Plus More . . .

Plus you get . . . 32K RAM, *free* AC power supply. Host mode that lets MFJ-1278 serve as

New MFJ MultiCom™ . . . exciting new 1278 software

High resolution AP news photo received on 20.738 MHz using MFJ MultiCom and MFJ-1278 with multi-gray modem.



MFJ-1289 New menu-driven MultiCom™ brings out the full power of your MFJ-1278 with multi-gray modem. No set-up required -- just load and use. You get incredible high resolution WeFAX maps and AP news photos right off HF. You also get color packet pictures and multi-gray SSTV.

Bursting with features . . . One-Key Macros™ combine multiple keystrokes into a single touch. Call-Alert™ sounds an alarm when any characters you tell it to watch for come in. Auto-Set™ instantly switches entire stored sets of parameters. Auto-Router™ stores digipeater node routes for instant use. Packet Multi-Plex™ lets you transmit or receive a binary file and continue your QSO. Multi-Word™ gives a powerful word processor that is tailor-made for multi-mode communications. Custom QSL created with paint program

a kiss interface or dumb modem, fast throughput anti-collision technology, independent transmit level for each radio port, random code generator, lithium battery backup, RS-232 and TTL serial ports, socketed ICs, tune up command, peripheral I/O port, automatic serial numbering, programmable message memories, dual radio ports (*each* HF or VHF), CW paddle jack, audio amplifier and speaker jack so you can monitor CW sidetone, transmit and receive audio and packet connect bell. *new* fully integrated instruction manual with *Fast Start*™ booklet and more. 9½ x 9½ x 1½ inches.

No Matter What™ Guarantee

You get MFJ's one year No Matter What™ Guarantee.

That means we will repair or replace your MFJ multi-mode (at our option) *no matter what* happens to it for a year.

Others give you a *limited* warranty.

What if they say, "Sorry, your *limited* warranty doesn't cover that?"

Get 9 new ways of having fun

Don't settle for 3 year old technology.

Choose the *only* multi-mode that gives you the latest advances and all 9 modes.

Get 9 new ways of having fun *today!*

Software Pack gets you on the air instantly!

MFJ software packs with interface cable get you on the air instantly if you use an IBM compatible, Commodore or Macintosh computer. Here are some of the programs available:

MFJ-1289, \$59.95. Menu driven. Super IBM compatible program. See ad below for details.

MFJ-1282B, \$39.95. New with multi-gray receive for Commodore 64/128. Menu driven.

MFJ-1287, \$24.95. Macintosh starter pack.

Multi-Gray WeFAX weather map received on 16.410 MHz using MFJ MultiCom and MFJ-1278 with multi-gray modem.



can be transmitted by FAX, SSTV or Packet. On line help. RS-232 cable. Tons more. Call for *free* MFJ catalog for full information: 800-647-1800.

Optional MFJ-1292 digitizer, \$199⁹⁵

. . . lets you *instantly* point, shoot and transmit a video picture -- *all in one smooth sequence*

Transmit your very own digitized pictures all over the world by packet, FAX or SSTV. MFJ MultiCom™ lets you integrate the MFJ-1292 "Picture Perfect" Video Digitizer. \$199.95 with your MFJ-1278 for shooting and transmitting your pictures in one smooth sequence.

Nearest Dealer/Orders: 800-647-1800

MFJ MFJ ENTERPRISES, INC.
Box 494, Miss. State, MS 39762
(601) 323-5869; TELEX: 53 4590
FAX: (601) 323-6551; Include s/h.

MFJ . . . making quality affordable

©1980 MFJ Enterprises, Inc.

There were only two casualties that I know about — one was Skeeter's (N7KWZ), bee sting and the other was the driveline to my car; I broke a universal on the way up the mountain and the club's vice-president, Dean Body, K7LAK, threw a chain on his trailer hitch and pulled my car to the top. As Dean was pulling me, I was on 2M to Scott Campbell, VE7QT, who picked up the necessary repair parts in the town of Kettle Falls.

For electricity, Randy Jones, N7CKJ, ran his packet station off a solar panel and a 12V battery set-up, and the rest of the radios were fired from a 1944 surplus Army generator that never missed a beat. We had a



Our faithful WWII vintage 2K generator and the handy cover for it left by the 760th.



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 AUTO-TRAK™ 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 ppd. Send ck. or M.O. to: RLD Research, McCloud, CA 96057

California residents add 6% sales tax. AUTOTRACK™ is a trademark of N H Enterprises.



Club president, Ken Coulter, WA7FRO and crew mounting the Tribander on the 40 ft. tower.

spare generator or two if the main went, and the antennas and towers are owned by the Panorama Radio Club.

The high points of the weekend were a call from the carrier Yorktown and a DX contact from EI4DW in County Donegal, Ireland. The club president, Ken Coulter, WA7FRO, cooked breakfast for the crew two mornings in a row and Vice President Dean Body, K7LAK, gave what few orders had to be given along with the able assistance

of his non-resident engineer, Scott Campbell, VE7QT.

It was a shame to have to leave the top of the mountain Sunday afternoon; I'm sure that it will be there waiting for us another year.

It was a memorable weekend for all concerned and though we are just a small group in a very remote part of the state, we made our contribution to Field Day 1990 and are looking forward to next year. □

I won't go

Dear Mr. Editor,

I am sure it doesn't make any difference if I attend the meetings. What goes on there only concerns my hobby and things that affect it.

Why should I waste that hour or so of time every month? All I could do during the meeting is express my thoughts and maybe add something

constructive to the progress and the good fortune of the club.

What a waste of time getting to know some of the other members of the club and the people who have been elected to lead the group. Come to think of it, just think how boring it would be to have all the rumors I've heard in the past dispelled by the truth by asking questions or just listening to the general discussion of matters that concern the club.

No, Sir! I just can't see attending the meetings. I would rather let other people make important decisions for me.

Sincerely yours,
I.M. Apathetic

(Revised version of a letter in the Toledo Firefighter, a publication of the Toledo Firefighters Union Local 92.) — Greater Toledo Amateur Radio Association, Toledo, OH. □

Signalcraft



RF ACTIVATED ON-THE-AIR CALLSIGN DISPLAY.
Lights up continuously during transmit. No connection to rig. DC adapter included. An attractive addition to any shack! Model CSD-1: \$39.95 + \$3.00 UPS



MOTORIZED PC BOARD ETCHANT AGITATOR.
Eliminates tedious & time consuming hand agitation. Variable speed. DC adapter included. A Homebrewer's Delight! Model A-10: \$89.95 + \$5.00 UPS



FIELD STRENGTH OSCILLATOR.
Generates an audible tone relative to the RF field it's detecting. "Listen" to your field strength. Excellent for remote adjustments. Model F50: \$64.00 + \$3.00 UPS
1 year warranty, 10 day money back guarantee. CA residents add 6.75% tax. Call/write for free info: 213-394-1050

WAGKYO ON THE AIR

MOTORIZED PC BOARD ETCHANT AGITATOR.

FIELD STRENGTH OSCILLATOR.

SIGNALCRAFT CO. 1555 14th St., Santa Monica, CA 90404

Field Day Antenna Installation System



One Person installs in minutes

Info \$1.00

ANTENNA LAUNCHING MADE EASY

\$29.95

add \$5 Air Ship

Re-usable Ready for Action Fast & Easy to Use Eliminates Climbing

1-801-373-8425
AntennasWest
Box 50082 W. Provo, UT 84605

Special Olympics communications

HARRY TOWNSEND, K6ELR

Communications for the Winter Special Olympics Alpine and Nordic skiing events at Mount Bachelor, OR on the weekend of March 10 and 11, 1990 was provided by the Central Oregon Radio Amateur group.

The Amateurs were stationed in the main lodge, at the start and finish of the Alpine race courses, the Alpine staging areas and the Nordic race areas. This allowed the Special Olympic athletes and their coaches to remain in the warm lodge until just prior to racing in the freezing, mostly cloud covered, lightly snowing weather.

The hand-held 2M radios being used by the Amateurs permitted smooth

running of the various heats of the races. The contestants could be lined up in the staging areas and then called to the chairlifts to be carried up to the starting gates. This eliminated "bunching up" of the contestants and overcrowding in the limited spaces of the starting gates on the mountain.

In case of a fall on the course, all heats could be stopped immediately until the athlete could get off the track and the area could be cleared. This helped the race officials and kept events moving smoothly throughout the weekend.

Each race official was shadowed by an Amateur so he could talk with another whenever required. Although

some of the officials and the Ski Patrol had their own commercial hand-helds and frequencies, this work by the CORA Amateur Radio operators kept the business frequencies clear of race traffic and the officials free to handle the operations.

The volunteer Amateurs helping included Peggy and Jim Sellers, KB7FGR, of Portland; Ames Hendrickson, N7NPD, organizer and net control for the operation; Jackie Shepherd, WX7A; Dick Gribble, KB7JMP; Jack Ulstad, N6DDS; Clint Carlson, NR7Y; Gretchen and Tim Bass, N7NJI; Carl Sorensen, KA7ANM; Frank Hoffman, N7LHX; B.J. Hoffman, KB7JFP; Malin Hale, WA7ZBL; Roger Kryzanek, N7CSH; Russ Sykes, WB9VTZ; Laura (N7NYJ) and Harry (K6ELR) Townsend; all of the central Oregon area. □

A true story

I'm such a bad ham. Let me tell you my story. On the day after Christmas I was driving back from Ontario on I-10. As I approached the Palm Springs off-ramp, just two car lengths ahead of me occurred the most spectacular automobile accident I had ever witnessed. This truck swerved to avoid being cut off by another vehicle with the result that it tumbled and rolled across all four lanes, landing on its side in front of me. Trying to avoid being hit by all the other cars in the vicinity, I steered my car to the side of the road, my adrenaline pumping, and thought I'd better contact the police with my radio. That is, I thought I had a radio; I used to always carry one in my suit case. I hadn't used it for so long — I hoped the battery was charged. So I proceeded to open my suitcase and yes, I found the radio but no antenna. I looked around and found it under my socks. So I put everything together — oh, another problem — only the upper half of my radio's digital display worked and I couldn't remember the Tram's frequency, but I finally got that figured out and started calling. In the meantime the bystanders had helped 3 passengers out of the overturned vehicle, who, because they were wearing seat belts, only sustained cuts and bruises. At first I didn't get any response on the repeater. However, I was soon being helped by Ron, N6BUX, who activated the autopatch for me. After being transferred from operator to operator I was put in touch with the CHP who said they had just received another call on the accident and that help was on the way. After Ron shut down the autopatch he commented that with cellular phones, the emergency traffic role of Amateur

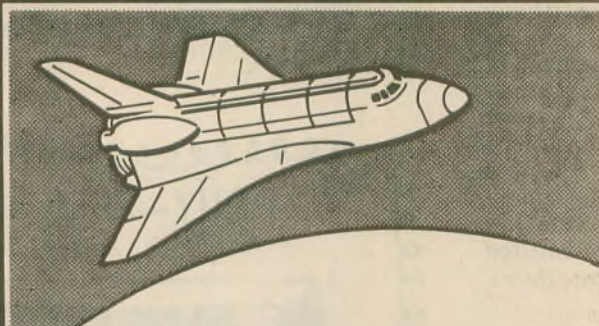
operators was perhaps not as vital as it used to be. I agreed. However, my presence there with the hand-held radio did have a comforting effect and several people did come up and ask if I had gotten through to the CHP. What I learned from all of this (besides "always wear your seat belt") was that as an Amateur you should at least be on the ball enough to remember your

call sign and know how to operate your equipment in an emergency. Now what did I do with my flashlight?

73, Jerry, WA6CPK

This is why we have RACES meetings and practice drills, so that when the time comes, we'll know what to do without having to spend precious time trying to figure it out. — the Coachella Valley ARC □

AMATEUR TELEVISION



SEE THE SPACE SHUTTLE VIDEO

Many ATV repeaters and individuals are retransmitting Space Shuttle Video & Audio from their TVRO's tuned to Satcom F2-R transponder 13. If it is being done in your area on 70 CM, all you need is one of our TVC-4G ATV 420-450 MHz downconverters, add any TV set to ch 3 and 70 CM antenna. Others may be retransmitting weather radar during significant storms. Once you get bitten by the ATV bug - and you will after seeing your first picture - show your shack with the TX70-1A companion ATV transmitter for only \$279. It enables you to send back video from your camcorder, VCR or TV camera. ATV repeaters are springing up all over - check page 411 in the 90-91 ARRL Repeater Directory. Call for a copy of our complete ATV catalog covering the 70, 33 & 23 CM bands.

CALL (818) 447-4565 M-F 8AM - 5:30 PM PST.

P. C. ELECTRONICS

2522 - WR PAXSON LN ARCADIA CA 91007



**Model TVC-4G
ATV Downconverter
only \$89**

TVC-9G 33 CM - \$99
TVC-12G 23 CM - \$109



**TX70-1A ATV
TRANSMITTER
only \$279**

**Value + Quality from
over 25 years in ATV.**

VISA, MC, UPS COD
Tom (W6ORG)
MaryAnn (WB6YSS)

Silent Keys

Timothy Nordland, WB6MOQ

It is with deep regret that we report Timothy F. "Doc" Nordland, WB6MOQ, Deputy Chief State RACES Radio Officer for the Governor's Office of Emergency Services, died suddenly on December 2 at his home in Anaheim. Doc is survived by his wife Jeannie, WD6BWN, also a longtime licensed Amateur Radio operator. He was 43 years old.

While not often visible in our offices, Doc was a great organizer and supporter of the Radio Amateur Civil Emergency Service program. He worked tirelessly and successfully to build up the RACES programs for the State and the counties of Southern California. Doc served as an unpaid professional with the State OES since 1985. Prior to that he was with the Los Angeles County Disaster Communications Service for about 10 years.

Nordland was active in the Amateur Television community in Southern California and was recognized as an expert in the identification of natural and manmade radio interference sources. He always found the time to assist any Amateur with a technical problem. He was chairman of the Tournament of Roses Radio Association, the group of volunteers that provide Amateur Radio and television communications during the annual Rose Parade. Doc was also a member of the Orange County Sheriff's Department aviation reserve unit. — *Information submitted by Stan Harter, KH6GBX, State Races Coordinator.* □

Seven-year-old Technician

MARCIE KEMP, KMV4M

Would you believe we now have a seven-year-old Technician? Well, that is what Luke Ward of Alexandria, Virginia accomplished on Oct. 6, 1990. According to the ARRL, Luke was one of only three known seven-year-old Novices in the country and Luke is the only one known to have upgraded (at least while still seven years old). No one that young has had a license of higher class. That apparently makes Luke the only seven-year-old Technician, and a unique individual. The Mt. Vernon club (where Luke and his father are members) is really celebrating.



Luke Ward, KC4TFL, awaits his new call sign.

Luke and his father, Keith, passed their Novice exams on August 24 and obtained their calls KC4TFL and KC4TAN, respectively. On October 6 they were both back at the examining session and both passed their Technician class. Luke now says he thinks he'll be ready to try for General in a couple of months!

Luke says the hardest part was the Morse code — the theory was easy. Take heart, Folks, Luke was technically inclined before he got interested in Amateur Radio. He has been "using" computers since 1985! He says his favorite programming language is BASIC. Luke's Amateur Radio teacher is his father, Keith (now KC4TAN, formerly KN5YFP). Luke and Keith have a Heathkit SB301 receiver but (so far) no transceiver. When they get a transmitter, Luke thinks he will use CW in preference to phone. His favorite listening bands are 20M and 80M, and DX is what he likes best. Luke is in 3rd grade at Springfield Estates and his favorite subject is math.

Virginia STM Geri Sweeney, N4 GHI, gave Luke and Keith their Novice exams; they went to the University of Maryland for their Technician exams. Yes, they requested new call signs! — *from the November issue of Auto-Call Magazine.* □

ALL BAND

SUPERTENNA

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

BUY—SELL—TRADE
All brands new and reconditioned

JST-135
HF Transceiver

- All Modular Construction
- 150 W Output
- General Coverage Receiver
- 1 Chip Direct Digital Synthesis
- U/LSB AM FM AFSK

JRC ASK FOR SPECIAL SALES PRICES

Find out why thousands of customers have switched to us.

NEW!
AUTHORIZED **AZDEN** DEALER

KENWOOD, ICOM, TEN-TEC, Astron, Cushcraft, Loran, MFJ, Butternut, B&W, Hustler, Antenna Specialists, AEA, Amertron, Van Gorden, ARRL, RF Concepts, Diamond, Kentronics, CallBook, Alpha Delta, Hell, Grundig, Uniden, Bearcat, Mirage, Ameco, Alliance, Daiwa, Hy-Gain & others

N4EDQ Amateur Radio Sales & Service
4400 Hwy. 19-A
Mount Dora, FL 32757

FOR THE BEST DEAL!
1-800-828-6433
10:00 to 5:00 P.M. EST. (Mon.-Fri.)

WE TRADE

BW

Ameritron gives you a full

kilowatt *output* (nearly the *input* of some linears) of peak envelope power for only \$1095 -- from a whisper quiet linear that's perfect for your operating desk because it measures just 8 1/4" H x 14" D x 14 1/4" W.

You could spend over *twice* the money for a legal power limit amplifier *twice* the size -- and all you'll get is an additional 1/3 S-unit -- a difference you won't ever notice.

You also get 850 watts on CW and even 500 watts RTTY.

All Band Coverage

You get all band coverage: rated output on 160, 80, 40, 20 and 15 meters (10 meters with user mod/export) as well as 80% rated output on MARS and WARC bands.

Tuned Input lets solid state rigs deliver full output

The Ameritron AL-80A uses a direct switched, 100% shielded pi-network tuned input circuit that provides an excellent load for any rig. Even the fussiest solid state transmitter works flawlessly with the AL-80A.

Pi-L Output Tank

A carefully designed Pi-L output tank using the optimum Q for each band gives you exceptionally smooth tuning, extremely wide range load impedance matching and full band coverage -- even on 160 and 80 meters -- *plus* you get an extra 10 to 15 dB of harmonic suppression.

You also get peak performance at different power levels from one end of the band to the other.

Ball bearing vernier reductions drives on both the plate and load control makes tuning precise and easy.

3-500Z Tube in shielded RF compartment gives you nearly 70% efficiency

You get the rugged time proven 3-500Z tube with an estimated life of 20,000 hours ICAS. That's nearly 20 years operating 20 hours a week -- you may never have to replace your tube.

The AL-80A is built on a rugged steel chassis. It has a separate RF compartment that's fully shielded to keep unwanted RF from leaking out. This keeps RFI and TVI to an absolute minimum.

A superb RF design and layout, a Hi-Q tank circuit and commercially rated RF power components give you nearly 70% plate efficiency over the entire operating range. This puts maximum power into your antenna instead of heating up your amplifier.

A whisper quiet internal computer style fan draws in cool air over the power supply components and blows it around the 3-500Z tube. This removes excessive heat and gives you reliable performance.

Built-in adjustable ALC circuit keeps your exciter from overdriving your AL-80A. The result? A clean signal without flat-topping.

A standby switch prevents harmful thermal shock to your 3-500Z filaments by keeping them lighted when you're operating barefoot.

Gutsy Heavy Duty Power Supply

The guts of the AL-80A is its heavy *heavy* duty power supply.

A husky 22 pound power transformer

using a high silicone steel core, computer grade filter capacitors totaling 26 ufd, heavy duty bleeders and ten 3 amp, 1000 V power rectifiers give a stiff 2700 volts fully loaded.

Some competing high priced amplifiers using *two* 3-500Zs *can't* give you much more power output than the AL-80A. Why? Because their lightweight power supplies can't deliver enough high voltage for the tubes.

Step-Start Inrush Protection™

When you first turn on your amplifier, a massive inrush current flows.

Your house lights flicker as you hear a loud "thump" from your amplifier. This terrible inrush current stresses *all* your power supply components to their limits. Your cold tube filament suffers abusive thermal shock.

Eventually, this massive inrush current will damage your amplifier.

The AL-80A special *Step-Start Inrush Protection™* stops damaging inrush current.

By starting your AL-80A through a 10 ohm

You also get a multi-meter that measures plate voltage, plate current, *peak* RF watts output and drive power/ALC detector voltage.

Comes completely factory built, tested and guaranteed to work . . . not a kit you have to build

You get a full kilowatt right out of the box ready to plug in and bust through QRM.

A kit could end up costing you more than your best price on the AL-80A -- and leave you frustrated if you can't get it to work.

A factory built AL-80A has much higher resale and trade-in value than a kit. Why? Because Ameritron's reputation for consistent quality and workmanship is known by hams everywhere.

Two Year Warranty

No other kilowatt amplifier on the market comes with a 2 year warranty. In the unlikely event that there are defects in materials or workmanship, we'll fix it free for 2 years from the date of purchase.

The 3-500Z is covered by the tube manufacturer's warranty.

Commitment to Service

Even after the 2 year warranty period, Ameritron Customer Service Technicians are available to help you keep your AL-80A performing flawlessly -- no matter how long you have it. Just call 601-323-8211.

Input Power or Output Power? Don't be fooled

The AL-80A gives you a full kilowatt *output* -- that's nearly the *input* of some linears. Output power is what goes into your antenna. Don't be fooled by amplifiers rated by input power.

Quality Made in USA

At Ameritron, we don't just ship amplifiers made in a foreign country -- we build them to last.

Save \$100 Off Regular Price of \$1095

Call your favorite dealer for your best price while the AL-80A is on sale for \$995 retail. Order today.

Limited time offer. Sale price offer subject to cancellation without notice or obligation. Available at participating dealers.

Lightning Fast QSK Switch

The optional Ameritron PIN-5 QSK switch gives you lightning fast T/R switching for full CW break-in, AMTOR, Packet and other QSK modes for only \$189.50.

It lets you switch the legal limit in microseconds into 2:1 VSWR loads with less than 0.5 dB receive attenuation.

Factory installation is available.

AMERITRON

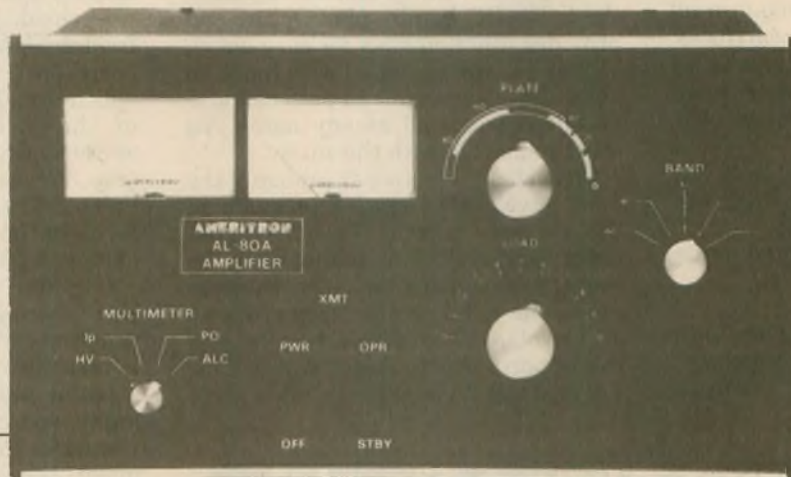
. . . the high power specialist

921 Louisville Rd. • Starkville, MS 39759
Sales: (601) 323-8211 • FAX: (601) 323-6551
Free Catalog or Nearest Dealer: 800-647-1800 © 1991
Made in U.S.A.

WORLD RADIO, February 1991 17

Ameritron AL-80A SALE

. . . get a full Kilowatt output . . . for ~~\$1095~~ \$995



current limiting resistor, then shorting the resistor with a relay, the AL-80A gives you a start up sequence that is *easy* on your tube and power supply components.

Don't consider a linear amplifier without this critical protection.

Exclusive Adapt-A-Volt™ Transformer

Too high a line voltage stresses components and causes them to wear out and fail. Too low line voltage causes a "soft-tube" effect -- low output and signal distortion.

Ameritron's exclusive Adapt-A-Volt™ transformer in the AL-80A lets you compensate for too high or too low line voltage.

With the AL-80A you get the longest component life and peak operating efficiency -- regardless of your line voltage.

Before you buy an amplifier make sure it can adapt to *your* line voltage.

Dual Illuminated Meters

Two large meters give you a complete picture of the operating condition of your AL-80A. They let you know right away if there is a problem.

Grid current of the 3-500Z is monitored continuously by one meter. Grid Current indicates proper amplifier operation better than any other parameter.

Product Review

N6RJ 2nd Op

NORM BROOKS, K6FO

For some time now, I have been using the N6RJ 2nd OP. It is a sophisticated program written for use on IBM PC and compatible computers. This program is designed for the DXer, including those who chase DX on the satellites.

Once you enter a contact into the log, the program uses it in preparing whatever report you wish. No additional entries are required. For example, when you enter a USSR contact, the program automatically identifies the Oblast number of the station. Later, when you check whether you have worked 100 Oblasts, the program will give you a report on your W-100-O status.

Here are the summary reports you can generate from your DX log:

- DXCC countries worked/confirmed on one band, all bands, one mode or all modes with or without Oscar satellites.
 - DXCC detailed spreadsheet of worked/confirmed data for each band and mode with mixed totals for each band.
 - WAZ (Worked all Zones) worked/confirmed one mode, mixed modes or Oscar (one or more satellites).
 - Oblasts worked/confirmed summary.
 - 6 band WAZ summary.
 - Display total entries in station log.
- There are many "mind boggling" features. Your entries appear in a huge

file sorted in chronological order (just as a written log book), another huge file sorted in call sign order and 324 smaller files, each for a DXCC country. You can enter ALL of your log entries into this program, even USA contacts. They will, of course, be filed under "K - United States of America."

Each of these 324 country files provides a mass of data which is different for each, including: beam heading (direct and long path); distance (statute or nautical miles or kilometers); CQ zone and continent; city or cities to which above are measured; latitude and longitude; sunrise and sunset times; postal rate and IRC info; DX bureau address; whether ARRL handles outgoing QSLs; and third party traffic status.

Entering data is the easiest thing to do. A screen comes up on which you enter call sign, time, date, band, mode and remarks. The computer offers the current date and time, so they will enter automatically if you are logging in "real-time." The program recognizes the 9 WARC bands, plus Oscar, and provides function keys for easy entry. Modes are also provided with function keys. QSL sent/received data can also be entered as well as any notes you want to include with the entry.

The call sign feature is probably the most advanced of any DX program on the market. It will "decipher" just about any call sign, telling you the country to which it belongs. In some cases, the call sign may belong to two or more DXCC countries. It gives you the opportunity to select which it is. For example if you enter a CE0, it gives

you the opportunity to identify whether the card is for Easter, San Felix or Juan Fernandez Islands. It used to be that the letter after the numeral in the call sign told you this, but that is no longer true. If you enter one of the "odd-ball" call signs that many countries are now using, it correctly identifies the base country. For example, entering prefix CX brings up VE-Canada.

The printing functions of 2nd OP are extensive too. You can print your complete log in several ways: all bands, one band, one band/one mode, one mode and for Oscar satellites. You can print detailed country listings by prefix, country name or continent. You can print complete reports on DXCC, Oblast and WAZ status by what you already have or what you need. You can even print labels to stick on your QSL cards. There are more printing options, too many to list here. Believe me when I say that if you're one who likes printed reports, you had better buy another box of paper.

I consider this program to be "user friendly." Most features of the program are reached by function keys, which are identified on the lower part of the screen. F9 brings up help screens, which are different at each step. You can't get into an inescapable "trap." F10 gets you out of the various levels of the program, and finally, F10 exits you from the program.

If you're into contesting, you will want to use the K1EA Contest Log program. Your log from it can be readily transferred to the N6RJ 2nd OP.

N6RJ 2nd OP is not copy protected (ugh). You can make whatever copies you need. However, you won't want to make copies for your friends, not only because it's illegal, but also because your name, call sign and address are imbedded in the program. The N6RJ 2nd OP users' manual, program and data files were conceived, designed and programmed by John Fail, KL7GRF. You can talk to him personally on Oscar 13 during most of the passes, at the "DX spot" 145.90 MHz. John also writes the DX column for *Oscar Satellite Report* (which no doubt explains why Oscar DX logging is included).

The N6RJ 2nd OP is available from Ham Radio Outlet (see their ad in any issue of *Worldradio* for addresses and telephone numbers). The K1EA Contest program mentioned above is available from Bill McGowan c/o Yankee Clipper Contest Club, 33 Truell Road, Hollis NH 03049. (603) 465-2392. □

Magnificent Alinco Deals!

ALINCO 45W 2M Xcvr. YOUR CHOICE!

DR-110T \$299.00 Red LCD Readout	DR-112T \$309.00 Black LCD W/Orange Backlite
---	--



Williams Maintains High Volume Purchasing Power
And no Big Store Overhead to Drive Up YOUR Cost!
It's No Accident Williams is the Nation's #1 ALINCO Dealer!

ALINCO DJ-160T 2M H/T...\$259.00
ALINCO DJ-560 2/70 Twin Band...\$399.00

We Stock ALL ALINCO Accessories!

OTHER ALINCO MODELS SPECIALLY PRICED

DR-590T, Remotable Twin-Bander, Xcvr.	\$629.00
DR-570T, 2/70 Twin Bander, Xcvr.	\$549.00
DJ-120T, Micro, 10 Ch., Tunable 2M H/T	\$209.00
DJ-460T, 20 Ch. 440 MHz H/T	\$269.00

FREE SHIPPING! (Pays for your Phone Call) N.C. Residents add 5% Sales Tax. SEND CHECK OR MONEY ORDER for Quoted Price, or Phone for CODs ONLY. Add \$3.50 for Phone CODs. NO CREDIT CARDS. Prices and availability subject to change without notice or obligation.

Now 17 Years of Service To The Amateur Public!
WILLIAMS RADIO SALES
600 LAKE DALE ROAD
COLFAX, N.C. 27235

ORDERS ONLY - NOON to 5:00 PM
(919) 993-5881
ORDERS & TECHNICAL 7 to 10 PM

Discover *Worldradio*.

Special Events...

Yukon quest

Special event station KL7KC will be operated between February 22 and March 10 during the running of the 8th annual Yukon Quest International Sled Dog Race. The station will operate in the general portion of the 80, 40, 20 and 15M bands and in the Novice portion of the 10 meter band. CW operation will be on or near 7.050, 14.050, 21.50 and 28.200. QSL via KL7KC, P.O. Box 81389, Fairbanks, AK 99708. □

UARC Territorial Prison

The University Amateur Radio Club will operate special event station NQ7Q at 0001-2400 UTC on Feb. 9 in commemoration of the renovation of the Wyoming Territorial Prison.

Operation will be on or near the following frequencies: CW—7.050 and 7.110; Phone — 3.925, 7.250, 14.275, 21.325 and 28.325.

For commemorative QSL, send QSL and SASE to: University ARC, NQ7Q, P.O. Box 3625, Univ. Station, Laramie, WY 82071. □

Lost Dutchman Days

The Supersition Amateur Radio Club will operate WB7TJD for a special event commemorating Lost Dutchman Days on February 16 and 17, 1400Z-0200Z.

Operation will be on 20, 15, and the Novice section of 10M. Local contacts via 147.12 MHz.

For special certificate and club QSL card send 2 units postage on 8½ X 11 SASE to SARC-WB7TJD, P.O. Box 1551, Apache Junction, AZ 85217. □



"The QRN you hear on this end is a very severe thunderstorm . . . no, there's no need for me to go QRT . . . it'll be all over in a few minutes!"

Amateur Radio Day 1991

On Saturday, Feb. 23 at 1500 to 2400 UTC, hams will be calling all nations from the Official Center of the World near Yuma Arizona.

Amateur Radio Day 1991 is sponsored by the YUMA ARES as a special event demonstration station and charity benefit for the International Red Cross.

A unique certificate confirming communication with the internationally recognized Official Center of the World is offered to all participating radio Amateurs submitting a QSL confirmation and 9×12 SASE to YUMA ARES c/o US Post Office, Felicity, CA 92283.

Watch for N6RTV on the following bands: 10 Meter Novice SSB 28.418 MHz; 15 Meter

General SSB 21.318 MHz; 20 Meter General CW 14.034 Mhz. □

Murgas commemoration

The Murgas Amateur Radio Club will operate special event station K3YTL at the close of the Wyoming Historical and Geological Society's Exhibit celebrating the 85th anniversary of Father Joseph Murgas' first public transmission over land.

Operation is scheduled for Feb. 2 and 3 on 25 kHz up from the General phone band and the Novice 10M band. For QSL, send your QSL and SASE to K3YTL, P.O. Box 1094, Wilkes-Barre, PA 18703-1094. □

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!

145 MHz	220MHz	432 MHz
144-148 MHz	144-148 MHz	430-450 MHz
F < 0.7 db	F < 0.6 db	F < 1.1 db
typ. 0.6 db	18-20 db	typ. 0.9 db
150 Watt	150 Watt	17-19 db
750 Watt	750 Watt	150 Watt
Type N	Type N	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. Henry Radio leads the way. Let us answer your questions and help you with your needs. Give us a call — ask for Jack (WA6VGS).

Henry Radio

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

TOLL-FREE ORDER NUMBER (800) 677-7976

For all states except California. Calif. residents please call collect on our regular numbers.



One more opinion

There's a big thing now about "needing" more hams to, by sheer numbers, smother the FCC and others involved in giving Amateur spectrum away. The plan is to make entry to Amateur Radio easier. The whole thing is expressed as though all those "hams-we-wish-we-had" were desirable and valuable by the pound. We've seen this mistake before.

If we fight off the politicians with vast numbers of poorly qualified people, we may win the battle but end up with our hobby full of dummies.

We are in danger of extinction by political plundering, and it challenges our conception of Amateur Radio as a reservoir of technically competent people who could save the public bacon in an emergency, resourceful experimenters who develop technology and an operational message system linking distances and countries for imminent need and general good will.

Isn't it ironic how a root of the challenge comes from the commercial sector that wants our spectrum to sell? We buy their products which are so good that many Amateurs abandon the hope of building, changing or servicing their own equipment. So much for "technical" and "resourceful."

When was the last time you passed traffic? Think we're recruiting guys who will? Most of us need to sharpen our radio skills.

If the League or our elected few are to defend us in the political/commercial arena, they must point to our DX activity, emergency operations, and nets. Even those may not be sufficient for our defense. Neither will marching on the capital with a million little pointy headed people with "ham" T-shirts. We need more compelling facts on which to defend ourselves. We must show growth of the values we represent.

Work Rare CW DX - CW Contests

"CONTEST CODE" is the answer. This powerful hypnosis cassette tape teaches you to copy High Speed (30/40 wpm) or Ultra High Speed (50/60 wpm). Subliminal speed you along! Only 20 min./day for 30 consecutive days yields results. Each tape \$14.95 (Specify which program you want) or both for \$27.95 ppd in US (NY residents add 7.5% tax).

PASS Publishing, Box 570, Stony Brook, NY 11790

I don't mind attracting wrath by saying I think we could use a few less of our low quality brethren and more newcomers who will become a credit to the hobby.

The no-code thing is OK if mandatory upgrading is applied to all Amateurs. The Novice/Technicians should have four years to make General. You'd only be tested for a license higher than the one you've held. Old Dave would have four years to use his 2x2 Advanced, during which time he'd better test for Extra and pass to stay on the air.

Imagine a four-layer system of four years each: Novice/Technician, General, Advanced and Extra. Get the Extra and you've got it made as long as you renew on time. With this system, we could point to measurable technical advancement. We'd also get rid of a lot of lids.

Next, let's find a way to put the word "ham" out of use. It was cute back when Amateurs were leading the world in technology. Now we find radio running second in the hindmost three, and we don't need demeaning names. "Amateur" isn't too swift either, but it's sort of international in acceptance. How about "Shortwave Operator"?

I'd like to see the word "Novice" dropped. Let's call it "Technician" and include all the Novice/Tech stuff with no code. It would introduce us to a lot of good people who'd make it through the classes. Goodbye to the others after four years.

Think what this would do for clubs.

Almost everybody would have a personal stake in upgrading classes. Bet your bottom dollar there'd be more personal interaction than there is now. Imagine our expertise in sixteen years!

The advent of single-sideband hailed the end of much of the home equipment building; the mode is great, but the loss was catastrophic. Hands-on self education is almost dead.

Another nail in the builder's coffin is the economy. All that money out there has spawned a huge equipment industry. Almost everybody can afford commercially built gear. I'd like to see the few who still use ingenuity be rewarded somehow for their added value. There are guys out there communicating with lasers and muffin fan modulation, and they should be recognized.

We need more forums of publication and reporting; places to show off the home-built; places to ask questions and contribute answers. We just lost one of the last remaining publications that actively recognizes technical competence.

We need to be politically recognized for our talents, not just what we buy. We can regain some of the ground we've lost; it's more than numbers. We must show intelligent growth. It's the only hope for defending our bands from the public appetite for more spectrum. We need to get back to our basic reasons for being allowed to enjoy this great hobby. Let's all advance!

DAVE REYNOLDS, KE7QF
Tempe, AZ

IMPORTANT NOTICE

Our repairable power supply (for the C-64) may be the last power source you will ever purchase for your Commodore.

•FINALLY•

A repairable C-64 power supply with outstanding features.

- 1-year Warranty
- External Fuse
- Schematic Included
- Highest Amperage Output (1.8 amps)
- Does Not Operate "Hot"
- Low Cost
- Sold Worldwide
- European Craftsmanship Throughout
- UL Approved (VGE Approved)
- Spare Parts Kit Available
- Utilizes Large Transformer
- Special Prices for Schools/Dealers

\$24.95

Over 52% of C-64 failures were due to power supply malfunctions.

• Save money in repairs and replace your power supply today.

Introductory Price of \$24.95 plus UPS.

REPLACEMENT CHIPS, PARTS AND UPGRADES

6526A CIA	\$12.25	Commodore 1750-512K	Special 4.3 amp output
6567 VIA	\$15.95	upgrade/expansion RAM	repairable C64 power supply.
PLA/82S100	\$12.95	cartridge for C64/C128	External fuse. A must for all
6581 SID	\$12.95	computers. \$169.95 plus UPS.	heavy peripheral users. (C128
Any 901 ROM	\$10.95		version avail.) \$45.50 plus UPS.
SX64 New Keyboard ...	\$49.95		

and many others.

IMPORTANT CATALOG ANNOUNCEMENT

Call for your NEW FREE 30-page catalog of specialty items for Amiga, Commodore and IBM. The catalog contains low cost replacement chips, parts, upgrades, 34 diagnostic products, tutorial VHS tapes, interfaces, complete power supply line and other worldwide products YOU WON'T find anywhere else. Call for Catalog.



THE GRAPEVINE GROUP, INC.

3 Chestnut Street, Suffern, NY 10901

1-800-292-7445 • 914-357-2424 • Fax 914-357-6243

We Ship Worldwide

Prices Subject to Change

INTRODUCING

HAM-PRO

ANTENNAS

HAM-PRO - The only amateur antenna manufacturer with confidence enough to claim EIA RS-409 compliance!

What does this mean for you? The best amateur antenna money can buy of course! Electronic Industries Association (EIA) recognized standards have been our design criteria for over 30 years making TV and FM transmitting antennas. Now, Ham-Pro applies tough EIA amateur requirements, producing an antenna that is electrically and mechanically superior to any other brand now on the market. Now available are monobanders for 20, 15, 10, and 6 meters, plus long 144, 220, and 432 MHz Yagis.

We're setting the new pace for amateur antenna technology with monobanders that meet industry standards. We're so confident you'll benefit from the superiority of these new beams, we offer a thirty day money back guarantee.

For detailed information and a copy of EIA-409, call and talk with one of our techs or engineers. Order from our factory and save dealer markup. We accept personal checks, VISA or Master Card.

Check These Features!



MEASURED GAIN, F/B, F/S RATIOS. NO SALES HYPE!

BEAM PERFORMANCE INSURED WITH FACTORY TUNED DRIVEN ELEMENT.

NEW BALANCED DOUBLE GAMMA FEED SYSTEM REDUCES TVI.

RUGGED EIA 112 MPH GUSTY WIND RATING.

LOWER IN BAND VSWR FOR HIGHER POWER EFFICIENCY.

30 DAY MONEY BACK GUARANTEE.

Model & Elements	Band	HAM-PRO MONOBANDERS MEASURED			Price
		Gain dB/d	Min VSWR band center	Max VSWR band edge	
H20-4	20 m	9.23	1.00	1.61	\$635
H15-4	15 m	8.80	1.04	1.65	\$475
H10-3	10 m	6.46	1.03	1.79	\$245
H6-6	6 m	9.41	1.02	1.91	\$250
H144-15H	2 m	13.73	1.04	1.68	\$225
H144-15V	2 m	13.73	1.02	1.93	\$225
H220-17	1.25 m	13.53	1.07	1.29	\$230
H432-24	70 cm	16.14	1.08	1.76	\$235

Call

1-800-879-7569

HAM-PRO

ANTENNAS

A Division of Kopps Corporation

6199-D Warehouse Way
Sacramento, California 95826
Phone: (916) 381-7710
Fax: (916) 381-4332

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

Join the ARRL

Although I disagree with your editorial stand against a code-free license, I value your publication in all other respects. I feel that to equate high code proficiency with high operator morality is pseudo-logic. While I do not think code should be required in the 1990s, it is fun and ecologically efficient, just as sailing without a motor. But ham radio is far and away the largest high-tech hobby in the United States and should be restructured to accommodate new interests and new ideas.

What I am most disturbed about are those hams who quit the ARRL because of its code-free position. Many of our bands may be lost by the stroke of a pen at WARC in 1992, and the ARRL is the best defense we have. Forget the code issue. Join the ARRL and help in the larger war we are facing!

HAL LAYER, KK6HY
San Francisco, CA

Just do it

Lately with all of the discussion of "no-code" and the future of our hobby, I feel the real cause for concern is being overlooked. It's not whether we have "no-code" or how many young hams or how many seniors we get licensed that is going to save our hobby; it's the other guy and someone else.

Rare is the Amateur Radio club that experiences active involvement from more than just a handful of members. It's much easier to say, "I don't have time, let John do it," or "Me? — serve on the board? No way, I'm just too

busy." You get the picture. It's just much easier to sit back and watch others do the work and then complain when something isn't done fast enough or doesn't suit your needs.

The administration of ham radio activities takes up a significant amount of time for those few who are willing to jump in and do their part as well as the part of the other guy. What is happening is "burn out." Some of our best hams are just saying "I quit" and pulling the plug. I'm afraid that if this trend continues, our hobby will suffer from lack of motivation or active promotion and thus will have no administration or direction. The other guy will do it all right; he'll come after our frequencies and because he is willing to do something, our frequencies will be reallocated.

The next time your club is having a dinner meeting, regular monthly meeting or special activity and you are asked to serve on the board or coordinate a function, say "YES" and become a solution to the future of our hobby instead of being the problem that will ultimately destroy it. The continued administration of ham radio is essential and hams themselves hold the destiny in their own hands.

STEVE BAUER, KC0HF
Wichita, KS

'89 DXathon medaler

Thanks very much for the medal, 1st Africa. Fine business. Am enjoying your magazine, and have others interested! Will think of something to publish from Africa, pictures, stories, etc. 73 and good luck, and thanks for *Worldradio!* — Ben Pont, 5Z4BP, Kenya



WHY SHOULD I SPEND A BUNCH OF MONEY FOR RADIO GEAR WHEN I CAN TALK TO SOMEBODY ACROSS TOWN THIS WAY?

VECTOR FINDER

ZERO-IN THE SIGNAL!

HAND-HELD PHASE SENSE ANTENNAS FOR VHF DIRECTION FINDING. USES ANY FM XCVR. COMPASS GIVES DIRECTION.

ARMS FOLD FOR STORAGE. TYPE VF-142 COVERS BOTH 2-MTRS & 220MHZ. OTHER MODELS AVAILABLE. WRITE OR CALL FOR MORE INFO.

(\$3 SHIPPING & TYPE VF-142
CA. ADD TAX) \$129.95 619-

RADIO ENGINEERS 565-1319
3941 Mt. Brundage Ave. Dept. WR
San Diego, CA 92111

CW Lite

Is the easiest Morse code training method in the world, bar none! And it is the fastest, too. Just close your eyes and relax. This powerful hypnosis cassette tape does the rest. Subliminals speed you along! Only \$14.95 ppd in US (NY residents add \$1.12 tax). Order today!

PASS Publishing, Box 570, Stony Brook, NY 11790

THE REMOTABLE TWIN BANDER

The ALINCO Model DR-590T is a full featured/dual band transceiver that is user friendly, and puts the fun back in Radio.

The DR-590T is packed with more features than most hams will ever use. But it is engineered so that you don't have to be an engineer to understand and use the various functions. The easy LCD display lets the operator know, at a glance, which functions are in operation.

ALINCO has listened to you, the Ham, and incorporated many of the features you told us you wanted in a Dual Band (VHF/UHF) radio. And we did it while keeping the operations truly user friendly.



DR-590T

- **Ultra-Compact Body**
5-7/8" (W) x 2" (H) x 7" (D)
 - **High Power (Selectable)**
High: 45W at VHF High: 35W at UHF
Middle: 10W Middle: 8W
Low: 5W Low: 4W
 - **Extended Receiver Range**
144.00 - 147.995 Mhz (TX), 130 - 173.995 Mhz (RX), 440.00 - 449.995 Mhz (TX), 410 - 470 Mhz (RX)
(Specification guaranteed on amateur bandsonly. Modifiable for MARS/CAP permits required)
- FEATURES
- **Simultaneous**
Receiving on both bands at the same time
Scanning intermix scan model on both bands at the same time.
 - **Independent VHF & UHF Controls**
 - **Detachable**
With the optional remoting kit, the front panel can be separated from the main unit.
 - **DSQ (DTMF Squelch) Function**
 - **Code Squelch Function**
You can program a 3 digit code that will open the squelch only when the same code signal is receive from another transceiver. This allows for selective receiving. Additionally, with the optional tone squelch unit, the

code squelch and tone squelch work together as a powerful calling function.

- **Various Useful Paging Functions for Grouping Calling and Individual Calling**
- **Remote Control Microphone**
With this microphone there are several functions that can be controlled remotely:
 1. Direct setting of frequencies in VFO mode
 2. Up/Down of memory channels in memory mode
 3. Shifting to call mode
 4. ARM (Automatic Repeater Mode)
 5. VHF/UHF Switching
 6. Up/Down by 1 Mhz steps
 7. Setting and Selecting DSQ codes
 8. Setting and Automatic Dialer
- **Scanning Features**
Memory Scan, Program Scan, ARM Scan, Band Scan, and more Scan.
- **Memory Channels**
The unit has 28 memory channels, one independent "Call" channel, and 10 ARM memory channels (40 channels in total). You can program set tones, shift frequencies, shift directions, and channel steps in each of the 28 memory channels.
- **ARM (Automatic Repeater Memory) Function**
10 repeater channels can be memorized

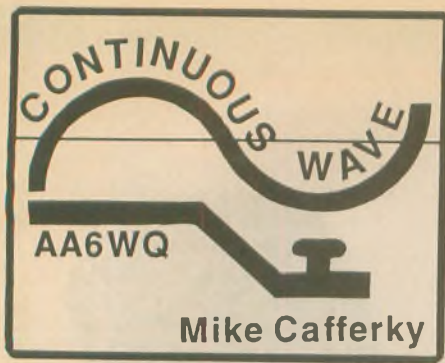
automatically. While ARM mode is active, scanning stops at vacant channels and pauses, then starts again automatically. This function is useful to find vacant repeaters.

- **ABX (Automatic Band Exchange) Function**
- **Bell Function**
- **Dimmer Function**
Selectable 2 different brightness of LCD light
- **Three Priority Functions**
VFO Priority, Memory Priority and Call Priority.
- **Repeater Operation**
The DR-590T can be used as a cross band repeater.
- **Full Duplex Cross band Operation**
- **Others**
 1. Auto Dialer Function
 2. 6 Channel Steps (5/10/12.5/15/20/25 KHz)
 3. DTMF Monitor Function
 4. 38 Sub-Audible Tones built-in
 5. And Many Other Features



ALINCO ELECTRONICS INC.

438 Amapola, Lot 130 • Torrance, CA 90501
Tel: (213) 618-8616 Fax: (213) 618-8758



The first day on mobile CW

The heat is sweltering. You're stuck in traffic with the highest speeds being slow and stop. What can you do while you wait for the next surge and merge?

Or you're on a cross country trip. You're tired of looking at the corn fields, the gravel, the pavement, the exit signs and the beer bottles. But what else can you do?

You could be talking to the world on mobile CW! So I thought soon after I got my Novice Class license. A few late nights after getting on the air, I worked two very good mobile CW operators: John, WG9K/M, and Jim, K7YLM/M, back to back. My initial reaction to these contacts was disbelief followed by curiosity. These two QSOs started me thinking about the virtues of mobile CW.

If those guys can copy and send while driving, I reasoned, why can't I? It wasn't long before I resolved to give it a try too. One problem haunted me, however: how can someone copy CW without paper and pencil? In order to make good on my resolve, I set about practicing to copy without them. It took several days before I felt ready to venture out on the road.

Another step which proved to be a real confidence builder was to see a mobile setup. Ralph, W6WET, a veteran mobile CW operator, provided the opportunity at just the right time. He showed me the details of his antenna mounting, feedlines, power cables — the works.

The final preparation step involved selecting and securing the right equipment for my subcompact car. I decided on using a built-in electronic keyer and paddle instead of a straight key because of the uneven road surfaces. Also, I selected a center loaded folding whip antenna so that I could drive my car into my garage at night and into parking garages during the day. I installed the transceiver so that it could be unhooked quickly; I could carry it with me so it wouldn't get stolen.

Time for the big test

When the installation of my setup was complete, the obvious next step was to test it. Now the feelings had shifted from disbelief and curiosity to terror mixed with excitement. Now was the time to "put up or shut up," I thought, so I plugged in the microphone and called CQ. This was not exactly my original plan, but it was a good start. All this was accomplished from the safety of the driveway. I knew the next morning would be the real test when the microphone would be laid to rest in the glove compartment in the car — "in case of emergency," I told myself.

The keyer paddle was carefully put in its place with quiet awe. Representing the joys of operating, now it also represented the rising self doubts and

anxiety of facing something totally new.

As I eased my car out of the driveway the next day, I turned on the transceiver. The time had really come. No more microphone-in-the-driveway stuff. There were other CW operators out there listening and I had to live up to the promises and my own aspirations.

That's when I realized that I was driving a 4-speed manual transmission. Why hadn't the other mobile operators warned me about this? My thoughts raced to grasp the gravity of the moment: steering, shifting, sending all at the same time. I thought that perhaps, with a little review, I could do the first two while just looking at the keyer paddle.

Driving down the street toward the freeway I sent out my first CQ. No answer. What a relief. Leaving a green traffic light, I made a left turn and suddenly realized that this could pose a further complication. It's one thing to drive straight and send code. It's quite another to turn a corner, shift gears and send code.

Waiting at a red light I thought it would be a good time to send CQ. Proud of that discovery that a red traffic light is an opportunity for the radio operator, I confidently gave my call three times.

All of a sudden, the rush of feelings which come during the very first on-the-air experience flooded back as I heard someone introducing himself from upstate. Excitement flooded the car as I prepared to confirm the communication link.

Hearing that it was my turn, I began to send the formal introduction when the traffic signal turned green. The car lurched forward as I stumbled out my call sign.

In the excitement I had forgotten to shift from first to second gear, so I pushed in the clutch pedal and finished my call sign. While the car coasted, I stammered the usual RST report. Then I realized that I still had the clutch

ICOM BATTERY INSERTS

BP-2	7.2v	500mah	\$14.00
BP-3	8.4v	270mah	\$15.00
BP-5	10.8v	500mah	\$21.00
BP-7	13.2v	500mah	\$23.00
BP-8	8.4v	800mah	\$21.00
BP-22	8.4v	270mah	\$22.00
BP-23	8.4v	600mah	\$22.00
BP-24	10.8v	600mah	\$26.00

KENWOOD BATTERY INSERTS

PB-21	7.2v	200mah	\$12.00
PB-21H	7.2v	600mah	\$15.00
PB24 Tabs	9.8v	600mah	\$15.00
PB-25/26	8.4v	500mah	\$18.00

YAESU BATTERY INSERTS

FNB-3/3A	10.8v	500mah	\$28.00
FNB-4/4A	12v	500mah	\$27.50
FNB-10	7.2v	600mah	\$15.00
FNB-11	12v	600mah	\$30.00
FNB-12	12v	500mah	\$30.00

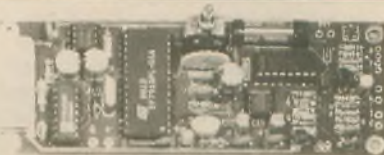
MORE BATTERY INSERTS

Tempo S1 Early	270mah	\$19.95
Tempo S2/4/5 Late	500mah	\$21.00
Standard BP-1	270mah	\$19.95
Ten-Tec BP1	500mah	\$19.95
San-Tec #142#144Tabs	600mah	\$22.00
Azden 300 Tabs	600mah	\$15.00
Bearcat	600mah	\$20.00
Regency MT1000 Tabs	600mah	\$15.00



*Add \$3.00 Shipping FREE Catalogue

TNR The Battery Store
279 Douglas Ave., Suite 1112
Altamonte Springs, FL 32714
1-800-346-0601



DIGICOM >64

Revision B Modem
Low Cost Packet for the C64

Complete Kit Only . . . **\$49.95**
Assembled Board . . . **\$79.95**

FEATURES: Software-based PACKET that makes your computer emulate a TNC. Requires modem between transceiver and cassette port. Our modem plugs directly into cassette port or remote mount via a cable, both connectors included. Watchdog timer and Reed relay PTT included. Power derived from computer. Circuit uses crystal controlled 7910 chip - no alignment. Revision B offers superior HF receive operation. Switch allows HF, VHF normal or VHF Equalized operation. LOCK, TX & RX LED's. Free disc included with every unit.

CA residents add 6.25% sales tax. S&H: \$4.50 (insured). Foreign orders add 15%. For more info or price list, send SASE (45c) to:

A&A Engineering

2521 W. LaPalma #K • Anaheim, CA 92801 • 714-952-2114

pedal engaged and had *not* shifted into second gear.

Thoroughly disoriented, I shifted back into first gear to try again. The result was an embarrassing whiplash as the engine compression quickly slowed the car, followed by the accelerator engaging as I realized too late what had happened. I sneaked a peek in the rear view mirror and found a look of consternation on the face of an impatient driver following.

The rest of the trip that day was a real experience of what Jim,

K7YLM/M had wisely predicted. "The first day the main objective is to keep from hitting something," he had warned. How true.

I thought about putting a "Student Driver" sign in the back window for a few days. I wondered what it would be like to be pulled over for drunk driving. Would I have to use the microphone to call MAY DAY? How long does it take for the "Jaws of Life" to extract an Amateur from his crushed subcompact?

If you are contemplating giving

mobile CW a try, by all means do it. Begin by preparing for that first day carefully. Be aware of the particular driving skills your own vehicle demands. Driving safely is the first responsibility.

You may wish to do your test drive on a quiet country road, an empty parking lot or a deserted street. Or, you may wish to plunge into rush-hour highway traffic and learn mobile CW operating real fast. In either case, there is no doubt that you'll find the outcomes rewarding and a whole lot of fun. □



Out of State 1-800-882-1343

(213)390-8003 FAX 213-390-4393

HOURS M-F 9:00 - 5:30 SAT 9:00 - 5:00 SE HABLA ESPANOL
QUICK SERVICE CENTER FOR REPAIR NEEDS

3919 SEPULVEDA BOULEVARD, CULVER CITY, CALIFORNIA 90230

ICOM IC-781



HF Equipment	List	Jun's
IC-781 Super Deluxe HF Rig	\$5995.00	Call \$
IC-765 New, Loaded with Features	3149.00	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-726 HF/50 MHz All Mode	1299.00	Call \$
Receivers		
IC-R9000 100 kHz to 1999.8 MHz	5459.00	Call \$
IC-R7000 25-1300 + MHz Rcvr	1199.00	Call \$
IC-R71A 100 kHz - 30 MHz Rcvr	999.00	Call \$
VHF		
IC-228A/H New 25/45w Mobiles	509/539	Call \$
IC-275A/H 50/100w All Mode Base	1299/1399	Call \$
IC-229A/H, 25/50w, 2M Mobile	449/479.00	Call \$
IC-2GAT, New 7w HT	429.95	Call \$
IC-2SAT Micro Sized HT	439.00	Call \$
IC-901 New Remote Mount Mobile	1199.00	Call \$
UHF		
IC-475A/H 25/75w All Modes	1399/1599.	Call \$
IC-48A, FM, Mobile	599.00	Call \$
IC-4SAT Micro Sized HT	449.00	Call \$
IC-4GAT, New 6w HT	449.95	Call \$
IC-32AT Dual Band Handheld	629.95	Call \$
IC-3220A/H Dual Band Mobile	659/699.	Call \$
IC-2500A FM, 440/1.2 GHz Mobile	999.00	Call \$
IC-24AT New 2m/440 mini HT	629.95	Call \$
IC-2400 144/440 FM	899.00	Call \$
220 MHz		
IC-3SAT Micro Sized HT	449.99	Call \$
1.2 GHz		
IC-12GAT Super HT	529.95	Call \$

KENWOOD TS-950SD



HF Equipment	List	Jun's
TS-950SD New Digital Processor HF	\$4399.95	Call \$
TS-850S New All Mode All Band	TBA	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	1982.95	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-241A 50w Mobile FM	469.95	Call \$
TH-27A Compact, 2m, HT	419.95	Call \$
TM-731A 2m/70cm, FM, Mobile	749.95	Call \$
TH-77A 2m/440 HT	599.95	Call \$
UHF		
TS-811A All Mode Base 25w	1265.95	Call \$
TR-851A 25w SSB/FM	771.95	Call \$
TM-441A Compact 35w Mobile	479.95	Call \$
TH-47A Compact FM, HT	429.95	Call \$
TH-55 AT 1.2 GHz HT	524.95	Call \$
TM-541A Compact 1.2 GHz Mobile	579.95	Call \$
220 MHz		
TM-331A Compact Mobile	469.95	Call \$
TH-315A Full Featured 2.5w HT	419.95	Call \$

YAESU FT-1000D



HF Equipment	List	Jun's
FT-1000D Top Performer	\$4399.00	Call \$
FT-747 GX Economical Performer	889.00	Call \$
FT-757 GX II Gen. Cvg Xcvr	1280.00	Call \$
FT-767 4 Band New	2299.00	Call \$
FL-7000 15m-160m Solid State Amp	2279.00	Call \$
Receivers		
FRG-8800 150 kHz - 30 MHz	784.00	Call \$
FRG-9600 60-905 MHz	808.00	Call \$
VHF		
FT-411 New 2m "Loaded" HT	406.00	Call \$
FT-212RH New 2m, 45w Mobile	499.00	Call \$
FT-290R All Mode Portable	610.00	Call \$
FT-23 R/TT Mini HT (351.00) Call for special price!		
UHF		
FT-712RH, 70cm, 35w Mobile	536.00	Call \$
FT-911 Compact 70cm HT	505.00	Call \$
FT-790 R/II 70cm/25w Mobile	681.00	Call \$
VHF/UHF Full Duplex		
FT-736R, New All Mode, 2m/70cm	2025.00	Call \$
FEX-736-50 6m, 10w Module	294.00	Call \$
FEX-736-220 220 MHz, 25w Module	322.00	Call \$
FEX-736-1.2 1.2 GHz, 10w Module	589.00	Call \$
FT-690R MKII, 6m, All Mode, port.	752.00	Call \$
Dual Band		
FT-4700RH, 2m/440 Mobile	996.00	Call \$
FT-470 Compact 2m/70cm HT	576.00	Call \$
Repeaters		
FTR-2410 2m Repeaters	1154.00	Call \$
FTR-5410 70cm Repeaters	1154.00	Call \$
Rotators		
G-400RC light/med duty 11 sq ft	242.00	Call \$
G-800SDX med/hvy duty 20 sq ft	390.00	Call \$
G-800S same/G-800SDX w/ia presets	322.00	Call \$

ALINCO

DR-590T



DR-590T, New Twin Band Mobile
DR-570T, 2 Meter/70 cm Mobile
DR-110T, Value Loaded, 2M Mobile
DJ-160T, Feature Packed 2M Handy
DJ-120T, Mini Size, Maxi Feature, 2M, HT

DJ-160T
2 METER H.H.



★★★ JUN'S FEBRUARY BARGAIN BOX ★★★

ICOM	KENWOOD
IC-3SAT, 220 MHz HT w/FREE BP82.....\$349.95	TH-26AT, Compact 2mHT..... Call \$
IC-24AT, Dual Band HT w/FREE BP83.....\$489.95	TS-940S/AT, Reg. \$2499.95.....Special \$1999.95
IC-229H, 2M, Mobile.....\$399.95	YAESU
IC-725, Compact HF w/FREE FREIGHT...\$789.95	FT-23R Mini, 2m, HT.....\$239.95

★ IC-RP2210, 220 MHz Repeater, List \$1,649, SALE . . . \$995.



DX WORLD

John F.W. Minke III, N6JM

6230 Rio Bonito Drive Carmichael, CA 95608

Activities Calendar

- 16-17 Feb. RSGB 7.0 MHz Contest (CW)
- 16-17 Feb. ARRL International DX Contest (CW)
- 23-24 Feb. UBA/REF French Contest (SSB)

For details on contest activity, consult your favorite contest column. We have no advance notice on some of the above and are basing the dates on those from previous years.

W100N

The following DXer was awarded Worldradio's Worked 100 Nations Award recently: 383) Kiyoshi Endo, JA0BSL, Dec. 7, 1990.

Many of you most likely know Romeo Stepanenko, UB5JRR, as 3W3RR, signing from Viet Nam not too long ago. The picture here is of Romeo operating with his "home call," 1S1RR, during the Spratly Island DXpedition last April.

Romeo is 26 years old and has been involved with Amateur Radio since November of 1987. He received his



Romeo Stepanenko, UB5JRR, was to have operated from Afghanistan near the end of December, signing YA0RR, provided he had the necessary funding.

Extra Class a few months later. He is presently employed with Moscow Boston International Ltd. Romeo's father is UB1RR, and his XYL is UT5JDA.

San Felix (CE0)

QRZ DX reports a new operator on the island, signing XQ0X by John, CE0ZAM. He should be there for five months and speaks very little English. Until he gets the hang of DXing, probably most of his activity will be with DX nets.

Antarctica

Inside DX reports that a French station will be on from Antarctica in late November, signing FT4YD.

Also from the Antarctic is 4K1B, who was reported on 17M near 18.082 MHz early in November. This station is located at Mirnyy Base. This was the end of the journey for those hearty individuals who transversed the continent last year. See "Six Across Antarctica" in the November, 1990 issue of *National Geographic*.

According to *DX News Sheet*, Andrew Gawthrope, G1SWW, will be arriving sometime around February at Hawley 5 Base, which is about 1000 miles from the coast. He will be signing VP8SWW and the base call of

VP8HAL, on SSB only. He plans to be there for two to three years.

Also soon to be active from Faraday Base will be VP8FAR and VP8GAV.

Italian calls in the Antarctic include IA0PS at Terra Nova Bay and IN0G, a special call operated by I0JBL, from the Italian National Institute of Geophysics in Rome.

The former East Germany prefix call Y88POL is located at Georg Forster Station.

QRZ DX reports that ZL0AAF is operating from Swan Base, located on the Balleny Islands, within the Antarctic Circle. This also counts for the IOTA awards program. No reference number has been assigned at present.

Honduras (HR)

During the month of November, HR1RMG was reported active on 75M. Check near 3.795 MHz around 1100 UTC. He has also been on 15M near 21.289 MHz at 2215 UTC and on 10M at 1845 UTC, working Europeans on 28.446 MHz.

On CW, HR1LW was worked at 1230 UTC on 21.019 MHz and on CW on 20M at 1230 UTC on 14.169 MHz.

Other calls reported include HR1KAS on 14.193 MHz at 0445 UTC, HR1RCK on 10.104 MHz at 1230 UTC and HR2BDC on 3.797 MHz at 0600 UTC. HR1KAS is often found in contests.

Cayman Islands (ZF2)

Bruce Frahm, K0BJ, reports that he will be on vacation at Grand Cayman Island January 19 through February 2. Look for him signing ZF2NJ on CW on 10, 15 and 20M, and possibly some SSB. Bruce has operated from there in January for the past two years.

IOTA

Howard, KD7EC, operates often from South Padre Island (NA-92) in Texas. He operates mostly 10M near 28.560 MHz. Hal didn't say when he planned his next trip to the island, but you could get an answer from him at Route 5, Box 255-X, Harlingen, TX 78552. Be sure to include an SASE with your request.

Another Stateside IOTA DXpedition will be Martha's Vineyard (NA-46) this spring. The team, lead by Tony Spino, WF1N, will operate SSB April 12 to 15, 10 through 75M. This

MORSE CODE

Morse Tutor (c) will take you from beginner through Extra Class in easy self-paced lessons

"Incomparable computer-based code course... a very well thought out program. Morse Tutor is, quite simply, a superb value." Bryan Hastings, Editor, 73 Amateur Radio

Features of this unique package include:

- Code speeds from 1 to over 100 wpm
- Standard or Farnsworth mode
- Code conforms to international standards
- Adjustable tone frequency
- Over 1 billion random QSOs possible
- QSOs similar to license tests
- Covers letters, numbers and punctuation marks
- Covers special characters, required by FCC
- Random characters specifically for each lesson
- Random characters review for all previous lessons
- Random words for each lesson
- Display text while listening or after copying
- All parameters are remembered from one lesson to the next and may be changed as desired

For IBM, PC, XT, AT, PS/2 or compatibles. Available at your dealer, through QST, or send \$19.95 for 5.25" or \$21.95 for 3.5" (CA residents add 6% tax) plus \$2.00 S&H to:

GGTE, P.O. Box 3405, Dept. MW, Newport Beach, CA 92659

HI-PERFORMANCE DIPOLES

Antennas that work! Custom assembled to your center freq. ea. 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 862	.....	95' \$85ppd
HPD-3*	180-80-40M hi-performance dipole 113' long	.....	\$75ppd
SSD-6*	180-80-40-20-15-10M space-saver dipole 71' long	.....	\$125ppd
SSD-5*	80-40-20-15-10M space-saver dipole-specify L 42' \$105 52' \$108ppd	.....
SSD-4*	80-40-20-15M space-saver dipole-specify L 46' \$93 52' 80' \$96ppd	.....

*9-bands with wide-matching-range tuner.

SASE for catalogue of 30 dipoles, slopers, & space-saving, unique antennas

WINN ANTENNAS
BOX 393 MT. PROSPECT, IL 60056 708-384-3414

NextDay **QSLs**

Baraboo, Wisconsin
Sauk County

K9ZZ

info \$1

AntennasWest
(801) 373-8425

Two-Color
Rainbow Assortment

Call Today & We Ship

	NextDay	2nd Day	Air Mail
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

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

island is part of Dukes County, Massachusetts.

Here are a few more islands reported on the bands recently:

EU-35	Novaya Zemlya	4K3BB
	14.027 MHz	0400 UTC
EU-58	Lerins Islands	TQ0LER
	21.260 MHz	1100 UTC
EU-76	Lofoten Islands	LA5RX
	24.905 MHz	1600 UTC
EU-97	Kotlin Island	UV1AD
	28.020 MHz	1245 UTC
AS-27	Wrangell Island	UA0HAE/UA0K
	14.007 MHz	0330 UTC
AS-29	Lyakhov Islands	UA0QCI
	14.031 MHz	0400 UTC
AS-63	Petra Islands	4K4/UA6CWG
	21.019 MHz	0945 UTC
NA-14	Campobello Island	VE1ANJ
	28.495 MHz	1315 UTC
NA-78	Isla Magdalena	6FXBCS
	14.025 MHz	0245 UTC
OC-27	Marquesas Islands	F00IGS/MA
	28.493 MHz	0100 UTC
OC-124	Palmerston Atoll	ZK1TW
	14.260 MHz	0730 UTC

Check your contest logs. That 4BIPAZ that was on during the recent World Wide DX Contest was located on Isla Ballena, located in the southern portion of the Sea of Cortez (Gulf of California) near La Paz. It has a newly assigned IOTA reference number of NA-124. And if you worked VE2LJ (Zone 02) he is at Harrington Harbour (NA-84). This island group is in the Gulf of St. Lawrence.

DX News Sheet reports that JW9MAA is active from Bear Island (EU-27), although we have seen no activity reports for this one.

We would appreciate it if those of you who visit various offshore islands or reside on some of the less populated islands let us know your operating schedule. Heavily populated islands such as Long Island and New York are not needed, as most people have worked them.

Grigoriy Sharunov, UA1ANP, is also active from Kotlin Island (EU-97). Greg says he is active daily on 1.835, 3.515, 7.015, 14.015, 21.015 and 28.015 MHz.



Call Sign Jewelry Shows Your Pride

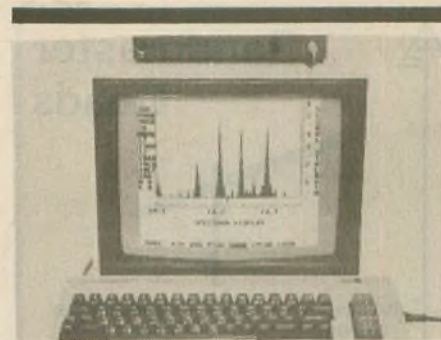
14 Karat Gold jewelry with your Call Sign. Collar pins, necklaces, tie pins, lavalieres, charms, operator rings, and call sign watches. Look great! Quality craftsmanship. Send for free information: KB2MB, H&M Jewelry Co., 26 Edgecomb Rd., Binghamton, NY 13905 or call (607) 797-5458.

Most Wanted survey

It is that time of year for the world famous Most Wanted Countries Survey. This survey is made in response to the subscribers of *The DX Bulletin* and was prepared by Chod Harris, VP2ML, a.k.a. WB2CHO, Editor/Publisher. The results were included in the December 1990 issue of his companion publication, *The DX Magazine*.

A total of 100 countries are included in this survey. However, we will just list the top 25.

rank	DXCC country	prefix	percent need	1989 rank
1	Albania	ZA	89	1
2	Burma	XZ	85	2
3	Afghanistan	YA	76	5
4	Yemen	4W	71	6
5	South Sandwich Islands	VP8	68	11
6	PDR of Yemen	7O	63	4
7	Bangladesh	S2	62	7
8	Ethiopia	ET	57	13
9	Malpelo Island	HK0	57	18
10	Peter I Island	3Y0	56	14
11	Agalega	3B6	55	17
12	Bhutan	A5	55	9
13	Mount Athos	SV/A	54	22
14	Tromelin	FR/T	54	12
15	Libya	5A	49	25
16	Glorioso Island	FR/G	48	28
17	Andaman	VU4	48	29
18	San Felix	CE0	47	31
19	Spratly Islands	1S	47	10
20	Heard Island	VK0	46	33



AMSPEC-3

H.F. SPECTRUM DISPLAY RECEIVER FOR THE RADIO AMATEUR

Open a window on your Amateur radio operations with this computer accessory for the IBM-PC or Commodore C64/128 computers. The AMSPEC-3 displays up to a 500 kHz segment of a pre-programmed 160-10 meter Ham band or general coverage segment in the 1.8-30 MHz range on your computer screen. The broad-banded input allows connection to suitable antennas or, through an appropriate adapter, to the station transceiver for common antenna use. Use the AMSPEC-3 to enhance station operations such as finding holes in DX pile ups, looking for open frequencies during net operations and CO's, and checking for propagation on other frequencies.

FEATURES AND SPECIFICATIONS:

- 1.8-30 MHz input range
- 70 db dynamic range (S9+25db)
- Modern up-conversion design with 2 IF's of 40 & 8 MHz
- 500 Hz filter for useable display width of 125-500 kHz
- Digital signal processing (DSP) for signal enhancement
- Moving pointer that can show station operating frequency
- Computer keyboard control of all functions including: Band select - Signal processing mode select - Scale expansion - Pointer lock and scroll.
- C64/128 model plugs into user port.
- IBM-P.C. model plugs into parallel printer port and auto-installs for CGA, VGA, or EGA.

Send SASE for additional details.

Prices: \$209.00 for C64/128 model and \$279.00 for P.C. model. Power transformer \$10.00 additional. California residents add sales tax.

Mauro Engineering
P.O. Box 1450, Mt. Shasta, CA 96067

21	Laccadive Islands	VU7	46	26
22	Malagasy Republic	5R	46	32
23	South Georgia Islands	VP8	45	21
24	Kampuchea	XU	44	15
25	Tunisia	3V	43	35

Obviously, the ranking of some of the above have already changed, such as Malpelo Island. The recent HK0TU DXpedition certainly made a change. And Burma is still up there as all the activity from Burma in recent years is no good for DXCC. The Yemen listings will also change, as they are now one country.

800-942-8873

Amateur Radio And Computer Equipment and Accessories

Comm P I nc.

1057 East 2100 South
Salt Lake City, UT 84106
801-467-8873

KENWOOD YAESU

BENCHER, INC. ICOM

Kantronics ABSTRON

RADIO AMATEUR callbook inc. Larsen Antennas

Wilson ANTENNA INC. DIAMOND ANTENNA

AEA CUSHCRAFT CORPORATION

uniden MFJ

HUSTLER HAM 10

BARBER & WILLIAMS

Call for your Special Price

DX Prediction — February 1991

Maximum Usable Frequency from West Coast, Central U.S., and East Coast (courtesy of Engineering Systems Incorporated, Box 939, Vienna, VA 22180).

The numbers listed in each section are the average Maximum Usable Frequencies (MUF) in MHz for contacting five major areas of the world centered on Africa-Kenya/Nairobi, Asia-Japan/Tokyo, Oceania-Australia/Melbourne, Europe-Germany/Frankfurt, and South America-Brazil/Rio De Janeiro. Chance of contact as determined by path loss is indicated as bold MUF for good, plain MUF for fair, and in parentheses for poor. UTC in hours.

FEBRUARY 1991 WEST COAST

UTC	AFRI	ASIA	OCEA	EURO	SO AM
10	(13)	14	19	(11)	18
12	(13)	14	18	(11)	17
14	(20)	13	17	(16)	33
16	(27)	14	24	20	36
18	30	14	21	(15)	39
20	31	21	(24)	(13)	40
22	26	29	31	(12)	39
24	23	31	36	(11)	35
2	20	27	36	11	27
4	16	18	28	11	23
6	(15)	16	24	12	21
8	(14)	15	21	(12)	19

CENTRAL USA

UTC	AFRI	ASIA	OCEA	EURO	SO AM
8	(17)	11	19	11	18
10	(16)	11	18	(11)	17
12	(25)	11	17	(16)	25
14	35	15	26	23	33
16	38	(14)	24	22	36
18	38	(14)	21	19	39
20	31	(21)	(25)	14	39
22	26	24	32	(12)	39
24	23	(21)	36	12	31
2	20	(14)	30	11	26
4	19	(13)	23	11	23
6	(18)	(12)	21	11	20

EAST COAST

UTC	AFRI	ASIA	OCEA	EURO	SO AM
7	17	(11)	(18)	11	19
9	16	11	17	(11)	18
11	32	11	16	16	25
13	38	12	31	23	31
15	40	(11)	26	23	35
17	40	(11)	23	21	38
19	35	(11)	(20)	16	39
21	29	(21)	(29)	13	39
23	22	(21)	34	12	32
1	20	(14)	24	11	28
3	18	(13)	21	11	24
5	17	(12)	(19)	11	21

Ivory Coast. How about "Thank you and best regards"?

QSL routes

A35XK	-WA6ZEF	JW0GB	-WB4ZBI
A71AM	-DJ9ZB	KC6MM	-VE3JDO
AH3C	-K9UIY	KE9A/VS6	-WE9R
BV2A	-K2CM	LS6E	-LU6EJP
C30CUA	-DL4SBL	LS6T	-LU6ETB
C30EOA	-F6GIN	LW1E	-LU8DPM
C31LND	-FD61TD	LX9DX	-LX1EA
C31XR	-DD9GA	LZ5A	-LZ1KGB
C6AFP	-N4JQQ	LZ5Z	-LZ1KDP
C6AFP	-K1TN	LZ9A	-LZ2KTS
C6A/KRIS	-KR1S	OM5W	-OK1AEZ
CN2BB	-DF4VS	OX3JF	-OZ1JFC
CN2JO	-F3MZ	P46J	-WX4G
CN2JP	-AE6H	PJ2/	
	(See Note 1)	OH1XX	-OH2BAD
CN2LB	-F1LBL	PJ2/	
CQ4L	-CT1AHU	OH9RP	-OH9RP
CY0SAB	-VE1CBK	PJ9W	-OH6XY
D68VT	-K5VT	PR5T	-PY5TT
DA0FDX	-DA2CU	PY0GCV	-PY2MT
DX1A	-DU1AU	PY0YP	-PY2MT
ED3MM	-EA3BOX	R6L	-UZ6LWZ
ED4CW	-EA4CW	RB3MO/	
FG5R	-W7EJ	UI9B	-UW6HS
FJ5BL	-F6AJA	RH0E	-UH8AE
FJ9A	-FJ5AB	ST2YD	-F6AJA
FR0P	-F6BFH	T36F	-OH6ZS
FQ0IGS	-F6EEM	T3T3	-OH3GZ
FT4WC	-F6GVH	TA5KA	-HA0NNN
GB5SH	-GM3YOR	TM5A	-F6IFR
GD3TXF	-G3TXF	TQ0LER	-3ALF
GJ3UW	-G3XTT	TV1L	-F1LBL
GU6UW	-G3XTT	TX2C	-F2CW
HG5A	-HA7RY	UA101L	-UA9MA
HX0U	-F6DZU	UA0BAZ	
IA0PS	-IK0GPP	UA10	-UA9MA
IH9T	-IK8CNT	V51Z	-OH2BH
IN0G	-IK0GPP	V63BD	-VE3JDO
IO0MMI	-IK0MMI	V63DX	-JA7HMZ
IR9R	-IT9GSF	V73AZ	-N6ASF
IU4K	-I4ABF	V85OM	-N2OO
I25A	-I5OUL	VP2EV	-HB9SL
J37A	-W3HNK	VP2EY	-HB9SL
J37K	-W8KFF	VP2VCW	-N6CW
J37L	-W8LWO	XE2PDY	-N6LHN
J6DX	-W8UMD	XE3/NE8Z	-K8LJG
J6LRU	-W8ILC	YT2B	-YU2KDE
JW8XM	-LA8XM	Y72R	-YU2CRT

YT3M	-YU3DJK	4BIPAZ	
YT3T	-YU3EIJ	(See Note 2)	
YT4T	-YU4ECJ	4D3HSP	-NR8Y
YT5R	-YU5GBC	4F5FV	-NA30
YT7A	-YU7GMN	4K2BAZ	-UA9MA
YT90A	-YT3AA	4K2BDU	-UA9MA
YW3A	-YV3AZC	4K201L	-UA9MA
YW5Y	-YV5LAJ	4K2OKV	-UA9MA
YW6W	-YV6CAX	4K4AB	-UA9MA
YZ4Z	-YU4EXA	4U1UN	-NA2K
YZ7Y	-YU7ECD	6FXBCS	-VE7DP
ZB0T	-DL1SDN	6G0V	-XE2GV
ZD8CUE	-G4ZVJ	7P8EN	-ZS5ACW
ZF2JR	-N6RJ	7Q7LA	-G0IAS
ZF2ML	-WB2K	7X0NU	-F6FNU
ZL0AAD/7	-DJ1ND	8P9EM	-G3VBL
ZL0AAE	-K8BL	8Q7JP	-I3EJ
ZL0ADN/7	-DJ1ND	9H10	-9H5CJ
ZL0AIC	-HB9AAA	9H3NS	-G4CVZ
ZP0Y	-ZP5JCY	9H3NT	-G3XSN
ZS9Z/		9H3NU	-G4CVZ
ZS1	-OH2BH	9H3NW	-GW4AMX
ZS9/W6KG	-YASME	9H8C	-PA0VAJ
ZW01M	-PY2MT	9J2SZ	-SP8DIP
ZW0ORF	-PY2MT	9M2HG	-JA1ARJ
ZW5B	-PY5EG	9M2RU	-N6LHN
ZX0KP	-PY2MT	9M6FH	-WE2K
ZX4V	-PY5VD	9M6NA	-JE1JKL
ZY0NS	-PP5SZ	9M6OO	-N2OO
Z9B	-KA6V	9M8ZR	-WA2HZR
D68GA	-Don Jones, 1605 Avenue O-4, Palmdale, CA 93551, USA		
UA1ANP	-Grigoriy Sharunov, P.O. Box 320, Kronstadt 189 610, USSR		
UM8QDX	-P.O. Box 1, Kadzhisai, Kirghizia SSR 722 452, USSR		
VR6BX	-Brian Young, P.O. Box 21, Pitcairn Island, SOUTH PACIFIC		
XU8DX	-P.O. Box 80, Kojimachi, Tokyo 102-91, JAPAN		
4K1ADQ	-Vlad Ivanov, P.O. Box 88, Kolpino 3, Leningrad, USSR		

Notes

1. Please QSL direct only.
2. CW contacts made with this station will be handled by VE7DP; SSB contacts by XE2BCS.

Many thanks to the following contributors: WF1N, W3BBL, N4SU, K5LIL, W6TUR, KD6LV, KD7EC, KB8ICW, K0BJ, UA1ANP, UA9MA, (please turn to page 47)

KEY



- Dual paddle
- Ball bearings
- Solid copper contacts
- Fully adjustable without tools
- Machined brass mechanism
- Heavy steel base
- Small footprint

Smooth effortless action. Rounded paddles are easy on the fingers. Knurled adjustment screws for spacing and tension of each paddle.

Enjoy the biggest improvement in keys in 20 years. Order yours today.

Model PK-100 Key \$99.95 + \$4 shipping U.S. & Canada. Sales tax in Calif.

KEYER



- Full featured.
- All controls on front panel.
- 1 amp. relay contacts.
- Keys + or - without adjustment.
- Keys any rig.
- 9-v battery operation.
- Fully RF proof.

Send CW effortlessly with the keyer that never makes a mistake. Full iambic keying with dot and dash memories. Monitor speaker. From the World's oldest manufacturer of electronic keyers.

Model PK-44 Keyer \$99.95 + \$4 shipping/handling in U.S. & Canada. Sales tax in Calif.



Send for free catalog that describes our Key, Keyer, Noise Bridge, SWR Meters, Preamplifiers, Loop Antennas, Toroid Cores, and more.

PALOMAR ENGINEERS
BOX 455, Escondido CA 92033
Tel. (619)-747-3343

EA...
RONICS...
CUSHCRAFT
ICOM MFJ YAESU CUSP...
BIRD MFJ YAESU CO...
IRDUS TOWER...
BUTTERNUT...
TEC...
BIRD...
A...



HAM RADIO OUTLET

LARGEST HAM OUTLET IN THE WORLD

February is
ICOM MONTH!

10 STORE BUYING POWER!

ICOM IC-765



100W GENERAL COVERAGE RECEIVER
HF ALL BAND TRANSCEIVER
Maximum Operation Flexibility
SALE! CALL FOR PRICE

ICOM IC-735



The latest in ICOM's long line of HF Transceivers
CALL FOR LOW, LOW PRICE

ICOM IC-2400A/3220

2m/440 MHz / 2m/440 MHz



IC 2400A shown
VHF/UHF DUAL BAND FM TRANSCEIVER

ICOM MONTH

is here!

SPECIAL PRICING ALL MONTH LONG!

ICOM DAYS at each store...

February is ICOM MONTH at HRO - with a special ICOM DAY at each of our stores:

- Feb. 2: Burlingame • Van Nuys
- Feb. 9: Phoenix • Woodbridge • San Diego
- Feb. 16: Salem • Denver
- Feb. 23: Oakland • Atlanta • Anaheim

On these dates at these stores:

- Free prize drawing each hour (must be present to win)
- Grand Prize drawing (need not be present to win)
- Demos by ICOM representatives
- Refreshments

PRIZES • DRAWINGS • DEMOS

ICOM IC-901

FIBER OPTIC MULTI-BAND TRANSCEIVER



2 METER AND 440 MHz EXTRA-LARGE MULTI COLOR LCD HM14 TOUCH TONE MICROPHONE
CALL FOR PRICE

ICOM



(2 SAT shown)

- IC-32AT** Dual Band Hand Held
- IC-2GAT** 2 Meter HT 7 WATT
- IC-2SAT** 2 MTR IC-3SAT, 220 MHz
- IC-4SAT** 440 MHz 5 WATT
- IC-24AT**, Duo-Band

ICOM IC-725



100W GENERAL COVERAGE RECEIVER HF ALL BAND COMPACT TRANSCEIVER

GREAT PRICE

FREE Shipment!
most items over \$100 UPS surface



Bob Ferrero W6RJ
President/Owner

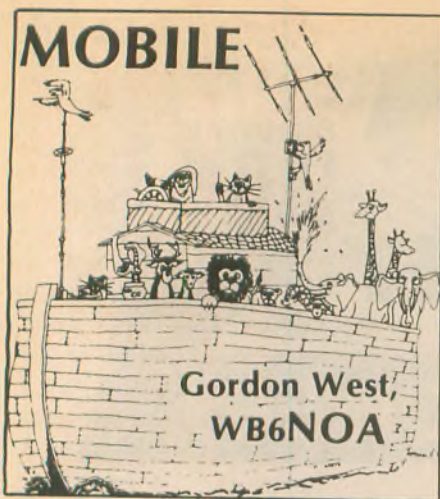
Jim Rafferty N6RJ
VP - National Sales Manager

ALL MAJOR BRANDS IN STOCK NOW!

- | | | | | |
|---|---|---|--|--|
| <p>ANAHEIM, CA 92801
2620 W. La Palma
(714) 761-3033
(213) 860-2040
Between Disneyland & Knotts Berry Farm</p> | <p>BURLINGAME, CA 94010
999 Howard Av
(415) 342-5757
Jeff, WD6ERA, Mgr
5 mi. south of SFO on 101</p> | <p>OAKLAND, CA 94606
2210 Livingston St
(415) 534-5757
Rich, WA9WYB, Mgr
I-880 at 23rd Ave. ramp</p> | <p>SALEM, NH 03079
224 N. Broadway
(603) 898-3750
(800) 444-0047
Paul, NW1U, Mgr
Exit 1-193, 28 mi. no. of Boston</p> | <p>VAN NUYS, CA 91411
6265 Sepulveda Blvd.
(818) 898-2212
Al, K6YRA, Mgr
San Diego Fwy. at Victory Blvd.</p> |
| <p>ATLANTA, GA 30340
6071 Buford Highway
(404) 263-0700
Larry, WD4AGW, Mgr
Doraville, 1 mi. north of I-285</p> | <p>NEW STORE!! DENVER, CO 89231
8400 E. Iliff Ave. #9
(303) 745-7373
(800) 444-9476</p> | <p>PHOENIX, AZ 85015
1702 W. Camelback Rd
(602) 242-3515
Gary, WB7SLY, Mgr
East of Highway 17</p> | <p>SAN DIEGO, CA 92123
5375 Kearny Villa Rd
(619) 560-4900
Tom, KMGK, Mgr
Highway 163 and Claremont Mesa Blvd</p> | <p>WOODBIDGE, VA 22191
14803 Build America Drive
(703) 643-1063
(800) 444-4799
Curtis, WB4KZL, Mgr
Exit 54, I-95, South to US 1</p> |

CALL TOLL FREE NOW! Toll free in California WEST 1-800-854-6046 MID-WEST/COLORADO 1-800-444-9476 SOUTHEAST 1-800-444-7927 MID-ATLANTIC 1-800-444-4799 NEW ENGLAND 1-800-444-0047

STORE WALK-IN HOURS: 10 AM - 5:30 PM • CLOSED SUNDAYS
Toll free, incl. Hawaii; call routed to nearest store; all HRO 800-lines can assist you, if the first line you call is busy, you may call another - or call direct to your local store. PHONE HOURS: 9:30 AM to 5:30 PM. Prices, specifications, descriptions, subject to change without notice. AZ, CA, CO, GA, VA residents, add sales tax.



Losing your memory?

It's not a pleasant thought to have to reprogram your transceiver after an accidental catastrophic memory drop. Now that many hand-helds have up to 40 channels of programmable memory, many mobile VHF/UHF rigs have up to 25 channels of memory, and some big HF transceivers have up to 100 channels of memory, it's not just a five minute job to reprogram.

Memory dump is not usually something simple like a dead lithium battery. Most lithium batteries may outlive the life of the transceiver. And although there are still rumors floating around the technical circles that a manufacturer's HF lithiums may die (requiring a very expensive factory visit for re-initialization of the CPU chip), the big lithium die-out has not occurred.

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!

If you are absolutely convinced that your lithium is ready to go, it's not that bad of a job, if you're a technical-type, to change it in your shack. This is accomplished by backing up the battery circuit with a lab-standard, low-voltage, well-calibrated power supply. You'll also need a factory-fresh new lithium battery and a small pencil soldering iron. The old battery comes out, the new battery goes in, and the lab-standard voltage power supply keeps the main memory chip from arresting on the operating bench. But let a Tech do this change-out — it requires just the right touch.

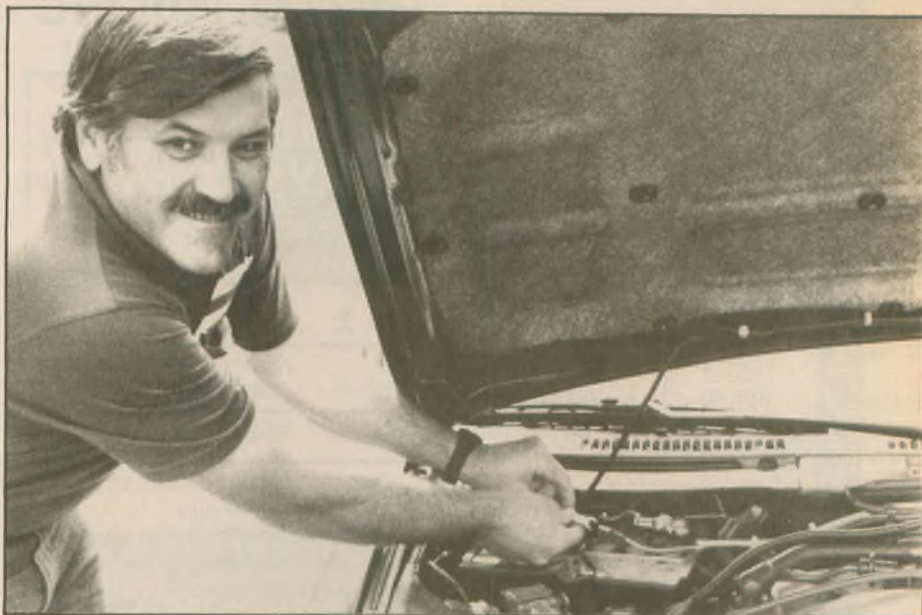
The most common cause of memory wipe-out is due to engine cranking. You jump in your car, motorhome or boat, and the radio is just fine. Start up the engine, turn on the radio, and all the memory channels read 144.000 or 446.000 MHz. Sound familiar?

Must be a dip in voltage, right? Nope — voltage is not the culprit, because you can actually remove your radio com-

pletely from 12V and still have the memory saved. Well, if it's not a voltage dip that's wiping out the memory, what is it?

Starter spikes. When viewed on an oscilloscope connected to the 12V DC input, starter spikes look like a forest of AC spikes traveling down and into your rig via the DX circuit. Starter motor spikes contain enough electromagnetic energy to actually induce energy onto other wires within your rig, even though your rig may be completely shut off at the power switch. And if the rig is turned on during engine cranking, all the better for these spikes to get into its brain. They resemble a stream of digital logic; when this forest of spikes gets into the memory section of your rig, turned on or off, the memory gets jumbled, and it goes crazy.

On some rigs only some of the memory goes — such as the offset or the memorized sub-audible tones. In other rigs, things subtly change, such



Ken, WF6H, connects a 2M rig's power cord directly to the battery to solve a memory jumble problem.

WD4BUM'S

1/4 WAVE 2 METER

MAG. MOUNT

ANTENNA

ONLY \$15.00

CAT #

M-300

Complete with strong black powder coated magnet & 15' RG58 coax. A PL259 is installed.

FREE interchangeable whips for 220 and 440 MHz are included.

SEND CHECK, M.O., VISA OR MC TO:

LAKEVIEW COMPANY, INC.

Route 7, Box 258

Anderson, SC 29624

1-803-226-6990

Add \$4.00 for shipping & handling
South Carolina residents add sales tax
Catalog available • Dealers welcome



HUGE 88 PAGE CATALOG

- Communications Receivers
- Portable Receivers
- Amateur Transceivers
- HT's & Mobile Transceivers
- Amateur & SWL Antennas
- Scanners
- RTTY and FAX Equipment
- Books, Manuals & Accessories

Send \$1 to

Universal Radio
1280 Alda Dr. Dept. WR
Reynoldsburg, OH 43068
Tel. 614 866-4267

as minus offsets becoming plus offsets. I even had one student who, when she started her car, found that all PL tones went up to the next higher tone.

Another student would only lose half his memory channels — and in yet another case, the display would actually shut down requiring the ol' reset maneuver. And you know what happens when you push the reset button . . . it's start-all-over-time again!

One cure for memory eradication is direct wiring to your battery. The battery acts like a giant filter cap and helps to minimize the spikes that travel up the red and black wires to your rig. But be sure to use a fuse on the red wire, right at the battery positive terminal. This will prevent a devastating fire in case your extra-long battery feedline becomes shorted between the battery and the fuses that come on the radio normal red and black wires.



A fuse on the battery positive terminal is a must.

The direct-to-battery connection usually does the trick. In hardcore starter-motor cases, devices under \$130 are available from the marine electronics industry to protect sensitive Loran and GPS receivers from an accidental catastrophic memory lapse. The best device I have tested is available from Nemar Corporation (2911 Gary Avenue, Santa Ana, CA 92704; 714/751-0488). It's called NavStart Guard and it sells for around \$130 from Nemar dealers throughout the coun-

try. It's a marvelous little instrument which removes your big battery from the line during actual ignition cranking while feeding your rig with an uninterrupted supply of internal gel-cell 12V. Your rig won't even blink during cranking — and this lets you know you're getting a smooth, uninterrupted source of 12 VDC to your equipment.



A built-in gel-cell floats your mobile rig during engine cranking, preventing a memory failure.

Inside the little box is a 12V gel-cell which charges itself from the big battery. When you flip over the key for engine cranking, the circuit cuts out your big battery and runs gel-cell 12V to your rig until the starting process is complete. It works great. And it should — it's expensive, but it is designed to protect \$3,000-plus marine navigational receivers that just can't take any starter spikes coming down the line.

So next time you start your motor and your memory dumps, wire directly to your battery for some very positive results, or in the worst cases, consider building your own or buying a fast-acting battery substitution device. □

MacSamuel

THE FINEST MORSE CODE
TUTORIAL SOFTWARE
FOR THE MACINTOSH™

MacSamuel is packed with features to make learning code a snap! Designed especially for a mouse-based user-friendly environment. Features include:

- Speeds from 5-99 WPM
- Standard or Farnsworth code
- Practice on selected character groups
- Random character and word generation
- Random QSO simulation
- True random callsign generation
- Disk storage and retrieval of any session
- Send code from your own text files

Let MacSamuel transform your computer into a real CW machine!

To order, send check or money order today for \$22.00 plus \$2.00 shipping/handling (PA residents add 6% sales tax).

AS

Avant Systems
P.O. Box 5437
Pittsburgh, PA 15206
(412) 441-5391

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 92033
Phone: (619) 747-3343



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 NiCd drain and WITHOUT RADIO MODIFICATION! FULLY GUARANTEED. \$29.95 PPD in USA. Calif. add \$2.00 Tax. BATTERY PACK CONVERSIONS Regulator Installed in your old, dead battery pack case: \$24.95 PPD (CA add \$1.70 Tax).

KENWOOD - Order Model L for TH-21/31/41AT. Model K1 for TR-2500, 3500, 2600 series. Slides on bottom of radio. Model K for TR-2400. Through battery plug.

YAESU - Order Model Y for FT-207R, Wilson. Fits in battery compartment. Model N for FT-203R, 208R, 209R, 727. Powered through 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



"Oh, were life that simple!" We hear that all the time when some sort of hypothetical situation is thrown up against reality. But as a purveyor of hypothetical situations, let me ask not your forgiveness but at least your tolerance and forbearance. We are trying; it's just that things are tough all over. Sometimes our efforts are taken out of context. Let me give you an example.

When it comes to HF propagation, we can come up with slick statements like saying that the path from here to London involves three hops or reflections off the F-layer, termed a 3F mode. But if you're a critical person, you'd ask what time of day I was talking about. And if you are one versed on antennas, you'd ask what radiation angle was involved.

Now Person #1 knows that propagation depends on the amount of daylight on a path, sometimes the E-layer cutting things off or making for complex paths, say 1E 2FG, from here to London. And Person #2 would know that antennas have lobes and my statement probably referred to the simplest mode of propagation, involving the lowest lobe of an antenna system. Smart folks!

Given their questions, I would have to face up to reality and make some qualifications. Thus, I'd have to admit the possibility that different modes, say 3F and 4F, could make a connection between here and London at a

given time of day. With that, I could begin the joys of discussing multi-path effects on propagation.

But once going down that route, I'd have to mention that great circle paths are not always the only ones involved in HF propagation. Moreover, I'd have to start talking about long-path. In that connection, I am reminded of a recent situation where I worked into Liechenstein via a crooked long-path connection, at a beam heading of 240 degrees west of north instead of 200 degrees west as geometry would suggest. That type of situation is more of a reality than theory; it must involve some sort of ionospheric tilt along the way, something that is beyond propagation programs at this time.

Having confessed to all those omissions, I'd probably be able to satisfy those who operate on the bands with CW and SSB. They could take any complete propagation forecast that I'd offer them with the MUF and signal strength in the course of a day and be able to make good use of it. But those of a digital persuasion, especially packeteers, would be short-changed, no doubt about it.

The clue to that statement goes back a couple of paragraphs when I mentioned multi-path effects. There, I talked about signals arriving at a receiver from two paths with significantly different lengths and coming from different radiation angles. What I didn't mention was the time delays involved, something crucial for digital communication.

Now the actual travel times from A to B depend on the ray paths of the wave and how much of the ionosphere was traversed by each wave in going up and down on the hops, sort of a grand summation of the distance segments along the path divided by the velocity of RF waves in the ionosphere in each of the segments. Okay, still with me?

Now with digital radio, the transmitter sends out a series of pulses; the width of each pulse depends on the

number of bits per second, the baud rate. For reliable communication under those circumstances, the group of waves that make up each RF pulse at the receiver must be well-defined and received before the next pulse arrives. Otherwise, the receiving station will falsely record a bit or be unable to tell a "1" from a "0," giving rise to either an error on RTTY, a signal repetition request on AMTOR or a retry on packet.

Of course, there are other hazards in digital radio, QRM and QRN, which cannot be predicted by theoretical considerations. Even without such problems, fading takes its toll on RTTY, the text on the monitor stopping when there's a disruption. With AMTOR, it's just a matter of another repeat or two to continue the transmission without error. But it's with HF packet that the ionosphere makes things difficult. Thus, considerations based on fading rates on a band determine the packet length that can keep the number of retries to a minimum.

But the data rate, expressed in baud, is another factor in digital communications and on HF radio; it is the multi-path effects on data pulses which are most important, indeed setting the upper limit on how fast transmissions can be made. Given that statement, a few words on multi-path effects are in order.

With the framework of an ionospheric model, one could calculate how much time it would take a signal to go from point A to point B. It would not be easy but on the other hand, not hard either — just a time-consuming affair. Just to give you a feeling of the magnitudes involved, take the case of a path from my QTH on Guemes Island to London using something like current solar conditions (flux = 175).

The path length on a great circle route is about 7,635 km and for a date like Oct. 15 and a frequency of 14 MHz, the two lowest modes open at 1500 UTC and involve 3 and 4 F-hops. Using Method 16 of the IONCAP propagation program, one finds that the time delay between transmission and arrival of a signal for the first of those two modes is about 26.7 milli-seconds, the time for the 4F mode being about 0.8 milli-second longer than the 3F mode. So there are some magnitudes, at least according to theory. Actually the time difference would not be exactly that value; it would vary to a certain extent because of the ionospheric irregularities along the paths. As I said, life is not always simple.

A "doubting Thomas" might look at those numbers and ask why they are so large. But if you just take the values, 7,635 km for the path length as well as the speed of light, 300,000 km/sec, a simple division gives about 25 msec for

MAXCOM[®]

AUTOMATIC ANTENNA MATCHER

The ultimate advanced technology —
when you need it most.

P.O. Box 502
Ft. Lauderdale, FL 33302
Call Sonny at (305) 523-6369

— THE BOTTOM LINE: "MAXCOM"WORKS —

FREE!

**ANTENNA & TOWER
MOUNT CATALOG**

+ HOT DIPPED GALVANIZED
+ IMMEDIATE UPS SHIPPING

CALL OR WRITE:

IIX EQUIPMENT LTD.
P.O. BOX 9, OAK LAWN, IL 60454
708-423-0605 • FAX: 708-423-1691

the time delay on the great circle path. But the calculated times are longer as the rays are followed through all the ionosphere, with refractions decreasing the wave speed in portions of the F-region, so the total time is greater than the simple estimate.

But the curiosity of "doubting Thomas" is vast and he has more questions: how many different modes must one consider, just two or are there more to worry about? Good question! That depends on how close the operating frequency is to the maximum useable frequency (MUF). When close to the MUF, there would be just one mode available, and multi-path effects do not exist. But then the question is, just how long would the ionosphere hold to that MUF — long enough to dispatch the traffic in hand or would the MUF increase and bring back multi-path problems or decrease, shutting off the path entirely? In order to answer that question fully, one would need to know how the MUF varies with time. IONCAP would be of help there.

By now Thomas probably would no longer be "doubting" but still have a full measure of curiosity. For example, he might ask how current practice on HF packet measure up to such theoretical notions. In that instance, packeteers use 300 baud or 3.3 msec bits on the higher HF bands. For the

path to London, at that baud rate the effects of multi-path delays would be serious, the time delay between the 3F and 4F modes being a significant fraction of the duration of a bit. But for a packet connection between here and the East Coast, say one-third the distance to London, it would be a different matter, more favorable from the multi-path standpoint but still at the mercy of fading rates, QRM and QRN.

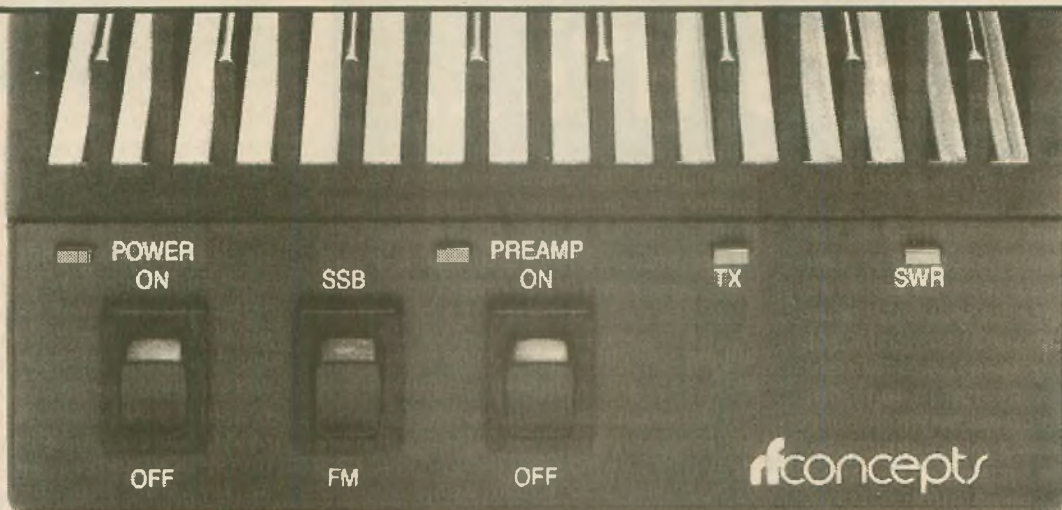
With that, Thomas nods knowingly but then asks if shorter paths are better, what about operating at lower frequencies? Is there any gain to be obtained there? In dealing with that question, I could go through some modest theoretical arguments, to the effect that the ionosphere is denser at lower frequencies than at higher ones; that would serve to increase the difference in time delays between multi-path modes. To clinch that argument, I'd point to the fact that the ionosphere is transparent to waves above the MUF, rare (in contrast to dense) enough that refraction does not take place. But that was qualitative; how about some numbers?

Rather than see Thomas' eyes get that glassy look from an overdose of theory, I'd point to some interesting experimental work just reported at the last Computer Networking Conference held on Sept. 22, 1990 in London, ON,

Canada. There, Tom Clark, W3IWI, commented that digital communication at 400 bits per sec went extremely well on the higher bands, 14 and 28 MHz, for a path from Maryland to New Zealand. But when taken to a 600 km path from Maryland to Massachusetts on a lower band like 75M, it was a disaster at the same baud rate and no data was exchanged in spite of strong signals.

The answer to the problem proved to be in multi-path effects. At 400 baud, individual signaling elements are only 1.25 msec long. By putting the signals on a scope, it was possible to see the start of a pulse, but multi-path effects set in shortly after that and the signal was "chopped up for a few msec." Indeed, because of multi-path effects, it took 5-10 msec for the signal to finally stabilize. When you consider that the next bit came along 2.5 msec after the first one, there was just no hope of making any connection that way.

Of course, the answer is lower baud rates on the lower bands, say like those used by RTTY and AMTOR systems. But Thomas knew that; why didn't they ask him? Beats me! But I think you can see now that the greater the demands we make on the ionosphere, the more we must know about it. Put another way, simple answers are not always sufficient! Okay? □



REAL POWER !

VHF & UHF AMPS

144 MHz Amps

RFC 2-23, 2W in= 30 out
 RFC 2-217, 2W in=170 out
 RFC 2-117, 10W in=170 out
 RFC 2-317, 30W in=170 out
 RFC 2-417, 45W in=170 out

220 MHz Amps

RFC 3-22, 2W in= 20 out
 RFC 3-211, 2W in=110 out
 RFC 3-112, 10W in=120 out
 RFC 3-312, 30W in=120 out

440 MHz Amps

RFC 4-32, 3W in= 20 out
 RFC 4-310, 30W in=100 out
 RFC 4-110, 10W in=100 out

riconcepts

P.O. Box 11039, Reno, Nevada 89510 · (702) 827-0133 · Division of Kantronics, Inc.
 Service: 1202 E. 23rd St., Lawrence, KS 66044 · (913) 842-4476

YL Roundup



When Mary Lou Brown, NM7N, who lives in Anacortes, Washington, went to the Soviet Union in July, 1990, she often heard people say "Zdrasvuitye!" It's a bit of tongue-twister that means "Hello!" in Russian. While women Amateur Radio operators (YLs) are in the minority in the United States, YLs are even rarer in the Sovyetskii Soyuz. She met only one during her tour. But Mary Lou was also the only YL to join a people-to-people exchange between

the Western Washington DX Club and the Soviet Union's Zilan DX Club.

Since her return to the United States, Mary Lou has been visiting radio clubs in various parts of the country and showing her slides from the Soviet Union, as well as slides from an all YL DXpedition to Fiji and Wallis Island, which she and two other YLs staged in July, 1989.

"I do a lot of traveling," she says. Mary Lou holds an Amateur Extra license and is vice director of the American Radio Relay League's northwest division, as well as Section Emergency Coordinator (SEC) for the ARRL's Western Washington section.

Mary Lou's OM, Bob Brown, NM7M, enjoys running QRP (low power), but not traveling. So Mary Lou and her dog, Fred, occasionally get into her motor home which is equipped with antennas and a deep-cycle battery to run radios. They motor across the country, and Mary Lou gives talks on Amateur Radio and encourages YLs and OMs alike to get involved and upgrade.

Her recent trip to the Soviet Union grew out of a visit that seven Soviet Amateurs made to the United States to meet members of the Western Washington DX Club in 1989. When Mary Lou learned that seven US Ama-

teurs would be invited to visit the USSR, she put her name on the list and was both surprised and pleased when she was selected.

She found some differences in the way American and Soviet Amateurs approach their radio hobbies, but she also found many similarities. "All the Russians we visited had homebrew equipment, except one who has a business and frequently travels to India and Japan. He has a Yaesu," Mary Lou says. "Computers are rare, but some have them."



Mary Lou Brown, NM7N, has recently been visiting radio clubs throughout the country, showing slides of her USSR visit.

HTs, HTs, HTs ...



FT-411 SERIES. MAXIMUM SINGLEBAND PERFORMANCE.

2-meter FT-411 and 440 MHz FT-811. 49 memories. Dual VFOs. PL encode/decode. DTMF autodialer (10 memories, 15 digits each). Auto repeater shift. Scanning features. Auto power-off. Battery saver. Extended receive. Audible command verification. Keypad and rotary-dial frequency entry. Many battery packs available, from 2.3 to 5 watts. More.

FT-411/811

YAESU

The Radio Place

2964 Freeport Blvd., Sacramento, CA 95818

(916) 441-7388



She says that many of the Soviet hams would like to have computers and get into packet radio. But they have little 2M gear and don't have repeaters. When they conduct emergency operations, they do most of it on high-frequency (HF) bands.

Devoting a room to Amateur Radio gear is very unusual in the Soviet Union because of cramped living quarters. Soviet Amateurs do not have problems putting up antennas in their neighborhoods, however. If a Soviet's rig causes television interference (TVI), that's too bad. The TV viewer will just have to put up with the TVI while the ham is on the air. For the most part, she says, Soviet radio Amateurs are considered part of the nation's elite. Also, when the Soviet government turns out some of its communication equipment, hams have first pick of the surplus gear, she says.

While in the USSR, Mary Lou and the other Western Washington DXers kept on the move. They attended a

meeting of the Central Radio Club of Moscow and saw Box 88 (the equivalent of ARRL's international mailing office for QSL cards). "Lots of packs were ready to be mailed," she reports. "However, when 'perestroika' (economic reform) came in, they (the hams) lost their discount postage rates. Now they don't have the money to mail the QSLs. They're trying to work things out." Delays in mailing QSL cards are just one small symbol of the dramatic changes taking place in the Soviet Union. The Soviets are trying to figure out how to join the rest of the world in a free-market economy.

Americans who want to interest more young people in Amateur Radio could learn some things from their Soviet counterparts, she says. A Soviet citizen must be at least 14 years old to get an Amateur Radio license, so many children are shortwave listeners first. One popular pre-hamming activity that seems well-suited to kids is a listening-obstacle course event. A running course is set up with obstacles and listening stations at various places. The kids must run to a station, stop and copy a code transmission, then run to the next station and keep repeating the process. By the time the kids are old enough to become hams, they are proficient at copying code—and in

good shape as well.

The mission of the Washington DX-ers was to help create more goodwill between Soviet and American radio Amateurs, and the Russians responded by wining and dining them well, Mary Lou reports. For example, after the US group was made members of the Zilan DX Club, they were taken to a nice restaurant to celebrate with dinner and dancing. "It was very hot, and the last thing I wanted to do was dance," she says, "but I danced."

Soviet breakfasts, she found, are quite unlike the typical American breakfasts of coffee and a roll. The Soviet Amateurs served up morning meals that included tomatoes, green pepper, cold cuts, bread, butter, meat and potatoes. Often, pancakes or crepes were served as a breakfast dessert. "It was more like dinner for breakfast. All the meals were large," she says.

While in the USSR, the American travelers were able to use Soviet equipment to communicate back home to members of the Western Washington DX Club. Not knowing what to expect, Mary Lou had taken her own Morse code keyer. "I had to hook it up with wire because of the difference in plugs," she says. But having a familiar piece of equipment did not prove too

helpful. Circuitry differences caused the keyer to malfunction. "Sometimes I got dots and sometimes I got dashes—but not consistent enough to use."

Mary Lou's OM had warned her that she probably should not try to use the homebrew Russian gear. He had thought it might be too difficult for her to operate. Mary Lou proved him wrong, however. One morning, as she prepared to keep a schedule back to the United States, one of the Soviet DXers showed her a few knobs to turn on his station, then left for work. From there, she was on her own with the unfamiliar equipment. But she was able to keep her schedule, thanks in part to some of her other ham experiences.

Since becoming licensed in July, 1981, NM7N has done such things as operate a Field Day station from atop a mountain, take part in DXpeditions and run emergency communications operations from her well-traveled RV. She is also learning to use computers in Amateur Radio, and she shares her OM's interest in Dxing with low power. "I've done some fishing around on QRP, and I've had a lot of fun contacts," she beams. "For example, I have worked to Mauritius from Washington State with just 5W."

Send suggestions to KB5LES, 1916 Parkside Dr., Denton, TX 76201.

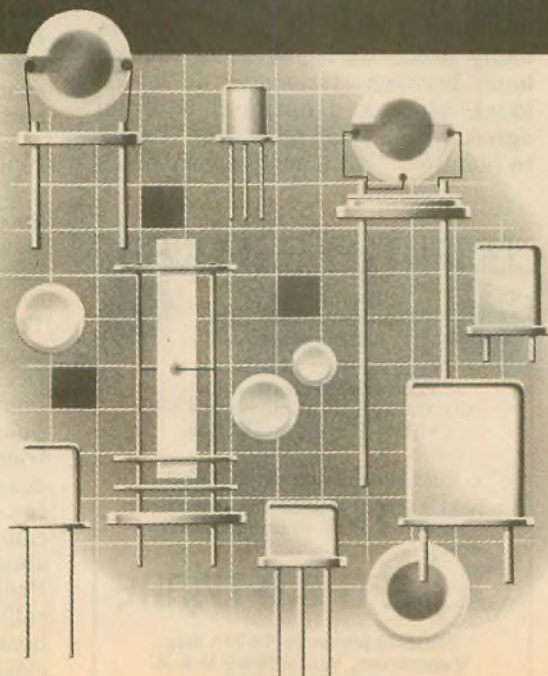
CUSTOM CRYSTALS

Crystals for many applications

For over 40 years, ICM has manufactured the finest in quartz crystals for every conceivable purpose.

A wide selection of holders are available to fit most any requirement. Our computer database contains crystal parameters for thousands of equipment types.

Need crystals for communications, telemetry, industrial, or scientific applications? Let ICM's sales department assist you to determine which type of crystal is best for you.



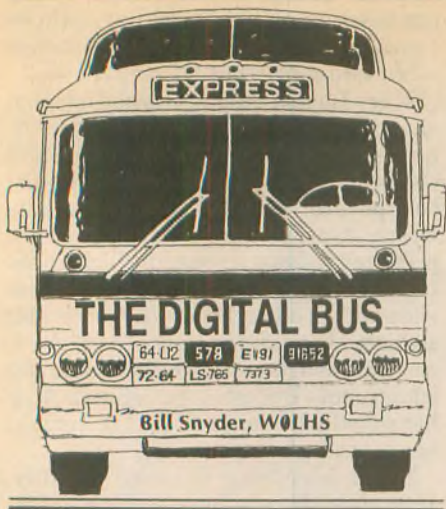
Can we solve your crystal problem?

For special purpose crystals, special holders, special sizes, call our crystal sales department. We will be pleased to provide recommended data.



International Crystal Manufacturing Co., Inc.

P.O. Box 26330, 701 W. Sheridan
Oklahoma City, OK 73126-0330
Phone (405) 236-3741, Telex 747-147
Facsimile (405) 235-1904



In the December column I wrote about SSB packet problems caused by the meandering message method of forwarding traffic. I complain quite often these days because the hundreds of messages addressed to ALL, ALLUSA etc. really clutter up my PBBS. I used to religiously read each bulletin that arrived, but now there are too many for me to check in the time I have for BBS housekeeping. So a lot of the junk mail sneaks by unread by me or anyone else, for that matter.

In the same issue I wrote about my two-way packet correspondence with Marty Mullican, G0NJJ, in jolly old England. I asked readers to try an overseas packet message to Marty, for I knew he would answer each communication received. It's a lot more fun to read a personal message from a real person rather than pages of drivel addressed to "ALL."

Well, a couple days ago I found a packet from Marty saying "they (meaning packet messages) are beginning to trickle in," and the next day another added "seven messages in so far." So I know our readers answered the call.

In his reply Marty asked the recipient to make a hardcopy of his answer, including the headers, and mail it to me. So far I have received three, two by mail and one by packet.

The first to arrive at my QTH was from Charles Martin, AB4Y, in Reynoldsburg, Ohio. Marty's answer had traveled through 17 stations to get to the WA8WNI bulletin board where Charles picked it off and mailed it to me. Unfortunately Charles didn't list the audit trail headings, so I can't really follow the time line of the message.

The next postal copy arrived from Lee Darrington, W0VF, in Omaha, Nebraska. Marty's packet message to Lee took five days; however, Lee says this is one of the fastest returns he has

received. "It usually takes 10 to 12 days," says Lee. Gee, it took Lee's letter to me that long to come the 400 miles from Omaha to Fargo by Uncle Sam's mailpersons.

The third one came via a two-day packet trip through six stations. It was from Bob Miller, KB9SU, in Wolcottville, Indiana. Unfortunately Bob didn't send the full audit trail call sign list from Marty's message so I cannot comment on the routing other than to say it went through 23 stations. Bob's comment on the whole thing is boiled down to these words: "This APLINK is doing a fine job reducing the delay time, thanks to Frank Moore, WA1URA, our local APLINK operator."

To read the full listing of the audit trail heading just add the letter "H" to the "R" (meaning "read"). In other words, type: RH and the number of the message on the BBS and the screen will show you the routing, times, etc. To print it out simply type: PR xxxxx H and it will spell out all the relay information on the paper. The xxxxx means the message number on the BBS.

It will be interesting to see how many packet messages arrive in Marty's England mailbox and how many answers return. If you wish to try the experiment, and I urge you to do so, just drop a message in your local PBBS mailbox addressed to Marty, G0NJJ @ GB7SPV.GBR.EU, then sit back and wait for the reply. Send me a packet message about your efforts.

National traffic system

The same column brought a letter from Gordon Wenz, N6GW, in San Diego. In that issue I stated that the meandering-message packet system badly needs management of routing lanes between stations at all levels: local, state and national. Gordon agrees with me and adds this: "I want to point out that a system very much

like you suggest has already been initiated in the National Traffic System operation, but much more participation by the packet fraternity is needed to fully implement the system. Why do so many operators loathe to participate in a formal systematized operation?"

"There is also the matter of routine and health and welfare third party traffic," Gordon continues in his letter. "Getting the message to the destination PBBS in a short time does not get the job done. It still has to be delivered to the addressee. 'Digital' operators are needed who are willing and able to interface with voice and CW nets to augment the geographic coverage for timely delivery to the addressee."

I agree with Gordon. One of the problems I have run into here in North Dakota is the interfacing of our packet network with the phone and CW nets in our low-density population area. There just ain't enough North Dakota hams to be able to relay every message to its destination without resorting to mail or long distance land-line calls. Nothing bugs me more than making an LD phone call with a message of love from some far off friend and then having the addressee say, "Oh how nice, but I've had five phone calls and three letters from him since he sent that message by radio." That recently happened when I struggled for three days to find the addressee at home to deliver the message. Oh well, it's only a hobby!

I have often wondered why the NTS doesn't have its own frequencies and HF-VHF gateways to carefully eliminate all the junk mail which plugs up the packet system day and night. The other day I saw this one-line message on my BBS system: "What or who was Hiram Percy Maxim?" It was addressed to ALL @ USA. Gee, I thought every ham owned an ARRL handbook and had heard of HPM.

Friendship

Ham radio generates a lot of very good friendships. One of mine is with Yasutaka Nagata, JA1JDD. We have been chatting back and forth on RTTY for nearly ten years. Taka lives in Tokyo and works for TEAC, the company that makes recording equipment. Occasionally he comes to the USA on business and when he does, he makes phone calls to a lot of his American friends. He has called me from both coasts when he has visited this country. So it was no surprise when he called from Tokyo to tell me he was about to visit the 3M Company in St. Paul, Minnesota. I figured Taka was calling from somewhere in the USA because the phone line was so clean and clear. What a surprise!

I told Taka many times that if he

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

came close to Fargo I'd drive down and have an eyeball QSO with him. So when I heard his voice from Tokyo I knew this would be the time. I told Taka to also contact our mutual friend, Bob Stanek, W0HAH, in Minneapolis and we would have a good person-to-person three-way QSO in Twin Cities.

I drove the 240 miles to Minneapolis and Bob and I went out to the airport to meet our Japanese friend. I had seen Taka's picture in the RTTY Journal and also on the cover of the Japanese CQ magazine, so I knew what he looked like. When I walked into the International terminal building in Minneapolis there was Taka walking towards me. What a grand moment! We've had many RTTY ragchews over the years, so it was exciting for both of us, I'm sure.

Then the fun began. Bob is a first-class clown/magician so when he invited us over to his shack I knew we were in for many laughs. After a brief look at the ham shack, Bob performed some of his magic for Taka and another Japanese colleague. Ham radio was out the door, and magic was in its place. What fun!


I had to return to Fargo, but Bob staged a dinner party for Taka and his guest on another evening. I'm sure the Japanese guests went back to Tokyo with a big story of fun to tell. I know I really enjoyed my hours with JA1-JDD. I hope he can come to the Minnesota area again for another visit. Ham radio makes good friends; you can bank on that!

Eavesdroppings

"I USUALLY GO TO BED ALL MISERABLE AND TAKE IT OUT ON THE XYL OR THE DOG ... I LIKE TO THINK OF MYSELF AS AN ELECTRON MECHANIC ... IT'S GREAT TO HAVE MY RTTY PRE-PROGRAMMED MESSAGES BECAUSE I SIMPLY CAN'T TYPE ... A REAL DX HOG IS A GUY WHO WORKS THE RARE ONE IN MONSTER PILE UP WHEN HE REALLY DOESN'T NEED THE CARD ... I USED TO KEEP 6,000 CHICKENS 4 EGGS ... I AM SUFFERING FROM THE INFLATION DISEASE CALLED COSTRAPHOBIA ... I'M STUCK WITH VERY SMALL CHIPS IN MY MEMORY BLANK ... QRT MEANS QUIT YOU QRMING LID ... I LIKE TO GET THE BIGGEST BANG FOR MY BUCKXXX I MEAN THE BIGGEST BAND FOR MY BUCKXXX I MEAN THE BIGGEST BANG FOR MY BUCK-- GET WHAT I MEAN? ... I DIDN'T COPY EVERYTHING THAT TIME BECAUSE YOUR SIGNAL WENT DOWN TO S-5 ... DON'T EVER TALK ABOUT YOUR-

SELF IN A NET — LEAVE THAT TO THE OTHERS AFTER YOU QRT ... I ALWAYS ROOT FOR THE UNDERDOG: ME! ... MUST QRT BECAUSE IT SNOWED LAST NIGHT AND MY SNOWBLOWER IS OUT OF GAS AND MY WIFE IS OUT OF PATIENCE ... MY SKULL MEMORY IS SO BAD I CAN'T REMEMBER WHAT I PUT IN EACH RTTY XMIT BUFFER THAT'S WHY YOU SEE SO MANY MISTAKES ... HAD A BUNCH OF AMTOR QRM THAT TIME SO PERHAPS WE SHOULD MOVE UP TO THE RTTY SUB-BAND WHERE WE BELONG ... I MISSED YOUR LAST TRANSMISSION BECAUSE I WAS TRYING TO TYPE INTO MY BUFFER AT THE SAME TIME ... THE TROUBLE WITH OLD AGE IS THAT IT EVENTUALLY GETS YOU DOWN — WAY DOWN ... I REALLY SMOKED MY POWER SUPPLY TO THE TUNE OF 275 BUCKS ... I HAVE GUESTS IN THE SHACK AND THEY DON'T BELIEVE I AM TALKING TO YOU WITH THIS C-64 COMPUTER ... MY WIFE THINKS SOFTWARE IS A TENNIS SHOE ... MY LAST TRANSMISSION WAS GARBLED BECAUSE MY THREE YEAR OLD TYPED IN THE BUFFER."

Thanks to W0HAH, WA6IEL, AH2AK, AB4Y, N6GW, W0VF, G0NJK, KB9SU, W0ML, W0PCI and W7VFR for their input to the column. My packet address is W0LHS @ W0LHS.ND.USA.NA, and postal mail will reach me at 1514 South 12th St., Fargo, ND 58103. 73 and as we say at the end of a CW contact, "DIT DIT." □



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

GORDON WEST RADIO SCHOOL

#04 21-DAY NOVICE \$22.95



- 112-page textbook
- two stereo code learning tapes
- sample 5 wpm Novice code test
- over \$50 in radio manufacturers' discount coupons.

#01 COMPLETE NOVICE . . . \$62.95

2 theory tapes, 2 textbooks, FCC Rule Book, 4 code tapes, code oscillator set, examiner test packet, and over \$50 in radio discount coupons.

#02 NOVICE CODE COURSE \$32.95

6 cassette tapes make it easy to learn the code from scratch.

#07A 2-WEEK TECH \$22.95

This Technician course includes 2 theory tapes and 1 illustrated textbook.

#05 COMPLETE GENERAL . . \$62.95

6 code tapes, 4 theory tapes, and 2 textbooks. Ideal for upgrade from Novice to General.

#06 GEN. CODE COURSE . . \$32.95

This General course includes 6 tapes for speed building from 5 to 13 wpm.

#08B COMPLETE ADVANCED \$62.95

This Advanced course includes 4 theory tapes, 1 textbook, and 6 code tapes (13 to 22 wpm).

#09 ADV. THEORY COURSE \$32.95

4 tapes and 1 illustrated textbook

#10 COMPLETE EXTRA . . . \$62.95

4 theory tapes, 1 textbook, and 6 code tapes (13 to 22 wpm).

#12 EXTRA THEORY COURSE \$32.95

4 theory tapes and 1 illustrated textbook for Extra class theory.

#11 EXTRA CODE COURSE \$32.95

6 tapes for speed building from 13 to 22 wpm for the Extra code exam.

#13 BRASS KEY & OSC. . . . \$25.95

#15 PLASTIC KEY & OSC. . . \$21.95

SINGLE CODE TAPES

\$10.95 each including shipping

- # 19 5 wpm Novice QSO tests
- # 20 5 wpm Random Code
- # 21 5-7 wpm Speed Builder
- # 22 7-10 wpm Speed Builder
- # 23 10 wpm Plateau Breaker
- # 24 10-12 wpm Speed Builder
- # 25 12-15 wpm Calls & Numbers
- # 26 13 wpm Random Code
- # 27 13 wpm Test Preparation
- # 28 13 wpm Car Code
- # 29 13-15 wpm Speed Builder
- # 30 15-17 wpm Speed Builder
- # 31 17-19 wpm Speed Builder
- # 32 20 wpm Random Code
- # 33 20 wpm Test Preparation
- # 34 20 wpm Car Code
- # 43 3-15 wpm Code Review
- # 40 12-21 wpm Code Review

Prices include shipping & handling
IL residents add 6 1/2%



RADIO AMATEUR CALLBOOK INC.

925 Sherwood Dr., Lake Bluff, IL 60044

Mon.-Fri. 8-4pm (708) 234-6600



QSO parties

Oil up your fist and get ready for the CW QSO Party on February 9 and 10. This is one of QCWA's major operating activities of the year. Don't miss it!

QCWA QSO parties are a lot of fun. They are also a great opportunity to demonstrate that high scores can be piled up on a contest without losing sight of courtesy and consideration. We have some real world class operators in QCWA, but QCWA parties are directed toward a more friendly, relaxed atmosphere with emphasis on good fellowship and good sportsmanship. Whether you are using a rusty old hand key or a computer keyboard, you will find QCWA members eager to work you. Be sure to take part in the CW party. It is a significant part of QCWA tradition.

Mark your calendar, also, for the SSB Party coming up on March 9 and 10. We will have more about that in next month's column. QSO parties are an internal activity intended for contacts between QCWA members, but we hope the high ethics demonstrated in the parties may serve to entice eligible non-members to become a part of this exceptional organization.

Convention schedule

The date for this year's QCWA convention in Canton, Ohio, has been set for September 27 and 28. Host Chapter #21 has a very efficient convention committee hard at work and plans are progressing nicely. Watch for more details. Perhaps you can work the convention into next fall's vacation schedule. And a bid from the Arizona Chapter has just been approved for hosting the 1992 convention. Details will be forthcoming very soon. It takes about two years of planning to put on a convention of this type and the Arizona Chapter is off to a good start.

The Arizona Chapter is a very active group with a number of "big name" members. The December meeting scheduled Barry Goldwater, K7UGA, as the keynote speaker; Leo Meyerson, W0GFQ, playing the piano for the "sing-along;" directors Lew McCoy, W1ICP, and Bob Rickey, NF6P,

representing the QCWA National Board of Directors; Fried Heyn, WA6WZO, and Jim Swafford, W7FF, representing the ARRL; and SOWP represented by Executive Director Paul Dane, W6WOW. With attendance like that at a meeting, what might they come up with for a national convention?

Now we need some bids for the 1993 convention. If your chapter is interested, contact QCWA membership service committee chairman El Charlton, W5MD. The committee can offer a good deal of assistance and advice. A convention takes a lot of hard work but it can be most rewarding.

Award presentations

In the December column, Herb Gleed, W6FQ, was recognized for his 22 years of outstanding distinguished service as net control for the QCWA International Net. The above right photo shows Herb receiving a QCWA Distinguished Service plaque from Director Bob Rickey, NF6P, at a QCWA/OOTC meeting.

In turn, Herb Gleed was given the honor of presenting a John Di Blasi award plaque to Moe Joffe, W6PHE. The Di Blasi award recognizes QCWA members who have, over a long period of time, made outstanding contribu-



Herb Gleed, W6FQ, receives the QCWA Distinguished Service plaque from Director Bob Rickey, NF6P.

tions in the honor and preservation of our association. The award to Moe was voted last year but this meeting was the first opportunity that had been found to make a formal presentation of the plaque.



Herb Gleed presents the John Di Blasi award to Moe Joffe, W6PHE.

Award nominations sought

Chairman of the publicity/awards committee, Bob Rickey, NF6P, is requesting the membership send in nominations for honor awards. Some of the awards haven't been given for several years and we know there are deserving people out there. See the inside front cover of the QCWA Journal for a list of those who have been honored in the past. Send nominations to NF6P by March 1 so they can be considered at the spring meeting of the board of directors. Awardees will then be honored at the convention in Canton, Ohio this fall.

Hot line report

Lead-times being what they are, it's pretty hard to provide timely information in a magazine column. There is one excellent solution to that problem though. QCWA Headquarters offers a "hotline report" which is available by subscription at a cost of \$6 per year. There is no publication schedule, but it is issued frequently and always has the very latest information on items of special interest. We think you may find it worthwhile. □

WD4BUM'S
HAM STICKS
ANTENNAS
for
H. F. MOBILE OPERATION
ONLY \$16.00 each

- Monobanders for 75 to 6 meters
- Very rugged fiberglass and stainless steel
- Telescopes for easy adjustment
- 3/8 x 24 TPI base fits most mounts
- Low profile & low wind load
- Needs no springs or guys
- Complete tuning & matching instructions included
- Approximately 7 ft. tall

Cat. #	Band	Cat. #	Band
9175	75 meters	9115	15 meters
9140	40 meters	9112	12 meters
9130	30 meters	9110	10 meters
9120	20 meters	9106	6 meters
9117	17 meters		

MANY MOUNTS AVAILABLE!

LAKEVIEW COMPANY, INC.
Route 7, Box 258
Anderson, SC 29624
(803) 226-6990
Or at Your Dealers

Add \$4.00 for shipping & handling
South Carolina residents add sales tax
Catalog available • Dealers welcome

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. Fred Springall, KB4EGH, (205) 288-5831. Meets 3rd Mon./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 Fri./monthly, 7:30 p.m.

ARIZONA

Cochise Amateur Radio Assn. Meets 1st Mon./monthly, 7:30 p.m. Located 3 mi. East of Sierra Vista and 3 mi. South of HWY 90 on Moson Rd., Sierra Vista, AZ. Net each Thur. at 7 p.m. on 146.16/76. Further info call Rich (602) 458-3928.

Scottsdale Amateur Radio Club. Meets 1st Wed./monthly, 7:30 p.m., 7375 E. 2nd St. in Scottsdale, AZ. Net is Mon., 9 p.m., 147.18 rpt.

Tucson Repeater Assoc., P.O. Box 40371, Tucson, AZ 85717-0371. 2nd Sat./monthly, 7:15 p.m., Pima Co. Sheriff Bldg., 1750 E. Benson Hwy. Net Thurs. 7:30 p.m. 146.22/82 (146.88-, 147.08-, 448.550-, & 145.15 Packet).
Western Arizona Radio Club. Meets 2nd & 4th Thurs./monthly, 7:30 p.m., First Baptist Church, 1700 Palma Rd., Bullhead City, AZ. Net Tues. 7 p.m. on 147.12 + 600. Info call Dave Adams, W6DRM, (602) 758-5171.

CALIFORNIA

Amador County Amateur Radio Club. P.O. Box 1094, Pine Grove, CA 95665. Senior Citizens Center, Jackson, CA. Meets: first Thur./monthly, 7:30 p.m. WA6WY Rptr., 146.835, 146.235. Net Tues. 7:30 p.m.

Amateur Radio Club of El Cajon, (WA6BGS). P.O. Box 50, El Cajon, CA 92022. Meets 2nd Thur./monthly, 7:30 p.m. at Buck Knives, 1900 Weld Ave., El Cajon, CA. Club Rptr. 147.675 (-); Nets Sat. & Wed. 7 p.m. on 147.570 simplex. Info (619) 698-6644.

Associated Radio Amateurs of Long Beach, W6RO. P.O. Box 7493, Long Beach, CA 90807. Meets: 1st Fri./monthly, 7:00 p.m. Signal Hill Recreation Hall, 1708 E. Hill St., Signal Hill, CA.

Butte Amateur Radio Club. Meets 1st Fri./monthly, Loma Vista School, 8:00 p.m. Marigold and East Avenue, Chico, CA. For info KE6EP or KB6COH, 893-5208.

Contra Costa Communications Club W6E2C/R. P.O. Box 661, San Pablo, CA 94806. Meets 2nd Sun. at 9:00 a.m. Hickory Post Restaurant/Lucky Lanes. For info call Don K6DPO, (415) 222-2449.

Downey Amateur Radio Club. Meets 1st Thurs./monthly, 1930 in the Cafeterium of South Middle School, 12500 S. Birchdale Ave., Downey, CA.

The Electronic Museum ARC. Meets 1st Fri./monthly, 7:30 p.m., Electronic Museum at Foothill College, Los Altos, CA 94022. Call-in 145.27/144.670.

Escondido Amateur Radio Society (E.A.R.S.). Meets 4th Mon./monthly, 7:30 p.m., North County Blind Activities Center, 157 E. Valley Pkwy, Ste. 1B, Escondido, CA 92025. Info Net Sundays, 8:00 p.m., 146.88 (-) or 743-4212.

Fresno Amateur Radio Club, Inc. P.O. Box 783, Fresno, CA 93712. Meets 2nd Fri./monthly, 8:00 p.m., Manchester School, 2307 E. Dakota, Fresno, CA. W6TO/R 146.34/94.

Fullerton Radio Club, Inc. W6ULI. 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. Tue., 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 Thur./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 Fri./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, except 3rd Mon. Call for location. 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. (Pot Luck). Veteran's Hall, Lake Isabella W6G0DZ Rptr. 224.50 down 1.6 low-level, 144.50 simplex.

Livermore Amateur Radio Klub, (LARK). Meets 3rd Sat./monthly, 9:30 a.m., City Council Chamber, 3575 Pacific Ave., Livermore, CA. Net Mon. 1900 on 147.12 +. For info: LARK, 859 Chippewa Wy., Livermore, CA 94550.

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). Sun. AM Club at Red Cross, San Rafael.

Monterey Park Amateur Radio Club (MPARC), K6GIP. P.O. Box 403, Monterey Park, CA 91754-0403. Meets 2nd Thurs./monthly, 7:30 p.m., Community Rm.—City Hall, 320 W. Newmark, Monterey Park. Nets: Tues. 7 p.m. 147.48 Simplex — 7:30 p.m. 28.385 MHz. Info: John Duce, N6EDX (818) 280-7052.

Moreno Valley Amateur Radio Assoc. P.O. Box 7642 Moreno Valley, CA 92303. Meets 4th Mon./monthly 7 p.m., Park & Rec. Bldg., 13671 Frederick Ave. Net: Tues. 8 p.m. 146.655- (PL 1A) & 224.460-. Info: Larry KA6GND (714) 656-1643.

North Hills Radio Club. P.O. Box 41635, Sacramento, CA 95841. 3rd Tue./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) 272-1409 So. Clairemont Recreation Center, 3605 Clairemont Dr., San Diego, CA. 1st Tue./monthly, 7:30 p.m.

Orange County Amateur Radio Club. Meets 3rd Fri./monthly, 7:30 p.m., Mercury Savings & Loan, 1895 Irvine Blvd. (4th becomes Irvine), Tustin, CA 92680. Net each Wed., 9 p.m., 146.55 Simplex.

Radio Amateur Mobile Society. P.O. Box 214091, Sacramento, CA 95821-10091. Meets 2nd Tue./monthly, 7:30 p.m., Carmichael Elks Lodge, 5631 Cypress Ave., Carmichael, CA. Net Saturday a.m., 224.84 at 8:30 & 146.79 at 9:00.

River City A.R.C.S. Meets: 1st Tue./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., Riverside County Office of Ed., 3958 12th St. Nets: Mon., 7:15 p.m., 222.860/224.46 and 7:30 p.m., 146.28/88. Info, call Steve Rathbone, KF6ZH, (714) 687-7793.

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. Info net every noon on Rptr. W6AK/R 146.910.

Sacramento "Old Timers" Ham Radio Brkfst. Club and Sacramento Valley Chapter #169 QCWA (Quarter Century Wireless Assn.). Meets 2nd Wed./monthly, 8 a.m., Lyon's Restaurant, 1000 Howe Ave. For info contact Paul Wolf, W6RLP (916) 331-1830.

San Gabriel Valley ARC. P.O. Box 88, Monrovia, CA 91017-0088. Meets 1st Tues./monthly, 7:30 p.m. (except Dec.) at Bowling Green Clubhouse, 405 S. Santa Anita Ave., Arcadia, CA 91006. W6QFK, Rptr. 147.165/765.

Santa Clara County Amateur Radio Assoc. (SCCARA) W6UW & W6UU. P.O. Box 6, San Jose, CA 95103-0006. (408) 249-6909. Meets: 2nd Mon./monthly, 7:30 p.m. at Agnes Developmental Center Aud., corner of Circle Dr. & Palm Dr., Santa Clara. Net all other Mon., 7:30 p.m. W6UU/R 146.385 + PL 100.0 / 442.425 + PL 107.2

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 Fri.

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 Parkway Ave., Redding, CA. Net 146.64, Wed., 8 p.m.

Sierra Foothills Amateur Radio Club. P.O. Box 3262, Auburn, CA 95604. Meets: 2nd Fri./monthly at Auburn Fire Station, 226 Sacramento St., Auburn, CA. Nets 7:30 p.m. Tue. 28.443 MHz, Thur. 145.43 MHz link with 223.86 MHz.

Simi Settlers Amateur Radio Club. P.O. Box 3035, Simi Valley, CA 93063. Meets: 2nd Thur./monthly, 7:30 p.m., at Seventh-Day Adventist Church, 1636 Sinaloa, Simi Valley. Rptr. 147.93/33.

Southern California Amateur Transmitting Society, SCATS, W6LRLU. P.O. Box 1770, Covina, CA 91722. Meets 1st Mon./monthly, Community Presbyterian Church, 540 E. Vine St., West Covina, CA. Net, Sun., 7 p.m. 147.765 -, W6QFK/R. Classes. Contact: Pat McNulty, N6GXZ (714) 622-8315.

Southern California Six Meter Club. P.O. Box 10441, Fullerton, CA 92635. USB Net Tue., 8 p.m., 50.150 and 8:30 p.m., 28.400. FM Rptr. Net Wed., 7 p.m., 52.18/98 and Thur., 8 p.m., 52.28/88. FM Smlx 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 W6EJF. 223.68 MHz.

The Trinity County ARC. P.O. Box 228, Weaverville, CA 96093. Meets 2nd Wed./monthly, at the CD Hall in Weaverville, 7:30 p.m. WA6BXN Rptr. 146.13/73.

Tri-County Amateur Radio Assoc. P.O. Box 142, Pomona, CA 91769. Meets: 2nd Mon./monthly, 7:30 p.m., 703 N. College Way, "The Faculty House," (lower level), Claremont, CA.

United Radio Amateur Club K6AA. L.A. Maritime Museum, Berth 84, Foot of 6th St. San Pedro, CA 90731. Meets 3rd Fri./monthly except Dec., 8:00 p.m. Talk-in 145.58 Simplex.

West Coast Amateur Radio Club. Tamara School, 17340 Santa Suzanne, Fountain Valley, CA. Meets 3rd Thur./monthly. 145.44/42

Western Amateur Radio Assoc. Meets 1st Tues./monthly, 7:00 p.m., Cerritos Park East, 166th St. and Carmentia Ave., Cerritos, CA. Rptr., N6ME 145.400/224.180MHz.

Westside Amateur Radio Club. Meets 3rd Thurs./monthly, 7:30 p.m., Santa Monica Red Cross, 1450 11th St., Santa Monica, CA. Info Net every Tues., 8 p.m., 146.670, -600.

West Valley Amateur Radio Assoc. 18011 Saratoga — Los Gatos Road, Los Gatos, CA 95030. Meets: 3rd Wed./monthly, 7:30 p.m. W6PIY/R. Net Tue., 8:30 p.m., 147.39 +, 223.96 -.

DELAWARE/PENNSYLVANIA

Penn-Del Amateur Radio Club. P.O. Box 1964, Boothwyn, PA 19061. Sponsor of KA3TWG/Rptr. on 224.220 serving all of S.E. Penn. and Northern Del. Info/net every Thurs. at 20:00 hrs. or call Hal Frantz (302) 798-7270.

FLORIDA

Gulf Coast ARC, Inc. P.O. Box 595, New Port Richey, FL 34656. Meets 4th Mon./monthly, 7:30 p.m., Colonial Hills Civic Ctr., 87 Peacock Dr., New Port Richey. WA4GDN Rptr. 146.67/07.

Indian River ARC, Inc. (IRARC). 597 Capri Rd., Cocoa Beach, FL 32931. Martin Andersen Senior Center, 1025 S. Florida Ave., Rockledge, FL. Meets: 1st Thur./monthly, 7:30 p.m.

Platinum Coast Amateur Radio Society. P.O. Box 1004, Melbourne, FL 32902. Meets 2nd Mon./monthly, 7:30 p.m., Brevard Co. Red Cross Hqtrs. Bldg., 1150 Hickory St., Melbourne, FL. Talk-in on 146.25/85 or 146.01/61.

South Brevard Amateur Radio Club. P.O. Box 2205, Melbourne, FL 32902. Meets 1st Tue./monthly, 7 p.m., Melbourne Public Library, 540 Fee Ave., Melbourne, FL

West Palm Beach Amateur Radio Club, Inc. WA4HW. P.O. Box 6834, Southboro Station, W. Palm Beach, FL 33405. Meets 2nd Tue./monthly, 7:30 p.m., Palm Beach Co. Emergency Op. Cntr., 3723 Belvedere Rd., W. Palm Beach, FL. Rptr.: 147.135 MHz. Info: Jeff, WB2OUK, 586-5120; Charlie, K2GNZ, 582-1164 or Henry, WA4HXZ, 655-4632.

GEORGIA

Dalton Amateur Radio Club (DARC). P.O. Box 143, Dalton, GA 30722-0143. Meets 4 Mon./monthly, 7:30 p.m., Dalton College Voc. Tech. Bldg., Dalton, GA. Info net: Sun. 9:30 p.m., 145.230 MHz; Wed. 9 p.m., 147.135 MHz.

HAWAII

Big Island Amateur Radio Club. P.O. Box 1938, Hilo, HI 96721-1938. Meets: 2nd Tue./monthly, 7:00 p.m., Helco Auditorium, 1200 Kilauea, Hilo. Talk-in on 146.76(-).

ILLINOIS

Amateur Cross Link Repeater. 10, 6, 2 mtrs., 220, 440, 900, 1.2 MHz, ATV. Meets: 1st Sat./monthly, 7:30 p.m. Info: net Sun., 8 p.m., 147.225 MHz. KD9FA Rptr./Chicago.

Bolingbrook Amateur Radio Club. Meets 3rd Mon./monthly, 7:30 p.m., Bolingbrook Pk. Dist. Rec. Ctr., Briarcliff Rd., Bolingbrook, IL. Info net Thursdays, 8 p.m., W9DAKO/R 147.33 MHz + 600 and WA9DPI/R 224.54 MHz - 1.6. Info hotline (708) 759-7005. ARRL affiliated club.

Central Illinois Radio Club, W9AML. Meets 4th Wed./monthly, 7:30 p.m. (from Sept. to May), McLean Co. Law & Justice Center, ESDA Rm., Bloomington, IL. Club Rptr. 146.94 - 600kHz.

Chicago Amateur Radio Club. Founded 1926. Meets 1st and 3rd Wed./monthly on Northside of Chicago, 7:30 p.m. Info call (708) 869-HAMS or (312) 545-3622.

DuPage Amateur Radio Club, (DARC). Meets 4th Mon./monthly, 7:30 p.m., Holy Trinity Catholic Church, 111 S. Cass Ave., Westmont, IL. Club rpters. are 145.25, CTCSS 107.2; 224.68- and 442.55 + CTCSS 114.8.

Elgin Amateur Radio Society. P.O. Box 1351, Elgin, IL 60120. Meets in EOC Rm. of Elgin Municipal Bldg. 2nd Fri./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 Tue./monthly, 7:30 p.m.

Hamfesters Radio Club, W9AA. P.O. Box 42792, Chicago, IL 60642. Meets 1st Fri./monthly, 8 p.m., Crestwood Civic Center, 139th & Kostner Ave., Crestwood, IL. Nets: Sun. 8 p.m., 28410 MHz and Mon. 9 p.m., 146.43 MHz.

Metro DX Club. Meets 3rd Fri./monthly (except Dec.), at Oak Forest Hospital, (employee quarters), 159th St. and Cicero, Oak Forest, IL, at 8 p.m. Christmas party in Dec. Net: DX/Club info, every Tues., 8 p.m., 146.46 Simplex.

Northwest ARC/W9LM. Meets: 2nd and 4th Tue./monthly, 7:00 p.m., Oehler Funeral Home downstairs community room, Lee & Perry Street, Des Plaines, IL. Net 28.375, 8:30 p.m., non-meeting Tuesdays.

Peoria Area Amateur Radio Club. Meets 2nd Fri./monthly, 7 p.m., Red Cross Bldg., corner of Knoxville & Armstrong, Peoria, IL. Info on W9UVI rpt. 146.250/146.850.

Schaumburg ARC (SARC). Meets: Schaumburg Park District Community Rec. Cntr. at Bode and Springinguth Roads, Schaumburg, Illinois. Third Thur./monthly, 7:30 p.m. Net 28.350, 8:00 p.m. Thur.

Six Meter Club of Chicago K9ONA. Bank of Lyons, Lower Level, 8601 West Ogden Ave., Lyons, IL. 2nd Fri./monthly, 7:30 p.m. Club Rpters: 146.37/97, 448.30/443.30.

Wheaton Community Radio Amateurs, (WCRA), P.O. Box QSL, Wheaton, IL 60189. Meets 7:30 p.m., 1st Fri./monthly, College of DuPage, Glen Ellyn, IL. Nets Sun. & Tue. 8:00 p.m., 145.39 MHz.

York Radio Club. Meets: 3rd Fri./monthly, 8 p.m., Elmhurst College (Science Bldg.) Elmhurst, IL. Net Mon., 8 p.m. W9PCS/147.42 simplex.

KANSAS

Pilot Knob Amateur Radio Club. Meets 1st Thurs./monthly, 7 p.m., 525 Shawnee St., Leavenworth, KS. ARES net every Thurs., 7:30 p.m. 147.60/147.00. For info call (913) 682-6904.

LOUISIANA

Baton Rouge Amateur Radio Club W5GIX. P.O. Box 4004 Baton Rouge, LA 70821. Meets last Tue./monthly, 7 p.m., Catholic High School cafeteria, 855 Heartstone Dr., Baton Rouge, LA. Net 8:30 p.m. each Sun. on 146.79.

MASSACHUSETTS

Mohawk Amateur Radio Club. Meets: 4 Wed./monthly, 7:30 p.m., American Legion Hall, 325 Pequog Ave., Athol, MA. (One block north of downtown traffic lights, past the bridge.)

MICHIGAN

Farmington Amateur Radio Club. Meets 2nd Wed./monthly, 7:30 p.m., Wheeler Street Fire Station, Farmington Hills, MI. Contact: Jim, WA8SEL, 474-8765. Talkin: 146.49MHz.

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. W8XJU Club Call.

Oak Park Amateur Radio Club. Oak Park Community Center, 14300 Oak Park Blvd. (same as 9 1/2 Mile Rd., west of Coolidge). Oak Park, MI 48237. 2nd Mon./monthly, 7:45 p.m. Talk-in on our 224.36 MHz or 146.84 MHz.

Top-Of-Michigan A.R.C. Meets 2nd Tues./monthly, 7 p.m. at the State Police Pst., Gaylord, MI. Net Tue., 9 p.m. EDT 146.82/22.

MINNESOTA

Minneapolis Radio Club. P.O. Box 25167, Minneapolis, MN 55458. Meets 3rd Fri. (exc. June, July, Aug.), Mpls. Red Cross, 11 Dell Place, Mpls, 7:30 p.m. Making waves since 1916.

MISSOURI

PHD Amateur Radio Assn. Inc. P.O. Box 11, Liberty, MO 64068. Meets last Tue./monthly, 7 p.m. Red Cross Bldg. (816) 781-7313, Volunteer Examiner Coordinator.

NEVADA

Frontier Amateur Radio Society, (FARS). Meets: 3rd Mon./monthly, 7 p.m. Denny's Restaurant across from Nevada Palace, 5318 Boulder Hwy, Las Vegas, NV. Net Mon. 7:30 p.m., 145.39 Rptr. on Black Mountain. Club info. Tom Bull, NW7S. 642-5033.

Las Vegas Radio Amateur Club (LVRAC). Meets: 2nd Tue./monthly at 7 p.m., Nevada Power Bldg. Wergent Rm. 6226 W. Sahara Ave. (Near Jones). Net Tue. 8:00 p.m. on 146.94 MHz. Info: Call George at 459-2586.

Sierra Intermountain Emergency Radio Assoc. (SIERA). P.O. Box 2348, Minden, NV 89423. (702) 882-0451 Meets: 2nd Tue./monthly, 7:30 p.m., Douglas County Lib., Minden, NV. Talk-in: 147.330.

NEW HAMPSHIRE

Great Bay Radio Assn., WB1CAG. P.O. Box 911, Dover NH 03820. (603) 742-0130/742-1374. 2nd Sun./monthly, 7:00 p.m. Dover City Hall. Talk-in 147.57.

NEW JERSEY

Bayonne Emergency Mgt. ARC (BEMARC), 16th St. & Ave. A Firehouse, Bayonne, NJ 07002. Meets 2nd Tue./monthly, 7:30 p.m. Tri-Band linked repeaters: 145-430/224.280/445.575 MHz.

Delaware Valley Radio Assoc. (DVRA). Our Lady of Good Counsel Church. 137 W. Upper Ferry Rd., West Trenton, NJ 08628. Meets: 2nd Tues, Wed./monthly, 8 p.m.

Garden State Amateur Radio Assoc., W2GSA. Meets 1st & 3rd Wed./monthly, 8 p.m. at Bicentennial Hall, Fair Haven, NJ. All are welcome.

Jersey Shore Chavörim. Meets 1st Sun./monthly, 9:30 a.m., JCC, 100 Grant Ave., Deal, NJ, Sept. thru June. Net 1st Thurs./monthly, 9 p.m. local on 145.110, KC2Q. For info call (201) 222-3009.

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 rptr. Club call K2AA.

NEW YORK

Communications Club of New Rochelle, NY. Harrison Street Firehouse. Richard Sandell, WK6R, (914) 834-2322. Meets: 1st Mon./monthly, 8 p.m.

Genesee Radio Amateurs (GRAM). N.Y.S. Civil Defense Center, State St., Batavia, NY 14020. Meets: 3rd Fri./monthly, 7:30 p.m. 147.285 + W2RCX.

Hall of Science Amateur Radio Club. P.O. Box 131, Jamaica, NY 11415. HOSARC, 2nd Tue./monthly, Hall of Science Bldg., 47-01 111 St., Flushing Meadow Park at 7:30 p.m. The tristesates' only 3-band linked rptr. system 144.300 S/223.600 - 1445.225 -.

Lancaster Amateur Radio Club (LARC). Meets 1st Tues./monthly, 7:30 p.m., Aurora Middle School, 147 Aurora St., Lancaster, NY. Net: W2UJR every Monday, 7:30 p.m. 146.55. Contact Luke Caliano, N2GDU, (716) 683-8880.

Lockport Amateur Radio Assoc. (LARA) Meets last Sat./monthly, 7:30 p.m., Mt. Olive Church, Chestnut Ridge Rd., Lockport, NY. Info net Sun. 9 p.m. on W2RUI/R (146.82-). Contact Jim, KB2CUX, (716) 433-8564.

Orleans County Amateur Radio Club (WA2DQL). Meets: Office of Disaster Preparedness (CD), West County House Rd., Albion, NY 14411, 4th Wed./monthly, 7:30 p.m., 145.270 - WA2DQL.

PROS, Pioneer Radio Operators Society. Meets: 1st Wed./monthly (except July/Aug.) 7 p.m., Masonic Temple, Rt. 78, Java Village, NY. Other Wed., 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, FAX, (516) 674-9600. Non-profit org. using Ham Radio to enhance the education of youngsters, nationwide. Join us - "Classroom Net", 7.238 MHz, 7 a.m. E.S.T. PSE QSL!

Suffolk County Radio Club. 3rd Tue./monthly, 8 p.m. Bohemia Rec. Ctr., Ruzicka Wy. W2DQ/R 144.610/145.210, 223.080/224.680 rptr. Info call Jim Heacock (516) 473-7529.

Westchester Amateur Radio Assoc. (WARA). Scarsdale Village Hall, Scarsdale, New York. Meets: 1st Wed./monthly, 8:00 p.m. For info call Dan Grabel, N2FLR, Pres. (914) 723-8625.

Westchester Emergency Communications Assn. (WECA) 147.66/147.06, 222.80/224.40, 447.475/442.475. Meets: 2nd Mon./monthly, 7:30 p.m., Westchester County Ctr., White Plains, NY. Info: P.O. Box 831, N. Tarrytown, NY 10591. (914) 631-7424.

NORTH CAROLINA

North Carolina Chapter TSRAC. Meets: Mondays, 28.350 on the air, 8:30 p.m. local time. "The Alligators" - all mouth, no ears.

OHIO

Amateur Radio Fellowship (ARF). Greg Ash, KA8TOA, Sec. 423 Pioneer Ave., Kent, OH 44240. Meets: 1st Sat./monthly at Kent Wally Waffle. KA8YKT rptr. 147.075.

Ashtabula County ARC. Ken Stenback, A18S (964-7316). County Justice Center, Jefferson, OH. 3rd Tue./monthly, 7:30 p.m. County Rptr., 146.715. **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.

Lancaster & Fairfield County A.R.C. Meets 1st Thur./monthly, 7:30 p.m., City Hall, Basement Club Rm., Broad & Main. Info Net every Mon., 8 p.m. KBQIK/R 147.63/03 Rptr.

North Coast A.R.C. P.O. Box 30529, Cleveland, OH 44130. Meets 2nd Thurs./monthly, 7:30 p.m. at North Olmsted Town Hall on Dover Center Rd. between Lorain & Butternut Ridge Rds. 10 miles west of downtown Cleveland.

Silvercreek Amateur Radio Assn. (SARA) Meets 3rd Thur./monthly, 7:30 p.m., Doylestown Village Hall, Doylestown OH. WD8PNF/R 147.99/39 rptr. For info call 216-925-2363.

Toledo Mobile Radio Association. P.O. Box 273, Toledo, OH 43697. Meets 2nd Wed./monthly, 7:30 p.m., Luke's Barn, Lucas County Rec. Ctr., 2901 Key St., Maumee, OH. W8HHF 147.87/27 Rptr. Rptr. Info/swap & shop, Sundays, wkly - 8:30 p.m.

Triple States Radio Amateur Club. Meets Wed./weekly on 28.480 at 8:30 p.m.; 7259 at 9 p.m. Rpters. 146.31/91 and 146.115/715. P.O. Box 240, Rd. #1, Adena, OH 43901. (614) 546-3930.

Warren Amateur Radio Assn. Meets 1st & 3rd Tue./monthly, 7:30 p.m. at Kent State Univ. Trumbull campus, Rt. 45 in Champion, OH. Club rptr. W8VTD 146.97MHz.

OREGON

Keno Amateur Radio Club. P.O. Box 678, Keno, OR 97627. Meets 3rd Thur./monthly, 7 p.m., Keno Fire Station. Rptr. 147.32 + W7UFM. Info: Tom Hamilton, WD6EAW, (503) 883-2736.

PENNSYLVANIA

Butler County Amateur Radio Club. P.O. Box 1787, Butler, PA 16003-1787. Meets 1st Tue./monthly, 7:30 p.m. at Red Cross Bldg., 312 Mercer St., Butler PA 16001. Call-in: W3UDX 147.96/36. Net 10:10 p.m. nightly.

RF Hill Amateur Radio Club. Meets last Thurs./monthly, 7:30 p.m. at First Federal Savings & Loan of Perkasio, 600 Market St., Perkasio, PA. Nets: Wed. & Sun., 8 p.m. on 144.71 - 147.310.

TENNESSEE

Nashville Amateur Radio Club. Meets 3rd Thurs./monthly at Lock 2 Metro Park off Pennington Bend Rd. Grilled hamburgers at 6 p.m., mtg. at 7 p.m. Call Jerry, KK4TV, at 754-2326 for info.

TEXAS

Beaumont Amateur Radio Club. Meets last Tues. of each month at the GSU Aud., South and Oxford Streets, Beaumont, TX, 7:30 p.m. Talk-in on 146.16/76 or 146.10/70. Join the fun!

Sun City Amateur Radio Club. Meets 1st and 3rd Fri./monthly, 7:30 p.m., 3709 Wickham Ave., El Paso, TX. K5WPH 147.240/147.840 Rptr. with remote operation on 220, 440, 6M, and 10M.

VIRGINIA

Southern Peninsula Amateur Radio Klub (SPARK). Meets: 1st and 3rd Tue., Salvation Army Community Bldg., Hampton, VA. Rpters: 146.13/73 & 449.55(-5) T. VE Exam Info: (804) 898-8031, WARTZ.

WEST VIRGINIA

Jackson County Amateur Radio Club. Robert D. Morris, WA8CTO, Sec.-Treas. 308 Edgewood Circle, Ripley, WV 25271. Meets 1st Thur./monthly, 7:30 p.m., United National Bank of Ripley. Net Mon. 9 p.m. on 146.67/07 WD8JUN/R.

Tri-state Amateur Radio Assn. Meets: 3rd Tue./monthly, 7 p.m., Green Valley Vol. Fire Dept., Norwood Rd. & 16th Street Rd., Huntington, WV. ARES net Thur. 9 p.m. on 146.76(-) W8VA/R. Info KB8EHJ (304) 824-5958.

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 rptr.

WYOMING

University ARC. 146.01/61 Meets: 1st Tue., 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 Wed.



By the time you read this, thoughts of the holiday season and the cheeriness of Christmas will have long left your mind. The doldrums of mid-winter will have gotten those in the northern climes tired of being cooped up. And those in the South will be letting the rest of the country know about their 80 degree weather. What does all this have to do with Handi-Hams and radio? Well frankly, not much, except that I'm writing this in early December and everyone is wrapped up in the business of the holiday season.

And so, like everyone else does during this joyous time of year, I've reflected a bit on the wishes of the Handi-Ham system which have been met and fulfilled in such wondrous ways during 1990. One of the biggest needs which was met was the creation of a Handi-Ham net. Oh, there has always been a net of sorts. For years the Pico Net All Day Watch has happened on 3925. It started as a group which took traffic and helped give road conditions in winter. Today it is also a meeting place for people all over Minnesota. Unbeknown to most of the daily check-ins, almost all of the net con-

trols are disabled in one way or another. The cheery voices of the net controls help pass time and have brought friendships to many local folks in this general area.

Besides the Pico net there have been other attempts at having a Handi-Ham net. In fact, one of the few memories I have of Handi-Ham founder Ned Carman, W0ZSW, is of his running the Saturday afternoon net. Each week there was a topic of interest ranging from "Who did you talk with on the air this week?" to "Do you have a dog?" Everyone who checked into the net had something which they were expected to contribute, whether they were working or living in nursing homes, vertical or horizontal in their physical polarization. When Ned died and the Handi-Ham system grew larger than the Minnesota area, a net was established on 40M on Saturday afternoons. KB0AE, Dick Eichhorn, was the net control and faithful check-ins were on the air for several years.

But as the Handi-Ham System became national in scope, the 40M net was not enough. Weak attempts were made to organize other nets but were not carried out. Last May, however, with the favorable propagation on 10M and Novices using SSB, a net on 10M was started. Since that time some wonderful things have happened.

John, N8IUM, who is literally stranded in his own home because of universal allergy (he's allergic to most chemicals and synthetic materials) met Paula, a Handi-Ham participant in Florida with the same problem; they have been able to provide support for one another in dealing with the isolation brought about by their disabilities.

John, N9AQJ, has provided support and encouragement to other quadriplegics who have checked into the net and had questions about the use of mouthsticks to operate computers and radios.

Father George, W0GH, has provided warmth and hospitality to those new Novices checking into the net for the first time, and he has cheered those who have been in need of a good word. Though horizontally polarized himself, Father George has provided encouragement for everyone by relating that just because you are physically limited it doesn't mean your spirit has to be dulled.

Lois, WB6PLR, has learned from other blind hams about what equipment has worked best for them.

Keith, KC4BVN, learned that he need not be afraid of getting on the air and that although MS had slurred his speech, he could be understood.

John, KB8KEN, got to let everyone know he had upgraded after much hard work and received congratulations from Handi-Hams who remembered the excitement of that first contact.

So if you would like to join a fun group of folks, check in to the net. You don't have to be a Handi-Ham member. The nets are there to help folks meet one another, answer questions and have a good time. Handi-Ham nets meet at the following times and frequencies. Times are given in central standard time.

10M net: Monday mornings 10-10:30 (sometimes longer) on 28.390.

15M net: Monday mornings 10:30-11 on 21.442.

40M net: Monday afternoons 3-3:30 on 7268.

80M net: Thursday evenings 7:30-9 on 3712. □

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 ltrs.

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.

Scrambled Eggs for bill of cap, in WHITE or GOLD. Add \$1.50 per cap.

EMBROIDERY WAREHOUSE
P.O. BOX 1476
SEVERNA PARK, MD 21146

World Ham Net Directory

Lists over 600 special interest ham nets. Tune in or work stamp collectors, airline people, missionaries, DXers, rag chewers, dozens more.

Listed by interest, frequency, meeting time.

\$9.95 + \$2 s/h (\$3 foreign)

The Basic Guide to VHF/UHF Ham Radio

Propagation, equipment, antennas, repeaters, contesting, awards & more.

\$6.95 + \$2 s/h (\$3 foreign)

The Scanner Listener's Handbook How to Hear More on Your Scanner Radio

Explore 25 - 2000 MHz! Band allocations and users, scanners, antennas, accessories, listening laws, equipment, information sources, more.

\$14.95 + \$2 s/h (\$3 foreign)

Order now from your radio book dealer or



Tlare Publications
PO Box 493W
Lake Geneva, WI 53147

catalog \$1,
free with order
Visa/MasterCard



**Search
And
Rescue**

Communications

Jerry Wellman, WB7ULH
P.O. Box 11445
Salt Lake City, UT 84147

PACKET! The newest dance in town is the Packet Hop. Don't stand around the dance floor waiting to be asked to join in, put your little foot forward and connect.

A friend convinced me to get a TNC some years ago. It was OK for a while, watching all the packets and sending some connects back and forth. What fun seeing how many nodes I could connect through and how far I could go. But I never did many long distance QSOs. After a while, it just sat. Once in a while someone would connect or I'd find a bulletin board to scan.

Packet racket

I'd read all those stories of how valuable packet could be in the Amateur Radio's public service role. It sounded fine, but I gave in to the NIM-BY syndrome ("Not In My Back Yard"). You folks use it, but not me. Last fall the communications coordinator, KA7RZR, for the Wasatch Front 100-Mile Endurance Run thought packet would be neat to try.

Well, a few of us included packet with our Amateur Radio gear and gave the "mode" a try. WOW! So, I was wrong. Packet is OK — more than OK, it's top on my list of ways to send large amounts of local traffic via Amateur Radio. Please don't take my word for it. For you emergency services team leaders, borrow a TNC and try it out.

Next time you have an emergency drill, incorporate packet and see how quick and easy it is. What a neat mode for passing names, numbers, survivor lists, addresses, routine status reports, etc. With a little planning and cooperation from a local BBS, you could land your messages on a bulletin board and have your exercise participants print them out for the various agencies you're working with.

Packet is another goodie in your bag of ways to serve. It doesn't replace voice or AMTOR or RTTY, but it has unique qualities that enhance our ability

to put Amateur Radio to use in the public service arena.

Some months ago I put a bulletin board (WB7ULH.#SLC.UT.USA) up, having my doubts that the existing network can efficiently handle large volumes of nationwide traffic. I'm still forming an opinion on this, however. What I see is so much stuff on 145.01 MHz and our UHF backbone, that the throughput percentage is very low because of all the retries and rejects. (Send me your opinions on this via packet, just don't make it ALLUSA.)

Making decisions

"Our job [as Amateur volunteers] is to relay messages. We're the command and control pipeline to the field. Our skills are technical, not managerial. We just relay messages!"

You've heard it said, possibly read it in some training materials and stuffed it into your brain. Maybe you've stood up in the crowd and said it. Think about it — do you really believe it?

What are you expecting in an emergency — the fire chief to tell you how to place your network or who to send to what location? More likely, the emergency coordinator is going to say "We need communications here, here and there." How you, as Amateur Radio team leaders or operator, accomplish the task is up to you. It can be done effi-

BATTERIES

Replacements (All New — Made in the U.S.A.)

CAMCORDER (batteries)	COMMUNICATIONS (complete battery packs and inserts)	SPECIALS!!!	CORDLESS PHONE (batteries)
JVC GR-C series \$35.95	ICOM PB-2 (500mah @ 7.2V) \$33.00 PB-5 (500mah @ 7.2V) \$44.28 *7(S) (1200mah @ 13.2V) \$63.00 *8(S) (1200mah @ 9.6V) \$59.00 *base charge only, one inch longer	ICOM Battery types 7(S) or 8(S) plus ICOM equivalent BC-35 charger for \$119.00	ATT 4110, 4310, 5210, 5310 \$ 9.00 Freedom 400 \$ 8.00 Nomad 200, 250, 400 \$ 8.00
PANASONIC PVBP80 (12V @ 2.3amps) \$35.95 LCS2012-VBNC \$35.95 LCS2012-BVBN \$36.95	KENWOOD KNB-1 (500mah @ 10.8V) \$39.00 KNB-4 (2200mah @ 7.2V) \$65.00 PB-1 (1100mah @ 12V) \$64.00		COBRA CP-100, 200, 300, 400, series \$ 8.00 CP-464S to CP-475S series \$ 9.00
RCA/HITACHI Full size VHS \$39.95 VHS-C \$39.95	YAESU FNB-2 (500mah @ 11V) \$20.00 **FNB-10 (600mah @ 7.2V) \$30.00 **FNB-10(S) (1000mah @ 7.2V) \$45.95 FNB-12 (500mah @ 12V) \$44.00 **FNB-12(S) (600mah @ 12V) \$49.00 **same size case as FNB-12	PANASONIC KX-T3805, PQP-25F301A \$11.00 KX-series most models \$ 8.00	
SONY NP22 \$32.95 NP55 \$32.95		SONY SSP-80 \$ 9.00	
		UNIDEN EX-series most models \$ 8.00 XE-series \$ 9.00	

MasterCard and Visa cards accepted. NYS residents add 8 1/4% sales tax. Add \$3.50 for postage/handling.



Prices subject to change without notice.

DEALERS WANTED (QUANTITY DISCOUNTS)

BATTERY-TECH INC.

28-25 215th PLACE, BAYSIDE, NEW YORK 11360

(800) 442-4275

IN NEW YORK (718) 631-4275

FAX: (718) 461-1978

TELEX: 51060 16795



- If you don't see it ask for it
- Custom battery packs
- High capacity packs
- Nickel Cadmium cells
- Alkaline
- Lithium
- Gel Cells (Lead Acid)

ciently or with a great deal of disruption and confusion.

One area I see lacking in our sea of technical knowledge and state-of-the-art equipment is an understanding of decision making and management. To place your communicators effectively, you need a basic understanding of the emergency services folks you serve. This takes a little work. How does the local system work? How will you fit Amateur Radio into the system? This is a big task and a frustrating one. You learn how to run a search mission not with the intent of running the mission, but to better understand how communications works. The best search pilots, communications officers, briefing/debriefing chiefs and SAR team members are those who know how to run a mission.

Get off your mic button! It took some work to get your license, so use that brain and get involved with emergency services (Mountain Rescue, Rescue Dogs, Civil Air Patrol, Coast Guard Auxiliary, ARES, etc.). All of these groups need talented people, especially skilled Amateur Radio operators.

Planning strategy

When the emergency (or exercise) happens, you'll need to make some decisions. You could panic, but that's not a good decision to make. Break the emergency picture into two views: situation and strategy.

An ideal method is to have two identical maps (such as a county street map) with clear plastic overlays. I've seen these maps mounted on plywood and hinged for easy use, transport and storage. On one map you plot the *situation*, be it search, power outage, flood, earthquake or bike race. This is the map for your facts. It's your overview of what your communications must support. If the disaster coordinator says "cover these hospitals" you mark them on your situation map. When the floods cut off roads, you enter it on the map.

A quick look gives you an idea of where you must place your resources as well as a clue as to distance, obstacles to avoid and routes to use. With dry erase markers or wax pencils you can color-code the needs. When a sta-

tion is manned it is marked in blue. Each network could have a different color (a quick look would tell you that hospital B is on the 146.88 MHz repeater while hospitals C and D are simplex on 147.54 MHz). This is your situational map.

The *strategy* map is your scratch paper. While the situation map grows and changes with "emergency facts" your strategy map shows your communications resources and gives you the ability to play "what if."

"What if we send N7OAD to hospital G and N7MLR to Red Cross station 4? Let's see, that's 10 miles for one and seven miles for the other. Wait, erase that, KB7HSY just checked in five miles closer to the Red Cross. But the road is flooded at State and Main. What if we get NA7G on the air, because he's closer to the airport and can use a back road?"

See what I mean? With a couple of clear plastic overlays, your strategy map can be very handy. Some of your plastic overlays could be set up in advance. One could have hospitals and medical providers. Another could show airports and major highways. One overlay for your strategy map could show all active Amateur Radio operators in the county. Another, in a dif-

ferent color, could show all packet stations.

Oh golly, you might have to do some more preparation? Hey, get professional, OK? (Or make it a Saturday team project!) What an impact — you show up at the emergency center with a couple maps, one showing your Amateur Radio (or communications) resources. Now you're helping out and making, egad that awful word, *decisions*. You've got the big picture — contributing by making good decisions quickly. No time wasted trying to figure out who has packet or where they live when they check in.

It's winter. Turn off the TV and build a couple of maps. You've been to a couple of emergency exercises and participated in the bike marathon, so volunteer now to be net control for the next event. Get your situation map and your strategy map ready. You'll turn some heads when you show up prepared and looking professional. If you get stuck on what maps to use, or need specific suggestions, drop me a packet or a note. But DO IT!

Another one of Wellman's semi-famous, mostly ignored, laws of search and rescue coordination: Volunteers will be many, but volunteer *professionals* will be scarce. □

New AOR Receiver

2016 Channels.
1 MHz to 1500 MHz



AR2500

Total Price, Freight Prepaid (Express Shipping Optional)

\$499

- Continuous coverage
- AM, FM, wide band FM, & BFO for SSB, CW
- 64 Scan Banks
- 16 Search Banks
- RS232 port built in.
- 25 Day Satisfaction Guarantee. Full refund if not Satisfied.
- Includes AC/DC power cord, Antenna, and Mounting Bracket.
- Size: 2 1/4"H x 5 5/8"W x 6 1/2"D Wt. 1lb.

ACE
COMMUNICATIONS

10707 E. 106th St. Fishers, IN 46038

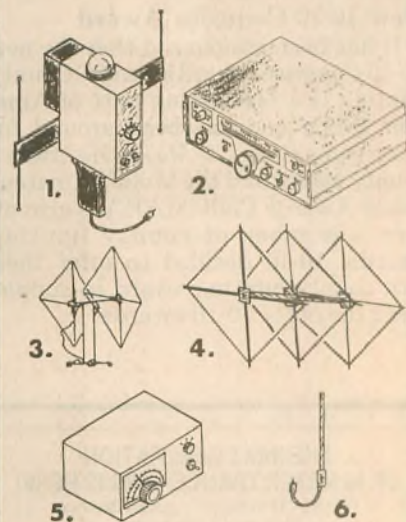
Toll Free 800-445-7717

Visa and MasterCard

(COD slightly higher)

In Indiana 317-849-2570 Collect FAX (317)849-8794

RF PRODUCTS



- | | |
|---------------------------|----------|
| 1. VHF DIRECTION FINDERS | \$129.95 |
| 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 EXT'N DR | \$79.95 |
| 6. 2MTR PORTABLE J ANT. | \$29.95 |

CALL/WRITE FOR DATA - SHIPPING AND CA TAX EXTRA

RADIO ENGINEERS

3941 Mt. Brundage Ave. Dept. WR
San Diego, CA 92111
619-565-1319

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) 352-4465 10:50 EST

*LABOR ONLY - PARTS & SHIPPING ADDITIONAL

R
O
T
O
R

P
A
R
T
S

10-10 INTERNATIONAL News

Chuck Imsande, W6YLJ
10-10 19636

A new era for 10-10

As we begin 1991, a new era also begins in 10-10. We start the year with a set of officers and board of directors that has been selected by the entire membership for the first time in the history of 10-10. A group of 10 directors will aid and assist the officers in guiding 10-10 to new heights in the Amateur community. Each director will have specific committee responsibilities. Each committee will be headed by a chair person and assisted by a co-chair person. Committees will be: operations, membership, communications, planning and finance. President Norm Lefcourt, W6IRT, is establishing committee organization and assignments. With responsibility for the above functions assigned to elected officials, the future and growth of 10-10 is assured. We look forward to this "new era" in 10-10 with firm guidance from our new officers and directors.

New 10-10 Counties Award

It has been announced that the new 10-10 Counties Award is ready. County hunting is a fascinating part of Amateur Radio and has been around for quite some time. *CQ Magazine* offers a county award and the Mobile Amateur Radio Awards Club (MARAC) also offers a number of county hunting awards. 10-10 decided to offer their own county hunting award to supplement the other 10-10 awards.

Any contact made on 10M with the exchange of 10-10 numbers and the county from which each station is transmitting counts for a county worked. QSL card confirmation for the contact is not required for the 10-10 Counties Award. However, a QSL card that confirms the contact, even if the county did not exchange during the QSO, is considered a valid contact and the county listed on the QSL card can count for the 10-10 Counties Award.

The 10-10 Counties Award is based on the honor system, just as the 10-10 Bars Award, wherein QSL confirmation of the contact is not required. The *CQ Magazine* County Hunter Award does require QSL confirmation of each contact in order to count. If you would be interested in this *CQ* award, it would be desirable for you to have your counties confirmed by QSL card at the time of working them.

In order for you to maintain a record of the counties you work, 10-10 is making available a 10-10 county hunter record book. This spiral bound 8½ x 11 inch book lists all of the 3076 counties in each state alphabetically, first by state and then by the county within the state. Space is provided to enter the Call of the station worked, the 10-10

number, the date and the award. Also enclosed are the rules for 10-10 county hunting and an application form for submitting your counties to the award manager.

The basic certificate is issued for submitting your first 100 counties. Each 100 counties worked after the first 100 may also be submitted. A colored seal will be issued for the following levels of achievement: a red seal for 500 counties; blue seal for 1000 counties; yellow seal for 1500 counties; green seal for 2000 counties; silver seal for 2500 counties; and a gold seal for 3000 counties. A Plaque will be awarded for working all 3076 counties.

The best way to begin your 10-10 county hunting is to go through all of your QSL cards and list all of the counties you have made contact with so far. Remember the 10-10 number and the county must be listed on the card. The 10-10 Counties Award manager has the new 10-10 county hunter record book. The cost is \$5 US postpaid and \$7 US airmail to DX members. To send for your record book, write to: Alice Jenkins, NR4R, 1 Mitchel Lane, Rossville, GA 30741.

Alice has volunteered to be our new 10-10 Counties Award manager. She

AZIMUTH WEATHER STAR

Reads Wind Speed (MPH/KPH) • Hi Gusts • Wind Direction • Rainfall Temperature (Present-Hi-Low) • Wind Chill • Scans All!



ACT NOW! SEND TODAY!

A Power-Packed Micro Weather Computer for Your Station... by DIGITAR

THOUSANDS IN SERVICE WORLD WIDE!

Protect your antenna & home. Our WX computer is loaded All the facts at your fingertip. Model TWR3—HANDY & COMPACT 2 1/2" x 2 1/2" x 1 1/2" • LARGE, EASY TO READ LCD READOUT Shows Wind Direction (2/10 deg) • Wind Speed • Records Hi Gusts • Outside Temp (F/C) • Hi/Lo Temp Record • Wind Chill • Time/Date • Scans All! Operates on DC/AC (Nicads & AC Adaptor Optional) • Tracks Rainfall (Daily/Annual) w/ Self-Dumping Rain Collector (Optional).

SYSTEM COMES COMPLETE WITH WeatherStar Computer (TWR3), Anemometer & Wind Vane, 40 ft. cable & connectors, Outside Temp Sensor (25') & Mounting Hardware. Just \$189.96

OPTIONS INCLUDE—Stainless **Desk Stand (DSK22)** \$9.95, Recharge **NiCad Pack (BP3)** \$7.95, **Extension Cable (40 Ft)** (EC40) \$14.95, **AG Power Adaptor (PS12)** \$9.95 • Shipping/Hdg Add \$7.50 TWR3 & \$1.95 per Option. Foreign orders—please ask for shipping costs.

THE NEW AZIMUTH AWARDS QSL LIBRARY

New Handsome Custom Albums

To Collect, Protect & Organize Your Hard-Earned QSL Cards... Plus Special Albums for DXCC, WAS/WAC, & WAZ Radio Awards

Organize your QSL cards by award! Easy browsing. Great protection. Albums of tough, dark blue vinyl with 20 crystal-clear pocket pages. Pages hold 6, 4"x6" cards. Add extra pages—250+ cards/album. Specify **DXCC • WAZ • WAS/WAC • Standard QSL Album**. Each just \$19.95 plus \$2.50 S&H Extra 20 **Page Packs (EP20)** just \$12.95 (\$2.50 S&H). (Foreign S&H—PPost 2X S&H. AirPP 6.5 S&H)

BUY 2 ALBUMS & GET 20 PAGES FREE!
(SAVE \$12.95)




THE NEXT GENERATION OF 10 METER TRANCEIVERS IS HERE!

Features—10 Memories—Cap/Mars Coverage (Upon proof of authorization)

Selectable TX Power—PA Function—Programmable Repeater Offset and an Honest to Goodness CW Keying Jack

M.S.R. Price \$449.00. Amateur Net Price \$289.95

ASK FOR IT BY NAME—THE RCI-2950 BY



RANGER Communications, Inc.

VISA MasterCard

A X M Incorporated
Serving the radio amateur who needs more than an amateur radio

11791 Loara Street, Suite B
Garden Grove, California 92640
Tel: (714) 638-8807 FAX: (714) 638-9556

Price Breakthrough

\$99.95

Just Was \$119.95 Plus S&H

AZIMUTH World RadioSphere

Model ARS-1

A Crystal Clear Acrylic World Globe With All Zones & Radio Prefixes Shown By Country!

Own the world of ham radio! Superb, 12" hand-blown clear acrylic world globe shows—DX radio prefixes (325+), 40 zones, lat & long, Intl Date Line, cities, countries & more. Beautiful—Gray land, clear oceans, red radio info & black nomenclature. Floats above your desk on stand. Mark your radio path around the world & wipe clean (pencil incl). Graphics sealed inside. Incredible American quality. A great gift!

World RadioSphere (ARS1) Just \$99.95 (\$6.95 S&H). SAVE Order 2— Just \$189.90 (\$13.90 S&H)

Credit Card Orders Call Today Toll Free Nationwide 1-800-882-7388
(9AM to 6PM PST) FAX 707-573-1482. Other Info 707-577-8007 Satisfaction Guaranteed! 14-Days or Your Money-Back! Not Delighted: Allow 2 to 6 Weeks Delivery • **ACT NOW! CALL or SEND TODAY!**

Azimuth Communications Corp.
3612 Alta Vista, Santa Rosa 95409 USA
© MCMLXXX Foreign orders quoted.

Azimuth Products Available at Henry Radio, AES & All Ham Radio Outlets!

SAVE \$20

VISA MasterCard

and her OM Paul, W4UIQ, are active members of the Chattanooga Choo Choo Chapter. Alice is the chapter head and Paul is the certificate manager. They are familiar with county hunting, having over 500 counties confirmed for the CQ Award.

Remember, there are 3076 counties in the 50 United States and not all have Amateurs. Therefore, many will have to be worked via a mobile station.

The 10-10 plaque for working all 3076 counties on 10M will not be easy to obtain. Here is a challenge for you paper chasers. Good luck, and have fun county hunting on 10M!

Is Andy the youngest?

Andy Robinson, KA3WDW, 10-10 #56827, is nine years old. He received his Novice license in April, 1990. He is in fourth grade at Beaver Elementary School in Downingtown, PA and in addition to Amateur Radio, he plays little league baseball, soccer, and he enjoys video games.

He has 17 states and 5 countries, (probably more by the time you read this). His dad, George, WA3LVR, 10-10 #14391, has a bet with Andy. If Andy gets his Technician license, dad will get his Extra. What if Andy passes his Tech and dad fails his Extra? Any other 10-10 members out there that are nine years old or younger? Let's hear from you!



Andy Robinson, KA3WDW, 10-10 #56827

Finally

If you are not a member of 10-10 and are interested in finding out more about 10-10 and how you can become a member and have your own unique 10-10 number, a SASE (#10 business size) envelope sent to me at 18130 Bromley Street, Tarzana, CA 91304-1701 will get you an information package. If you would like a sample copy of the latest issue of the *10-10 International News*, send me a "green stamp" (\$1) and you will get both the info pack and the *News*. An address label would

be appreciated. No SASE is required when you send a buck.

If you have lost your 10-10 number, I can find it for you. Just send me your call, including all previously issued calls, with an SASE, and you can get

DX World

(continued from page 29)

UB5JRR, The Salt City DX Association (KB2G), Western New York DX Association (KD2YP), Metro DX Club (WD9GGY), Western Washington DX Club (K7WA), American Radio Relay League, *The DX Magazine* (VP2ML), *Long Skip* (VE3IPR), *DX News Sheet* (G4DYO), *The Long Island DX Bulletin* (W2IYX), *Inside DX* (N2AU), *QRZ DX* (W5KNE) and *The DX Bul-*

back into 10-10 real easy. Remember, once a number is issued, it is yours forever. Numbers are never reassigned, so once you have been issued a 10-10 number, it stays with you no matter where you move. 73 es cu next month.

letin (VP2ML).

Well, I finally exceeded the 300 mark with FR5ZU/J, HK0TU and ZS9/W6KG, bringing it to 301. Of course, I still need the cards. We only run 100W and have never owned an amplifier. And, of the three new ones, only the first one was from a list.

As for 1991 we hope you all have some good DXing and work many new ones. Don't forget to send in your count for the DXathon. Very 73 es GL DX, John, N6JM. □

IT'S NICE TO FOOL MOTHER NATURE!



SPECIFICATIONS

Attack time	Zero to 10ns, depending on induced waveform.
Surge current	8/20 us., 20,000 amps
Operating Temp.	-65 to 125 Celsius
Discharge Inductor	Toroidal, insulated.
Back-EMF GDU	600-1000V, ceramic body construction, G.I. Clare
VSWR	Less than 1.1:1 over rated spectrum
Insertion loss	Less than .1db
Impedance	50-75 ohms
Hardware	18-8 stainless hardware 8-32 stainless steel ground lug, 1/8" thick 5032-H32 case, 6-32 mounting hardware
Finish	Natural aluminum
DC resistance across	47K to 250K ohms, resistive
Capacitive effects	Less than 1pf
GDU specs.	Meets REA PE-80 IEEE 587 CCITT K12
Environmental	Recommended for indoor service at input bulkhead to station's grounding system. May be used outdoors if protected from direct rain exposure.
Warranty	One year standard

Unlike any other lightning protection device for coaxial transmission lines, I.C.E.'s Model 300 series requires no pre-determined voltage to develop between conductors before voltage suppression begins. Units are constant drain, capacitor-blocked, non-DC passive, and each relies on a heavy discharge inductor paralleled with a ceramic gas-discharge assembly to provide a lightning-fast trap system for induced voltages.

Virtually indestructible, 300 series arrestors are built in 1/8" thick standard chassis enclosures with dual stainless steel mounting/grounding screws.

Over a thousand satisfied customers have chosen from the numerous models & connector choices offered. Each is packed with mounting hardware, storage box, and 4-page owner's manual.

(PATENT APPLIED FOR.)



MODELS, PRICES HF-VHF (1.5 TO 225 MHZ)

MODEL 301/U	300W, SO239s	\$29.95
MODEL 301/N	300W, N CONNS.	\$31.95
MODEL 301/B	300W, BNC	\$29.95
MODEL 301/R	300W, RCA PIN	\$29.95
MODEL 303/U	5KWPEP, SO239s	\$34.95
MODEL 303/N	5KWPEP, N CONNS.	\$36.95

CATV, 75 OHMS

MODEL 310, RCV. ONLY, "F" CONNS.	\$26.95
----------------------------------	---------

MODELS, PRICES VHF/UHF (30-500MHZ)

MODEL 302/U	300W, SO239s	\$29.95
MODEL 302/N	300W, N CONNS.	\$31.95
MODEL 302/B	300W, BNC	\$29.95
MODEL 302/T	300W, TNC	\$29.95
MODEL 304/U	1KW, SO239s	\$34.95
MODEL 304/N	1KW N CONNS.	\$36.95

TVRO SATELLITE TV

MODEL 315, DC PASSIVE, "F" CONNS.	\$24.95
-----------------------------------	---------

1-800-ICE-COMM

Order Line	1-800-423-2666
Main Office	(317) 545-5412
Customer Service	(317) 547-1398
Fax (24 hours)	(317) 545-9645
Mail	P.O. Box 18495 Indianapolis, In 46218



MADE IN THE U.S. WHERE MOST OF THE WORLD'S FINEST PRODUCTS ARE DESIGNED AND BUILT.

CONSTRUCTION

The Rockloop

C.F. ROCKEY, W9SCH

Want to try something different? Build a Rockloop!

If you live in an apartment or condo where normal antennas are frowned upon, this should be of special interest to you. But, in any case, it's fun, easy to build and inexpensive. Perhaps its performance will amaze you as it has me.

Being arranged for the 15, 20 and 30M bands, the Rockloop will fit easily within most shacks. It is about as small as it should be to radiate effectively at these frequencies, yet it tunes properly to them and performs accordingly.

The accompanying diagram should be self-explanatory. If you have no small glass or porcelain insulators, use plexiglass strips. You will need 12 ft. of any copper "house wiring" wire, either No. 12 or No. 14. B&S gauge is suggested.

The frame is made of any old dry wooden strips. The tuning capacitor

should have air-dielectric, as the RF voltage may well break down a mica insulated unit.

Keep the leads to capacitor and toroidal transformer short. Wind the toroidal transformer with No. 22 wire or something similar.

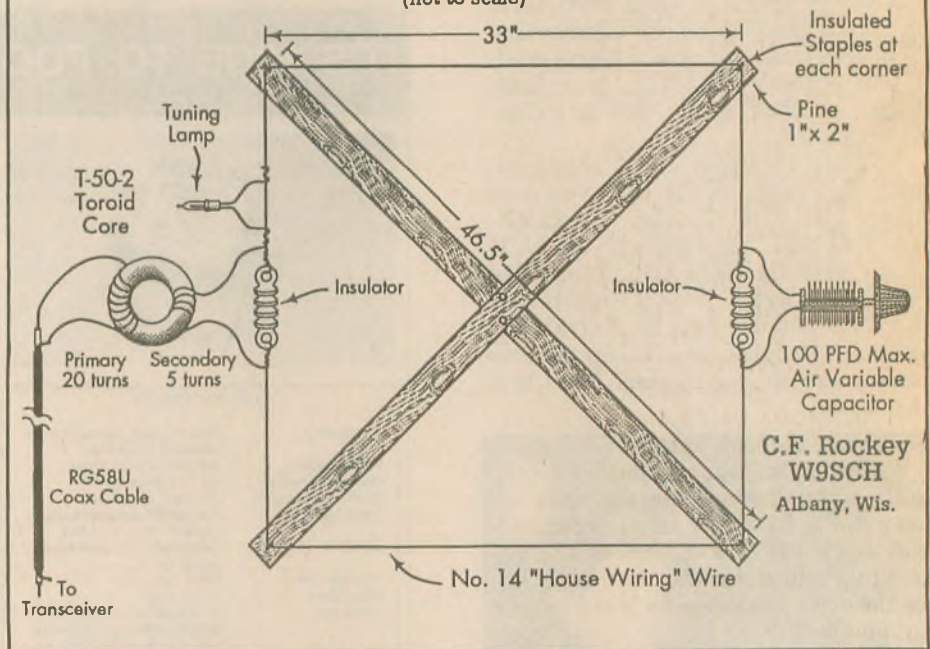
imum capacitance. Then run the output up to 5W for effective QRP operation (but not over 10W).

Try to keep the loop away from large metallic objects, house wiring and other conductors. Insofar as possible, if possible, point an edge of the loop in your favorite direction, but I have found that this is not critical.

At 5W on 15 and 20M CW, I have worked Czechoslovakia, both Germanies, Italy, Brazil, Switzerland, Finland, Costa Rica, Venezuela, England, Yugoslavia, Denmark,

The Rockloop

A Compact Antenna for the 15, 20 and 30 Meter Bands
(not to scale)



Enjoy NEVER CLIMBING YOUR TOWER AGAIN

Are you too scared or too old to climb? Never climb again with this tower and elevator tram system. Voyager towers are 13 and 18 inch triangular structures stackable to any height in 7 1/2", 8 3/4" or 10" section lengths. Easy to install hinge base, walk up erection. Next plumb tower with leveling bolts in base. Mount rotor and large heavy beams on Hazer tram and with one hand winch to top of tower for normal operating position. Safety lock system operates while raising or lowering. At last a cheap, convenient and safe way to install and maintain your beam. This is a deluxe tower system that you can enjoy today.

SPECIAL TOWER PACKAGE: 50 ft. high by 18" face tower kit, concrete footing section, hinged base, HAZER kit, Phillystran guy wires, turnbuckles, earth screw anchors, 10' mast, thrust bearing, tool kit, ground rod and clamp, rated at 15 sq. ft. antenna load @ 100 MPH. **\$1974.95.**

50' by 13" wide tower, same pkg as above	\$1670.95
HAZER 2 for Rohn 25-hvy duty alum 12 sq ft wind load	324.95
HAZER 3 for Rohn 25-std alum 8 sq ft wind load	232.95
HAZER 4 for Rohn 25-hvy galv stl 16 sq ft wind load	303.95
TB 25 Ball thrust bearing, 2 1/2" max mast dia	74.95

NEW HAZER VHS-8 Trans System for Rohn 45 22 sq ft wind load	860.00
NEW HAZER VHS-9 Trans System for Rohn 55 22 sq ft wind load	895.00

Satisfaction guaranteed. Call today and order by Visa, M/C or mail check. Immediate delivery.

Glen Martin Engineering, Inc.

Dept. W
RR 3, Box 322,
Boonville, MO 65233

816-882-2734
FAX: 816-882-7200



In use, keep the plane of the loop vertical for best results. There are a couple of sharp nulls on each side of the loop plane, but these are scarcely noticeable. Practically, Rockloop is non-directional.

This is a QRP device as it stands. More than 10W or CW power of SSB PEP might well damage either the toroidal transformer or the tuning capacitor. I have found that this has proven adequate under normal conditions. Just be careful!

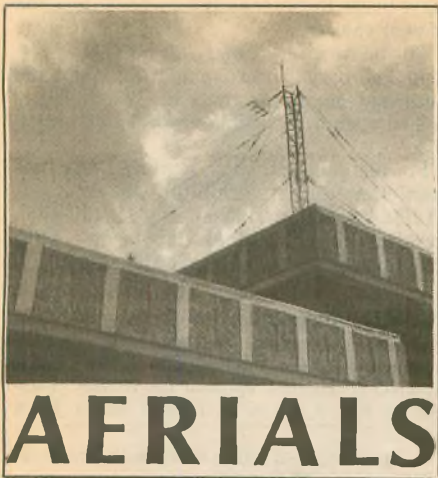
To tune the Rockloop, set your transmitter to about 2 or 3W CW output at the center of the desired band, then adjust the tuning capacitor to brightest glow of the tuning lamp (which should correspond to minimum SWR). Expect some "hand-capacity" and compensate accordingly.

My loop tunes to 15M with the capacitor plates barely in, to 20M at about 1/3 and 30M at about 1/2 max-

France, the USSR, Hawaii, Argentina, Spain, Norway, Poland, Liberia, Mexico and Japan, as well as made dozens of US and Canadian contacts on all three bands. The antenna sits here on top of my operating cabinet on the first floor of our Wisconsin frame cottage — so I guess you might agree that it works!

The use of QRP power greatly reduced the possibility of RFI of all sorts, lowers the world QRM level and presents a sporting challenge. Try it, it's fun!

One problem with the Rockloop that might be anticipated will occur in buildings equipped with aluminum wall-insulation or aluminum siding. But this will be the case with any inside antenna. Where this limitation does not exist, the loop will be found to be remarkably effective in practice and provide you with a new Amateur Radio adventure. □



An antenna review: The GAP all-band HF vertical

These guys have solved a problem associated with verticals. That is, an awful lot of RF is wallowing around and dropping into the dirt instead of going outward bound.

The GAP gets the feedpoint up (they must have been reading my columns of a few years back). It really is a dipole (center fed) turned vertically. About 32 feet in length and weighing but 16 pounds, Lil and I had no problem getting it up, that is, after putting it together; give yourself more than the 30 minutes promised in the brochure.

How does it perform? Sweepstakes, 1990: 01, 02, 03, 04, 05, 06, 07, 07. Like a hot knife through butter.

While that might not seem like much to the full gallon and five elements on top of a 125 ft. tower, gang, remember that this is 100W, a vertical, and I was going up and down the band, waiting for the other exchange to finish before jumping in.

I was just a barefoot boy answering the CQ callers. They just kept coming back to me. POW! POW! POW!

I'd work a station and then stay on the frequency and hear MANY stations calling the one I'd just worked. Another thing I'd do is (having a short call, I can get away with this): wait just a split second until I could hear the rumble of many stations calling — then I'd throw my call in and the pursued station would come right back to me.

I am almost struck with disbelief myself. I mean, this is a vertical. But

then, it's a vertical with a big difference, as I'd again work two stations in a clock minute. Throughout the contest, I gave it a workout on every band. I worked just about everything I heard.

I started calling CQ (on 20) and worked stations at :45, :46, :48, :50, :50, 51. Frankly, I found the moving up and down more like a chase, so I went back to that. There's always the question, "Is it the antenna or the conditions?" That's why I like to test an antenna during contest conditions. In a competitive situation you really know what is happening. Are you getting beat up? Standing in long lines to work some station? Are the really loud stations, after you finally get through to them, asking for repeats and fills? Or is all just zip, zip, zip, zip? This GAP really beats loading up a chain link fence or metal bunk beds. But, then when you phase two sets of bunk beds . . . but that's another story.

Seriously, this was all too easy. I've decided that next year I'll work only the "A" (lower power) stations and no "B" (higher power) stations. I'll give to the needy, not the greedy.

I look through the log and see :58, :59, :00. I also see a :40, :41, :42. There's an :18, :19, :20, :21. Later there's a :19, :20, :21, :22, :23, and more like that.

Well, I missed one state. That's no fault of the GAP. Maybe I wasn't in the right place at the right time. Was it on when I was reading the newspaper? Or while I was getting a good night's sleep?

So, there's my adventure with the GAP. I was indeed pleased. If I were a whole lot younger and I had two of those GAPs phased, I'd tell those contest hotshots to . . . look out!

(Kurt N. Sterba, hamdom's mystery man, wears his cloak of anonymity so that he may go on the air testing antennas and not be met by pals giving overly generous signal reports or by knaves saying "You sound terrible, go back to your shopping cart antenna.") □

**AAIA
SIDEKICK ANTENNAS**



\$79.95 + 5.00 shipping/handling

- More Gain-Very Efficient
- Rugged Construction-Tested at Sea
- Self Mounting to Tower or Mast
- Extended Double Zepp 84" @ 144
- Broadband - Tunes Outside Band
- SO-239 Feed - Very Low Loss
- Stainless Elements and Hardware
- All New Innovative Design
- Customers Report Very Positive

144 - 220
440 Mhz.
Models

Order Direct 1-800-874-2880
VISA-MC OK No Extra Charge
BROADCAST TECHNICAL SERVICES
11 Walnut St., Marshfield, MA 02050



HV Variable Capacitors

for Antenna Tuners/
RF Amplifiers

- Roller inductors
- Counter dials
- Antenna tuners & Kits. Reasonable prices!

KILO-TEC

P.O. Box 10 • Oakview, CA 93022

To order call: (805) 646-9645

SWR & POWER METERS

- The only meters that show PEP output directly, accurately, instantly.
- No SWR "cal" control. It's automatic.
- Read SWR while transmitting—even on SSB!
- Exclusive patented circuit.
- 1-30 MHz.



M-835. The deluxe version. Two 30 element light bars give 3% resolution. The 6" scales with bright red indicators can be seen clear across the room. Has four power ranges 2, 20, 200, 2000 watts.

Model M-835 \$189.95 + \$4 shipping/handling U.S. and Canada. For 12-v DC. 115vAC adapter Model PS-95 \$15. California residents add sales tax.



M-827. The original light bar meter. Two 10 element light bars. Three power ranges 20, 200, 2000 watts. Instantaneous power readings. "Hands off" SWR reading. Built-in 115vAC power supply. 12vDC model also available.

Model M-827 \$139.95 + \$4 shipping/handling 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 92033
Phone: (619) 747-3343

HAMFESTS



Colorado

The AURORA REPEATER ASSOCIATION will hold its 10th Annual Swapfest on Sunday, Feb. 17 at the Jefferson County Fairgrounds in Golden.

Doors will be open from 8:30 a.m. to 2 p.m. For additional information, contact Judi, WDØHNP, at 303/450-6910 or Jan, KA7TYU, at 303/680-8857 or write to Aurora Repeater Association, P.O. Box 39666, Denver, CO 80239.

Florida

The annual Sarasota Hamfest and Computer Show will be held at the Roberts Arena on February 16 and 17. There will be free parking, forums and many prizes.

Saturday activities will include a tour to Jungle Gardens, shopping and lunch and a banquet at 7 p.m. VE exams will be offered on Sunday at 10 a.m.

Admission is \$5 in advance or \$7 at the door. Talk-in: 146.910 repeater.

Reservations are necessary for RV hookups. For tables and booths, contact Gene Marino, 4858 Tivoli Ct., Sarasota, FL 34235; 813/355-0675. For tickets send SASE to John Bates, 5604 Antoinette St., Sarasota, FL 34232; 813/371-6104.

Indiana

The LA PORTE AMATEUR RADIO CLUB will sponsor the Cabin Fever hamfest on Saturday, Feb. 23 at the La Porte Civic Auditorium.

Doors will be open from 8 a.m. to 2 p.m. (Chicago time). Computer enthusiasts are welcome. Forums will cover microwave as well as introduction to Amateur Radio.

A \$4 donation will be accepted at the door. Tables can be reserved for \$5 upstairs or \$4 downstairs.

Talk-in on 52 Simplex.

For reservations or further information, call TX 219/362-2679 or send an SASE to P.O. Box 30, La Porte, Indiana 46350.

Iowa

The DAVENPORT AMATEUR RADIO CLUB will celebrate its 20th year by hosting its 1991 hamfest at a new, bigger location on Sunday, Feb. 24. It will be at the QCCA Expo Center in Rock Island, IL which features a 24,000 square-foot exhibition floor, ample parking and one-level handicapped accessibility.

Doors open at 8 a.m. and there will be a grand prize drawing at 3 p.m. The hamfest features a large indoor flea market, commercial exhibits, food, VE exams and door prizes.

Talk-in on the WØBXR 146.28/.88 repeater.

Tickets are \$3 in advance or \$4 at the door. Tables are \$7 each.

For more information, tickets or table reservations, contact: Dave Johannsen WBØFBP, 2131 Myrtle St., Davenport, IA 52804. For ARRL/VEC exam information, contact: Al Broendel N9OK, 2712 38th St., Rock Island, IL 61201.

Massachusetts

The ALGONQUIN ARC will sponsor a hamfest on Saturday, Feb. 16 at the Marlboro Middle School cafeteria. Electronic flea market and VE exams will be featured.

Doors will open to vendors at 8 a.m. and to the public at 10 a.m. VE exams will be given at 9 a.m. (preregistration required).

Admission is \$2. Tables are \$10 in advance or \$12 at the door.

Talk-in on 146.61, 223.94 and 449.925.

For more information contact Ann, KA1PON, at 508/481-4988 or write AARC, Box 258, Marlboro, MA 01752.

Michigan

The CHERRYLAND ARC will sponsor a hamfest on Saturday, Feb. 16 at the Immaculate Conception School in Traverse City.

Doors will open from 8 a.m. to 1 p.m. Features will include dealers, food and refreshments.

Admission is \$3; tables can be rented for \$4.

Talk-in on 146.86 repeater.

For further information, contact Ken Musson, W8QKP, 9680 Peninsula Dr., Traverse City, MI 49684; 616/947-1372.

Minnesota

On Saturday, February 9, 1991, the ROBBINSDALE ARC will sponsor its 10th annual Midwinter Madness Ham Radio and Hobby Electronics Show. Midwinter Madness has had great success over the past 10 years because of the exhibitors which have displayed a wide variety of products and information to the hobby electronics enthusiast.

The 1991 show will be held at the spacious new National Sports Center, located in Blaine. Booth assignments are on a first come first

serve basis. Register early for a booth location of your choice.

The show set-up times will be Friday evening, February 8, from 5 p.m. to midnight and Saturday morning from 5 a.m. - 7 a.m. Doors will be open to the public from 7 a.m. until 3 p.m.

For further information contact Doug Arnston, Commercial Exhibitor Chairman, at 612/828-3312 (business) or 612/420-3050 (residence) or write to the Robbinsdale ARC, P.O. Box 22613, Robbinsdale, MN 55422.

New York

The ORANGE COUNTY AMATEUR RADIO CLUB will sponsor its Winter Hamfest on Feb. 9, 9 a.m. at John S. Burke High School.

A donation of \$2 will be accepted at the door. VE exams will be given.

Talk-in on 146.760.

For more information, call 914/895-2113 or write to Gregory, KB2AUQ, RD3 Box 349D, Wallkill, NY 12589.

Ohio

The Mansfield Mid Winter Hamfest and Computer Show will be held on Sun., Feb. 10 at the Richland County Fairgrounds in Mansfield.

There will be plenty of prizes and over 300 tables at this flea market in large, heated buildings.

Doors open to the public at 7 a.m. Tickets are \$4 in advance and \$5 at the door. Tables are \$9 in advance and \$12 at the door, if available. Advance ticket or table orders must be received and paid for by Feb. 1.

Talk-in (call W8WE) on 146.34/94.

For additional information or reservations send SASE to Dean Wrasse, KB8MG, 1094 Beal Road, Mansfield, OH 44905 or phone 419/589-2415 after 4 p.m. EST.

The CUYAHOGA FALLS ARC will sponsor its 37th annual hamfest on Sunday, Feb. 24 at the St. V. center on State Rd.

Doors will be open from 7 a.m. to 3 p.m. This location has over 35,000 square feet for buyers and sellers and is wheelchair accessible.

Admission is \$3 in advance or \$4 at the door. Tables can be rented for \$5 in advance or \$6 at the door, or sellers may bring their own tables.

Talk-in on 87/27.

For reservations or further information, contact Bill Sovinsky, K8JSL, 3405 24th St., Cuyahoga Falls, OH 44223; 216/923-3830.

Oregon

THE SALEM AND OREGON COAST EMERGENCY REPEATER ASSOCIATIONS will sponsor the 1991 Ham Fair on Saturday, Feb. 16 at the Polk County Fairgrounds.

The doors will open at 9 a.m. Admission is \$5 in advance or \$6 at the door.

Activities include a giant flea market, exhibits and commercial dealers.

Talk-in on the 146.26/.86 repeater. For more information write: 1991 Salem Ham Fair, P.O. Box 784, Salem, OR 97308; 503/585-9554.

Vermont

The NORTHERN VERMONT WINTER HAMFEST COMMITTEE will sponsor a

**DISCOVER
LOW PRICES**

PL-259 Nickel/Tellur(r), USA, 69¢ or \$15/25
 PL-259 Silver/Tel, USA, \$1.29 or \$25/25
 PL-259 GOLD/Tel, USA, \$1.49 or \$30/25
 N (UG 21) for 9913 9088 etc. \$3.25
 UG-255 convert HT BNC to UHF \$1.79

NEW! Flexible 9913-type, low-loss
 for crank-ups & rotators 59¢
 RG-8X non-contaminating 23¢
 RG-8X, 95%, premium 14¢
 RG-213 Mil-type 31¢
 #14 ant wire 7¢

Cable in 50
 Increments
 Only

RADIO WORKS

BALUNS

Current-type(c)
 Laboratory Developed
 Superior Construction
 Unequaled Specifications
 11 models for every application

B1-2K 1:1 2KW 'Current' 80-10M \$15.95
 B4-1.5K 4:1 Low-loss 1.5KW 80-10M \$17.95
 Y1 4K 1:1 4KW 'Current' Beam balun \$23.95
 B4-2KX 4:1 Precision 'Current' 160 10M \$35.95

(804) 484-0140

FREE 64 pg. DISCOUNT Catalog. Everything for wire antennas. Allow 4-6 weeks for bulk-rate delivery. Send \$2 for 1st mail. Mention this ad for sale prices. ADD SHIPPING - VISA & MC welcome. Give card #, exp date, signature COD add \$3.30 - shipping. Virginia Residents add 4.5% sales tax. Dealer inquiries welcome

Box 6159 • Portsmouth, VA 23703

hamfest on February 23 at Milton High School in Milton.

Doors will be open from 9 a.m. to 3 p.m. An indoor flea market, forums, demos, auction and VE exams will be featured.

Admission is only \$2, and tables are free! (first come, first serve).

Talk-in on 145.47/600 or 146.85/-+600.

For further information, contact Mitch Stern, WB2JSJ: 802/879-6589; or Joe Ty-mecki, N1DMP: 802/893-6458. □

NCDX Club event

The Northern California DX Club, which usually meets in the San Francisco Bay area, will meet in Sacramento this year on Feb. 8 and 9. Non-member Amateurs who are interested in DX, contesting or packet cluster are also invited to attend.

Starting at 6 p.m. on Friday at the Santa Fe Inn (2600 Auburn Blvd; 916/482-4770 or 800/848-7744), an "attitude adjustment" period will be held, followed by dinner at 8 p.m. Two excellent presentations will be given: NCDXC member Peter Onnigian, W6QEU, professional antenna engineer and founder of Ham-Pro Antennas will speak on "What's New in Yagi Amateur Radio Antennas;" NCDXC member Jay O'Brien, W6GO, will then speak briefly on "Today's New Developments in Packet Clusters."

The dinner will cost \$15. per person, including tax and gratuity. Entree choices are Breast of Chicken Tarragon, Roast Prime Rib of Beef Au Jus, or Vegetarian. This is a dinner meeting where all who attend are expected to have dinner to cover meeting room cost. If for some reason you cannot have dinner, a donation of \$5 to the NCDXC will be appreciated. Send dinner reservations, including entree choice and prepayment to Ed Merritt, KF6EN, 2512 Cambon Way, Sacramento, CA 95821; (916) 489-2285.

The Sierra Inn is offering a special room rate of \$38 per person (\$5 each additional person) for those who wish to stay overnight to attend the Saturday activities.

Saturday's activities include an all day open house at the W6GO/K6HHD antenna farm in Rio Linda. You will see their packet cluster equipment and the QSL manager publication facility. Golfers will gather at nearby Haggin Oaks Golf Course. Tee time reservations have been obtained for 10 a.m. The greens fee is \$16 which includes \$2 prize fund pro-rata. Send golf reservations with prepayment to John Van Blitter, K6NM, 3032 Country Club Drive, El Macero, CA 95618; (916) 756-3700.

This will be a fun event, so get your reservations in early, preferably before Jan. 1. Those registering for the dinner before Jan. 8 will be eligible for the early registration door prize — a Ham-Pro 15-element 2M Yagi (value \$225) donated by Ham-Pro Antennas.

You will be welcomed by official greeters Bob Cox K3EST/6 CQWW contest director, and Pete Peterson K6EDV of the T26LP Tuvalu expedition fame.

For information call Tony Borgia, K6DR, (916) 482-8147. □

FRIEND OF BILL W.??
Contact: HAAM RADIO 4 + 5 + 9
ARS N8KDW
4121 S. Fulton Place
Royal Oak, MI 48073
(313) 549-5275



School Club Roundup 1991

School Club Roundup (formerly Operation SEARCH) is sponsored by the Council for the Advancement of Amateur Radio in the New York City Schools, the ARRL and its Hudson Division Education Task Force to foster contacts with and among school radio clubs.

Contest period: Monday through Friday Feb. 11 to 15, 1991 (the second full week in February), 0800 to 2000 EST. Operate no more than 24 of the 60 hours. Logs must clearly show on and off times. Off periods must be at least 30 minutes.

Classes: (I) Individual or Single Operator (non-club); (C) Club or group (non-school); (S) School club or group (grades K-12).

Exchange: Your call sign RS(T), class ("I", "C" or "S") and US state or DX country. For example, W2CXN answers N2RQ's call by sending N2RQ DE W2CXN 57(9) S NY.

Scoring: Stations may be contacted once each on phone and CW (packet and RTTY count as CW). No repeater contacts except satellite and "real time" packet. One point for each phone QSO. Two points for each CW QSO.

Multiplier: Number states plus DX countries plus 2 X "C" class QSOs plus 5 X "S" class QSOs.

Final Score: Multiply QSO points by multiplier.

Reporting: Sample log and entry forms are available for SASE. Entries should be mailed to School Club Roundup, c/o Lew Malchick, N2RQ, Brooklyn Technical HS, 29 Fort Greene Place, Brooklyn, NY 11217. Logs must include exchange information, bands and signature of all operators (and authorized club official or trustee). Dupe check sheets are required for entries of over 100 QSOs. Must be postmarked by March 18, 1991.

Awards: Certificates will be awarded to the top three entries in each class. A special certificate for any station contacting 10 or more school clubs will be awarded. Send a large SASE or sufficient IRCs for complete results and more information about CAAR/NYCS. □

Personalized Skywave Propagation Programs

- Skywave Hourly Predicts SKYCOM 1.1 . . . \$39.95
Apple Macintosh or IBM-PC's and compatibles
 - World day/night Maps DX WINDOW . . . \$39.95
Apple Macintosh
- For more info call (703) 255-6600 or SASE to:

ENGINEERING SYSTEMS INC.
P.O. Box 939
Vienna, VA 22183

1990

Worldradio DXathon

ELIGIBILITY: All licensed Amateur Radio operators worldwide.

DATES: 1 Jan.1990 through 31 Dec. 1990.

BANDS: Five bands

•80 •40 •20 •15 •10

MODES: Five modes

•Phone •CW •Satellite

•Visual (SSTV, FAX)

•Digital (includes RTTY, AMTOR & Packet)

OBJECTIVE: Contact as many Nations via as many different modes as possible. A Nation is defined as an entity with enough sovereignty to issue its own postage stamps.

SCORING: Your final score will be the total number of Nations worked per mode. You may count a Nation only once per mode. An example of scoring: If you work Japan on CW and SSB on 20 meters, the point value would be 2 points. If you work Poland on CW on 10 meters and 20 meters, the point value would be 1, as a Nation can only be counted once per mode.

SUBMISSIONS: All entries must be submitted on official DXathon entry forms or a reasonable facsimile and should include call, date, time, band and mode for each entry. Use separate sheets for each mode. QSL cards are not required. In addition, a DXathon Summary Score-sheet should be filled out with your score totals on it. All entries must be postmarked no later than 28 February, 1991. Entries must include your call, name, address and be signed with a declaration that the contacts were complete two-way contacts. Mail all entries to: **WORLDRADIO, 2120 28th Street, Sacramento, CA 95818, USA.** All participants will be listed in Worldradio. Decisions of the DXathon committee will be final. The committee has the right to disqualify an entry 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 committee. **AWARDS:** Will be given based on the number of entries. 100-point minimum must be accumulated to be eligible for an award. **RULE CHANGES:** Rules may be modified over the years to reflect feedback from the participants. Please send copies of this notice to your DX friends. Send \$.45 business size SASE to Worldradio for entry forms and nations list.

NEW PRODUCTS

Information in "New Products" is supplied by the manufacturers to acquaint *Worldradio* readers with new products on the market.

Sorry, wrong number!

It has come to our attention that the press release we printed (p. 68, Jan. '91) concerning the CW Mental-Block Buster tape and booklet of Pass Publishing, Box 570, Stony Brook, NY 11790, listed an old price of \$19.95. The correct price should be \$24.95 to US residents, plus \$1.50 sales tax for NY residents.

Logging software

EPO Software of Vancouver, Washington announces the release of a complete family of copyrighted logging software specifically designed for the Amateur Radio operator. These databases have been developed, refined and improved with the input of thousands of hams worldwide during the past decade. Each of these programs can generate high-speed hard copy, video or ASCII log files and is suitable for single band or multi-band use. User friendliness and flexibility are integrated into each software package.

Electrolog II. The "electronic logbook," is a sophisticated general-purpose logging and QSLing program. This program keeps track of all QSO data in a variety of file configurations and generates QSL cards and labels in several formats. *Electrolog II* is available for IBM compatible, Commodore 64, C128 and the Apple II series of computers. Suggested list price is \$19.95.

Contest Log and Dupe Sheet is an easy to use contest log program featuring RAM-based duping, error-free default entry and super-quick searching. Frequent disk dumps mean that information is not lost due to power

failures. Log printouts are suitable for mailing in most contests. A minimum number of key strokes make entry of contest information fast and accurate. Contest Log and Dupe Sheet is available for IBM compatible, Commodore 64, C128 and the Apple II series of computers. Suggested list price is \$14.95.

DXCC Autolog and WAS Autolog are specialty logging programs designed for DXers and award hunters. *DXCC Autolog* features instant, up-to-date country/prefix indexing and tallying. *WAS Autolog* provides for rapid searches of states worked. Both programs are available for the Commodore 64 and C128 computers. *DXCC Autolog* is also available for IBM and compatible hardware. Suggested list price for each of these packages is \$14.95.

Ten-X Log for the Commodore 64 is a unique database that will sort and alphabetize by a variety of fields including call sign or membership number. RAM-based retrieval and sorting means more rapid data access than slow disk-based systems. Although designed specifically for use by 10-X members, users will find a variety of applications for this program. Suggested list price for *Ten-X Log* is \$14.95.

Each of these software packages may be purchased directly from EPO Software, 7805 NE 47th Ave., Vancouver, WA 98682. (Please include \$2 shipping with each order.) □

DL-1500 Dummy Load

AEA is pleased to announce a new dry dummy load. The DL-1500 simulates a perfect 50 ohm antenna up to 650 MHz so you can test your transmitter without radiating a signal on the air.

Specifications include an impedance of 50 ohms; VSWR which is less than 1.3:1 below 650 MHz; power dissipation of 1500W for less than 10 seconds or 100W for 10 minutes; maximum element temperature of 350 degrees centigrade (697 degrees Fahrenheit); and a DC-650 MHz frequency range.

The AEA DL-1500 dummy load is now available for \$109.95 through authorized AEA dealers. □

Data controller

MFJ Enterprises, Inc. announces the release of the new MFJ-1278T Turbo multi-mode data controller. MFJ-1278T is Amateur

Radio's first multi-mode ever with a high-speed 2400 baud modem built-in. It retails for \$359.95.

MFJ-1278T Turbo gives you fast 2400 baud packet. By communicating faster you'll reduce chances for errors during transmission, lessen congestion at crowded times and/or channels and more efficiently utilize our Amateur frequencies. You'll also get 1200/300 baud for full compatibility with older TNCs.

MFJ-1278T gives you all nine digital modes. It lets you transmit and receive packet, Amator, RTTY, ASCII, CW, FAX (including multi-gray level wire photos and weather



maps as well as other FAX modes) SSTV and contest memory keyer. You also get Navtex reception.

MFJ-1278T also gives you a built-in dedicated printer port; Easy Mail™ personal mailbox; 20 LED precision tuning indicator; multi-gray level FAX/SSTV modem; 32K RAM; AC power supply; host mode that lets MFJ-1278T serve as a KISS interface or dumb modem; fast through-put anti-collision technology; independent transmit level adjustment for each radio port; random code generator; lithium battery backup; RS-232 and TTL serial ports; standard 850 Hz RTTY shift; socketed ICs; tune up command; peripheral I/O port; automatic incrementing serial numbering; programmable message memories; dual radio ports (each HF or VHF); CW key paddle jack; speaker jack that lets you monitor CW sidetone; packet connect bell and transmit/receive audio; new fully integrated instruction manual; and a new Fast Start™ booklet.

The new MFJ-1278T comes with MFJ's one year unconditional guarantee. The MFJ-1278 (without the new high speed modem) remains available for \$279.95. In addition, the new 2400 baud modem can be purchased separately (MFJ-2400, \$79.95) and installed in any MFJ and most other TNCs. For more information or to order contact any MFJ dealer or MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762; 601/323-5869 or order toll free at 800/647-1800. □

Multi-band transceiver

Project yourself into the 21st century with ICOM's new IC-970 all mode multi-band transceiver. Designed for the serious operator on 144, 440 and 1200 MHz, the IC-970 provides the most futuristic technology for DX, digital and satellite communications.

Verstile communications. The IC-970 comes fully equipped as an all mode dual-bander for 144 MHz and 440 MHz. Operate the 1200 MHz band by installing the optional UX-97 band unit or listen to what's happening in the world with the UX-R96 wide band receiver unit, receiving 50-905 MHz continuously.

Dual band watch. Capable of receiving both main and sub band audio simultaneously. Multiple scanning systems also function concurrently on the main and subbands.

Identify yourself

with our custom engraved call pins

1 line 1" x 3" ..\$1.25
2 lines 1" x 3" ..\$1.50
3 lines 1 1/2" x 3" \$2.00

DAVE W2CFP
TOMPkins CO. A R C

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

Instant Solar Power

The \$319.95 Bullet-Tested QRV Solar Power Supply keeps your repeater on the air round the clock or powers your 100w rF 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
Box 50062-W Provo UT 84605

(801)373-8425

Reach beyond the stars. Reach beyond the stars with the new IC-970. Communications via satellite has never been so easy. This amazing transceiver automatically tracks uplink and downlink frequencies when the tuning control is rotated. Ten memory channels specially designed for quick satellite communications emphasize ICOM's total commitment to your future communication needs.

Progressive quality throughout. ICOM's extra large multi-function display is easy-to-read, providing complete main and sub band information. Ninety-nine memory channels per band store operating frequencies, modes and repeater information.

ICOM's exclusive DDS system accelerates the PLL circuits lockup times and provides improved Carrier-to-Noise-Ratios. A built-in pager and code squelch function, plus direct keyboard entry and ICOM's CI-V system are just a few additional IC-970 features that will propel you into the 21st century. You'll see why the IC-970 is the transceiver of a new generation! □

Rotating tower hardware

Rotating Tower Systems, Inc. announces the availability of guy wire bearings and rotating base assemblies designed especially for use with Rohn 25 tower. This hardware will allow the construction of a highly versatile and economical rotating tower using the very popular Rohn 25 tower sections and companion rotators.

The unique design of this hardware results in extreme immunity to ice and snow conditions while still retaining ease of installation and maximum service life. Rotating stacks of smaller monobanders, stacked tribanders, large VHF/UHF arrays, and antennas mounted at optimum heights are ideal applications for a rotating tower made from these components. In addition, component design allows the rotating base unit to be mounted at any tower height, minimizing the number of guy wire bearings.



For information and prices write or call Rotating Tower Systems, Inc., Box 44, Prosper, Texas 75078; (214-347-2560). □

Radio Works catalog

The Radio Works' latest catalog, new and expanded to 72 pages, is dedicated to the wire antenna enthusiast. It is a source-book of wire antenna systems, components, and accessories at discount prices.

With each new catalog issue, the latest products from the Radio Works are introduced. *Catalog 901* introduces the Y1-4K Yagi-Balun, the TunerLoop and TunerLoop II, multiband loop antennas, and the G5RV Ultra, a ladder-line fed G5RV that combines the finest qualities of the G5RV and the Radio Works' RemoteBalun. The new Carolina/4 has its debut. This is a 20-10M version of the increasingly popular Carolina Windom that is only 33 feet in length.

Very high quality coaxial cable along with gold and silver-plated, Teflon® insulated PL-259s are available at special prices. The new Certified Coax Line including the exclusive Flexi, a flexible 9313-type coax, is now listed in this issue of the Radio Works' discount catalog.

The balun specification matrix has been expanded to three pages and the antenna section now has its own features, applications and specifications matrix. These charts detail the

characteristics of each of the 12 baluns and 16 antenna systems made by the Radio Works.

Everything you need to accessorize or update your present antenna system is in this catalog: wire, cable, coax, insulators, connectors, adapters, coax switches, MilSpec Dacron®, double-braid Dacron® support lines, HF, VHF, and UHF mobile antennas, books and much more are all offered at discount prices.

The cover price of the Radio Works' *Catalog 901* is \$2 but to all *Worldradio* readers, it is FREE. (If you want your copy extra fast, send \$2 to cover first-class postage.) Contact the Radio Works, Box 6159, Portsmouth, VA 23703; 804/484-0140. □



Antenna tuner

MFJ Enterprises, Inc., the world's leading manufacturer of antenna tuners and other Amateur Radio accessories, announces the release of the new MFJ-924 440 MHz tuner with built-in SWR/Wattmeter for only \$69.95.

This new MFJ UHF tuner handles power up to 200W. Its compact 8×2½×3 inch size and wide impedance matching range make it an excellent choice for mobile and/or base operation. It also features SO-239 input and output connectors and a wing nut post for grounding. Built-in SWR/Wattmeter shows you power on 30 or 300W scales as well as SWR.

MFJ-924 comes with MFJ's one year unconditional guarantee. For more information or to order, contact any MFJ dealer or MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762; 601/323-5869, or order toll free at 800/647-1800. □

The Key Element

Heil invites you to be a part of one of the biggest advancements in SSB transmission since the "Donald Duck" vs. AM days. If you are not satisfied with the sound of your station, it's no wonder — most communications microphones used today were designed years ago for public address use, not for the sophisticated requirements needed for SSB techniques.

No one microphone can be all things to Amateurs, so the new Heil HC-5 element was developed especially for maximum clarity on SSB transmissions. The response of this tiny element rolls off sharply under 350 Hz and above 3100 Hz with a peak at 2400 Hz for high articulation in the speech range.

Amateurs who care about maximum results in getting over, around and through the DX pile-ups now have another weapon — the HC-4 Key Element. You can easily install this small, advanced Heil element with its broad-range impedance-matching characteristics into virtually any microphone case you own, or you can purchase the custom HM-10 or BM-10 with the Key Element already installed.

For further information, write to No. 2 Heil Dr., Marissa, IL 62257 or call 618/295-3000. □

Logging simplified!

Introducing **Logic Jr.**[™], the computer logging program from PDA. It features easy installation, help at the press of a key, the easiest data entry & retrieval, and yet has features unlike any other program in its price class:

Auto logging of DXCC, zones, name, QTH, date, & time • multi-QSO display--as easy as looking at a conventional logbook! • search on any item • progress tracking for any award • online DXCC progress check • auto DX and Direction display • practically unlimited comments for rag chewing and nets • log printouts, QSL cards & labels • excellent manual and telephone support • generous upgrade credit towards LOGic II (features computerized radio interfacing, auto contest scoring, custom report facility, and more) • For IBM PC, Amiga, and Atari ST. Hard drive reqd. Coming for Mac. Only \$39 delivered* in US, Canada, and Mexico. MC/Visa. Free info pack. Demo available.



Personal Database Applications Dept. WK
2616 Meadow Ridge Drive
Duluth, GA 30136-6037
404-242-0887

Hours 4 - 9 PM Eastern M-Th

THE 1991 QSL BOOK!

Extending a 70 year tradition, we bring you three new Callbooks for 1991, 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 500,000 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 1991 Callbook Supplement is a new idea in Callbook updates, listing the activity in both the North American and International Callbooks. Published June 1, 1991, 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 1991 Callbooks will be published December 1, 1990. Order now for early delivery as soon as the new books are available. 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, 1990**
Supplement - June 1, 1991

	Including shipment to U.S.A. points	Illinois residents, incl. tax & shipping	Including shipment to foreign countries
<input type="checkbox"/> RC0191 Single 1991 North American Callbook	\$33.00	\$34.90	\$39.00
<input type="checkbox"/> RC0291 Single 1991 International Callbook	33.00	34.90	39.00
<input type="checkbox"/> RC0391 Single 1991 Callbook Supplement	13.00	13.65	14.00
<input type="checkbox"/> RC01912 SPECIAL OFFER: Order both 1991 Callbooks at the same time for shipment to one address.	63.00	66.80	73.00

Name _____ Amount enclosed _____

Address _____

radio amateur
callbook

Dept RACM0006
 925 Sherwood Dr., Box 247,
 Lake Bluff, IL 60044, USA

Mon-Fri 8-4 Central
 Tel: (708) 234-6600



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
Arizona				Missouri			
Mar 2	Tucson	K7OPX (602) 886-7217	w/i only	Feb 12	Ocean Springs	AA5TX (601) 875-2142	w/i
California				Nevada			
Feb 2	Burbank	KE6AR (818) 349-0927	w/i	Feb 2	Henderson	Janet Welsh (702) 565-0242	w/i
Feb 9	Camarillo	N6SR (805) 484-4461	p/r pref; w/i OK	Feb 9	Reno	WS2Z (702) 826-6028	p/r or w/i
Feb 3	Chico	W6YKU (916) 342-1180	p/r pref	Feb 16	Reno	K7HRW (702) 827-8450 day, or (702) 972-3933 night	p/r 30 days prior, w/i OK
Feb 2	Concord	WW6H (415) 254-5090; WA6AEO (415) 676-8239	w/i	New Jersey			
Mar 9	Hesperia	NF6I (619) 241-4732; K6BET (619) 244-6080	w/i OK	Feb 16	Bayonne	WA2QYX (201) 451-9471	w/i OK
Mar 9	Redding	NT6E (916) 253-REVA	w/i	Feb 9	Cranford	N2XJ (201) 635-7686	
Feb 2	San Dimas	K6THQ (714) 596-9383	p/r 1 week prior	Feb 13	Fort Monmouth	WB2GYS (908) 532-5353	w/i
Feb 16	San Dimas	K6THQ (714) 596-9383	p/r 1 week prior	Feb 4	Sayreville	K2FD (201) 442-9215	w/i
Feb 9	San Pedro	N6DYZ (213) 325-2965	w/i OK	New York			
Mar 9	Santa Barbara	KB5AH (805) 682-2665	w/i	Feb 24	North Babylon	KA2RGI (516) 957-0218	w/i OK
Mar 9	Seal Beach	NN6Q (213) 420-9480	p/r	North Carolina			
Mar 16	Signal Hill	NN6Q (213) 420-9480	p/r pref; w/i	Mar 9	Durham	Pete Goolsby (919) 544-3215	w/i
Colorado				Feb 9	Yadkinville	N4XRY (919) 699-8469	w/i
Feb 9	Aurora	W0IJR (303) 366-9689	w/i	Ohio			
Feb 16	Westminster	N0CFM (303) 451-1231; N0HNR (303) 278-4280	p/r or w/i	Feb 23	Warren	Tom Roscoe (216) 448-0306	w/i
Connecticut				Mar 9	Westerville	William Tabor (614) 864-8370	w/i
Feb 23	Gales Ferry	KY1F (203) 536-0187	w/i	Pennsylvania			
Feb 23	Milford	NB1M (203) 933-5125; WA1YQE (203) 874-1014	w/i	Feb 2	Erie	W3CG (814) 665-9124	w/i
Idaho				Feb 8	Nazereth	John Greenage (215) 767-4778	w/i
Feb 9	Boise	W7JMH (208) 343-9153	w/i	Feb 4	Pennsburg	K3ZXQ (215) 679-5764	
Illinois				Feb 4	Philadelphia	Rollie Madara (215) 259-6420	w/i
Feb 9	Belleville	John Sundstrom (618) 397-7235	w/i	Feb 7	Philadelphia	ND3Q (215) 482-0386 or (215) 879-0505	w/i
Feb 16	Loves Park	W9SS (815) 877-6768	p/r; w/i	South Carolina			
Feb 9	Mt. Vernon	L.C. McDuffie (618) 244-7987	w/i	Feb 23	N. Charleston	AA4IX (803) 873-9465	w/i
Feb 9	Oak Forest	KA9HDN (312) 247-0650	w/i	Texas			
Indiana				Feb 16	DFW Airport	KF5BL (214) 252-8015	w/i
Feb 2	Laporte	Alan Rutz (219) 785-2602	w/i	Feb 9	Eddy	N5KZD (817) 859-5374	w/i
Iowa				Feb 23	Midland	KT5G (915) 694-9450	w/i OK
Mar 9	Dubuque	Mike Jozefowicz (319) 582-8563	w/i	Feb 23	Orange	Sid Phillips (409) 886-2732	w/i OK
Feb 23	Council Bluffs	AA0BS (712) 322-1454	w/i OK	Virginia			
Maryland				Feb 16	Chesapeake	KC4YX 424-4764	
Feb 23	Laurel	(301) 572-5124	p/r pref; w/i	Feb 2	Middletown	NC4B (703) 869-5241	p/r pref
Mar 9	Salisbury	KB3MT (302) 436-8360	w/i	Washington			
Massachusetts				Mar 9	Pasco	N7LXY (509) 388-4951; (509) 783-8442	w/i
Feb 6	Agawam	Jeanette Platanitis (413) 786-1463	w/i	Wisconsin			
Feb 16	Melrose	WB1F (617) 322-7654	w/i	Feb 2	Racine	NW9P (414) 658-8390	w/i
Mississippi				Mar 2	Racine	NW9P (414) 658-8390	w/i
Feb 23	Keesler AFB	Stan Hecker (601) 875-9341	w/i				

Genuine *Seth Thomas* 24 Hour Quartz Clock



SPECIAL \$29.95
• 2.50 S/H
SAME DAY SHIPPING

B.A. FOX, INC.
LARRY-WA4LPV
113 N. Church St.
P.O. Box 8208
Spartanburg,
S.C. 29304

(803) 582-6464
Check/MO/VISA

No. 708 • 24-HOUR MANAGER.
Brown case. Shatter-resistant crystal.
Sleep second hand. True 24-hour
quartz movement.
Diameter 14" Depth 2 3/4"

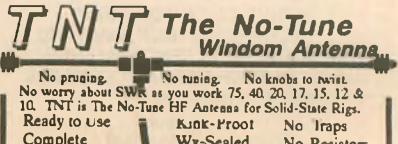
Matching 12 Hour Clock Also Available At Same Low Price
The Perfect Addition To Any Shack

CW Mental-Block BUSTER

Explode mental blocks about CW. Increase your speed. Based on 40 yrs. of research. Results Guaranteed. Not a CW practice tape.

\$24.95 ppd (NY residents add \$1.87 sales tax.)
PASS Publishing, Box 570, Stony Brook, NY 11790

TNT The No-Tune Window Antenna



No pruning. No tuning. No knobs to twist.
No worry about SWR as you work 75, 40, 20, 17, 15, 12 & 10. TNT is The No-Tune HF Antenna for Solid-State Rig.

Ready to Use
Complete
Includes 100 ft
RG-8x feedline

Kink-Proof
Wx-Sealed
3000 V Insul
Rated 300W

No Traps
No Resistors
No Pruning
No Trouble

TNT \$89.95
Window 137 ft. long

Add \$7 P&H
Infopack \$1

Box 50062-W, Provo, UT 84605 (801) 373-8425

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.

QSL SAMPLES — 25¢. SAMCARDS, 48 Monte Carlo Dr., Pittsburgh, PA 15239.

ELECTRON TUBES! Transmitting, receiving, military obsolete. . . all types. Large inventory. Fast delivery. DAILY ELECTRONICS, P.O. Box 5029, Compton, CA 90224. 213/774-1255, outside CA 800-346-6667.

MORSE TERMINAL KITS allow sending and receiving Morse Code with your computer. For Tandy Color (\$39.95), Tandy 1000 (\$49.95), and IBM compatible computers (\$49.95) plus \$3 shipping. Other products. Free Catalog. State computer type. DYNAMIC ELECTRONICS INC., Box 896, Hartselle, AL 35640, 205/773-2758.

SIMPSON MOD260 MULTIMETER — \$30.00. Like new. W6XM, 619/459-5527.

QSL T-SHIRTS. Your QSL card, photo, drawing, etc, enlarged to approx. 8x10 & transferred to white cotton T-shirt, 50/50 sweat. Excellent color & resolution. T's — \$16.00, sweat — \$20.00 + \$3.00 shipping. Sizes (S,M,L,XL). Satisfaction guaranteed. LAURELWOOD DESIGNS, 2728 SE Laurelwood Dr., Milwaukie, OR 97267.

ROSS' \$\$\$\$ NEW FEBRUARY (ONLY) SPECIALS: J.S.C. RG-213 500 ft. — \$150.00; Kenwood TS-940SWAT — \$1979.90, TH-75A — \$398.50, TH-225A — \$279.90, TH-27A — \$349.90, TH-315A — \$299.90, TH45AT — \$299.90, TH-46AT — \$339.90, TH-47A — \$359.90, TH-41BT — \$229.90, TH-31BT — \$229.90; ICOM IC-761 — \$2,229.90, IC-765 — \$2499.90, IC-725 — \$770.00; IC-471H — \$939.90, IC-2SAT — \$305.90, IC-24AT — \$484.90, IC-290H — \$449.90; Yaesu FT-1000D — \$3450.00, FT-411E — \$299.90, FT-470 — \$394.90, FT-747GX — \$709.90, FT-33R — \$259.90, FT-311RM — \$359.90, FV-101DM — \$229.90; TEN-TEC 585 — \$1,878.50, 562 — \$1859.90, 222 — \$29.90, 252-MOE — \$129.90; MFJ 1278T — \$299.90, 941D — \$98.90, 949D — \$134.90, 812B — \$27.50. Send SASE for used list. All L.T.O. (limited time offer) Looking for something not listed?? Call or write. Over 9,039 ham-related items in stock for immediate shipment. Mention ad. Prices cash, FOB Preston. Hours Tuesday-Friday 9:00 to 6:00, 9:00 - 2:00 p.m. Mondays. Closed Saturday & Sunday. ROSS DISTRIBUTING COMPANY, 78 South State, Preston, ID 83263. 208/852-0830.

CHASSIS & CABINET KITS, SASE, K31WK, 5120 Harmony Grove Rd. Dover, PA 17315.

POST CARD QSL KIT — Converts post cards, photos to QSLs! Stamp brings circular. K-K LABELS, P.O. Box 412, Troy, NY 12181-0412.

STAMP COLLECTORS — SASE brings my price list of Worldwide Ham Stamps. PHIL SAGER, WB4FDT, 411 Sparta, Ruston, LA 71270.

PERSONALIZED HOURLY HF SKYWAVE PREDICTIONS from your city or town: SKYCOM 1.1 floppy disk for Apple Macintosh or IBM PC and compatible personal computers. Includes complete mathematical description of theory (\$39.95). 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 (\$39.95). SASE for more info: ATTN: DX; ENGINEERING SYSTEMS INC., P.O. Box 939, Vienna, VA 22183. Ph 703/255-6600.

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.

AMATEUR RADIO REPAIR — experienced licensed, reasonable. ROBERT HALL ELECTRONICS, W6BSH, P.O. Box 280363, San Francisco, CA 94128-0363. 408/729-8200.

FREE ham gospel tracts, SASE, N3FTT, 5133 Gramercy, Clifton Heights, PA 19018.

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, March, April, May, September, October, November, 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 PAM MYERS, N8IAK, 510 W. Harrison, Alliance, OH 44601.

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.

IBM PC VIDEO DIGITIZER connects through the printer port, capturing up to 640 by 480 with 256 gray levels in 20 seconds. Includes software for CGA EGA, and VGA. Grabs can export pictures for DTP. Only \$89.98. More information send \$3.00 for sample disk. COLORBURST, P.O. Box 3091, Nashua, NH 03061.

BUILD 35' FREE STANDING TILT-OVER TOWER. Plan Book—\$8.95 plus \$1.00 s.&h. Build metal lathe, metal shaper, milling machine, drill press, brake, engines, etc. Large SASE for book list. GINGERY TOOL, P.O. Box 75, Fordland, MO 65652-0075.

ATTENTION TONO OWNERS! TCOM-777, a superb terminal program for your THETA-777 and IBM. \$25.00 or write for more info. R. LEWIS, P.O. Box 522, Garrisonville, VA 22463.

WANTED: BUY & SELL all types of electron tubes. Harold Bramstedt, C&N ELECTRONICS, 6104 Egg Lake Rd., Hugo, MN 55038, 1/800/421-9397 or 612/429-9397.

COMMODORE C64/C128 P.D. Amateur Radio, utility, business programs. Send SASE for list to WB1FOL, 77 Wentworth St., Malden, MA 02148.

CODE PROFICIENCY DRILLS are transmitted from WB31VO 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.

INTERESTED IN VHF-UHF-SHF try the VHFer now in its 10th year. Large SASE. VHFer, P.O. Box 685, Holbrook, AZ 86025.

TRANSMITTING TUBES WANTED FOR MUSEUM. Amateur or commercial. Tubes purchased, traded or donations welcome. All correspondence answered. Visitors welcome. K6DIA. YE OLDE TRANSMITTING TUBE MUSEUM, P.O. Box 97, Crescent City, CA 95531 707/464-6470.

HAM RADIO REPAIR CENTER quality workmanship. Solid state or tube, all makes and models. Also repair HF amplifiers. A-Z ELECTRONIC REPAIR, 3638 E. Indian School Rd., Phoenix, AZ 85018. 602/956-3024.

BROWNIE'S QSLs since 1939. Catalog & Samples \$1.00. 3035 Lehigh St. (REAR), Allentown, PA 18103.

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.

R390, R390(A) SSB ADAPTER, excellent SSB RTTY, solid-state, \$29.95. Ballast tube replacement, solid-state, \$22.50. No receiver modifications needed. G.B. COMMUNICATIONS, INC., 963 Birch Bay Lynden Road, Lynden, WA 98264.

FIVE WATTS! Only nine parts! 30/40 meter transmitter! All parts from Radio Shack! Complete plans — \$2 plus stamp! BILL LAUTERBACH, 1709 North West, #103, Jackson, MI 49202.

AMP REPAIR CENTER — 35 years experience. Former Service Manager with amplifier manufacturer. 90 day warranty OMEGA ELECTRONICS, 4209 Live Oak Road, Raleigh, NC 27604. 919/231-7373. 73, Bill K4BWC.

QUADS

Includes all necessary parts.
(Balun optional)
Many models to choose from,
including W.A.R.C. models.

UPS Shippable

For more information contact:
Lightning Bolt Antennas
R.D. #2, Rt. 19
Volant, PA 16156
(412) 530-7396

More MART

ROSS' \$\$\$\$ USED FEBRUARY SPECIALS:

Kenwood TS-830S — \$829.90, TS-930S WAT — \$1299.90, TM-521A — \$429.90, TM-721A, TSU-4 — \$549.90, BC-11 — \$69.90, TM-2550A — \$319.90, TS-440SWAT — \$1039.90; ICOM IC-R70 — \$495.90, IC-22A — \$139.90, IC-230 — \$139.90, 471A — \$589.90, IC-761 — \$1649.90, Yaesu FT-102/W MAG.SPPROC — \$566.90, FV-102DM — \$239.90, FTV-650B — \$169.90, Collins 32S-3, 75S3B, 516F-2, 312B-4, SM-2 all round \$1599.90, 30L-1 — \$999.90.

Looking for something not listed? Call or send SASE. Have over 190 used items in stock. Mention ad. Prices cash, FOB Preston. Hours Tuesday-Friday 9:00 to 6:00, 9:00 - 2:00 p.m. Mondays. Closed Saturday & Sunday. ROSS DISTRIBUTING COMPANY, 78 South State, Preston, ID 83263. 208/852-0830.

1991 CALLBOOKS: North American, \$25.60; International, \$25.60. Both \$49.60. 1991 ARRL Handbook, \$23.95. Postpaid USA. (California residents: add \$1.65 tax/book. DUANE HEISE, AA6EE, 16832 Whirlwind, Ramona, CA 92065. 619/789-3674 (eves).

HR 2510 MODIFICATIONS, frequency, RF power, SSB overdrive cures, Roger Beep, modulation, power mic wiring, \$10 automatic transmitter switching. Two radios on one antenna. Receive on both, transmits on either. A must for the radio enthusiast. Schematic and parts list. (Radio Shack part numbers) \$5. Send to: JACK FISHER, PO Box 612 B, Oceano, CA 93445.

NEED QSL CARDS? Ours are different! 90-110 lb card stock, all colors, no curl up! New designs, colors, photos. Low prices, most cards are \$25 for 500 cards. Try us you will be glad you did! High quality, fast service. N4ZDU, GILMORES PRINTING, Rt. 3, Box 1151, Oldtown, FL 32680.

RUSPRINT QSLs. New full color satellite!! ARRL, cartoon, patriotic, mike & key, telegraph keys, economy, historic, state outlines. Quantities start at 100. Plastic cardholders. Display 20 cards. Three-\$4.50. Four up \$1.30 each. More information? Business SASE with 45¢ postage. RUSPRINT, Rt 1, Box 363WR, Spring Hill, KS 66083.

MAKE BIG \$\$\$! Become an American Electronics dealer! Great profit opportunities for new businesses since 1965. Call NICK DELLEN, 1-800/872-1373.

WANTED, MODS FOR HALLICRAFTERS FPM-300II, ARRL Mobile Manual. K5TVC, 4303 Kingsway, Farmington, NM 87402.

WANTED: Knight-Kit KG686 RF gen. Manual/copy; Uniden CR-2021 receiver; WAØROI, Route 1, Polk City, IA 50226.

DON C. WALLACE, W6AM — The history of Amateur Radio, by Jan Perkins, N6AW. Hardbound, 450 pages. Prepublication price \$19.95, plus \$2 s&h. California residents add \$1.35 sales tax. Offer valid till 1/31/91. WALLACE & WALLACE, 11823 Slauson Avenue, Suite 38, Santa Fe Springs, CA 90670.

QRPers REJOICE! Heathkit HW-8 mods available in reprint of the first edition of *The Hot-water Handbook*. Send check or money order for \$6.75 (price includes 1st class postage) to RICH ARLAND, K7YHA, P.O. Box 522, Dallas, PA 18612-0522.

ALL ABOUT CRYSTAL SETS. Theory and construction of crystal set radios. \$7.95, ppd USA. ALLABOUT BOOKS, Dept. W, Box 14155, Fremont, CA 94539.

WANTED REPLY COUPONS of all types, IRCs & others. Buy, sell, trade. JIM NOLL, P.O. Box 3410, Escondido, CA 92033.

GET YOUR "FCC COMMERCIAL GENERAL RADIOTELEPHONE LICENSE". Electronics Home Study. Fast, inexpensive! "Free" details. COMMAND PRODUCTIONS, D-173, Box 2824, San Francisco, CA 94126.

THE 50 MHZ DX BULLETIN up-to-date worldwide 6M news. \$1.00 for info and sample. HARRY SCHOOLS KA3B, 1606 S. Newkirk Street, Philadelphia, PA 19145.

AMATEUR RADIO TRANSMITTERS, receivers, etc., that you can build dirt cheap. Write for list — WA4DSO, 3037 Audrey Drive, Gastonia, NC 28054.

LET THE GOVERNMENT FINANCE your Amateur Radio-related small business. Grants/loans to \$500,000. Free recorded message: 707/449-8600. (LH3)

RTTY JOURNAL published 10 times per year for those interested in digital communications. Read about RTTY, AMTOR, MSO'S, PACKET, RTTY DX and Contesting. Plus technical articles concerning the digital modes. \$15.00 per year (foreign higher). RTTY JOURNAL, 9085 La Casita Ave., Fountain Valley, CA 92708.

ALL ABOUT METERS. A Learn-by-doing history of the development of electrical meters. Build seven simple meters using common hardware. \$7.95, ppd USA. ALLABOUT BOOKS, Dept. W, Box 14155, Fremont, CA 94539.

QSL'S HIGH QUALITY, all quantities, best prices. \$1.00 brochure and samples. DON ELLIS, K3LQQ, 84 Chapel W., Zephyrhills, FL 33544.

WEEKLY HAM TRADER: Mailed First Class every Friday. Subscriptions \$13.00 for six months (26 issues) or \$25.00 for full year (52 issues) U.S.A. Canada/Mexico/International inquire. Ad rates 20 cents per word non-commercial, 40 cents commercial. Prepaid ads and subscriptions to: WEEKLY HAM TRADER, P.O. Box 1159, Arnold, MO 63010.

RECEIVER KENWOOD R-600 factory checked — \$285.00. W6XM, 619/459-5527.

Happy Valentine's Day !

RADIO STORE

VISIT YOUR LOCAL

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
(714) 761-3033
(213) 860-2040

Ham Radio Outlet
999 Howard Ave.
Burlingame, CA 94010
(415) 342-5757

Ham Radio Outlet
2210 Livingston St.
Oakland, CA 94606
(415) 534-5757

Ham Radio Outlet
5375 Kearny Villa Rd.
San Diego, CA 92123
(619) 560-4900

Ham Radio Outlet
6265 Sepulveda Blvd.
Van Nuys, CA 91411
(818) 988-2212

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

Quement Electronics
1000 So. Bascom Ave.
San Jose, CA 95128
(408) 998-5900

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

COLORADO

Ham Radio Outlet
8400 E. Iliff Ave., #9
Denver, CO 80231 • (303) 745-7373
FAX: (303) 745-7394 • (800) 444-9476

CONNECTICUT

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

FLORIDA

McClaran Sales, Inc.
P.O. Box 2513 • 1-800-331-6186
Vero Beach, FL 32961
Aluma Towers & GAP Ant.

Mike's Electronics
1001 N.W. 52nd St.
Fort Lauderdale, FL 33309
(305) 491-7110

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

IDAHO

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

MASSACHUSETTS

Tel-Com Inc.
675 Great Rd., Rt. 119
Littleton, MA 01460
(508) 486-3400 & 3040

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 HAMPSHIRE

Ham Radio Outlet
224 N. Broadway
Salem, NH 03079
(603) 898-3750

Rivendell Electronics

8 Londonderry Road
Derry, NH 03038
(603) 434-5371

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 Radio, Inc.
1280 Aida Dr.
Reynoldsburg (Columbus), OH 43068
(614) 866-4268 • (800) 431-3939

VIRGINIA

Ham Radio Outlet
14608 Build America Dr.
Woodbridge, VA 22191
(703) 643-1063

QSL CARDS—Look good with top quality printing. Choose standard designs or fully customized cards. Request free brochure, samples, (stamps appreciated) from CHESTER QSL's, 310 Commercial, Dept. D, Emporia, KS 66801. FAX 316/342-4705.

COMMODORE 64 HAM PROGRAMS — 8 disk sides—over 200 Ham programs \$16.95. 25¢ stamp gets unusual software catalog of utilities, games, adult and British disks. HOME-SPUN SOFTWARE, Box 1064-W, Estero, FL 33928.

NCL-2000 BAND SWITCH New, \$30 p.p. MAXIMILAIN FUCHS, 11 Plymouth Lane, Swampscott, MA 01907.

PARAGON QSL'S, seventeen two and three color or stock designs or your custom design. ARRL Member card. Prices start at \$19.95/100. DX or Contest specials, \$29.95M. Rubber stamps for every use. Send \$.45 SASE for samples. PARAGON STAMP, 190 Arboleda Rd., Santa Barbara, CA 93110.

WANTED: HAM EQUIPMENT AND OTHER PROPERTY. The Radio Club of Junior High School 22 NYC, Inc. is a non-profit 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. As 1991 begins please look over whatever unwanted equipment you may have, and call us. We will pick up or arrange shipping. You will receive the tax deduction, but most important, the privilege of knowing that your gift really made a difference in the education and upbringing of a child. Write us at: The RC of JHS 22 NYC, Inc., P.O. Box 1052, New York, NY 10002. 'Round-the-clock hotlines: Voice 516/674-4072, FAX 516/674-9600.

CONTEST TIME! Plagued by TVI? Can neighbors hear you on their telephone? TCE Laboratories can help you stay on the air. TVI filters @ \$24.95, telephone filters @ \$18.95, AC line filters @ \$42.95, RFI proof telephones available. Call 1-800-KILL-TV.

\$2.50 WORLD BEAM HEADINGS, 150 US cities selection with \$6.95 handbook purchase listing 330 countries, prefix, zones, time, DXCC, QTH/QSL info, world grid maps, 300 Pacific islands, grid maps. DX BLUE BOOK, Dept. W, 4920 Mayflower St., Cocoa, FL 32927. 407/632-6809.

THE SPEC-COM JOURNAL is published bimonthly, 6 times per year. Dedicated to Fast Scan Television but committed to covering slow scan television, facsimile, RTTY, ASCII, AM-TOR, packet radio, satellites, TVRO and all other specialized modes of communication. Now with thicker, color enhanced issues. Back issues and sample copies \$3.50 ppd. Annual subscriptions: USA \$20, Canada/Mexico \$25, foreign surface \$30. MC/VISA add 5% and Iowa residents add 4% for tax. KA0JAW has now joined WB0QCD to co-publish the SPEC-COM Journal for specialized amateur enthusiasts. Contact: MEMBERSHIP SERVICES, P.O. Box 1002, Dubuque, IA 52004-1002 or call 319/557-8791.

TEST EQUIPMENT FOR SALE: Cleaning out shack. Hewlett Packard signal generator model HP 608E, 10 to 480 MHz in good working condition — \$250. HP 415B VSWR meter like new, with crystal detector — \$175. Directional coupler same freq range — \$225. All three pieces for a complete professional VSWR set-up — \$500. HP 606-B 50 KHz to 65 MHz sig gen, reconditioned like new — \$200. Global-E&L instruments capacitor checker, digital, like new with IB — \$175. New Elenco model F-1000 digital frequency counter with IB, to 1 GHz — \$225. Prices include boxing and UPS shipping costs within continental U.S. PETER ONNIGIAN, W6QEU, 1236 40th Ave., Sacramento, CA 95822 916/381-4469 during normal office hours, Pacific time.

WANTED: U.S. AMATEUR CALLBOOKS 1920 THRU 1945. BOB, W4JNN, 703/560-7161 or write P.O. Box 166, Annandale, VA 22003.

C64 SSTV SOFTWARE. Receive, transmit pictures, schematic, one IC interface included — \$19.95. R.P. ROBERTS, Box 423, Waterford Works, NJ 08089.

TEN-TEC, NEW BOXED LATEST 1991 PRODUCTION MODELS, USA made, 562 OMNI V, 585 Paragon transceivers, 425 Titan, 422 Centurion, 420 Hercules linear amplifiers, 238, 253, 254 antenna tuners, 239, 240 dry dummy loads, mobile HF antennas, keyers, cabinets, filters and accessories, VISA/MC or check. For best mail-order deal, write/phone Bill Slep 704/524-7519, SLEP ELECTRONICS COMPANY, Highway 441, Otto, NC 28763-0100.

RTTY-PC COMMUNICATIONS program: multi-featured and easy to use! Not a terminal program to operate a multi-mode controller, but a genuine Baudot (RTTY) RX/TX program! Dedicated to HF RTTY (does ASCII, too). Type-ahead buffer, printer/disk functions. One key sends your pre-composed 'message.' Change/view messages while receiving. Help screen. Customizable. Many other features. Works with your IBM PC-XT-AT-PS/2 or clone, interface, & transceiver. Requires 256K, RS-232 port. Manual is on disk; bound manual \$6.00. Free brochure available. Now with 45 day no-questions-asked money-back guarantee if not satisfied! RTTY-PC version 1.07 is only \$29.95 + \$3 s/h (free s/h if ordered by mail). VISA/MC accepted. COMTECH RESEARCH, 5220 Milton Rd, Dept. 3, Custar, OH 43511. 419/278-6790.

WANTED: Instruction manual for operating EICO Model 232 VTVM. MEYER MINCHEN, AG5G, 4635 SW Fwy, Houston, TX 77027, 713/622-6161.

BLEEP BLOOP. Very distinctive dual tone NASA style beeper announces the beginning and end of each transmission. Assembled and tested \$21.00 ppd. JOHN DAY, Box 67032, Scotts Valley, CA 95067.

STAINLESS STEEL U-BOLTS, turnbuckles, eyebolts, screw eyes, bolts, screws. Small quantities, free catalog. ELWICK, Dept. 801, 230 Woods Lane, Somerdale, NJ 08083.

FREE BUTTERNUT HF6V VERTICAL with instructions. Moving. You pick up. Glendale, CA. 818/244-7821.

RADIO MODIFICATIONS: HF all band transmit; V/UHF frequency expansion. \$1.00 each + SASE. List — SASE. SOUTHERN PATUXENT GROUP, 1445-W Parran Rd., St. Leonard, MD 20685.

ADVERTISERS' INDEX

- | | | |
|---------------------------------------|---|---------------------------------------|
| A & A Engineering — 24 | Gene Hansen Co. — 16 | N4EDQ Amateur Radio |
| A.R.C. — 6 | GGTE Morse Code — 26 | Sales & Service — 16 |
| Ace Communications — 45 | Glen Martin Engineering — 48 | NCG Companies — 6 |
| Alabama Amateur Electronics — 28 | Grapevine Group, Inc. — 20 | P.C. Electronics — 15 |
| Alinco — 23 | H & M Jewelry Co. — 27 | Palomar Engineers — 7, 22, 29, 33, 49 |
| Antennas West — 6, 12, 14, 26, 52, 55 | HAAM Radio 4+6+9 — 51 | Pass Publishing — 20, 22, 55 |
| Antennas, Rudy Plak — 3 | Ham Radio Outlet — 30, 31 | Pauldon Assoc. — 28 |
| Antique Radio Classified — 60 | Ham-Pro Antennas — 21 | Personal Database — 53 |
| Avant Systems — 33 | Handi-Tek — 33 | QCWA — 11 |
| AXM Inc. — 46 | Henry Radio — 2, 19 | Radio Engineers — 22, 45 |
| Azimuth — 46 | ICM — 37 | Radio Place — 36 |
| B.A. Fox, Inc. — 55 | ICOM — 60 | Radio Works — 50 |
| Battery Tech — 44 | IIX Equipment, Ltd. — 34 | rf concepts — 35 |
| Brian Beezley, K6STI — 56 | IMRA — 39 | RLD Research — 14 |
| Broadcast Tech. Services — 49 | Industrial Communication Engineers, Ltd. — 47 | Signalcraft Co. — 14 |
| Butternut Electronics — 10 | Jun's Electronics — 25 | Synthetic Textiles, Inc. — 14 |
| C.A.T.S. — 45 | Kilo-Tec — 49 | Tiare Publications — 43 |
| Callbook — 39, 54 | Lakeview Co. — 12, 32, 40 | Tibi Productions — 4 |
| Comm-Pute Inc. — 27 | Lanz Company — 11 | TNR Technical, Inc. — 24 |
| Courage Center — 4 | Lightning Bolt Antennas — 57 | Universal Radio — 32 |
| DX Edge — 40 | Mauro Engineering — 27 | Van Gorden Engineering — 7 |
| Embroidery Warehouse — 43 | Maxcom — 34 | Visit Your Local Radio Club — 41, 42 |
| Engineering Systems — 51 | McClaran Sales — 8, 56 | Visit Your Local Radio Store — 58 |
| EPO Software — 38 | Media Mentors — 12 | W5YI-VEC — 32 |
| Fallert's Engraving — 52 | MFJ — 13, 17 | W9INN Antennas — 26, 28 |
| | Mike Forman — 59 | Williams Radio Sales — 18 |
| | | Yaesu — 5 |

CLASSIFIED ADS FOR JOBS WANTED OR POSITIONS OFFERED will be run free of charge in **Worldradio's MART**.

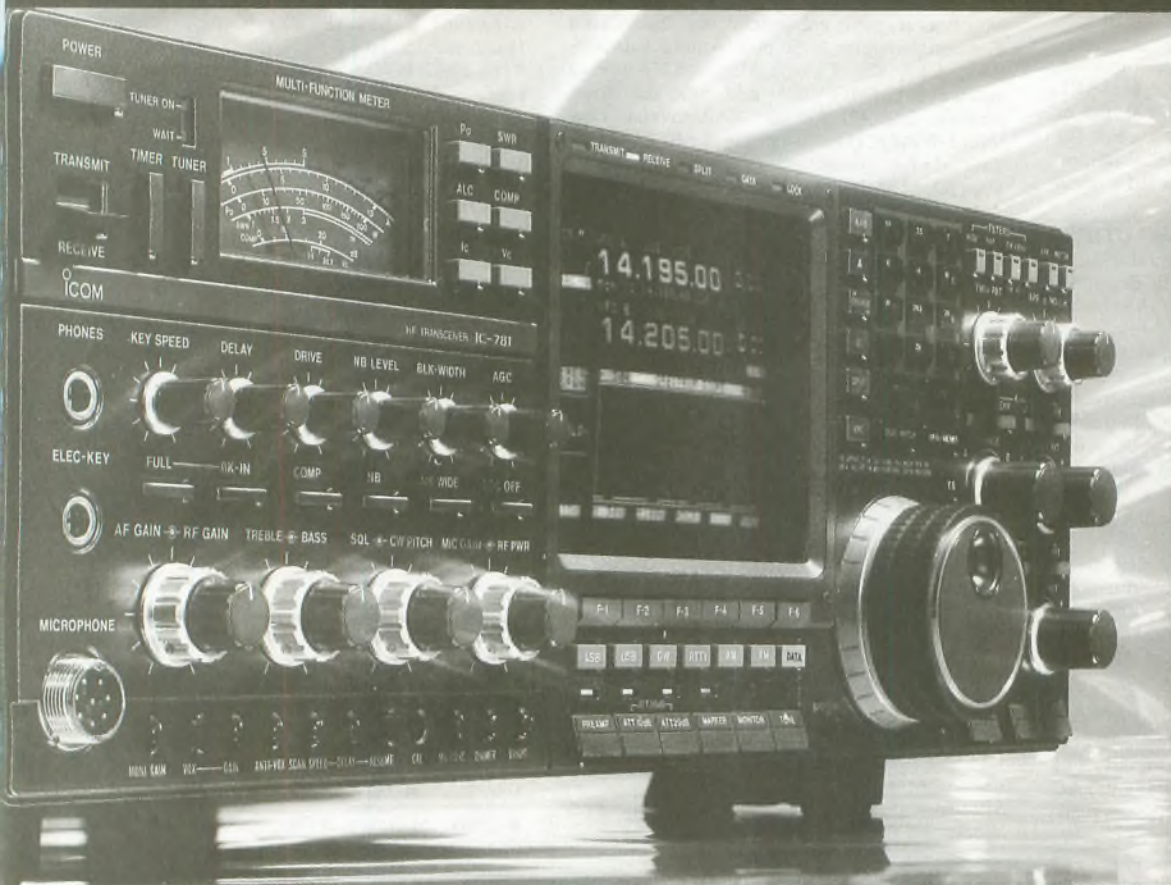
Wanted: TUBES

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

THE LAST WORD IN PERFORMANCE

THE ICOM
IC-781
HF TRANSCEIVER



Nothing compares to the captivating experience of operating the finest transceiver on the market, the IC-781. The exhilaration of operating the IC-781 is matched only by the luxury of its crystal clear communications.

Designed for rigorous operation, the IC-781 is the result of extreme dedication, exceptional craftsmanship and precision engineering. The IC-781 fuses the perfect blend of features such as driving power, incredible clarity, a Multi-Function CRT Display, Spectrum Scope and Icom's exclusive DDS System to achieve unbeatable HF operation worldwide.

Whether you aspire to DX, contest or enjoy legendary performance, the IC-781 inspires countless hours of devoted attention. Backed by a service commitment second to none, four factory service centers and a one-year factory warranty, the IC-781 characterizes Icom's dedication to excellence.

For full details call the Icom Brochure Hotline at 1-800-999-9877.

CORPORATE HEADQUARTERS:
ICOM America, Inc. 2380-116th Ave. N.E., Bellevue, WA 98004
CUSTOMER SERVICE HOTLINE (206) 454-7619
CUSTOMER SERVICE CENTERS: 3150 Premier Drive, Suite 126, Irving, TX 75063
1777 Phoenix Parkway, Suite 201, Atlanta, GA 30349
3071 - #5 Road, Unit 9, Richmond, B.C. V6X 2T4 Canada
2380-116th Ave. N.E., Bellevue, WA 98004

All stated specifications are subject to change without notice or obligation.
All ICOM radios significantly exceed FCC regulations limiting spurious emissions. 7011150


First In Communications

Give your Amateur Radio friends (or yourself)
a gift that lasts all year



Worldradio

...for what's going on in the
world of Amateur Radio



Please enter (or renew) my own subscription

Name _____

Address _____

City _____

State _____ ZIP _____

- 12 issues: \$13
- 24 issues: \$25
- 36 issues: \$36
- Lifetime: \$130

- New Renewal
- Check enclosed
- VISA MC American Express

For delivery to non-US ZIP please add \$10/yr.

Card# _____ Exp. date _____ Signature _____

Please enter (or renew) a gift subscription to

Name _____

Address _____

City _____

State _____ ZIP _____

- 12 issues: \$13
- 24 issues: \$25
- 36 issues: \$36
- Lifetime: \$130

- New Renewal

Sign the gift card _____

I wish (do not wish) to be billed for the renewal of this gift.

For delivery to non-US ZIP please add \$10/yr.



Worldradio

201 Lathrop Way, Ste. D • Sacramento, CA 95815 • 800/365-SUBS



Second-class
postage paid
Sacramento, California
and additional
mailing offices

(USPS 947000)
PO Box 189490
Sacramento, CA 95818

POSTMASTER: Send
changes of address to above
(Please include mailing label.)