

Worldradio

Year 20, Issue 10

April 1991 • \$1.25

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QRP computers

Radio rescues — *Talaria*

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YL Roundup — Involving "young" YLs



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Worldradio

Year 20, Issue 10

April 1991 • \$1.25

A tale of radio rescues

SONNY IRONS, KA4LEG

During the five years we lived at West Caicos on board our 53 ft. salvage tug, *Final Victory*, we were involved in numerous boat rescues. Radios played an important part in the discovery of the disasters and in completing these rescues. In many instances, had there been no radios for communications, vessels and lives would undoubtedly have been lost. This is the story of one such rescue.

TALARIA (part one of two)

Talaria was a 37 ft. sailing vessel. She was rigged as a yawl and had a small gasoline engine for auxiliary power. She was a beautiful boat and well maintained.

Herb, K1SXZ, and his wife were sailing from Boston, Massachusetts to the Caribbean for the winter and would then return to her homeport in the spring.

As my wife, Judy, and I listened on 7.268 (The Waterway Net), we heard *Talaria's* progress down the American coast. Herb was a very efficient radio operator and I formed a mental image of him, not knowing that we were destined to provide assistance to him in months to come.

(continued on p.6)





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Your ham horoscope

T. Sturdly Zort, AE7K, your amiable stargazer

Aries (March 21-April 19)

A tall, dark, handsome stranger will knock at your door. He is a bill collector, looking for payments on your Dragon TR700. Pay him or see it go on a DXpedition to your bank. Count your blessings.

Taurus (April 20-May 20)

An attempt at upgrading succeeds. Because you already have an Extra, FCC sends you a Certificate of Questionable Sanity, suitable for framing. You have so many fillings that brushing your teeth causes TVI.

Gemini (May 21-June 20)

Watch what you eat and drink. If you are at a ham swapfest, watch it but do not eat it. If it watches you, well, what else did you expect? That military surplus Super Stealth technology rig you bought at this swapfest for \$5 brings a team of CIA/NSA/DIA agents to your door.

Cancer (June 21-July 22)

Enlarge your personal and business contacts. If they are large already, forget it. For the first time your club's Field Day score outnumbers beer cans

and bottles left behind. Avoid controversy. Or pay your insurance premiums. Or both.

Leo (July 23-August 22)

Floods completely surround your house with water, and you claim your house a new DXCC country. The ARRL sends you a Certificate of Questionable Sanity, suitable for framing. Your cat goes on a DXpedition to Switzerland to take yodelling lessons.

Virgo (Aug. 23-Sept. 22)

Enthusiasm will be high. Excoriate your opponents vigorously but tactfully. Your pet elephant refuses to take you howdah-mobile. Your QRP rig chirps badly, until it hatches a buzzard egg. Your family eats omelettes for a week. Be affectionate.

Libra (Sept. 23-Oct. 22)

Expect an inheritance. But first, expect a relative to croak. UFOs destroy your OSCAR antennae. UFOs decorate OSCAR-46 with baubles, bangles and beads. AMSAT awards you a Certificate of Questionable Sanity, suitable for framing.

Scorpio (Oct. 23-Nov. 21)

While digging up your back yard to add more radials, you discover a pot of gold. Assert yourself. Contact influen-

tial people. Make another payment on your Dragon TR700, or else.

Sagittarius (Nov. 22-Dec. 21)

You put an anchovy pizza in your CD player by mistake. It sounds so much better than what you normally listen to that you decide to leave it there. Avoid needless arguments. Smile more often. Buy more horoscopes—I need \$\$.

Capricorn (Dec. 22-Jan. 19)

Your patent application for a Kielbasa Antenna is rejected. You decide to re-design it, this time without mustard. The US Patent Office sends you a Certificate of Questionable Sanity, suitable for framing. Your second cousin twice-removed is removed even farther by some guys in white coats.

Aquarius (Jan. 20-Feb. 18)

Set priorities carefully. Be polite to relatives. Your cat returns from yodelling lessons able to send better packets than your \$3000 data controller. Your 75M roundtable is jammed by King Arthur, who wants it back.

Pisces (Feb. 20-March 20)

Your hamshack wall collapses from weight of so many Certificates of Questionable Sanity, suitably framed. □

If you're not subscribing to Worldradio, you're missing a lot of Amateur Radio news.

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We now bring you a list of your friends and neighbors, those clever enough to slip under the wire and get their Worldradio Super Booster (Lifetime Subscriber) high status before the staggering postal increase caused us to raise the price: Paul Herrmann, W2JDK, Lockport, NY; Anton Anker, KD3CD, Apollo, PA; Mark Lawyer, W3ZY, Hanover, PA; John Shoultz, N3HIS, Lititz, PA; David Welker, WB3AMO, Sunbury, PA; Alfred Horn, NW3P, Wilmington, DE; David Bridge, KB3MT, Selbyville, DE; Maj. Gary Jordan, KB4VIR, Niceville, FL; Robert Cole, K8IZK, Cincinnati, OH; Fred Peerenboom, KE8TQ, Dayton, OH (See you there the last weekend of April!); Linda Volz, N8ISV, Fairview, MI; A.A. Smith, Jr., KB0KF, Grand Junction, CO; Dale Szabo, KB6DRA, Wildomar, CA; Richard Thompson, WA6NOL, Santa Ana, CA; Jim Brunk, N6BHX, Martinez, CA; Bob Ripley, WA6BYD, Rancho Cordova, CA.

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A note from one reader said, "Have you ever considered offering an extended payment plan for those folks desiring to be a life member? Extending payments over a three to six

month period might help younger or less affluent hams support your magazine. I appreciate the accounting complications it might cause, but I'll bet it would be worth the effort in the long run."

Sure, we'll go along with whatever anyone would like. Quarterly over a year, or whatever is convenient. Only one thing: send your special arrangement request to our 28th Street address, not the computer house on Lathrop.

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In the February issue we identified world famous Curtis Spangler as W6ECT, when everyone surely knows his call is N6ECT. Apologies. Blame the gremlin.

Got a nice note from W4WL . . . He said he has been having a grand time with radio since 1920. He's now 83 years young. So much for how bad RF can be for you.

The way it should be here! JA5FHB, Katsutsugu Sekiya, was just appointed as Minister of Posts and Telecommunications (their FCC) in Japan.

We receive many hundreds of local radio club bulletins and newsletters (and would like to receive even more). Each is given close attention.

I really like this thought from The Groundwave, Daytona Beach (FL) ARA: "The tradition of ham radio has always been a brotherhood of each one helping another to move forward with new knowledge and accomplishment."

Speaking of bulletins, we always read about balky generators after Field Day. Generators?? Running a car battery is so much better. Give it a try, take a couple per rig. Speaking of FD, we'll be trying something different this year. Please listen for November Six Whiskey Romeo.

Richard Painter, WA6KUI/4, Nashville, TN, sent in the January issue of The Tennessee magazine in which there was a nice story about MARS operators David and Betty Pope (no calls given) in Mercer, TN.


MARS is pretty busy these days. I remember one MARS station I saw in 1967 at a place called Dong Ha.

— Armond, N6WR

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TALARIA

(part one of two)

(continued from page 1)

I could tell from Herb's radio conversations that he was a man used to working and playing by a fixed schedule. He would outline his itinerary with clock-like precision. After many years at sea, I had learned to say, "weather permitting." A fact of sailing life is that the weather and sea conditions sometimes preclude our best laid plans. Herb appeared to still have that lesson to learn. And learn it well, he did.

Our first direct radio contact with Herb was while he proceeded down through the lower Bahama Islands. *Talaria* was coming down the west coast of Mayaguana Island, and Herb wanted to anchor for the night in Abraham's Bay. He complained about the lack of information in the guide book and at the featureless chart spread across his lap. "Not much detail shown for Abraham's Bay," he said. On the radio, I explained to Herb that I knew Abraham's Bay very well, having spent two months there while salvaging the abandoned Air Force base, just north of the bay. I explained that I had surveyed the bay and had produced my own chart. I encouraged him to enter from the west end of the bay. He told us that he had already rounded the western point and was headed southeastward to where he saw a small opening in the reef at the east end. I further suggested that he return to the western entrance as it was the easiest approach. I guess that Herb was loath to retrace covered ocean, and he stated his intention to make entrance at the east end near the supply dock shown on his chart.

Within an hour, we heard a slightly agitated Herb back on 7.268. Seemed he was aground on a coral head just inside of the reef opening. It was getting dark, and he wasn't sure which way to kedge off and if there were any other obstructions on his approach to the bay. I had already unrolled my Abraham's Bay chart and laid it on the chart table in *Final Victory's* wheelhouse. Back on the radio, I asked Herb to give me two bearings, one to the end of the supply dock and the other to the water tank at the Air Force base. Within a few minutes, Herb was back at the mike with the two bearings. I was able to plot the bearings, and they intersected right on top of a coral head shown on my chart. We instructed Herb to kedge off to the northeast and then to proceed on a certain heading for a short distance to a spot of clear sand just inside the Bay. Herb and his wife soon freed themselves and anchored on

the clear sand, with no damage to their vessel. Herb was glad we had that chart and thanked us. Just another courtesy between cruising boatmen. Happens all the time. But Herb still hadn't learned his lesson, as it turned out.

The next day was time for our monthly voyage to Cap Haitian, Haiti for supplies for our development on West Caicos. Twelve hours later, and *Final Victory* was securely tied to the pier in Cap Haitian. I was surprised that evening to find *Talaria* tied alongside of us, when we returned to the pier after picking up 400 bags of mangoes for shipment to Providenciales. During our enjoyable evening with Herb and his wife, I found that my mental image of Herb's physical features were naturally wrong, but I thought about how accurately I had pegged his cruising philosophy. Judy and I tried to get them to stay in Cap Haitian another day so we could show them around. "Love to," Herb said, "but we are on a schedule. Have to take off in the morning." They did. Bound for St. Thomas, I think.

About the time I had almost forgotten about *Talaria*, it was spring and Herb and his wife were passing by West Caicos on their way back north. We talked on 7.268 for a time as I tried to get them to stop at West Caicos for a visit. The weather was deteriorating with winds 25-35 knots from the northeast. Seas were running 10 to 12 ft., and prospects were for worsening conditions. Herb, of course, knew all of this, but dismissed it as he told us he was on a schedule and had to be back in Boston by such-and-such a date. As a helpful suggestion, I told Herb it would be safest if he would sail up the west coast of Mayaguana, all the way to Pirate's Wells, before turning west to cross the north coast of Plana Cays and Crooked/Acklins Island. Herb asked why, so I explained that because of the bottom declivity between Plana Cays and

Crooked/Acklins, seas often build up to enormous sizes. Also, the Boiler, a rock three miles off of northeast point, is unlighted and very dangerous. "It forms a trap for a sailboat," I explained.

"Thanks, but I think it is shorter to go south of Plana Cays," answered Herb.

"Over and out," I concluded, thinking that maybe Herb was in too much of a hurry.

The weather got much worse that night, and as we had our dinner at the galley table, rolling from gunwale to gunwale and listening to the shrieking wind in our own rigging, I thought about the *Talaria*. That night I left the intercom on from the wheelhouse to the aft stateroom so we could listen for Herb. Just foreign broadcast stations on 40M. We slept.

About 6:00 a.m., all hell broke loose on 7.268. "Mayday, mayday, mayday, this is K1SXZ, *Talaria*. Does anyone read me?"

"*Talaria*, this is the tug *Final Victory*. What is your position and condition?"

Herb explained in an unbelievably calm voice that he was just south of the Boiler near Crooked/Acklins Island. The wind and seas had grown tremendously during the night. Before dawn his mainmast rod rigging snapped, and the mast came down. The rod rigging kinked and came across the deck like a scythe. It damaged the cabin and caught Herb's wife behind the knee, creating a terrible gash. Herb had anchored in about 60 feet of water with seas up to 30 feet high breaking over his little boat. Already he had lost an anchor. His last two anchors were now down, but the rope was chafing seriously. Something had jammed the propeller so that his auxiliary engine was useless. Herb explained his predicament with calm clarity. If his anchors let go, he would be washed up onto the reef. He doubted if they would survive a crash on that reef. I knew that reef well and confirmed his assessment. His wife had a tourniquet on her leg. She was down below, but the boat was being nearly rolled over in the breaking surf. Herb described the interior of the cabin, "Everything is smashed and there is even blood splattered on the overhead." Herb said his wife was brave, but she needed medical attention urgently. "Can you come over with *Final Victory* and get us off *Talaria*?"

Looking at my chart, I found that it was 100 nautical miles to *Talaria*. At 10 knots—10 hours. Herb didn't think that either his wife or *Talaria* would make it for ten hours.

Will the Talaria make it? See next month's Worldradio for this story's exciting conclusion. □

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Special radio classes

The San Benito Amateur Radio Club in Texas sponsors radio classes in the Rio Grande Valley for the Novice and Technician tickets. These classes are unique because the majority of students are between the ages of nine and 13. Club president and instructor Fred "Al" Wasielewski sees great opportunity in preserving the Amateur Radio hobby by getting young people involved.

Wasielewski himself received his first ticket at the age of 13, after he took an interest in radio and started absorbing as much technical information as he could find. Then, noticing the antenna farm of his neighbor, he in-

roduced himself and acquired a qualified elmer, Ed Wilcox. Wilcox taught Wasielewski all about Amateur Radio, including Morse code.

Wasielewski went on to form the San Benito ARC. The students photographed here have just successfully finished their Novice or Technician classes. Also part of the graduating class, though not shown here, are John E. Stein; David Garza and Anthony Garza (age nine); and Leon Watson (age 80!). What started out as a 12 week course was completed in six weeks by this group, and four kids have already passed their Novice.

All the kids are part of the Faulk In-

termediate School in Brownsville. This radio class is particularly interesting in that the Faulk school teachers are also enrolled. Tom and Bob Havens, instructors of Earth sciences and computer literacy, respectively, are brothers (their father, 80, is also a club member) and they are, along with Roger Watson, all teachers of these kids!

Because of the economically deprived situation of these kids, the radio classes are offered for free except for textbooks which were, for this class, mostly supplied by the radio club. The San Benito ARC is a non-profit, ARRL affiliated special service club (#2247). These free classes are offered three times a year. Those who can afford it are asked to make a donation to the SBARC Scholarship Fund which is awarded annually to a graduating senior of San Benito Senior High School.

The club also sponsors the 146.66 repeater and is associated with RACES, MARS, ARES and NWS, Brownsville. The SBARC is the only special service club of its kind in the Rio Grande Valley, its network covering an area from South Padre Island to Rio Grand City. □



Front row (left to right): Beatrice Gonzalez, Zugay "Sugar" Ontiveras, Erika Villalon, Elvia Gonzalez, Abe Guevara and Omar Cantu; second row: Roger Watson, Fred "Al" Wasielewski (WA2VJL), Tom Havens and Bob Havens.

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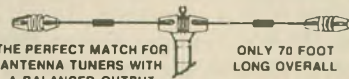
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G5RV ANTENNA



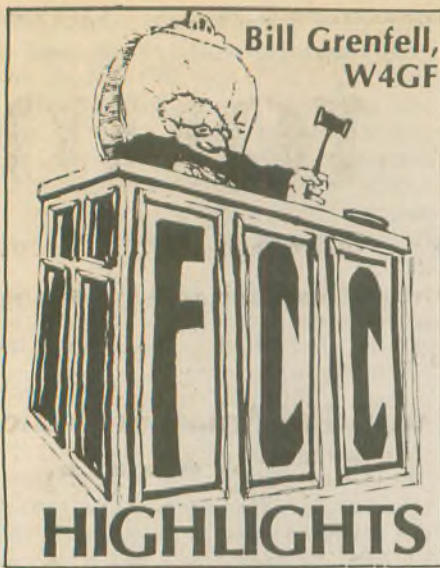
The G5RV MULTIBANDER antenna is an excellent all band (3.5-30 MHz) 102 foot dipole. On 1.8 MHz the antenna may be used as a Marconi type antenna when used with a tuner and a good earth ground. The proper combination of a 102 foot flat top and 31 feet of 300 ohm KW twinlead transmission line achieves resonance on all the amateur bands from 80 through 10 meters with only one antenna. There is no loss in VSWR and SWR. 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 xfmr or cable, with 31' bal. feedline)	
G5RV JR	40-10	51'	\$29.95 PPD
		(no xfmr or cable, with 26' bal. feedline)	

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Convicted felon Michael Harrison is no longer WB2PTI. He pleaded "no contest" to the charges which put him in prison. Harrison pleaded guilty of advertising non-existent Amateur equipment at low prices, resulting in a 21 month prison sentence, a \$125,000 fine and a requirement that he make full restitution to all whose orders he failed to deliver. The FCC's revocation of the WB2PTI call sign was based on the rules which make felons unqualified for an FCC station license. (*Westlink Report*, 1/4/91)

International Amateur Radio Network (IARN) founder Glenn Baxter, K1MAN, has again been cited by the FCC for alleged violations of Part 97. Although several other Amateurs have been cited and fined for violative operations on the HF bands, Baxter's \$3,400 fine total now registers the highest dollar amount. Baxter contends that the FCC does not have the authority to levy fines; only the courts can. He objects to the forfeitures being called fines since "it carries an implication of guilt." Baxter's 45-minute broadcasts are transmitted 44 times a week on 80,

40, 20 and 10M. He has paid none of the forfeitures and has threatened the FCC with a lawsuit. Meanwhile, his transmissions continue generally as before. One exception is that he now refers to his transmissions as "bulletins" instead of "broadcasts" most of the time. The transmissions still elicit catcalls and QRM from unidentified Amateurs. The first violation notice, sent last August, did not carry a fine. It was followed by several NALs, each of which carried monetary forfeitures.

The 80M Novice band is moving south. The FCC acted on January 4 to relocate the 80M Novice/Tech CW sub-band to 3675-3725 kHz. Since Novice 80M privileges were created, the sub-band had been 3700-3750 kHz. In announcing the frequency shift, the FCC noted that the change will reduce the problem of mutual interference between Canadian Amateurs and hams in the US. It also says that the change will benefit Novice and Technician Class operators by giving both more of an opportunity to sharpen up on their CW skills. At the same time the shifting of the 80M Novice segment was approved, the Commission acted to deny an ARRL request to enlarge the sub-band by another 25 kHz. This, the FCC

says, would create more interference rather than less. No effective date for the change has yet been announced. (*Westlink Report*, 2/1/91)

A bill to prevent the loss of radio spectrum by the Amateur Radio Service was introduced, on the first day of the new 102nd Congress, by Rep. Jim Cooper (D-Tennessee). Cooper is a member of the House Subcommittee on Telecommunications and Finance, where the bill is likely to be referred for consideration. The bill, The Amateur Radio Spectrum Protection Act of 1991, is designated as HR73. The legislation proposes that "the Federal Communications Commission shall not diminish existing allocations of spectrum to the Amateur Radio Service after January 1, 1991."

In commenting on HR73, the president of the ARRL, Larry Price, W4RA, welcomed Rep. Cooper's support of the Amateur Radio Service and expressed the hope that many congressmen will join him as co-sponsors. Mr. Price acknowledged that Amateur Radio has many friends on Capitol Hill, and he pointed out the success in defeating unreasonable license fees in 1989 as evidence of that.

In the findings portion of his bill,

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 Feb. 1, 1991.

Reminder: A unique call sign is assigned to each amateur station during the processing of its license. A new call sign is sequentially selected from the alphabetized regional-group list for the licensee's operator class and mailing address. Each call sign has a one or two letter prefix and a one, two, or three letter suffix separated by a numeral indicating the geographic region. Certain combinations of letters are not used. When the call signs in any regional-group list are exhausted, the selection is made from the next lower group.

Because the FCC does not reassign call signs which have been dropped from the computer data base, and because the "N" series of the Group "C" call signs are nearly exhausted in some radio districts, Group "D" will reflect Technician/General Class licenses as well as Novice Class licenses.

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 17325-7245.

Radio District	Group A Am. Extra	Group B Advanced	Group C Tech./Gen.	Group D Novice
0	AA0DK	KF0PH	N0MWW	KB0IHL
1	WO1M	KC1ZG	N1JVV	KA1YFA
2	AA2DD	KE2ZF	N2LPZ	KB2MDB
3	WJ3L	KD3VN	N3IVB	KA3YKP
4	AC4CL	KN4VS		KC4VNV
5	AA5WV	KI5NF	N5RZI	KB5OUF
6	AB6AP	KK6VV		KC6RJT
7	AA7HH	KG7MK	N7QEI	KB7MPU
8	AA8DC	KF8LE	N8NIS	KB8LTE
9	WY9R	KF9BG	N9KMA	KB9GFA
North Mariana Is.	AH0J	AH0AG	KH0AM	WH0AAP
Guam	KH2O	AH2CI	KH2EW	WH2AMU
Johnston Is.	AH3D	AH3AD	KH3AE	WH3AAG
Midway Is.		AH4AA	KH4AE	WH4AAH
Hawaii		AH6KW	NH6YH	WH6CJY
Kure Is.			KH7AA	
American Samoa	AH8D	AH8AE	KH8AI	WH8ABA
Wake Wilkes Peale	AH9A	AH9AD	KH9AE	WH9AAH
Alaska		AL7MR	NL7VY	WL7CAJ
Virgin Is.	NP2J	KP2BV	NP2EC	WP2AHF
Puerto Rico		KP4RM		WP4JUC



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- *DX-a plenty!
- *Made by Terlin Aerials! Australia's leader in HF whips.
- *Same commercial design proven in the rugged Outback for 15 years!

There is an adjustable spike for low SWR. Shaft constructed of fiberglass with pre-tuned copper helical windings. Exterior covered with smooth, epoxy resin, and polyurethane for strength, durability, and protection. Tap points are clearly engraved for each band. Sockets are made of rust-free brass. WANDER LEAD used for quick, easy manual band changing. You just plug it into lowest socket, then wind it counterclockwise to desired band. Wander Lead is removed for 75m operation. Mounting ferrule is nickel-plated brass with standard 3/8x24 stainless steel stud. Optional spring and base, the industry's best bar none! Spring is heavy-duty zinc-plated spring steel. Rust-free base is two inches in diameter with a SO-239 on the side and a 1/2 inch hole on the bottom for mounting.

OUTBACKER - 300 watts PEP, 6 ft., 75, 40, 20, 17, 15, 12, 10 meters
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OUTBACKER JR. - 150 watts PEP - 4 ft. long - 75, 40, 20, 17, 15, 12, 10 meters
Model # OBJR-7 \$209.00

OUTBACKER SPLIT - 6 ft., 300 PEP, breaks down into two 3ft. sections for easy storage, pouch included, 75,40,20,17,15,12,10 meters
Model # OBS-7 \$269.00
3 section \$299.00

OUTBACKER MARINER - 300 watts - 6 ft. long - Amateur bands: 75, 40, 20, 15, 10 meters/ ITU Marine bands: 4.1, 8.2, 12.4, 16.5, 22.1MHz, requires 3/8-24 mount. Model # OBM \$389.00

Options: 500 watts, 6ft. only, add \$30.00. 30 meters for any models, add \$20.00.

* Spring and base \$65.00
* Terms: check, money order, UPS brown \$5.00, UPS blue \$10.00, C.O.D. add \$4.50

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Rep. Cooper states that nearly one half million radio Amateurs are licensed by the FCC after thorough examination in radio regulations and technical principles of radio communications; that Amateurs operate their stations solely with a personal aim and without pecuniary interest; that one of the basic purposes of the Amateur Radio Service is to provide voluntary non-commercial radio services, particularly emergency communications; and that emergency communication services by volunteer radio Amateurs "have consistently and reliably been provided before, during and after floods, tornadoes, forest fires, earthquakes, blizzards, train wrecks, chemical spills and other disasters." However, he also notes that the FCC has taken actions which resulted in the loss of over 100 MHz of spectrum to Amateurs. (ARRL News Release, 1/8/91)

And, as many already know, the FCC has eliminated the need for new Techni-

cian Class Amateur Radio license applicants to demonstrate proficiency in Morse code in order to have all Amateur privileges above 30 MHz. Technicians who have obtained their licenses prior to February 1991 will be grandfathered, meaning that their existing HF privileges will continue. The new "codeless" Technician written examination will have 55 questions. New Technicians wishing to gain access to HF privileges below 30 MHz will be required to pass a 5 wpm Morse code test before three accredited VEs, and if they pass, they will be given a Certificate of Successful Completion of Examination (CSCE) to serve as evidence of their qualifications. There will be no call sign designator to distinguish between Technicians who have or have not passed a code test. (W5YI Report, 1/15/91; ARRL News Release, 12/14/90; Westlink Report, 12/21/90) □



Steve Sykes and Jim Lill, licensed Army MARS operators man the new MARS gateway station located at Harris Corporation, RF Communications Group in Rochester, NY. The Harris equipment and personnel have been loaned in support of increased message trafficking due to Desert Storm operations.

Harris works with MARS

The US Armed Forces personnel in the Middle East are finding it easier to send messages to their families stateside thanks to thousands of civilian, volunteer MARS radio operators and advanced radio equipment loaned by Harris Corporation.

MARS operators and Harris Corporation have used the equipment to establish an additional communications link at Harris RF Communications Group in Rochester, New York. The Rochester link can transmit more messages in less time, thanks to new

automatic link establishment and high-speed data transmission technologies pioneered by Harris Corporation.

Harris RF Communications Group has loaned state-of-the-art antennas, transmitters, and receivers to the Army and installed similar equipment in Rochester, New York, to receive messages from Saudi Arabia. The company has committed more than \$500,000 in equipment and personnel in support of the MARS program. □

Special Events...

44th Anniversary

The Suburban ARC will operate special event station W0DCW on April 21 from 1800 to 2400 UTC to celebrate the 44th anniversary of the club.

Operation will be in the lower portion of the General bands and 28.425 MHz.

For QSL, send an SASE to Henry G. Schaper, KA0AWS, 241 Tapestry Dr., St. Louis, MO 63129. □

DXpedition to Delaware

The members of the Warminster ARC will conduct their 3rd annual DXpedition to the rare state of Delaware, operating special event station WA3DFU/3 on April 21.

Suggested frequencies are 7.275, 14.275, 21.375 and 28.375 MHz. CW contacts will be made upon request.

QSL with an SASE to Warminster ARC, Box 113, Warminster, PA 18974. Direct questions to Alan Folsom, KY3T, at 215/674-7154 or 215/343-6851. □

Panola County Jail

The Panola County Historical and Genealogical Association will operate special event station W5VDQ from 1500Z to 2200Z on April 6 and 1900Z to 2300Z on April 7 to commemorate the 100th anniversary of the restored Panola County Jail and Museum.

Transmission will be in the lower 25 kHz of the General and Novice phone bands. Send QSL card, contest number and SASE to 213 North Shelby St., Carthage, TX 75633 or the W5VDQ Callbook address. □

Martha's Vineyard

The island of Martha's Vineyard (IOTA, NA-46) will be on the air from April 12 through 15.

The team, led by Tony Spino, WF1N, will operate SSB in the General portions of the 10, 15, 20, 40 and 75M bands. RTTY operation is also planned. (The island is Dukes County, Massachusetts, for county hunters.)

QSL to WF1N direct (previously KA1HBV) or via the Bureau. Other members of the team are Rich, NT1I; Sam, K1SCN; and Lou, KA1DIG. □

Florida Cracker Trail Ride

The Fort Pierce ARC will operate special event station KJ4YF from 1400Z to 2100Z on April 13 to commemorate the 4th Annual Trail Ride of the Florida Cracker Trail Association.

Operation will be on the 40, 20, 15 and 10M phone bands and the Novice portion of 10M. □

For a certificate, send a QSL and a large SASE to FPARC, P.O. Box 0004, Fort Pierce, FL, 34954. □

92nd anniversary

The Olympia Amateur Radio Club will sponsor special event station WA3BAT aboard the USS Olympia to commemorate the 92nd anniversary of Admiral Dewey's triumph over the Spanish Fleet at the Battle of Manila Bay during the Spanish-American War.

Operation will occur from 1300 UTC, April 27 until 2000 UTC, April 28 on the following modes and frequencies: CW—7.133 MHz; RTTY—40, 20 and 15M bands; 2M FM—145.270 MHz; phone—3.895, 7.245, 14.245, 21.365 and 28.365 MHz (+-5 kHz QRM).

For certificate, send QSL and 9×12 inch SASE with three units of postage/IRCs to Olympia RAC, WA3BAT, P.O. Box 928, Philadelphia, PA 19105. □

Golden Jubilee

The MD Anderson Cancer Center ARC will operate special event station KK5W for 50 consecutive hours beginning at 2200Z April 12 through 2400Z April 14 as part of the Golden Jubilee (1941-1991) in celebration of the University of Texas MD Anderson Cancer Center.

Operation will be in the General portions of the 80, 40, 20 and 15M and in the Novice portion of 10M.

For a certificate, send QSL and SASE to KK5W, MD Anderson Cancer Center ARC, 1515 Holcombe Blvd., Houston, TX 77030. □

AACS 50th Anniversary

The former Army Airwaves Communications System of the US Air Corps, WWII, will celebrate 50 years of foreign service in Gander, Newfoundland with the operation of special event station VO1ACS on May 1 through 5.

Operation will be on the following times and frequencies: CW—1700Z to 1800Z on 14061 kHz or 21061 kHz; SSB—2000Z to 2300Z on 14287 kHz or 21397 kHz.

Send QSL and SASE to W6YO, 1416 7th, Delano, CA 93215. □

International Marconi Day

The Cornish Radio Amateur Club is coordinating International Marconi Day, which will be celebrated on April 27th from 0000Z to 2400Z. This year's event will be bigger than ever. Listen for 14 or 15 stations representing Marconi communication sites around the world. The North American sites are VE1IMD, VO1IMD and K1VV/IMD. Most site stations will use the suffix "IMD" or "/IMD."

A certificate modeled after an actual Marconi stock certificate is offered to those who work most Marconi sites (number will be announced on the air). More details on the award will be given by site stations.

All modes may be used this year, so stations may be found on CW, RTTY, SSB and packet. To contact the Cornish Radio Amateur Club, write to P.O. Box 100, Truro, TR1 1rx, Cornwall, England. □

Jackass Mail Run

The Porterville Amateur Repeater Association will operate special event station KG6WG on April 20 from 1600Z to 2400Z to commemorate the 30th annual Jackass Mail Run.

Suggested SSB frequencies are 28.355, 14.265, 7.292 and the WA6CYN repeater, 145.31 (Dn 600) for mobile stations in the San Joaquin Valley.

For QSL certificate send an SASE to KG6WG c/o PARA, P.O. Box 872, Porterville, CA 93258. □

Shuttle mission anniversary

The Goddard Amateur Radio Club, home of the space shuttle retransmissions, will operate special event station WA3NAN from 1100Z on Friday, April 12, through 1712Z on Sunday, April 14. Frequencies will be 3860, 7185, 14295, 21395 and 28395 kHz.

This operation is in commemoration of the 10th anniversary of the first space shuttle mission. For certificate, send QSL and SASE to Shuttle Special Events, GARC, P.O. Box 86, Greenbelt, MD 20770. □



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AWARDS

Chaverim scholarship

The Chaverim of Delaware Valley, Inc., one of several non-profit organizations of Jewish Amateur Radio operators, with headquarters in the Philadelphia/Southern New Jersey locality, are pleased to announce the availability its scholarship amounting to at least \$600, to be awarded to a licensed Jewish Amateur Radio operator who desires to pursue post-secondary education and is seeking financial assistance.

Applications may be obtained by writing to Mr. Jay Kuperman, WA3IFY, 1934 Devereaux Avenue, Phila., PA 19149. Completed applications must be received *no later than May 15, 1991*. The successful candidate will be notified and presented with a check during the first week of June, 1991. □

FAR scholarships

The Foundation for Amateur Radio, Inc., a non-profit organization with headquarters in Washington, D.C., plans to award 36 scholarships for the academic year 1991-1992 to assist licensed radio Amateurs. The Foundation, composed of 50 local area Amateur Radio clubs, fully funds five of these scholarships with the income from grants and its annual hamfest. It administers, without cost to the donors, seven scholarships for the Quarter Century Wireless Association, four for the South Milwaukee Amateur Ra-

dio Club; three each for the Baltimore (MD) Amateur Radio Club, the Radio Club of America, and the West Allis Radio Club of Milwaukee (WI); and two each for the Dade (FL) Radio Club, the Amateur Radio News Service, and the 10-10 International Net. It also administers one each for the Richard G. Chichester Memorial, the Young Ladies' Radio League, the Columbia (MD) Amateur Radio Association, the Frederick (MD) Amateur Radio Club, the Vienna (VA) Wireless Society, and the Kevin B. Perdue Memorial.

Licensed radio Amateurs may compete for these awards if they plan to pursue a full-time course of studies beyond high school and are enrolled in or have been accepted for enrollment at an accredited university, college or technical school. The awards range from \$500 to \$2,000 with preference given in some cases to residents of specified geographical areas or the pursuit of certain study programs. Clubs are encouraged to announce these opportunities at their meetings, on their nets, during training classes and in their club newsletters.

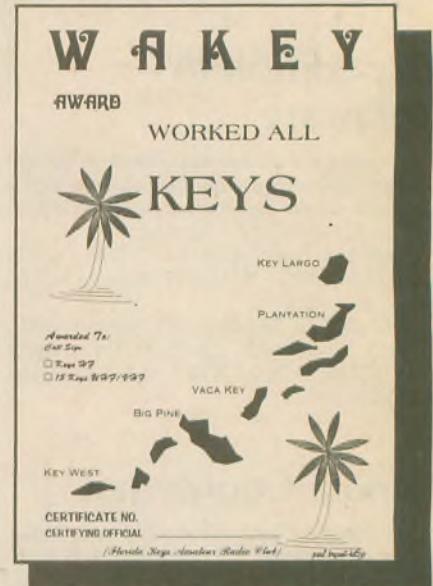
Additional information and an application form can be requested by letter or QSL card, postmarked prior to May 31, 1991 from FAR Scholarships, 6903 Rhode Island Avenue, College Park, MD 20740. □

Worked All Keys Award

The Florida Keys make up one of the most interesting island groups in North America. The word "key" comes from the Spanish word "cay" and means "island." The Florida Keys begin just south of Miami and are separated into three different sections: the Upper Keys, the Middle Keys and the Lower Keys.

Although there are over 820 islands in the Florida Keys depicted on some government charts, there are only about 30 islands from Key Largo to Key West which have year-round inhabitants. Among the population, ham radio operators are a vital group participating in many community activities. These include emergency communications, especially during the hurricane season, communications for foot races across our seven mile bridge, off shore power boat races and the myriad community activities scheduled throughout the year.

When you make contact with one of the many Amateur Radio operators living here, part-time as well as year-round, you learn more about the keys. Discover which key(s) has its own deer, alligators, fresh water ponds, old Indian settlements, forts and living coral reefs. Learn about the national marine sanctuaries, state parks and diversity of vegetation and tropical wilderness. Catch on to some of the annual topics. You'll uncover QSOs ranging from sport fishing to diverse festivities such as the annual Fantasy Fest in October. You just won't believe your ears (or eyes if you come to visit!).



As the cold weather invades the North, thousands of winter visitors escape to the tropical Florida Keys. Among these are our welcomed Amateur Radio friends. During these winter months, the local "machines" buzz as meetings, lunches, rag chews and simple "how do I get to" queries are orchestrated. It's a fun time with a lot of activity. The summer months, albeit more laid back than winter, still invite a lot of fun . . . swimming, snorkeling, deep sea fishing, skin diving and, of course, the breathtaking Fourth of July fireworks displays from various islands.

Now you can join in this experience and earn an attractive certificate at the same time. The Florida Keys Amateur Radio Club is sponsoring the Worked All Keys (WAKELY) Award. To earn this prestigious certificate, just work and confirm five different Florida Keys on High Frequency (HF) or 15 different keys on UHF/VHF. Send your QSL cards or a photo copy of them to the Florida Keys Amateur Radio Club (FKARC), Awards Committee, P.O. Box 545, Big Pine Key, FL 33043.

Ham radio paradise—The Florida Keys . . . a great place to call home and a great place to call!—*Information submitted by Paul E. Bryant, KD5JZ* □

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MFJ-949D

\$149⁹⁵

- Peak reading meter
- Built-in dummy load
- Covers 1.8 to 30 MHz
- 1 year guarantee



You won't find all the MFJ-949D features in any other 300 watt tuner, not even at twice the price — or twice the size.

Put the most power into your antenna
The MFJ-949D Deluxe 300 watt tuner matches your rig to virtually any antenna from 1.8-30 MHz so you get maximum power out. It tunes out SWR on verticals, dipoles, inverted vees, random wires, beams and mobile whips fed by coax, balanced lines and wire.

Lighted peak reading meter
MFJ's *peak* (and average) reading Cross-Needle meter shows you SWR, forward and reflected power — all in a glance. Shows peak SSB power. The meter is illuminated for easy reading in dim light. Has light switch. Lamp requires 12 V.

Built-in dummy load
A built-in 300 watt 50 ohm dummy load makes tuning up your rig soooo easy. It reduces needless QRM and saves your finals.

You'll find it handy for testing and repairing your rig, setting power level adjusting your mike gain and more. An external dummy load can cost you *another* \$30 — plus it takes up valuable space at your operating position and requires another cable.

Full 1.8 to 30 MHz coverage
Make sure the tuner you're considering covers all the HF bands ... the MFJ-949D does. Plus more ...

You get an antenna switch that lets you select 2 coax lines (direct or thru tuner), random wire

or balanced lines and built-in dummy load. You get a 4:1 balun for balanced lines.

Unconditional Guarantee
You get a full one year unconditional guarantee. We will repair or replace your MFJ-949D (at our option) *no matter what* for a full year. Others may give you a 90 day limited warranty. What do you do after 90 days? Or before 90 days if they say, "Sorry, it's your fault"?

SWR and maximum power into your antenna. After all, isn't that why you use a tuner?

High efficiency and a compact size
The MFJ-949D uses a single high-Q airwound coil that takes up a minimum of space without mutual coupling problems. You get a highly efficient tuner that puts maximum power into your antenna *and* a compact 10x3x7 inch size that fits right into your station.

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OLD-TIME RADIO



The following is dedicated to my very good friend, computer mentor and ham radio elmer, Gary Martin, whom I first knew as W7GRS, then W7XT. Gary died of cancer in Marysville, Washington on September 21, 1989 at the age of 47. It is of interest to note that he never smoked, drank, nor had he ever abused his body in any way.

The following is a story I found in Gary's computer files. With the exception of a spelling correction or two, it is precisely as he wrote it. — Jim Sutton, WA7PHD.

Ham radio

GARY MARTIN, W7XT

I was 13 years old. That's when I was exposed to ham radio. Actually, that isn't true. I had been exposed some years before, but the impact of that first exposure didn't leave a lasting impression.

The year was 1946. There was a teenager who lived across the street from my grandparents. He was a ham radio operator. His name was David Held. I never actually got to know David even though his brother, Mikey, was my best friend. When you're only five years old, best friends are hard to find.

Mikey and I spent hours together, exploring the world around us: two city blocks. He lived on one; I lived on the other. One day, Mikey showed me the room where his brother kept his radio. At age five, I didn't know what all that stuff was. Apparently I wasn't too interested in finding out either!

Within minutes, Mikey and I were back outside. Forget radio, let's play cowboys and Indians or explore a new island. So much for my early exposure to ham radio.

At 13 I guess I was typical. I was smart. And if I didn't already know the answer, I thought I did. Thirteen was the perfect age to discover ham radio. My mind was still sharp! If it didn't involve school work, I was open to learning new things. Enter the code and electronic theory. A sharp, open mind is difficult to maintain once you've discovered girls. That would occur only too soon.

By the time I was 14, I knew the code and theory. Aren't fresh young minds disgusting! Regardless of how sharp the young mind might be, it needs help getting knowledge. Someone must be willing to impart that knowledge. I'll always be grateful for the patience of Bill, W8RNL.

At 14, I was hooked on ham radio. I was also hooked on girls. But, being the shy type, I only thought about girls. When I wasn't thinking about girls, there was ham radio.

In September of 1956, I started attending high school. Before the month was over, I had my novice license, KN8CTQ. How very proud I was.

It was in November of that year I met Al. Al was a senior, I was a freshman. Al didn't have a license but he'd taken his Novice exam two weeks before. Together, we patiently awaited the arrival of his license.

Al intimidated me right from the start. I mean, with him being a senior and all. How Al passed his novice exam was even more intimidating. He passed the code test by copying 7 wpm—solid. How did he do that? Al shared his secret with me. Every night he'd copy W1AW code practice, using a Heathkit AR-1 receiver with a defunct BFO. You'd have been intimidated too! If you'll stop and think about it, you'd have to agree. Al had accomplished an amazing feat.

My receiver was a fancy Hallicrafter S-38D. I was struggling to copy 2 wpm. I should have been doing much better than that. After all, I had "passed" my Novice exam only a few weeks before. But that's another story.

Well, Al eventually got his license. But by now, I was an old-timer. I'd

already been on the air for about three months. Proof of this was the fact that my code speed was already up to a solid 5 wpm.

At school, Al and I had the same lunch period. Having a common interest, we ended up spending time together. We used this time wisely. We memorized the contents of that license manual as though our very lives depended on it. We would read the questions to one another, prompt with the answers, over and over and over. Finally, we were convinced in our own minds. We were ready!

I was on the air constantly, either practicing code with Al or talking to other novices in neighboring states. Bill, W8RNL, had loaned me his old 50W Eldico transmitter. My antenna was a dipole. I made the elements as long as our property would permit. I think it resonated somewhere around five megacycles. Well, that's what they were called in those days. That was before the descendants of Mr. Hertz got all upset. They wanted their distant relative to get proper credit for his work. I'm not sure Mr. Hertz cares one way or the other.

Anyway, my 5 mc antenna was fed with flat 300 ohm TV twinlead. I know now that that antenna with that feedline won't work. The antenna wasn't the right length. Even if it was, the impedance of the feedline was wrong. It just won't work. But, I didn't know all that then! After all, I was just a dumb 14-year-old who thought he knew everything. I guess ignorance really is bliss. I made contact after contact, not knowing that it wouldn't work. Those days were exciting.

Al, on the other hand, was not sharing my excitement. Al was using a Heathkit AT-1 transmitter. The AT-1 used link coupling and ran about 30W input. Al's antenna was a dipole cut precisely to the operating frequency and fed with the finest 75 ohm twinlead that money could buy. Al did everything right; Al owned a handbook. The only problem was that Al never made any contacts, except around town.

Al wasn't discouraged. Frustrated, yes. Discouraged, no. To Al, the saying "he couldn't get out of his back yard" brought sleepless nights. But Al faithfully listened to W1AW and studied his license manual.

I had my Novice license for six months. Thanks to Al's help with the theory, I was ready to upgrade to a General Class license. In April of 1957, I took the General exam. I was nervous. My heart was pounding. Six weeks later, I clutched in my hand that General Class license; K8CTQ. I was one proud 14-year-old. My first contact as a General was with a VE3

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in Canada. My transmitter for that contact was homebrew, crystal controlled and running 4W input.

Two months later, Al took his General exam. As with his Novice, Al passed with flying colors. Al celebrated by firing up his AT-1 and working someone across town.

I had acquired a Knight VFO shortly after receiving my General license. What freedom! Al continued to be rock bound in the Novice band, working guys around town. One day, I just happened to tune across the band and heard Al calling his heart out—CQ after CQ—without any response. It was pathetic.

It was then I heard this little voice saying, "You know, Gary, old buddy, if you connected the output of your VFO directly to your 5 mc mismatched antenna, your signal would be weak enough so that if you used a fictitious call, you could play a neat trick on your friend Al."

"That would be illegal!" I told myself. I could see my Dad paying that \$20,000, and me spending five years in jail—all because I played a practical joke on my friend Al. Oh, if only I had discovered girls sooner.

Al finished calling CQ and waited for a reply. Before he had finished, I had the output of my VFO connected directly to the antenna. I paused for a moment and then began calling him. Trying my best to disguise my fist, which by now he knew as well as his own, I signed a KN4-something and stood by. Al came back immediately. The excitement in his fist produced a warm feeling somewhere inside my being. I helped Al "get out of his backyard."

After exchanging signal reports, etc., I confessed over the air. "Glad to see you finally working some DX, Al. This is Gary, K8CTQ." You know, Al didn't speak to me for several weeks after that.

Well, Al was always one to go by the book. I didn't have the book, so I would try things just to find out. Like the time I discovered you don't connect an earth ground to an AC/DC radio. When you're 14, those sparks are mighty big!

Al had read the book on his AT-1 transmitter several times over. He kept reading about the antenna tuner. He thought an antenna tuner was an accessory; needed only when the antenna wasn't resonant. Al knew his antenna was resonant and so he didn't need any antenna tuner. In reality, with the AT-1 transmitter, the antenna tuner was a necessity. Without the antenna tuner, you can only work guys around town, or KN4's operating portable. Could that be one of the reasons link coupling isn't used much anymore?

Well, in desperation, Al built himself a nifty little antenna tuner. It consisted of a variable capacitor and two-inch coil stock. Al did a great job of building the tuner. The coil was mounted on standoff insulators and sitting out in the open. It looked very impressive. Not only was it impressive looking, it worked! Instantly, Al was working guys all over the place. Al was on cloud nine. However, poor Al soon found that the bottom side of cloud nine was very dark.

Al had succeeded in increasing his signal output to the antenna. Unfortunately, there were several TV antennas in the neighborhood that were more than willing to receive his signal. One of those antennas was connected to his parents' television. Well, that wouldn't do. His parents would tolerate ham radio, but not at the expense of TV.

For a while, Al operated during quiet hours. Somewhere between five and six o'clock in the morning. Al quickly found out the meaning of "quiet hours." He always thought it meant quiet because few people were watching TV. He suddenly realized that during those hours, the bands were very quiet. Action must be taken.

One day I stopped by for a visit. Al asked me to help him check out his

TVI problem. I was more than happy to help. I owed him something after my "little trick." I was to stay in the shack, which was in the basement. Al would be upstairs. When Al yelled, I was to hold down the key. Al would then switch through the channels checking for TVI.

Well, Al yelled. And I keyed. There I was, helping Al discover which channels had TVI. Meanwhile, I was making a discovery—a very beautiful discovery. I discovered that a pencil lead touched to an antenna tuner coil, and drawn away very slowly, will create the most beautiful blue arc. Well, needless to say, the results of my discovery really helped Al. It gave Al first hand knowledge of a serious TVI problem, on *all* channels!

Al was normally an easy going guy. Normally. I know of two things that upset him. I became aware of the first when using a KN4 callsign. The second one came to me as I was being thrown out of his shack. To emphasize how upset he was, I was thrown out of the house as well.

In time, Al forgot about my little stunts. After all, they really were harmless little pranks. That was 30 years ago; I don't pull those kinds of tricks anymore. Besides, today, nobody builds antenna tuners with coils in the open. But if they did... □

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Isn't it time you got radioACTIVE with the Courage HANDI-HAM System?

Call or write the Courage HANDI-HAM System W0ZSW at Courage Center, 3915 Golden Valley Road, Golden Valley, Minnesota 55422, phone (612) 588-0811.



QRP computers

C. H. STEWART, KD5DL

Things must have been pretty tough in the days before electricity. Remember the story about how Abraham Lincoln had to watch TV by candlelight?

The growth of technology is truly amazing. It's been estimated that half of all technology has happened in just the last 60 years or so. And, like the growth in the world's population, the growth in technology is advancing exponentially.

We take computers for granted, but 50 years ago there weren't any. In fact, the first electronic computer, ENIAC, wasn't even started until 1943, and the idea of a personal computer was science fiction until about 15 years ago.

A phenomenon struck in the 1970s when several of the popular electronic magazines published construction plans for "personal" computers, thanks, primarily, to the introduction of integrated circuits. It wasn't very long before hobbyists were buying computers and computer kits with names like Altair, IMSAI, SWTP and Sinclair, and the computer revolution was started!

Portability

Way back 15 years ago a computer was called "portable" if it could be crated around in cardboard boxes; when someone actually put a carrying handle on a computer they completely redefined the word "portability." But even the most portable of computers still required an AC outlet for operating power.

When Hewlett-Packard and Texas Instruments introduced "programmability" to their pocket calculators, they ushered in the first truly portable "pocket computers." Still, most of us wanted to see a pocket computer that had a real computer keyboard and a user friendly programming language, like BASIC.

Today's pocket computers

By loose definition, for our purposes anyway, a pocket computer is a computer small enough to fit in a pocket comfortably, one that uses a high level programming language (such as BASIC), has a QWERTY style keyboard, a self-contained power source and dis-

POCKET COMPUTER COMPARISON				
MODEL	SIZE	DISPLAY	MEMORY	EXPANDABLE
SHARP PC-1211 RS PC-1	6-7/8x2-3/4x19/32	1x24	1.4K	NO
SHARP PC-1500 RS PC-2	7-11/16x3-3/8x1	1x26	2.6K	TO 24K
SHARP PC-1250 RS PC-3	5-5/16x2-3/4x3/8	1x24	2/4K	NO
CASIO FX-700P RS PC-4	6-1/2x2-3/4x3/8	1x12	0.5K	TO 1.5K
CASIO PD-310 RS PC-5	6x3-1/2x5/8	1x12	16K	NO
CASIO FX-730P	6-1/2x3x1/2	1x24	8K	TO 16K
CASIO FX-795P RS PC-6	5-5/8x2-3/4x3/4	1x24	8/16K	TO 16K
CASIO FX-850P	7-5/8x3x1/2	2x32	8K	TO 40K
CASIO PB-1000	7-3/8x3-7/8x1	4x32	8K	TO 40K

Some of these computers may have more memory than indicated, depending on manufacturer's version and/or store label. All computers have cassette interfaces and optional printers. The Sharp PC-1500 has an optional 4-color printer and an RS-232 interface. The Casio FX-730P, FX-795P and FX-850P also have an optional 4-color printer and the FX-850P and PB-1000 have optional RS-232/Centronics interface units.

play and a non-volatile memory. Obviously, such a computer would offer unparalleled convenience and accessibility to the user.

The Sharp and Casio, Inc., are by far the two largest manufacturers of today's pocket computers, and both companies have had their products sold under the Radio Shack label. The first big mover was Radio Shack's PC-1 (a Sharp PC-1211), a 1.9K machine which fit snugly into a $6\frac{7}{8} \times 2\frac{3}{4} \times 1\frac{9}{32}$ inch case and weighed less than six ounces. Quite a number of scientists, technicians, financial advisors, students and just plain hobbyists cut their teeth on this computer, which was also known as the Radio Shack TRS-80 Model 1.

The Radio Shack PC-2 (Sharp PC-1500) was a little too large to be called a pocket computer, but it was a quantum leap ahead with a memory expandable to 16K and an optional RS-232-C interface.

What the PC-2 lacked in size was more than compensated for by the PC-3 (Sharp PC-1250). This little computer was real shirt pocket size, measuring only $5\frac{1}{16} \times 2\frac{3}{4} \times \frac{1}{8}$ inches and weighing only four ounces! At least

two versions of the PC-3 were made available; the one wearing the Radio Shack logo had 2K of memory while the one under the Tandy label had double that at 4K.

Casio, the other major pocket computer manufacturer, rounds out the Tandy/Radio Shack line-up. The PC-4 was a version of the Casio FX-700P; the PC-5, also a shirt pocket size computer, was a Casio PD-310; and the only pocket computer currently in the Radio Shack line, the PC-6, is similar to the Casio FX-795P.

Other Casio computers worth mentioning are the FX-730P, an 8K machine expandable to 16K; and the FX-850P and the new PB-1000 (both of which expand to 40K). The PB-1000's size is borderline pocketable, but it does feature a 4-line touch screen display and an RS-232C port.

Sharp or Casio?

If you wanted to buy a pocket computer today, at least from Radio Shack, it would have to be a Casio. You could find Sharps, other Casios, Hewlett-Packards and, perhaps, a few other brands at some computer stores, larger department stores and some office supply outlets. But I'll limit the information here to the Sharp and Casio lines.

Most of the Casio pocket computers sport the QWERTY style keyboard, expandable memory, an upper- and lower-case alphabet (and other special characters used in electronics mathematics and science) and user-friendly

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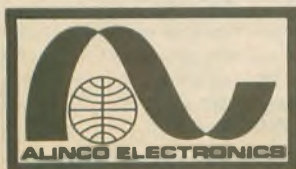
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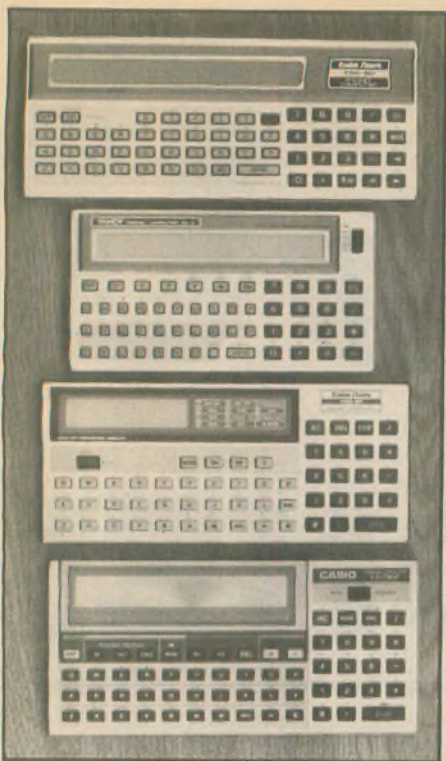
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Popular pocket computers (top to bottom): Radio Shack PC-1, Tandy PC-3, Radio Shack PC-4, and Casio FX-730P. The typical size of many pocket computers is in the 7×3×½ inch range. Accessories often include printers, cassette interfaces and, sometimes, RS-232 ports.

single-key BASIC and mathematic inputs.

Program memory is partitioned into 10 independent program areas and the capability to jump from one program area to another. Having ten program areas to work in is really advantageous when you want to store several different programs that share identical line numbers.

Sharp pocket computers have only one program area, but there is a way the user can partition the memory to hold 18 separate programs. It's called "program stacking." The additional programs are "tail ended" onto the previous programs, and each in-



The Casio FX-730P is an 8K (expandable to 16K) pocket computer capable of BASIC and statistical programming. A Data Bank function permits taking electronic memos and can be used to store and use formulas and equations.

dividual program is identified by one of 18 keyboard characters. The trick here is to understand that each new program cannot share any line numbers already used: if the first program ends with line number 200, the next program must start at a higher line number, say 210. Stacking is a little awkward, at first, but it is an efficient way of using Sharp's memory.

The Sharps do not feature single-key entry of BASIC and mathematic commands, as do Casios, so the commands must be typed out in full, or one of the approved abbreviations must be used. For example, you could type out INPUT, or you could abbreviate it as I., IN., INP. or INPU. This, too, could be tricky; remember abbreviations for READ, RESTORE and RETURN, or GOTO and GOSUB.

Both the Casio and Sharp models are highly accurate. Mathematical calculations are performed with a 12-digit mantissa and are displayed with up to a 10-digit mantissa. The BASIC languages vary a little bit, even among models by the same manufacturer, but they are easily translatable. And both manufacturers provide numerous accessories, including cassette storage interfaces, printers and, for some, RS-232 and Centronics interface units.

So, which one is best? It's like making a selection among quality new cars or transceivers; it's strictly personal preference. My personal favorite is a Casio model, so for future articles I'll stick primarily to simple Casio BASIC. This issue's Aerials column illustrates a pocket computer program to design a short half-wave dipole for any HF frequency. □

Pack carefully

According to the AP, a cellular phone in luggage aboard a plane tripped the aircraft's smoke alarm, causing an unscheduled landing in response thereto. The phone was found in the ON condition and it was ascertained that a call had been received by the phone, causing the problem. Editor's note: Today cellular phones, tomorrow packet radio?

Better be sure your portable packet gear or Amateur Radio is off. When packing portable electronic gear with a slide switch as an ON/OFF switch, put a small piece of masking tape on the switch so it cannot accidentally be turned on by shifting items in the luggage. — *Scope Palomar ARC, Vista, California.* □

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Science Museum of Long Island Electronics and Radio Communication Center

A group of local radio Amateurs have established a "new age" electronics communication center at the Science Museum of Long Island. The museum, a 22-room mansion on 40 acres overlooking Manhasset Bay, is the site of the Electronics and Radio Communication Center (ERCC). The museum is a non-profit organization concentrating on teaching the sciences to children and adults. It offers consulting services to educators, staff development workshops and hands-on training for teachers with limited science preparation. This winter, a group from the museum including the director, Dr. John Loret, will go on a research expedition to Patagonia, Argentina. The ERCC at the museum has an active Amateur Radio station and will be in constant communication with the expedition.

The ERCC is now teaching radio communication and electronics to beginners in preparation for their Novice license. Its teaching faculty will expand its program to teach with hands-on training, computers, satellite communication, packet radio, ATV, RTTY and other developments of the new electronic age. The sights are set quite high for the expansion of the ERCC.

The museum presents 62 science programs to approximately 40,000 school children each year. On December 5, 1:15 p.m., on 15M, we demonstrated to 20 students and teachers attending classes that day at the museum a radio communication with W5RRR, the Amateur Radio station at the NASA

Johnson Space Center in Houston, Texas. The students, with Alex, AI2Q, at the microphone, had a field day in talking to the operator, Dick, and asking questions about the Columbia shuttle which was in orbit at the time.

Another important addition to our ERCC is the Antique Radio and Electronic Section. We have received as donations antique radios and telegraph keys, and hopefully we will receive more antique memorabilia to add to

our collection. All donations will be displayed with the contributor's name.

Members from the Long Island QCWA, Chapter 81, spearheaded the project with help from members of LIMARC, Nassau and Suffolk radio clubs. Everyone is welcome to help or to contribute to the Electronic Radio Communication Center. The members of the ERCC Committee are: W2KPQ, Ed; W2KO, Mike; K2LJH, Sid; AI2Q, Alex; AE2Z, Kate; W2ERJ, Milt; KA2OVR, Bill; and W2TLC, Herman.

For additional information, contact the Science Museum of Long Island, Attn.: ERCC, 1526 N. Plandome Road, Manhasset, NY 11030. □



Committee for the Electronic and Radio Communication Center of the Science Museum of Long Island. From left: W2KO, Mike; AE2Z, Kate; K2LJH, Sid; KA2OVR, Bill; W2KPQ, Ed; and AI2Q, Alex. Not present: W2ERJ, Milt and W2TLC, Herman.

WWII key needed

While on holiday in England last year I visited a private aircraft museum located about 35 miles NW of London.

The curator of the museum is Derek, G3LXP. Within the museum he has established the WWII Aircraft Radio Museum and is anxious to obtain at least one J-37 airborne CW radio key. This type of CW key was common on several US military aircraft during WWII.

The museum will place a plaque next to the key indicating the name and address of the contributor. Any contributors may contact me, Bill Pearce, W0MWO, USNR (Ret.) at Eagles Rest, 9 Knightsbridge Place, Pueblo, CO 81001-1434; 719/544-0691. □

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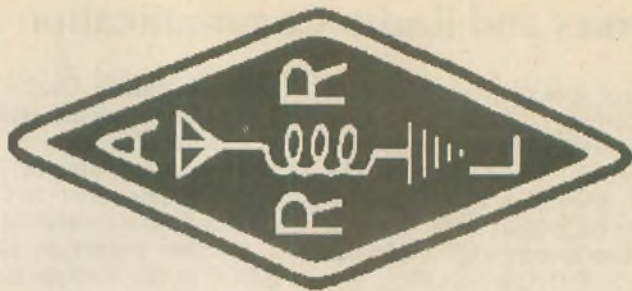
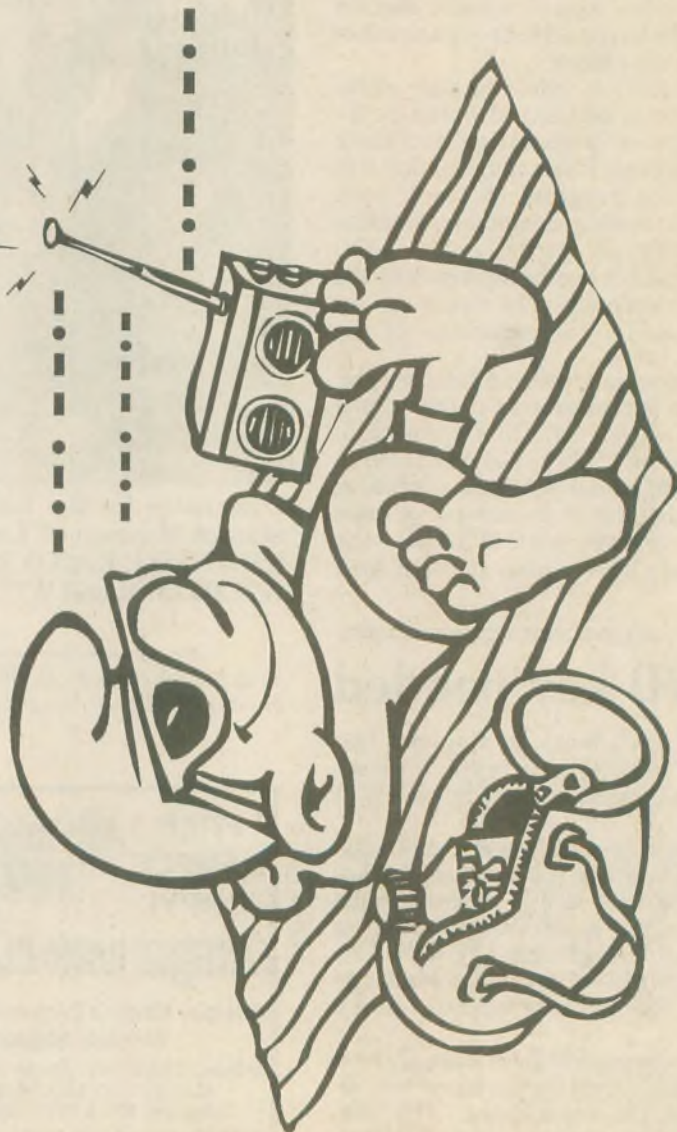
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Amateurs assist after Australia earthquake

The following is extracted from "The Newcastle Earthquake Disaster," by Philip Greentree, VK2IW (Amateur Radio, June 1990).

Australia's first fatal earthquake occurred at 1027 hours on Dec. 28, 1989. It was a disaster for which there was no warning in a land that is the world's oldest continent and, presumably, the most stable. Although only a 5.5 on the Richter scale, the earthquake had devastating effects on the city of Newcastle, the sixth largest in Australia. The effects were made worse by the many inner city buildings that were up to one hundred years old and constructed from single and double cavity brick. Twelve lives were lost and the damage exceeded 600 million dollars. Many hundreds of people returned from summer vacation only to find their homes destroyed.

Amateur Radio Operators, as part of WICEN, the Wireless Institute Civil Emergency Network, played an important part in supporting the disaster recovery efforts.

As soon as local operators arrived at SES HQ they were assigned to rescue crews being dispatched. Many of these crews were volunteers who just walked in off the street. There were no radios in their trucks and WICEN was able to step in.

But WICEN's presence was only a token one. VKs 2XDW, 2HT and 2KEI were the only local members; the rest of the operators were all volunteers who were demonstrating just how well trained and self disciplined the Amateur Radio community is in Newcastle.

Geoff, VK2GL, was dispatched with a structural engineer from the NSW Electricity Commission, and they worked as a team all through the night.

VKs 2CD, 2CRR and 2VO were among the early arrivals that WICEN coordinator Dennis, VK2XDW, immediately dispatched to the field with SES rescue crews. The family team of Keith, VK2AKH, and his son Alan, VK2MGL, weren't far behind.

That night it became obvious that the SES controller was in need of a contact person between him and the media. The Amateur Radio operators set up a health and welfare unit in an adjacent SES building. This team, led so ably by Keith, VK2AKX, took over responsibility for welfare inquiries from the public and handled all press releases on behalf of the SES Controller.

One thing that impressed international experts in earthquake recovery was the way the authorities so rapidly blocked off the central business district and inner suburban areas, thus



The partially collapsed George Hotel

keeping sightseers out and making the job much easier for rescue teams. With so many barricades into the city and so many barricades needed, there were just not enough police to go round until reinforcements were rushed in from Sydney and other parts of the state. Amateur Radio operators manned a number of the barricades providing a radio link as required. Many police were walking round with mobile phones, but the telephone system was so congested that they were basically useless. As army and police reinforcements arrived, the several Amateur Radio operators involved were taken off barricades and reassigned to rescue teams.

Dennis, VK2XDW, the local coordinator for WICEN, lives in Mayfield, a couple of kilometers from the city center. He was quickly mobile—and stunned by what he saw. The huge Newcastle Technical College where he

is a teacher was a wreck. The nearby Parkview Hotel was collapsing and all around were people milling in a state of confusion. Just down the road was Hamilton—shattered. With all power and telephones out of action, it was obvious that Amateur Radio would be needed.

He proceeded to the State Emergency Services headquarters at the other end of the inner city and found emergency workers assembling for duty. Alderman Don Geddes, the area controller of SES, immediately informed Dennis that WICEN had been activated and that every available radio Amateur was needed.

It was one of the largest emergency activations of Amateur Radio in Australian history. Immediately, local Amateurs responded and raced toward SES headquarters.

Ray, VK2TV, from the City of Gosford (70 kilometers to the south), a radio controller for the Volunteer Rescue Authority, was sent by the VRA directly to the Newcastle Workers Club to set up a direct link with their HQ in Sydney.

Dennis, VK2XDW, dispatched Graham, VK2FA, to the Newcastle Workers Club to provide a direct HF link from his mobile to the WICEN station at Police Rescue HQ in the Sydney suburb of Marrickville.

Brian, VK2YBC, took over net control and quickly established himself as a true professional on the microphone; only rarely did his messages need repeating.

Hamilton Telephone Exchange had taken a battering and had been cleared, the staff unable to return to the building for several hours. During that time

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local telephone links were out of action. When the telephones were restored, the congestion was so great the public phone system was next to useless for a long time.

Amateur Radio was for a time the only link between the Royal Newcastle Hospital and the outside world. That hospital had taken a battering, two main wings being damaged so badly they will never be used for hospital work again. Faced with a loss of 250 beds as a result, and with the Mater Hospital 10 kilometres west suffering damage also, things for a while were very grim as casualties continued to pour in. For a time, WICEN was passing emergency messages from that hospital to Sydney.

By Friday it was obvious there were just not enough local Amateurs, since many were away on holidays, so when WICEN, Sydney asked if help was needed, the answer was an emphatic yes. In no time, VKs 2DLY, 2CKD and 2EMU were on their way, others following over the next few days.

Still more Amateur Radio volunteers were coming from Sydney and the Central Coast areas to the South, the Hunter Valley to the West and Port Stephens to the North. Newcastle hams who had been away on holidays were returning to lend assistance.

The workload was enormous. In the six days from the time of the earthquake, the State Emergency Services handled more than 4000 individual calls for help, hundreds of these being passed in by Amateur Radio operators attached to SES teams in the field.

With responsibilities for radio net control of a considerable proportion of the SES rescue effort, media relations and welfare, disaster victim registration and every available operator in the field, the WICEN group was doing fine. In fact, if we had known that the region's ambulance service had lost its central communications room, we could have placed a great number of operators in individual ambulances until an emergency communications unit arrived from Sydney later in the day.

"Tas," "Darren" and WICEN operator Kevin, VK2CKD, from Sydney stopped working only for a bit of sleep when they really needed it. As they finished allocated jobs, in would come a call via 2M for a list of more jobs. They demolished dangerous chimneys, covered up shattered roofs, propped up shop awnings about to fall and worked, and worked and worked.

The Australian military forces were activated on Friday with the 14 Field Squadron of the Royal Australian Regiment moving into the disaster

area. Whilst the army has tremendous communication capabilities, all their frequencies are incompatible with civilian services. Within a short time, a group of radio Amateurs had been dispatched to link the army with SES HQ. With so many army teams in action, they themselves experienced communications problems, and the need for a radio link between 14 Field Squadron HQ and the many field units resulted in further radio Amateurs being dispatched to form a separate 2M network.

The army group's commanding officer was amazed and deeply impressed at the level of communications mounted by these civilians. He was equally surprised at the level of sophistication of the equipment in use and the professional standard of supposedly "amateur" operators.

The backbone of the Amateur Radio operations were 2M hand-helds and it was quickly becoming clear that the old basic HTs were superior to some of the newer microprocessor controlled devices. Digital paging systems located on 149 MHz were severely interfering with many of the HTs, but not so a group of 15 year old Icom HTs.

Running on dry cells, the Icom HTs worked perfectly. Others using NiCd batteries quickly showed their useless-

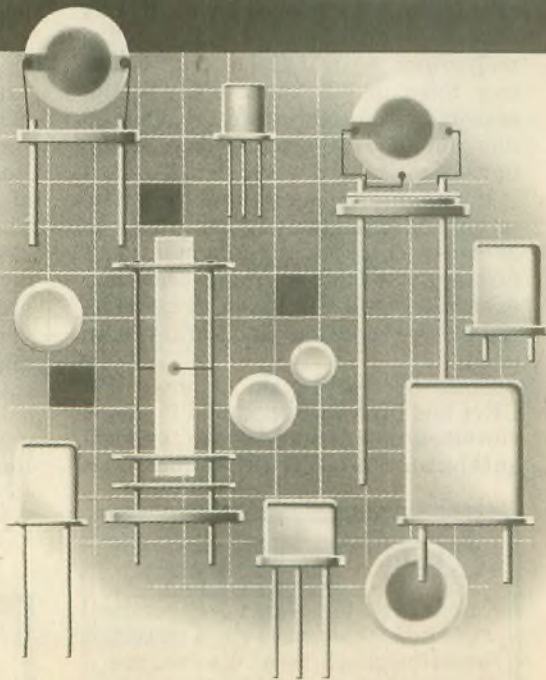
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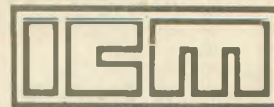
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ness in a disaster situation. When NiCd batteries die there is no warning, and when they do, how does one recharge them when in the field during an earthquake disaster?

Through Friday night the recovery continued and Saturday saw the urgency of the rescue efforts slowing down a little as all living persons trapped in the wreckage were believed to have been found. By Saturday the WICEN team was nearing exhaustion.

It was announced on Sunday afternoon that the following day, Police would be setting up a special center outside the main disaster area for the issuing of passes enabling residents and businesses limited entry to the disaster area. Entry was to be permitted only if the relevant building was safe. This meant a radio link with City Hall was required, since that was where all required information such as ownership and damage status was obtainable.

WICEN was called on to perform the communications task and a third



Police rescue, VRA and firemen looking into the Newcastle Workers Club.

repeater was needed. A new unit for 147.100 MHz which had been on trial with radio engineer Peter, VK2ZRT, prior to installation was pressed into use in Peter's workshop which had survived the earthquake. Using the call sign VK2WSC, hundreds of messages were passed to and fro throughout Sunday and Monday by VKs 2EMU, 2DLY and 2BOA.

Peter, VK2ZRT, did a tremendous job as he repaired equipment that had failed in the field. Loan equipment enabled much needed operators to stay in the field.

By Tuesday it was becoming obvious that the dust was settling, all bodies had been recovered, and the disaster rescue emergency was over. It was time to go and leave the situation to the mop crews, so WICEN and its volunteer team of 60 Amateur Radio operators were stood down on Wednesday, Jan. 3, 1990 after seven non-stop days of plain hard work.

It was interesting to note the extraordinarily high level of good behaviour shown by the Amateur community. At no stage was there anything other than exemplary self discipline demonstrated on the repeaters and various nets used.

Since the earthquake, Hunter WICEN has been reformed and is now a vibrant group recognized by the local authorities. WICEN (NSW) has been

formally accredited as a specialist rescue support group, as part of the NSW emergency services plan.

WICEN and the 60 radio Amateurs whose communications skills had held a good deal of the rescue effort together for so many days received a letter from the Lord Mayor of Newcastle. No other official recognition for the work performed by Amateur Radio has been received.

Australia must be the only country that doesn't realize what Amateur Radio involves. Could it be many Australians don't understand the difference between the highly qualified, federal government examined radio Amateurs and the technically unqualified CB radio fraternity?

Is the word "amateur" a misnomer? In the context of Amateur Radio, "amateur" means the operator does not receive payment as distinct from a commercial broadcaster. Yet Amateur Radio operators form the largest group of technically qualified radio operators with a legal allocation of radio frequencies second only to the Australian Army. Few realize that radio Amateurs are licensed to not only transmit television, voice, teletype, computerized digital data etc., but to build their own equipment as well.

In the USA, the Soviet Union and a great many other countries, Amateur Radio is a breeding ground of future electronic and electrical engineers. Why the difference in Australia? □

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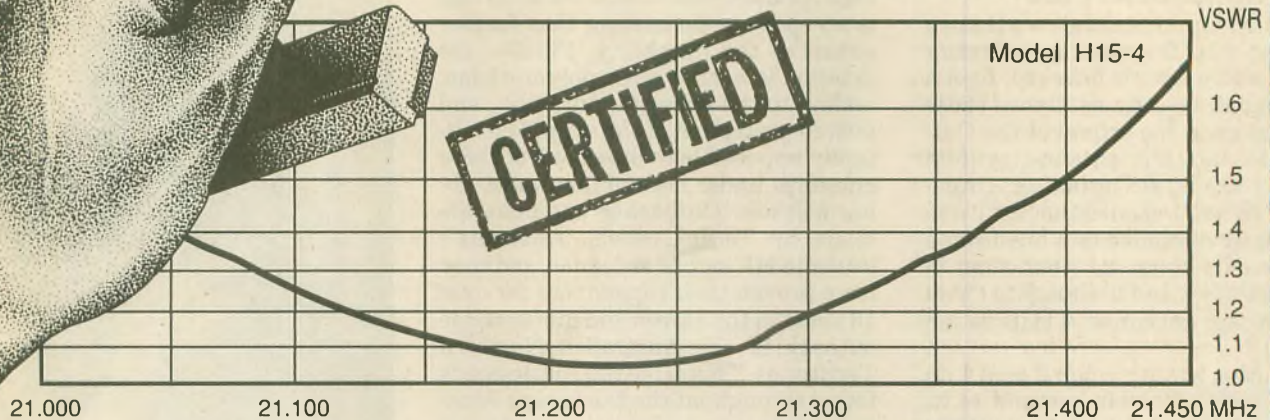
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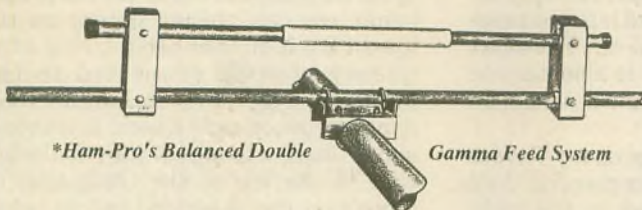
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Product Review

The Outbacker HF antenna

RICH ARLAND, K7YHA

"Waltzing Matilda, waltzing Matilda, you'll come a waltzing Matilda with me..." Oh, sorry. I get a bit carried away at times. One of those times was upon the arrival of the Outbacker 8-band HF antenna system from Don Arnold at Outbacker Antenna Sales. When I opened the box I was immediately reminded of a line from a certain movie about an Australian in New York City and I thought, "You call that an antenna? THIS is an antenna!"

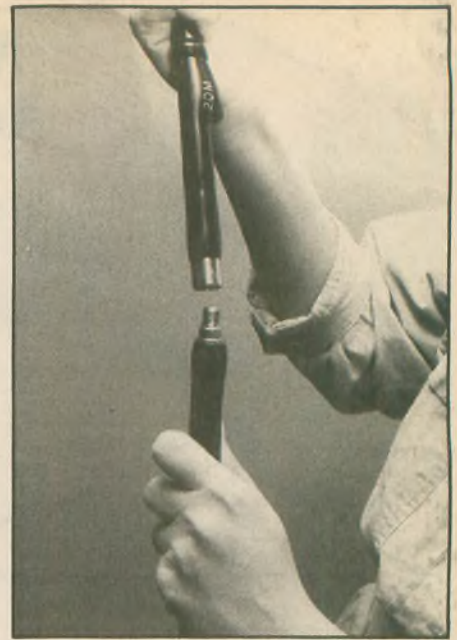
The Outbacker is a rugged (and I do mean *rugged*) 6 ft. whip antenna, (4 ft. and take-down models are available) that covers wight HF Amateur bands—75, 40, 30, 20, 17, 15, 12 and 10M. The Outbacker Split is a take-down version of this antenna that breaks down into two 3 ft. sections (or three 2 ft. sections) for storage and back packing. Also offered is the Outbacker Mariner, a 6 ft. version set up for the 75, 40, 20, 15 and 10M ham bands and selected ITU frequencies including 4.1, 8.2, 12.4, 16.5 and 22.1 MHz. My 6 ft. model will handle 300W PEP, as will the take-down model and the marine version. The 4 ft. model will handle only 150W PEP. The 6 ft. models are also available in 500W PEP versions upon special request. In all, it's a rather impressive product line.

I spoke earlier of the Outbacker being rugged and I am here to tell you that the 6 ft. Outbacker 8-band HF

antenna system that I have reviewed is absolutely the most rugged HF antenna that I have ever seen, bar none! The construction of the Outbacker centers around a shaft of fiberglass which has pretuned copper helical windings and taps for band selection. Over all of this is an epoxy resin coating that further enhances the durability. Finally, the exterior is coated with polyurethane, adding to the strength, durability and overall protection of the whip. It is virtually impossible to break one of these antennas under normal (and most abnormal) use. Outbacker antennas are made by Terlin Aerials, Australia's leader in HF mobile antennas, and they have proven their ruggedness for over 15 years in the barren and inhospitable outback of the Australian Northern Territories. This same rugged design is found throughout the Outbacker Amateur product line and is very good news for the serious HF mobiler.

The Outbacker 8-band HF antenna uses taps which are an integral part of the antenna. A "wander lead" extends from near the base of the whip and is wound counter-clock wise around the whip with the end plugged into which ever tap is needed. All taps are engraved on the whip so that easy band changing is possible. In addition, the taps are made out of rust and corrosion resistant brass. SWR is controlled by the small adjustable wire whip at the top of the Outbacker. In essence, the 8-band Outbacker is like having eight separate whip/resonator antennas in one package! The ease of band changing is a major selling point of this HF antenna system. No tools are required, just plug the wander lead into the proper tap and you are on the air. The short whip (called a "spike") is also easy to adjust using a knurled knob. Again, no tools are required.

I tested the Outbacker on my Toyota van which had a commercial ball mount already installed on the right rear of the vehicle. This position is my HF antenna mount and formerly held a Hustler whip/resonator or a 102 inch CB whip (used for 10M mobiling). The Outbacker was threaded into the ball mount and tightened down after following initial tuning instructions which came with the antenna. Since I had the Ranger AR-3500 10M multi-mode in the car the first band tested



A 6 ft. Outbacker take-down model (note the "20M" engraved on the whip).

was 10M. The results were excellent, with much DX being worked as I drove to and from work. Signal levels were slightly lower than experienced with the 102 inch whip. However, the whip provided much more capture area and slightly higher efficiency at the expense of a lot of steel up in the air.

Tuning the Outbacker antenna was extremely simple using the new MFJ-207 HF antenna analyzer. Connecting the MFJ-207 to the coax from the Outbacker and tuning the frequency on the analyzer's dial (for the proper band) you can quickly determine the lowest SWR on that band. Using a frequency counter connected to the MFJ-207, a direct readout of the resonant frequency can be seen. It is then a simple matter to adjust the small whip wire at the top of the Outbacker or reposition the Wander Lead to lower the SWR. Also, using the MFJ-207, you can quickly determine the bandwidth of the Outbacker by locating the 2:1 SWR points on each side of resonance. The bandwidth on all bands met or exceeded those published in the Outbacker literature. Instructions for the Outbacker advised that once positioned, the wire whip at the top of the antenna need only be adjusted for 75M and the top end of 10M. Installation and tuning instructions furnished with the antenna are clear cut and easy to follow.

Taking the HW-9 mobile was an experience. Since I have no latent death wish, I do not operate CW while driving! The HW-9 was used at several hill-top locations over a couple of weekends. It was found that the Outbacker

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could be pressed into service on the CW end of 40M by retuning the wire whip. However, 80M CW required an antenna tuner to get a good match to the HW-9. In all fairness, the standard ham Outbacker was not designed to operate on the low end of 80M, so results were predictable. However, special order Outbackers can be made to complement the CW portions of any band. Just say the word and Terlin Aerials will wind the necessary turns on your Outbacker.

As to overall results, the Outbacker is a very good performer on the HF bands and should be considered a good value for the money for the serious HF mobile operator. The dollar investment in multiple whips or resonators from other manufacturers will definitely offset the cost of the Outbacker antenna. As with any short antenna system, there are trade-offs. While the much longer "bug-catcher" type antennas (with their long whips and huge loading coils) may prove to be slightly more efficient in the 75 and 40M range, the increased height is a definite drawback since the antenna is prone to smacking low hanging tree branches, overpasses, etc. which can seriously damage whips and coils. My Outbacker has taken some serious abuse from low hanging branches and has come away none the worse for the wear. And to keep it looking great, simply apply a light coating of car wax to the antenna and all the bugs, marks and mung that normally clings to the antenna whip can be easily wiped off, restoring the Outbacker to it's original "like new" condition. The Outbacker performs extremely well, both physically and electrically, for a short, helically wound antenna.

Prices for the Outbacker system are currently being revised. Since these antennas are made in Australia and air shipped to the US, air fare and manufacturing costs keep fluctuating. Terlin Aerials has indicated that the cost of the petroleum based materials used in construction are increasing. The importer, Outbacker Antenna Sales, has indicated that they will be offering a 7-band model which will help to offset the rising costs of manufacturing. For further details on the Outbacker antenna, write or call Outbacker Antenna Sales, 330 Cedar Glen Circle, Chattanooga, TN 37412; 615/899-3390. Don't forget to tell Don that you saw it in **Worldradio!** □

Resonant: Small insects which infest pitch

Resonant filter: Used to remove small insects from your pitch; sometimes called a "pitch fork."

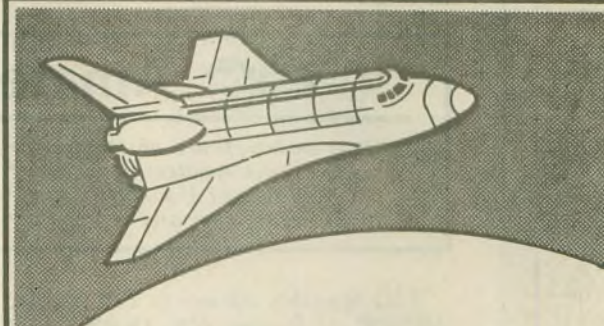
—Yakima ARC, WA



Some hams home-brew their radio gear, but here's a ham who goes one step further: Bob Pulhuj, KE8ZJ, of Toledo, Ohio, has home-brewed the bicycle that carries his radio gear. He built the frame for his recumbent bicycle from scratch.

Bob will show this bike and more of his home-brewings at the second annual meeting of the Bicycle Mobile Hams of America at the 1991 Dayton Hamvention, where they'll have a forum on Sunday, April 28 at 9:30 a.m. The forum program will include HFing from a bicycle, antenna design, accounts of travel and adventure, and of course Bob and his home-brewing projects. All bicycling hams are invited. For more information write to BMHA, Box 4009, Boulder, CO 80306.

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STATION APPEARANCE

Diana L. Prah, KD7TO

Send Worldradio a picture of your shack and the staff will choose a winner to receive a free one-year subscription! Stations will be judged by

neatness (wires tucked away, etc.) and accessibility of equipment. Monetary value of equipment is not a consideration.



Diana L. Prah, KD7TO, of Miami, AZ, is this month's winner.

Diana has been an Amateur for five years, and particularly enjoys chasing

DX. Her shack and operating console were custom designed and constructed by her husband.

Besides hamming, Diana also cares for three young sons, ages 9, 6 and 5, and enjoys cooking as a second hobby.

Following is a description of her equipment:

Kenwood TS-940S, Alpha 78 linear, Nye Viking MB-V tuner and Hy-gain HDR-300 rotor.

Digital equipment includes a Robot 400 SSTV terminal and an AEA PK-64/Commodore 64 for RTTY, Morse, Amtor and HF Packet.

Peripheral equipment includes a monitor, disk drive, printer, phone patch, electronic keyer, remote antenna switch and a remote antenna tuner.

Antennas include a 523 ft. end-fed long wire with remote tuner, dipoles for 160/80/40 and a 10-element Wilson System 40 triband Yagi on a Rohn HBDX 48 ft. tower. □

Ode to code

CARLE GRAFFUNDER, WY7H

Out of nothingness it comes in waves of silk, smooth as cream, swinging exquisitely, or like a machine gun, firing staccato bursts, sometimes ragged and sometimes measured, riding earth's blue from rim to rim.

It's not just sound and fury, not just dits and dahs: It's an inner eye that links with minds I cannot see. Like summer zephyrs, it comes gently to my ears and pricks memories, rejuvenates thought, encourages originality, makes me laugh. Ah, code is sheer poetry.

But, more than that, it's shelter — enclosure to keep out gallumping whirl of workaday toccata, barrier against sound of metal and brawl, refuge of comfort and peace. Ah, code is being at home.

But code is also music. Once it came through sounders, then streamed through "cans." Now speakers play code's tune from wall to wall. Beginner's scratch or rhythmic flow of well-honed "fist," identities emerge like songs from long, thin paths of sky. Ah, code is music to the heart.

Out of nothingness it comes in waves of silk, smooth as cream, riding the blue. It's not just sound and fury; it's not just dits and dahs. It's poetry; it's music; it's home sweet home: It's code. —Originally published in *QRM Newsletter* □



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This month's winner is Ted Medin, N6TRF, of Poway, CA. Don't forget Spider ants and the bug.

At work I often have mail communications with people from outside the United States.

Once I had a program request from a user in West Germany and after answering his request I signed with my call sign. Sometimes that brings out an

Amateur on the other end.

His reply was terminated with a call sign, O7USF. I thought that was a strange call coming from West Germany, but what do I know, so on my next communication, I suggested we might set up a sked and told him about my rig... Kenwood 830S ant G5RV up 35 f+ ...

Well, his next reply was hilarious. He allowed that he didn't know what the N6TRF was all about, so he had just bumped my sign by one character or number and put it in his reply. Then when I told him about my rig, he confessed he had to go to his associates to find out what that was all about.

What really got a belly laugh out of me was that he had looked at my rig description and couldn't figure out what kind of an insect an "ant G5RV" was. □



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!

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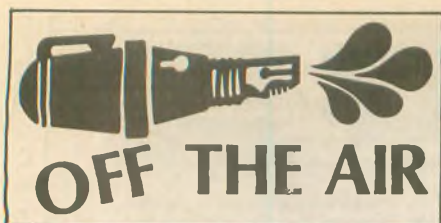
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Packet frequencies

While reading the article in the January issue of *Worldradio* entitled "HF Packet: a personal experience," I noted a statement which did a great disservice to the Amateur community, the RTTY community in particular. Although it does occur, it should not be fostered to operate packet below 14.003, and specifically not below 14.099. That area, by gentlemen's agreement, is for RTTY and AMTOR. In addition, use of the 14.099 frequency will result in interference with the 14.100 CW beacons which are of great service to worldwide communications.

The frequencies 14.075 to 14.099 are for RTTY and AMTOR, and 14.099 to 14.101 should be kept clear for the beacons. Any use of frequencies above 14.101 are within the gentlemen's agreement for HF Packet operation.

PETER RIMMEL, K8UNP
Hollywood, FL

Irresponsible

Irresponsible. That is the only way I can describe Mike Cafferky's "Continuous Wave" column in the February issue of *Worldradio*. In the article, he describes his first day on mobile CW, that is, using a keyer paddle to send Morse code while driving, and copying the code sent to him in his head. He describes forgetting to shift gears, having his car lurch forward, difficulty turning corners while sending, and being "thoroughly disoriented," and yet still recommends mobile CW as "a whole lot of fun!"

Mr. Cafferky knows that he is driving erratically while sending code: "I wondered what it would be like to be pulled over for drunk driving," and he says, "I sneaked a peek in the rear view mirror and found a look of consternation on the face of an impatient driver following." He quotes another mobile CW operator, "The first day the main objective is to keep from hitting something." But he still treats the likelihood of an accident as a joke: "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?" Very funny. I hope Mr. Caf-

ferky doesn't find out how long it takes. And I hope the accident he causes doesn't involve ME!

Driving an automobile safely requires the driver's full attention. Sending and copying Morse code ALSO requires one's full attention. After reading Mr. Cafferky's article, I cannot understand how he can recommend doing both at the same time. Mr. Cafferky is lucky that his inattention to his driving while focussing his entire attention on sending and receiving Morse code didn't result in an accident. If he does become involved in an accident while operating mobile CW, the entire responsibility and liability will be his. Any lawyer who sees a copy of his column will guarantee that!

His disclaimer that "driving safely is the first responsibility" rings hollow when, a few lines further on, he says, "... you may wish to plunge into rush-hour highway traffic and learn mobile CW operating real fast." The fact that mobile CW CAN be done does not mean that it SHOULD be done, or that it can be done SAFELY.

JOHN T. PHILLIPP, N6ZAE
San Dimas, CA

Demonstration

Recently I participated in an excellent, all day demonstration of Amateur Radio with four other hams at an elementary school. I felt the day would have a chance to be successful because our coordinator was well organized and prepared. We set up and checked out the equipment the night before. The introductory talk was a dry run, and we made a few test QSOs. Each of us knew our responsibilities. But, in reviewing the day, it is evident that it was successful because many hams took the time and effort to have an informative QSO with us.

Prior to the day of the demo, the teachers had the children prepare questions. I found both the stateside and DX operators took extra time to answer the questions and to tell the classes something about their state, country, etc. I really liked working the hams who had enough personality to engage in more than a "you're 59 here OM, WX in XYZ is..." QSO.

Some notable contacts were: the 8P6 who stopped a 10M run to chat with

HTs, HTs, HTs...



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the children for about 15 minutes; the local who called when I was having trouble making any QSO; the G4 who honestly said he didn't watch TV, he was too old, and therefore he didn't have a favorite TV show; and the "mobile 4" who chatted with us as he traveled between service calls—that opened eyes, both teachers and children learned we can operate from a car and conduct this hobby during work hours.

"Professionally," I thought my most impressive contact was the 10M QSO with the G0/Mobile (aren't sun spots great!). I was using a vertical and 200W PEP SSB. We had another station operating CW the entire time. Also in the same hallway was a code practice oscillator for the children to practice on after they received their Archie comic book.

Because of the thoughtfulness of other hams, we may get a few new, young hams out of the 600 children, first through sixth grade, who partook in the excitement one school day. Definitely the kids will remember talking to, and hearing about, areas outside of their town. The world became a little smaller and they're now aware of a new hobby.

EDWIN F. STEEBLE, K3IXD
Glenwood, MD

Disability waiver

As I understand, the recent disability waiver allows a person with a medical excuse to become exempt from the code examinations. This is not a futuristic practice advisable for the FCC. Opening the gates and allowing anyone with a simple note to become licensed decreases the education, respect and honor one gains in becoming an Amateur Radio operator.

In the future, people are going to become uneducated, licensed operators, not knowing their operating potential and spreading their uneducated practices over the airwaves. This will only decrease the community's respect for hams.

I ask myself, why would the FCC want to pass this proposal? The only reason I can figure out is that someone felt that physically and mentally disabled persons are being discriminated against. How could there be discrimination when a well developed educational program like the HandiHams System is available to assist those individuals?

Enclosed is a picture of Steve, WA6YFD. He passed his Extra Class license, 20 wpm and 30 technical questions, on Friday, Aug. 31, 1990. Steve is affected with Muscular Dystrophy,



but he is the last person who would want special treatment. One of the reasons he passed his Extra Class license was to prove to himself and the rest of the FCC that he could become an Extra Class operator under its traditional guidelines.

BELINDA BECK-MEYER,
KC6AAN
Novato, CA

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It's the money

I read *Worldradio* every month and love it. I also read *QST*, put out by the famous ARRL. It is nice to read both and get a full view on what is going on.

I love your comments and summaries about the FCC and what is going on in the world of Amateur Radio. I am very concerned about this no-code issue. It appears to me that we have had no-code operators for a long time and no one has mentioned the fact. Look at the novice of today; he barely learns enough code to send the alphabet, he is passed into the Novice Class, and soon he upgrades to Technician Class. And that is it. He then spends all his time working 2M as well as the 10M SSB bands. The concept of no-code is supposed to encourage more people to take up Amateur Radio.

Let me tell you what is really holding back people who would like to become Amateur Radio operators. It is the price of the new gear on the market. Most of the gear now is loaded with memories, bells, whistles and other novelties which the average ham does not use and never tries to use.

It appears to me that the makers of modern gear have completely priced the average ham out of the market for good solid state gear. I doubt very much that the new no-code Technician Class license will have a profound effect on the number of hams we have in the United States.

MARION O. CATREN, WB0VIB
Stafford, KS

The cost of CW

It seems that all major ham radio manufacturers are ignoring the need for low-cost, simple, apartment-compatible rigs. I don't care about the Novice voice enhancements. I want to work CW, and nobody is manufacturing a rig that I can afford today.

So, my dear radio manufacturer, would you like to get my money into your bank? Here's how you can do just that: make me a low-cost, CW rig that will allow me to work the major Novice bands from my apartment at an affordable price with simple operating controls at a low price which has TVI under control and doesn't cost so much and includes an antenna that I can erect (and remove) easily from my apartment window along with some anti-idiot circuits to keep me from burning up the radio's guts with a bad SWR treatment, and remember to provide this to me at a price that I can afford, and include a 120-Volt power supply so that I can plug it in and start working code without having to become a genius and expert in electrical engineering. Oh yeah, one last thing,

remember to make it at a price that I can afford.

I want to practice Morse code, but with the price tag for an 80/40/15/10M rig well over \$500 (actually it's over \$1,000) and with the realistic de facto requirement that you must have your own home, I'm just not going to do anything with Morse code for several more years.

Oh well, I've tried. Looks like ham radio is not for me right now; maybe never. Oh well, there are better things to do with my money, and evidently the major manufacturers don't want my money anyway. Or perhaps they just can't meet this market with an affordable product. Who knows? Who cares? Either way, I'll just sit on my caryes.

CLINT DANBURY, N4WBM
San Francisco, CA

A look back

Okay, so maybe I am an "old fogie." I was licensed in 1932 in the days when to become a ham, all you needed to do was pass 10 wpm, sending and receiving, along with a fairly tough written exam. If you passed, you were a ham—no special privileges beyond what were then allotted to all hams. You received a pretty, blue certificate

signed by the then Federal Radio Commission's head honcho, James M. Chappell. You also received a plainer, 8½ × 11 piece of paper containing your call sign. This was your station license. All calls started with the letter "W" and there were only nine call districts. If you moved, you got a new call; I held three different calls in those days, as I moved about the country. Ham radio was fun at that time, when we had only about 50,000 licensees. The Call Book was only about 5/16 of an inch thick, and the Amateur Radio Handbook looked about the same and cost five bucks.

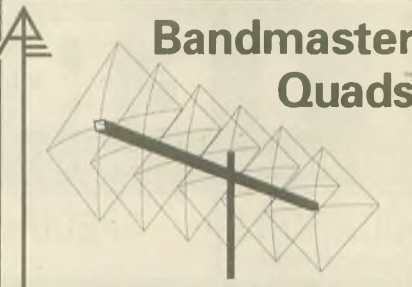
In that era, the Federal Radio Commission, forerunner of the FCC, paid strict attention to what we hams were up to, and pink slips were issued regularly for such infractions as failure to identify each time you turned over to the other station. CW was the main mode, with AM phone just coming in. We didn't even know what SWR was, let alone worry about it. As long as we got out, let the neighbors complain about their lights flickering! We took pride in how long an RF spark we could pull with a lead pencil off the household light switch plates—brass, then!

All of this nostalgia brings me to the reason for writing this in the first place—the no-code flap . . . It's all a cop-out folks, presumably to attract more people into the hobby. Do we really, really, need so many more in the hobby, based on the idea that we will lose frequencies if we don't populate them to the saturation point (which they are nearing already)? I don't buy this, because if they (FCC, etc.) want to take the frequencies, they will, regardless of how much we use them; witness 220.

I don't believe this no-code business will actually attract all that many more people, particularly since they would be so severely limited in their operating privileges. In my humble, perhaps dated opinion, I feel that if a person really wants to become a ham, he will learn the code. It can be done, as witness the nearly half a million of us who did it, at all ages, some even with severe handicaps. I personally hadn't used code for years, until I decided to forego my standing as the world's oldest General Class and up-graded to Extra. Took a bit of practice, but no sweat. Many just don't want to take the time to study or aren't really that interested in the first place.

Let's face it—if you don't want to use CW, you don't have to. How many of us remember all the theory we learned to pass the up-grades?

It's a hobby, people, not an engineering degree, and most of us can't fix our own radios anyhow, these days. But if the present trend in licensing con-



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

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April 26, 27, 28, 1991

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• Asst. General Chairman, Ross Brown, WA8DQH

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Nominations are requested for "Radio Amateur of the Year," "Special Achievement" and "Technical Achievement" awards. Contact: Hamvention Awards Chairman, Box 964, Dayton, OH 45401.

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Novice thru Extra exams scheduled Saturday and Sunday by appointment only. Send FCC form 610 (Aug. 1985 or later) - with requested elements shown at top of form, copy of present license and check for \$5.25 (payable to ARRL/VEC) to: Exam Registration, 8830 Windbluff Point, Dayton, OH 45458

1991 Deadlines

Award Nominations: March 1

License Exams: March 26

Advance Registration and banquet:

USA - April 4 Canada - March 31

Flea Market Space:

Spaces will be allocated by the Hamvention committee from all orders received prior to February 1. Notification of space assignment will be mailed by March 15, 1991. Checks will not be deposited until the selection process is complete.

Information

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Lodging Information: (513) 223-2612
(No Reservations By Phone)

Flea Market Information: (513) 767-1107

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Please write to Lodging, Dayton Hamvention, Chamber Plaza, 5th & Main Streets, Dayton, OH 45402 or refer to our 1990 Hamvention program for lodging information which includes a listing of hotels and motels located in the areas surrounding Dayton.

HAMVENTION is sponsored by the Dayton Amateur Radio Association Inc.

Advance Registration Form

Dayton Hamvention 1991

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Flea Market Reservation Deadline: February 1

Enclose check or money order for amount indicated and send a self addressed stamped (#10) envelope.

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tinues, look for another CB debacle —not too many steps away from licensing by application rather than examination. So speaks a real old timer, for what it's worth.

L. K. (LOU) BEAN, KV4JC
St. Croix, VI

Know code

No-code has arrived. Despite the concerns, complaints and warnings of most hams, the commercial interests have prevailed. We were told that it was to be only an "entry level" license at frequencies above 2M. We were told that it was needed to preserve the growth of Amateur Radio. We were told that it was for the best. After all, the proponents insisted, CW is an obsolete mode of communications and it hinders far too many from obtaining a license. What we were told was never documented by reliable evidence, and people like me did entirely too little to stem the tide of misinformation. All that is now hindsight. The battle is lost and no-code becomes a reality as of February, 1991.

Where do we go from here? Is it best to shrug our shoulders and accept the "inevitable?" I propose that there is a better approach. Let's turn no-code into *know* code. Begin thinking of how we can encourage these new "Technician licensees" to learn Morse code and enter the full spectrum of Amateur Radio. We owe it to our hobby to do so. Morse code represents more than a unique and reliable means of communication. It epitomizes the spirit of challenge that has made Amateur Radio what it is today. As changes have been legislated (some good and some not so good), a knowledge of Morse code has remained until now a distinguishing feature of the ham. After all, one can purchase a book with every question and answer on every test, but you had to *learn* code. At 5 wpm, the challenge wasn't all that great, but nevertheless, it required a sort of discipline which set our hobby apart from the 11M mess. Discipline is what sets the ham apart. As time (and

re-regulation) has eroded some of what Amateur Radio was, we have faced new problems. Problems like arguments between competing nets, deliberate interference and profanity on the air. Morse code has not solved those difficulties, but it has been a factor in requiring some form of discipline that has, no doubt, helped Amateur Radio.

So back to *know* code. What can we do to reach these new codeless licensees and encourage them to learn code? (I'm told that nearly a month before the no-code licenses are to be issued the ARRL has stacks of completed 610s for the new "Technician Class" ready to forward to the FCC.) They will have a significant impact on Amateur Radio for years to come. I suggest the following:

1. Talk up the code. Don't focus on the difficulties. It isn't all that hard. Encourage them to learn and grow in their new hobby.

2. Give prominence to teaching Morse code in your organization's license classes. Often, when the Novice classes are taught we rely on tapes to teach the code. Establish a special class for code and work with those learning code and those who are trying to increase their speed. Set out some hand keys and teach sending as well as receiving. Often in the past we have

taught them to receive, but left them with no sending skill whereby they can enjoy on-the-air activity (the result of a previous FCC regulation blunder).

3. Promote CW activities as part of your club's functions. Set up more Field Day CW stations. Demonstrate CW operation at swap meets and hamfests. Organize CW groups within your club to promote CW operation.

4. Conduct CW nets in addition to the voice nets on 2M. Perhaps we can entice some "Technicians" to want to participate. Set aside time for code practice on the lower portion of 2M and elsewhere where the new "Technicians" have access.

5. Encourage participation in the annual "Straight Key Night" on New Years Eve. Talk it up. It's a great way to avoid dangerous traffic on a cold night.

You may have more and better ways to promote *know* code. I'd be happy to hear them. I'm current in the *Callbook*. Drop me a line and I'll do what I can to pass it on.

W.B. "WHIT" WOODARD,
KI6WB
Rocklin, CA

Fighting the CW giant

Let's not fight the no-code license; let's fight to keep what we have. Let's turn what most think as a bad move by the FCC into a new tool to bring in new hams. See how many hams in your local area General Class and higher use CW 50 percent of the time, or how many can even still copy CW. Scary, isn't it? We have to change the way we think and act toward CW. It's just another way to communicate, as is RTTY, packet, SSB, AM, FM, Amtor, SSTV and before you fly off the handle because you think I am against CW, read on. Have you ever talked to someone who stutters? They want to talk clearly more than we want them to, but listen to them sing! Absolutely astounding, isn't it? So we have to change the way we treat and teach CW.

Conventional Novice and Tech classes could be taught together with the no-code Technician classes, and the code exam could be given at the end of these sessions. This way, everyone could see how easy it is and by having the classes combined, there may also be a little added peer pressure by classmates to try code. Such a setting might be less intimidating for those who had not initially intended to challenge CW.

JIM HUNDLEY, N8AYQ
Williamsburg, MI

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Misprint?

Gordon West's article (July 1990) on the Outbacker was very interesting with the exception of his statement that there is "an external wire, wound clockwise firmly around the antenna shaft..." This is quoted from the third paragraph on page 47.

However, in the advertisement by Outbacker Antenna Sales on page 58 there is the statement that you just take the external wire and "... plug it into the lowest socket, then wind it counterclockwise to desired band."

Since the pictures in Mr. West's article appear to show the wire wound in a counter clockwise direction I must assume this is a misprint or perhaps a failure to observe that the direction differs according to the observer's position.

If the observer is situated at the antenna base, then the wire is wound toward the base in a counter clockwise direction, but it goes away from the observer in a clockwise direction.

In a similar way an observer at the top of the antenna will observe the wire coming toward him in a counter clockwise direction but he would see it going away from him in a clockwise direction.

This is another example of how the term of reference is relative to the position of the observer. However from a purely pragmatic viewpoint it would seem that most observers would be situated above the base of the antenna since most would choose a fender, bumper or trunk mount. Since the external wire is always plugged into the base, then the "natural" point of view is from the base to the top of the antenna. With that in mind, the wire is wound counter clockwise as stated in the advertisement.

JACK WELLS, WQ0H
Colorado Springs, CO

Help

VK4SS needs a sked to work Delaware to complete a WAS. Write to Alan Shawsmith, 35 Whynot St., West End, Brisbane, Q 4101, AUSTRALIA.

DICK RANDALL, K6ARE
Livermore, CA

*There was a young ham named Lamar
Who was obsessed with SWR.
He spent all his time pruning
And tweaking and tuning,
While his log lay unused in the drawer.*
—Gary Meyers, K9CZB; Argonne
ARC, IL

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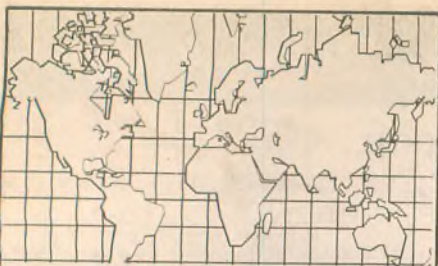
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Activities Calendar

06-07 Apr. PZK SP DX Contest (CW)
27-28 Apr. USKA Helvetia-26 Contest

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

There were no applications received for the Worked 100 Nations Award sponsored by Worldradio this period. However, we are taking this opportunity to list the nations that qualify for the award. The rules are available from N6JM or Worldradio for an SASE. The list is also applicable for the annual DXathon, with the exception that reciprocal calls are valid to the DXathon.

NATIONS LIST

February 11, 1991

A2 Botswana
A3 Tonga
A4 Oman
A5 Bhutan
A6 United Arab Emirates
A7 Qatar

A9 Bahrain
AP Pakistan
BV Taiwan
BY China
C2 Nauru
C3 Andorra
C5 Gambia
C6 Bahamas
C9 Mozambique
CE Chile
CN Morocco
CO Cuba
CP Bolivia
CT Portugal
CX Uruguay
D2 Angola
D4 Cape Verde
D6 Comoros
DL Germany
DU Philippines
EA Spain
EI Ireland
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EP Iran
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FP St. Pierre & Miquelon
FW Wallis & Futuna
G England
GD Isle of Man
G1 Northern Ireland
GJ Jersey
GM Scotland
GU Guernsey
GW Wales
H4 Solomon Islands
H5 Bophuthatswana
HA Hungary
HB Switzerland
HB0 Liechtenstein
HC Ecuador
HH Haiti
HI Dominican Republic
HK Colombia
HL South Korea
HP Panama
HR Honduras
HS Thailand
HV Vatican City
HZ Saudi Arabia
I Italy
J2 Djibouti
J3 Grenada
J5 Guinea-Bissau
J6 Saint Lucia
J7 Dominica
J8 St. Vincent & Grenadines
JA Japan
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SM Sweden
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SU Egypt
SV Greece
T2 Tuvalu
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T5 Somalia
T7 San Marino
TA Turkey
TF Iceland
TG Guatemala
TI Costa Rica
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VK9 Christmas Island
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VP2E Anguilla
VP2M Montserrat
VP2V British Virgin Islands
VP5 Turks and Caicos Islands
VP8 Falkland Islands
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VQ9 British Indian Ocean Territory
VR6 Pitcairn Islands
VS6 Hong Kong
VU India
XE Mexico
XT Burkina Faso
XU Cambodia (Kampuchea)
XV Vietnam
XW Laos
XX Macao
XZ Burma
Y2 East Germany (GDR) (Note 1)
YA Afghanistan
YB Indonesia
YI Iraq
YJ Vanuatu
YK Syria
YN Nicaragua
YO Romania
YS El Salvador
YU Yugoslavia
YV Venezuela
Z2 Zimbabwe
ZA Albania
ZB2 Gibraltar
ZD7 St. Helena
ZD8 Ascension
ZD9 Tristan da Cunha
ZF Cayman Islands
ZK1 Cook Islands
ZK2 Niue
ZK3 Tokelau Islands
ZL New Zealand
ZP Paraguay
ZS South Africa
ZS3 Namibia
3A Monaco
3B Mauritius
3C Equatorial Guinea
3D2 Fiji
3DA0 Swaziland
3V Tunisia
3X Guinea

4S Sri Lanka
4W North Yemen
4X Israel
5A Libya
5B Cyprus
5H Tanzania
5N Nigeria
5R Madagascar
5T Mauritania
5U Niger
5V Togo
5W Western Samoa
5X Uganda
5Z Kenya
6W Senegal
6Y Jamaica
7O South Yemen
7P Lesotho
7Q Malawi
7X Algeria
8P Barbados
8Q Maldives
8R Guyana
9G Ghana
9H Malta
9J Zambia
9K Kuwait
9L Sierra Leone
9M Malaysia
9N Nepal
9Q Zaire
9U Burundi
9V Singapore
9X Rwanda
9Y Trinidad & Tobago

Notes:

1. Date of contact must be prior to the unification date in October 1990.
2. Many of the above nations have more than one prefix.

IOTA

The IOTA awards program, sponsored by RSGB, is alive and well. We have a large selection of islands and island groups for you to check. Many of these are within reach for the modest DXer.

AS-22	Medvezhi Island	UZ0QXY/4K4	14.006 MHz	0830 UTC
EU-08	Inner Hebrides	GM0EWX	28.498 MHz	1800 UTC
EU-29	Zealand Archipelago	OZ1GKU	28.465 MHz	1300 UTC
EU-33	Vesteralen Islands	LA4MQ	14.256 MHz	2330 UTC
EU-46	Senja group	LA5QFA	28.472 MHz	1330 UTC
EU-55	Solund group	LA1WO	28.530 MHz	1315 UTC
EU-66	Solovetskiye Islands	RZ1OAA	14.193 MHz	0915 UTC
EU-91	Kotlin Island	UV1AD	14.015 MHz	1330 UTC
AS-22	Bear Islands	4K4QQ	14.026 MHz	0300 UTC
NA-10	Cape Breton Island	VE1XA	21.355 MHz	1830 UTC
NA-17	Isla Cedros	XF1C	21.004 MHz	2200 UTC
NA-19	Kodiak group	NL7VT	14.222 MHz	2300 UTC
NA-41	Alexander Archipelago	NL7BY	14.222 MHz	0000 UTC
NA-51	Queen Charlotte Is.	VE7IDZ	14.260 MHz	0800 UTC
NA-55	Deer Isle	W1RPC	28.528 MHz	2300 UTC
NA-56	Los Canarreos Arch	CM4QC	7.010 MHz	0230 UTC
NA-61	Princess Royal group	VE7GKH	14.160 MHz	0130 UTC
NA-67	Ocracoke Island	AB4TL	14.190 MHz	2045 UTC
NA-75	Gulf Islands	VE7VP	14.227 MHz	2000 UTC
OC-59	Kosrae Island	V63NW	14.195 MHz	0800 UTC

Always take a listen near 14.260 or 21.260 MHz to see if there is any IOTA activity. These are the general frequencies where island hunters hang out, often passing information on upcoming IOTA DXpeditions.

VE7FEI, also in the Gulf Islands, has reported in to the ET Net on 14.160 MHz around 0100 UTC.

UA0KAP is reported to have been at AS-71 in February.

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3 160, 80, 40M	60 ft. ..	\$ 48
2 80, 40M	40 ft. ..	\$ 36
1 NO-TRAP DIPOLE - 160, 80, 40M	112 ft. long	\$ 79
2 80, 40M	85 ft. ..	\$ 62
3 BAND SPACE SAVER DIPOLE - 180 thru 10M*	48 ft. long	\$ 93

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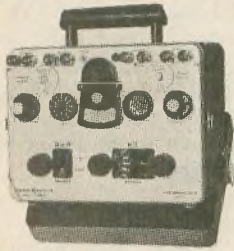
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2590A shown with 5245L Counter and 5253B Plug-In (sold separately).

**HP 5245L
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Now you can own one of the most versatile frequency counters ever built! Almost everyone who has been in the electronics business for the last 30 years has used one at one time or another.

- DC TO 50 MHz (EXPANDABLE TO 18 GHz)
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- DELAYED TIME BASE 0.1 μ sec TO 20 sec
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Military version of the HP 180A Scope with a 1801A Vertical Plug-in and a 1821A Timebase. There are many other plug-ins available such as TDR's, spectrum analyzers, etc. The Mainframe 180A is actually usable to 100 MHz. All solid state. Snap up this bargain 50 MHz Scope while supplies last! Manual included; Accessories sold separately.

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- 5254A Frequency Converter \$ 100.00
Increases counter range from 300 MHz to 3000 MHz at 50 mV sensitivity.
- 5256A Frequency Converter \$ 400.00
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- 5281A Video Amplifier \$ 50.00
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- 5282A Time Interval Unit \$ 50.00
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- HP 608E (10 MHz to 480 MHz) Later Model \$ 250.00

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- 0 - 95% AM MOD; + CW or PULSE
- \pm 0.5% FREQ. ACCURACY



- 5264A Preset Unit \$ 75.00
Measures N x frequency, N X period, N X ratio, ratio, divides by N and preset counts.
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Converts counter to a digital DC voltmeter with 10, 100, and 1000 V ranges.
- 5267A Time Interval Unit \$ 100.00
Measures 1 μ sec to 10^6 sec with 0.1 μ sec resolution at 0.3 V sensitivity.





Trond Olsen, LA8XM/JW8XM, poses at his Oslo QTH.

XF1C on Cedros Island (NA-17) is very active, including the contests. We worked him during the CQ Worldwide 160M Contest the end of January. If you were in the contest, make sure to check your logs and request a QSL.

Hal Howard, KD7EC, reports that he will be operating from South Padre Island, Texas (NA-92) March 15 through April 15. He also operates there about once a week for short periods. Check 28.560 or 21.260 MHz.

There was even island activity during the 10-10 QSO Party the first

weekend in February. If you worked W1RPC in Maine, he is located on Deer Isle (NA-55).

Now that you have seen what is there, perhaps you are interested in the program. Details are available from Dewitt L. Jones, W4BAA, P.O. Box 379, Glen Arbor, MI 49636. Overseas DXers should write to Roger Balister, G3KMA, La Quinta, Mimbri-bridge, Chobham, Woking, Surrey GU24 8AR, England. Be sure to include an SASE. Copies of the directory are available from *The DX Bulletin*, P.O. Box 50, Fulton, CA

95439 for \$4. An updated directory is soon to be published by Roger, the IOTA manager. It is highly recommended that you have a directory if you are interested in the program, as it is almost impossible to keep records of the islands that you have worked without it.

Don't forget the WF1N visit to Martha's Vineyard (NA-46) in April. Tony says his team will operate SSB in the General portions of the bands, 10 through 75M. Look for them between April 12 and 15.

Trond Olsen, LA8XM, has spent the last two CQ Worldwide DX contests on CW operating as JW8XM from Svalbard. Most of the activity had been on 40M. Trond reports, judging from all the mail he has received, that he gave many a DXer a new one on that band, including N6JM. Trond has been licensed since 1969 and for the last six years has been actively chasing DX and has a 314 DXCC count to show for it. He says in real life he is a computer salesman for a well-known American firm.

San Felix (CE0X)

John, XQ0X, has been active on 40M and should be on 6M soon, according to the *DX News Sheet*. As of the latter part of January through mid-February, his activity has been mostly limited to the DX net on 14.236 MHz. Check from about 0300 UTC.

John has also wandered elsewhere and has been reported on 40M SSB near 7.159 MHz working Europeans on Saturdays at 0730 UTC. Also check near 21.295 MHz around 0300 UTC and 28.495 MHz at 2000 UTC.

Crozet Island (FT4W)

FT4WC checks in to the ET Net on 14.160 MHz regularly on Fridays from 2000 UTC, and on Saturdays on 14.256 MHz at the same time. *The Long Island DX Bulletin* reports that he can also be found on 15M near 21.270 MHz around 1530 UTC.

Tadzhikistan (UJ)

We found many reports of activity for this one. For an SSB contact on 40M, look for UJ8JDT from about 2100 UTC near 7.078 MHz. Also reported around the same time was

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UJ8JI on 7.072 MHz and UJ9XWB on 7.069 MHz.

For a CW contact on that band we have the following reported:

UJ8BC	7.005 MHz	0045 UTC
UJ8JI	7.011 MHz	0200 UTC
UJ8JJK	7.002 MHz	0215 UTC
UJ8JX	7.002 MHz	1830 UTC

Twenty meters is where most of the activity appears, both SSB and CW. Check the following for your particular mode:

RJ8JDV	14.044 MHz	0300 UTC
UJ8AH	14.010 MHz	0100 UTC
UJ8JM	14.030 MHz	1345 UTC
UJ8JMM	14.259 MHz	0345 UTC
UJ8JX	14.160 MHz	0015 UTC
UJ8KA	14.201 MHz	0315 UTC
UJ8SAD	14.178 MHz	0300 UTC
UJ9KWC	14.187 MHz	0300 UTC

For the WARC bands try UJ8JCQ on 24.955 MHz around 1200 UTC or UJ8KA near 18.074 MHz at 1345 UTC.

Madagascar (5R8)

According to *The Long Island DX Bulletin*, 5R8GN shows on 14.197 MHz at 1930 UTC announcing his schedule for the following day, which includes 10, 15 and 20M. Also check the net that meets on 14.222 MHz.

Also reported was 5R8JD who had reported into the ET Net on 14.160 MHz around 2200 UTC on January 25. He has also been found a few times up on 10M near 28.510 MHz after 1530 UTC.

Niger (5U7)

The only active station from this one seems to be 5U7NU. He often visits the various 20M DX nets after 2100 UTC. Try 14.206, 14.226 or 14.256 MHz.

On 15M he was with the DX net that meets on 21.335 MHz, and on 10M he was busy on 28.479 MHz from about 1530 UTC on January 10.

Togo (5V7)

At least three stations were reported from this one recently. The most active was 5V7AK who was reported on 7.001 MHz at 2100 UTC, 21.020 MHz after 1130 and 28.020 MHz around 1400 UTC.

5V7DP is also active and has been worked on 7.159 MHz at 0700 UTC, 14.253 MHz at 1715 UTC and the net on 21.335 MHz after 1715 UTC.

The third call reported was 5V7SA. We found only two reports, one on 3.799 MHz at 2115 UTC and the other on that net again on 21.335 MHz.

DXCC project activity reports

We have been receiving weekly reports from the DXCC desk on the progress they are making on the backlog. (Over the past year or two they

became buried in new applications and endorsements, probably due to an increased interest in DXing, DXpeditions bringing up new ones, etc.) To show you how they are doing, we have prepared the following progress report (received-R, processed-P, backlog-B):

New applications (week ending)	R	P	B
Jan. 6, 1991	32	72	757
Jan. 13, 1991	39	152	644
Jan. 20, 1991	19	49	614
Jan. 27, 1991	18	95	537
Feb. 3, 1991	19	79	477

Endorsements (week ending)	R	P	B
Jan. 6, 1991	52	122	2717
Jan. 13, 1991	47	87	2677
Jan. 20, 1991	40	77	2640
Jan. 27, 1991	24	114	2550
Feb. 3, 1991	31	114	2467

Other members of the headquarters staff have been assigned to reduce this workload, taking them away from their normal duties. The DXCC program is a good thing, but remember that not all members of the ARRL are DXers. Therefore, we cannot see the reason for any complaints of a \$10 fee for more than one submission per year, especially when there are no restrictions on the amount of cards and endorsements sent for the once a year free submission.

DXCC companion

If the backlog at the DXCC desk isn't enough, the ARRL has come up with a publication to help the potential DXer on the path to his DXCC. *The DXCC Companion, How to Work Your First 100 Countries*, is written by Jim Kearman, KR1S. Intended for new DXers, it covers the sport of DXing from making that first DX contact to applying for membership in the DX Century Club. It contains it all! Everything the beginner needs to know, including antennas, propagation, operating, etc., is included in this book. The text is also supported with a bit of humor and a few cartoons.

The text is divided into 15 chapters and runs you through in a logical order of what to expect. The first chapter is "What is DXing?" One might think this dumb, as everyone knows what DX is. Right? Maybe so, if you read



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our column. But what about the new Radio Amateur? This is the book for him or her.

Chapter five, "Your First DX Contact," has you on your way to your first contact. We think Jim got carried away here. A couple of pages were dedicated to phrases in other languages, which means nothing if you have no understanding of foreign languages. He even suggested courses offered at community extension schools. We feel this will defeat our potential DXer right off the bat. This isn't necessary, and Jim even states this. Of course, if you know another language, it won't hurt you either. Incidentally, your very first QSO ever was your first contact toward DXCC, as your own country counts, unless it was maritime mobile.

Chapter nine, "Sending and Receiving QSLs," is quite worthwhile and explains the method of properly preparing a QSL card, both the design and correctly entering the QSO data. I'm sure many a seasoned DXer should read this chapter.

Chapter 11 covers the DX nets and lists issue. This one is good reading for everyone, whether you are for them or against them. Read it, then form your own opinion. The chapter goes along with the subject covered in the

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- 1 CUBEX QUAD Instruction Manual (Boom and wire not included)

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previous chapter—that of pileups.

The book, all 124 pages of it, is available from The ARRL, 225 Main Street, Newington, CT 06111, for \$6. Please include \$2.50 for postage and handling, (\$3.50 via UPS). Try your local Amateur Radio store first.

Antique QSL department

The following QSL card is a little more than 25 years old, not necessarily an antique. The call VE8NO was issued to Frank Vanderzande, located at Coral Harbour, Northwest Territories.

Coral Harbour, N.W.T.
64 N. 83 W., ZONE 2

VE8NO

Radio WA4KXC confirming QSO of 19.1
at 19.1 GMT on 19.1 Mc. Ur. A. sigs
RST 599 73 PSE QSL TKS
WA4KXC QSL Manager Frank Vanderzande

Coral Harbour is located on Southampton Island, at the entrance of Hudson Bay in northern Canada. This island is NA-07 on the IOTA Reference List and is included in the top 50 Most Wanted Islands for those working in the IOTA Awards program. In the most recent issues of the *Callbook* no Amateurs have been listed as residing on that island.

There is airline service to Coral Harbour, and there are at least two places that accommodate visitors to the island. Perhaps some sporting DXer might want to take a trip up there and activate the island.

QSL information

Still waiting for that HK0TU card? The DX newsletters report that the cards are being printed in Japan and probably will not be ready until this spring sometime.

John Bartlett, KH3AE, reports that

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DX Prediction — April 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.

CENTRAL USA

UTC	AFRI	ASIA	OCEA	EURO	SO AM
8	21	15	25	14	19
10	(25)	13	22	(13)	21
12	34	18	20	22	24
14	39	21	20	25	31
16	39	18	(18)	26	36
18	39	(15)	(17)	24	39
20	32	25	32	20	41
22	26	28	39	15	41
24	23	26	41	(13)	34
2	20	23	39	12	28
4	20	21	37	19	24
6	23	17	30	16	21

APRIL 1991 WEST COAST

UTC	AFRI	ASIA	OCEA	EURO	SO AM
10	(16)	20	25	14	21
12	(22)	17	22	(13)	(19)
14	(28)	20	19	22	28
16	32	19	(18)	25	34
18	33	(15)	(17)	24	38
20	32	24	32	21	41
22	27	30	39	(14)	40
24	23	33	41	(13)	38
2	20	34	41	(12)	31
4	20	30	39	20	26
6	21	28	37	18	22
8	(18)	23	30	16	20

EAST COAST

UTC	AFRI	ASIA	OCEA	EURO	SO AM
7	21	(15)	25	13	20
9	23	13	22	18	21
11	33	19	20	23	23
13	38	18	(20)	26	31
15	39	(15)	(18)	27	36
17	38	(13)	(17)	25	39
19	35	(18)	(26)	22	41
21	29	23	36	16	40
23	24	26	40	15	38
1	21	23	39	13	31
3	17	20	37	12	26
5	24	17	30	15	23

Johnston Island does not appear to have a QSL bureau listed with the ARRL. Anyone desiring to send cards to the island may send them to: KH3/WH3/AH3 Bureau, Box 764, APO San Francisco, CA 96305.

You are all aware of the postal rate increase, effective February 3. *QRZ DX* reports that the rates to Canada and Mexico have increased to 40¢ and 45¢, respectively, and the overseas air mail rate is now 50¢ per half ounce.

Kiyoko, our roving YL about the Pacific who has operated as or from 5W1HM, C21NI, T30KY, T31KY, ZK1BY, ZK1XY, ZK2KY, ZK3KY, YJ0AKY and whatever may be next, requests all QSL requests be sent to her post office box address in Japan. However, don't expect a reply for some time as she will not begin answering them until she returns home, whenever that is!

Dave Kennedy, N4SU, who has contributed many of the old cards to our

antique QSL department, is also involved with the QSL bureau. Dave, the "S" sorter for the K4-N4-W4 incoming ARRL Bureau, says that he unfortunately has to destroy about 30 percent of all the DX cards which he handles because of the lack of envelopes at the bureau. Most of these are for the old timers. It frustrates Dave more than the young foreign DXers who will never get replies to their QSL pleas.

So, you no longer collect QSL cards? If you are going to work DX, you sure can expect there will be cards coming to you through the bureau. Make it easier for the bureau workers and keep envelopes on file. Each envelope should be 5x7½ inches, have one unit of first class postage, your name, address and your call in large letters at the upper left. Also, include loose excess postage. Some bureaus will accept cash for both the envelopes and postage. How about giving the new DXer a break, or even those who still wish to collect cards. You did once, didn't you?

QSL routes

A71CD	—WA4JTK	C9EC	—DF3EC
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AH0F	—JA2NQG	DUI/DL1VU	—DLIMCY
	(See Note 1)	EA0BOD	—EA4BOD
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H61T	-SM0KCR	V51JM	-NK2T
HS0E	-K9EL	V63NW	-DF6FK
IJ4R	-I4USC	V63VU	-DL1MCY
J6LJN	-W8QID	V73AT	-K2CL
J6LRX	-WD8IXE	VK9LA	-DJ5CQ
J6LSW	-N14M	VK9LM	-DJ5CQ
J6LTA	-N14M	VK9XA	-DJ4OI
JW1MFA	-LA1MFA	VK9XC	-DK7UY
K9EL/V56	-K9EL	VK9XE	-DJ4UJ
KC6OPD/		VP5VDH	-WD8MQJ
WH0	-JF2KOZ	VP8CFM	-GM4KLO
KC6OPD/KH0	-JF2KOZ	VQ9AY	-G4RFV
KC6VU	-DK6EX	XQ0X	-CE3ESS
PJ2J	-K1CPI	XW5AHH	-JA5AHH
PJ7A	-OH6FT	Y88POL	-Y32WN
PJ9A	-OH6XY	YN/SM0OIG	-SM0KCR
	(See Note 2)	YS1DRF	-W2PD
PJ9W	-OH6XY	ZF2PZ/ZF8	-N7KPX
	(See Note 2)	ZK1XA	-DJ1ND
PJ9Y	-OH6XY	ZK1XB	-DJ1ND
	(See Note 2)	ZK1XU	-VE3CPU
ST0DX	-WB2WOW	ZY7EH	-PS7AB
T21CE	-DJ9ZB	ZY7EK	-PS7AB
T22VU	-DJ9ZB	ZY7TR	-PS7AB
T22YL	-DL5UF	3D2QB	-SM3CER
T23XX	-DL2GBT	4Z80TA	-4X6LM
T30CT	-DF7CC	7Q7E	-DF3EC
T31AF	-DL2MDZ	7Q7JA	-JH8BKL
TJ1BJ	-K4UTE	7S3OWG	-SM3CVM
TJ5CW	-F6EEM	8P6NX	-W0SA
TJ5YL	-F6FYP	9M8RH	-DJ4OI
V21AN	-WB8SSR	9N1HMB	-JA6CBG

Notes
 1. This manager requests that QSL cards be sent direct.
 2. The Callbook is reported to three years out of date for this address. Try Carl Ikaheimo, P.O. Box 1, SF-21171, Korppoo, Finland.

Many thanks to the following contributors: WV4F, N4SU, W6TUR, NN7A, KD7EC, KH3AE, LA8XM, PS7AB, American Radio Relay League, Salt City DX Association (KB2G), Western New York DX Association (KD2YP), Southern California DX Club (WB6PSY), Western Washington DX Club (K7WA), *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 Bulletin* (VP2ML).

All applications for the 1990 DX-athon should have been received by now. As of mid-February the number of applications has not been that much different from the previous year. We need some input about your interest or disinterest in the DX-athon and what can be done to increase the incentive. Please send your suggestions to *Worldradio*. Those of you working on the 1991 DX-athon should keep a running count. Contacts made during the contests count. We enter ours into the computer and also credit the first contact of a particular nation. Very 73 de John, N6JM. □

Working the edges of the band and subbands

RONALD A. ERB, WO8Z
 Official observer, Ohio section

As a member of the Amateur Auxiliary, I was not surprised by last year's out-of-band clamor over the US stations working the Bouvet expedition. Everyday I monitor and report stations operating too close to the band or subband edges. While my official advice is free, the FCC's is not!

I get many replies from stations that I send notices to that they simply just did not realize their signal has band width. As a matter of fact, the FCC in November of 1989 defined the limits of each Amateur signal that we are responsible for in 97.307.

The old "rule of thumb" was 3 kHz from the band edge that I was working toward with my single sideband signal. But clearly, that is no longer good enough advice. Here is a good summary quoted from the ARRL 1990 *FCC Rule Book*:

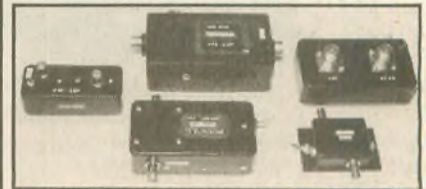
"... Amateurs commonly consider full-carrier, double sideband AM signals to be about 6 kHz wide and single-sideband, suppressed-carrier signals to be about 3 kHz wide. Yes, but those bandwidths are probably only 6dB down, and that isn't what the FCC worries about. Thus, to determine where you may set your VFO in relation to the band edge or band subband edge for your class of license, you'll have to figure out where your signal is attenuated 40 dB. Don't just assume that if your SSB transmitter bandwidth is 3 kHz, then just add a few hundred Hz to be safe. That may be fine, if the shape of the band-limiting filter is sharp enough to attenuate the signal from 6 to 40 dB. If you're going to operate as near as possible to a band edge, then do so after carefully reviewing your equipment specifications if they include such information. Remember, your carrier and all of your

sidebands must be confined within the amateur bands and subbands as applicable."

In reviewing the statistics of all Amateur Auxiliary notices sent last year, nearly 30 percent accounted for out-of-band operation. Those found operating too close are just as likely to be "old hands" at Amateur Radio as the newcomers. □

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QSL route correction

A note from Art Geyer, N8AG advises us that N8AJ is NOT the route for ZF2AG/ZF8, as we printed in our March column. ZF2AG/ZF8 is via N8AG, also ZF8AA. We are regret any inconvenience caused by this error, and convey our thanks to Art for his eagle eye.

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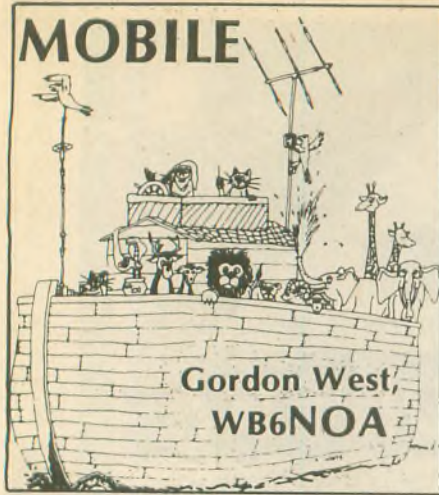
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MOBILE



Mobile HF whips evaluated.

This month we will look at high frequency, 3 through 30 MHz mobile whips. The type I'm talking about are those that screw into some sort of ball mount or $3/8 \times 24$ inch threads and use the metal body of your vehicle or the stainless steel rails of your boat as a ground plane. Before we breeze through the list of whip manufacturers and my field tests of their quarter wavelength antennas, let's review some important basics about mobile whips.

1. Longer whips work better than shorter whips. The shorter the mobile whip, the lower the radiation resistance and the lousier your signal will be.

2. Mobile whips work well up high on a vehicle. Ideally, the mobile whip would be mounted smack dab in the center of your roof. Trunks are OK, but down low on bumpers may create high SWR.

3. Most 6 ft., single-band mobile whips work about the same whether they are helical top-loaded, full helical loaded or center-loaded. A whip is a whip. However, base-loaded whips normally don't work well on high frequency.

4. Still no breakthrough in $3/8 \times 24$ inch type mounts. A trunk lip mount is a good way to go without boring holes. Chain-mounts are OK for the bumper, but this usually mounts the whip too low. Giant magnetic mounts look terrible on a roof, but they work great!

Let's take a look at the different manufacturers and the types of whips I have tested from each of them. If I left anyone out, it's because the whip is not in my antenna test bin. The tests are conducted on a series of mobile mounts (cars, boats and motorhomes) and on the top of a big steel warehouse.

• *Barker & Williamson* (215/788-5581). I have tried their window-mount antennas for apartment dwellers. They seem to work sufficiently, but you can



Bumper mounting may place the mobile whip too low for good performance.

never really seem to get enough ground plane to make these babies really work well. Call them for their catalog of portable window-type antenna whips.

• *Gene Hansen* (505/898-3251). I once tried his first antenna invention, a mobile HF whip with automatic all-electronic band switching. It worked well, but his newer version which requires manual band switching on the big mobile coil seems to do a lot better. The "supertenna" coil mounts down low, and it certainly makes for a very nice, neat installation with a relatively decent signal. It was easy to match, manually.

• *ICOM* (206/454-8155). ICOM, along with SGC, markets a stainless steel whip which is tuned inside the trunks by a fully automatic antenna tuner (AH-2). It's a terrible performer. The whip is simply too short to let the automatic antenna tuner do its thing. However, if you can attach some extra long wire to the whip and then throw the wire over a palm tree, you have a mobile antenna system that will outperform most conventional whips.



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

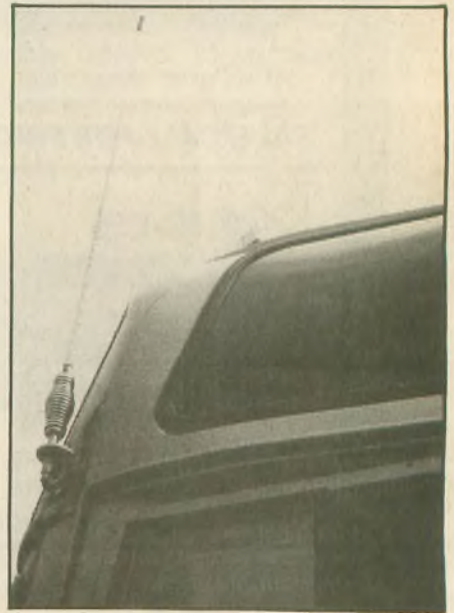
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What a shame—we would all love to operate all bands efficiently with just a single stainless steel whip and a \$555 tuner hidden away in the trunk, but it just doesn't work well.

• *Kenwood* (213/639-4200). Bet you didn't know they have a spider-type set of mobile whips. They do! The little coils are so skinny, however, that performance is not that great. Mechanically, the antenna isn't that sturdy either. If you run just one whip at a time, it seems to work out OK. In my opinion, Kenwood should stick with radio gear and not try to get into mobile HF antennas.

• *Lakeview Company* (803/226-6990). Here are the best set of \$18 mobile whips around. The stainless steel stinger fine-tunes a helical center-load affair. The antenna body is fiberglass, and it works like gangbusters. They also have a big loading coil antenna for



Helical Mobile Mark HF whip is located perfectly, mounted high up on this mobile home.

wide-band operation, and special matching at the base allows you to trim down the SWR to a perfect 1:1 match. The best part about Lakeview is that they immediately handle any technical problems and do an excellent job of representing their HF mobile antenna line-up.

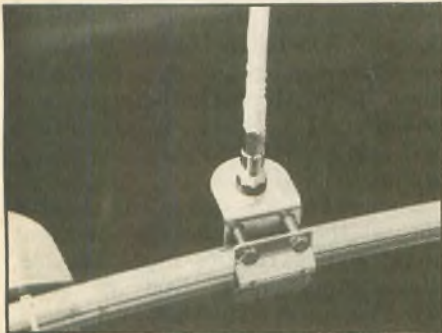
• *Mobile Mark, Inc.* (312/671-6690). This company produces 6 ft. and 8 ft. all-helical mobile whips, and they also produce special-order HF antennas for marine frequencies. I swear by these antennas, although they are expensive (about \$32 each). They are almost indestructible, and there is no stainless steel tip—they're all fiberglass and all helical for good broad-banded operation.

• *Outbacker* (615/899-3390). This Australian antenna can come with up

to 15 different bands, all easily tuned via a little jumper lead. The antennas are almost indestructible, and they work well in maritime mobile installations. There are many different models to choose from, and they even have one that breaks down into three sections for travel convenience. It's very, very expensive—around \$250—but well worth it if you want one shaft with multi-band capabilities when manual, stop-the-car tuning is necessary.

• *Radio Works* (804/484-0140). I mention this company because they have a selection of mobile antennas, ready for immediate shipment. Their catalog is worth calling for, too. It lists the very latest in mobile HF antennas, and if ever you wanted to see what a whip looks like, the Radio Works catalog tells all.

• *SGC* (206/746-6310). Like the ICOM AH-2 and AH-3 automatic antenna tuners, the SGC auto tuner Model 230 attempts to tune a short whip antenna for all-band operation. The tuner works



Mobile Mark helical whip in a marine installation (mount from Valor)—good location over a big ground plane.

great in marine applications when tuning up a long wire, but it's a miserable performer when trying to tune up a short 6 ft. stainless steel whip. A dedicated band whip is much better than the very expensive auto-tuned whip.

• *Spider Antenna* (818/341-5460). Here is an antenna you won't need to stop the car to adjust for a different band. Up to four bands can be run, all at once, on a single stainless steel or aluminum shaft. The Spider Antenna features top-loading and is a terrific performer if you can stand the weird look of it and the windage at the end of the shaft. If you absolutely refuse to stop the car to change bands, consider the Spider.

• *Mosley* (1-800/325-4016). Did you know that Mosley has a set of mobile HF whips? They do, and people tell me they work darn well. Unfortunately, I can't seem to get my hands on a set of whips to give them a test—so all I can tell you is that Mosley is very secretive

about them, but reports indicate good performance.

• *Valor Enterprises* (513/698-4194). Valor whips are similar to Ham Sticks™ from Lakeview. Valor whips feature a stainless steel stinger, mounted into a helical center-loaded white fiberglass shaft. The whips run about \$20 each and offer little wind resistance at highway speeds. Performance is good, but construction is similar to mass-produced CB whips—OK at first glance, but if you really study them carefully, there are areas where they could improve on the mechanical assembly.

• *Hustler Antennas* (817/325-1386). The standard of the industry—big white loading coils atop a stainless steel or aluminum fold-over shaft, with stainless steel stingers. Hustler even makes a multiple-coil mount to run several bands all at the same time. Who could say anything wrong about the great Hustler antenna series? They continue to be the standard of the industry, but one must admit that the big coils halfway up the shaft do flap around in the breeze a lot more than a stainless steel whip on a fiberglass shaft.

• *Swantenna*. Manufactured years ago by Swan Corporation, if you ever find one of these antenna systems at a swap meet, grab it quick. Then call me. I'll make you quite a deal! Same thing with the Webster Band-Spanner . . . they are marvelous antennas; if you can ever find one of these, hold onto it!

• *Texas Bug Catcher* (817/771-1188). The original 1000W, big-coil, open-air, center-loaded antenna system with a big capacity hat: a big antenna for big signal results. Call this group for a catalog of the different antennas they produce which are so often copied by others. They look real strange, but they work very well.

And how many of you remember the big 160M antennas with the loading



Trunk-lip Hustler mount: a perfect set-up for a no-holes installation, mounted up high.

coil that looked like a fishing float in the middle of it? Or how about that California kilowatt which was running around with a huge 20M, 16 ft. whip with a copper toilet bowl float at the tip? Big antenna, with a big signal.

There is a correlation. Big tall whips, mounted up high on the ground plane, do much better on signal strength and low SWR. But comparable height mobile whips ALL do a nice job with no clear-cut winner. A whip is a whip is a whip! □

Did you know . . .

A person in the US listening to Big Ben via radio with the microphone in the clock tower would hear the chimes before a person on the street below the tower? — *Nevada County ARC, Grass Valley, CA* □

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177th QCWA chapter.

QCWA is now boasting 177 chapters throughout the world. Floyd Henderson, Chapter No. 177 applied for charter on December 28. Twenty-six charter members signed the application, and essentially all were *new* QCWA members. Sincere congratulations to our newest chapter.

It only takes 10 members to start a new chapter and, as with Chapter #177, brand new QCWA members can sign the petition. Their QCWA membership applications can go in right along with the chapter petition. The fellowship offered by local chapters is an essential part of QCWA and we are looking forward to the day when there will be a local chapter within a reasonable commuting distance of every QCWA member. Florida has provided a particularly good demonstration of the benefits of multiple chapters. There is no jealousy there about "breaking up" one chapter to form another. Their experience has demonstrated that more localized groups just bring in more new members, thus all of QCWA benefits.

QCWA Headquarters will be glad to help you organize a new chapter. They can provide you with the names of all national members living within any particular geographical area. With that list and a little bit of recruiting for new members, you shouldn't have any trouble finding 10 people to start a new chapter. Just remember that all must be members of the national association

before they can become chapter members.

Hitchhikers welcome.

One of the problems affecting chapter attendance is the fact that some of our older members are reluctant to drive at night or have other problems which make transportation difficult. Make a conscientious effort to seek out these people and offer them a "riding pool." It can mean a lot to them and it can boost your meeting attendance considerably. Another possibility is alternating between luncheon meetings and evening meetings. You may find a number of unfamiliar faces showing up at one meeting or the other. Baltimore Chapter #20 holds one meeting in the northeast side of town and one in the southwest. There are a number of possible variations like these that are worth exploring. Give them a try.

75 Year Award.

Northwest Chapter No. 4 sent a picture showing the presentation of a QCWA 75 Year plaque to Dr. Clifford Spike, W7OS, of Gig Harbor, Washington. Shown on pg. 48 (left to right): Dr. Fleet Ratliff, N7ICG, Chapter No. 4 president; Dr. Spike, W7OS; Merle McLaughlin, W7DNY; and Ray Etherington, W7FNC.

The award was given on October 28th at the Cottesmore convalescent home in Gig Harbor (near Tacoma, Washington) where "Doc" is a resident. This was somewhat of a "birthday present," since Doc turned 90 years old in October. First licensed in 1915 with the call 7CS, Doc helped start the Tacoma Radio Club in 1916 and was one of the founders of QCWA Chapter No. 4. Doc has not been able to speak since having a stroke in 1983, but he does a good job of talking through his eyes and hand motions. When he was given the 75 Year Award, the tears in his eyes left no doubt about his pleasure!

In May of 1915 Doc's father gave him the princely sum of \$3 and he purchased a tuning coil from Otto Nicholson, then 7ON. With this he was on his way to operating spark. By summer he had obtained his first license, 7CS, and in December he had his 1st class operator license. He has been an avid and active Amateur ever since. He received the call letters W7OS in 1927. In 1952 he joined QCWA, #651. See the QCWA Journal for more details about Doc's active life and the many contributions he has made to his community and to Amateur Radio.

QCWA scholarships.

Applications for QCWA scholarships are now available upon request and must be completed and returned prior to June 30. Applicants must hold

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You get three tough 811A transmitting tubes, extra heavy duty power supply, all HF band coverage, pressurized ventilation, tuned input, dual illuminated meters, adjustable ALC and much more . . . for an incredible \$649 . . .

The first 600 watts makes the most difference

The AL-811 gives you 600 watts PEP output -- that's nearly 2 full S-units over your barefoot rig.

That could mean the difference between hearing, "You're Q-5 armchair copy" and, "Sorry can't copy you, too much QRM."

Now you won't have to stand aside while the "big guns" steal your DX. You'll be able to log some of those stations first.

Going from 600 watts to the full legal limit gives you less than one S-unit increase. But is that fraction of an S-unit worth the 3 to 4 times more money it'll cost you?

The AL-811 gives you a powerful punch at a price that's easy on your wallet.

All band, all mode coverage

The AL-811 covers all HF bands (10/12 meters with easy user mod). There's no compromise on WARC and most MARS bands -- you get a 100% rated output.

You can operate the AL-811 on all modes. You get 600 watts output PEP SSB and 500 watts output CW. You even get 400 watts on demanding continuous carrier modes like RTTY, SSTV, FM and AM.

How the low cost 811A tube resists premature failure - even when your amplifier is mistuned

811A tubes resist premature failure in two ways.

First, they're constructed with widely spaced elements that minimize the chance of elements touching and causing a short -- even if the plate gets hot enough to melt.

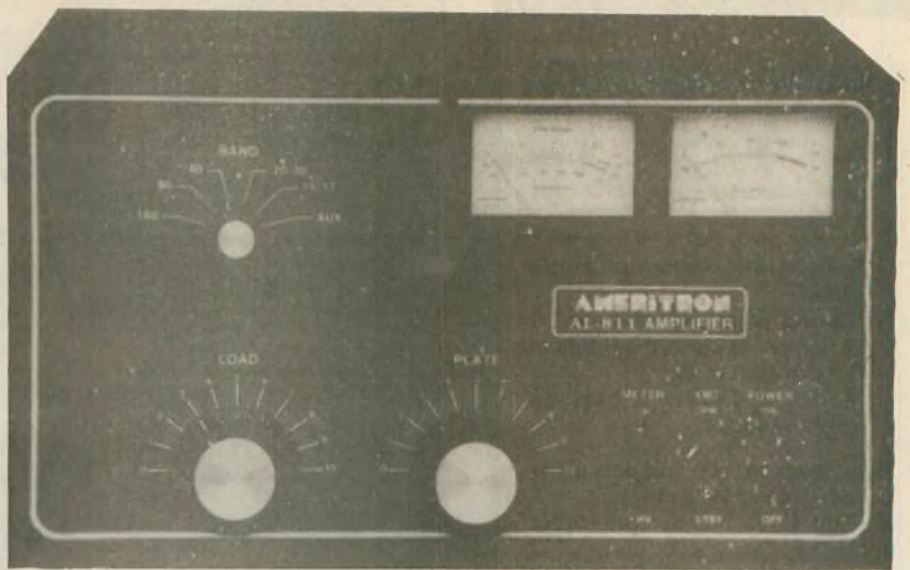
Second, they use a directly heated thoriated tungsten filament cathode that prevents the electron emitting layer from instantly stripping off -- even if mistuning causes a sudden, severe current overload.

Indirectly heated oxide cathode tubes (like the \$400 3CX800A7) can be rendered instantly useless if their electron emitting layer is stripped off because of a severe current overload due to mistuning.

The Ameritron AL-811 is excellent for the newcomer because it's tough enough to withstand momentary mistuning. And the tubes are so inexpensive that you can replace one for mere pocket change.

The Ameritron advantage: extra heavy duty power supply that gives you peak performance year after year

The heart of the AL-811 power supply is its heavy duty power transformer with a



high silicone steel core weighing a hefty 17 pounds.

A full wave bridge using 52.5 ufd of total capacitance (four 210 ufd, 470 volt capacitors) produces 1500 volts under full load and 1700 volts no load. That's excellent high voltage regulation!

Full height computer grade filter capacitors with screw terminals are used -- not short stubby, light duty soldered-in "high technology" capacitors that can't dissipate the heat generated by high current.

The rectifier diodes are rated for a massive surge current of 200 amps. They won't blow even if you accidentally short the high voltage supply.

Wire wound, 7 watt, 50 K ohm equalizing resistors safely protect each filter capacitor -- not 2 watt, 100 K ohm carbon composition resistors that can open and cause your filter capacitors to explode or fail.

The Ameritron AL-811 power supply is built tough so you get peak performance year after year.

Tuned input provides excellent load for any rig

A Pi-Network tuned input provides a 50 ohm load for your rig. Even fussy solid state rigs can deliver their full drive to AL-811.

Low loss slug tuned coils -- tunable from the rear panel -- let you optimize performance. High quality low drift silver mica capacitors maintain proper tuning.

Output tank: optimum Q on each band

The low loss pi-network output tank of the AL-811 has been carefully designed for optimum Q on each band and built with quality RF components.

The result is peak performance over each band, wide impedance matching range and exceptionally smooth tuning with efficiencies close to 70%. Even a 3:1 SWR load won't damage the tubes or tank components.

A ball bearing vernier reduction drive makes plate tuning precise and easy.

Quiet pressurized ventilation keeps your tubes safely cooled

A quiet fan pressurizes the cabinet with over 20 cubic feet per minute of cool air.

This large volume of air flow keeps the 811A tube temperature safely below the tube manufacturer's rating -- even with a key down carrier at 500 watts output.

Two illuminated meters

Two illuminated meters give you a clear

picture of your AL-811 operating conditions so you can tell right away if something is wrong.

The Grid Current meter continuously checks for improper loading. The other meter switches between high voltage and plate current to warn of abnormal conditions.

Ameritron exclusive Adapt-A-Volt™ power transformer

Too high 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™ power transformer has a special buck-boost winding that lets you compensate for stressful high line voltage and performance robbing low line voltage.

This makes your components last longer and gives you peak performance -- regardless of your line voltage.

Plus more . . .

An Operate/Standby switch lets you run barefoot, but you can instantly switch to full power if you need it.

A transmit LED tells you when your rig is keying your AL-811.

A 12 VDC keying relay makes it compatible with all solid state and tube rigs. A built-in back-pulse cancelling diode protects your rig's keying circuit.

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The QCWA 75 Year Award is presented to Dr. Clifford Spike, W7OS, of Gig Harbor, Washington.

at least an FCC General Class license and be enrolled in or have been accepted for enrollment in an accredited university, college or technical school and intend to pursue a full-time course of studies leading to at least an Associate degree. Graduate students are also eligible. There is no restriction on the course of study. Applicants must be recommended by a member of QCWA. Please help us search out deserving

students and make them aware of this most worthwhile program.

Seven QCWA scholarships are being offered this year. Each pays \$750. Four of the awards are designated as QCWA Memorial Scholarships, honoring all QCWA Silent Keys. Three other awards are specifically designated as the Robert S. Cresap Memorial Scholarship, the Cresson F. Donbar Scholarship, and the Leo Meyerson Family Living Scholarship. The program is funded by QCWA and administered by the Washington, D.C. Foundation For Amateur Radio (FAR). The foundation administers an additional 29 scholarships, with awards as high as \$2000, and applicants for the QCWA scholarships will be considered for any of the 36 scholarships for which they can qualify. (Some of the FAR scholarships do have restrictions on the course of study and/or geographical residence preferences.) Application forms and/or additional information may be requested prior to May 31 by writing: FAR Scholarships, 6903 Rhode Island Avenue, College Park, MD 20740.

The Foundation for Amateur Radio, incorporated in the District of Columbia, is an exempt organization under Section 501(c)(3) of the Internal Revenue Code of 1954. It is devoted exclusively to promoting the interest of Amateur Radio and those scientific, literary and educational pursuits that advance the purpose of the Amateur Radio Service. □

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ALABAMA

Montgomery Amateur Radio Club (W4AP). P.O. Box 3141, Montgomery, AL 36109. Meets 3rd Mon./monthly, 7 p.m., State Trooper Dist. Office, Coliseum Blvd. & Federal Dr. Nets Sun. 8:30 p.m. 146.84 and Thurs. 8:15 p.m. 147.18+. Info: Fred, K8AJX, (205) 270-0909.

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. at club facility on Moson Rd., Sierra Vista, AZ. Net: WOLKI info Net every Thurs., 7 p.m., WA7KYT/R 146.16/146.76 rpt.

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. WA6WYR 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, 8 p.m. at Chico Community Hospital Conf. Cntr., 670 Rio Lindo, Chico, CA 95926.

Contra Costa Communications Club, Inc. W6E2C/Rptr. P.O. Box 661, San Pablo, CA 94806. Meets 2nd Sun./monthly at 9 a.m. Hickory Post Restaurant/Lucky Lanes. Nets: 07:10-08:30 M-F; 7:30 Thur. eve. all 145.110. 224.300 & 444.275 w/possible PL 82.5. Info call Ed, KA6OFR, (707) 996-0962.

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

East Bay Amateur Radio Club, Inc. Meets 2nd Fri./monthly, 8 p.m.-10 p.m., Northbrae Community Church, 941 The Alameda, Berkeley, CA. Info: Gordon Firestein, (415) 527-9382.

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 146.3494.

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. Commonwealth, Fullerton. Net ea. Tue., 8 p.m. 147.975 (-600). Info, Phil Gray, KJ6UV (714) 524-5223.

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 WB6ODZ 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 N6IUY, 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., City Council Chambers—City Hall, corner of Cottonwood & Frederick Sts. Net Tues. 8 p.m. 146.655 (PL 1A). Info, Larry Marcum, 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.

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. (SCCARR) W6UW & W6UU. P.O. Box 6, San Jose, CA 95103-0006. (408) 249-6909. Meets: 2nd Monday/monthly, 7:30 p.m. at Agnews Developmental Center Aud., corner of Circle Dr. & Palm Dr., Santa Clara. Net all other Mon., 7:30 p.m. W6UU/R 146.385 + / 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, WB6LRU. 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. FM Rpt. Net Thur., 8 p.m., 51.80/51.30 tx. FM Smpx 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 2283, 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. 145.44-4Z.

Western Amateur Radio Assoc. Meets 1st Tues./monthly, 7:00 p.m., Cerritos Park East, 166th St. and Carmenita 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 -.

Yucaipa Valley Amateur Radio Club. Meets 3rd Mon./monthly, 7:30 p.m. at Far West Savings, 1195 Calimesa Blvd., Calimesa, CA.

CONNECTICUT

Tri-City Amateur Radio Club. P.O. Box 686, Groton, CT 06340. Meets 2nd Tue./monthly, 7:30 p.m. Alternating, Groton Public Library at Rt. 117 & St. Lukes Lutheran Church at Rt. 12. Novice classes. Info, contact Bob, KA1BB, (203) 739-8016.

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 Cntr., 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 Hdqtrs. Bldg., 1150 Hickory St., Melbourne, FL. Talk-in on 146.25/85 or 146.0161.

West Palm Beach Amateur Radio Club, Inc. WHAW. 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. Cntr., Briarcliff Rd., Bolingbrook, IL. Info net Thursdays, 8 p.m., WD9AKO/R 147.33 MHz + 600 and WA9DIP/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.

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 rptr. 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.

MASSACHUSETTS

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

MICHIGAN

Farmington Amateur Radio Club. Meets 2nd Wed./monthly, 7:30 p.m., Wheeler Street Fire Station, Farmington Hills, MI. Contact: Jim, WABSEL, 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. W8JXU 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 146.64 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. Wengert 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., W81CAG. 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.

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. For info call Arnie, W8YXB, (718) 343-0172.

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 W2RU/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. WB2KJ, 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 Gabel, 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 TSARC. Meets: Mondays, 28.350 on the air, 8:30 p.m. local time and Sat. 10 a.m. on 7240. "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.

Clyde Amateur Radio Society (C.A.R.S.) Meets 2nd Tue./monthly, 7:30 p.m., Municipal Bldg., Clyde, OH 44811. NF8E Rptr. 144.75/145.35. 444.60 (+5 MHz). Net Sun. 9 p.m.

Dayton Amateur Radio Assoc. P.O. Box 44, Dayton, OH 45401. Meets 1st & 3rd Fri./monthly (Sept. thru June) 8 p.m., Career Academy on River Corridor Dr. Info on W8BI 146.34/94 & 222.34/223.94.

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. K8QIK/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 Middle Sch. cafeteria, 27351 Butternut Ridge Rd., North Olmsted, OH.

Silvercreek Amateur Radio Assn. (SARA) Meets 3rd Thur./monthly, 7:30 p.m., Doylestown Village Hall, Doylestown OH. W8PNF/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

Central Oregon Radio Amateurs, (CORA). P.O. Box 723, Bend, OR 97709. Meets last Thur./monthly, 7 p.m., Bend Senior Cntr., 1036 NE 5th, Bend, OR. Net Sun. 7:30 p.m. 147.06 + MHz. Info call: (503) 382-1685.

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, W6EAW, (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.

Merger County Amateur Radio Club W3LIF. P.O. Box 996, Sharon, PA 16146. Meets 4th Tue./monthly at 7:30 p.m., Shenango Valley Med. Center, Farrell, PA. Net, Thur. 9 p.m. on 147.75/15 W3LIF, Digi. 145.010.

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

Warminster Amateur Radio Club, WA3DFU. P.O. Box 113, Warminster, PA 18974. (215) 443-5428. Meets 1st Thurs./monthly, 7:30 p.m., Neshaminy-Warwick Presbyterian Church, Warminster, PA. Net on 147.690/147.090 Wed. 8:30 p.m.

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

Arlington Amateur Radio Club, (AARC). Meets 3rd Fri./monthly, 7:30 p.m., Arlington Human Resources Bldg., 401 Sanford, Arlington, TX. Talk-in-444.2, 224.8 and 147.14.

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.

Virginia Beach Amateur Radio Club (VBARC). Open Door Chapel, 3177 Virginia Beach Blvd., Va. Beach, VA. Meets First Thur./monthly, 7:30 p.m. For info (804) 497-1235.

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 W8JNU/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

The Mike & Key Amateur Radio Club. Meets 3rd Sat./monthly, 10 a.m. Renton Good Neighbors Cntr., 305 S. 43rd, Renton, WA. Talk-in on 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.



The following selections are reprinted from the Courage Handi-Hams System's winter 1991 Handi-Ham World.

Handi-Ham notes from KOHR

As many of you know, the Federal Communications Commission earlier this summer overturned a long standing policy about Morse code examinations for all applicants and instituted a waiver program. Beginning early in June, disabled applicants for a higher class Amateur Radio license, upon producing a proper note from their doctor and a request for a waiver, could be granted a waiver of the 13 and 20 wpm code requirements. Similarly, the Commission ordered VECs to institute new testing procedures for the five wpm code test which would accommodate severely disabled applicants. Shortly after instituting these new procedures, the Commission issued a Notice of Proposed Rule Making calling for the permanent installation of these types of procedures, asking for comments from the Amateur Radio population. Very unfortunately, the reply time was very short. We tried to get information out to our membership as quickly as possible. A number of Handi-Hams members were able to get their comments into the FCC on time. Judging from the responses that we received here at Headquarters, it looks like the majority of the comments were critical about the Commission's allowing almost anyone with any type of a disability to obtain a waiver. Many members of the Handi-Ham System wrote in alternative ways of reaching appropriate accommodations. Two petitions by the ARRL to extend the comment and reply comment were denied by the Commission.

This amendment of the Commission's rules became effective Feb. 14, 1991.

In addition, a disabled Amateur will, in some cases, be able to give a

volunteer examination for an element from which he was exempted, such as the 20 wpm code.

This past year has seen some changes in our Handi-Ham system services, most especially equipment loan and purchase. Because of some rather extreme financial pressure, we have had to severely restrict our equipment loan program. Equipment which previously had been available for loan was made available for purchase by handicapped members of the system. Many members have taken advantage of this service by purchasing this used equipment at very reasonable prices. Some equipment is still left and, of course, we continually receive donated rigs which will be available for purchase. If you have a specific need, please indicate that to Sister Alverna O'Laughlin by dropping her a note.

Courage Center offers catalog of adaptive products

Many people who have physical or sensory disabilities have functional limitations such as limited mobility, difficulty in reaching or grasping, uncontrolled movements, inability to speak in order to communicate or joint pain. Technology can play an important role in furthering their independence. Courage Center offers low-cost, custom-made equipment and devices for people with physical and sensory disabilities to make everyday life simpler and more enjoyable.

The metal and woodworking shops at Courage Center are operated by an all-volunteer work force comprised mainly of retired engineers and craftsman. They fabricate a wide range of products for people of all ages that are custom-made to meet each individual's needs and for virtually every function of life — communications, personal and self care, homemaking, recreation, education, work and more. For example, shop volunteers have created ramps to enable someone in a wheelchair to bowl by pushing the ball down the ramp. The archery bowstander allows for one-handed use of a bow and arrow from a wheelchair for sport and recreational use. A computer operator

with spasticity or tremors may be able to work more productively by using a keyboard mask for more accurate key strokes, or a person with limited use of his hands may benefit from a phone holder.

If you would like a copy of the "Adapted Equipment for Independent Living" catalog, please call Courage Center at (612) 520-0566.

Are you really "radioactive" (by John A. Poltawsky, N9AQJ)

In a recent column for Worldradio, student coordinator Maureen Pranghofer expressed concern over many of the Handi-Hams not being more active on the Amateur bands. This inactivity is surprising considering how hard we worked to pass our FCC exams and how many different ways there are to enjoy ham radio.

Now is the time to be active! Although the present solar cycle has peaked, excellent propagation on the HF bands should continue for two more years. Then for several years, long range communications will be poor until the upswing of the new solar cycle.

Do not let anxiety or shyness prevent you from transmitting. Even experienced hams sometimes suffer from sweaty palms and a churning stomach. Jumping into the fray is the best way to deal with this problem. Patient hams are always waiting to help newcomers make a QSO.

Amateur Radio activity often seems to revolve around the exchange of QSLs. You may not be fully participating in the hobby if you have difficulty filling out these cards. This obstacle has been removed recently. A volunteer has offered to act as QSL manager for qualified members.

The often too brief or mediocre conversation that passes for a QSO makes even Amateur Radio boring sometimes. Try sharing interests with and asking questions of the other Amateurs. Most people like to talk about themselves and the area where they live.

Listening seems so cozy and safe. Anyone can do it without a license. However, until you transmit, there will be friends you have never met and places you have never truly visited. Listening cannot compare with the reality and immediacy of a two-way radio contact. □

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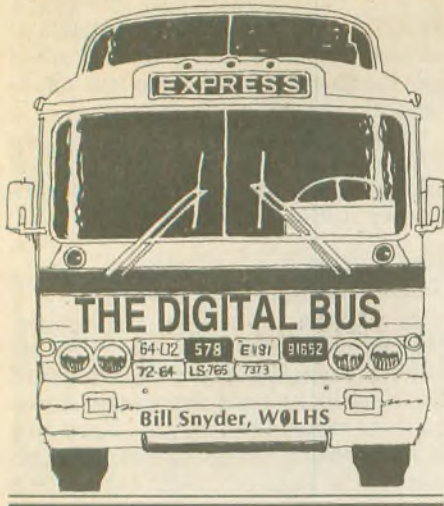
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In my continuing saga about packet communications with Marty Mullican, G0NJK, the displaced "cornhusker" from Nebraska now operating in jolly old England, I'm sorry to report that problems have caused the experiment we started to sort of peter out. Marty, through no fault of his own, was off the air for a month, and so many messages to him were probably tossed into the electronic packet bit bucket.

Because the lead time between the day I write this column and the day you get to read it is quite long, it's hard to keep up a running story on our experiment. We set out to see how the overseas packet path would work between the US and England. I asked readers to send Marty a message via their local packet BBS and report to me when they received an answer. The experiment started out great; a number of readers sent their first packet message to an overseas address. As Marty received the packetgrams, he answered each one. In the message Marty requested that the recipient make a hard copy of his answer and mail it to me. I reported here on the early returns. But then the stream of return messages quit arriving. I assumed that the experiment was over. Then, when I went to check my BBS the other day, I found a packet from Marty telling me the British PBBS he uses as his home bulletin board had been shut down for one month due to hardware problems. "To date," Marty said, "I have received 16 messages and have replied to all."

So if you haven't heard from your message to Marty, it probably got caught in the downtime period of the BBS in England and thereby disappeared into never-never land of lost bits and bytes. When messages get old they seem to go down the drain automatically. It all depends on how long the software allows the old stuff to remain in memory. But that's the

wonderful world of packet Amateur Radio.

More SOL stuff

Last month I did a little reminiscing about my days with the SOL computer. I bought an SOL about 15 years ago and still have it. I'm holding it for a forthcoming communications museum to be built in nearby Bonanza Village, a 15 acre collection of historic buildings jammed full of antique stuff. I plan on donating my "antique" computers to the new communications building about to be erected. Along with computers, there will be interpretive displays of early day radio, both broadcast and Amateur, plus our local ham club station, W0ILO. Over the years, Bonanza Village has collected a considerable quantity of antique radio equipment, ranging from boat anchors to usable junk, stuff that can be put on display. For example, we have the complete ham station owned by the late Goodwin Dosland, W0TSN. "Dos," you old timers will remember, was the president of the ARRL for ten years. His gear was donated by Mary Dosland, W5DEW, Goodwin's widow. (If you're a real old timer in ham radio, you'll remember Mary, too. She was the "Texas Dew Drop," a pillar on 20M phone back in the 30s and 40s. Mary hasn't lost her rich southern accent; it still appears on the local 2M repeater every now and then.)

If you drive on highway I-94 through North Dakota, watch for Bonanza Village signs in the Fargo/West Fargo area. The village is only half a mile off the highway at Exit 85. If you are looking for a home for some of your antique radio stuff, drop me a line and I'll put you in touch with the Village staff. Bonanza Village is operated by the Cass County Historical Society and is the second favorite tourist attraction in North Dakota.

Back to the SOL computer yarn. Garry Parrish, AA6GW, after reading

an earlier reference to my SOL computers, felt inspired to send me a package of computer magazines that contained listings of computer users groups. I am really amazed at the listings! In one biweekly magazine published in the San Francisco Bay Area, "Computer Currents," there are bulletin boards listed for non-smokers, musicians, overeaters, dentists, fantasy fans, real estate buffs, lawyers, genealogy, dating help, alternative lifestyles, plus a batch of other exotic and mundane categories—even one for antique radios. And the same goes for users groups. There are listings for users groups of all kinds, from Adam to Victor. From the looks of the listings you could go to a meeting every night of the year and never hit the same group twice.

Back to the SOL once again. I told last month about getting help to fix my ailing SOL computer when the proprietary chip that did the boot-up work went "west." I couldn't remember the complete name of the genius who gave me all the repair advice over the telephone. (He told me, from memory, how to modify a circuit so I could install a substitute PROM chip to replace a no longer available unit.) Well, Garry had the answer to that also. If I'd looked again at Garry's letter which accompanied the magazines, I would have seen the name of Lee Felsenstein jump out at me like a jack-in-the-box. Yup, that was the name of my telephone adviser. Lee put me back in business for which I thank him publicly!

Garry also had this to say: "About your SOLs. The general consensus, among people that I have talked to, is that the SOL is a nice conversation piece but wouldn't even make a good boat anchor these days. I worked for Processor Technology from their start-up in Emeryville, California, until about eight months after they moved to Pleasanton, CA (1976 to 1980). Processor Tech was a little too grass roots then (coming from the Berkeley area, where Lee Felsenstein and Bob Marsh still hang out) and Apple decided to go the corporate route, a la Silicon Valley. I know there are other reasons why PT went down, but the big one was... money. By the way, a great book, *Fire in the Valley, the Making of the Personal Computer*, by Paul Freiberger and Michael Swaine; 1984, Osborne/McGraw-Hill, is the best source of information I have seen on just how the PC has evolved through the last couple or three decades. I think it is still available."

In my column which inspired Garry, I asked if anyone knew if there were still any SOL user's groups (PROTEUS for Processor Technology Users) still floating around the country. Garry

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responded with this: "... after exhausting all the people I could think of, including Lee (Felsenstein), there are no longer any SOL groups left. Of course I am speaking only of the San Francisco Bay Area, there might be some crazies in la la land, or points south. Not to say this is the only place in the world either. PROTEUS was disbanded about three years ago."

Garry also included a copy of an advertisement for the bankruptcy auction of Processor Technology stuff. One thing that struck me was the fact that 16 IBM typewriters were offered for sale. I wonder if they had been hooked to SOL computers or left pristine. And all that was only a little more than a decade ago.

Eavesdroppings

"HE HAS A SMALLER SIGNAL THAN YOUR VERY LARGE ONE ... I THINK HE HOLDS THE RECORD FOR THE MOST RYRYRY'S IN A SINGLE CONTACT ... YOUR SIGNAL IS NOW RST 5999 OR SO ... QSL HERE IS 100? VIA THE BUREAU ... CALLING CQ RTTY SOUTH DAKOTA FOR W.A.S. ... THE BIRDS ARE GATHERING OUTSIDE MY SHACK WINDOW MAKING PLANS FOR NEXT YEAR'S OFFSPRING ... ONE NIGHT I WAS CLIMBING UP ON A RADIO TOWER TO CHANGE THE LIGHT BULB ON TOP WHEN A CAR DROVE UP AND A COUPLE GOT OUT AND STARTED TO MAKE LOVE. I YELLED AT THEM AND THEY JUMPED UP AND BEAT IT. WHEN I GOT DOWN I FOUND HER PURSE WHICH I DELIVERED TO HER THE NEXT DAY. YOU SHOULD HAVE SEEN THE LOOK ON HER FACE ... HIS WIFE LEFT HIM IN OCTOBER BUT HE DIDN'T DISCOVER IT TILL SUPER BOWL SUNDAY ... MY WIFE AND I ARE HEADING FOR THE GOLDEN STARCHES FOR LUNCH ... I FINALLY GOT ON PACKET, NOW WHAT DO I DO? ... I SURE MISS JIM AND TAMMY BAKKER ON THE TELLY, THEY WERE GOOD FOR A LOT OF RELIGIOUS LAUGHS ... I THINK I MISSED AFGANESTAN ON RTTY BECAUSE I CAN'T

The deadline for news releases and special announcements is the 10th of the month, two months prior to issue date. Example: Deadline for the August issue, which is mailed in early July, is 10 June.

SPELL IT... I'M A FOUR FINGER TYPIST - THREE ON ONE HAND AND ONE ON THE OTHER ... I USED TO OIL MY OLD MODEL 15 TELETYPE MACHINE BY DIPPING IT IN A TUB OF OIL AND THEN LET IT DRIP DRY FOR A WEEK OR SO ... I AM A DIVINE GUIDANCE TYPIST - I PRAY THE FINGERTIPS KNOW WHERE TO GO ... BEEN ON AMTOR FOR OVER FIVE YEARS AND JUST LEARNED HOW TO USE IT ... I'M RUNNING A MEASURED 27 WATTS INTO THE ANTENNA HERE, I DON'T KNOW WHERE THE OTHER WATTS GO ... 73 AND ALL THAT OTHER GOOD STUFF."

Thanks to WA6DAL, W0GP, W7VFR, W0VF, K6DSB, W6MEO, W0HAH, KB4GBS, KT7E, WA1GUD, and the stack of others who furnished the eavesdroppings for this month's column. I also wish to thank Garry Parrish, AA6GW, for the computer magazines and the interesting stuff about Processor Technology. My packet address is W0LHS @ W0LHS.ND.USA.NA or my mail box is at 1514 South 12th Street, Fargo, ND 58103. 73 de Bill Snyder, W0LHS. DITDIT. □

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Jerry Wellman, WB7ULH
P.O. Box 11445
Salt Lake City, UT 84147

Don't get caught in the dollar dilemma. Often the solution is not found in spending money. I wonder how often we equate dollars to knowledge or leadership. Is the one with the most toys our next search team leader?

Experience being an on-scene communicator comes from being on scene. Search and rescue, because it grabs headlines, involves issues which politically savvy leaders need to address; when it comes to getting the job done, it's experience that's going to save lives, not a fancy airplane, a glitzy uniform or a car full of radios.

On many searches I've participated in or observed, it's the innovative, experienced member who has effected the "save" or the "find"... it's been those folks who don't have five or six complete dress uniforms or own several airplanes. Often they're just members who have taken their SAR role seriously and know how to operate equipment effectively, understand what the mission is all about and calmly go about doing great things. Many times it is a small handful of people who respond dependably and reliably on most missions.

It's not your vocal group who shows up for the yearly party or the weekly meetings. It's not the group who gets the subsidized flying for "training" or "practice." It's not the day-to-day radio hogs who delight in exercising the push-to-talk switch. (For you in CAP, it's not the folks who simply *must* have a single-digit call sign simply because "I'm important.") It's a

dependable few who have a solid feel for SAR and place importance on doing the job well. You'll know who they are because they make sense when they have something to say, and they do the right things at the right times because they have experience—in the field.

Keep writing

In a year's worth of letters from Worldradio readers, I've yet to hear from anyone saying they're "in charge" of an SAR group. I've heard from quite a variety of group members and many communicators with years and years of experience. I feel honored when you write to say you're sending copies of this column to your leaders or communications officers.

The most vocal group has been Civil Air Patrol members. From new and old your comments have lamented the lack of information on how to just do your job. I was sent a series of "unofficial" newsletters from a group of CAP members who communicate via computer on INTERNET. Your letters and these newsletters comments are great! I agree that there is a great gap in communicating. You're correct when you mention the great turnover in CAP communications and the lack of information reaching operational level from the policy makers.

Take heart and press on! Keep asking questions, press for answers, keep your leaders' feet to the fire and don't give up. Read as much as you can about search and rescue. Read all the CAP regulations, directives and manuals. When things don't make sense, press for answers and explanations. Keep active in ARES, teach ham classes, become *radio-active*. From a local consultant: If you let the bozos take over, they will. Remember, the best way to thwart bozoism is to demand experience and professionalism. You can tell a bozo because of all the doodads

accompanied by a general lack of understanding. They're also very vocal at meetings and during non-emergencies. Fortunately, most bozos hide when the alert goes out for an actual mission.

Net control station

Are we having fun yet? If it's not fun, why bother? It's fun being on the front line of an SAR mission. It's fun meeting with area Amateur Radio operators to share information and increase SAR awareness. When it stops being fun, it looks like busy work—and I have enough of that. Some fun takes effort (work) but it's still fun.

Bart, KA7ZFD, conducted a great ARES training net about being NCS. He also helped engineer a cute mini-exercise for the net. If you're interested, ask him about the exercise (KA7ZFD@WB7ULH.#SLC.UT.USA on packet).

Here are some of the key points. A net control must be able to hear and be heard. Using a walkie-talkie with a rubber dummy load isn't the way to go. You must have reliable equipment, a good antenna and the ability to stay on the air with or without commercial power.


The NCS is in control and must exercise that control with instructions. Bart recommends repeating each instruction at least three times, speaking clearly and urging stations to take notes. The NCS must control anger and set an example for the other stations.

There are, explained KA7ZFD, three types of nets. The tactical net is closest to the action and handles front line operations. This is usually a local area net. Then there is the resource net. This net solicits volunteers, equipment and other resources for the emergency. The final net is the command net. It is the leadership link for the groups' commanders. These nets often run concurrently on different frequencies.

NCS implies leadership. The NCS must have supplies ready NOW (paper, pencils, working radios, operating space, etc.) Bart says, "Write it down. Don't rely on your memory. Use a log and message forms." Good stuff Bart.

I once made up a sign for the local CAP search headquarters station: "When in doubt, SHUT UP." If you're the net control, folks are going to be listening to you (including all those with scanners). Be sure of what you're going to say. Take time to communicate! Be accurate. Sound good and remember, listening is more important than talking.

NCS and the command folks must communicate. Work with (and educate) your search commanders. Remind them that without communications, they only command their desk. Most

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coordinators don't have communications equipment or the time to establish the needed nets for the search. Help to encourage participation by responding. Don't give the SAR (or CAP) commander the excuse that "the common people are unreliable."

Random thoughts

The new Civil Air Patrol communications manual has been printed. It's dated December 1990. If you're interested in a copy, you can order it from the CAP National HQ Bookstore, Maxwell AFB, AL 36112. You'll want to specify CAPM 100-1.

Speaking of books, I assembled a list of search and rescue books and publications for a recent search coordinator seminar. If you'd like a copy, send me an SASE (long size envelope) and I'll

send you one. If you've read any neat SAR books or have any information on SAR material, I'd appreciate hearing from you, too.

Being of some communications value to the local SAR system should not have a price tag, and having a carload of equipment shouldn't imply you're the expert. You can't buy experience, knowledge and understanding. You can buy stuff, but stuff doesn't save lives. People save lives. People save lives by effectively using what they have. Sometimes it's not much, but it works.

Don't fall into the "stuff trap," and don't be fooled by the "stuff" you think you need. Most of what you need is a willingness to have fun and to learn and a desire to serve.

From a list of earthquake lessons

Gordon West Radio School "U"

Gordon West with West Radio School announces *multiple classes at a single weekend facility*—from no-code Technician, all the way through Extra. "We call it Radio School 'U'—'U' for Under one roof. Once a month we present up to five different classes at the same hotel facility. This might allow a licensed husband to attend a General code class while his wife and kids are in an adjoining meeting room preparing for the no-code Technician license," comments Gordon West, WB6NOA, past recipient of the ARRL Instructor of the Year award.

West's instructors were developed in last year's Radio School instructor/elmer program. "Terrific instructors came to our classes, began guest teaching, and now they are ready to present their particular session on their own," adds West. "Gordo" will still continue to teach the Novice and no-code Technician himself.

General code and Extra code weekend classes will be taught by Daniel Fort, AA6LM, nicknamed "Dit-dah Dan." Dan is an active CW QRP enthusiast who lives and breathes Morse Code and is recognized locally as the best code instructor around.

Advanced theory and Extra theory will be instructed by David Corsiglia, WA6TWF, best-known for his technical expertise and his world famous 440 MHz remote base system recently detailed in a national magazine article. Corsiglia's ham experience extends more than 20 years in the technical field, and he has the unique personality

to make Advanced theory and Extra theory fun.

For more information about attending a course or becoming a course instructor, write to Gordon West Radio School, 2414 College Drive, Costa Mesa, CA 92626; 714/434-0666 or 714/549-5000. □

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learned: In an emergency, communication systems will be inadequate, and trained persons will become supervisors. Remember that the media will have the best communications available. Their resources will stagger the imagination; be prepared to use them. Equipment will be lost, damaged or stolen. There will not be enough walkie-talkie radios or batteries. A radio will only be as good as its battery, and its battery only as good as its charger. Things will get better—sometime after they have become considerably worse.

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YL Roundup



Most women would agree that girls just don't grow up in an environment supporting the knowledge of electricity, cars, woodworking, welding or any other predominantly male career or hobby. For the most part, girls are thought to enjoy cooking, sewing, child-rearing, flower arranging and similar interests. But more young women are now becoming Amateur Radio operators, thanks to dedicated teachers such as W8LNU, Dr. David P. Koch, who is on the faculty at Hockaday, an all-girls preparatory school in Dallas, Texas.

He affectionately refers to his students as "Amateurs in training." And he has high hopes that the girls will learn more about physics through their exposure to the hobby. "I have squeezed ham radio into the physics class," he says. "The novice written materials are worked into the electrical portion of our physics study, which began this semester. At the beginning of the fall semester, we started with code by spending a few minutes introducing new letters at the start of each week. Then we practiced a few minutes each day. If they got the practice phrases, I gave them extra points. Twenty out of the 31 girls passed the code, so I hope to have 20 hams at the end of the year," he explains.

The school approved the use of Amateur Radio as part of the curriculum after the father of one of the girls donated a station. They got approval to put up an antenna and began opera-

tions. Although their transmitter went out for awhile and their antenna was hit by lightning, the girls have continued making contacts all over the world. The transmitter was repaired by another parent and the antenna replaced. Dr. Koch uses what is left of the original antenna to emphasize safety.

"Our biggest problem here is time," he says. But plans for next year include offering a co-ed course, with Amateur Radio classes for the Hockaday girls and the boys at St. Marks, a nearby all-boys school. Koch is hoping to add packet and satellite capabilities to the school station as well.

The no-code licensing will not affect his teaching, he says. He will continue offering Morse code to his students as an incentive to upgrade. One of Koch's ex-students says she's thought about upgrading. Lisa Mann, KB5MSV, a senior at Hockaday, got her Novice license last year during her physics class. She was motivated because her grandfather is a ham. Lisa says, "I've talked (on the school station) a couple of times, once to a guy in Yugoslavia. It was fun."

Other girls and young women have found Amateur Radio to be an exciting hobby. One good way for young people to get in touch is by checking into nets. Some net frequencies include: The CQ All Schools Net on 28.303 MHz (Tuesdays and Thursdays at 1730 UTC), BRATS Youth Net (in the Baltimore, Maryland area on Thursdays at 0030 UTC) on 147.63/03 MHz and Young Hams Ragchew Net (in the New England area on Tuesdays and Saturdays at 0000 UTC) on 28.420 MHz. For more net frequencies, check the *ARRL Net Directory* published by ARRL, 225 Main St., Newington, CT 06111 and YLRL's *YL Harmonics Directory Issue*, P.O. Box 1446, Magalia, CA 95954.

As an added incentive for young women who have their license, YLRL (Young Ladies Radio League) offers an annual \$1,200 scholarship. This year's

recipient is Melissa Benish, N3FAC, of Pittston, Pennsylvania. She is attending Pennsylvania State University and is majoring in aerospace engineering. "I chose this major," says Melissa, "because I am interested in the design of rockets and shuttles. Receiving the 1991 YLRL Scholarship has helped ease my financial burden. Organizations like the YLRL help students like me to attain their goals by sponsoring these scholarships."

Melissa comes from a ham family and grew up with Amateur Radio. As a young girl, she tagged along with her father to hamfests, special events and to Field Days long before she got her license at age 18. Melissa now holds a General Class license. Her family includes: KB3GB, Lenore, her mother; K3SAE, Michael, her father; KE3J, Lisa, her sister; and N3CXB, Douglas, her brother.

As for being a YL in a predominantly male hobby, Melissa says, "it makes me unique, although I think YLs are catching up." Since there were no YL groups in the area around Penn State, she joined the Murgas Amateur Radio Club, which she says is very active. As a member, she has helped out with the annual hamfest and tries to contribute as much of her time as possible to contesting and special events.

In her room at school, Melissa has a packet station, which she uses to keep in touch with her parents instead of the conventional telephone. "My friends are fascinated when I send messages," Melissa explains, "and I enjoy telling them about Amateur Radio and how interesting it can be. "Amateur Radio has given me so much," she says. "I've made many friends and talked to people all over the world."

An opportunity for YLs, young and old, to meet other YLs from all over the world will be at YL World-91 in Stockholm from June 20 to 22. Information about registration, tours, and speakers is available from Kerstin Bengtsson, SM5EUU, Bjornfallsvagen 8, S-722 42 Vasteras, Sweden (an SASE would be helpful—remember to get correct Swedish postage or IRCs for overseas). This is the very first International European YL convention.

A national YL meeting is scheduled for June 7 through 9 at HamCom in Arlington, Texas. To receive a HamCom newspaper with all the details and registration information, write to: Judi Jaks, NØIDR/5, 626 Torrey Pines Ln., Garland, TX 75044. (Please enclose \$1 to cover postage.)

If you have suggestions or information about YL events, write to me at 1916 Parkside Dr., Denton, TX 76201. My packet address is: KB5LES @ N5LDD.NTX or KB5LES @ 76201. □

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Thanks to those who make a difference!

There are more than six million businesses and organizations, hundreds of government agencies, and over 490,000 licensed hams across this country. I am writing this as a tribute to those select few who have made a difference for K2USA at Fort Monmouth, New Jersey, one of the 17 Army MARS stations running phone patch and MARSgram traffic to and from the brave men and women in Operation Desert Storm, and as a challenge to the rest of you.

Nine companies and organizations that make a difference

Thanks to Tom Kesolits and others at the American Defense Preparedness Association for providing K2USA with an AEA PK232MBX packet unit. Their contribution is worth more than \$400.

Thanks to Jersey Central Power and Light Co. for donating all of the material, most of the construction equipment and a team of half a dozen skilled technicians who made it possible for us to put up an 800 ft. rhombic antenna—the "king" of MARS antennas in CONUS. Special thanks go to Jim Lowney (Vice President) and John Johnson (Group Supervisor). Add it all up and the folks at JCPL made a donation worth more than \$10,000 to K2USA.

Thanks to JPS Communications of Raleigh, North Carolina for donating an extremely useful RT200.

Thanks to MCI for donating (along with Sprint) all domestic long distance telephone services to K2USA and the other 16 army MARS stations for the duration of Operation Desert Shield/Storm. At K2USA alone, MCI's contribution adds up to more than \$8,000 a month or nearly \$50,000 since phone

patches from Saudi got started last September.

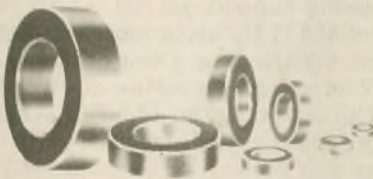
Thanks to New Jersey Natural Gas Co. and its employees for collecting MARSgram forms at its customer service and repair centers statewide and delivering them to K2USA. These wonderful folks have performed this invaluable service six days every week since last Fall.

Thanks to the electricians and others at Servair Electric, Inc. for installing and maintaining a variety of electrical lines and other services into the K2USA station. Hams may be good at putting up antennas, but we can be all thumbs when it comes to other electrical work.

Thanks to Sunair Corp. of Ft. Lauderdale, Florida for donating a state-of-the-art, solid state Sunair RT-9000 digital HF/SSB transceiver and Sunair LPA-9600 1kW linear amplifier. These rigs are the cats meow, not to take anything away from our vintage Collins KWMs, 30S1s circa 1965. This donation represents \$7,000 for the transceiver and more than \$12,000 for the linear amplifier. We get lots of 5X9+30 signal reports now!

Thanks to Transworld Communications, Inc. of Escondido, CA, for providing K2USA with an invaluable RT200 unit. Dr. Michael Ruggiero at Transworld is our patron saint.

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Thanks to US Sprint for donating (along with MCI) all domestic long distance telephone services to K2USA and the other 16 stations running patches from Saudi. Sprint's contribution is more than \$8,000 per month for K2USA alone, \$50,000 since September.

Here is the thought I want to leave with executives of other companies in the United States: to paraphrase President Kennedy, ask what you can do for MARS!

Two government agencies that make a difference

Thanks to the Directorate of Engineering and Housing at Fort Monmouth, New Jersey, for its tireless contributions to the success of K2USA. These great folks make sure that everything we need gets done on a priority basis.

Thanks to CSMS personnel from the 119th Maintenance Btn. of the NJ National Guard for working with JCPL to install our king-sized 800 ft. rhombic antenna at K2USA. The unit commander, LTC Dave Fiedler, WB2CDG, is also active as AAR2XI in MARS.

To those of you in hundreds of other federal, state and local agencies, let me throw down this challenge: find a way that you can help us in MARS help our fine servicepersons!

Thanks also to our 28 tireless volunteer MARS operators

Here are 28 very special people who collectively run almost 2,000 phone patches and 1,000 MARSgrams each month from K2USA: Station Manager Gerry Silverman, WB2GYS (60+ hours each month); Technical Director Bob Bissett, ND2L (60+); Administrative Coordinator Bill Dixon, N2CXX (80+); Mike Begala, K2CTJ (10+); Mike Beller (15+); Marv Bronstein, K2VHW (30+); Joe Cotignola, WR2B (36+); Mike Doelger, WD2GXP (40+); Joe Dreifuss, WA2GSY (30+); Fran Dreifuss, WB2SZB (20+); Art Fitzpatrick, W2YBS (12+); Marty Goldfarb, KB2JSG (12+); Tammy Golembeski (30+); Rev. Jim Hawkins, N4KKC (20+); Bill Koeth, KB2KSL (10+); Tim Koeth, N2LPN (15+); Dennis Kopecky, WJ2R (10+); Beth LaRocca (40+); Bernie Lubinsky (please turn to page 63)

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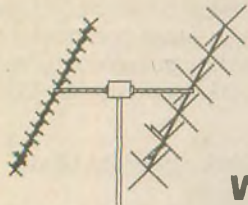
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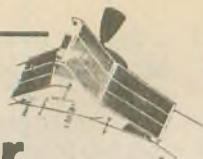
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WB5ZDP
Keith Berglund



Well Amateur satellite fans, we've got two, count 'em *two*, more Amateur satellites in orbit. First RS-14 was launched in late January, and then RS-12/13 was launched in early February. RS-14 has two Mode-B analog transponders and a Mode-B digital transponder. RS-12/13 is a near exact clone of RS-10/11 with two satellites worth of Mode-A capability.

On January 29 at 11:59:52 UTC the Russians launched AMSAT-OSCAR-21. This satellite was formerly called RS-14 before launch, but the Russians have recently joined the world community of Amateur satellite enthusiasts and will now give their satellites the "AMSAT-OSCAR" designation. AO-21 was built through the joint efforts of AMSAT-U-ORBITA in the Soviet Union and AMSAT-DL. This cooperative effort began in 1989 when an agreement was reached between representatives from each organization. In this agreement, AMSAT-U-ORBITA designed and built the linear transponders, command receiver, telemetry system and power supplies. The AMSAT-DL group designed and developed the digital transponder known as RUDAK-2. RUDAK-1 is aboard OSCAR-13 but is, unfortunately, not working.

AO-21 was launched into a 1000 km, 82 degree inclination orbit. The period of the bird is about 105 minutes with an increment of 23 degrees west for each orbit. What this means is that the OSCAR-Locator should be a perfectly good method to track this bird (see March 1991 *Worldradio*).

AO-21 contains two types of transponders. The first is an ordinary Mode B transponder, functionally just like the ones on OSCAR-10 and OSCAR-13. Actually, there are two separate Mode B transponders separated by a few kHz. Each is an inverting transponder 80 kHz wide. I am not certain if the satellite controllers will have both on at the same time or if they will only

AO-21 TRANSPONDER FREQUENCIES

MODE-B #1
Uplink Passband 435.102 to 435.022 MHz
Downlink Passband 145.852 to 145.932 MHz

MODE-B #2
Uplink Passband 435.123 to 435.043 MHz
Downlink Passband 145.866 to 145.945 MHz

Digital Transponder
RUDAK-2

Uplink frequencies:
RX-1 435.016 MHz 1200bps, FSK, NRZIC/Bi-phase-M
RX-2 435.155 MHz (AFC) 2400 bps, BPSK, Bi-phase-S
RX-3a 435.193 MHz (AFC) 4800 bps, RSM
RX-3b 435.193 MHz (AFC) 9600 bps, RSM
RX-4 435.041 MHz (digital AFC) RX for RTX-DSP

Downlink frequency
145.983 MHz, 3 Watts

The downlink can be switched to the following operating modes:

Mode 1: 1200 bps, BPSK, NRIZ, (NRIZ-S) (like FO-20)
Mode 2: 400 bps, BPSK, Bi-phase-S (like AO-13 beacon)
Mode 3: 2400 bps, Bi-phase-S
Mode 4: 4800 bps, RSM, NRZIC (Bi-phase-M) (like 4800 bps uplink)
Mode 5: 9600 bps, RSM, NRZI (NRZ-S) (like 9600 bps uplink)
Mode 6: CW keying (only for special events)
Mode 7: FSK (F1 or F2B) e.g. RTTY, SSTV, FAX etc. (special events)
Mode 8: FM modulation by D/A signals from DSP-RISC processor (speech)

Table 1

have one on at a time. Table 1 details all of the frequencies on AO-21.

The other transponder is a very sophisticated digital transponder known as RUDAK-2. As you can see in Table 1, there are many inputs and outputs using many types of modulation. One mode that I see is missing is ordinary 1200 baud FM AFSK, in other words standard terrestrial packet. The modes that they chose are quite arguably superior to FM AFSK, but SO WHAT! By using modes like 4800 baud BPSK, they have excluded 99 percent of the Amateurs all over the world! At least the Mode B Analog transponder is easily usable.

As you remember, on Mode B you transmit to the satellite (uplink) on 435 MHz and receive the downlink from the satellite on 145 MHz. According to the spacecraft designers, only 100W maximum EIRP (Effective Isotropic

Radiated Power) will be required to work the satellite. What this means is that you can work the bird with 10W to a 10dB gain antenna or 75 to 100W into a quarter wave vertical or J pole. On the receive side, a directional antenna which could be pointed at the satellite would be nice, however, a non-steerable, omni-directional antenna such as a Ringo Ranger or J pole will probably do OK. A receive pre-amp will never hurt, though.

I guess a word is in order about the Mode-B analog transponders. Unlike the Mode-A transponders of RS-10/11 that I have talked so much about, this transponder is an "inverting" transponder. If you uplink on LSB you will downlink on USB. This is the established convention; uplink on lower side band, and downlink on upper side band. Make sure when you are trying a single side band QSO that you adhere to this convention. CW is rather obvious, up on CW, and down on CW. Follow this convention and you will have no trouble receiving your signal.

One way of thinking about an inverting transponder is that it works on the principle of a "translation frequency." In simple terms, this means the satellite translates or converts any received signal to a different frequency for transmission back to Earth. On the first Mode-B transponder of OSCAR-21, the translation frequency is 580.954 MHz. That is, the frequency of the signal beamed back to Earth is equal to 580.954 minus the frequency of the signal received by the bird from Earth. If you transmit up at 435.050 MHz, for example, then the bird will re-

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transmit it at (580.954 - 435.050 =) 145.904 MHz. In other words, if you transmit up at 435.050 MHz, you should expect to receive your own downlink on 145.904 MHz. The translation frequency on the second Mode-B analog transponder is 580.989 MHz.

RS-12/13 . . . AO-22 ??

Hurray! Guess what, Mode A fans, RS-12/13 was launched early in February. Preliminary reports say that RS-12's beacon and transponder have been heard. That's right, we have another Mode-A satellite to use and to help many of you get started in Amateur satellites. Maybe, since RS-14 is now being called AO-21, RS-12/13 will be called AO-22. For now, though, until they announce one way or the other, I'll still call it RS-12/13.

RS-12/13 is, for all practical purposes, an exact clone of RS-10/11. RS-12 and RS-13 were built at the Tsiolkovskiy Museum of History of Cosmonautics in Kaluga, USSR, which is located about 120 miles southwest of Moscow. RS-12/13 is a single unit, just like RS-10/11, mounted on a primary COSMOS ship navigation satellite. RS-12/13 receives its power from the primary satellite so, unlike most Amateur spacecraft, power is not a problem.

RS-12/13's orbit is virtually identical to RS-10/11's orbit. The orbit is a circular 1000 km (621 mile) orbit with an inclination to the Earth's equator of 83 degrees. It takes about 105 minutes per orbit and the increment is 23.5 degrees west for each orbit. If you have an OSCAR-Locator, the overlay for RS-10/11 will do just fine. I hope that the ARRL will give the equatorial crossing times for this bird just like they do for RS-10/11.

The frequencies for RS-12/13 can be found in Table 2. I'm relatively sure that they are going to run this bird just like they run RS-10/11. That is, only one of the packages will be on at a time. As I stated previously, RS-12 seems to be the one turned on for now.

As you can see, there are more modes than just Mode-A, however, as long as there is good propagation on 15M, there won't be any Mode-K or Mode-T. I remember when they had RS-11 in Mode-K when there was world wide propagation. It was a real zoo! There were folks calling CQ on 15M that didn't even know that their signals


RS-12\13 TRANSPONDER DETAILS			
		RS-12	RS-13
Mode-A:	uplink	145.910 to 145.950	145.960 to 146.000
	downlink	29.410 to 29.450	29.460 to 29.500
	beacon	29.408 (or 29.454)	29.458 (or 29.504)
Mode-K:	uplink	21.210 to 21.250	21.260 to 21.300
	downlink	29.410 to 29.450	29.460 to 29.500
	beacon	29.408 (or 29.454)	29.458 (or 29.504)
Mode-T:	uplink	21.210 to 21.250	21.260 to 21.300
	downlink	145.910 to 145.950	145.960 to 146.000
	beacon	145.913 (or 145.959)	145.862 (or 145.908)
Mode-KA:	uplinks	21.210 to 21.250 and 145.910 to 145.950	21.260 to 21.300 and 145.960 to 146.000
	downlink	29.410 to 29.450	29.460 to 29.500
	beacon	29.408 (or 29.454)	29.458 (or 29.504)
Mode-KT:	uplinks	21.210 to 21.250 and 29.410 to 29.450	21.260 to 21.300 29.460 to 29.500
	downlinks	145.910 to 145.950	145.960 to 146.000
	beacons	29.408 (or 29.454) 145.913 (or 145.959)	29.458 (or 29.504) 145.862 (or 145.908)

Table 2

were being picked up and rebroadcast via satellite.

On the other hand, when propagation was not so good (for HF), I know of several people who made their first satellite contact on Mode-T. All that is required is a transmitter on 15M and a separate receiver on 10M. The question that some have asked me is whether their new age synthesized transceiver will do for Mode-T; after all, it will transmit on one band and then receive on another. The answer is NO. Remember, on satellite work, you're working full duplex. That is, you are transmitting and receiving simultaneously. Due to the dopplar shift caused by the moving satellite, you must be able to correct your transmitter frequency on the fly.

The orbit of this bird is virtually a duplicate of RS-10/11's but it won't be exactly the same to several decimal points. What this means is that sometimes the satellites will be over your QTH simultaneously, but most of the time they will be separated by at least 35 or 45 minutes. The good news is that we'll have Mode-A activity virtually around the clock. Good Luck, and See you on AO-21 and (AO-22)?! ☐



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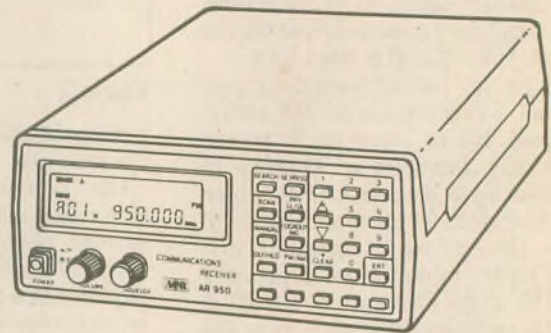
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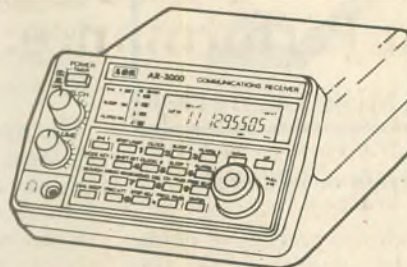
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| Speed: | 20 ch/sec. scan. 20ch/sec. search |
| IF: | 736.23, (352.23) (198.63) 45.0275, 455KHz |
| Increments: | 50Hz and greater |
| Selectivity: | 2.4KHz/-6db (SSB) 12KHz/-6db
(NFM/AM) |
| Audio: | 1.2 Watts at 4 ohms |
| Power: | Input 13.8 V. DC 500mA |
| Antenna: | BNC |
| Display: | LCD |
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| Mobile Mounting Bracket. | MM1 | \$14.90 |
| RS232 Control Package | SCS2 | \$295.00 |

(software & cable) offers spectrum display and database.

Specifications:

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| Sensitivity: | .35uV NFM, 1.0uV WFM,
1.0AM/SSB/CW |
| Speed: | 38 ch/sec. scan. 38 ch/sec. search |
| IF: | 750.00, 45.0275, 5.5MHz 455KHz |
| Increments: | 5,12,5,25 KHz |
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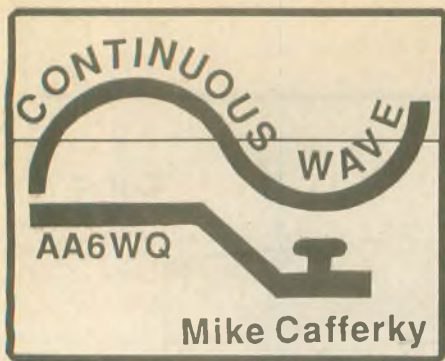
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CW: a right brain or left brain function?

Think through the process of using Morse code. In sending code, the operator thinks of each word while the brain silently sends nerve stimuli to the muscles which control a keying device linked to the radio. With practice, the nerve pathways which guide the muscles get well used and eventually "motor memory" is achieved where the muscles engage almost without thinking about the specific motions needed to form dits, spaces and dahs, the building blocks of the code characters.

While sending code no words are spoken, no body language can be shown, and no tone of voice conveying meaning or nuance can be given. Imbedded in simple audible monotones, the words themselves have the task of carrying the full message. To communicate effectively then, a CW operator must choose words carefully not only for brevity but also for clarity.

On the receiving end

Stripped of spoken words, body language and tone of voice, Morse code remains simply a unique form of non-verbal communication. Instead of hearing familiar verbal symbols which represent things we know, we hear a simple monotone switched on and off in a rhythmic, repetitive pattern.

This tone received by the ear is sent to the brain where it is silently interpreted character by character or word by word. As each character or word is interpreted, the brain stimulates the arm and hand muscles to enable the operator to transcribe the received signal into alpha-numeric characters on paper. If the operator can copy code mentally, then the interpretation is

generated mentally as the code is received, while no visual copy is needed for understanding.

Morse code is not really another "language." It is a code for English. When we learn Morse, we are not learning new words (except for a few abbreviations and radio-related words). Instead, we are training our brains to interpret a different set of stimuli which is merely symbolic of things we already know.

The split brain

Most CW operators don't usually think about the mechanics of how Morse code works. They just do it. However, I recently received a letter from a *Worldradio* reader suggesting a connection between gaining proficiency in CW and the differences between the left hemisphere and the right hemisphere of the brain.

The suggestion left me wondering, how does Morse code "work" in the brain? Is it the left side of the brain which is used in CW or is it the right side of the brain? Are some people's brains better suited for learning this form of communication than are others? What part does musical (or some other specific) ability play in becoming proficient at Morse code?

While we usually think of our brains as a single unit, it is actually divided into two halves. Research in mental processing indicates that each half of the brain is capable of perceiving, processing information, interpreting, learning, remembering and feeling. Information is processed by the whole brain, not just one hemisphere or the other. The difference between the two

halves is the way each deals with incoming information.

For instance, the left side of the brain is believed to deal with incoming information by logical thought, detailed analysis and sequential processing, as well as language and motor skills. On the other hand, the right brain is responsible for spatial relationships, non-verbal expression, musical ability, attention, imagination and interpreting data as a whole rather than by analyzing the component parts. Information detected by the ears is "transmitted" to both the left and right hemispheres simultaneously.

Which hemisphere dominates in CW?

So where does this leave us when it comes to copying Morse code? Short of doing a comprehensive literature search and scientific experimentation, the writer here suggests the following two possibilities.

It is conceivable that during the early stage of learning Morse code, the left hemisphere is dominant. It is during this time that the sequential code patterns are learned dit by dit and dah by dah. Processing code at five words per minute or less is accomplished with a logical, analytical process. The words are spelled out character by character. This is not to suggest that for slower code speeds the right hemisphere is dormant. It is just that its role may have less influence for learning the code at the slow speed.

A possible second stage in learning occurs as the CW operator begins to understand the larger patterns of characters and words. As skill increases the operator does not need to "count" the dits and the dahs in order to distinguish between one character and another. Instead, the brain interprets the whole rather than picking out the component parts. It is during this second stage of learning CW that I suggest the right side of the brain begins to play a more dominant role. However, this does not suggest a lack of left brain activity during code copying. Remember that information coming to the brain through the ears is processed by both halves of the brain simultaneously.

The two-stage model suggested here may not do justice to the complex functions which occur at lightning speed within the nervous system while copying Morse code. The experimental psychologists or neurologists among us may be able to suggest a more precise description.

Are you a hopeless case for upgrading?

Assuming that it is true, should the above information be an excuse for

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someone who has had a difficult time learning CW? Clearly not. If you consider yourself primarily a "left brain person" will you be doomed to a miserable time learning or improving your CW? I doubt it. Unless you have sustained major damage to one hemisphere, you will have both to assist you in CW. So instead of being discouraged that both sides of your brain are needed to upgrade to General or Extra Class, you could be encouraged that you have what it takes to get it done.

Should all this be used to suggest that those who have a difficult time upgrading should feel guilty that they don't apply themselves more? No one can be the judge of another's will to learn, the degree of commitment or the amount of effort put forth to accomplish his goals. Each can simply at-

test to the amount of work required for what he has achieved himself.

There is literature which suggests that some people have an easier time with right hemisphere brain activities. If this is true, these people may be able to learn Morse code quicker than others. It may prove true that to progress to gradually faster and faster code speeds, both the left and the right hemispheres need to be involved. Perhaps this is one reason why upgrading can take so many weeks and countless hours of repetition; both the left and right sides need to be trained and integrated together to be effective at higher speeds.

If you wish to comment on these or other CW ideas, feel free to write to me, Mike Cafferky, AA6WQ, at 14031 Champlain Ct., Fontana, CA 92336. □

MARS

(continued from page 57)

(30+); Drew Moore, KB2UV (24+); Sgt. John McKinny (30+); Rich Pascale, N2LMX (12+); John Provan, N2LLL (60+); Joe Questore, WA2JDL (20+); Mike Reason, W2EXQ (10+); Russ Rozea, KB2FWP (10+); Paul Scipione, AA2AV (30+); Janice Starek (60+); Dave Sternberg (12+); and Col. Norm Styer, AI2C (36+).

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If you are one of the almost 490,000 other licensed radio Amateurs in the US who isn't yet involved with one of the three MARS systems, let me leave you with this thought: somewhere in the Persian Gulf tonight there is a lonely serviceperson who could have had the joy of calling home if . . .

There are now nearly 12,000 American radio Amateurs operating in the various MARS systems (5,000 in Army MARS, 3,500 in Navy/Marine MARS, and 2,900 in Air Force MARS). We could use a lot more help! If you would like to take your "hobby" and make it a "life line," you can contact the three MARS systems for membership information.

Air Force MARS: Chief, Air Force MARS, AFCC/DOYX, Scott AFB, IL 62225-6001; 618/256-6522.

Army MARS: Robert Sutton, Chief Army MARS, US Army Information Systems Command, Fort Huachuca, AZ 85613-5000; 800/633-1128.

Navy/Marine MARS: Robert D. Loe, Chief, Navy/Marine MARS, Naval Communication Unit, Washington, DC 20397-5161.

See you at Dayton

Air Force, Army and Navy/Marine MARS will have a booth at this year's Dayton Hamvention (Apr 26-28). Be sure to stop by and say hello! □

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CONSTRUCTION

Using ferrite beads to keep RF out

JACK ALTHOUSE, K6NY
Palomar Engineers

RFI and TVI have been with us for a long time. Now we have microwave ovens, VCRs and many other devices that do wrong things when they pick up RF.

There are several ways to tackle the problem but most of them involve opening the affected equipment and adding suppressor capacitors, filters, and other circuit modifications. Unfortunately, there is a serious disadvantage associated with this approach. Any modifications made to domestic entertainment equipment can—and often are—blamed for later problems that arise in it. Modifying your own equipment is not so bad, but taking a soldering iron to your neighbor's stereo is risky.

An alternative approach is to use ferrite beads to reduce the amount of RF entering the equipment. If the equipment is in a metal box, or even if it's in a plastic box, if RF is prevented from entering the box on the antenna lead, the power cable, the speaker leads, the phono pickup leads and on any other wires entering the box, it is possible to solve the problem without any modification to the equipment. Ferrite beads just slip over the wires and stop RF from going in.

Ferrite beads are made of the same materials as the toroid cores used in broadband transformers but are used at much higher frequencies. For example, ferrite Mix 43 is used for tuned circuits in the frequency range .01 to 1 MHz. It is efficient and losses are low. But, if it is used in the 40-200 MHz range it is lossy. So when you slip a bead of Mix 43 over a wire and there is RF in the 40-200 MHz range going down the wire, it is just as though you put a resistor in the wire. But you did not have to cut the wire to insert a resistor; you just slip a bead over the wire. If the resistance of one bead is not enough you can add more beads or add longer beads to get more resistance. The beads, unlike a resistor, do not affect the wire at low frequencies so the audio, DC, and other low frequency components go through the wire just as though the bead were not there.

There are three bead materials in general use: Mix 73, Mix 43, and Mix 64. The impedance in ohms of size FB-18 beads vs. frequency is shown in the following table.

From the table we see that beads of

Bead Material	Frequency				
	1-MHz	10-MHz	40-MHz	100-MHz	1000-MHz
73	45	110	110	110	120
43	15	70	110	150	160
64	6	40	110	160	400

the three materials work about the same at 40 MHz where the impedance is 110 ohms. Below 40 MHz material 73 is best. Above 40 MHz material 64 is best. For overall performance from 1-1000 MHz material 43 is the best choice.

It is important to remember that the frequencies mentioned are those of the interfering signals to be eliminated; not the operating frequencies of the equipment being protected. For example, to protect a telephone operating at voice frequencies of .002 MHz we use type 43 or 73 beads to keep 14 MHz RF out.

So when you buy beads you must specify both the physical size (FB-3, FB-8, etc.) and the material (Mix 73, Mix 43, etc.) depending on the frequency of the RF interference. FB-1, FB-3, and FB-7 have .05 inch holes that will slip over bare #18 gauge wire. FB-8 has a .09 inch hole and will slip over the insulation of #22 wire. FB-24 and FB-63 have .2 inch holes to go over larger wire or cable.

Cables. So far we have talked about slipping beads over individual wires. But, in many cases, we are going to find two-wire speaker cables, two-wire or three-wire power cables, twinlead antenna cable, and multi-wire control cables. Cable wires are close together and act just like a single wire as far as RF pickup is concerned. So the whole cable can go through the bead and this will suppress RF transmission through all the cable wires. This is a lot easier than putting beads on each wire.

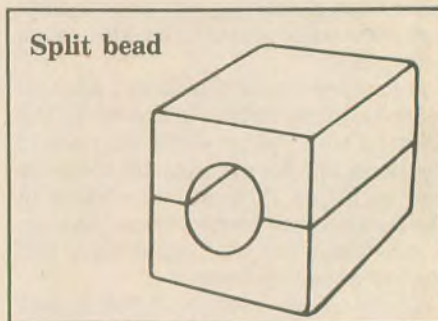
Twinlead is a special case. If you put a bead on each wire you'll kill the TV signal. But if the whole twinlead goes through a single bead, the TV signal goes on through but the RF interference is suppressed by the bead. This is because the twinlead is a transmission line to the TV signal but looks like a single wire to the RF interference.

This brings us to coaxial cable. The signal going through the coax is confined to the inside of the coax shield. But the outside of the shield acts just like any wire; it can pick up RF and that RF can be carried to the TV or monitor. Shield beads placed over the cable will suppress this interference.

Toroids. When we start talking about slipping beads over coaxial cable and multi-wire cable we see that we may need beads with pretty big holes. Also, if the cable has a molded plug on the end (like some power cords, for example) the plug has to go through the hole and we may need a very big hole indeed. Fortunately a variety of ferrite toroid cores are available with holes as big as 1.4 inch diameter. They are not available in all the same materials as beads but in similar ones. As a guide when specifying toroids for RF suppression: Mix 77 is the best below 40 MHz; Mix 43 can be used from 1-1000 MHz and is the best from 30-150 MHz; and Mix 61 is the best above 200 MHz.

After you put that big plug through the toroid hole you'll find that the toroid fits the cable very loosely. Don't worry. It will still work fine. If there is room to do it, loop the cable around and run it through the toroid again. Do this as many times as you can. Each turn is just like adding another toroid. And, using the big Mix 61 cores, you add an inductive choke where two turns is four times as good as one turn, three turns is nine times as good, etc.

Split beads. This is a new development to solve the problem of putting beads or toroids over cables that have big plugs on the end. They are beads that have been cut in half. You put the two halves over the cable and wrap them with tape to hold them together. The mating edges are polished smooth so the two halves mate very closely. They are available with center holes of ¼ inch and ½ inch diameter. Also for flat computer cable 2 or 2½ inches wide.



It is important that the two halves of the split beads fit exactly together. So the ¼ inch hole beads cannot be used for cables larger than ¼ inch. It does not matter if the cable is smaller than the hole. All split beads now available are of 43 material which is the best overall material for 1-1000 MHz interference suppression.

Telephone interference. The standard telephone is highly susceptible to RFI. The telephone wiring in the house and outside on poles make a large receiving antenna. And in the telephone instrument are voltage-variable

resistors that act like detector diodes so nearby radio stations are clearly heard. The solution is to keep RF out of the telephone by putting ferrite beads on the telephone cable as it enters the instrument. The plug of modular telephones will go through F82 toroids. Or 1/4 inch split beads can be put over the cable.

Burglar alarms. These are much like telephones in that they have extensive wiring throughout the building that acts like an antenna to pick up RF. The solution is the same: Use beads or toroids on the wires entering the electronics box to keep RF out. It also may

be necessary to put beads on the 115V AC power cord.

VCRs. The VCR is a real RFI problem. Ferrite beads on all wires entering the VCR can eliminate RFI from most Amateur bands. But on 80M even this doesn't always work. W6BIP has worked on this problem; see *Ham Radio Magazine*, October 1984, p. 113.

We have been talking about keeping RF out of equipment. You can also use beads and toroids to keep RF in. That fish tank heater that makes all that racket on 80 meters is using its power cord and the house power wiring to radiate interference. A bead or toroid

on the power cord right at the heater can keep the noise from entering the wiring. Computer power cords and connecting cables can be treated in the same manner. Sometimes RF comes out of a transceiver's power cable. A toroid can stop it. Or RF flows on the outside of the antenna cable, going right around your lowpass filter. Again, toroids to the rescue.

Each interference problem is different. You have to try this and then try that until you find a solution. Using the principles outlined here, ferrite beads and toroids can be extremely helpful. □



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Certainly you've noticed that DXers are like fishermen, always boasting of a recent conquest or lamenting the big one that got away. I must confess I'm no different than the rest of them, although my levels of delight and anxiety seem to be a lot lower than some of the folks I know. Indeed, I describe myself as a "mid-scale" DXer, no threat to anyone but one who's always on the look-out for something new or interesting.

Okay, having said that, let me unfold more tales about long-path, one of my favorite subjects. At the outset, however, I must confess that I got into long-path rather late in life. Of course, being off the air for 40 years didn't help. But in my "dipole days" back in December of 1983, I had a QSO with UB5NQ in the morning hours around

1500 UTC. That seemed to be what I'd call a typical DX QSO until he sprung on me the fact that he was using a 10-element Yagi and working me via *long-path!* Zounds! My dipole was doing better than I gave it credit. And I'm still wondering about the boom length on that Yagi. 10 elements. Amazing!

With that, my interest in long-path perked up but really didn't become a passion until we got up our beam in '85. That was back in my "QRP days" and I worked it for all it was worth. Thus, I moved off dead center, idling at 80 DX-CC countries with my dipoles, and added another 20 countries in as many days with the new beam. Indeed, my ultimate QRP QSO was with ZS1AAX on long-path using just 5W.

And I kept plugging away at long-path, finally using that mode to obtain my WAZ by working those elusive zones in the Middle East (Zones 21 and 22) and Africa (Zones 37 and 39). After that, it was just more for my DXCC count. But I also did something of a stunt, working Stan, ZS5ADV, twice in a day, first at night on short-path and then again the next morning on long-path. I can't say I was the first one to do it but it gave me a lot of pleasure.

So why am I telling you all this? Well I just pulled off another stunt, working ES1RA on both long-path and short-path within five minutes. How about that? Those QSOs covered 32,000 and 8,000 km, respectively, and there's more to the tale so get yourself comfortable and bear with me.

It all happened one morning in late October of 1990. I was prowling the

20M band, looking for signals on long-path. I heard a loud UB5 calling CQ at about 25 wpm but I couldn't raise him. Then I spun the beam over the North Pole and the same UB5 came in again but now almost unintelligible from multi-path effects—curious. I went back, pointing the beam over the South Pole and there he was again, much stronger and quite readable, but still no luck.

A bit later I stumbled on Oleg, ES1RA, calling CQ at a more modest speed, about 20 wpm. The beam was still pointing south and I raised him easily, exchanging RST 579 reports. In the course of our QSO, Oleg told me he was running 200W into a GP (a vertical for the uninitiated). Remembering the old phrase, "Verticals radiate equally well/poorly in all directions," it occurred to me to try for a short-path QSO as well. Why not? Nothing to lose!

So when I signed with him, I spun the beam back over the North Pole and he was now down to about RST 559 and cluttered with multi-path. Knowing his call, I gave him a shout and made the connection. So there it was, long-path and short-path QSOs in five minutes. But there was more to the event, mainly from thinking about the problem.

It was clear that long-path propagation was very good that day; strong signals from Europe were coming in from the southerly direction over the North Pole, albeit with multi-path problems. How does one look at that? The first thing to recognize is that beams have F/B ratios, regrettably less than the manufacturers would like us to believe. So for a given direction, one cannot discount signals coming in via the back lobe.

What more does one have to work with in a situation like this? Well, did you ever think about propagation times? I did a calculation on the distances involved in the ES1RA QSO: 7,646 km short-path and 33,354 km long-path. At a speed of 300,000 km/sec, signals would be reaching me in about 26 msec and 108 msec, respectively, after his key was pressed, the short-path signal reaching me first no matter which way the beam was pointing. After that, what I heard depended on the signal strengths from the two directions, the forward gain of my beam and its F/B ratio.

Given the features of my beam, it was clear that the long-path signals were the strongest. But with the bad multi-path problem when trying to copy him over the North Pole, I could only conclude that significant signals were reaching my receiver from both directions: the short-path ones first via the forward lobe when pointing north and the long-path ones later in time via the back lobe. But when pointing over

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the South Pole, things changed; the weaker signals from the short-path still arrived earlier via the back lobe and the stronger signals from the long-path arrived later via the front lobe of the antenna.

Okay, as a physicist, you've just seen me make an "arm-waving argument" or two, explaining things in qualitative terms. Now I can do better, even modeling the situation on my computer, using both graphics and sound.

So after some fumbling in GW-BASIC, I put together a program that was general in its nature, emulating what you would hear for any code speed and adding signal strengths correctly in time sequence for any distance combinations on short- and long-path. I'm pleased to say the graphics were crystal clear, though the sound effects were less happy, my code words (PARIS and CODEX) being played out at a speed that would make a Novice wince. (I had ambitions of playing out the CW at a faster speed but neither QuickBASIC nor TurboBASIC compilers had a sound command which could handle the volume or intensity of sound.)

Now such efforts offer a means of exploring what you've heard in something more than a qualitative manner. Indeed, one draws comfort from recalling sounds that relate to what one is seeing on the computer screen. The real fun part is when something comes through and then is verified on the air. In that regard, think about when I had my beam pointed south, receiving good signals on long-path. Face it, those short path signals were there too, though perhaps down in the mud. But what would one hear if they perked up a bit?

Let me tell you, again from first hand experience. The next day I was keen on exploring signals via short and long-path, hoping that a good connection would be available again in both directions. So what happens? I heard UT5NF in Nikolayev, just north of the Black Sea, calling CQ slowly, readable on long-path and muddled with multi-path when coming in from the north. But pointing south with the conditions which prevailed, I could hear his early short-path keying, coming in weakly before the stronger long-path signals reached me. Zounds! You might try that exercise if you're a non-believer; just turn off your AGC and listen hard, particularly to dashes. If you're listening to signals from a GP, I'm confident you'll find what I'm talking about, a weak short-path signal before the long-path one starts to come in.

Now just to nail this idea down, think back to all the multi-path signals you've ever heard. I'll wager they were

delayed echos, weak tails on signals which arrived *after* a strong signal ended, the sort of thing one hears from a N+1 hop path after the signals from the N hop path have subsided. The long-path/short-path situation discussed above is quite different. True, it required equal radiation in the short- and long-path directions from a vertical antenna. But it's probably about as close as I'll ever come to hearing a bonafide RTW (round the world) signal in these days of crowded bands.

So if you're a CW person working LP in the morning hours, listen for those big East Bloc signals, perhaps coming from GP antennas. If you hear the




weak short-path precursor when the long-path signals are coming in, write it up in your log; you've heard signals from both sides of the world within about 0.1 second! Better yet, after raising one of them on LP, take 30 seconds to spin your beam back to the SP direction, get an RST report and set a new record for the shortest time between LP and SP QSOs! And send me a note so I can do the boasting for you right here in Worldradio. □

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10-10 INTERNATIONAL News

Chuck Imsande, W6YLJ
10-10 19636

1990 was a good year

Maybe 1990 was not a good year for some things, but it was a good year for 10-10. In addition to completing our first election of officers and directors on a membership basis, we were successful in increasing our membership by over 3,200 new members. The largest gain was in the 4th district with slightly over 550 new members and the smallest gain was in the 3rd district with just under 200 new members. The DX membership grew over 300 new members. In addition to the paperwork associated with processing new memberships, the district managers and our hard working records manager, Lee Pasewalk, WB6MGM, 10-10 #213, processed almost 1,500 changes to membership records. These changes include call upgrades, call area changes and SKs. These do not include address changes, of which there are many.

What this all adds up to is a lot of work! Remember that these district managers and our records manager are all volunteers, just like all of the officers, directors, and other managers. Time spent doing their volunteer work many times removes time from their own schedule to operate their radios.

One way each of you can help is to keep your dues current. Stay on the ACTIVE list. 10-10 dues at \$4 per year is still the best bargain in Amateur Radio. Remember, you can renew your dues for several years at one time by sending \$4 times the number of years to your district manager. If you are one of 10-10's members and have lost your number or do not know who your district manager is, an SASE to me will get you your number or a list of district managers.

For those interested, the highest 10-10 number issued through January 1991 was #58610. It was issued to KB9FUI. It will not be long until we reach another milestone, 10-10 #60000! One number above 58610 has been issued as a special commemorative number. It is #61994 to HY6JUN. HY6JUN is a special event station in Normandy, France, and is operated by L'Association Des Radio-Amateurs Del La Manche/Normandy to celebrate the landing on Utah Beach on D-Day.

It is activated each June 6 and will again be on the air on June 6, 1991. The station is located in an old German bunker and the antenna is located on top of the bunker. An American flag flies on the antenna tower, a gift from N2GSH, and has flown over the Capitol Building in Washington DC. Mark your calendar for June 6 and listen for HY6JUN, 10-10 #61994.

A loss to 10-10

In December 1990, 10-10 lost an old time member and a long time volunteer. Mac McKenzie, ZL3RK, 10-10 #4169, became a Silent Key. Mac was our ZL DX manager for New Zealand since 1979. He was a strong supporter of 10-10 and could be heard from ZL land regularly. We will miss him.

It has been decided that Carol Hugentober, K8DHK, will now handle the ZL membership along with all other DX memberships. Additionally, Les Olson, VK2JLO, 10-10 #30262, has stepped down as our VK DX manager and Carol will also now handle the VK membership. We thank Les for his many years of service to 10-10 as the VK manager. VK and ZL members should now send their dues, etc. to Carol at 4441 Andreas Ave., Cincinnati, OH 45211, USA.

New 10-10 Counties Award

10-10 Counties Award Manager Alice Jenkins, NR4R, has been busy sending out the new 10-10 Worked All Counties Award rules and application forms as well as the 10-10 County Hunter Record Book. The popularity of this new award is evident by the number of requests for "your county please" during the recent 10-10 Winter QSO Party, February 2 and 3. If you are interested in county hunting on 10M and the 10-10 Worked All Counties Award, send a #10 SASE to Alice at One Mitchel Road, Rossville, GA 30741. The 10-10 County Hunter Record Book is also available from Alice for \$5 US or \$7 DX. This 8½ × 11 inch spiral bound book is a necessity for keeping your county records if you do not have a computer.

V73AX from Kwajalein Island

During the recent 10-10 Winter QSO Party, I happened on V73AX on Kwajalein Island in the Marshall Island group. I asked Dick, the operator of the

Kwajalein Amateur Radio Club Station, if they had a 10-10 number. His reply: "We had one and it was on the wall, but it has become lost and nobody can remember what the number was." He told me the club's call was KX6BU and that V73AX was a special call. Well, I quickly jumped over to my computer and punched up Gerry Gross's 10-10 program, looked for KX6BU and there it was! 10-10 #8239. Passed it back to Dick and he immediately began giving it out. If you worked V73AX during the contest and want a card confirming Kwajalein Island, send an SASE along with your card to Kwajalein Amateur Radio Club, KX6BU, Box 444, c/o APO San Francisco, CA 96555.

New information manual

After many months of work, 10-10 now has a 24 page information manual. This 5½ × 8½ inch booklet contains everything you would like to know about the 10-10 organization. All officers, managers, awards, a net guide as well as a brief history of 10-10 is included. It tells about membership, chapters, contests, paper-chasing, the daily 10-10 Net and details about 10-10 awards. It contains a cut-out application form and list of district managers with their addresses. Inside the front cover is the official ARRL-ICAO phonetic alphabet and inside the back cover is a time conversion chart converting time zones to UTC (Zulu) time for both standard and daylight savings time.

This 10-10 information manual is designed to be kept as a ready reference at your operating position. A copy will be sent to each new member. Existing members can obtain a copy from the writer (address below) for \$1, which just covers printing cost and postage. Please *no* SASE required, as the new information manual will not fit into a #10 size envelope, but an address label would be appreciated. (You will receive your package faster if you include an address label!)

Finally

If you want information about 10-10, send me \$1, two first class stamps and an address label to 18130 Bromley Street, Tarzana, CA 91356-1701. You will receive the new 10-10 information manual and a copy of the latest issue of *The 10-10 International News*, 10-10's official quarterly magazine.

Lost your 10-10 number? Send me an SASE and I will run a computer check and locate your lost number. Remember, 10-10 numbers are assigned only once, and if you ever had one it will be on file in our computer data base. Include all previous calls, if any. 73 es cu next month. □

Field Day Antenna Installation System



One person installs in minutes

Info \$1.00

Re-usable

Ready for Action

Fast & Easy to Use

Eliminates Climbing

ANTENNA LAUNCHING MADE EASY

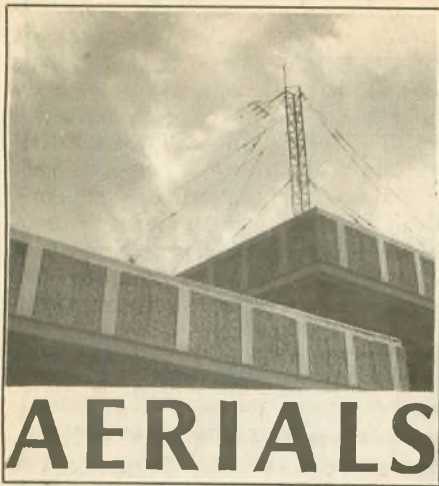
\$29.95

add \$5.00 S&H

1-801-373-8425

AntennasWest

Box 5002 W. Provo, UT 84605



AERIALS

Short dipoles

C. H. STEWART, KD5DL

What do you mean you don't have room for a 160M dipole? You can move to the wide open spaces of Montana, can't you?

How many of us feel cheated because we have an all-band rig but resign ourselves to the upper bands simply because we don't have the real estate to put up a 160, 80 or even a 40M dipole?

Antennas are strange beasts; they hardly ever seem to work according to theory. Theory says that if we want a half-wave dipole, we cut the wires to fit 468/F feet. Unfortunately, most of us stop there — we don't have the space to string up a 125 or 260 ft. long dipole, so we resign ourselves to working only the bands requiring shorter antennas.

Of course, you could always use an antenna tuner to match the odd impedance of a shorter antenna to the 50 ohms of your rig. Kurt Sterba is known for debunking a lot of misinformation about antennas and tuners, and claims success at matching the impedances of shopping carts and beach umbrellas using a tuner.

Other experimenters have also shown that the ends of a dipole can be drooped, bent, folded back or otherwise meandered to fit the available real estate, and claim good success with matching and efficiency. In fact, a lot of hams report good success with coiling up the excess wire somewhere in the middle of each leg to get the antennas to fit on their lots.

It may not seem sensible, but all of these methods work. The usual technique is to cut the dipole's legs a little longer than the formula calls for, get the antenna to fit where we want it to fit and then trim the ends, a little at a time, until we get the antenna to resonate at the desired frequency. It's not necessarily scientific, but it gets the job done.

The following pocket computer pro-

gram allows us to design a short half-wave dipole for any HF frequency to fit whatever space we have available, gives us a reasonable idea of what the impedance will be and calculates the SWR based on the guesstimated impedance.

Dipole theory

Theory says that a center-fed half-wave dipole of infinitely thin wire in free space has a resonant length equal to half the speed of light divided by the resonant frequency. If the wire is purely conductive, the free space dipole has a radiation resistance (impedance) very close to 73.1 ohms. When a transmitting dipole is current fed, the resulting power is directly proportional to the product of the current and radiation resistance.

A free space dipole exists in theory only. In reality we don't have infinitely thin wires, perfect conductors or even any free space. Practical real-life dipoles make adjustments for these problems, and real-life dipoles are slightly shorter than their theoretical cousins.

Theory doesn't say much about bending, drooping, coiling, or meandering of the infinitely thin wire, but it does suggest that if all of the power is derived by the relationship between current and resistance, then we can bend, droop, coil or meander where the current is approaching minimum. Since a dipole exhibits minimum current near the ends, that is the best place to do the bending, etc., and we'll still have a dipole almost as good as a long, straight one.

Previous editions of the ARRL Antenna Book provided some guidance to building physically short off-center-loaded dipoles, along with a chart to computer dimensions, reactances and coil positions for such antennas. The chart was a little awkward to use, and you had to convert reactances to inductances on your own.

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Stainless Steel
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Manual switching -- no resonator changing
Large, air wound coil
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TUNER-TUNER™



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- Save those finals!
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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.
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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)

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"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.

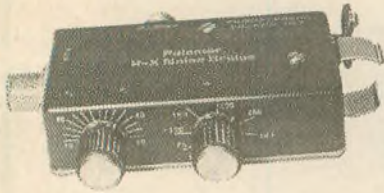


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Phone: (619) 747-3343

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.

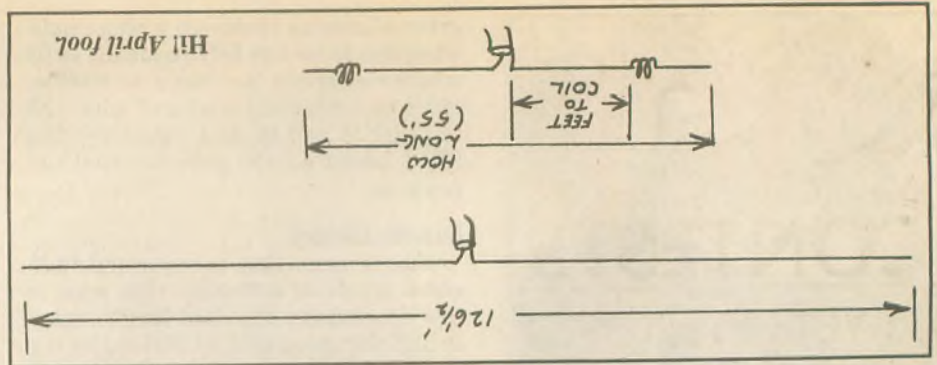
The price is \$69.95 in the U.S. and Canada. Add \$4.00 shipping/handling. California residents add sales tax.



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



A dipole designed for the midpoint of the new Novice 80M band is almost 126½ feet long. Say we only have 55 feet between trees; we can still get good results with a shortened dipole. If we place our loading coils 20 feet away from the feed point, the computer tells us that each coil would have to be 87.63µH, our input impedance would be about 28.25 ohms and the expected SWR would be 1.76:1.

The new *ARRL Antenna Book's* short dipole section in the *Mobile and Maritime Antennas* chapter helps somewhat, but the real boon, at least for computer programmers, is the presentation of formulae used to calculate antenna characteristics, which makes it possible for us to develop our pocket computer short dipole program.

```

0 REM: SHORT DIPOLES, BY KD5DL
10 N=100: INPUT 'F (MHz)',A: B=468/A:
  PRINT 'L='; INT (N*B)/N; 'FT'
20 INPUT 'HOW LONG',C: INPUT 'WIRE SIZE
  E',D: IF D<4 THEN 40
30 D=.324826/SQR (1.26075*D)
40 INPUT 'FT TO COIL',E: F=INT (6500*C
  /B)/N: G=1e6/(34*π*A)
50 H=(LN ((234/A-E)*24/D)-1)*((1-A*E/2
  34)^2-1)/(234/A-E)
60 I=(LN ((C/2-E)*24/D)-1)*((A*C/2-A*
  E)/234^2-1)/(C/2-E)
70 J=G*(H-I): P=50/(π*A):K=INT (J*P)/N
80 PRINT 'L=';K;'µH': IF F>50: L=F/50
90 PRINT 'X1=';F;'Ω': IF F<50: L=50/F
100 PRINT 'SWR=';INT (N*L)/N;'':1: GOTO
  10
  
```

The computer program does several things. First, it calculates the practical length of a full size dipole, then asks how long we want the shortened dipole to be, what size wire we want to use and the distance from the feedpoint to the loading coils. It then tells us what each coil's inductance should be to make the antenna resonant. It also guesstimates the antenna's impedance, then derives an expected SWR.

The antenna impedance is, at best, a guess. The program assumes that an ideal real life dipole has an impedance of 65 ohms, and that this impedance decreases proportionately with the reduction in overall size. Practical experience shows, however, that a dipole's impedance depends on numerous other factors, including height above ground and proximity to other structures. Consequently, the computed SWR is also only a guess.

The SWR is important, not that it makes the antenna any better or worse,

but it indicates the amount of power that is reflected back into the transmitter. Nearly all Amateur rigs can handle SWRs up to 3:1, but a hairpin match, matching stub, balun, or tuner should be used if the SWR is much above 2:1.

If your rig has an SWR meter, or you have an outboard meter, you should measure the system SWR, using low power, once you erect the antenna. Never operate your transmitter full power if the SWR exceeds the manufacturer's specifications.

One interesting note about this program: if you are building your antenna with metal rod or aluminum tubing, enter the diameter of the tubing, in inches, when asked for wire size. Any size up to four inches is permitted. Wire sizes four inches or greater are assumed to be AWG wire sizes, and line 30 converts AWG to diameters in decimal inches. The formula in line 30 is very accurate, and you may want to file it away in your notebook for future reference.

The program, by the way, uses only 403 bytes of memory in our Casio FX-700P pocket computer. It will run, as written, on any Casio pocket computer and, with minor BASIC translations, it should work on most other computers. □

(Don't panic! Kurt N. Sterba is still alive and well, or at least, his last report to us indicated as such. He's on vacation ... somewhere. He's a cantankerous old soul and he rarely divulges details. When is he returning? Hmm. "Soon," he says.)

When looking for a clue as to why something goes wrong, never rule out sheer stupidity.

—The Yarn, Norway, ME □



DX YL to North American YL contest

Sponsored by the Young Ladies Radio League, this contest is open to all licensed women operators throughout the world.

Hours of operation: CW—1400 UTC Wednesday, April 10 to 1359 UTC Thursday, April 11. Phone—1400 UTC Wednesday, April 17 to 1359 UTC Thursday, April 18.

Procedure: DX YLs call "CQ North American YL" and North American YLs call "CQ DX YL."

Operation: All bands may be used. No cross band operation. Net contacts, repeater contacts and contacts with OMs do not count. Stations may be worked and counted once on each band and mode. Participants may work only 24 hours of the 36 hour contest. Operating breaks must be indicated in the log.

Exchange: Station worked, QSO number, RS(T) and state/province/country. Entries in log must also show time, band, date and transmitter power.

Scoring: A. Phone and CW will be scored as separate contests. Submit separate logs for each contest. B. DX YLs, including Hawaii and Alaska, may contact all the North American continent, which includes the 48 contiguous states and Canadian provinces. C. Contestants on the North American continent (including the 48 contiguous states and Canadian provinces) may contact DX YL stations, including Hawaii and Alaska. D. A station may be counted once on each band for credit and one point is earned for each station worked once on each band. E. Multiply the number of QSOs by the number of different states/provinces/countries worked. A multiplier is counted only once in the contest. F. Contestants running 100W or less on CW and 200W PEP or less on SSB at all times may multiply the results of E by 1.5 (low power multiplier).

Logs: All logs must show your state/province/country to qualify for awards. For each QSO logs must show the station worked, QSO

number given and received, RS(T) given and received, country/province/state of station worked, time, band and date. Logs must also state the power output used and the operating breaks taken. If you have 200 or more QSOs, submit a separate log for each band and submit a "dupe" sheet.

Do not send carbon copies of logs. Please print or type. Logs must be signed by the operator and no logs will be returned. Remember to file separate logs for each contest. Logs must show claimed score and must be postmarked by May 10 or they will be disqualified.

Mail logs to Vice President YLRL, Dana Tramba, NØFYQ, RRI Box 213, Peck, KS 67120.

Duplicates: For each duplicate contact that is removed from the log by the Vice President, a penalty of three additional and equal contacts will be exacted.

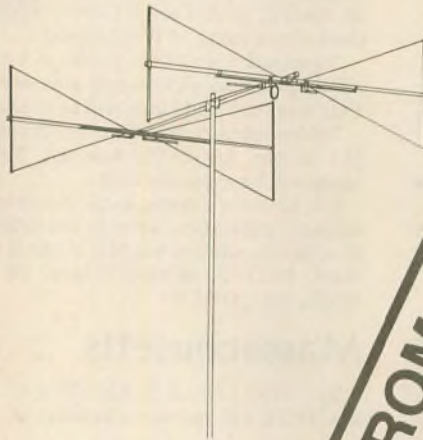
Awards: Cup to first place DX phone; cup to first place North American phone; cup to first place DX CW; cup to first place North American CW. Plaque to highest combined CW and phone North American score; plaque to highest CW and phone DX score. The second and third place DX and North American winners in each contest will receive certificates.

Suggested frequencies: CW—80M—3.540 to 3.570; 40M—7.040 to 7.070; 20M—14.040 to 14.070; 15M—21.120 to 21.150; 10M—28.180 to 28.210. SSB—80M—3.940 to 3.970; 40M—7.240 to 7.270; 20M—14.250 to 14.280; 15M—21.380 to 21.410; 10M—28.380 to 28.410 MHz.

Note: Since band allocations in other countries are often different than the United States, North American YLs should look for DX YLs in other parts of the bands, especially on 40 and 80M. □

The HF5B "Butterfly"TM

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



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

Butternut 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

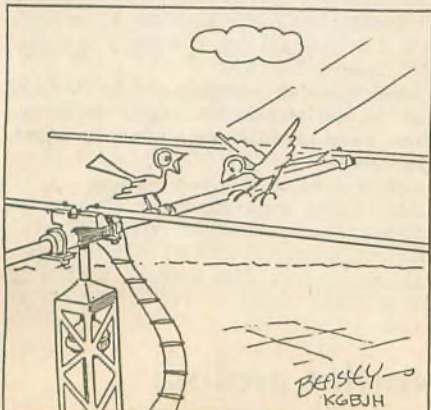
- Designed for the low-band DXer
- Automatic bandswitching on 80 and 40 meters
- Add-on units for 160 and 30 or 20 meters
- 32 feet tall - may be top loaded for additional bandwidth.

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

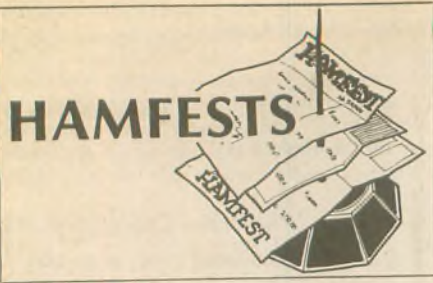
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I WOULDN'T LAND THERE --- OL' "SPARKS" IS RUNNING ABOUT A 10 TO 1 SWR TODAY!



Delaware

In association with the Delmarva Hamfest Association, the AWARE AMATEUR RADIO CLUB will sponsor the 1991 New Delmarva Hamfest on Sunday, April 14 at the Nur Temple in New Castle.

Doors will open to the public at 8 a.m. and activities will include indoor and outdoor swaptables, tailgating, VE testing, commercial exhibitors and more.

Talk-in on 147.225/825 or 224.00, 224.220 repeaters.

For swappable information and reservations, send an SASE to P.O. Box 1964, Boothwyn, PA 19061. For additional information, contact Brian Pasternak, KA3VSP, at 215/497-2124. □

Illinois

The ROCKFORD AMATEUR RADIO ASSOCIATION will sponsor their Amateur Radio and Computer Fair on Saturday, April

14 at the Forest Hills Lodge in Rockford.

Doors will be open from 8 a.m. to 3 p.m. and features will include an indoor flea market with Amateur Radio and computer deals, VE exams, refreshments, free parking and door prizes.

Tickets in advance are \$3 (they will be \$4 at the door); send an SASE to RARA, 200 Westmoreland Ave., Rockford, IL 61102. For further information call Joe Roling at 815/399-6995.

The MOULTRIE AMATEUR RADIO KLUB would like to announce the 28th annual Sullivan Hamfest on April 21.

Tickets are available in advance for \$2 each or three for \$5; at the gate they will be \$3 each or two for \$5.

There will be a limited number of tables available for reservation at \$7.50 each. Indoor space is limited.

Talk-in on 146.055/655 and 449.275/444.275.

For more information, contact Ralph Zancha, WC9V, at 502 E. State St., Lovington, IL 61937; 217/873-5287 evenings. □

Maryland

The SUMMIT AMATEUR RADIO ASSOCIATION will present their 3rd annual Carroll County Hamfest and Computer Show on April 21 at the Carroll County Agricultural Center just south of Westminster.

Doors will open to the public at 8 a.m. and admission is \$5 (XYLs and kids enter free). Full breakfast and lunch will be available.

Tables can be reserved for \$10 in advance or \$15 on the day of the hamfest. Tailgating space will be available for \$5.

For advance tickets, table reservations or further information, write to the SARA, P.O. Box 341, Randallstown, MD 21133 or call Tim West, N3DRB, 301/992-7745 or Al Parker, KS3L, 301/747-2076. □

Massachusetts

The WELLESLEY AMATEUR RADIO SOCIETY will sponsor a hamfest on April 21

from 9 a.m. to 2 p.m. at the Wellesley Senior High School parking lot.

Admission is \$2. The site will be wheelchair accessible and refreshments will be available.

Talk-in on 147.03/63 (Wellesley repeater).

For further information, contact Gerry Driscoll, NV1T, at 617/444-2686. □

Michigan

The BLOSSOMLAND AMATEUR RADIO ASSOCIATION will sponsor a hamfest on April 7 at the Berrien County Sportsman's Club in St. Joseph.

Doors will be open to the public at 8 a.m. and features will include dealers, a swap shop, test bench, refreshments and free parking.

Tables are available for \$4 in advance or \$5 at the door. Setup will begin at 6 a.m.

Talk-in on 145.47 and 146.82 repeaters.

For further information, write to the BARA, P.O. Box 175, St. Joseph, MI 49085 or call Wayne Wilson, WB8TSO, at 616/983-6406. □

Minnesota

The LAKE REGION AMATEUR RADIO CLUB will sponsor their 4th annual hamfest on April 13 from 8 a.m. to 3 p.m. at the Otter Tail County Fairgrounds Hockey Arena in Fergus Falls.

Doors will be open for early setups only on Friday at 4 p.m. Security will be provided and there will be camping spots for Friday night.

The club is featuring VE testing, Army Mars meeting, packet meeting, commercial dealers, flea market, concession stand and more.

Admission is \$4 at the door or \$3 in advance. Tables (6 ft.) are \$4.

For further information, contact Keith McKay, NØFKF, Rt. 1, Box 46, Battle Lake, MN 56515; 218/826-6274.

The ROCHESTER AMATEUR RADIO CLUB will sponsor its 14th annual Rochester Area Hamfest and Computer and Electronic Show on Saturday, April 6 at 8:30 a.m.

Last year was a complete sellout; be sure to make your table and space reservations early this year. Tables will be available for \$8 in advance or \$9 at the door. Setup will begin on Friday night, April 5, from 4:30 to 7:30.

For further information, contact John Scott, NØHZN, 2824 NW 24th St., Rochester, MN 55901; 507/285-9236. □

Missouri

The JOPLIN AMATEUR RADIO CLUB will sponsor the Joplin Hamfest '91 on April 20 at the National Guard Armory in Joplin from 7 a.m. to 3:30 p.m.

Admission is \$2 in advance or \$3 at the door. Features will include VE exams, dealer exhibits, swap meet, auction, rabbit hunt and refreshments.

Talk-in on 147.210, NAØX repeater.

Swap tables are available for \$5; send an SASE to Larry Hendrix, WBØYU, 107 Hillview, Joplin, MO 64804. For further information, contact Jim Seeten, NUØA, at 316/251-9635 (days) or 417/251-0910 (evenings). □

North Carolina

The RALEIGH AMATEUR RADIO SOCIETY will sponsor its 1991 RARSfest for

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, Phyllystran 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 Rohm 25-hvy duty alum 12 sq ft wind ld	324.95
HAZER 3 for Rohm 25-std alum 8 sq ft wind ld	232.95
HAZER 4 for Rohm 25-hvy galv stl 16 sq ft wind ld	303.95
TB-25 Ball-thrust bearing, 2 1/2" max mast dia	74.95
NEW HAZER Vw-8 Transit System for Rohm 25 22 sq ft wind load	860.00
HAZER Vw-9 Transit System for Rohm 25 22 sq ft wind load	895.00

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For further information, write:

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hams and computer enthusiasts on April 14 from 8 a.m. to 4 p.m. in the Jim Graham Building of the North Carolina State Fair Grounds.

Features will include a flea market, free parking and RV accommodation. Exams will be given at 10 a.m. in the Holzhauser Building.

Admission is \$6 at the door or \$5 with pre-registration. Tables will be available for \$9.

Talk-in on 146.64/04.

Set-up will be from 12 noon on April 13 and 6 a.m. to 8 a.m. on April 14.

For tables and pre-registration, contact Roland, NF4P, 1421 Parks Village Road, Zebulon, NC 27597; 919/269-4406. □

Ohio

The NORTH COAST AMATEUR RADIO CLUB will hold their Spring Hamfest on April 21 at the LDA of Cuyagoga County in Cleveland from 8 a.m. to 2 p.m.

Tables will be available for \$10 for the first and \$8 for each additional. Setup will begin at 6:30 a.m.

For further information, send an SASE to Ron Nichols, N8LZA, 5402 Velma Ave., Parma OH 44129 or call 216/351-7787 after 6 p.m. □

Oklahoma

The LAWTON-FORT SILL AMATEUR RADIO CLUB will hold their 44th annual hamfest on April 13 at the Lawton County Fairgrounds from 8 a.m. to 5 p.m.

No pre-registration is necessary except for table space.

Talk-in on 146.91/31.

Rides from the airport will be available.

For more information contact Bob Morford, 1415 NW 33rd, Lawton, OK 73505; 405/355-6120. □

Texas

The KEY CITY AMATEUR RADIO CLUB is celebrating its 62nd anniversary by hosting the Official West Texas Section ARRL Convention and Hamfest on April 13 and 14 at the Abilene Civic Center.

Doors will be open to the public from 8 a.m. to 5 p.m. on Saturday and from 9 a.m. to 4 p.m. on Sunday. Tickets are \$5 in advance or \$6 at the door. Tables will be available for \$2. The hamfest will feature a large indoor carpeted market area, commercial exhibits, overnight security, free electricity, wheelchair accessibility and loaders. The Quality Inn (1-800/588-0222) across the street will offer special rates for hams.

Talk-in on 146.16/76 and 147.12+ (WTC).

Send for tickets or a flyer to KCARC, P.O. Box 2722, Abilene, TX 79604 or call Bill Jones, N5DOX at 915/698-4606 for further information. □

West Virginia

The Charleston Area Hamfest and Computer Show will be held on Sunday, April 7 at the Charleston Civic Center from 9 a.m. to 3 p.m.

Admission is \$5 and features will include ladies' programs, an all indoor flea market and ample parking.

Talk-in on 147.75/15.

For computer dealer information, contact Terry Sanner, WV8V, at 304/744-8065; for Amateur dealer information, contact Doug

Sweeney, N8AJC, at 304/766-6655. For other information, contact Jimmie Hewlett, WD8MKS, at P.O. Box 8364, South Charleston, WV 25303; 304/768-1142. □

Hungarians meet at Dayton

The INTERNATIONAL HUNGARIAN AMATEUR RADIO CLUB, with membership from all continents, will meet during the Dayton Hamvention. There will be an informal dinner on Thursday, April 25 at 7:30 p.m., and there will be a formal gathering in Room 7 of the Hara Arena on Friday, April 26 at 1 p.m. All Hungarian speaking hams and anyone else interested are invited to attend.

After the formal program, participants can be found near seating sector #23 of the arena. Talk-in on 144.440 simplex.

For information on hotel accommodations, contact Andy Rado, KA8BAI, 705 Albert St., Englewood, OH 45322; 513/832-3747. For further information, contact "Laci" Radnay, W1PL, 66 Wheeler Ave., Melrose, MA 02176; 617/665-6419 or Janos Rozsa, VE3NKW, 113-4590 John St., Beamsville, Ont LOR 1B1, Canada; 416/563-5046. □

QCWA Banquet

The Dayton/Cincinnati chapter of the Quarter Century Wireless Association announces the 1991 Annual QCWA Banquet on Friday, April 26, the first evening of the Dayton Hamvention.

Neil's Heritage has an outstanding meal for us. C.O.D. bar is at 6:30, and the banquet starts at 7:30 p.m. The speaker will be Robert G. Heil, K9EID.

Tickets are \$15 each, reservations required. Come join the fun. QCWA membership is not required to attend.

For tickets or information contact Bob Dingle, KA4LAU, 657 Dell Ridge Drive, Dayton, OH 45429; 513/299-7114. □

The power of the printed word

Because of several articles that have recently appeared in *Worldradio* describing youngsters who are doing exciting things in ham radio, I have been able to contact them and invite them to participate in my Youth Forum at Dayton this year; I am inviting hams to bring non-ham children to the forum on Saturday, April 27 so that they may hear *youngsters* giving presentations about the fun of ham radio. Come and join us! — Carole Perry, WB2MGP □



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Model P-410X (for 115-v AC) or Model P-412-X (for 12-v DC) \$164.95. Model P-408 (SWL receive only for 115-v AC) \$139.95.

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Information in "New Products" is supplied by the manufacturers to acquaint *Worldradio* readers with new products on the market.

Address correction

The February issue's new product notice for EPO Software listed the mailing address street as NE 47th Ave. The correct street is NE 147th Ave. □

Audio filter

The MagicNotch filter is an automatic audio notch filter designed to instantly remove heterodyne QRM from SSB reception. It effectively reduces interference caused by negligent operators tuning on or near the frequency, CW signals, and other carriers. The MagicNotch filter is also very useful in reducing the effects of computer generated RFI.

No tuning of the filter is required. When interference of a constant frequency is detected by the control circuitry, the internal switched capacitor active filter (SCAF) is automatically tuned to that frequency, effectively reducing the interference by up to 40 dB. The filter will continue to track any variation in the frequency of the interference until it disappears. The width of the notch is extremely narrow so there is no noticeable degradation in the quality of normal speech signals. The filter activates in less than one second. In many cases, the operator may not even be aware that a carrier has appeared. Operation of the filter is indicated by a two color LED which turns red when an interfering signal is locked in.



No modifications to existing equipment are necessary. The filter operates on the audio output from the receiver as obtained from the external speaker output. The built-in 2W amplifier is sufficient to drive any 8 ohm speaker. The filter is powered by 10-14 volts DC, which is usually obtained from the ac-

cessory connector of the rig. The compact 5½×3×1½ inch unit is housed in an attractive grey and blue aluminum enclosure.

A recorded demonstration of the unit's performance can be heard via telephone at 408/336-3503. MagicNotch may be ordered directly from JCom, P.O. Box 194, Ben Lomond, CA 95005-0194; 408/336-3503, at the introductory price of \$99.95 plus \$5 shipping and handling or from your nearest dealer of quality Amateur Radio products. □

Frequency counter

The radio-frequency finder/counter model 1500A from Startek International Inc. is a new, compact 1-1500 MHz counter that will fit in a shirt pocket and operate from 110VAC, 12VDC or internal rechargeable NiCd batteries for up to five hours of continuous operation. A red eight digit LED display is readable from 15 feet or more. A TCXO time base provides accuracy of +/- 1PPM. The unit has two overlapping ranges: 1 to 500 MHz and 200 to 1500 MHz. Two "gate" or "sample times" are switch selectable, a fast gate time of .25 seconds yields a 1 kHz resolution and a slow gate time of 2.5 seconds yields a 100 Hz resolution. The unit can be operated and charged simultaneously with a 9-12 VDC, AC adaptor. The input signal is coupled via a BNC connector on the top. Various probes and antennas can be utilized to optimize performance for specific uses and frequency ranges. The 1500A is housed in a rugged, attractive anodized aluminum case measuring approximately 3.4×3.8×1 inches and weighing less than nine ounces with the internal batteries installed.

Small enough to fit in a shirt pocket, the 1500A can actually out-perform many instruments costing much more. The excellent sensitivity of the unit makes it ideal for use with the telescoping RF pick-up antenna to accurately and easily identify and measure transmit frequencies from hand-held, mobile or fixed radio transmitters. The 1500A is the



most reliable and cost effective instrument of its type currently available.

The 1500A was designed and is assembled in Ft. Lauderdale, Florida and sold with a full year parts and labor limited warranty. For further information, call 800/638-8050, 305/561-2211 or FAX: 305/561-9133. □

SCAF filter

Palomar Engineers announces the release of a new audio filter, Model PF-300. It uses the new switched-capacitor audio-filter technique to give excellent skirt selectivity, typically twice as sharp as the IF Filters in transceivers.

For AM and SSB reception it features a 16th order low pass filter with cutoff frequency variable from 3000 Hz down to 300 Hz. There is also a 600 Hz highpass filter to eliminate hum and rumble.

For CW reception PF-300 has a 16th order bandpass filter with three bandwidths: 250 Hz, 100 Hz and 45 Hz. The filter frequency is variable from 300 to 3000 Hz.



The filter connects between the speaker or headphone output of the receiver and a speaker. Audio output is up to 5W. The PF-300 is priced at \$139.95. To order or for further information, contact Palomar Engineers, P.O. Box 455, Escondido, CA 92033; 619/747-3343; FAX 619/747-3346. □

SWR Analyzer

MFJ's innovative new MFJ-207 HF SWR Analyzer instantly gives you a complete picture of your antenna SWR over an entire band — without a transmitter, SWR meter or any other equipment. All you do is plug your

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antenna into the coax connector, set your MFJ-207 HF SWR Analyzer to the frequency you want and read your SWR. It makes setting up and trimming your antenna precise and easy.



You can take your battery operated handheld MFJ SWR Analyzer right to your antenna and measure the SWR of your antenna directly. It lets you eliminate the distorting effects of the coax. You can monitor SWR changes as you make adjustments to your beam or vertical — you'll know right away which way to adjust it. You can shorten or lengthen your dipole and see the effect immediately, and you can instantly check multi-band dipoles and trap verticals to see if the low SWR points are where you want them and then adjust your antenna until they are right.

You'll find the perfect adjustment for your mobile whip in seconds by actually seeing the SWR as you pull the whip in and out without transmitting. You can easily find the ideal place on your car for your mobile antenna by checking different spots with the MFJ HF SWR Analyzer. You can see how the SWR varies over your entire band and quickly find your usable 2:1 SWR bandwidth. You can see

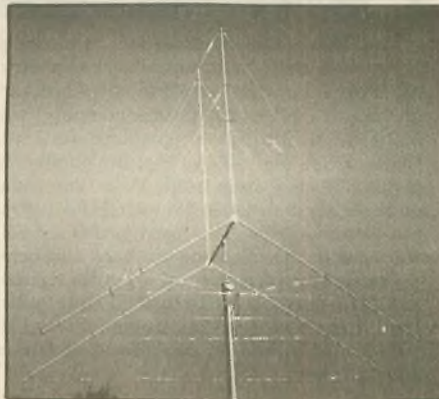
your SWR change as you drive under an overpass and see how mobile whip flutter affects SWR.

You can see what happens to your SWR as you swing your beam toward the power line or away from your tower. You can see how rain or snow affects your beam or dipole, you can tune up your antenna tuner without transmitting and you can check the SWR of the input to your linear amplifier. □

Delta loop

Lightning Bolt Antennas introduces a new delta loop type antenna to its line of products.

The 32MCD is a tri-band antenna made of filament wound fiberglass and aluminum for solid construction. The antenna comes complete with stainless steel hardware, aluminum spiders, wire, boom and boom bracket. It can be fed with a single coax feedline with an optional 2:1 transformer, or each band can be fed separately with a quarter wave stub of 75 ohm coax.



The main feature of this antenna is the upside-down "Y" construction which allows for less wind load or area for ice to form. The 32MCD sells for \$235 with \$25 extra for optional 2:1 transformer.

For additional information on this and all other products please contact Lightning Bolt Antennas, Rd. #2 Rt. 19, Volant, PA 16156; 412/530-7396. □

Phone order QSL cards

Chester QSL Cards, the nation's foremost QSL card printer, now offers you the ability to order QSL cards on-line using their new Bulletin Board System. You may also monitor your order and obtain current information regarding shipping dates. By using the BBS, you can save \$5 on your order to help offset the cost of your call. You can also request their free samples and order form packets.

Other options on the BBS include a message center and the ability to upload and download files.

By using one of several popular terminals or terminal emulations, you may use the BBS's Windows mode which takes advantage of cursor control codes. The only terminal requirement is the ability to display 80 columns and 24 lines.

You may access the Bulletin Board from 6 p.m. to 8 a.m. Monday through Friday, and 24 hours Saturday and Sunday, CST. Phone: 316/342-8818. 300, 1200, 2400 Baud. 8 bits, no parity, 1 start, 1 stop. □

IBM compatible software

MFJ Enterprises, Inc. announces the release of the new MFJ-1289 MultiCom™ software for only \$59.95. This "load and use" MFJ-1278 software requires no set up. It lets you transmit and receive multi-gray level weather fax maps, multi-gray level SSTV pictures and multi-gray level AP news photos.

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The MFJ Packet Multi-Plex™ lets you send and receive packet messages during a binary file transfer. You can exchange programs without your QSO being completely cut off.

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The MFJ MultiCom™ also lets you integrate the optional MFJ-1292 "Picture Per-

fect" Video Digitizer so you can shoot and transmit a video picture by SSTV, FAX or Packet — all in one smooth sequence. You also get menu control of your entire disk, disk utilities for graphics screen capture and conversion to packet picture format, disk of sample pictures, effective packet through-put readout, screen colors set, sound on/off switch, RS-232 cable, complete instructions and much more.



The MFJ-1289 MultiCom™ requires an MFJ-1278 with multi-gray level modem or other MFJ TNC (features limited by TNC) and an IBM XT/AT or compatible computer with 512K RAM. MultiCom™ graphics work with CGA, EGA and VGA. Picture quality depends on the system used. MFJ-1289 comes on three 5¼ inch disks; 3½ inch (MFJ-1289M) are also available. This copy protected software can be installed on your hard disk drive.

For more information or to order, contact any MFJ dealer or write to MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762; 601/323-5869, or order toll free at 800/647-1800. □

Balun systems

Electronic Specialists expands their Network Protection product line to include balun systems for twisted pair network installations.



BAL-Net installs directly on equipment to be protected and includes the coaxial-twisted pair conversion system together with spike, surge and interference control elements. Common and differential mode suppression is incorporated for maximum protection. Optional RFI interference suppression is available. Units feature quick installation.

BAL-Net is available with BNC, Twin-axial, "N" or TNC coaxial connectors.

Priced from \$75, BAL-Net is available from stock to four weeks from Electronic Specialists, Inc., 171 So. Main St., Natick, Massachusetts 01760; 800/225-4876. □

Reactor

This little "new product announcement" has filtered its way down from a number of sources, notably W6AAQ. It's for a Standby and Field Day Power Source.

Luminescent Electronic Products, Inc., P.O. Box U-235, Trinity Site, New Mexico, offers a self-contained nuclear reactor for communications applications. The reactor will provide power for as long as 12 years. Output is rated at 20 kW, decreasing to 15 kW after 12 years.

To protect users from undue radiation, each reactor comes complete with a shielding kit, comprised of five self-stick lead plates and twenty radiation-monitor film badges. The lead plates attach to the external structure of the reactor. For additional safety, the manufacturer offers an optional 1000 ft.-long extension cord.

The reactor glows in the dark, making it particularly easy to find on dark nights at remote communications and Field Day sites. Each reactor package includes a standard 23 volume site evacuation plan. The plan includes a blank Nuclear Regulatory Commission application. Reactor prices start at 2.3 million. Please allow seven years delivery from receipt of order. License tags and taxes not included. Void where prohibited by law. — Nevada County ARC Gold Country Nuggets, January 1991. □



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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 three months in advance. For example, if your VE group is scheduling an exam for September, please have the information to us by mid June.

Worldradio, 2120 28th St., Sacramento, CA 95818.

Please mark the envelope "VE Exams."

List the location, any 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				Massachusetts			
May 4	Tucson	K7OPX (602) 886-7217	w/i only	May 6	Boston	WN1U (617) 436-2413	w/i
Arkansas				May 22	Cambridge	KA1MQX (617) 253-3776	w/i
May 11	Little Rock	Dora (501) 753-2207	w/i	May 18	Melrose	WB1F (617) 322-7654	w/i
	Russellville	Ben (501) 964-6885	w/i	Mississippi			
California				May 14	Ocean Springs	AA5SP (601) 875-9341;	p/r pref;
May 4	Burbank	KE6AR (818) 349-0927	w/i			AA5TX (601) 875-2142	w/i OK
May 25	Fairfield	Jerry (916) 662-0801	w/i only	Missouri			
May 16	Fountain Valley	KI6WK (714) 846-6984	p/r	Apr 20	Joplin	KB6LO (417) 623-6170	p/r
May 4	Fresno	Kelsey (209) 855-8558	w/i only	Nebraska			
May 25	Hawthorne	WS6T (213) 600-4160	p/r	May 28	Omaha	AJ0A	w/i
May 11	Hesperia	NF6I (619) 241-4732;		Nevada			
		K6BET (619) 244-6080	w/i OK	May 11	Reno	WS2Z (702) 826-6028	p/r; w/i
May 30	Long Beach	KA6HOQ (714) 897-6331	w/i OK	New Jersey			
May 19	Porterville	Pat (209) 539-2429	w/i	May 18	Bayonne	WA2QYX (201) 451-9471	w/i OK
May 11	Redding	NT6E (916) 253-REVA	w/i	May 16	Bellmawr	WA2VQG (609) 546-7710	w/i
May 18	Redwood City	Dudley (408) 245-4801	w/i only	May 11	Cranford	W2XJ (201) 635-7686	
May 8	Sacramento	Lyle, AA6DJ (916) 483-3293	Novice/Tech only; w/i	May 8	Fort Monmouth	WB2GYS (908) 532-5353	w/i
				May 6	Sayreville	K2FD (201) 442-9215	w/i
May 18	San Diego	KB6WB		New York			
May 4	San Dimas	K6THQ (714) 596-9383	p/r 1 week prior	May 10	Albion	WA2QDV (716) 798-0976	p/r pref.;
							w/i OK
May 18	San Dimas	K6THQ (714) 596-9383	p/r 1 week prior	May 26	North Babylon	KA2RGI (516) 957-0218	w/i OK
May 11	San Pedro	N6DYZ (213) 325-2965	w/i OK	North Carolina			
May 11	Santa Barbara	KB5AH (805) 682-2665	w/i	May 11	Yadkinville	N4XRY (919) 699-8469	w/i
May 18	Signal Hill	NN6Q (213) 420-9480	p/r pref; w/i	Ohio			
May 18	Turlock	W5XK (209) 883-2968	Novice/Tech only; w/i OK	May 25	Canton	WB8UVN (216) 453-5896	
Colorado				May 5	Marion	WS8S (614) 499-3565	
May 13	Boulder	N0BWS (303) 530-2903	p/r pref.; w/i OK	May 8	Middletown	K8NHE (513) 422-9384	
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When to disconnect

A. Watch the sky during a thunderstorm. The second you see the lightning, start counting off the seconds until you hear the clap of thunder.

B. If you have counted up to five

seconds, the center of the storm is one mile away. If you reach 30 seconds, the lightning is six miles away.

C. By counting periodically you will be able to tell whether the storm is com-

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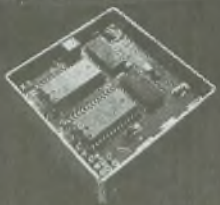
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