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Legal Forum

Norm Brooks, K6FO

I was impressed. I was impressed with the tremendous amount of legal talent sitting at the head table at the Legal Forum of the ARRL Southwestern Division Convention at Scottsdale, Arizona, October 11. And as I listened to their report on "Hams and Antenna Ordinances," I realized that these attorneys, all hams, plus many others of course, were getting things done in the fight against anti-antenna ordinances.

Chris Imlay, N3AKD, Legal Counsel for ARRL is a practicing attorney in Washington, D.C. He introduced the other attorneys in the panel (see photo caption). He brought us all up to date on PRB-1.

PRB-1

PRB-1 (from Private Radio Bureau #1) is the FCC preemption order. Such orders have the authority of federal statute. Even though it does not challenge local authorities' right to designate land use, local municipalities consider it scary when the feds take away any part of their authority.

PRB-1 says three things:

1) Local authorities cannot prohibit Amateur Radio antennas. They must permit Amateur Radio operation in their jurisdictions.

2) Any esthetic requirements, such as screening, must reasonably accommodate Amateur Radio communications. They must allow the amateur to be able to communicate.

3) Any restrictions established by the local jurisdiction must be the minimum to accomplish the municipality's purpose.

This means they can require the planting of trees around the base of your antenna; they can require anti-climbing safety devices; they can require that a tower you put up be a crank-up tower. But they've got to let you have an antenna that's functional, and that's where the cases come in. Usually the question for interpretation is: How high must the antenna be?

(please turn to page 6)



This library display is traveling to different cities, spreading the word about Amateur Radio and hurricane preparedness. The display was set up by Fred "Al" Wasielewski, WA2VJL, and his two sons — Fred, KA5UVY, and Miguel. (Photo by Charles M. Robinson III, San Benito News)

Colvins now DXing in Nepal

We concluded our Yasme DXpedition to Mexico, using the call XE1GKG, on December 1, 1987. We had 8,000 QSO's with amateurs in 122 countries. We were in both of the CQ WW DX contests on phone and CW. We made about 1,500 contacts in each portion of the contest and operated on all major amateur bands, from 10 through 160M.

We were the center of two major 6.2-strength earthquakes. It was scary but the only damage to the motel in which we stayed was that many items fell off shelves. Fortunately, none of our radio equipment was damaged.

We had great difficulty communicating with the local people because most of them spoke only Spanish. One exception is Francisco, XE2CN, and his family. They helped

us in many ways, and we really needed and appreciated that help.

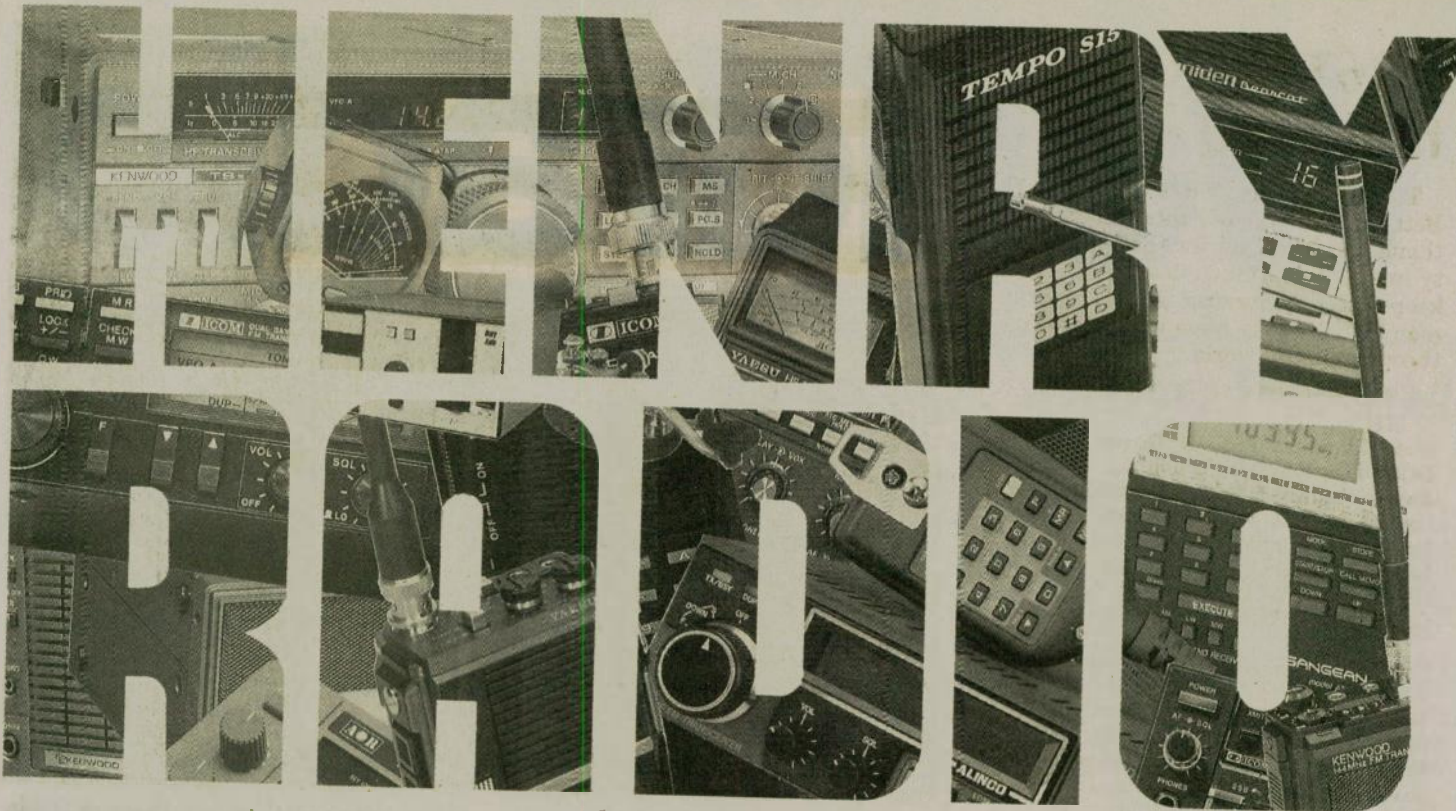
We are very pleased to announce that our next operation will be from the Kingdom of Nepal. We have permission to operate there in honor of the king's birthday, which is December 29, 1987. Look for us from there from Christmas on.

LLOYD COLVIN, W6KQ
IRIS COLVIN, W6QL

A/O-10 is back

Restoration of AMSAT/OSCAR-10 Mode B operation was anticipated to take place around December 1, 1987. The satellite had been in "hibernation" due to power availability falling below required levels.

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Tom Christian, VR6TC, and wife Betty, VR6YL, of Pitcairn Island thank the following for their generosity in supplying much-needed funds to keep their generator going for the many QSO's they have with amateurs throughout the world.

- Bill Bennett, N3DLH, Ft. Washington, MD
- Bud Hammons, K6EDN, Downey, CA
- Dale Diehl, K5WUF, Oklahoma City, OK
- Joseph Krentz, W6HCX, Paramount, CA
- Corwin Roberts, W16L, Albany, CA
- Dr. Patrick Sonnier, Lafayette, LA
- Leonard Mendel, K5OVC, Percy, AR
- Gordy Clark, W4PTH, Dublin, GA
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- Clarence Campbell, Jr., AA4UM, Madison Heights, VA
- Dick Mercer, WB6OTB, San Jose, CA
- Jim Hubbell, N5COP, Whitesboro, TX
- Manfred Eitenberger, OE3EMN, Austria



For the third consecutive year, the Fellowship ARC of southern Florida visited three hospitals in Miami this past Christmas, giving needy and disadvantaged children a chance to talk to Santa Claus at the North Pole via Amateur Radio. Toys donated by club members were distributed, and a good time was had by all. (Photo by Lou Dorfmeister, KBAARD)

A Guide to Pitcairn, a 70-page book about the history and daily life of Pitcairn's inhabitants, is available for a limited time from Dr. Charles M. Moser, W6HS, 10861 Langdon Ave., Mission Hills, CA 91345. All 20 books have been autographed by Tom Christian, making them true collector's

items. Cost of the book is \$5 postpaid. Pitcairn postage stamps are available for one-third of the catalog price. (Dr. Moser will be cruising from early January to mid-February, with Pitcairn as one of his last stops.)

●●●●●

*If at first you do succeed — try to
hide your astonishment.*

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PUBLISHER'S MICROPHONE

First, we'd like to give due recognition to the latest Worldradio Super-Boosters (Lifetime Subscribers): James Faris, N6MJB, of Lancaster, California; Ray Baldwin, WB7OHF, of Tucson, Arizona; and Charles Ward, NC0A, of Canon City, Colorado.

By such recognition, fellow members of the radio club will know they are sitting next to a class act. In this case, it should be called world-class.

You may have read his editorials or heard the speeches at conventions. The Sage of New Hampshire advocates code-free licenses, saying they have them in Japan, and that is why Japan is ahead of the USA in electronics.

It would be nice if things were as simple as that. From such logic we could imagine that there is a Cracker-jack box driver's license in Japan, and the great Honda automobile is due to 12-year-olds behind the wheel.

Now to the real world. Japan has NO capital gains tax! That alone makes the playing field quite uneven. With only that advantage, they would have to be asleep at the switch not to be able to defeat an adversary with

one hand tied behind their backs.

Also, in contrast to the USA, banks in Japan can own businesses and businesses can own banks. When Sumitomo Steel want financing, they go to Sumitomo Bank and get it — at 3%. When a new employee goes to work for a Japanese corporation, he or she is handed the manual which says, "Read books that are relevant to your work for an hour every day at home."

Can you imagine what would happen if any company here tried that? "That doesn't fit my lifestyle," or "That's not on my list of priorities."

An Australian (who was a POW in WWII) has written a book about business in Japan. He interviewed the chiefs at the major corporations, who were very candid. They used the word "Bushida" which means "Warrior."

Yes, it's pretty hard to compete with those who take business *THAT* seriously.

There was no Amateur Radio at all in Viet-Nam. The schoolrooms were not air-conditioned. No teacher's aides or much of anything else. Chalk was a big deal. The schools were mortared and the teachers were prime assassination targets of the Viet-Cong. However, when all the little Nguyens came to the USA, their math ability

put them two grades ahead of American kids the same age!

There are many reasons why the Yanks are getting creamed, but having a 5 wpm code test isn't one of them!

Letter from Vern Hansen, KD6UI, who said Worldradio "is the best Amateur Radio publication." We do like getting letters from people with good taste.

Howard Clements, W0USE, said he hadn't been on the air since January, 1985, but Worldradio got him interested again.

If you know someone who says, "I'm too old to learn new things," tell them about Henry Howell, KA2YVR, who got his Novice at 84 and his General at 85.

John Sturek, K6OZV (W9JCK prior to WWII), has been "Elmer" for 59 people ranging in age from 10 to 83. He likes our diversified coverage and says Worldradio has helped him locate some of his ham friends from the distant past.

Our plea for readers to send in photos of newsworthy happenings in their home area resulted in a letter in which the point was made that many buy a camera but seem overwhelmed by the complexity of it all, and that maybe we should have photography lessons in the magazine.

OK, here's the easy guide. If you are outside and the sun is behind you, light falling on the subject and it's a bright day, set the lens at F/16 and set the time at the film speed. If you are using ASA 200 film, go at 1/250; if you are using ASA 400 film, go at 1/500. Then send your pix to us. We don't care if you send them to other mags also. See who prints them first!

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— ARMOND, N6WR

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Legal Forum

(continued from page 1)

Two cases

The first case that interpreted PRB-1 was in Lakeside Park, Kentucky. The municipality wasn't going to give the amateur a permit for any tower at all. The U.S. District Judge, before PRB-1, said, "You don't get a tower." The Court of Appeals said, "Yes you do. We're overturning that District Court decision. We're sending it back for action consistent with the PRB-1 preemption." The end result was that the amateur can have a 78' antenna, and he was awarded \$13,800 in attorney's fees. That amount represented the fees from the effective date of the PRB-1 order, forward.

The second case to interpret PRB-1, of national importance, was in Sands Point, Long Island, New York. While the amateur was pouring concrete for the base of an 85' tower, the city issued a restraining order. The city's height limitation was 25 feet. The amateur sued the city, citing PRB-1. The U.S. District Court for Eastern New York issued a partial summary decision, saying that the 25' height limitation was not reasonable and was therefore unlawful.

The judge said that an absolute limitation of height affects the amateur's right to the full use of his amateur license. Further, the municipality failed to prove that an antenna higher than 25 feet would endanger the safety, health or welfare of the community.

Don't cheat

Rod Stafford, KB6ZV, told of two cases in the Pacific Division. In the first, the amateur was issued a permit to erect a 50' tower and antenna. Once he had his permit, he bought a 70' tower and put it up. His sketch of details of the installation, which em-



Left to right: Wayne Overbeck, N6NB, Vice Director, Southwestern Division; Neil Wake, KV7O, and Joel Kirschbaum, KB6FF—both attorneys in Phoenix area; Chris Imlay, N3AKD, Legal Counsel for ARRL; Marshall Quiat, AG0X, Director, Rocky Mountain Division; and Rod Stafford, KB6ZV, Director, Pacific Division.

phasized the concrete base, showed the antenna in a distorted manner so that it looked like the antenna had elements only 4' long. The city is now suing him in a local court, which is adverse to us. It is better to fight antenna cases in a federal court. Federal judges are appointed for life, and are thus less susceptible to local influences.

Don't shoot yourself in the foot

An amateur applied for a permit to put up a tower higher than the city's ordinance. The local planning commission, based on the material presented to them, approved the tower. Then, before the city council, the amateur berated them for requiring so much detail. As a result, the council denied the permit. In this case, the amateur could have walked away happy if he

had not shot himself in the foot.

Rod's advice is to get an attorney knowledgeable to land matters early in the case. He may find that there are more options open to you.

PRB-1 works

Marshall Quiat, AG0X, advises that your attorney get the legal kit from ARRL, which tells how to use PRB-1.

In a case in Lakewood, Colorado, PRB-1 made the city stop limiting the height of towers to the same height as buildings.

Boulder, Colorado ordinances said there were no limitations on the height of antennas, but that towers (that support them) are limited to 35 feet. In a current case, expert witnesses were used to establish the fact that to do what the amateurs want to do, the

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towers must be at least 70 feet in height. There were no experts on the other side to rebut this. We expect to win this case, because of the expert testimony.

Safety

The other side will argue that a 100' tower must be 100 feet from the lot line. This can be offset by quoting the Ganner Olsen reports. These studies show that properly guyed towers that collapse, fall straight down within 21% of the height of the tower. Guyed towers do not fall like cut trees.

Real estate values

They will argue that real estate values deteriorate on property next to the tower. Ask their real estate person for specific cases where property was devalued, and you will find that they cannot come up with any.

Case preparation

Marshall's advice is to hire a knowledgeable lawyer at the first level and establish a good court record, using expert witnesses, because an appeals court works only from the record. Most lost cases are because of poor case preparation. At this point, we can't stand to have losers. We don't want to weaken PRB-1.

Deed restrictions

Wayne Overbeck, N6NB, has been making a systematic study of deed restrictions. He found that in Los Angeles County, every new development prohibited antennas. In Wayne's study he found that was also true in other places: D.C., Arizona, San Francisco Bay area and the Dallas-Ft. Worth area.

Today it is not easy to put up an antenna. Everyone believes large antennas cause RFI and small ones don't. Neighbors are increasingly having veto power over what you can do with your land. It is expensive to fight any kind of legal battle over land use matters.

When you buy property and sign a deed with restrictions in it, you agree to live by the rules. New restrictions are well written, from a legal standpoint, and are difficult to crack. New restrictions even include the provision that the association can put a lien on your property to pay their lawyers' fees — and you signed that!

Neil Wake, KV7O, agreed with Wayne's remarks about restrictive covenants. He said you can't buy a new house with such covenants. It must be some kind of malpractice for a builder to offer a new house without a restrictive antenna covenant, he mused.

There are two kinds of antenna

problems, he went on. "One — paper-work — you can handle yourself. The other is where you must appeal to someone's discretion. That's when you need an attorney, because you have to talk the local bureaucrats into something."

The cheapest thing any attorney is going to do for you is give you advice. When you talk to the attorney, ask what it's going to cost in the first interview. Then ask yourself, "Is the problem worth solving?" To the average ham, it wouldn't make sense to. "God help you if you become the test case!"

Joel Kirschbaum, KB7FF, added that there is another way around restrictive covenants: make friends with your neighbors before you dig the hole. Even though the restrictions are against you, your barbecue buddy is not likely to bring action against you.

In fighting antenna restrictions, you must show that Amateur Radio antennas are a normal accessory to the use of real property, such as tennis courts, barbecue pits, swimming pools and the like.

Norm Brooks, K6FO

I had been looking forward to this bus ride for months. That was ever since it was announced that a trip to Senator Goldwater's amateur station would be a featured part of the Southwestern Division ARRL Convention on October 10. I remembered reading that as Air Force MARS station AFC6BG, this station had handled over 200,000 phone patches and almost 100,000 written (teletype) messages for U.S. service personnel and their families. I wanted to see just what W7UGA now looked like.

The buses ran every hour, and

Q & A

In the question and answer session that followed, the following were brought out:

After a tower and antenna have been up for six months, the neighbors don't even notice it any more.

An Amateur Radio operator is a fellow who, when you're giving away \$5 bills, will shop around for a better deal.

In a court case, use the ARRL's videotape "At Any Moment" to dynamically show the importance of Amateur Radio.

If a legal battle is going to be an expensive one, maybe it would be cheaper to sell the house and go somewhere else.

Remember, only 50% of the lawyers trying cases win. The other 50% lose.

In a local Arizona case, Alan Unangst, WC7R, is blazing the trail. He signed a restrictive deed before he became a ham. We hope he wins this one. □

Check your license expiration date.

Goldwater station tour

tickets for the ride were available only for specific hours. This was to control the crowd, as the only way to see the station was via the bus. No personal cars permitted.

Our 2 p.m. bus had about 30 people aboard. It made its way out Scottsdale Boulevard — a sort of "motel row" in Scottsdale. Soon we were in the residential neighborhood. Many fine homes were in planned communities behind adobe walls. There were a lot of low, flat roofs topped with gravel. Some even had sprinklers going on the roofs, as a form of cool-
(please turn to page 14)

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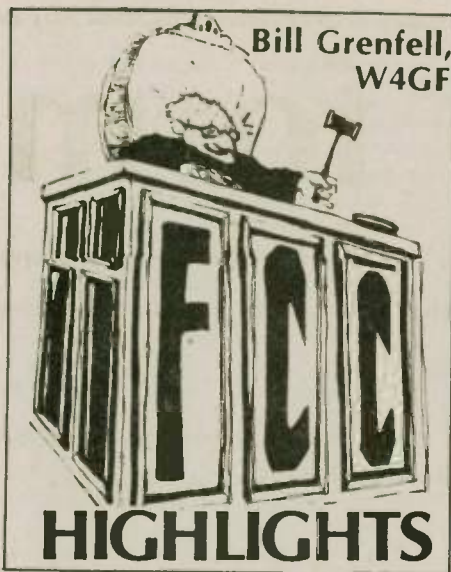
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The FCC has removed its October 5, 1987 cancellation of accreditation of Region 12 volunteer examiners (VE's). The interruption in the Caribbean area testing lasted about two weeks. FCC is reported to have advised the pertinent VEC's of nine individuals not eligible for reappointment. The cancellation action was reported in last month's **HIGHLIGHTS**. Also, a petition was reported filed on November 23, asking that only individuals whose accreditation remains revoked be prohibited from VE program participation. (*W5YI Report*, 12/01/87)

Included in FCC's 10/05/87 Docket 86-161, action dismissing several petitions regarding Novice operator privileges was amendment of Rule Section 87.61 as follows:

The line entry in the table in Section 97.61(a) which shows frequency band 28000-29700 kHz and emission A1A is removed. Section 97.61(d)(3) is revised to read "A station with a Novice or Technician control operator is authorized to transmit only emissions A1A and J3E in frequency subband 28300-28500 kHz."

As reported in last month's **HIGHLIGHTS**, the basic purpose (and result) of Docket 86-161 was expansion of Novice operator privileges.

One "instant Novice" possibility being considered by the FCC is allowing new operators to use their volunteer

examiner's call sign! (with an identifying suffix). FCC has not indicated its disposition of the petition, RM5924, for which the comment period ended June 20, 1987. The chief of FCC's Special Services Division is reported to have said "The real option is whether to do it or not." (*W5YI Report*, 11/15/87)

Comments filed on petitions RM 6094 and RM6095 by the ARRL suggest further informal investigation and possible alternate solutions would be appropriate prior to a formal rule-making. The petitions include a request that the code test message not be required to contain every one of the required characters.

The League said that it was "not desirable to create a situation in which an examiner can, in accordance with the rules, prepare an examination which includes only a few of the letters, characters, punctuation and prosigns, thus creating an examination which an unprepared person can easily pass..." (*ARRL Letter*, 11/19/87)

A Pineola, North Carolina amateur's petition to reduce the five amateur operator license classes to two was denied and dismissed. The FCC said it had considered restructuring before and that no new issues were raised (by this petition). (*W5YI Report*, 11/15/87)

FCC's San Juan, Puerto Rico office has fined an amateur's father \$1,000 for operating his son's amateur station without a license. The father was

using his son's call sign. His own amateur license was revoked several years ago. (*W5YI Report*, 11/15/87)

Written examinations are sufficient to insure potential operators will operate within the rules, writes an Extra Class amateur licensee who has petitioned FCC to eliminate the code test requirement for the Novice and Technician licenses (filed October 22, 1987). (*W5YI Report*, 12/01/87)

Regarding the Docket 87-14 proposal to allocate the 220-222 MHz of the amateur 220-225 MHz band to the land mobile services, FCC Commissioner James Quello advises: "... As I have stated on numerous occasions, the land mobile community has failed to demonstrate a need for additional spectrum. Indeed the Commission is currently evaluating comments on the need for additional sharing. In my opinion, the issue of 'need,' in and of itself, justifies a cautious approach to further land mobile sharing."

The denial of two Boulder County, Colorado amateurs' applications to erect 125' towers has caused filing suits in both federal and state courts seeking to overturn the decision. Despite citation of FCC's PRB-1, the public service activities of local amateurs, and other arguments, the county found that amateur antennas should be limited to 35 feet, and that PRB-1 did not apply.

Adopted September 16, 1985, (*please turn to page 10*)

Amateur Radio call signs

Amateur Radio operators often ask the FCC what call signs have been assigned lately. This list shows the last call sign in each group to be assigned for each district, as of December 1, 1987.

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

| Radio District | Group A Am. Extra | Group B Advanced | Group C Tech./Gen. | Group D Novice |
|---------------------|----------------------|---------------------|-----------------------|-------------------|
| 0 | WD0D | KE0RU | N0IRR | KB0BKL |
| 1 | NN1Y | KC1HD | N1FIM | KA1RFI |
| 2 | WC2A | KE2DI | N2HSP | KB2EOL |
| 3 | NM3I | KD3FM | N3FWN | KA3SIM |
| 4 | AB4EU | KK4TT | N4ROU | KC4CJN |
| 5 | AA5DU | KG5FT | N5LTK | KB5ETD |
| 6 | AA6FP | KJ6BI | N6QXU | KB6UVZ |
| 7 | WI7A | KF7FH | N7KDE | KB7DFM |
| 8 | NZ8K | KE8OU | N8IYQ | KB8DJJ |
| 9 | NV9Q | KE9HG | N9HAR | KA9ZQD |
| N. Mariana Is. | AH0E | AH0AD | KH0AJ | WH0AAH |
| Guam | KH2G | AH2BU | KH2DD | WH2ALG |
| Johnston Is. | AH3A | AH3AC | KH3AB | WH3AAC |
| Midway Is. | | AH4AA | KH4AD | WH4AAF |
| Palmyra, Jarvis Is. | AH5A | | | |
| Hawaii | | AH6IP | | WH6BVM |
| Kure Is. | | | NH6NZ | |
| American Samoa | AH8C | AH8AD | KH7AA | WH8AAW |
| Wake Wilkes Peale | | AH9AC | KH8AE | WH9AAH |
| Alaska | | AL7JK | KH9AD | WL7BPX |
| Virgin Is. | KP2T | KP2BK | NL7LQ | WP2AFU |
| Puerto Rico | | KP4ON | NP2CG | WP4AFU |
| | | | WP4NA | WP4HSC |



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

FCC Highlights

(continued from page 8)

PRB-1 is FCC's Memorandum Opinion and Order "in the Matter of Federal preemption of state and local regulations pertaining to Amateur Radio facilities." (ARRL Letter, 11/04/87)

James Fisher, K4GF, has petitioned the FCC for appropriate amendment of the rules to limit bulletin transmissions of an amateur station to not more than 10 minutes each 24-hour day.

Howard McKeathian, N6ELL, has petitioned the FCC to provide Technician Class operators with all high frequency band privileges, on the basis of a need for more experienced operators.

Michael Fitch, FCC's Private Radio Bureau Chief, has been appointed Senior Legal Advisor to FCC Chairman Dennis Patrick. The Bureau's Acting Chief is Ralph Haller, N4RH.

President Reagan has nominated Bradley Holmes to be an FCC Commissioner. He is Chief of the Policy and Rules Division of the Commission's Mass Media Bureau.

Effective immediately, the new address of the FCC Norfolk, Virginia Field Office is: Communications Circle, Virginia Beach, VA 23455.

END-OF-MONTH LICENSE TOTALS

| September | 1987 | October |
|-----------|------------|---------|
| 43,214 | Extra | 43,479 |
| 98,147 | Advanced | 98,287 |
| 114,428 | General | 114,497 |
| 91,633 | Technician | 92,267 |
| 82,779 | Novice | 82,216 |
| 430,201 | Totals | 430,746 |

Special Events...

U.S. Constitution

The Kaw Valley ARC will operate W0CET/200 from 0001Z, January 30 to 2400Z, February 6, to commemorate the U.S. Constitution. From 1600Z, Saturday, January 30 until 0000Z, Sunday, January 31, operation will be from the State Capital Grounds.

For QSL, send QSL and #10 SASE to W0CET, 613 Medford, Topeka, KS 66606-1829.

Marshall Islands

The Kwajalein ARC will operate KX6BU from 0600Z, January 30 until 0600Z, February 8, to commemorate the 44th anniversary of the battles of Kwajalein and Roi-Namur.

Frequencies: SSB—14.250, 21.350, 28.550; CW—7.050, 14.050, 21.050, 28.050. For \$7, KX6BU will issue a QSL, a certificate and a 64-page book on the battles; \$3 will bring the QSL

and certificate. All requests should be sent to KX6BU, P.O. Box 444, APO San Francisco, CA 96555. □

George Washington

The Orange County ARC will operate WB2SON on February 13, 1500Z-2200Z, from Washington's Headquarters, to commemorate George Washington's birthday.

Suggested frequencies: 3.860, 7.230 and 14.260. Also, local 2M repeaters and packet will be active for contacts. For certificate, send QSL and 9"×12" SASE (39¢) to OCARC, c/o Barbara Christopher, N2AWI, RFD 2 Box 447, Wallkill, NY 12589. □

Valentine's Day

The Loveland Repeater Association will sponsor a special event station in conjunction with the Loveland Valentine's activities. Operation will be up 25 kHz from the lower edge of the General Class phone bands and up 25 kHz from the lower edge of the Novice 10M band.

Operating time: 1300 UTC, February 14 to 0700 UTC, February 15. Send SASE for QSL to Michael H. Walker, KA0VFF, 3816 Ash Ave., Loveland, CO 80538. □

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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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Niue Island

Mary Lou Brown, NM7N, and Jan Scheuerman, WB2JCE, will be going on a DXpedition to Niue Island, ZK2-land. They hope to be on the air February 21-26.

They will be on both CW and SSB. Look for them around the following frequencies: 7.025, 7.225, 14.025, 14.225, 21.025, 21.125, 21.300, 28.025, 28.125 and 28.300. Their call signs will be ZK2MB and ZK2JS.

QSL via NM7N, 504 Channel View Dr., Anacortes, WA 98221, and WB2JCE, 4610 SE 1st Place, Cape Coral, FL 33904. SASE requested. □

Asuncion's 450th

Paraguayans held a special event station in Asuncion from 0000 UTC, August 8 to 2400 UTC, August 16. The station was part of the city's celebration of its 450th anniversary; 24 other stations (portable) also operated from their homes as a support. It was the first time that Paraguayans had used a special call sign — ZP450A.

A total of 12,000 QSO's were made on all bands, including CW, RTTY, SSTV and SSB; 200 countries were worked. All documents were sent to the ARRL for approval of the prefix. Commemorative QSL cards will be

sent to anyone (including SWL's) requesting it by air mail with some IRC's. All others will be sent via buro.

QSL to Radio Club Paraguayo, P.O. Box 512, Asuncion, PARAGUAY, or via the buro. □

New QSL address

Those who have had problems getting QSL's from the November 7th special event station operated by the ARC of El Cajon, should send 9"×12" SASE's (with 39¢ postage) to: Richard R. Beisigl, 702 Latisha Place, El Cajon, CA 92021. □



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| IC-735 Gen. Cvg Xcvr | 999.00 | Call \$ |
| IC-745 Gen. Cvg Xcvr | 1049.00 | Call \$ |
| IC-751A Gen. Cvg. Xcvr | 1649.00 | Call \$ |
| IC-575A 10m/8m Xcvr | 1399.00 | Call \$ |
| Receivers | | |
| IC-R7000 25-1300 + MHz Rcvr | 1099.00 | Call \$ |
| IC-R71A 100 kHz-30 MHz Rcvr | 949.00 | Call \$ |
| VHF | | |
| IC-275A All Mode Base w/PS | 1199.00 | Call \$ |
| IC-275H All Mode Base 100w | 1389.00 | Call \$ |
| IC-27A FM Mobile 25w | 429.00 | Call \$ |
| IC-27H FM Mobile 45w | 459.00 | Call \$ |
| IC-28A FM Mobile 25w | 429.00 | Call \$ |
| IC-28H FM Mobile 45w | 459.00 | Call \$ |
| IC-2AT FM HT | 299.00 | Call \$ |
| IC-02AT FM HT | 399.00 | Call \$ |
| IC-μ2AT Micro HT | 329.00 | Call \$ |
| IC-900 Six Band Mobile | 589.00 | Call \$ |
| UHF | | |
| IC-475A All Mode 25w | 1399.00 | Call \$ |
| IC-47A FM Mobile 25w | 549.00 | Call \$ |
| IC-48A FM Mobile 25w | 459.00 | Call \$ |
| IC-4AT FM HT | 339.00 | Call \$ |
| IC-04AT FM HT | 449.00 | Call \$ |
| IC-μ4AT 440 FM HT | 369.00 | Call \$ |
| IC-3200A FM 2m/70cm 25w | 599.00 | Call \$ |
| 220 MHz | | |
| IC-375A All-Mode, 25w, Base Sta. | 1399.00 | Call \$ |
| IC-38A 25w FM Xcvr | 459.00 | Call \$ |
| IC-37A FM Mobile 25w | 499.00 | Call \$ |
| IC-3AT FM HT | 339.00 | Call \$ |
| IC-03AT Deluxe HT | 449.00 | Call \$ |
| 1.2 GHz | | |
| IC-1271A All Mode 10w | 1229.00 | Call \$ |
| IC-120 1w, FM, Xcvr | 579.00 | Call \$ |
| IC-12AT Deluxe 1w HT | 459.00 | Call \$ |



TS-440S/AT

| HF Equipment | List | Juns |
|--------------------------------|-----------|---------|
| TS-940S/AT Gen. Cvg Xcvr | \$2349.95 | Call \$ |
| TS-940S Gen. Cvg Xcvr | 2119.95 | Call \$ |
| TS-930S/AT Gen. Cvg Xcvr | 1999.95 | Call \$ |
| TS-830S Xcvr | 1199.95 | Call \$ |
| TS-430S Gen. Cvg Xcvr | 899.95 | Call \$ |
| TS-440S/AT Gen. Cvg Xcvr | 1299.95 | Call \$ |
| TS-440S Gen. Cvg Xcvr | 1099.95 | Call \$ |
| TS-140S Compact, Gen. Cvg Xcvr | 899.95 | Call \$ |
| TS-680S HF Plus 6m Xcvr | 999.95 | Call \$ |
| TL-922A HF Amp | 1599.95 | Call \$ |
| Receivers | | |
| R-5000 100 kHz-30 MHz | 949.95 | Call \$ |
| R-2000 150 kHz-30 MHz | 699.95 | Call \$ |
| VHF | | |
| TS-711A All Mode Base 25w | 999.95 | Call \$ |
| TR-751A All Mode Mobile 25w | 629.95 | Call \$ |
| TM-221A Compact FM 45w | 419.95 | Call \$ |
| TM-2530A FM Mobile 25w | 459.95 | Call \$ |
| TM-2550A FM Mobile 45w | 489.95 | Call \$ |
| TM-2570A FM Mobile 70w | 589.95 | Call \$ |
| TH21-BT FM, HT | 279.95 | Call \$ |
| TH-205 AT, New 2m HT | 279.95 | Call \$ |
| TH-215A, 2m HT Has It All | 359.95 | Call \$ |
| TH-25AT 5w Pocket HT NEW | 329.95 | Call \$ |
| UHF | | |
| TS-811A All Mode Base 25w | 1,199.95 | Call \$ |
| TR-851A 25w SSB/FM | 729.95 | Call \$ |
| TM-421A Compact FM 35w | 439.95 | Call \$ |
| TH-415A 2.5w 440 HT | 379.95 | Call \$ |
| TH-41BT FM, HT | 299.95 | Call \$ |
| TH-45AT 5w Pocket HT NEW | 349.95 | Call \$ |
| TW-4100A, 2m/70cm FM | 669.95 | Call \$ |
| TR-50 1w 1.2GHz FM | 599.95 | Call \$ |
| 220 MHz | | |
| TM-3530A FM 220 MHz 25w | 479.95 | Call \$ |
| TH-31BT FM, 220 MHz HT | 299.95 | Call \$ |
| TM-321A Compact 25w Mobile | 439.95 | Call \$ |
| TH-315A Full Featured 2.5w HT | 379.95 | Call \$ |



FT 757GX

| HF Equipment | List | Juns |
|-----------------------------------|-----------|---------|
| FT-ONE Gen. Cvg Xcvr | \$2859.00 | Call \$ |
| FT-980 9 Band Xcvr | 1795.00 | Call \$ |
| FT-757 GX II Gen. Cvg Xcvr | 1079.95 | Call \$ |
| FT-767 4 Band New | 1895.00 | Call \$ |
| FL-7000 15m 160m Solid State Amp | 1895.00 | Call \$ |
| Receivers | | |
| FRG-8800 150 kHz - 30 MHz | 699.95 | Call \$ |
| FRG-9600 60-905 MHz | 679.95 | Call \$ |
| VHF | | |
| FT-211RH FM Mobile 45w | 459.95 | Call \$ |
| FT-290R All Mode Portable | 579.95 | Call \$ |
| FT-23 R/TT Mini HT | 299.95 | Call \$ |
| FT-209RH FM Handheld 5w | 359.95 | Call \$ |
| UHF | | |
| FT-711RH FM Mobile 35w | 479.00 | Call \$ |
| FT-770RH FM Mobile 25w | 479.95 | Call \$ |
| FT-73 R/TT Mini HT | 314.95 | Call \$ |
| FT-709RH FM HT 4w | 359.95 | Call \$ |
| VHF/UHF Full Duplex | | |
| FT-736R, New All Mode, 2m/70cm | 1749.95 | Call \$ |
| FT-726R All Mode Xcvr | 1095.95 | Call \$ |
| HF/726 Module for 10, 12, 15M | 289.95 | Call \$ |
| 430/726 430-440 MHz | 329.95 | Call \$ |
| 440/726 440-450 MHz | 329.95 | Call \$ |
| SU-726 Sate Duplex | 129.95 | Call \$ |
| FT-690R MKII, 6m, All Mode, port. | 569.95 | Call \$ |
| Dual Bander | | |
| FT-2700RH FM 2m/70 cm 25w | 599.95 | Call \$ |
| FT-727R 2m/70 cm HT | 479.95 | Call \$ |
| 220 MHz | | |
| FT-109 RH New HT | 379.95 | Call \$ |
| Repeaters | | |
| FTR-2410 2m Repeaters | 1249.95 | Call \$ |
| FTR-5410 70cm Repeaters | 1289.95 | Call \$ |



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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 two months in advance. For example, if your VE group is scheduling an exam for September, please have the information to us by mid July.

Our address is Worldradio, 2120 28th St., Sacramento,

CA 95818. Please mark the envelope "VE Exams".

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

p/r = pre-register

w/i = walk-in

| Date | City | Contact | Notes | Date | City | Contact | Notes |
|-------------------|-----------------|----------------------------|---------------------|--|-------------|-----------------------|----------------------|
| Alaska | | | | Missouri | | | |
| Feb 3 | Anchorage | KL7HFQ (907) 243-2221 | w/i; no fee | Feb 6 | Camdenton | WA0E (314) 346-2944 | p/r pref |
| Feb 6 | Fairbanks | AL7IF (907) 474-0842 | w/i; no fee | Nevada | | | |
| Feb 6 | Juneau | KL7KD (907) 789-0292 | w/i; no fee | Feb 20 | Reno | K7HRW (702) 972-3933 | 30-day p/r; some w/i |
| Feb 17 | Eagle River | KL7HFQ (907) 243-2221 | w/i; no fee | New Jersey | | | |
| California | | | | Feb 13 | Cranford | W2NR (201) 889-8534 | w/i |
| Feb 6 | Burbank | W6JEP (818) 848-9340 | w/i OK | Feb 18 | Bellmawr | WA2VQG (609) 546-7710 | w/i OK |
| Feb 7 | Chico | W6YKU (916) 342-1180 | p/r pref | Ohio | | | |
| Feb 7 | Pleasant Hill | WX6A (415) 932-0491 | w/i only | Feb 13 | Dayton | KA8ZWD (513) 426-1355 | |
| Feb 13 | Camarillo | N6SR (805) 484-4461 | | Feb 13 | Maumee | KU8B (419) 729-5245 | |
| Feb 13 | Downey | K6OWA (213) 869-6683 | | Pennsylvania | | | |
| Feb 13 | Los Altos Hills | KG6XF (408) 255-9000 | w/i only | Feb 4 | Levittown | K3TX (215) 946-1040 | w/i OK |
| Feb 17 | Eureka | KB6FIW (707) 442-9245 | w/i OK | Feb 6 | Erie | W3CG (814) 665-9124 | w/i OK |
| Feb 18 | Fountain Valley | N6ISY (714) 775-6095 | p/r; some w/i | Tennessee | | | |
| Feb 21 | Sunnyvale | W6NLG (408) 255-9000 | w/i only | Feb 20 | Memphis | WD4LFD (901) 386-4375 | 2-day p/r |
| Feb 27 | Eagle Rock | WB6PSY (818) 710-1705 | w/i | Texas | | | |
| Feb 27 | Lower Lake | N6JFG (213) 258-9127 | | Feb 8 | Brady | WD5H (915) 597-2561 | 7-day p/r |
| | | KB6AMP (707) 263-4213 | p/r by 2/12; no w/i | Feb 13 | Midland | KT5G (915) 694-9450 | w/i OK |
| Colorado | | | | Feb 13 | San Antonio | NS5I (512) 681-0702 | w/i |
| Feb 13 | Denver | W0IJR (303) 366-9689 | p/r pref | Feb 20/21 | Harlingen | WA2VJL (512) 399-0328 | 30-day p/r; w/i |
| Feb 20 | Estes Park | WB0NUL (303) 988-7222 | w/i pref | Virginia | | | |
| Florida | | | | Feb 6 | Middletown | NC4B (703) 869-5241 | some w/i |
| Jan 23 | Fort Myers | WV4F (813) 481-4880 | p/r | Feb 20 | Vienna | NK4U (703) 691-0078 | w/i |
| Feb 20 | Melbourne | WB9IVR (305) 724-6183 | w/i OK | West Virginia | | | |
| Illinois | | | | Feb 9 | Fairmont | KU8C (304) 366-0132 | 7-day p/r; no w/i |
| Feb 13 | Oak Forest | NF9N (312) 448-9432 | w/i OK | Wisconsin | | | |
| Feb 18 | Chicago | W9WBY (312) 929-6550 | | Feb 20 | Fox Point | KB9G (414) 351-5311 | w/i OK |
| Iowa | | | | ATTN: Teachers — Send us an order for sample issues of Worldradio, one for each of your students! | | | |
| Feb 28 | Davenport | N9OK (309) 786-7203 | p/r; w/i | | | | |
| Kansas | | | | | | | |
| Feb 6 | Parsons | WA0B (316) 421-3445 | p/r pref | | | | |
| Feb 13 | Olathe | NK0B (913) 764-6347 | p/r pref | | | | |
| Feb 26 | Kansas City | NC0M (913) 262-0631 | p/r pref | | | | |
| Feb 26 | Topeka | NA0F (913) 828-3317 | p/r pref | | | | |
| Maryland | | | | | | | |
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Satellite Experimenter's Handbook

Now, under one cover, here is all you need to communicate through or pick up the signals from orbiting satellites. Whether your interest is in Amateur Radio, weather or TV-broadcast spacecraft, you'll find what you're looking for in *The Satellite Experimenter's Handbook*.

Since the first OSCAR (Orbiting Satellite Carrying Amateur Radio) was launched in 1961, thousands of Amateur Radio operators, scientists, educators and satellite enthusiasts from around the world have used these "birds" for pleasure, education

and experimentation. You can join them! And if you're already into satellite communications, you'll find a wealth of practical information on all aspects of these spacecraft — from satellite design to ground-station equipment and antennas.

Whether you're a beginner, an experienced satellite enthusiast, a teacher or a scientist, you'll find *The Satellite Experimenter's Handbook* to be indispensable. \$10 U.S., \$11 in Canada and elsewhere. (Outside of North America please add an additional \$5 for postage.) John Champa, K8OCL, 7800 Hartwell St., Dearborn, MI 48126. □

Hints and bits

David Mascaro, WA3JUF

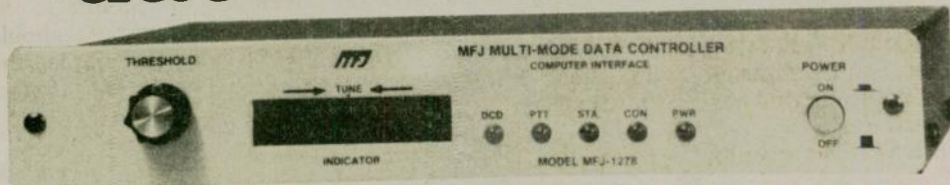
Use fuses between your high current power supplies and your amplifiers and transverters. The transverters and other equipment have reverse polarity diodes inside that protect against the accidental reversal of the supply leads.

Without an in-line fuse, your Astron 20 amp power supply will pump its full current into the transverter, which will certainly blow the diodes and many other semiconductor devices.

Replace the 50¢ fuse or the transverter . . . it's your decision.

—Mt. Airy VHFRC □

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Plus you get high performance HF/VHF/CW modems, software selectable dual radio ports, precision tuning indicator, 32K RAM, AC power supply and more.

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

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

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

You can use the MFJ Starter Pack to get on the air instantly. It includes computer interfacing cable, terminal software and friendly instructions . . . everything you need to get on the air fast. Order MFJ-1282 (disk)/MFJ-1283 (tape) for the C-64/128 and VIC-20 or MFJ-1284 for the IBM or compatible, \$19.95 each.

Packet

Packet gives you the fastest and most reliable error-free communications of any amateur digital mode.

With MFJ's super clone of the industry standard -- the TAPR TNC-2 -- you get genuine TAPR software/hardware plus more -- not a "work-a-like" imitation.

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

Hardware DCD gives you more QSOs because you get reliable carrier detection under busy, noisy or weak conditions.

A hardware HDLC gives you full duplex operation for satellite work or for use as a full duplex digipeater. And, it makes possible speeds in excess of 56K baud with a suitable external modem.

Good news for SYSOPs! New software lets the MFJ-1278 perform flawlessly as a WORL/WA7MBL bulletin board TNC.

Baudot RTTY

You can copy all shifts and all standard speeds including 170, 425 and 800 Hz shifts and speeds from 45 to 300

baud. You can copy not only amateur RTTY but also press, weather and other exciting traffic.

A high performance modem lets you copy both mark and space for greatly improved copy under adverse conditions. It even tracks slightly drifting signals.

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

You get both the American Western Union and the international CCITT character sets. Autostart for unattended reception and selectable "Diddle".

A receive Normal/Reverse software switch eliminates retuning and Unshift-On-Space reduces errors under poor receiving conditions.

ASCII

You can transmit and receive 7 bit ASCII using the same shifts and speeds as in the RTTY mode and using the same high performance modem. You also get Autostart and selectable "Diddle".

CW

You get a Super Morse Keyboard mode that lets you send perfect CW effortlessly from 5 to 99 WPM, including all prosigns -- it's tailor-made for traffic handlers.

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

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

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

An AFSK CW mode lets you ID in CW.

The CW receive mode lets you copy from 1 to 99 WPM. Even with sloppy fists you'll be surprised at the copy you'll get with its powerful built-in software.

You also get a random code generator that'll help you copy CW faster.

Weather FAX

You'll be fascinated as you watch WEFAX signals blossom into full

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fledged weather maps on your printer. Other interesting FAX pictures can also be printed -- such as some news photographs from wire services.

Any Epson graphics compatible printer will print a wealth of interesting pictures and maps.

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

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

Pictures and maps can be printed to screen in real time or from disk on IBM and compatibles with the MFJ-1284 Starter Pack.

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

Slow Scan TV

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

You'll not only enjoy receiving pictures from thousands of SSTVers all-over-the-world but you can send your own pictures to them, too.

You can print slow scan TV pictures on any Epson graphics compatible printer. If you have an IBM PC or compatible you can print to screen in near real time or from disk with the MFJ-1284 Starter Pack.

You can transmit slow scan pictures right off disk -- there's no need to set up lights and a camera for a casual contact.

You can save slow scan pictures on disk from over-the-air QSOs if your terminal program lets you save ASCII files.

The MFJ-1278 transmits and receives 8.5, 12, 24, and 36 second black and white format SSTV pictures using two levels.

Contest Memory Keyer

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

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Message memories let you store contest RST, QTH, call, rig info -- everything you used to repeat over and over. You'll save precious time and work more QSOs.

You get automatic incrementing serial numbering. In a contest it can make the difference between winning and losing.

A weight control lets you penetrate QRM with a distinctive signal or lets your transmitter send perfect sounding CW.

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(continued from page 7)

ing. I commented that most yards were "low maintenance" — sand and gravel, decorated with cacti. The locals corrected me, saying that the sand and gravel will sprout weeds in the rainy season, and that it takes less effort to grow a Bermuda grass lawn and let it burn in the summer time.

Up a steep hill and we were there! There's the Goldwater home — a long, low rancher, sprouting a myriad of lightning rods! The locals advised that the lightning rods were not decorations; they were needed for the electrical storms that frequent there. The radio "shack" was a separate building as large as the home itself. In addition to the radio room, it had two rooms — a bath and kitchenette — which were used by the crew of Air Force personnel who handled all that traffic.

As I stepped into the radio room, I noticed two stars above the door, which reminded me I was entering the company of a Major General. Stepping inside, my eyes bulged in amazement. This was not only a radio station, it was a trophy room. There were medals in plastic boxes, plaques with their gleaming brass plates, magazine covers, photographs, diplomas and



Norm Brooks, K6FO (right), found that Senator/General Barry Goldwater, K7UGA, was still cordial and attentive after shaking hundreds of hands at his Open House during the October Southwestern Division Convention.

certificates — all in frames, trophies, keys to cities and memorabilia of all kinds. All attested to the fact that Senator/General Goldwater has lived a full and interesting life, helping a lot of people and doing a lot of things.

Here he is on a magazine cover, which says "Goldwater for President in 1964." Just think! If he had become president, he could have been issued the call sign W1 (W3?), and beat King Hussein to the punch.

W7UGA is no longer an Air Force MARS Gateway station; the Air Force pulled its equipment out some time ago. Everything in the radio room is now the personal property of Barry Goldwater. The equipment lineup is what you'd find in a lot of DXers' radio rooms.

Outside, a "Christmas Tree" mast overlooks the hill, with monobander beams on just about every band. This is a neighborhood of "estates," so the nearest neighbor is several hundred feet away.

Senator Goldwater was a gracious host. He chatted with the visitors and provided whatever "photo opportunities" were desired. Armond Noble, N6WR, took my picture as I chatted with Barry, and it is now proudly framed on my wall. I have a caption on the photo that reads "Senator, if I were you I'd..." □

Did you know?

In the Far North, sled dogs have their revenge! Ever hear of the "Lead Dog's Revenge"? This is a special race held in Alaska where the mushers strap themselves into harnesses in front of the sled and the lead dogs relax in the driver's seat!

This is one of the most entertaining events at the Two River Musher's Association near Fairbanks, Alaska, and guaranteed to bring a smile from both viewers and contestants alike. One musher has won three times in a row. Should his lead dog be weighed to compare?

Topic of conversation: Next time you work an Alaskan station, ask him if he ever saw that race!

— Triple States RAC, Adena, OH □

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Care and feeding of repeater sites

Norm Brooks, K6FO

Here's your quiz. At a mountain top repeater site:

Why put a heavy screen *above* exposed cables? Why seal tiny holes in the side of an outdoor cabinet? How do you ground the equipment to solid rock? Why should you never make a maintenance visit alone?

If you attended Hartley Gardner, W1OQ's seminar at the ARRL Southwestern Division Convention at Phoenix, October 10, you'd know the answers to those questions.

Mother Nature

Hartley told the full house of about 150 that you should not try to fool around with Mother Nature. She determines how your equipment and antennas will survive, and what the temperatures will be in your shelters. Even in sunny Arizona, true winter occurs on the mountain tops. The ice load on your antennas and towers can double or triple normal wind loading. And there's the answer to one of the questions: when the ice thaws and falls off the tower and antennas, it falls in huge chunks and can severely damage cables and building roofs, unless you install some kind of shield.

Why bother with a small hole in the side of a cabinet? Because on mountain tops, the wind blows horizontally, and even a tiny hole can allow a huge hunk of ice to build up *inside* a cabinet.

Use rubber gaskets and caulking where cables enter a building. At 6,000' elevation, every critter on the mountain tries to get into your warm building.

Lightning

Here's where we find the answer to the question about the rocks. Lightning bolts abound on mountain tops, and ground rods or grounded towers are a must. Unfortunately, poor ground conductivity is endemic to mountain tops, so what to do?

Draw a ring around your installation with the heaviest gauge conductor you can afford. (See Figure 1.) No. 2 gauge wire will be OK, but use

heavier if you have it. The telephone company uses 3-0 or 4-0. The ring should curve at all points, there should be no corners. Drive ground rods at intervals, and connect this ring to the rods. What if all you have is rocks? Then skip the ground rods, and install radial wires from the ring. (See Figure 1.)

If your ring is 2 gauge wire, the radials could be 10 gauge. Work it in between the rocks to avoid tripping. The objective is to make a huge capacitor to ground that will absorb the current of a lightning strike. If

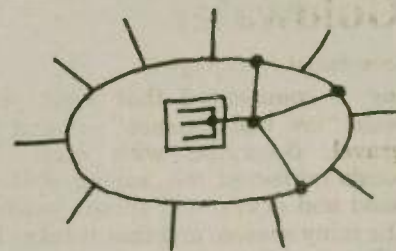


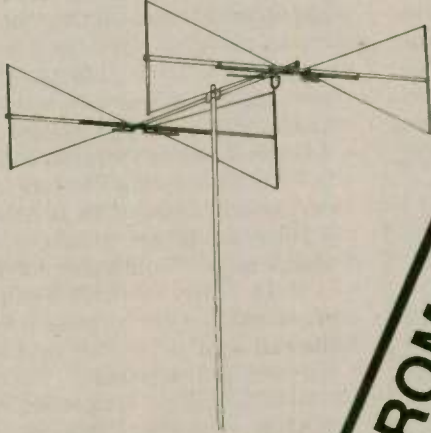
Figure 2

your ring is huge, you may also want to tie its sides together with heavy wire.

Inside the building, tie all the equipment racks together with low impedance conductor. Tie them all to one

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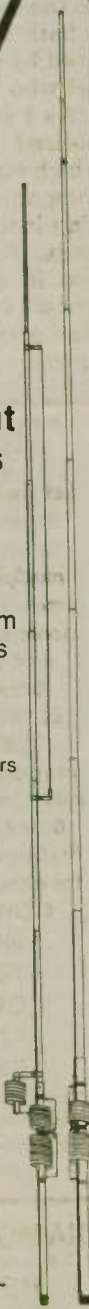
- Designed for the low-band DXer
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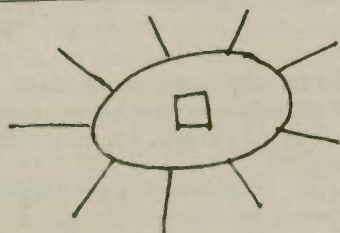


Figure 1



Hartley Gardner, W1OQ, moderated the forum "The Care and Feeding of Repeater Sites."

point in the building, then tie that point to the AC ground and the ring. (See Figure 2.)

Joints

You must be able to inspect the joints in your ground system from time to time. Welding or brazing makes the best joints. There is an ex-

othermic system called Cadwell welding, that heats a copper ingot to a white heat, which flows into the joint. It costs about \$3 per shot. Inside the building, bolts and clamps are OK. Soldering is *not* good in any joint subject to lightning. Hartley showed the group some soldered joints after a lightning hit. Every joint was burned off at the soldered joint.

Protecting the radios

When lightning strikes the top of a tower, most of the current flows down the tower to ground. Part of the current comes down the coaxial cable and can damage radios. Cavities and duplexers provide some protection to the radios. Exception: a notch duplexer, which may provide some DX continuity through to the radios. Lightning arrestors can be installed in RF lines. In home installations, a transmatch will protect radios, as it can handle 1000V or so from a kW transmitter.

RFI

In addition to Mother Nature's hazards, your radio equipment at a repeater site must be able to operate without being affected by other radios at or near the site. Unfortunately, the mathematical nature of radio waves makes them want to multiply, add or subtract in some peculiar ways. This is called intermodulation, or "intermod." Intermod takes place in *any* non-linear device where a strong signal is present. When it takes place in the final transmitter stage, a one-way device called an isolator is needed.

The isolator effectively isolates the final amplifier from the outside world. Incoming signals from an outside source are routed to a dummy load, rather than allowed to mix in the final amplifier. (See Figure 3.)

Other items at the repeater site may cause RFI. Any joint of dissimilar metals could become a non-linear

device and behave like a diode. Corroded joints in guy wires are notorious for this. Replace guys with non-metallic guys if you can. In one site, where there was an intense RF field, a 6' piece of wire lying in the dirt was re-radiating RFI. In another case, an old rusted padlock hanging on a metal fence was the culprit.

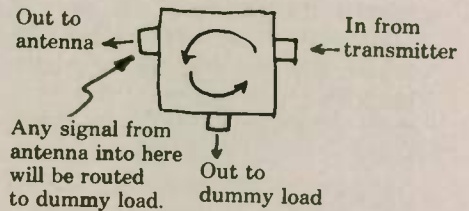


Figure 3

Isolator

Keep all chain link fences tight and grounded. Inspect your site critically. If it's neat, with nothing loose or rubbing or flapping, you've done a good job.

Access

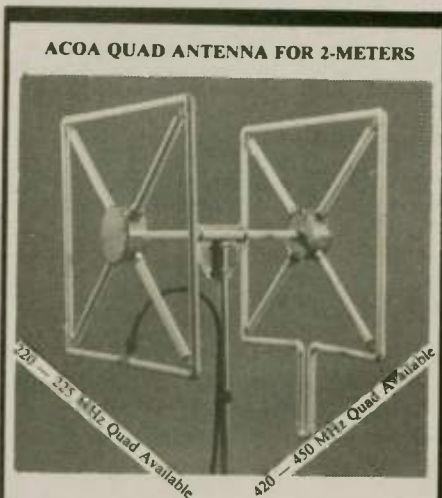
What good is a repeater site if you can't always get there? One of Murphy's Laws says the repeater will fail when you need it the most. And that seems to be in the season of the worst weather. In any case, don't go to a repeater site alone. Have a buddy with you to get help if the worst happens. (Your HT won't help; the repeater is down, remember?) □

Good operating

Good operating calls for friendly operating. It serves no useful purpose to bad-mouth a repeater — on that repeater or on any other repeater. It serves no useful purpose to argue about how the controls of a repeater are set — on the air.

Do it on the telephone, or do it at a meeting. Always keep in mind that many are listening on scanners or VHF receivers. Many are trying to decide whether they like Amateur Radio. You do not help when you stir a hornet's nest.

Good operating demands friendly operating. —Baltimore RATS, MD



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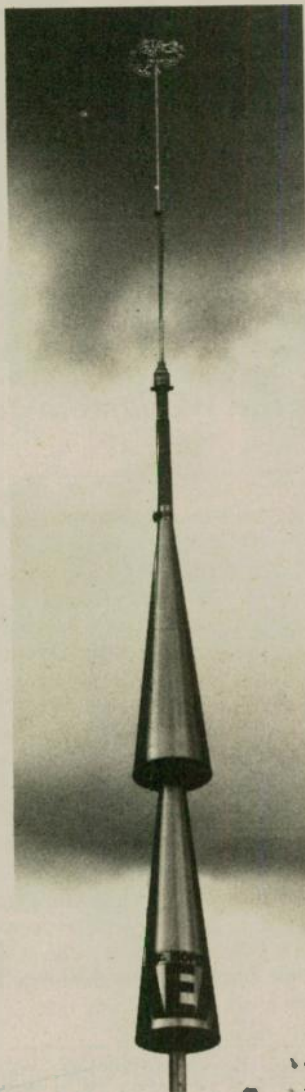


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A standard 50 Ohm SO-239 connector is recessed within the base sleeve (fully weather protected). With the IsoPole you will not experience aggravating deviation in SWR with changes in weather. The impedance matching network is weather sealed and designed for maximum legal power. The aerodynamic cones are the only appreciable wind load and are attached directly to the support (a standard TV mast which is not supplied).



High Performance Hand-Held Antenna — The Hot Rod

The Hot Rod antenna can be expected to make the same improvement to hand-held communications that the IsoPole antennas have made to base station operation. **Achieve 1 or 2 db gain over ANY 5/8 wave two meter telescopic antenna.** The factory tuned HR-1 is 20% shorter, lighter and places far less stress on your hand-held connector and case. It will easily handle over 25 watts of power, making it an excellent emergency base or mobile antenna. In the collapsed position, the Hot Rod antenna will perform like a helical quarter wave. Three Hot Rods are available; HR-1 1/2 wave 2M Ant., HR-2 for 220 Mhz, and HR-4 for 440 Mhz. Amateur Net Price on all Hot Rods is \$19.95.

For either base station or hand-held operation AEA has the perfect VHF/UHF antenna. Put more punch in your Packet station with an AEA IsoPole or Hot Rod antenna. To order your new antenna contact your favorite Amateur Radio Distributor. For more information contact Advanced Electronic Applications, P.O. Box C-2160, Lynnwood, WA 98036, or call 206-775-7373.

IsoPole Specifications

| Model | 144 | 220 | 440 |
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| Freq. Coverage (Mhz) | 135-160 | 210-230 | 415-465 |
| 2.1 VSWR bandwidth | >12Mhz @ 146Mhz | >15Mhz @ 220Mhz | >22Mhz @ 435Mhz |
| Power Rating | 1 kw | 1 kw | 1 kw |
| Gain** | 3 dbd | 3 dbd | 3 dbd |
| Radiating Element Length | 125.5" (3.2m) | 79.25" (2m) | 46" (1.2m) |
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Even at ham conventions there is talk about fishing.



Fried Heyn, WA6WZO, asked "Well, how do you guys think I'm doing as Director?"



In the Old West, men wore a pistol on each hip. Things have changed.

Seen at the scene

The Worldradio "candid camera" strikes again

N6WR photos



"And then I got across 450 volts at 100 mills."

Story with a moral

A ham was hunting in the forest when a storm came up. It was raining torrents, so he crawled into a hollow log. It fit snugly.

The rain lasted four hours and the water-soaked log began to contract. The storm ceased and the man tried to get out but could not. The log held him tight. He knew he would die of starvation unless he could get free.

His whole life flashed before him, especially his mistakes. Suddenly, he remembered he had not subscribed to **Worldradio**. This made him feel so small that he was able to crawl out of the log.

The moral is: Do not put off subscribing to **Worldradio** until you get in a tight pinch. — Adapted from filler in *Tamiami ARC newsletter* (Venice, FL); by Jack Hawkins, K4KEB

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My first contact

David Kershaw, KQ6T
(former WD6DXE)

I had finally put up an antenna, the last of the obstacles preventing me from making my first radio contact. The moment the antenna was up I went to my operating position. I flipped the necessary switches and waited for the radio to warm up. My pulse quickened. Within seconds I was to the point where I couldn't sit still. I had to tap my pencil or turn dials frantically.

Using the only band I could use at the time, I switched to 40 meters. Countless thousands of people, hams and non-hams alike, could be listening. Gulp!

I made a short transmission announcing that I was looking for someone to talk to. As soon as I finished transmitting, I started to write down the letter equivalent of the dots and dashes that were coming from the speaker. I received a slow, steady series of dots and dashes the moment I finished transmitting. They said, "WD6DXE WD6DXE WD6DXE DE WB6TRG WB6TRB WB6TRZ."

I was so surprised that I just about fell out of my chair. Somebody had answered me the first time! (From my experience in listening to such things and what my Dad has told me, you usually have to announce for several minutes on and off in order for a contact to be made.) The problem was that each time it was different.

"Oh no," I thought frantically, "what am I going to do? What is this guy's call sign?" Now I was really nervous.

After a dozen exchanges, I learned his name — Art — and his location — Whittier. I also figured out his call sign — WB6TRZ. Coincidentally, as it turned out, this was Art's first contact too. Because of this, the contact was a long and tricky one. I had to use skills I had never practiced before, first-hand, and do it without help from the other end.

There is even more to it the first time. It is hard to think and send code at the same time, and you can't do it when receiving either. As a result, I had to interpret my writing and plan a response during the frantic pause between our transmissions. My head was spinning as I thought, "What do I do? What do I say? I have got to have more to decipher my writing, but I have got to hurry because I might lose his signal if I wait too long."

We took an hour and a half to exchange no more than basic information: signal reports, names, addresses and the kind of equipment we were using. (You must remember that Art and I could only receive code at 5 wpm. It may not sound like much, but to the beginner, dots and dashes go by awfully fast at 5 wpm.)

At last I had completed the contact. I

was exhausted. "I will need a long break to recover from that," I thought to myself. The break was shorter than I thought it would be. Soon afterward I was on the radio again calling for another contact. I was hooked! □

Novice materials

As you probably have read or heard, the number of Novice operators is not growing very fast at all. In an attempt to help get class materials, many companies have offered their supplies at their cost or very reduced rates. (Besides, have you tried to buy a code key or oscillator at Radio Shack lately? You can't!)

Fred Maia, W5YI, has received many gracious offers from the likes of Gordon West's Radio School, Grove Enterprises, and Ameco.

Fred had bundled a pile of materials together at a super price. Check out this list of stuff: complete oscillator (with case); code key; ARRL FCC rule book; Ameco Element 2 Manual; W5YI Novice package; FCC Form 610's; "Learn the Code" tape; 5 wpm test preparation tape.

The normal cost on this is \$46.30, but Fred sells it at \$19.95 plus \$2.40 postage (1st class).

This is something we should take a serious look at for our next Novice class. Maybe we should have a club program some night devoted to constructing (mass producing) some oscillators. All the parts in the package are available separately. If you would like to order anything or want more information, just give WB0MHK a call. — W5YI Report □

ESTABLISH A HAM TESTING CENTER IN YOUR AREA

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

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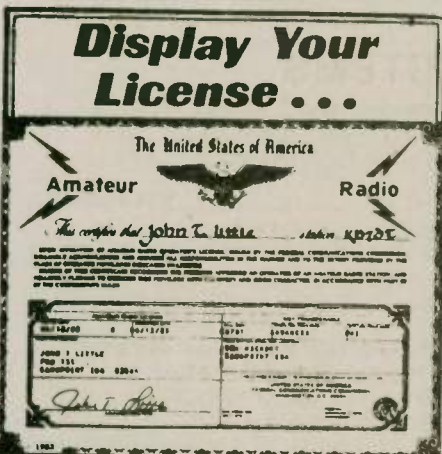
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Jean Priestley, KA2YKN

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you say you just don't have the time or it isn't your bag anymore? Maybe you're thinking it is for someone else, or that you've put your time in already.

Don't sit back on your laurels just yet. There is plenty of work to be done and we will need quite a few good people. There are many good reasons to take part. If you have never tried because you feel you don't know enough, get some on-the-air experience in the next event. Get activated and you will learn fast and find it very rewarding.

Just a couple of the best reasons for being active in public service is serving your community, and orienting yourself with your abilities, limitations and your community. I can't stress enough the importance of being prepared in advance for a real emergency, and don't think for even one minute that it can't happen just because we haven't had an earthquake lately.

Recently there was a chemical leak in Maple Shade that affected a large number of people. A very bad storm killed a young man one tragic Saturday night. A large train wreck occurred several months ago that hams assisted with. If it happened some-

where else, it could happen locally too.

Yes, there is something each of us can do to make our efforts collective. Know how to handle traffic if necessary, and have the proper information about your community handy. Always be sure your equipment is in proper working condition, maintain self-discipline and avoid overreacting in an emergency situation.

Think about what you have just read, and keep in mind that we and our families are a special people and have special skills that we can contribute to our communities in times of special need. Working together we can make a big difference. But we must prepare today for our communities tomorrow.

10K River Run

Marilyn Rock, KA0RUL

Members of the Fort Myers, ARC provided communications for the City of Palms 10K River Run held in Fort Myers on December 5. Communications were coordinated by Tom Keeley, KB4KJM. Other volunteers included: Lucille Gainer, KI4ZW; Bob Strathy, WV4F; Marilyn Rock, KA0RUL; Doug Deininger, KA0GYF; Russ Ingraham, W4UIO; Peggy Cummings, KY8Y; and Jim Hall, W3IJR.

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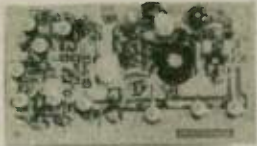


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TXA5-33 1 WATT ATV TRANSMITTER BOARD.....\$139del
 Over 1 watt p.e.p. on sync tip. Sync stretcher. RF/video demod of output built-in to drive monitor. Requires FMA5 or XFMA5 for sound, 13.8vdc @ 500ma. 3"x5". We stock crystals for 910.25 or 911.25 MHz (simplex) and 923.25 MHz (repeater output).

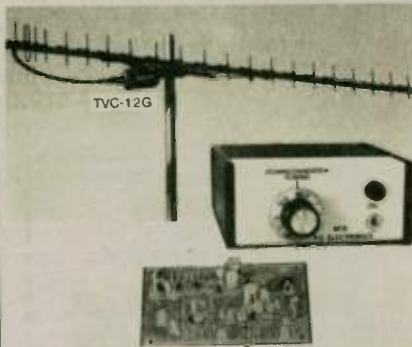


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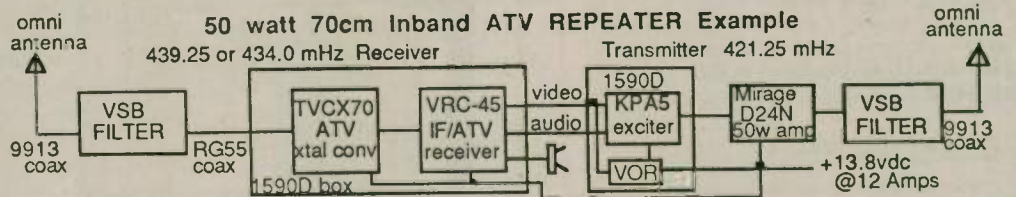
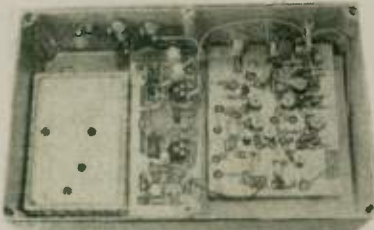
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 Sensitive GaAsfet preamp & mixer. Specify input frequency & 45.75 MHz output.

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 Outputs: 2 videos, line & speaker audio, S-meter. Squelched audio. 12vdc. Mount in Hammond 1590D (\$17) with TVCX-70 or TVCX-33 for complete repeater receiver.

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HAMS! Call or write for our full line ATV catalog...Downconverter boards start at only \$39

Stolen yacht recovered — thanks to Amateur Radio

Janice Wooler, VK4Vfy/MM, N2GQN/AA/MM, KD2XT/MM

Whilst on a voyage on board our yacht *Yawarra* between Fiji and Tuvalu (formerly the Ellice Islands), at the end of October 1986, I was reporting our position and weather conditions daily to Tony's Net, a popular maritime mobile net in the southwest Pacific (14.315 MHz, 2100 UTC daily).

On October 26, John Mowatt, P29JM, from Bougainville, asked all vessels on the net to watch for a yacht which had been stolen from its moorings at Kieta two days previously.

The information given at the time was that the vessel was a 30' fiberglass yacht, cream with four red horizontal stripes including a red gunnel stripe and named *High Noon*. The name was in large lettering on both sides with the O's painted to look like eyes. It had a fractional rig, outhung rudder, centre-board, sail number of 1589, red and yellow spinnaker and an outboard motor.

The owner's name and telephone number were given with a request to

call him, reverse charges, with any information about the vessel.

For each of the following days, this information was repeated on the net with additional information being given that the man believed responsible for the theft was wanted by Interpol for similar crimes. Also, the registration papers for the yacht *Colomba* had been stolen from Kieta at approximately the same time. As *Columba* was about the same size as *High Noon*, it was believed that a name change may have taken place on the stolen yacht. Authorities in the countries around the Pacific were also notified.

Having had our own yacht burgled in Fiji only a few weeks before, my husband, Nick, and I felt very sympathetic for *High Noon's* owners. Several times we discussed the theft and the likely whereabouts of the yacht. We both felt Tuvalu and Kiribati (formerly the Gilbert Islands) were likely destinations as they were both small, out-of-the-way countries with very little yacht traffic.

Because of this, we discussed the theft with the Chief of Customs in Funafuti, Tuvalu, and gave him the details when we checked in a few days later.

Even so, we were still caught by surprise when, a month later, in Kiribati, we recognized the new yacht that had arrived three days earlier (while we were anchored at a small island several miles away), as the *High Noon*. The name had indeed been removed

from the sides, but otherwise the paintwork was unchanged. The name *Colomba* was roughly applied with tape in small lettering on the side.

Fortunately, Tony's Net was in progress at the time we made our discovery. I contacted Terry Small, ZL1MA, Net Control, and asked him to check the *High Noon's* information, which I then copied down to take to customs and police. We were now 99% sure that it was indeed the stolen yacht.

We then spent a frustrating 1½ hours trying to convince the authorities (who had no record of the theft). Finally we spoke with the police commissioner, a Scotsman, who rapidly confirmed our story with the PNG authorities. A man was arrested and the vessel placed under police guard that afternoon. (He has since been tried and found guilty of stealing the yacht.)

The owner of *High Noon* was notified that it had been found and was able to liaise through John, P29JM, to obtain details from me as to the condition of his vessel, etc., and we were able to meet him at the airport when he flew into Tarawa eight days later.

If it had not been for the Amateur Radio network, the vessel would never have been found as the only other yacht in Kiribati at the time did not have Amateur Radio equipment and had not heard of the theft.

The robber had already surmounted his greatest hurdle before we discovered him as he had been given Customs and Immigration clearance into Kiribati, using false registration papers and a forged port clearance paper (from Costa Rica).

We also discovered he had arranged for *High Noon* to be slipped on the small marine railway in Tarawa and had been inquiring about paint. Large stencils for the name *Colomba* were found on board *High Noon*. It appears that in another week, *High Noon* would have had a colour change and the new name and home-port applied in a professional manner. He would have then only needed to spend a few more weeks in one of Kiribati's outer lagoons for the "heat" to have died down and have completely committed the perfect crime.

(please turn to page 24)



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



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DAYTON Hamvention

April 29, 30, May 1, 1988

Early Reservation Information

- Giant 3 day flea market • Exhibits
- License exams • Free bus service
- CW proficiency test • Door prizes

Flea market tickets and grand banquet tickets are limited. Place your reservations early, please.

Flea Market Tickets

A maximum of 3 spaces per person (non-transferable). Tickets (valid all 3 days) will be sold IN ADVANCE ONLY. No spaces sold at gate. Vendors MUST order registration ticket when ordering flea market spaces.

Special Awards

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

License Exams

Novice thru Extra exams scheduled Saturday and Sunday by appointment only. Send FCC form 610 (Aug. 1985 or later) - with requested elements indicated at top of form, copy of present license and check for \$4.35 (payable to ARRL/VEC) to: Exam Registration, 8830 Windbluff Point, Dayton, OH 45458

Hamvention Video

VHS video presentation about the HAMVENTION is available for loan. Contact Dick Miller, 2853 La Cresta, Beavercreek, OH 45324

1988 Deadlines

Award Nominations: March 15

Lodging: April 2

License Exams: March 26

Advance Registration and banquet:

USA - April 4 Canada - March 31

Flea Market Space:

Orders will not be processed before January 1

Information

General Information: (513) 433-7720
or, Box 2205, Dayton, OH 45401

Flea Market Information: (513) 898-8871

Lodging Information: (513) 223-2612

(No Reservations By Phone)

Lodging

Reservations received after Housing Bureau room blocks are filled will be returned along with a list of hotel/motels located in the surrounding areas of Dayton. The reservation will then become the responsibility of the individual.

HAMVENTION is sponsored by the Dayton Amateur Radio Association Inc.

Lodging Reservation Form

Dayton Hamvention - April 29, 30, May 1, 1988
Reservation Deadline - April 2, 1988

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____

Arrival Date _____

() Before 6 pm () After 6 pm

Departure Date _____

Rooms: () Single () Double (1 bed, 2 persons)
() Double Double (2 beds, 2 persons)

Deposit required - Room deposit must be paid directly to the hotel or motel by date shown on the confirmation form sent to you. Use canceled check for confirmation.

PLEASE SEPARATE

Advance Registration Form

Dayton Hamvention 1988
Reservation Deadline - USA-April 4, Canada-March 31

Name _____

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How Many

Admission _____ @ \$8.00* \$ _____

(valid all 3 days)

Grand Banquet _____ @ \$16.00** \$ _____

Women's Luncheon _____ @ \$6.75 \$ _____

(Saturday)

(Sunday) _____ @ \$6.75 \$ _____

Flea Market _____ \$23/1 space

(Max. 3 spaces) \$50/2 adjacent

Admission ticket must \$150/3 adjacent \$ _____

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* \$10.00 at door

** \$18.00 at door, if available.

Mail to - Lodging, Dayton Hamvention, 1880 Kettering Tower, Dayton, OH 45423-1880

Make checks payable and mail S.A.S.E. to - Dayton Hamvention, Box 2205, Dayton, OH 45401

Stolen yacht

(continued from page 22)

High Noon's owner, Ian Worth, was so impressed by his contact with Amateur Radio — not only the recovery of his boat, but also with communication between Tarawa and Kieta, before he arrived in Kiribati and afterward with his wife — that he has already obtained the books and tapes so he can start studying for his license!

ABOUT THE AUTHOR: Jan and her OM, Nick, crossed the Tasman in mid-1984. During the voyage they were in touch with amateurs Harry Jeffries, VK4VKS; Geoff Wallace, VK4VLI; Horace Longson, ZL3WE; and Tom Dowling, VK4OD (ex-VK4NUN). Jan and Nick have been cruising the Pacific ever since.

Jan, VK4 Very Fine Yachtie received her American call sign, N2 Great Queensland Navigator in late 1986, and her full call from January 26, 1987 is KD2XT (no special phonetics

have been thought of for this call sign yet!). In February 1987, Nick and Jan were in Ponape, East Caroline Islands en route to Japan.

—Amateur Radio; contributed by Tom Dowling, VK4OD □

Definition of RACES

The term RACES in California is used to describe any Amateur Radio operator who is enrolled in a specific government, in accordance with California State Codes governing the registration and use of Disaster Service Workers, to provide communications via the Amateur Radio Service.

A disaster does not have to be declared to use RACES personnel.

The RACES section is usually attached to that government's emergency preparedness office, or to the department it designates, such as Sheriff, Communications, etc. It may be called something other than RACES by the jurisdiction, but the foregoing definition is the generic definition in California.

An amateur may be both a member of ARES and RACES; this is, in fact, encouraged. The distinction is that RACES responds to and serves the State or a local government; ARES supports non-governmental activities and organizations. □

Alert follow-up

As promised in our January issue ("False alarm," page 3), here is some additional information on the contact lens alert that ran on page 3 of our December issue.

We received letters and phone calls that ranged from those chastising us for not recognizing this as a hoax to those who felt we were doing our readers a disservice by running the "False alarm" article.

The problem with most rumors is that there is an element of truth in them, which sometimes makes it difficult to determine their accuracy. In the future, we will not print articles such as this unless we have verifiable facts to back them up. We appreciate each of our readers who contacted us.

In our opinion, the following letter best answers the questions raised by the original article, while still pointing out possible occupational hazards of wearing contacts.

In a recent issue of *Worldradio* (issue 6, year 17), an article with the headline "Contact lens alert" describes accidents where contact lens-wearing employees were supposedly permanently blinded as a result of electrical mishaps. Since the early '70s, these stories have surfaced from time to time. They are completely unfounded and further, have no basis in scientific fact.

Cases of ultraviolet photokeratitis, or welder's flash, are not uncommon and are well-documented.* These cases are often reported in areas where the welder is not wearing suitable eye and/or face protection. Typically, the damage to the eye is temporary and the eye returns to normal within 48 hours.

The guidelines for eye and face protection in welding are quite specific and, when followed, the potential harmful effect of arc flash is significantly reduced if not eliminated.

You will find, in the enclosed source material, articles from National Safety News, Occupational Safety and Health, Argus (American Academy of Ophthalmology) and information from the American Optometric Association and the Contact Lens Association of Ophthalmologists. They have all responded to the issues raised by these rumors and continue to emphasize that with proper safety equipment, contact lenses are safe in the workplace. They should not be worn in areas where noxious or irritating vapors are present.

It is unfortunate that these rumors persist because millions of people of all ages depend on contact lenses for their vision. Contact lenses are a comfortable, safe vision modality.

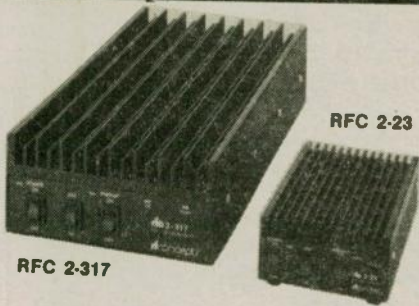
PEGGY ROSS

Communications Manager
Bausch & Lomb Optics Center
Rochester, New York

Those who still have doubts about this matter may contact the American Optometric Association, 243 N. Lindbergh Blvd., St. Louis, MO 63141, (314) 991-4100; and/or the American Welding Society, 550 NW LeJeune Rd., Miami, FL 33135, (305) 443-9353.

*Safety With Lasers and Other Optical Sources: A Comprehensive Handbook, David Sliney and Myron Wolbarsht. □

rfconcepts



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Congratulations!

Scott Baker, WD6DLL, and his wife, Margie, are having their 50th wedding anniversary on February 7, 1988. It would be great if amateurs from all over would send them congratulatory cards at 1080 Vis Madrid, Livermore, CA 94550.

RICHARD RANDALL, K6ARE
Livermore, California

Medical books aid Third World

I happened to be reading a local newspaper the other day when I came across an interesting article about a Dr. Hannalore Lehnhoff of Kings Park, Long Island, New York, who collects medical books and medical magazines donated from hospitals,

medical schools and private practices. He then distributes them to medical students in Third World countries who cannot find them or afford to buy them.

These books are desperately needed because these countries cannot afford to print textbooks in their own languages. The medical books donated are printed in English, as these foreign students are taught English as a primary language. All books donated contain inserts which say these books have been donated by Americans to promote good will with the Third World countries.

Dr. Lehnhoff would like to see this project develop into a nationwide project that would also send technical books (engineering, refrigeration, etc.) and Amateur Radio publications.

Schenkers International Forewaters Company — a shipping company in New Jersey — has transported many of these books to Third World countries at no cost and given free space to store these books and magazines. Volunteer help is needed to pick up these books and magazines and take them to the shipping company where the books will be crated before shipping.

I wonder if radio amateurs would be

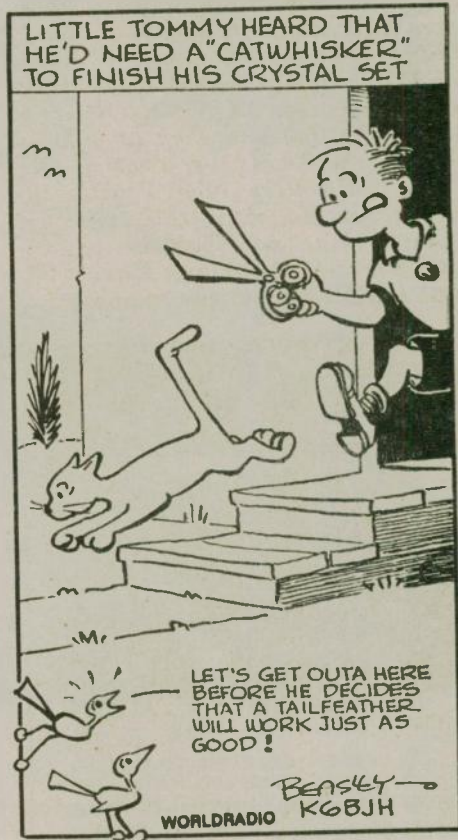
interested in helping to spread the word about this book project on DX nets, international nets and missionary nets.

For more information, please send an SASE. Thanks.

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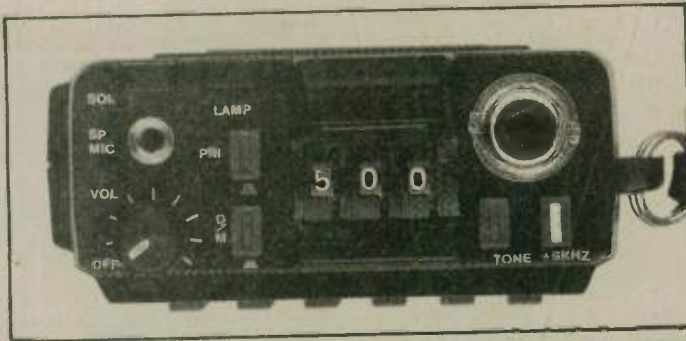
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 AES-Las Vegas, NV
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 Barry Electronics-New York, NY
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STATION APPEARANCE

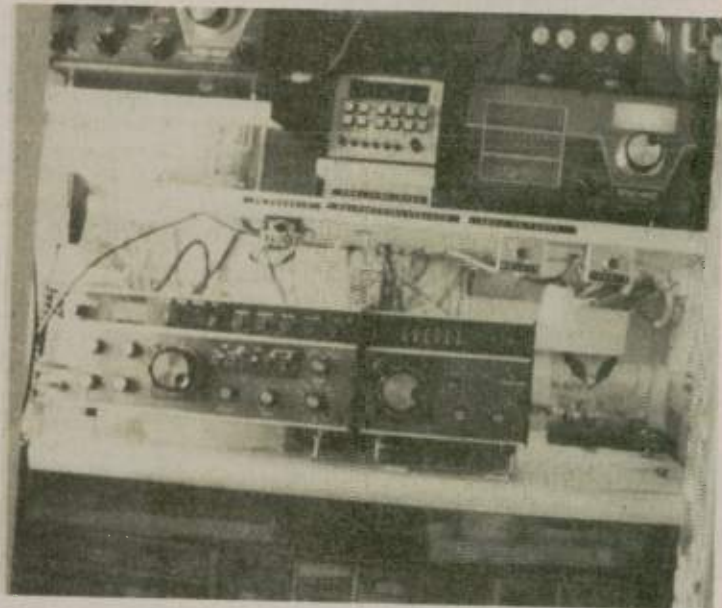
FEBRUARY WINNER

Myrton Billings, W2BIV/4

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.

Dr. Myrton J. Billings, W2BIV/4, of Hollywood, Florida is our February winner. As can be seen from the pictures, his is a unique station.

Billings writes: The equipment is housed in a 34"-wide hall closet, and four heavy shelves of 3/4" plywood were used. Because of the poor angle, I had to piece together two photos, but I have sent one picture of the overall installation. Many hams have commented on the neat, efficient installa-

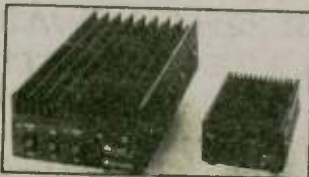


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tion and the use of a limited space.

I was first licensed in New York City in 1927 and received the General, which was the only license issued at that time. In 1929 I received one of the first amateur Extra First Class tickets, which were issued when the 20M phone band was opened up and this ticket was mandatory. This was many years later supplanted by the Advanced Class ticket. The station has been in constant operation and I am a devoted CW operator.

The bottom shelf supports a Ten-Tec Corsair 560 and the 263 remote VFO. To the right of this are the iambic keyer and hand keyer; a small 12V lamp illuminates this area. This shelf is 30" high and provides ample comfortable operating room. The two patch boxes over the keying area are for low band and 2M antennas.

The second shelf supports a Drake TR-4cw, Accu 2, electronic memory keyer and the RV-4C remote VFO; above this is the SL-56 audio filter. The coax switch can be seen in the

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background twice due to the overlap, which could not be helped.

The next shelf above supports the Astron RS-20A, the Ten-Tec 226 antenna tuner and the Drake MN-4 antenna tuner. The patch box below and to the left is the RF filter for the audio filter into which the headphones plug. To the right is the patch box to switch the audio filter to either rig. Below and to the rear is the patch box for switching the keyer between both rigs.

The extreme upper and lower shelves contain plastic boxes with spare parts and tools. To the back of the lower shelf are two heavy-duty power supplies. A Ramsay CT-70 Frequency Counter appears over the MN-4. My 2M gear includes a Kenwood TR-7950, IC-2AT and a Drake TR-220.

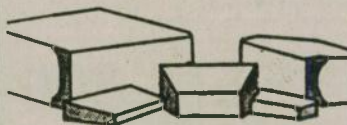
Our antennas have to be erected and removed every time we operate. These are lightweight and extended with a mono-filament pulley line and elastics. All our antennas are unconventional and work very well.

I am a retired dentist. I'm also a 55-year member of QCWA #348, a 50-year member of ARRL, and hold WAS, WAC, WAVE and DXCC, ARRL public service certificate, two awards from New York governors for public service when I was Emergency Coordinator of Kings County, and one presidential award. I helped establish one of the first Emergency Communication systems in Kings County, New York.

Although my activity is limited by condominium restrictions, I manage to operate in my own "Ham Know-How Way." □

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Code Matters



Loraine
McCarthy, N6CIO
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Practice do's and don'ts

This month, let's review more specifically the "do's" and "don'ts" of practicing code. When talking with students who are experiencing some difficulties with their code progress, I usually find that making changes in their practicing habits will correct most problems. So let's take a more specific look:

Practice do's

1) Practice the code *writing* it down. Listening alone is not sufficient. You must make the translation and get it down on paper.

2) Copy the code letter by letter. If you miss a letter, write down the next letter you hear and keep *writing*.

3) Write in the manner that comes naturally for you. Usually students

don't have difficulty getting the code written down until about 16-18 wpm. Prior to that, the hold-up is the "translation" that delays the hand.

4) Work with a character speed that is similar to the exam. The Novice and General exams are usually given at a character speed of 13 wpm, and the Extra at a character speed of 20 wpm.

5) Check your work. After copying a section of code, try to read it as if it were text. Identify any letters you are consistently missing for selected practice. Do this before you listen to the answer.

6) When practicing sample QSO's simulate the exam setting. Make up two or three versions of sample tests and take one after each practice QSO.

7) Save your practice in a notebook so you can review your progress.

8) If you have equipment, try some code on the air!

9) Practice hand-sending any letters that are giving you difficulty. Close your eyes and listen to the sound of the letter. Do this for just two or three minutes each day. Make associations with that letter, such as words that are important to you (e.g., a family member's name).

10) Most important: Stay positive and be *GOAL ORIENTED!* Keep a record of your daily practice and have a date in mind that you plan to test.

Practice don'ts

1) Do not study the code by sight; learn it by sound.

2) Use car practice only as a backup to writing the code down. I don't count listening in the car as part of your daily practice time.

3) When practicing, do not compare yourself or your progress to anyone else. As with anything else, learning code is an individual thing.

4) Don't *overpractice!* If you become tired or frustrated in a practice

session, you probably have practiced too long. This will tend to work against you. If this occurs, put your practicing aside and come back to it a little later.

5) Try not to miss a day of practice. If you are short of time on a given day, try to write at least 15 minutes to maintain.

6) When practicing, if you find that you are not doing well or if you miss a letter, do not stop your recorder and start again. Try to write for about five minutes at a time to build up endurance as this is the length of a test. If you continually stop the recorder and start again, you are not challenging yourself.

7) Do not copy the same material or QSO over and over again as this tends to promote memorization instead of code copy.

8) Do not put off taking the test if you think you might be ready! Go ahead and give it a try and remember — if you do not get a passing score the first time, evaluate what needs improvement, practice more and reschedule another test!

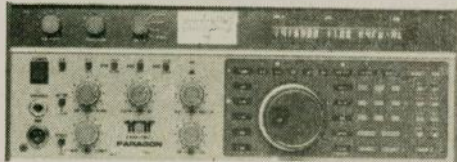
Now check yourself against these practice "do's" and "don'ts," and if you are experiencing some difficulty, see if you can correct it by changing some practice habits. If you have a good technique that has worked well for you, drop me a note if you would like to share it. See you in April!

Here at Radio School, we have sample exam tapes at 5, 13 and 20 wpm: Also random tapes at 5-7, 13-15 and 20-22 wpm. If you would like to order one of these, single tapes are \$9.95 plus 75¢ for P&H. Theory courses for Novice, Technician-General, Advanced and Extra are available for \$19.95 each plus \$3 P&H. If you would like to place an order you may write to me direct: Loraine McCarthy, N6CIO, Code Instructor, 315 1/2 Ruby, Balboa Island, CA 92662. □

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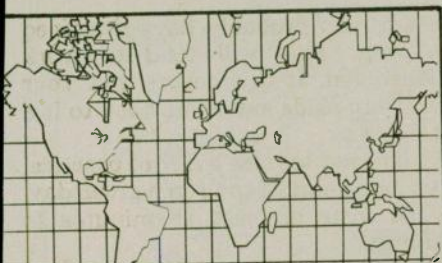
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Marin radio class

The Marin ARC will offer a 10-week Novice Radio License Course starting Wednesday, January 27. The class will be conducted at Building 549 Hamilton Air Force Base. Classes will start at 7:30 p.m. and include both the code and theory necessary to pass the FCC Novice Class license examination. Instruction will be free and open to all ages.

For information or registration, contact either of the following instructors: Nels Lecklikner, N6AQY, (415) 897-8950; Ron Baker, KE6IT, (415) 883-0942. Or leave a message at (415) 883-9789, the Marin ARC, at any time. □



DX WORLD

John F.W. Minke III, N6JM

6230 Rio Bonito Drive Carmichael, CA 95608

Activities Calendar

| | |
|-----------|-------------------------------------|
| 16-17 Jan | MRASZ Hungarian DX Contest (CW) |
| 30-31 Jan | UBA/REF French Contest (CW) |
| 06-07 Feb | RSGB 40M Contest (SSB) |
| 13-14 Feb | VERON PACC Dutch Contest |
| 13-14 Feb | RSGB 160M Contest (CW) |
| 13-14 Feb | SRJ Yugoslavian DX Contest (CW) |
| 20-21 Feb | RSGB 40M Contest (CW) |
| 20-21 Feb | ARRL International DX Contest (CW) |
| 27-28 Feb | UBA/REF French Contest (SSB) |
| 05-06 Mar | ARRL International DX Contest (SSB) |
| 26-27 Mar | CQ World-Wide WPX Contest (SSB) |

W-100-N

Two Worked 100 Nations Awards were processed this period:

- 325. YC7DF Chairil Hamid
- 326. W6BDD Don Raduziner

Chairil completed all his contacts on 15M SSB and is one of the many amateurs from Indonesia to apply for this world-famous award. Don collected the necessary QSL cards for all his contacts made during the year 1987.

Seychelles (S79)

Very active recently was S79WS which was operated by DJ6QT. He was reported on several bands, including the new WARC bands. In fact, he was on all the bands 10 through 160M. Even RTTY contacts were given out by S79WS. He is scheduled to be leaving soon, although we do not have a date.

Also active from the Seychelles is S79D, who was reported on both CW and SSB. The single CW report was 14.031 MHz at 1930 UTC near the end of November. He was also reported on 14.207 MHz working Europeans at 1745 UTC and the East Coast on 15M near 21.245 MHz around 1830 UTC.

Western Sahara (S0)

Martti Laine, OH2BH, through QRZ DX, reports that a total of 11,864

contacts were made during the S0RASD DXpedition, using a TS-430S, a TH3 and dipoles. The band breakdown is as follows:

| Band | SSB | CW |
|------|-------|-------|
| 10M | 450 | 48 |
| 15M | 665 | 672 |
| 20M | 5,622 | 1,840 |
| 40M | 177 | 2,013 |
| 80M | 148 | 172 |
| 160M | 37 | 19 |

DXers in Europe amounted to 4,764 of the contacts, with the Americans close behind with 4,554. By the time you read this, the DX Advisory Committee will have made up its mind whether or not to accept this one for new country status.

Brunei (V85)

Several stations have been reported from this one, although none of them appear to be very active. Three reports were found for V85BA, all on different bands. On 75M, V85BA was worked on the West Coast around 1430 UTC on 3.793 MHz; later, on 40M at 1530 UTC, he was putting a signal in the Yukon on 7.077 MHz. Check 20M near 14.175 MHz around 0030 UTC, as he was reported working the Midwest on October 30.

The pages of *Long Skip* show three stations — V85AR, V85NO and V85RM, all on 14.225 MHz working into Ontario at 1500 UTC. This would suggest some lucky Canadian DXer grabbed three with one shot.

Other Brunei stations include the following, with the usual frequencies and times:

| | | |
|-------|--------|------|
| V85AA | 7.003 | 1430 |
| V85HG | 14.200 | 1330 |
| V85JB | 14.215 | 1530 |
| V85RA | 14.175 | 1230 |
| V85TT | 21.026 | 2315 |

Hong Kong (VS6)

Very active from Hong Kong on the bands is VS6DO, especially the lower bands. For 160M check 1.824 MHz from 1300 UTC. He has also been reported worked on both coasts of North America on 80M. Listen near 3.504 MHz after 1200 UTC.

Other frequencies to look for VS6DO include 7.002 MHz at 1200 UTC, 14.017 MHz at 0030 UTC, 21.005 MHz at 1315 UTC, and 28.017 MHz at 0745 UTC. Unfortunately, the

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|-----------|-----------|-----------|-----------|
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10M opening here was only into Europe. QSL cards for VS6DO are now handled by Mary Anne Crider, WA3HUP.

Charlie Hanchett, VS6UA, is also active most mornings on 15 and 10M. Look for him after 2300 UTC.

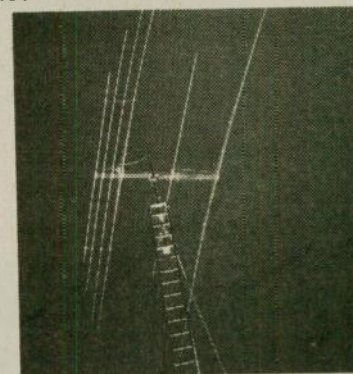
Several other stations from Hong (please turn to page 34)

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IC-28A/28H

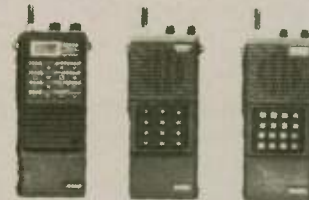


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DX World (from page 31)

Kong were reported during the month of November and include (frequencies are MHz, times are UTC):

| | | |
|-------|--------|------|
| VS6CC | 3.506 | 1415 |
| VS6CT | 14.209 | 2345 |
| VS6BL | 14.023 | 2345 |
| VS6TQ | 14.016 | 2345 |
| VS6UN | 21.017 | 1000 |
| VS6UO | 7.008 | 2145 |
| VS6UP | 7.004 | 1415 |

Karl Renz, K4YT, is reported to now be in Hong Kong and will be signing with VS6EC.

Nepal (9N1)

The Colvins, of Yasme DXpedition fame, are reported to be operating from Nepal after finishing their XE2GKG operation in Mexico and should have begun operations the same time as the Japan UNICEF Ham Club DXpedition to celebrate the king's birthday with the call 9N5YDY.

Father Moran, 9N1MM, has been reported a couple of times on 20M, both CW and SSB. Check 14.022 MHz around 1700 UTC and 14.190 MHz at 0100 UTC. Also reported was 9N1MC near 14.198 MHz around 1300 UTC.

Sri Lanka (4S7)

DX News Sheet reports that Hubert and Nanda Lorenz, DK1ZN and DJ0CP, will be active from Sri Lanka during their annual holiday from December 28 through January 28, 10 through 20M, SSB, CW and RTTY. Nanda will sign 4S7YLR and Hubert will sign DK1ZN/4S7.

The DX Bulletin notes that Toshi Kawanishi, JA8RUZ, will continue to Sri Lanka after the completion of his 9N5YDY DX pedition to Nepal. No call has been assigned as yet, but the operation was planned the first week in January.

Ernest Amarasinghe, 4S7EA, and Shanti, 4S7WP, have been very active from this one along with a few others. The most popular band is, of course, 20M. We shall try to break them down by band and/or mode. West Coast stations should take a listen via long-path.

| | | |
|-------|--------|------|
| 4S7RO | 7.004 | 1230 |
| 4S7NE | 7.004 | 0100 |
| 4S7EA | 14.018 | 0030 |

| | | |
|--------|--------|------|
| 4S7VJ | 14.020 | 1845 |
| 4S7WP | 14.002 | 0030 |
| 4S7WG | 14.002 | 0145 |
| 4S7EA | 14.172 | 0130 |
| 4S7NMR | 14.188 | 0200 |
| 4S7NB | 14.202 | 1300 |
| 4S7RO | 14.195 | 0200 |
| 4S7VK | 14.176 | 0200 |
| 4S7WP | 21.004 | 1530 |
| 4S7NMR | 28.510 | 1000 |

| | | | |
|------------|---------|-----------|---------|
| DL2ZAD/KC6 | —DL2ZAD | KC6CS | —JE1JKL |
| ED1A1 | —EA1PJ | KC7RD/5N9 | —KE2BH |
| FJ0A | —F6AJA | KF1V/PJ7 | —KF1V |
| HX6IFO | —FF6URA | KP2A | —N6CW |
| HZ1AB | —K8PYD | KP4HL/KP5 | —NG7X |
| HZ1HZ | —N7RO | L2D | —LU5EIC |
| J6DX | —W8UMD | LU1ZA | —LU2CN |
| K4YT/DU8 | —KE3A | LX9BV | —DL7MAE |
| K4YT/418 | —KE3A | N3JT/HK0 | —N3JT |
| | | N8BJQ/J6 | —W8IMZ |

Visalia

Now is the time to prepare yourself for the biggie of the year. On April 22, 23 and 24, the Southern California DX Club will host the 1988 International DX Convention, to be held at the Grosvenor Holiday Inn in Visalia. The program has not been finalized as of yet, but you will not be disappointed.

The cost this year is \$38, which includes the Saturday evening banquet and a Sunday brunch. Send your registration prior to February 28 to Don Bostrom, N6IC, 4447 Atol Ave., Sherman Oaks, CA 91423. Make your check payable to International DX Convention. If you apply after that date, it will cost you an additional \$6.

You must make your own hotel reservations direct to the hotel at (209) 651-5000. Do not use the 800 number.

Antique QSL Department

Don Gumpertz, K6OF, takes us back in time this month to the year 1937. Don worked J8CB of Keijo in Korea on 40M. The date was given as 2-11-1937, but we don't know if it was February or November. At that time Korea belonged to Japan and was included in the 8th call area. In those days Don was using his original call — W6LCD.



QSL routes

| | | | |
|-------|---------------|-----------|--------|
| AY6OF | —LU4FM | CW4C | —CX4CR |
| BV0RY | —JG1RVN | CW5A | —CX5AO |
| BY1QH | —(See Note 1) | CW8B | —N7RO |
| CW2A | —CX2AAL | DF6FK/KC6 | —DF6FK |

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FEBRUARY 1988 WEST COAST

| UTC | AFRI | ASIA | OCEA | EURO | SO AM |
|-----|------|------|------|------|-------|
| 10 | (10) | 11 | 14 | (8) | 13 |
| 12 | (10) | 10 | 13 | (8) | 12 |
| 14 | (19) | 10 | 13 | (15) | 31 |
| 16 | 26 | 10 | 18 | 19 | 35 |
| 18 | 28 | (10) | 16 | (15) | 37 |
| 20 | 23 | 20 | 23 | (9) | 38 |
| 22 | 19 | 28 | 30 | (9) | 38 |
| 24 | (17) | 30 | 34 | (8) | 29 |
| 2 | 15 | 26 | 35 | 8 | 21 |
| 4 | 12 | 13 | 21 | 8 | 18 |
| 6 | (11) | 12 | 18 | 9 | 16 |
| 8 | (10) | 11 | 16 | (9) | 14 |

CENTRAL USA

| UTC | AFRI | ASIA | OCEA | EURO | SO AM |
|-----|------|------|------|------|-------|
| 8 | (12) | 9 | (14) | 8 | 14 |
| 10 | (12) | 8 | 13 | (8) | 13 |
| 12 | 30 | 8 | 12 | 16 | 24 |
| 14 | 36 | 9 | 21 | 22 | 32 |
| 16 | 38 | (8) | 18 | 21 | 35 |
| 18 | 28 | (8) | (16) | 18 | 37 |
| 20 | 23 | (16) | 24 | (10) | 38 |
| 22 | 19 | 22 | 30 | (9) | 38 |
| 24 | 16 | 22 | 35 | 9 | 29 |
| 2 | 14 | 17 | 29 | 8 | 20 |
| 4 | 13 | (10) | 18 | 8 | 17 |
| 6 | (13) | (9) | (16) | 8 | 15 |

EAST COAST

| UTC | AFRI | ASIA | OCEA | EURO | SO AM |
|-----|------|------|------|------|-------|
| 7 | (12) | (8) | (14) | 8 | 14 |
| 9 | (12) | 8 | 13 | (8) | 13 |
| 11 | 31 | 8 | 12 | 20 | 23 |
| 13 | 36 | 9 | 21 | 23 | 30 |
| 15 | 39 | (8) | 18 | 23 | 34 |
| 17 | 32 | (8) | (16) | 21 | 36 |
| 19 | 26 | (8) | 24 | 16 | 38 |
| 21 | 21 | 20 | 31 | (10) | 38 |
| 23 | 16 | 20 | 35 | 9 | 32 |
| 1 | 15 | (10) | 28 | 8 | 21 |
| 3 | 13 | (9) | 17 | 8 | 18 |
| 5 | 13 | (9) | (15) | 8 | 16 |

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|-----------|--------------|----------|--------------|
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| PJ1B | -N2MM | VS6UA | -W2YM |
| PJ2/W1BIH | -W1AX | WY6L/KH3 | -N6DAS |
| | (See Note 2) | XF1C | -WB6JMS |
| PJ7X | -KF1V | YB0ARA | -WA6AHF |
| S01A | -EA2JG | YJ0A | -K6BDX |
| S79WS | -DJ6QT | ZC4DX | -DJ9ZB |
| | (See Note 3) | ZK1XE | -OH1RY |
| SU1ER | -N6CW | ZY0FWW | -PY7ZZ |
| | (See Note 4) | ZZ51W | -PP51W |
| SU1MR | -N6CW | 3A7F | -3A2LF |
| | (See Note 4) | 3X0HBR | -DL5LAY |
| SV0EQ | -KE2BH | 4U1ITU | -W1RR |
| SV0FE | -K0TLM | | (See Note 7) |
| T5GG | -I2MQP | 5H1HK | -JH4RHF |
| | (See Note 5) | 5R8VT | -K6VT |
| T32BA | -DL2ZAD | 5T5NU | -P6FNU |
| T32BB | -DF6FK | 5Z4DU | -KE4DA |
| T62SI | -DJ6SI | 5Z4FA | -JA6XZS |
| T77F | -I2WWV | 5Z4JD | -N6TJW |
| TI9M | -TI8CBT | 5Z4SS | -JA1ODC |
| | (See Note 6) | 7P8DN | -W8JBI |
| TV9DX | -FD1DBT | 7P8DP | -W8JBI |
| V31EA | -K6BWX | 8A11T | -YB6MF |
| VE7CRW/ | | 8P9HQ | -K3ZR |
| VE8 | -VE7CRW | 8P9HR | -K4BA1 |
| VE8CDX | -VE3CDX | 8P9HS | -K4BA1 |
| VK9YD | -OH5VD | 8P9HT | -K4BA1 |
| VK9YE | -VE3MMB | 8P9HU | -K4BA1 |
| VP2MU | -K8UE | 8P9HV | -N4TX |
| | (See Note 7) | 9J2EZ | -I4FGG |
| VP6W | -WW6F | 9M6ZR | -WA2HZR |
| VP8AEF | -RSGB | 9N5YDY | -JA8RUZ |
| VP8BKQ | -G4ORQ | | |

Nations Award during the past year. If they could work the DX, you can too, even if you only have a dipole. Good luck and have fun in 1988! Very 73 de John N6JM. □

The other members of the party will include Lefty Boggess, KE4VU, Dan Cisson, N4GNR, and Bob King, W3GH. A charter has been arranged from Kingston, Jamaica, on the 70' Holiday I. The DXpedition will be operating sideband as N2AEDF/KP1, and CW as K2SG/KP1, 160 through 10, 24 hours a day, with the possibility of RTTY and SSTV. QSL will not be via home call, and will be announced later.

Navassa Island

Bob Shelton, N2EDF, and Tony De Biasi, K2SG, of the 1985 6Y5NR/KP1 DXpedition will lead an assault on KP1-Navassa Island from February 10 through 18.

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

- J87LC -P.O. Box 389, Roseau, DOMINICA
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 TA2/N4EXR -Glenn Whited, Box 208, APO New York, NY 09254
 VS6TQ -P.O. Box 541, HONG KONG
 Y10BIF -P.O. Box 7075, Baghdad, IRAQ
 ZB2EO -P.O. Box 634, GIBRALTAR
 5T6RA -P.O. Box 14, Kaedi, MAURITANIA
 7P8CB -Jose, Mahuti Hospital, Box X019, Ficksburg 9730, REPUBLIC OF SOUTH AFRICA
 7P8DX -P.O. Box 333, Maseru, LESOTHO

- Notes**
1. For mid-November contacts with Mike, you may QSL via NS7Z. All others should be sent direct to BY1QH.
 2. The address is OK in the Callbooks for W1AX, except for 1986.
 3. Use the 1987 Callbook address only.
 4. This applies for contacts made with SU1ER November 24 and 25; SU1MR November 17-23.
 5. Do not send any cards direct to T5GG, as his mail is not getting through. It is suggested that you wait until T5GG is accepted at the DXCC desk.
 6. Send your TI9M cards to TI8CBT direct only. Do not use the bureau.
 7. This applies for contacts made during the CQ World-Wide November 1987 test only.

Contributors this month include K6OF, W1BIH, The Salt City DX Association (KB2G), Western New York DX Association, Kansas City DX Club (AB0X), Southern California DX Club (NK6A), Western Washington DX Club (K7ZR, *DX News Sheet* (G4DYO), *The Long Island DX Bulletin* (W21YX), *Inside DX* (N2AU), *Long Skip* (VE3IPR), *QRZ DX* (W5KNE) and *The DX Bulletin* (VP2ML).

Although the propagation was poor in 1987, determined DXers did not let that bother them. DXers such as Jay O'Brien, W6GO, completed his Golden Jubilee DXCC within the first couple of days last January and Don Raduziner, W6BDD, worked his 100 nations for Worldradio's Worked 100

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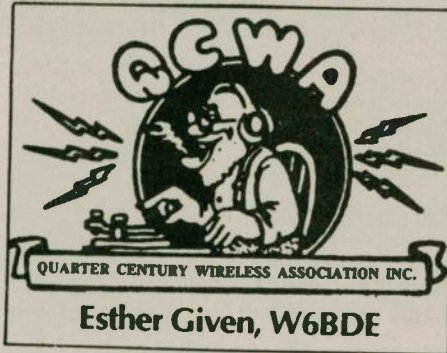
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QCWA announces its 31st QSO Party, which affords members an opportunity to meet and greet each other on the air each year, avail themselves of QCWA contact certificate requirements and enjoy the fun.

The CW Party will begin Saturday, February 13, at 0001 UTC and end Sunday, February 14, at 2400 UTC. The Phone Party will start Saturday, March 12, at 0001 UTC and conclude Sunday, March 13, at 2400 UTC. Plaques will be awarded to top score entrants in each party.

QCWA was 10 years old when Stan Belliveau, W7AYO, originated the idea in 1957, and with the help of Dr. Spike, W7OW, and Charles Emigh, W7ER, Party #1 was launched. Each successive year has proved that more and more members enjoy the QSO Party, renewing old acquaintances and making new ones.

Rules: The 1988 event allows 1 pt. for each QCWA member contacted on each band. In addition, 2 multipliers may be used — 1 for members of each different chapter worked (a chapter can only be counted once regardless of number of times logged). Members not affiliated with chapters will report themselves "AL," meaning at large rather than chapter affiliated. A multiplier of 1 may be used for each different state, province or country reported by AL's. The total number of contacts \times the total number of multipliers = the final score.

A valid QSO must contain QSO number, operator's first name and QCWA chapter or "AL" identification. (The latter must include state, province or country.)

Contacts may be made on any authorized amateur frequency. However, no crossband, net or repeater contacts are accepted.

Logs: CW logs must be mailed to El Charlton, 1533 Outrigger Dr., Baton Rouge, LA 70816 and Phone logs to William Goforth, W5URR, 3540 Delaware St., Baton Rouge, LA 70805. All logs must be received by these Baton Rouge Chapter 109 tellers by April 13, 1988. Full information can be found in the winter issue of the *QCWA Journal*.

The Quarter Century Wireless



Three of the 13 surviving QCWA charter members attended the October 30-31 QCWA convention in San Diego, California, where they were awarded spark gap replicas. *From left to right: Dave Talley, W2PF; QCWA President Leland Smith, W5KL; Moe Jaffee, W6THE; and Bob Baird, W9NN. (Photo by George Mitchell, K6ZE)*

Association is an organization of over 10,000 hams who were licensed 25 or more years ago. Dedicated to the promotion of interest in Amateur Radio communication, advancement of the electronic art, and making use of the reservoir of knowledge and experience of its membership, QCWA's major commodity is fellowship. It offers time-tested operators the opportunity

to share their years of experience in Amateur Radio through the exchange of ideas and amiable reminiscence.

In addition, its 165 chapters offer many members the opportunity to meet together for social enjoyment. Members who operate QCWA booths at conventions or hamfests are always amazed at the number of eligible amateurs dropping by who had no idea of the existence of an organization made to order for them.

Now that a new year is underway, amateurs presently licensed whose original ham tickets were issued in 1963 or earlier are eligible for QCWA membership. Licensing need not be 25 continuous years, and the actual anniversary day or month is not important. It is the *year of first license* that counts; thus, anyone first licensed any time in 1963 became eligible for QCWA membership on January 1, 1988.

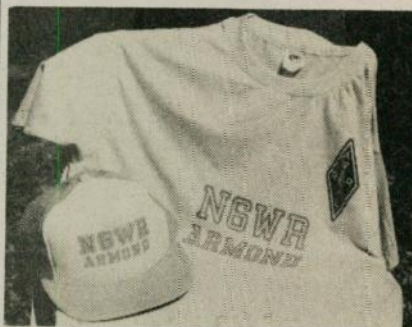
Applicants should submit original and previous call signs, and QTH's. YL's should be sure of correct last name(s). Applications are available from QCWA Headquarters, 1409 Cooper Dr., Irving, TX 75061 or any chapter secretary.

Two important name changes were sanctioned by the QCWA Board of Directors at its annual meeting in San Diego the end of October.

The quarterly publication has been renamed the *QCWA Journal*. The Board recommended emphasis be placed on publishing more scientific and educational information as benefits an organization of its caliber.

The second name change involved granting the request of New York Metro Chapter 46. This group evolved from the original establishment of the Quarter Century Wireless Association and wishes to honor those founding members. It will henceforth be known as Founders' Chapter 46. As noted in previous writings, the New York group did not apply for chapter status until 45 others had done so, thus missing out on being numero uno. □

Only One Person in
the World has your call . . .
YOU!



Letter style on shirt is "Ivy Open" and on cap is "Sportswear."

Now you can wear and display your call, name and your club name on a high-quality T-shirt for only \$10.00. Your call, name and A.R.R.L. logo (if desired), printed on shirt front, with club name printed on shirt back. Shirts (sizes S, M, L, XL) are available in light blue, light yellow, beige (tan) or white. A.R.R.L. logo available in 2 1/4" x 5" or 1 3/4" x 3" in red. Lettering is available in two styles — Ivy Open or Sportswear — and the following colors: black, royal blue, maroon, brown, green, red, or orange. For individual orders please add \$1.50 per item for shipping and handling. Club orders (would prefer quantities of 10 or more) are shipped postpaid.

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Pomona, CA 91768

California residents add 6% sales tax.

Visit Your Local RADIO CLUB.

ALABAMA

Birmingham Amateur Radio Club, Inc. (BARC)
Meets at the American Red Cross Building
2225 3rd Ave. North in downtown Birmingham, Alabama
1st and 3rd Thursdays/monthly at 7:30 p.m.
For info call Chuck Conkell, N4MLN, (205) 833-9555

Montgomery Amateur Radio Club, Inc. (W4AP)
Alabama State Trooper District Office
Intersection of Coliseum Blvd. & Federal Dr.
Randy Smith, N4LZK, (205) 832-4598
Meets 3rd Monday/monthly — 7:00 p.m.

ALASKA

Arctic Amateur Radio Club
Geophysical Institute West Ridge U of A
PO Box 81389
College, AK 99708
1st Friday/monthly - 7:30 p.m.

ARIZONA

Arizona Amateur Radio Club
Meets 2nd Thursday/monthly — 7:30 p.m.
1510 E. Flower Street, Phoenix, AZ
Net: W7IO Information Net every Thurs., 7:00 p.m.
W7WGW/R 147.88/147.28 Rptr.

Old Pueblo Radio Club
Meets: 2nd Wednesday/monthly — 7:30 p.m.
Location: Franklin Building
University of Arizona
N.E. corner of 6th St. & Park.

Tucson Repeater Association
P.O. Box 40371, Tucson, AZ 85717-0371
2nd Sat./monthly — 7:30 p.m., Pima Co.
Communications Bldg., 2145 E. Ajo. Net Thurs. 7:30 p.m.
146.28/88 (146.22/82, 147.68/08, 147.70/10-PKT)

CALIFORNIA

Amador County Amateur Radio Club
P.O. Box 1094, Pine Grove, CA 95665, Pioneer Elementary
School, Pioneer, CA • 1st Thurs/monthly 7:30 p.m.
WA6WIY Rptr. — 146.835, 146.235.
Net Tues. 7:30 p.m.

Associated Radio Amateurs of Long Beach, Inc. W6RO
P.O. Box 7493, Long Beach, CA 90807
Meets: 1st Friday/monthly — 7:30 p.m.
Signal Hill Recreation Hall
1708 E. Hill St., Signal Hill, CA

Citrus Belt Amateur Radio Club
777 East Rialto Ave.
San Bernardino, Calif.
P.O. Box 3788, Zip-92413
Meets: first Friday/monthly—7 p.m.

Coachella Valley Amateur Radio Club (CVARC)
Columbia Savings and Loan Association
Highway 111 and Highway 74
Palm Desert, CA 92260
1st Monday/monthly 7:30 p.m.

Contra Costa Communications Club WD6EZC/R
P.O. Box 661, San Pablo, CA 94806
Meets 2nd Sunday at 8:00 a.m.
Hickory Post Restaurant/Lucky Lanes
For info call Carl KA6OLK (415) 237-2621

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

Gabilan Amateur Radio Club
South Valley J.H.S.
385 IOOF Ave. • Gilroy, CA 95020
Meets: 2nd Thursday/monthly — 7:30 p.m.
Talk-In 145.47-

Golden Empire Amateur Radio Society (VEC)
P.O. Box 508 • Chico, CA 95927
Club call W6RHC — Repeater 146.25/85
Meets at Esplanade House, 1528 Esplanade
Room 101, 3rd Friday/monthly — 8:00 p.m.

The Hayward Radio Club, Inc.
Fire Station #6 — 1401 West Winton Ave.,
Hayward, CA. Classroom in back of station.
Meets: 3rd Friday/monthly — 7:30 p.m.
For info contact Mrs. Elfy Griffiths N6DOC

Hilltop Amateur Mastertie System (HAMS)
Informal mtgs. weekly/Mon. 5 p.m. at Shakey's Pizza,
12924 Washington Blvd., Mar Vista, CA.
Meets 3rd Mon./monthly at Bicycle Shop Cafe,
12217 W. Wilshire Blvd., W. LA. Info, N6FD 213/823-0767

Kern River Valley Amateur Radio Club
P.O. Box 1902 • Lake Isabella, CA 93240. Meets 4th
Sat./monthly at 4 p.m. (Pot Luck). Veteran's Hall, Lake
Isabella WA6UYW Reprts.—146.085/146.685 224.22/Down
1.6 WB6ODZ Repr.—224.58 Down 1.6. Low-Level

Livermore Amateur Radio Klub (LARK)
St. Bartholomew's Episcopal Church
Meets: 3rd Saturday/monthly — 9:30 a.m.
Net Mondays 7:00 p.m. 147.12 +
For info call WD6J (415) 829-5229

Marin Amateur Radio Club (MARC) W6SG
Box 1231, San Rafael, CA 94901. Meets 1st Fri./8 p.m.;
MARC Clubhouse Bldg. 549, HAFB, Novato, CA (415) 883
9789 (Summer exceptions; contact Pete N6IYU, 924-1578)
Sunday AM Club at Red Cross, San Rafael

North Hills Radio Club
P.O. Box 41635, Sacramento, CA 95841
3rd Tuesday/monthly — 7:30 p.m., Carmichael Elks Lodge
5631 Cypress Ave. • Carmichael, CA
Net 145.19 Thur. at 8:00 p.m.

Radio Amateur Mobile Society
Meets: 2nd Tuesday/monthly — 7:30 p.m.
Carmichael Elks Bldg.
Cypress and Hackberry, Carmichael, CA
Net Saturday a.m. 224.84 8:30/146.79 9:00

River City A.R.C.S.
Meets: 1st Tuesday/monthly — 7 p.m.
SMUD Building, Room A
Elkhorn and Don Julio, Sacramento, CA
For info: (916) 483-3293

Sacramento Amateur Radio Club, Inc.
Contact: Bob Lyman, K16FT, (916) 726-2694
Meets Sacramento Blood Bank
32nd St. & Stockton Blvd., Sacramento, CA
2nd Wednesday/monthly-7 p.m.

Sacramento "Old Timers" Ham Radio Brkfst Club
Meets 2nd Wednesday/monthly — 8 a.m.
Carrows Restaurant near Watt Ave. and Hwy 80 exit
For info contact Paul Wolf, W6RLP (916) 331-1830

San Fernando Valley ARC Inc. (W6SD)
Meets 3rd Friday/monthly — 7:30 p.m. • Red Cross
Bldg. 14717 Sherman Way, Van Nuys, CA 91407. Exams
8 a.m. 1st Sat./monthly • Pre-registration via P.O. Box
3151, Van Nuys, CA 91407

San Gabriel Valley ARC
Bowling Green Clubhouse
405 S. Santa Anita Ave. • Arcadia, CA 91006
Meets: 1st Tuesday/monthly — 7:30 p.m., except Dec.
W6QFK — Repeater 147.165/765

San Mateo Radio Club
Beresford Park Recreation Center
28th Ave. and Alameda de las Pulgas
San Mateo, CA 94403
3rd Friday/monthly — 7:30 p.m.

Santa Clara County Amateur Radio Assoc. W6UU
P.O. Box 6 • San Jose, CA 95103. W6UU 146.385 +
Meets: Santa Clara County Service Center
1555 Berger Dr., Building 2 Auditorium
2nd Monday/monthly — 7:30 p.m.

Santa Clara Valley Repeater Society (SCVRS)
P.O. Box 3085 • Sunnyvale, CA 95087
(408) 247-2877. 146.76 (-600 KHz),
224.26 (-1.6 MHz), 444.60 (+5 MHz). 2 meter/220 net
Mon. 9 p.m. • Mtgs.—3rd Fridays.

Sierra Foothills Amateur Radio Club
P.O. Box 3262 • Auburn, CA 95604
Office of Education Bldg., 360 Nevada St. Auburn, CA
Meets: 2nd Friday/monthly — 7:30 p.m. Nets: Tues.
7:30 p.m. 28.443 MHz. Thurs. 7:30 p.m. Rptr. 145.43/223.86

Solano County Amateur Radio Society
P.O. Box 457 • Fairfield, CA 94533
Meets: 3rd Wed. 7 p.m. — Vanden High School
441.150 + 5 (Remote 145.69 simplex)
PL 77Hz, (707) 448-1461

South Bay Amateur Radio Association
Los Cerritos Community Center, Fremont, CA
Dick Melcher, WA6MDI
Call-in 147.615/015
Meets: 3rd Wednesday/monthly — 7:30 p.m.

Southern Calif. Amateur Transmitting Society (SCATS)
P.O. Box 1770 • Covina, CA 91722
Meets: Cortez School
2226 E. Rio Verde Dr. • West Covina, CA 91791
1st Monday/monthly — 7 p.m. (coffee 6:30 p.m.)

Stanislaus Amateur Radio Assoc. (SARA)
P.O. Box 4601 Modesto, CA 95352
Stanislaus Co. Administration Bldg.
12th & H Streets • 3rd Tues./monthly — 7:30 p.m.
145.39 MHz WD6EJF, 223.68 MHz

Stockton-Delta Amateur Radio Club, Inc.
U. of the Pacific, Rm 122
Kensington & Mendocino
2nd Wed. monthly, 7:30 P.M.
Rptr. 147.165/765 Net Wed. 8:00 P.M.

Tehama County Amateur Radio Club
13620 Trinity Ave. • Red Bluff, CA 96080
Meets: 1st Friday — 7:00 p.m.
Lincoln Street School
Net Wednesday 8:00 p.m. 147.705 repeater

The Trinity County ARC
P.O. Box 2283, Weaverville, CA 96093
Meets 2nd Wednesday/monthly,
at the CD Hall in Weaverville, — 7:30 p.m.
WD6FHX Repeater 146.13/73

Victor Valley Amateur Radio Club
P.O. Box 869, Victorville, CA 92392
Meets: Victor School Board Room, 6th & "A"
2nd Tuesday/monthly — 7:30 p.m.
WA6EFW Repeater 146.34/146.94

Western Amateur Radio Assoc.
Cerritos Park East
166th St. and Carmenita Ave.
Cerritos, CA.
1st Tuesday/monthly 7:00 p.m. - 145.400

Yucaipa Valley Amateur Radio Club (YVARC)
Gibraltar Saving's Community Room
34880 Yucaipa Blvd., Yucaipa, CA 92399
Pres: Fred Schmidt KG6QN (714) 794-1244
Meets: 3rd Monday/monthly — 7:30 p.m.

CONNECTICUT

Tri-City ARC
Groton Public Library
Route 117
Groton, CT 06340
2nd Tuesday/monthly — 7:30 p.m.

FLORIDA

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

Platinum Coast Amateur Radio Society
1150 S. Hickory St., P.O. Box 1004
Melbourne, FL 32902-1004
Meets: 2nd Monday/monthly at Melbourne Red Cross
Talk-in on 146.25/85 or 146.01/61 rptr.

Sarasota Amateur Radio Ass'n, Inc.
Meets: 3rd Tues./monthly — 8 p.m. on the 6th floor (board room) of the County Admin. Bldg. corner of 301 & Ringling Blvd. Club Rptr. W4IE, freq. 146.91/31, open to all. Phone patch *Up #Down. Welcome

South Brevard Amateur Radio Club
P.O. Box 2205 • Melbourne, FL 32902
Meets 1st Tuesday/monthly — 7 p.m.
Melbourne Library, 2275 S. Babcock St.
Melbourne, FL

HAWAII

Big Island Amateur Radio Club
P.O. Box 1938 • Hilo, HI 96721-1938
Meets: 2nd Tuesday/monthly - 7:30 p.m.
Helco Auditorium, 1200 Kilauea, Hilo
Call in: 146.88(-) or 146.76(-)

ILLINOIS

Bolingbrook Amateur Radio Society
P.O. Box 1429
Bolingbrook, IL 60439-7429
(312) 759-4747 • Call in 147.93/33
Meets: 3rd Monday/monthly — 7:30 p.m.

Chicago Suburban Radio Association (CSRA)
P.O. Box 88, Lyons, IL 60534
Meets 2nd Wed./monthly — 8 p.m. Community Rm.
Clyde Federal Savings & Loan Association
7222 W. Cermak Rd. • North Riverside, IL

Dupage Amateur Radio Club W9DUP
Mid-America Savings and Loan
55th & Holmes (55th St. near RT 83)
Clarendon Hills, IL • 4th Monday/monthly — 7:30 p.m.
Club repeater 145.250 — 600 KHz

Fox River Radio League
Valley National Bank, Lower Level
Northgate Shopping Ctr. & RT. 31, Aurora, IL
(312) 584-4925 for more information
Meets: 2nd Tuesday/monthly-7:30 p.m.

North Shore Radio Club
Karger Rec. Center—1850 Green Bay • Highland Park, IL
2nd Monday/monthly — 7:30 p.m.
For info call (312) 945-0356
WB9FRM Repeater 147.945-600, PL 1B

Six Meter Club of Chicago - K9ONA
Rptrs. 146.37/146.97 448.300/443.300
Info net - Tues. 9:00 p.m. 146.37/97
Annual Hamfest 2nd Sunday in June
Santa Fe Park, Willow Springs, IL

INDIANA

Fort Wayne Radio Club
James Wolf, KR9U
P.O. Box 15127 • Fort Wayne, IN 46885
The Salem Church
Meets: 3rd Friday/monthly — 7:30 p.m.

Northeastern Indiana Amateur Radio Club
P.O. Box 745, Auburn Indiana 46706
Meets: 2nd Tuesday/monthly — 7:00 p.m. at members homes
Daily traffic net at 2300Z
on 147.96/36 MHz, the WB9VDK repeater

MARYLAND

The Peninsula Radio Operators Society (PROS)
Family oriented activities — training and exams held throughout the year.
PROS Rptrs. 146.925 and 146.625
PROS, P.O. Box 2315, Salisbury, MD 21801

MICHIGAN

Hazel Park Amateur Radio Club
Hoover Elementary School - Hazel Park
P.O. Box 368-Hazel Park, MI 48030
2nd Wed. each month 7:30 p.m.
Sept. thru May 147.51 Simplex Call-In

South Eastern Michigan A.R.C.
Meets: 1st Friday/monthly—7:30 p.m.
Grosse Pointe North High School, Bldg. C, Cafeteria
Commons. For info contact: AK8I (313) 372-1252
W8FWC Rptr. 146.740/146.140

MISSOURI

St. Charles Amateur Radio Club, Inc. (SCARC)
St. Peters Civic Center, St. Peters, MO
I-70 and Salt Lick Road
Meets: 4th Tuesday/monthly—7:30 p.m.
WB0HSI Repeater 07/67

Heart of America Radio Club
211 W. Armour
Kansas City, MO
Meets: 3rd Tuesday — 7:30 p.m.

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

NEVADA

Frontier Amateur Radio Society (FARS)
Meets: 1st Friday at the Fly-N-Chef at 7 p.m.
Scenic Airlines Terminal, McCarran Airport,
Las Vegas, NV • Net Mondays 7:30 p.m. 145.39
Info: Bob Herrell, WB5PTO, 641-6682

NEW HAMPSHIRE

Great Bay Radio Assn., WB1CAG
P.O. Box 911, Dover NH 03820
(603) 742-0130/755-2600
2nd Sunday/monthly — 7:00 p.m.
Dover Dist. Court. Talk-in 147.57

NEW JERSEY

Gloucester County Amateur Radio Club (GCARC)
Woodbury V.F.W.
1st Wednesday/monthly—8:00 p.m.
Woodbury, NJ • Talk-in 147.18/78
For info call K2JF (609) 589-2318

South Jersey Radio Association (SJRA)
Pennsauken Sr. Hi Sch. at Hylton Rd. & Remington
Ave., Pennsauken, NJ 08109. Jan.-Oct. 4th Wed./month-
ly-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, Inc.
Harrison Street Firehouse
Bill McCarren, K2LV
(914) 738-0768
Meets: 1st Monday/monthly — 8 p.m.

Genesee Radio Amateurs (G.R.A.M.)
N.Y.S. Civil Defense Center
State St. • Batavia, NY 14020
Meets: 3rd Friday/monthly — 7:30 p.m.
147.255+ W2RCX

Hall of Science Amateur Radio Club, Inc.
P.O. Box 131, Jamaica, NY 11415 — HOSARC — 2nd Tuesday/
monthly — Hall of Science Building, 47-01 111 St., Flushing
Meadow Park at 7:30 p.m. The trisates' only 3-band linked
rptr. system 144.300 S/223.600 — /445.225 —

Radio Club of Junior High School 22 N.Y.C., Inc.
111 Columbia St. • New York, NY 10002
"At The Core of The Big Apple," QSLs invited.
For info contact WB2JKJ and "The Crew" learning
English thru Ham Radio at (516) 674-4072, 24 hrs.

Staten Island Amateur Radio Assn. (SIARA)
P.O. Box 495, Staten Island, NY 10314-0020
Meets 3rd Friday/monthly — 8:00 p.m.
Rm. B-201, College of Staten Island, Sunnyside
Club Repeater — W2CWW/R — 440.325/445.325

Westchester Amateur Radio Assoc. (WARA)
Scarsdale Village Hall
Scarsdale, New York
Meets: 1st Wednesday/monthly — 8:00 p.m.
For info call B. Dubbs, Pres. (WA2FSR)(914) 725-1191

NORTH CAROLINA

Raleigh Amateur Radio Society, Inc. (RARS)
P.O. Box 17124 • Raleigh, NC 27619
Meets: 1st Wed./monthly, 7:30 p.m. • First Presb. Church
Club net daily, 8 p.m. on RARS 04/64, W4DW
Annual Hamfest, 2nd Sunday in April

NORTH DAKOTA

Fork Amateur Radio Club
United Hospital, Grand Forks, N.D.
Call-in 34/94
Meets last Tuesday/monthly — 7:30 p.m.

OHIO

Amateur Radio Fellowship, Inc. (ARF)
N8HUN, Linda Delugach, Secretary
P.O. Box 2486 • Streetsboro, OH 44241
Meets: 1st Sat./monthly at Kent Wally Waffle
KA8PHO repeater 147.675/075

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

Northern Ohio Amateur Radio Society (NOARS)
K8KRG/WB8JBM • P.O. Box 354, Lorain, OH 44052
Meets 3rd Mondays/monthly—8 p.m. at Gargus Hall
Info: George—W8ANM • (216) 933-2841
Ohio's largest general interest club.

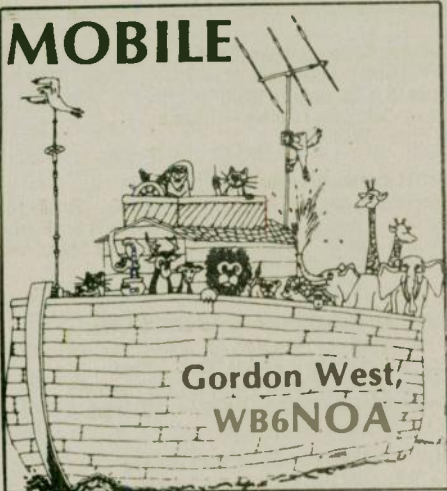
OREGON

Salem Amateur Radio Club (SARC)
Northwest Natural Gas Auditorium
3123 Broadway N.E.
Salem, Oregon 97303 • Talk-in 146.86
Meets 4th Tuesday/monthly — 7:30 p.m.

PENNSYLVANIA

Mercer County Amateur Radio Club — W3LIF
P.O. Box 996 Sharon, PA 16146
Meets: 4th Tuesday/monthly at 7:30 p.m.
at Shenango Valley Medical Center — Farrell, PA
Net — Thursdays 8:45 p.m. on 147.75/15 W3LIF/R

MOBILE



The unabashed West review

It's time to review products that I have been sent this past year. I am choosing those goodies that are most at home in a mobile installation or

Penn Wireless Assoc. Inc.
Falls Twp. Municipal Bldg.
Trenton Road
Fallsington, PA 19054
4th Monday/monthly — 8:00 p.m.

Warminster Amateur Radio Club
P.O. Box 113, Warminster, PA 18974
Meets: 1st Wednesday/monthly — 8:00 p.m.
at St. Johns Lutheran Church, Hatboro, PA
Net Wednesdays — 8:30, 147.09/69

UTAH

Ogden Amateur Radio Club
P.O. Box 3353
Ogden, Utah 84409
Meets: 3rd Wed./monthly—7:00 p.m.
at the Red Cross Bld., 20th & Washington

VIRGINIA

Southern Peninsula Amateur Radio Klub (SPARK)
Meets: 1st and 3rd Tuesdays
Salvation Army Community Bldg. • Hampton, VA
Operates 146/13 147/73 Repeater
For info call 480-2346 or 851-5573

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

WEST VIRGINIA

Jackson County Amateur Radio Club, Inc.
D. Geneal Bailey, NK8P, Sec.-Treas.
113 Winters Dr., Ripley, WV 25271
First National Bank of Ripley
Meets: 1st Thursday/monthly - 7:30 p.m.

The Kanawha Amateur Radio Club
P.O. Box 1694 • Charleston, WV 25326
Meets: 1st Friday/monthly-7 p.m.
South Charleston City Hall annex
Repeaters 6.82 and 6.88

could apply to temporary set-ups. These are not "advetorials"—this is how I judged their operation from actual in-use reviews.

Antron 10M whip (P.O. Box 2744, Youngstown, OH 44507)

We've talked about this one before—it's a 10M wave, ground included, white fiberglass 18'-tall, three-section whip. It's ideal for Novices that want a healthy signal on 10 with a very low angle of radiation that only a vertical can give. It even has a SWR ring for tuning out any slight mismatch when you QSY.

You need to whack off about 6" from the tip of the antenna to pop it into 28.4 MHz range—obviously this was intended originally for CB. However, it's a wide-band performer, and gets out great on 10M. It's also all fiberglass, so a brush with a power line won't fry you. It can also take up to a KW if you run that much on 10. It's great for Novices and Techs on 10!

MFJ Artificial Ground (MFJ 931)

This box looks like a small antenna tuner, and in a way it is. But it tunes the *ground* side of your antenna system. Remember, every 1/4-wave antenna wire or whip needs a mirror counterpoise image of itself to radiate properly. I always recommend a proper and healthy ground system for ships, motorhomes and apartments. However, if you are on the third story of a hotel and all the plumbing is PVC, you may need to resort to this black box.

Manually tune it like a tuner, an . it "resonates" the ground into any meager ground wire or pipe you may have. Just watch out for the end of that wire—it gets hot! The tuner needs to be changed each time you change bands. It worked very well getting RF out of a ham shack on the 15th floor. Everything else failed on

20M—but when we tuned the box for maximum current to ground, it took the stray RF to ground and allowed us to optimize our temporary antenna circuit.

If you have a band that is giving you trouble on tune-up, and if it's the ground giving you the problems, this MFJ ground tuner works well. However, *nothing* beats a real ground system without the tuner.

AEA 10M Handy

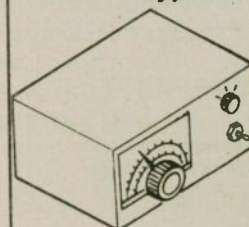
This is a sideband walkie-talkie on 10M. AEA imports it from Japan, and it has an excellent receiver that is hot as a firecracker with smooth AGC action. It's a VFO set with pre-set frequency ranges. It comes set up for beacon band reception as well as on the bottom end of 10M phone for Novice and Tech voice privileges (28.25-28.3, 28.3-28.350).

Its long telescopic whip gives you a fair chance at working some DX. A supplied ground wire helps. But it will probably take you a few tries to finally latch onto a station that can hear your tiny 2W PEP QRP signal. Unless that distant station is knocking the S-meter out of the socket, your chance of raising someone weak is pretty slim. But when you do, it's a real treat. It works. I like it. But getting everyone



Antron whip

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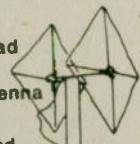


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to come back to you is a real challenge. Hook it up to an outside antenna, and it works like a champ!

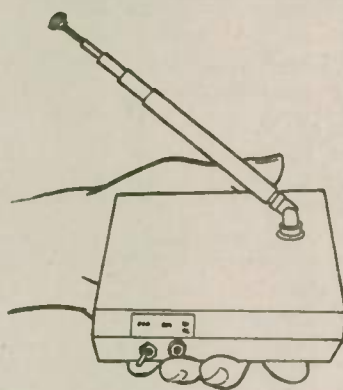
Shortwave sniffer

Do you have one of those portable shortwave receivers that you take on business trips into your hotel room, but find the only place you can get reception is when you stand next to a window? A new portable active antenna that covers all shortwave frequencies brings the signal in from the window and couples it inductively to your portable shortwave set. It also works great in boats and RV's when your shortwave set with its tiny antenna is on the inside, but all the signals are on the outside!

Just put this device near any window, and it sucks up the signal and passes it down to the probe that then couples it to your own loop stick or telescopic whip antenna. I also find it works quite nicely on the VHF frequencies.

So if you have a portable and can't get reception on the inside, consider this little device. For a spec sheet, write Inline Components, 4521 Campus Dr., Irvine, CA 92715.

Morad antenna (1225 NW 46th St.,



Sniffer

Seattle WA 98107)

No one makes a 5-band HF trap vertical specially for marine applications but Morad. Their 18-footer uses rigid gold anodized tubing and gleaming white traps. It's a 50Ω feed, so you'll need to mount this set-up within inches of a tuned or massive ground counterpoise. They also have a version that is strictly on marine channels, but they *don't* have one that's both marine and ham. Like all 5-band traps, this requires no tuner if you do your ground radial/counterpoise work properly.

Morad also makes a 10dB gain, 2M

base antenna. This is ideal for repeater operation. They also have a marine version of this same whip. Years ago it was Shakespeare with their 176-1 that was the king of 2M/marine base antennas, but they discontinued it so now it's up to Morad to fill the bill. Write for the Morad catalog—their antennas are commercially rated specifically for heavy-duty use.

FCC "Commercial" Test Prep Guide

At last, a book that prepares you for the new FCC commercial general radiotelephone operator license exam. This is not a ham General, but rather the new commercial general that replaces the old commercial first and second class ticket.

At last the FCC revised those old tube questions. Now it's all on solid-state electronics, and the commercial 100 multiple-choice test is a brain buster.

This book has just been updated to reflect the new questions. It contains updated rules and regulations, transistor and digital circuitry question preparation, a separate chapter for radar endorsement, and FCC-type multiple-choice exams. The FCC still requires the commercial ticket to adjust aviation, marine radios, marine radars and certain land mobile fixed services. (No longer is the commercial ticket required for regular land mobile, CB and domestic industrial radio service.)

The book is expensive—\$25—but it's well worth it if you are planning on taking the commercial ticket. It's available from us here at Radio School, 2414 College Dr., Costa Mesa, CA 92626. Add \$2 postage and handling.

Survival

Here's a 200-page book that gives you all the tips necessary on survival when the big disaster occurs. From earthquakes, to floods, to crime prevention—from emergency communications, to shelter, to tornadoes—this book has it all. Its author, Vickie Mason, is a licensed ham and really knows her stuff when it comes to surviving the big one.

I like the book because it talks in plain language and gives some great hints on setting up an emergency communications station. It's about \$10 from the author, P.O. Box 4974, Orange, CA 92618-4974.

Ham set or marine SSB set?

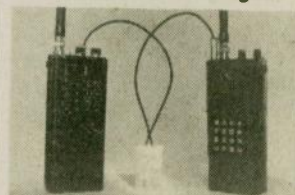
The reprint of my article on this very delicate subject is available free for a self-addressed, double-stamped envelope. I say it the way it is when it

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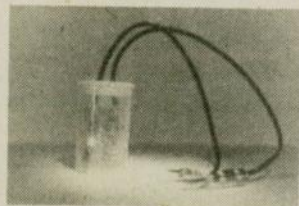


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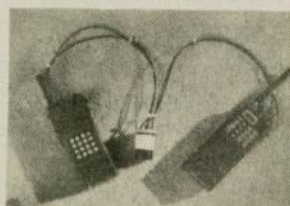
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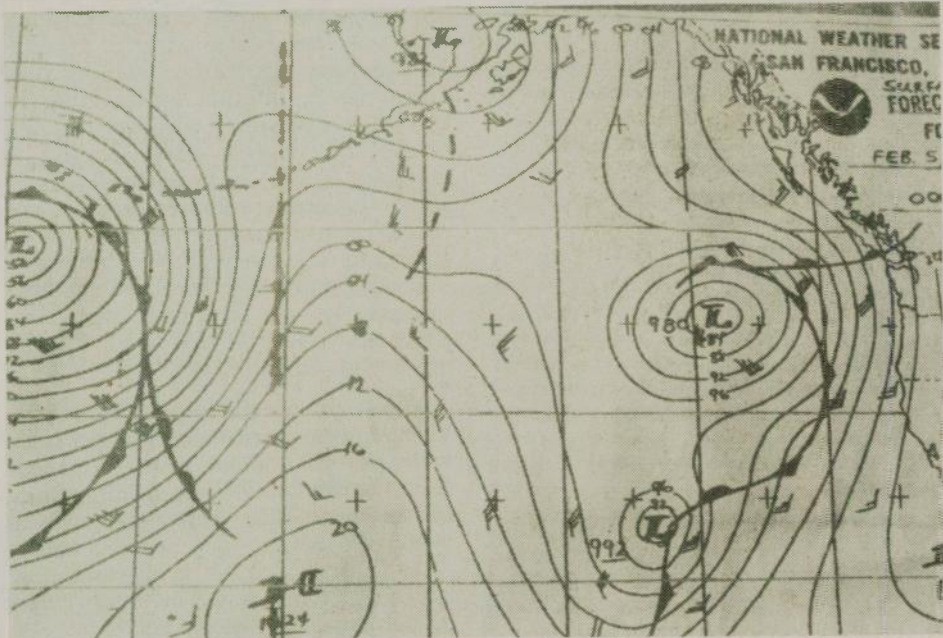
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Print-out of Stephens chart

comes to making the decision on whether you buy the ICOM M700 marine transceiver, or the Kenwood 440 ham set and also play it on marine frequencies. If you have someone thinking about getting their ham ticket for offshore cruising, tell them to drop me a note.

They might also include \$29.95 for my brand new mariner's Amateur Radio preparation course. This has been specifically designed for the cruising mariner that wants to get the Amateur Radio license quick and get on the air using their new entry-level call sign.

Weather facsimile

Our last product this month is a weather facsimile converter that works with any shortwave receiver and any good quality printer. It's made by Stephens Engineering, Washington, and this expensive but neat \$900 device takes audio from your ham set and converts the FAX signals into sparkling weather maps on your existing printer. For best use, I found the Kodak Diconix ink-jet printer is a good choice.

The neat thing about this box is that it does not require an existing computer to do its thing. Audio in and printer out. See it at a local marine electronics store, and take my word for it—it's a great way to automatically capture the latest weather informa-

tion using your existing ham set with general coverage receive and a top-quality printer that you may already have in your shack.

That's it for this month—let me know if you would like a review on a particular product, and I'll give it my best shot. With so many new products coming out, it's sometimes hard to separate the real performers from those that could use a little more engineering.

Speaking of that, next month we'll look at that all solid-state Maxcom antenna tuner, as well as a digital weather station that requires an EEE degree to run it. □



Army MARS

Bill Field, WB3JVG

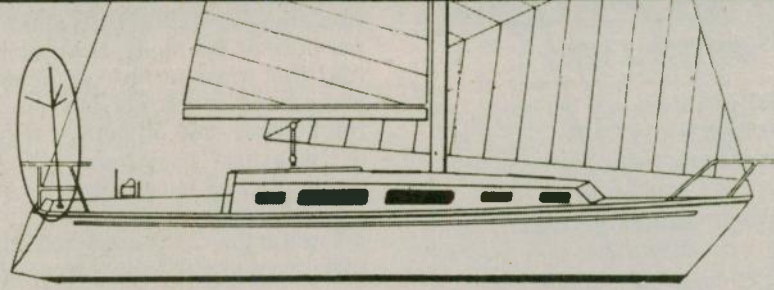
In 1925, pioneers in the U.S. Army Signal Corps founded the Army Amateur Radio System (AARS) with the intent of promoting Amateur Radio through public service-oriented communications. The AARS continued operating up until the beginning of World War II, when operations were suspended.

In 1941 there were 60,000 licensed amateurs in the United States and its possessions, and about 20% of them assisted in ending the war, either in a military or civilian capacity. Following the war, the AARS was reactivated and in 1948, upon formation of the U.S. Air Force, it began joint Army-Air Force operations as the Military Amateur Radio System.

In 1952 the system was renamed the Military Affiliate Radio System

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(MARS), and in 1962 the Navy-Marine Corps formed their own branch, thus launching the program as a true joint-service program, working toward a common goal.

In addition to promotion of Amateur Radio, the MARS program was established to provide an increased pool of public service-oriented volunteers trained in military communications procedures who are prepared to provide normal communications and to assist military, civil defense and other disaster officials with communications in times of local, national or international crises.

During the 1977 Johnstown flood, Army MARS volunteers provided 12 consecutive days of around-the-clock emergency communications. The services involved — including the American Red Cross, Army MARS and ARES/RACES — handled approximately 25,000 messages during the 12-day ordeal.

In such situations, of course, none of the volunteers receive any compensation other than self-satisfaction and most of the equipment used is privately owned.

During times of non-emergency, MARS volunteers provide an invaluable service by handling traffic to and from servicemen stationed worldwide, their families and friends. As an example, during the Viet-Nam War, the three joint MARS services handled 100,000 telephone calls and written messages per month. The morale value was so great that the Army had trouble convincing people that the planned purpose of MARS was an emergency radio system rather than just a morale and welfare system.

In the same light, Donald W. Hodous, WD8ILX/AAT5EX, of

Strongsville, Ohio was quoted on a TV telecast saluting his MARS activities as saying: "I've had occasions of people arriving at their destination in Germany, even in the United States for basic training... the mothers have cried just to know that their son or daughter had arrived at their location safely."

To become an Army MARS member, one must be 14 years old or older and a U.S. citizen or an alien legally admitted for permanent residence. In addition, one must possess a valid Amateur Radio license and a radio station which can operate on two MARS HF frequencies.

Novice Class license holders are welcome to join and operate on MARS phone frequencies, but to remain a member they must upgrade within the 18-month period their license is valid. The potential member must also be willing to follow the rules and procedures as prescribed in the field training manual issued to each new member by Chief Army MARS.

The participation requirement is a minimum of 12 hours per calendar quarter, or an average of one hour per week. If these requirements can be met, and they are by no means overly restrictive or difficult to meet, the member is accorded several benefits.

Free of charge, MARS members are permitted to enroll in practical correspondence courses in areas including — but not limited to — electronics/electrical theory, mathematics and communications procedures.

In rare cases, members may be able to requisition a very limited amount of U.S. Army Surplus radio equipment and parts, for use in their radio station. However, this is not very easy to do and requires official approval!

The frequencies allocated for MARS use are all outside the amateur bands, and the most common modes of operation are CW, RTTY, SSB and FM. Regardless of the mode, the member will find that training in communications procedures is carried out on a year-round basis, and all nets — regardless of whether they are specifically designated as such or not — are considered training nets.

Training is conducted from the field training manual, which serves as the

bible for the good communications practices stressed in MARS. Hands-on experience in traffic handling provides the foundation for training in MARS procedures, with proficiency being the overall goal. Should a member make a procedural error, which is quite common and is, of course, expected, the mistake will be corrected in a constructive manner.

Mistakes are welcomed and are used extensively for training purposes. After all, it is said that we learn the most from our mistakes!

The Army MARS program can provide something interesting and worthwhile for just about every Amateur Radio enthusiast. While specific training nets are held each week, several types of specialty nets are also held.

An informative net is the technical net in which interested members bring up subjects for discussion.

Some other types of nets which might be encountered as a MARS member are: swap and shop nets, emergency disaster training nets, and of course the traffic handling nets. It is up to the membership to provide input to the various nets and thus to make the program enjoyable for everyone.

In summary, Army MARS is a Department of Defense-sponsored program manned mostly by civilians who donate their time, equipment and efforts with the intent of training to provide public service communications during both emergencies and non-emergencies. Qualified amateurs may join as Affiliate Members in a volunteer capacity, have no military service obligation and may resign at any time, but must meet program requirements to remain a member.

Special thanks to the following sources of information used in this article: Charles A. Andrews, AAR3IM-PA, State MARS Director PA; Lt. General Emmett Paige, Jr., AAA9CG, Commander U.S. Army Information Systems Command; Joseph J. Slemenda, AAR3IQ-PA; and *Worldradio*, January 1984 issue.

If you are interested in joining Army MARS or require further information, please contact Bill Field (WB3JVG/Army MARS Station AAR3HW/PA) at (814) 863-2161 between 7 a.m. and 4 p.m. or at (814) 237-1275 at any other time.

If you would like to observe some of the Pennsylvania Army MARS Nets, you may wish to monitor them at the following times: 8 a.m. (M-S), 4020 USB; 4 p.m. (daily), 4030 LSB; 8 p.m. (Sunday and Tuesday: Phone Training Net; M, W, Th: CW nets), 4020 USB.


— Nittany ARC, State College, PA □

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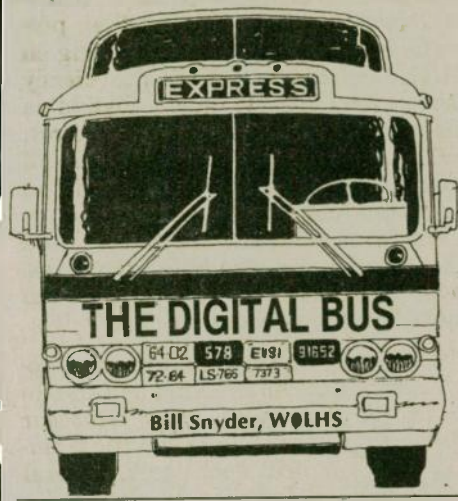
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are only vague rumors to this old brain.

The whole experiment was a lot of fun, and it was full of surprises. The first big shock came the day I discovered there were about 30 outgoing messages stuck at the next station down the line from me. I made this discovery by listing the files for my call sign. As the screen filled with message headings, I nearly fell off my chair. There were messages nearly a month old rotting away on a spinning hard disk.

What caused the sticky files? Well, the first thing is a simple truth: a forwarding file has to know where to send the message, and if it doesn't have the proper address information, the message just waits for something to happen. The SYSOP of the station was unaware of the building pile of traffic buried in his BBS. His forwarding files did not know what to do with a bunch of them, and so they just plain went stale. Newer software flags old messages, but wouldn't it be a good idea to make the SYSOP aware of the age automatically?

Most of our traffic delays were actually caused by poor propagation. Our network of net/ROM and BBS stations was quite lengthy, with two links measuring slightly over 100 miles each. Thus the 2M path was not always open with the next station and the path would drop out for long periods of time.

Our BBS software sends the messages off the top of the pile, instead of on a first-in, first-out basis. So, the bottom of the pile really never was touched. The pileup started when I returned from a two-week auto-tour of eastern Canada and dumped a heap of answers into the system. The messages left my BBS rapidly, but they hung up at the next station because of poor propagation. After a lengthy confab with the SYSOP of that BBS, the stuck traffic was liberated and sent on

its way, by both HF and VHF links.

Another problem discovered by the test was ping-ponging of messages. This phenomenon happened when we tried ZIP codes for the first time. I sent out my answers by using wild cards in the forwarding files. The next BBS down the line (a new route) also had wild cards in his forwarding instructions, so his BBS would send my messages back to me, mine would put a new number on it and return it to him the next hour. By ping-ponging one message, you can run up a good traffic total overnight.

Well, we've solved those problems, and now we're looking for new ones to tackle. I'm sure the more populated areas have had all these same things happen, but North Dakota is on the end of the packet line so it was all new to us.

Things have improved, however, with the development of new paths for our traffic and a new super digipeater installed at the 750' level of a 1,200' TV tower. The tower is on a ridge 400 feet above the surrounding terrain, so it is really effective!

The new high-tower digi has effectively opened up a reliable VHF link to Minnesota, Iowa and Wisconsin. Another path has been pioneered to our high-frequency outlet in Winnipeg, VE4AFO, so we are now reachable without too much trouble.

Our network is growing rapidly. More and more radio amateurs are joining us, but many of them are not learning how to use the system properly. We see a lot of strange things: DXing by digipeating, ragchewing through multiple digipeaters and beaconing every which way. Luckily, the novelty is wearing off and things are getting down to real business. Traffic is moving nicely; so now, if you wish to try it out, send me more messages, I'm pretty sure I will get them, and I'll answer each one when it arrives.

During the past few months I have been receiving a steady stream of packet messages via the nationwide traffic system. It started when I asked readers to send a packet message to me at my public bulletin board address. I made the request to test out the system, and I promised to relate some of my experiences with the project. Well, here are some of the things that happened during the message exchange trial.

First, let me say, I answered almost every message. There were a few, however, that were lost when I accidentally erased a batch before I had typed my answer. So, if you didn't get an answer from me (some got doubles), it either went to the memory never-never-land of computers, or it is hung up somewhere in the system. And believe me, messages can and do get hung up!

Originally, I planned to do a little statistical analysis of the data collected, but then I remembered I flunked Math 305 (Advanced Statistics) in college. (It was my only flunk — I showed up a day late for the final!) And Math 305 is 50 years back in time, so the mean, median and mode

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George Hitts, Jr., W1DA, and I now use the network almost daily. We swap RTTY DX information with a 24-hour turnaround about the norm. Tad, KT7H, sends me RTTY DX information weekly. So, where a few weeks ago I was giving the system about a 3 on a scale of 10, now I have boosted my appraisal of the packet traffic network to a big 6.

Drop me a packet message; my address is W0LHS @ W0LHS, or W0LHS @ 58103. I would like to hear from more stations in Wisconsin, Illinois and Iowa, because I would like to try the 2M network in those areas. Thanks to all those who have participated; the list is too long to thank individually. I hope everyone, by now, has received my personal thanks via the North Dakota pony express packet net.

NOTE: What do you do with your old Callbooks? I send mine to someone behind the Iron Curtain. They enjoy getting them and you can mail both copies by surface mail for less than \$5 book rate. In the past, I have mailed them to club stations or individuals who supplied me with personal mailing addresses. This year mine went to UT5RP in the Ukraine; last year it was a club in Bulgaria. It takes about three months to get to the foreign country.

Eavesdroppings

GUESS THE BAND IS IN POOR SHAPE FOR BOTH OF US ... I SPENT THE WEEKEND PADDLING THE OLD BUG IN THE CW CONTEST ... I MUST QRT TO PICK UP A TEEN-AGER AT THE BUS STOP ... I'M SURE GLAD I CAN'T SEE THE PLATES OF MY LINEAR WHEN THEY GET REAL RED ... I

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PROBABLY OUTLAST ME ... THANKS FOR THE USE OF YOUR SPEAKER, IT'S BEEN FUN SWAPPING DITS AND DAHS ... OH, OH, I JUST BLEW THE LINEAR. GUESS BETTER SIGN AND SEE WHERE THE SMOKE IS COMING FROM.

NOTES: Dick Kriss, KD5VU @ KB5PM, wants MacIntosh users on RTTY, packet and AMTOR to contact him. He uses the new Red Ryder 10.3 program and says it's super.

Congratulations to Chuck at J6LRT for the fine job of handling a RTTY pileup. I liked it when he told callers not to call forever!

Most interesting eavesdropping of the month: THE BV0 STATION CAME ON AT 0530 FOR A CEREMONIAL OPENING CONTACT WITH JA1ACB. I COULDN'T GET THROUGH THE JAPANESE PILEUP. I HEARD THE OPENING CEREMONIES AND THEY WERE QUITE IMPRESSIVE!

73 digital and RTTY DX fans. Keep smiling and piling! Bill Snyder, W0LHS @ W0LHS, 1514 So. 12th St., Fargo, ND 58103. DIT DIT

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10-10 INTERNATIONAL News

Chuck Imsande, W6YLJ
10-10 19636

The backbone of 10-10

The backbone of many organizations, including 10-10, is the volunteer help that makes the organization function. In the case of 10-10, there are no paid officers and no paid employees; in fact, most of the volunteers that carry on the business of 10-10 spend money out of their pockets. Sure, all volunteers are supposed to be reimbursed for their postage, necessary phone calls, etc., but I can tell you from first-hand experience that there are a lot of little things one either forgets or just lets go as being too trivial to list on one's expense report.

So why does one do so much for so little? Because every one of the volunteers loves Amateur Radio and believes in 10-10. Believe it or not, there are over 50 volunteers that serve 10-10 on a continuing basis, contributing up to 20-30 hours a month. A lot of these hours would be spent operating the radio if they were not attending to 10-10 affairs.

Two of our hard-working volunteers are a YL/OM team: Carol and John Hugentober. YL Carol, K8DHK, 10-10 #29588, is our DX Manager and OM John, N8FU, 10-10 #16154, is our 8th District Manager. Carol became DX Manager in 1985 and John became the 8th District Manager in 1981.

Carol was licensed in 1962 and joined 10-10 in 1979; John was licensed in 1955 and joined 10-10 in 1977. John works for the post office and Carol is a professional housewife. They have been married for 27 years and have a daughter Melody, KA8LAB, and a son John, KC8MZ.

In addition to the many, many hours Carol and John volunteer to keep the records of the DX and 8th districts current, they still find time to spend on the radio. Carol has worked 150 countries and received her 10-10 1400 Bar, while John has managed to work 302 countries and get his 10-10 700 Bar. And as if John did not have enough to do with keeping the 8th

district records and spending at least six hours a week on the radio, he is studying and learning to speak the Japanese language, while Carol spends her spare time quilting and doing needlework and crafts.

The Hugentobers are not only devoted Amateur Radio enthusiasts, but are also typical of the truly devoted volunteers that make the 10-10 organization one of the finest in Amateur Radio. Thank you, Carol and John, for your years of dedicated service to 10-10.

Thank you, Chuck Busby and Malcolm Spangler

Two of 10-10's District Managers have decided to "hang 'em up" — both for personal reasons. Chuck Busby, KC5FX, 10-10 #21872, who has handled the Bars and Plaques for those who have had 1,000 or more 10-10 contacts, recently underwent heart surgery and has concluded that discretion is the better part of valor. He has passed his volunteer job over to Rus Wirtz, WD5IRF, 10-10 #32288.

The other is Malcolm Spangler, K4KUT, 10-10 #13577, who has been 4th District Sub-Manager for about nine years, handling Virginia, North Carolina and South Carolina. Malcolm's successor is Dale Marquis, WA4EZU, 10-10 #33498.

Again, we owe great thanks to Chuck and Malcolm for the exemplary manner in which they have done their jobs. That's what "volunteer" means!

W6OI, where are you?

Morrie Goldman, W6EHM, 10-10 #4189, has been receiving a number of requests for W6OI/5 QSL cards. W6OI is the 10-10 Club Station Call and was activated in Shreveport, Louisiana for the recent 25th Anniversary Convention of 10-10.

W6OI is operating from Shreveport as W6OI/5 under the guidance of Mel Sojka, KD5DE, 10-10 #33513. Requests for QSL cards for W6OI/5 should be sent to Karen Conley, KA5WXE, 10-10 #40883, 9432 Castlebrook Dr., Shreveport, LA 71129-4808. Of course, you must make contact with W6OI/5 in order to receive a card. Please enclose an SASE with your request.

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25th Anniversary pins

Gary Engleman, K5HGL, 10-10 #17149, has a few 10-10 25th Anniversary pins left from the Shreveport Convention. These are very attractive and nice souvenirs to remember the 25th anniversary of 10-10. The cost is \$4 plus \$1 postage to Gary at P.O. Box 460118, Garland, TX 75046.

Briefly

The mail continues to bring lots of requests for the 10-10 Information Package. So if you are new to Amateur Radio and like to operate on 10M, you can find out about 10-10 by sending me a #10 (business size) envelope with a 22¢ stamp. My address is 18130 Bromley St., Tarzana, CA 91356-1701. If you would like the Info Pack and a copy of the latest *10-10 International News*, the official publication of 10-10, just send me a green stamp (\$1) with your name and address.

Finally

Have you sent your tax deductible contribution for the 10-10 Scholarship Fund to Gerry Gross, 10-10's treasurer, yet? If not, why not sit down right now and send your check made out to 10-10 International Net Scholarship Fund direct to Gerry Gross, WA6POZ, 10-10 International Net, Inc. Treasurer, 8145 Cozycroft Ave., Canoga Park, CA 91306. Remember we are committed to two \$750 Scholarships in 1988. This is your chance to help a worthy cause in the interest of Amateur Radio.

Do you have a story about yourself, an Amateur Radio experience, or know something interesting about someone else involved in 10-10? Send it to me for possible inclusion in a future issue of *Worldradio*.

Thanks to Howard Bowman, 10-10's president and Joe Williams, editor of the *10-10 International News*, for input to this month's column.

Hope everyone had a Happy and Joyous Holiday Season and hpe to cu on 10 sometime in the year 1988. Best 73 es cu next month. □

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Moonbounce

Over the years, there have been a few very dedicated people interested and involved in 6M EME, or "Moonbounce," as it is often called.

Recently, several prominent 6M operators have been pursuing an active EME program on 6M. Mike Staal, K6MYC, and Ray Rector, WA4NJP, are two of those operators who have recently been joined by that renowned 6M DXpeditioner, Jimmy Treybig, W6JKV. They have been bouncing 6M signals back and forth off the moon at each other for months.

Ray, WA4NJP, in Georgia, reports that on November 14, 1987 at 1800 UTC, he worked Jimmy, W6JKV, via the moon with good signal reports both ways. Jimmy uses two 50' boom antennas mounted side by side, with horizontal polarization. Ray uses four big antennas. On November 15, at 0900 UTC, Ray worked Mike Staal, K6MYC. Mike was only using one antenna. Only minimal sequencing was needed to complete a contact.

No mention was made as to whether or not these are new distance records for 6M EME. Ray said he had a contact on November 23 at 0100 UTC with Jimmy, W6JKV, which he thinks might be a first. He said they both had their antennas aimed high in the sky (no horizon gain). Signals were very strong and very consistent.

Ray says his echoes off the moon are being heard by local amateurs with single antennas (Jim Holt, N3AHI, and his 66B Hy-Gain). He thinks this is a very interesting and exciting mode of operation. If you are interested, drop him a line, as they are looking for others across the United States and around the world who might be interested in joining them in some global attempts. If you are active on 6M EME, let me know.

Winter Es season

The Winter Es season seems to be in full swing as I write this in early December. On December 1, we had a pretty good evening, followed by several others, and a little daytime activity. On the 1st, Joe O'Connell, W7KQU-Seattle heard Pat Pugh, K7VAY/5-San Antonio, on CW for a long time, but just could not get his attention. Most of the Es has been in to the Southern W4's, the W8/W9/W0 area, and the W5's in New Mexico and the closer in W7's and W6's. Reports indicate that there have been some double-hop Es QSO's going on. We hope conditions will improve as the season progresses.

The results being realized by others around the world have been impressive, as F2, TE or Es-linked activity is occurring at a time when there is not much on the face of the sun to indicate such activity is warranted. With flux numbers being somewhat normal and no great amount of geomagnetic disturbances taking place, a lot of interesting contacts are being made.

Mike, ZD8MB, recently worked HC1BI and hears the FY7 and HC2 beacons often. He plans his own beacon to be on 50.032.5 by February. From Malta we find that not only are 9H1BT and 9H1CG active on 6M, but so are 9H1EL, 9H1FL and 9H1GB.

On October 3, 1987, Paul Galea, 9H1BT, heard the FY7THF beacon

between 1735 and 1815 GMT. On the 4th, he heard it again at 1930 GMT. DL9RM heard CT0WW's beacon on 50.030 recently. The ZB2VHF beacon is said to be back on the air on 50.035, according to EA4CGN, who had cross-band 10/6M QSO's on November 11 with A22KZ and ZS3AK. Unfortunately, reports from Italy say they will get no 6M permits this year. Reports out of Spain say that on November 16, 1600-1630Z, they had ZS beacons in.

Hal Lund, ZS6WB's fine VHF Newsletter of November 21, 1987 reports a new ZS 6M meteor scatter record was established on November 21 when ZS2NR worked A22KZ. The first ZS Es activity of the year was reported on November 14, with an hour-long opening between ZS6HS in Johannesburg and ZS2BE in Port Elizabeth, with signals peaking well over S9 and the ZS2SIX beacon being heard into ZS6 with good signals. The ZS2SIX and ZS1STB (50.010) beacons have been coming through to ZS6 well on MS in the early morning hours.

Dave, ZS4S, is a new addition to 6M, having worked Rad, ZS4AAB, and Dave, A22KZ, recently. The 9H1SIX beacon was still being heard regularly by Dave, A22KZ, before he left for England. The latest reports of reception were on November 15-16. The ZS6LW beacon, north of Pretoria, on 50.022.5, runs 50W input to a 6-element Yagi at 35 feet. CW identifier transmits "DE ZS6LW" continuously.

The antenna was to be turned toward Australia about December 1, to remain there at least through the end of January. Hopefully by that time, beams to the United Kingdom and South America and an omnidirectional antenna will have been added to the VK beam using time sharing.

From this side of the pond we received reports that HH7PV heard the South Carolina and New Orleans beacons on November 30. Jose Freytes, NP4X, in Puerto Rico reports that on December 1 at 1800Z he had 10 minutes of ZS2SIX's 50.005 beacon signal at a time when he had an LU opening in progress. VP2MO reports his 50.086 beacon is on weekdays from 2000Z and on most of the time during the weekends.

SMIRK DXpedition

True to his word, Dr. Rick Dorsch, NE8Z, went on a SMIRK DXpedition to KP2, U.S. Virgin Islands and VP2V, British Virgin Islands. He used a Heathkit SB-110, an MFJ Grandmaster Keyer as the beacon ID'er, and the revamped version of the "Galapagos Quad" that SMIRK had in its #39

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Six Shooter. He cut the elements in half, in his version, and put in a PVC pipe. He got a very small 6" diameter quad that fit right into his suitcase! It worked like a champ again for him.

Operating from Mandahl Peak (800' ASL) as NE8Z/KP2, he had 68 QSO's in seven countries. He worked LU's, CX's, OA8ABT, CE's, PY's, KV4AD and KP4EOR. One of the highlights of his trip was working LU5DRD who was running 500mW. He was 5/5 to Rick on SSB. Operating out of the best and highest hotel overlooking South America, the Fort Burt, as NE8Z/VP2V, he had 45 QSO's in six countries. He worked LU, VP2V, KV4, PY, CX and CE.

He had the opportunity to visit with Art Swain, VP2VA, who is the BVI licensing official and holder of a SMIRK loaner rig. Rick said that Art indeed has one *huge* mountain in his backyard completely blocking him to the USA. All 6M activity must be done by him driving to the top of the island and setting up portable.

Seems like Art is an excellent candidate for the Super Comshack remote base system like Tex Kennedy, N5TX, is now running. He could remote his 6M and HF operation to the top of that mountain in his backyard and work DX from his 450 MHz HT and his armchair! That is what Tex is doing now, in addition to working 6M or HF from the mobile.

I don't have a lot to report from out in the Pacific and Far East, but they also apparently have been getting some activity. Hatsuo Yoshida, JA1VOK, reports receiving the VK6RIT 52.320 beacon on October 17. On November 7, VK4ALM had JA's into his location. The JA's have been receiving the usual HL/HM, VS activity, and getting down into the ZL and UK area again.

Pat Rose, W5OZI, informs me that QSL's for HC8VB can be sent to: Diego Bucheli, HC8VB, San Cristobal Island, Galapagos Islands, Ecuador, South America. Any of you who worked HC8VB should be able to reach him at that QTH. It is my understanding that, so far, all the HC8 contacts have been with operators on San Cristobal Island.

I see that the new ICOM 575 rig is now available. The new Kenwood TS-680S and TS-680V are also coming out. I have seen the HF version, the TS-140S, and it looks like a honey!

Other new gear becoming available is the Digitrex Electronic (Jack King, K8MA) 28/50 MHz versions of the MPX-MINI 40M SSB/CW, 0-10W adjustable output transceivers, made in the USA. Advanced Electronic Appli-

cation (AEA), P.O. Box C2160, Lynnwood, WA 98036-0918 is marketing the 10M DX Handy SSB/CW HT, which we know as the Mizuho MX-28S, and the 6M model, the 1W MX-6SR.

Tex, N5TX, has one of these 6M Mizuho HT's and has had a ball with it. They are no longer available in the United States unless we can now get them from AEA. AEA is evaluating the response to the 10M model before they make any decisions about importing the 6M and other band models. There will be a review of it in the February 73 *Magazine*. If you want more info about it, write to AEA (see QTH above).

Yaesu has their FT-736 and FT-767 rigs that can cover 6M coming out. The FT-690MKII is still available.

Don't forget to pay your club dues for 1988 to the various clubs you belong to. The Central States VHF Society dues are \$5 and due in January of each year. SMIRK dues are \$3, due in January of each year. I have not mailed out the #40 SMIRK *Six Shooter* newsletter yet (although it is about ready), because we spent a good part of the funds available to help get Jose Cespedes, YN3CC, Nicaragua, on 6M. I thought it more important to get that country active on 6M than to get out the newsletter. It was one or the other.

YN3CC now has a Yaesu FT-620B and 5-element Yagi, provided by SMIRK. He is waiting on clearance from his authorities to operate. He has mentioned seeing KPRC Channel 2 in Houston, Texas on his TV recently. His Channel 2 in Managua does not come on the air until about 5 p.m.

Has anyone figured out who W5GBH is yet?

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Many people have predictable jobs. That is, they go to work each day and do the same task repeatedly, be it assembly line, entering data into a computer, typing, answering phones, or doing some type of electrical work. But my days at the HANDI-HAM Headquarters are far from ordinary. That is what has made my job so interesting. Never do I have to worry about being bored or depressed by the mundaneness of repetitive tasks. Here is a sample of what happens in a typical day at HANDI-HAM Headquarters in Golden Valley, Minnesota.

HANDI-HAMS is located in a rehabilitation facility called Courage Center. My office, the offices of Sister Alverna, WA0SGJ (equipment coordinator), and Bruce Humphrys, K0HR (department director), and the Amateur Radio shack are all housed on the second floor of Courage Center. It is a wonderful environment — spacious, bright and cheerful.

Work for me begins about 8 a.m. I like to start the day off by picking up traffic for us off the Packet Bulletin Board. If you follow this column at all, you know I do this with a Versabril Computer. Then it is on to the Kenwood 930 where I usually make at least one QSO a day.

We have a beautiful station, using the call sign W0ZSW, but it does not get used as often as we would like. So I try to make at least one QSO a day to let people know that HANDI-HAMS is indeed alive and well. One of our goals for 1988 is to try and get the station more active, so hopefully you

should be hearing us on the bands a bit more often.

After completing QSL cards, I usually dig into correspondence. Answering mail and the forever ringing telephone is the biggest part of my job. Once all the phone calls have been answered and all the mail given appropriate responses, I use the remaining time to do follow-up with students. Having over 800 students and their corresponding volunteers to deal with, there is always plenty of follow-up to be done.

Calling upon students who have been studying various levels for their Novice and Technician/General licenses is probably one of the favorite parts of my job. In addition to this I also spend several hours each week interviewing new students and finding them volunteers with whom they can work in their local areas.

Here is a sample of some of the telephone calls and type of mail I receive each day at HANDI-HAMS.

MV and his brother SV, who live in Nebraska, have dropped me a note indicating that the two of them are earnestly working toward their Novice licenses. They have requested a code oscillator. I answer that I am pleased they are working together, but also remind them that our services are geared for the handicapped and not for other persons in a group or in a family situation. That is, we do not loan study material or equipment to persons who are not handicapped unless they are directly teaching a handicapped person and do not have access in their own area to such material. Occasionally we have had problems with groups having one disabled person who start distributing our materials to other people in that group.

The phone rings and it is a gentleman from Georgia who is interested in starting a class at the local school for the blind. We discuss the need for all students in the class to join the HANDI-HAM System and the services that would be available to such a

group. If you are involved with a residential school or other group of handicapped people in your area, remember that we can be of assistance.

I have received a letter from a man living in northern Minnesota who had virtually dropped out of Amateur Radio. He felt his disability was severe enough that he could not master the code. After hearing about the Novice enhancement he looked forward to getting his license. I informed him that I was absolutely delighted that he was willing to try it again and gave him some suggestions for studying the code.

One thing to keep in mind, however, is that some of these folks get confused because they hear about the new Novice enhancement regulations and don't understand that code is still required. Make sure when you are introducing a prospective candidate to Amateur Radio that you make it known to them that in addition to the fun aspects of phone, that good ol' Morse code is definitely still required and there are no waivers of the code no matter how severely disabled the individual.

And now I have just opened a letter which was returned to us from Bogota, Colombia. Apparently the person has moved. This brings up a request which I have for any readers who may have knowledge of hams living in the Bogota area. We have an active student who is severely disabled living in Bogota. She is about ready for her Novice license but needs contact with local hams. Anyone out there who knows of someone who might be able to help, please contact us at HANDI-HAMS.

Then, there is the good news from a student who has several disabilities that he has just passed his Novice exam. He is a hot shot on the code, copying almost 13 wpm and has his Century-21 all set up for the day when that ticket comes. That's the best news! It makes my day to learn that someone's hard work and the work of local volunteers have produced results.

As I close this column, I see I have a letter from North Carolina asking for a taped copy of the License Manual. Traffic from six people has just rolled in via a phone call from a local ham, and one of the students who lives in the Courage Center Residence will be stopping by shortly to work on his Morse code with the Commodore-64 computer.

For information about HANDI-HAMS, contact us at Courage HANDI-HAM System, 3915 Golden Valley Rd., Golden Valley, MN 55422; (612) 588-0811.

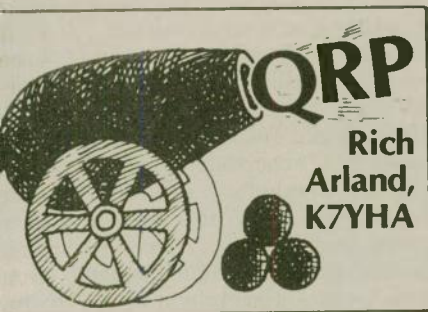
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This month's column is going to be a departure from the regular QRP scene. Instead, we are going to kick around a couple of topics that are near and dear to my heart. I often like to look back over the last 30 years and see where I started and review the path that I have taken to the present. It is not only an enlightening experience but a humbling one, as well. All too often, those of us who've "been around awhile" tend to forget that we were new to the radio hobby at one time, not so long ago.

Shortwave listening/DXing

My introduction to Amateur Radio was preceded by eight years worth of SW listening and SW DXing. I am still quite active as an SWL and SW DXer, much to the consternation of some of my fellow radio amateurs. As a matter of fact, I am secretary of the Great Circle Shortwave Society, a group of SWL's and DXers that enjoys the nostalgia aspect of our hobby.

The GCSS caters to holders of the WPE call signs originally issued by *Popular Electronics Magazine*, between 1959 and 1975. How many of you closet SWL's out there had a WPE call? We have fun by pursuing the hobby using older, tube-type equipment. If you would like more info on the GCSS, write Dr. Harold Cones, 22 Whits Court, Newport News, VA 23602.

It seems somewhat of a paradox that the majority of the Amateur Radio fraternity (in the States) tends to regard SWL's and SW DXers as social outcasts. Many countries look upon SWLing and SW DXing as an art form not to be taken lightly. There are still countries in the world where you must spend time SWLing and amass a collection of QSL's prior to becoming eligible for an Amateur Radio license!

Stateside hams have a real problem understanding that you *do not* have to hold an Amateur Radio license in order to enjoy the radio hobby. The standard question that most hams ask the ardent SWL is: "When are you going to get your ham ticket?" When the answer comes back: "Sorry, I'm not

interested!" the ham tends to view the SWL as a loser or nerd.

I find that SW DXing sharpens my listening skills remarkably. Having known some world-class SW DXers, I can state that it takes as much or more skill, patience, time and dedication to hear the Indonesian regionals, Falklands Island Broadcasting Service and many of the African SW outlets as it does to make the DXCC Honor Roll! The SW DXer must be well versed in antennas, propagation, habits/anomalies of the targeted SW station, audio processing techniques, receiver operation/limitations, etc.

Just because the information exchange is not real-time and the SW DXer must wait months or even years for the confirmation letter or QSL card to arrive once the reception report is sent, does not mean that this portion of the radio hobby should be looked down upon by radio amateurs.

How it all started

My exposure to radio started in the mid-'50s, when mom and dad would tune in foreign broadcasts on the huge floor model Greebe receiver that dominated one wall of our home. That old receiver became my magic carpet to the four corners of the world.

My involvement with SWLing became more intense after a few years and I tried, unsuccessfully, to build a super-regen receiver in 1959. After almost setting the house on fire, mom and dad decided to bankroll a Heathkit GR-81 receiver. It was not that they were extremely hot on the idea of me building a receiver. Rather it was the fear that another attempt at homebrewing might incinerate the entire household that galvanized them into action. The GR-81 was not without price . . . I mowed yards all summer long to "earn" that radio.

The GR-81 worked moderately well but not nearly as good as the Greebe. Bill McCrory and Tom Cloutier (two

friends from school) became interested in SW and MW DXing about this time. My trusty Heathkit provided me with many hours of fun and entertainment. Bill, Tom and I used to compare notes, logs, and QSL's in an attempt to outdo each other. It made for some great fun and served to fan the flames of a fledgling electronics hobby for each of us.

I haven't heard from Tom in years, but Bill has managed to ply his electronics hobby into a job with the U.S. government. I, too, turned my electronics hobby into a career. SWLing led to Amateur Radio, which opened many doors over the last 24 years. I pursued an electronics curriculum in college and then joined the USAF where I served 20 years in electronic communications. Looking back over the years, it sure is surprising how much has changed from the days spent DXing with the Greebe and GR-81. Time flies when you're having fun!

I am sure many of you can relate similar stories of how — through SW and MW listening — you became interested in Amateur Radio, got a license and went on to pursue a career in electronics and/or communications. It is amazing to see how young some of us were when we were introduced to the radio hobby.

That brings me to my second point. With all the hoopla about our aging ham population, young people's seeming disinterest in Amateur Radio and Novice enhancement (to keep the newly licensed hams active), it would seem that SWLing would be a natural entry level for the high school student.

Amateur Radio's future

It is unfortunate what we have done to our kids. Through modern technology we have made them into instantly gratified video-idiots. If it doesn't move on a CRT or TV screen, it isn't worth dealing with. If the ef-

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forts do not produce instant results, it's not worth the trouble. With this mind-set, it is easy to visualize why today's teenagers (with few exceptions) do not want to put forth the effort to obtain an Amateur Radio license. It requires *work*. Face it, Morse code is intimidating. Those of us who use it do not regard it that way, but "Joe Average" sure does. I am not advocating a code-free license . . . relax!

However, the natural progression of things seems to be from SW listening into Amateur Radio, at some point. Why not push the idea of using SW in the social science classroom? What better way to let today's teenagers see how other parts of the world live.

No hobby, even Amateur Radio, can approach the dynamic proportions of SW listening. Culture, politics, music and socio-economic positions are all part of the SW broadcaster's bill of fare.

How many hams tuned into R. Moscow, R. South Korea, R. Habana Cuba and Voice of America after the Russians blew Korean Airlines Flight KAL-007 out of the air, in 1983? If you didn't, you missed a lot of important information. How about R. Baghdad and Voice of the Islamic Republic of Iran (VIROI) during the last seven years of their bloody war? Remember our attempt in April '86 to make

Tripoli, Libya into a parking lot? The airwaves heated up over that little sortie!

If "Barbi and Ken" on TV news are your only contact with the world, you might as well live in a cave.

It takes no special skill or heavy cash investment to pursue SWLing. What better way to initiate our young generation into the world of electronics, communications, geography and world events than to get them started in SWLing. Once they are hooked on SW, can Amateur Radio be far behind? Food for thought.

Book review

I am going to start the book review a little early this month. The book we'll look at this time comes to us from Down Under and lends itself well to the preceding topics. Ashok Nallawalla . . . *what a name!* It just comes across so . . . Australian.

Actually, Ashok is co-editor of the book *Better Radio/TV Reception*. Don't let the title fool you. This is a great book that will be a welcome addition to anyone's shack. It is primarily geared to the newcomer to the radio hobby, but old-timers should find some gems of wisdom within the pages as well.

Ash and his two co-authors, Arthur T. Cushen, MBE and Bryan D. Clark, have succeeded in publishing the kind of book that will take the neophyte radio hobbyist out of the dark. The chapters are well written and explain things like propagation (especially gray-line propagation) in terms that are easily understood. There is no regional emphasis at all. This book can be equally well used in Europe as well as North and/or South America.

Better Radio/TV Reception de-

scribes simplified approaches to improving any sort of radio or TV reception by emphasizing an understanding of the fundamentals without relying on a lot of technical jargon. The book uses a plain language, no-nonsense approach to each topic.

While the book is primarily directed to SW listeners and TV DXers, the newcomer to Amateur Radio will benefit from the topics because of the clear, concise approach used. The book covers a wide range of topics including an overview of broadcasting, operation of SW transmitters, types of programming, propagation, receivers and specs, antenna theory, actual antenna projects, test equipment, computer in the radio hobby, an in-depth look at several International SW Broadcasters, SW DXing, QSL collecting and much, much more.

The only complaint I have about this book is the way the receiver specs were seemingly tossed in with the description of how the receiver works and workings of the various receiver controls. If, in the next edition, Ashok and "The Boys Down Under" could possibly put these in a section by themselves, it would make it easier to read.

Of course, this is the perfect book for that young man or woman on your list of people who have expressed interest in SWLing or Amateur Radio. U.S. sole source distributor is Gilfer Shortwave, P.O. Box 239, 52 Park Ave., Park Ridge, NJ 07656. Price is \$14.95 plus shipping.

While this column has diverged from the normal QRP themes, it really isn't that far off base. Believe me, we QRPers take our lumps from the QRO guys on a regular basis. Sorta like the SWL and the Amateur Radio operator paradox, only (more often than not) waged with watts and not with words!

Listening for weak SW stations really does enhance your ability to pick out weak signals on the ham bands. If QRP operation isn't weak signal work, I don't know what is. It goes without saying, that if you can't hear 'em you can't work 'em. SW DXing and SWLing provide not only a wonderful diversion to the Amateur Radio hobby, but much needed information on world events, too.

If we are going to attract young people into the Amateur Radio hobby, we are going to have to find some entry level other than the Novice license. SWLing would seem to be a natural point to start.

Next month: The Saga of the Pine Cone Portable . . . or How Do Ops Check a New Antenna and Get Eaten Alive by Bugs. 73 and Gud DXing, Rich Arland, K7YHA, 9 Vine St., Shavertown, PA 18708.

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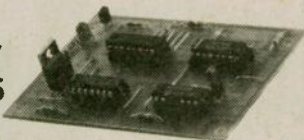
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Simple pi-pad attenuators for the experimenter

Most professional RF labs spend hundreds of dollars for the purchase of pad attenuators for their engineers and technicians to use in the development of new circuits. Yet, curiously enough, Amateur Radio operators or home experimenters don't seem to use them or are completely unaware of their existence and use.

Basically, pad attenuators provide a controlled amount of resistive attenuation to radio frequency signals, are usable generally over a very large band of frequencies, and provide a reasonably constant impedance over their frequency range. They are used extensively on spectrum analyzers for controlling the amount of input signal to the device in a calibrated fashion, and recently they are finding use in the same application on the front end of communication receivers.

They are also used in laboratories and experiments to minimize reflections between subsystem components and stages, and can be used in antenna gain and directivity measurements. However, as stated previously, good pads are not cheap or readily available to the amateur experimenter.

Fortunately, it is possible to build a pi pad attenuator that will give good results for general experiments for a few dollars! Should one be lucky enough to have access to a calibrated radio receiver or spectrum analyzer; it is possible to make pads with precise amounts of attenuation for only a few dollars more! This article describes how one can go about accomplishing that goal over a weekend.

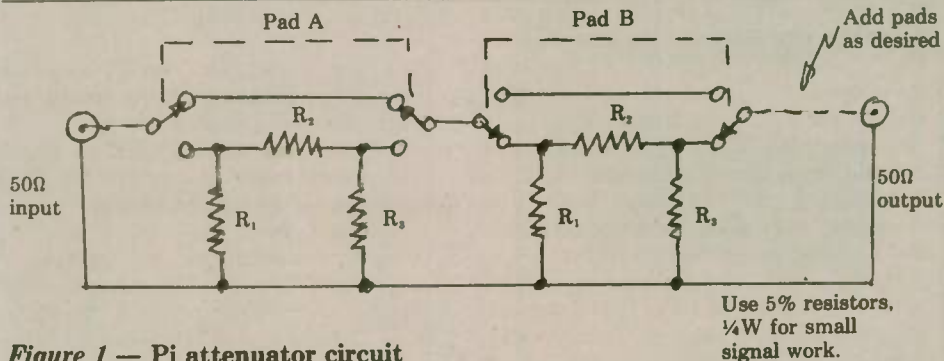


Figure 1 — Pi attenuator circuit

Figure 1 illustrates the basic circuit configuration of a two-pad pi attenuator. Note that each pad consists of three resistors connected in a "pi" design, hence its name. A double-pole double-throw toggle switch is used to switch each pad in and out of the circuit.

The values of the resistors are such that a specific amount of thru-put attenuation is provided to the signal, yet the series-parallel combination of the resistors is fixed to a specific value; in this case they are fixed to 50Ω. Hence, the pad attenuators described can be directly interfaced to any 50Ω coax cable or any equipment with a 50Ω impedance.

However, it is possible to design a pad attenuator for virtually any fixed impedance. To do this, I will refer the reader to the excellent ARRL publication, *Solid State Design for the Radio Amateur*.

In this publication, the necessary equations are given to design pi-pads, T-pads and L-pads for any specific impedance or increment of attenuations. The only thing somewhat critical with these pads is the tolerance of the resistors used. For the pads described in this article, I would recommend using resistors with at least 5% tolerance specifications. This will give equipment that will display attenuation close enough to the design requirements. However, if 1% resistors are available, I wouldn't hesitate to use them, although it is not absolutely necessary to do so.

Keep in mind that the theoretical values calculated and the real world resistors available will never be precisely the same. Therefore it is only

possible to select the closest value with the best tolerances to the calculated design value. In short, there will always be some error in accuracy; all that can be done is to minimize it.

Table 1 shows the closest value resistors which should be used for the desired amount of attenuation. Note that as many of these pads can be cascaded together as the builder wishes. Most professional attenuators provide about 100dB of total attenuation in the increments listed in Table 1. However, if you want only a total of 40dB, that is permissible.

Having built several of these pads, the trick to good attenuation results is in the mechanical design of the pad.

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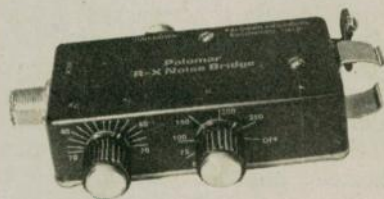
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| 2 | 430 | 12 |
| 3 | 300 | 18 |
| 6 | 150 | 39 |
| 10 | 91 | 68 |
| 20 | 62 | 240 |

Table 1

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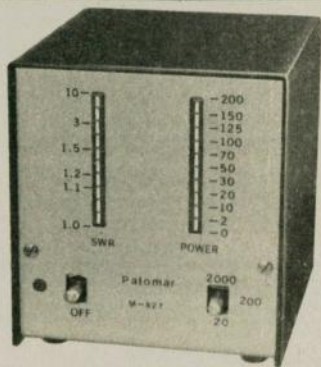


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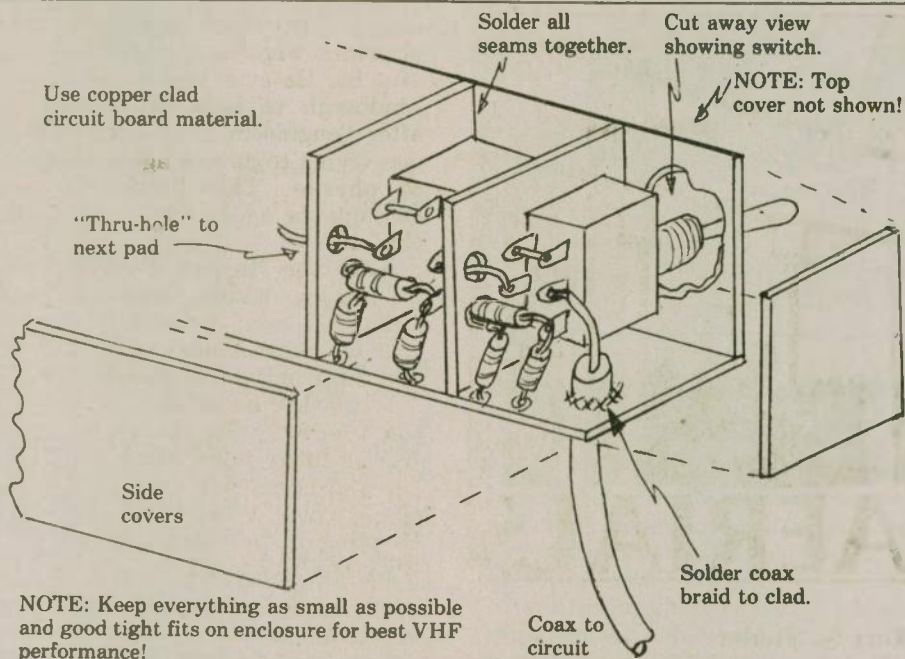


Figure 2 — Mechanical design of pi attenuator pads

especially if it is to work at VHF frequencies.

Figure 2 illustrates the design technique which I have used successfully out to 300 MHz. Double-sided copper clad circuit board material was used throughout. Note that each pad is mechanically contained in a small compartment. The seams of each compartment are soldered together to provide 100% shielding. The only penetration between stages is a small hole which allows a wire to interconnect the stages together.

The size of each compartment will be governed by the size of the toggle switch used. I used subminiature switches. The resistors are soldered directly to the switch terminals and copper clad ground. Keep the resistor leads as short as possible and the compartments as small as possible.

Note that the drawing shows the braid of the coax being soldered to the copper clad. BNC connectors may be substituted if desired, instead of soldering the braid. Although not shown in the illustration, the same technique is used for both input and output sides of the attenuator housing. You simply decide how many stages and increments of attenuation you want between the input and the output.

I have tested similar attenuators for amount of incremental attenuation with a calibrated spectrum analyzer and signal source. If the mechanical enclosure is tight, the units seem to work very well out to about 300 MHz. Incremental attenuation was measured to be generally within 5%, which makes them more than acceptable for (please turn to page 59)



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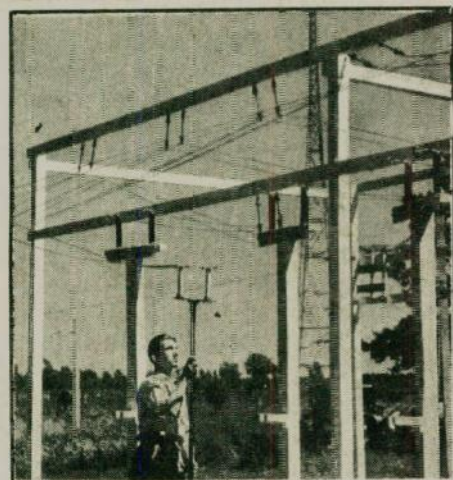
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AERIALS

Kurt N. Sterba

I'm very grateful for the nice letters that have been received regarding my humble efforts. Also received a criticism claiming that much espoused here was wrong and the writer's qualification for saying so was, "I am an engineer."

What bothered me was that he didn't refute specific points with scientific evidence. As for being an engineer, I remember when "engineers" were working on the first U.S. satellite (the one with Eisenhower on tape recorder) and discovered at the very last minute that the IF frequency of the receiver on board which was to receive commands was double that of the local oscillator; thus, the second harmonic would have blocked the receiver.

I remember some years back sitting in a room when "engineers" argued that you could not beat a crystal oscillator against a variable oscillator as there would be too much noise in the output.

For many years the late Juan Trippe, of Pam Am, had to argue with "engineers" about making airplanes

bigger. They kept telling him that airplanes were as big as they could ever be. He even had to get Charles Lindbergh to help him design one after "engineers" told him what he was trying to do was against the laws of physics. This battle continued through the ages up to and including the 747.

After the Russian Foxbat fighter fell into our hands, "engineers" were falling all over themselves laughing that the communications system still had tubes in it rather than transistors.

What they never realized was that the Russians knew that an atomic explosion many miles away would frazzle transistors but tubes would continue to play. When I listened to them laughing in unawareness I just sat there and wondered.

I'm really getting tired of hearing amateurs prattle on about Japanese radios hurting the U.S. economy. Think about this . . . if every single U.S. amateur active on the HF bands had bought a Japanese rig, all of that together would equal the check that Japan Air Lines writes for one airplane manufactured in Seattle, Washington.

For the apartment dweller, antennas and grounds can be a most perplexing problem. The ground can be non-existent or unreachable. Or, by following some misguided crusade to tie down somewhere, one may end up with a ground so long that the ground is radiating more than the antenna and Dan becomes Rather Not.

The wrath of your neighbors can also be accompanied by "hot mike." RF is all over the place. And RF that is there is not somewhere else, where it should be.

As my antenna guru told me, "Boy,

look at how we did it in the '20s — counterpoise, boy." And he's right. Cut a 1/4-wavelength wire for the band you are on and tie one end to the ground lug on the rig. Yes, I know, you are wondering what to do with the 66 feet of wire you now have in your hands. Just wad it up and throw it under the table. Oh sure, it would be better if you ran it neatly around the baseboard and all that, but let's not get carried away. Please use insulated wire and wrap a lot of tape over the end because that is where the voltage is highest.

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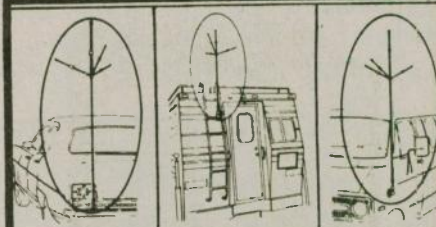
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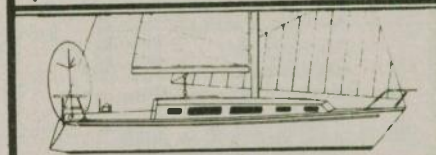
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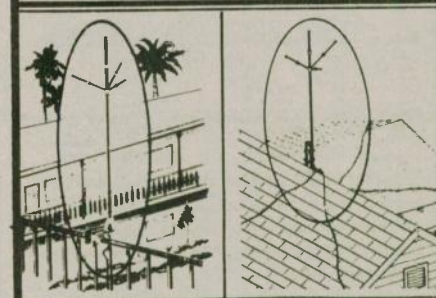
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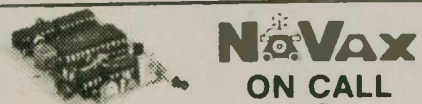
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It is really amazing just what can be worked with mobile antennas indoors or mounted on condo balconies, etc. On March 8, I worked two DX continents within five minutes with an 8' wire draped around inside for an antenna on 10M SSB, running barefoot power. Fun.

One English group has a contest limiting antenna height to no more than 25' and the length to a maximum of 135'. And you have to go QRP to boot. Under those conditions, one might need the patience of Job.

One old trick, which may be new to many is: if you are having restrictive antenna problems, leave the mobile antenna on your car and run coax to your station in the house when you wish to operate.

Speaking of verticals, there was a recent statement in an amateur publication with which I differ slightly. The statement was that a ground-mounted vertical worked best. I would not say the fine gentleman who made it is wrong; all I would say is that you should try it for yourself.

It is my belief that you should get your vertical antenna as high up as possible. You may find that your vertical atop the TV mast on your house may prove to be a real tiger.

Here's the semi-logic behind such a

statement. First, unless you have a great radial system, ground loss is terrible. The higher the antenna moves the less important the radials become. Now let us digress for a moment and examine exactly why the vertical is supposed to have this magical and sought-after "low angle of radiation."

Picture, if you will, your everyday center-fed dipole. Wire runs east and west, radiation maximum is north and south through the middle of the wire. You see in your mind the main lobe of radiation at a 90° angle to the wire.

OK, now we are going to, javelin-like, shove this antenna into the ground exactly halfway. Thus, we have a 1/4-wave vertical showing. (Note: This is for illustration purposes only; there is no wire in the ground, but we'll get to that in a minute.)

That main lobe of radiation is now still 90° off from the antenna and now hugging the ground. Therein lies the benefit and the problem of verticals.

Ah yes, lower angle of radiation means better bounces off the ionosphere to get to somewhere far away. Beautiful, if this great antenna is sitting on a sheet of copper 100 wavelengths long in the middle of Utah somewhere.

You may have noticed some books referring to the Earth under the vertical as an "image" antenna. Well, pull the radials off and see what happens — you have a "mirage" antenna.

Now to the problem of the ground-mounted backyard antenna. The low angle of radiation is a blessing and, as you shall see here, a curse. Here it comes, taking off at that "low angle" — SPLAT right into your washer and dryer, and SLURP into the grounding. The car in the garage gets some; the house wiring gets some more; your neighbor's garage filled with drill presses and his lathe gets some. On the other side of you the model train rails get their share; that house with

aluminum siding across the alley from you has just killed your chances of going north to Europe. Your kids wonder why the lights in their room are blinking on and off.

Some people insist on saying that a vertical radiates equally poorly in all directions. Not true. It radiates wonderfully in all directions. It must be radiating — you just got into three TV sets, two stereos and an electronic organ.

Get the thing up in the air away from all this ground clutter. You will still have a cherished low angle of radiation. You are still working with the main radiation at a 90° angle to the wire. Actually, getting it up higher will lower the angle even further. You will also get some other higher angle lobes which will make working in closer easier.

You still have the problem associated with verticals being noisier than horizontal antennas and no front-to-anything rejection.

If this is a pressing problem at your QTH, you may enjoy experimenting with receive loops which can be very directive and low noise.

A different article in another publication had the writer "gee whizzing" because he found the half-sloper worked better than the full sloper (Pause for definitions: A full sloper is a 1/2-wave dipole, center-fed, with one end fastened to a tower and the other end near the ground. You can visualize it at about a 45° angle. The half sloper has a 1/4-wavelength of wire coming off the tower fed by the center conductor with the shield side going to the tower.) Of course it will work better. The high current part (center) is at least twice as high as it was before.

The center of a dipole is all important. That is where it all happens. When putting one up, avoid like the plague those silly diagrams where people use broken bottles or whatever for the center of the antenna and then wrap on globs of tape to keep it out of the water. Tacky.

Spend a few dollars and get a professional connector, such as are made by Budwig, Van Gorden and Palomar, to name a few manufacturers.

Amazing how some people can spend hundreds, if not thousands, of dollars on RF generating equipment and then pour it all into some mess of who-knows-what impedance.

That's like putting on your tuxedo and having holes in your shoes.

Your comments, questions and literate arguments are most welcome.

A "golden oldie"

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Florida

THE SARASOTA HAMFEST AND COMPUTER SHOW will be held February 20-21, 9 a.m. to 5 p.m., at the Roberts Sports Arena, 3000 Ringling Boulevard, Sarasota.

Featured both days will be forums on RTTY, packet, DX, MARS, nets and satellites; ladies events; exhibitor tables at \$16 each for two days (set-up noon February 19); RV hookups at exhibition hall for \$10 per night; banquet Saturday night \$15 per person. Admission tickets are \$5 in advance, \$6 at the door.

Talk-in on 146.91 and 147.30.

Sarasota Hamfest Inc. Director Allan E. Matlick, W2TKU, can be reached for more information through the Sarasota ARA, 1817 Buccaneer Terrace, Sarasota, FL 33581. □

Illinois

The STERLING-ROCK FALLS ARS's 28th Annual Hamfest will be held at the Sterling High School Fieldhouse, 1608 - 4th Avenue, on March 20. Doors open at 7:30 a.m.

Commercial distributors, dealers, large flea market and space for self-contained campers. ARRL VE testing on site; contact Jim Buikema, NR9G, 512 N. Genesee St., Morrison, IL 61270; (815) 772-7874. Concession stand available. Tickets \$3 advance, \$4 at the door. Tables \$5 including electricity (bring own cord).

Talk-in on 146.25/85 (W9MEP).

For information, tables or tickets, contact Sue Peters, P.O. Box 521, Sterling, IL 61081; (815) 625-9262. □

Indiana

The Indiana Hamfest—sponsored by the MORGAN COUNTY REPEATER ASSOCIATION—will be held March 13. Open to the public at 8 a.m.; set-up Saturday, March 12, 3-9 p.m. Security provided overnight. Hamfest will last from 6 to 8 p.m. on Sunday. All vehicles must be out of the building by 7:50 a.m., after which the only access will be through pedestrian door.

The event will be held indoors with 60,000 sq. ft. of space at the Indiana State Fairgrounds Pavilion Building in Indianapolis. Among the features will be VE exams and ladies' programs. Free paved parking. Admission is \$5 at the door. Flea market tables (8') are \$8 each, including space. No space without table will be sold. Advance registrations suggested; TABLES SOLD OUT IN 1987.

Talk-in on 145.25.

For table reservations or information, send SASE before February 26 to Aileen Scales, KC9YA, 3142 Market Place, Bloomington, IN 47401; (812) 339-4446. □

Massachusetts

The ALGONQUIN ARC is sponsoring a hamfest at Marlboro Middle School Cafeteria (Union Street off Rte. 85), on February 14, 10 a.m. to 2 p.m. Sellers set up at 8 a.m.

Featured will be an electronics flea market. Event is wheelchair accessible. Admission \$2; tables \$8 in advance, \$10 at the door.

Talk-in on 146.01/61 and 146.52.

For more information, contact Dan Gardner, KB1WW, AARC, Box 258, Marlboro, MA 01752; (617) 481-1587. □

Minnesota

The ROBBINSDALE ARC will be sponsoring its 7th Annual Midwinter Madness Hobby Electronics Show on Saturday, February 27, 8 a.m. to 2 p.m., at the Medina Ballroom, Hwy. 55, 4 miles west of I-494, Hamel.

Featured will be manufacturers, dealers, flea market (opens at 8 a.m.), prize drawings and FCC testing. Retail exhibits open at 9 a.m., which is also when testing begins. Admission is \$3 in advance, \$4 at the door. Flea market is \$8/table, \$4/half-table.

To register for exams, send completed Form 610, photocopies of current license and code credit, and \$4.55 (payable to ARRL/VEC) to: Ron Shultz, 6308 Peacedale Ave., Edina, MN 55424. Walk-ins are limited; register by January 27.

Talk-in on 147.60/00 (K0LTC) and 146.52.

To register, send SASE and fees to Robbinsdale ARC, P.O. Box 22613, Robbinsdale, MN 55422; or call Bob at (612) 533-7354. □

New York

The February 14 Long Island Hamfair, sponsored by LONG ISLAND MOBILE ARC, will be held indoors at Electrician's Hall, 41 Pinelawn Road, Melville, 9 a.m. to 3 p.m. Take Long Island expressway (495) to exit 49 north, 1/10th of a mile north, right onto Pinelawn Road, 1/4 mile east on the right.

There will be free parking, food and refreshments, door prizes, swap and shop, computers, dealers, ARRL information, satellite communications, VHF tune-up clinic and more. Admission \$4 at the door, \$3 after 11:30 a.m.

Tables (4'x6') are \$12 in advance or bring your own at \$4.50 per foot, \$8 minimum. Send check to LIMARC, Hank Wener, 53 Sherrard St., East Hills, NY 11577; advise for electricity—outlets available for testing.

Talk-in on 146.25/85 (W2VL).

For more information, call (night only) Hank Wener, WB2ALW, (516) 484-4322 or Mark Nadel, NK2T, (516) 796-2366. (LIMARC's next hamfairs will be May 15 and September 18.) □

The 1988 ARRL Hudson Division Convention will be held in conjunction with the WECAFEST '88 hamfest on Sunday, March 13, at Westchester Community College.

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Valhalla. The convention is jointly sponsored by the HUDSON AMATEUR RADIO COUNCIL (HARC), the WESTCHESTER EMERGENCY COMMUNICATIONS ASSOCIATION (WECA) and WARY-FM, the college's radio station.

The one-day event will be packed with activities, including new ham forums, ARRL workshops, a giant flea market, FCC exams and more! Admission is \$4 at the door.

Talk-in on 147.06, 146.91 and 224.40.

For exhibitor/vendor information, please contact Bob or Sarah Wilson at 2 Soundview Ave., White Plains, NY 10606; (914) 997-8491.

For general information, contact Program Chairman Rich Moseson, NW2L, (201) 680-1585, or write "The GREAT '88," c/o NW2L, 19 Linden Ave., Bloomfield, NJ 07003. □

Ohio

The NORTHERN OHIO ARS (NOARS) will host its annual WINTERFEST at Gargus Hall in Lorain on Tuesday, February 9. All indoors with food service. Doors open at 6:30 a.m. for seller/dealer setup; 8 a.m. for general admission.

Talk-in on 146.10, 146.70, 448.600 and 443.600.

For information, contact John Paul Jones, WA8CAE, c/o 41751 North Ridge Rd., Elyria, OH 44035; (216) 324-3181 days, (216) 282-4256 evenings. □

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FEST/COMPUTER SHOW will be held Sunday, February 14, at the Richland County Fairgrounds in Mansfield.

Prizes, forums and flea market in large, modern heated buildings. Doors open to the public at 7 a.m. Forums include DX, packet, ARES and more. Tickets \$3 in advance and \$4 at the door. Tables \$5 in advance and \$6 at the door. Half tables available. Advanced ticket/table orders must be received and paid by February 4, 1988.

Talk-in (W8WE) on 146.34/94.

For information or advanced tickets/tables send SASE to Dean Wrasse, KB8MG, 1094 Beal Rd., Mansfield, OH 44905, or phone (419) 589-2415 after 4 p.m. EST. □

Texas

The SOUTH TEXAS AMATEUR REPEATER SOCIETY is sponsoring a hamfest February 20-21. Show opens at 9 a.m. Saturday; set-up at 7 a.m.

Expected to draw more than 2,000 from the United States and Mexico, the activities will take place at the Casa de Amistad, Civic Center, Fair Park Blvd., Harlingen. Advance tickets \$5; at the gate, \$6.

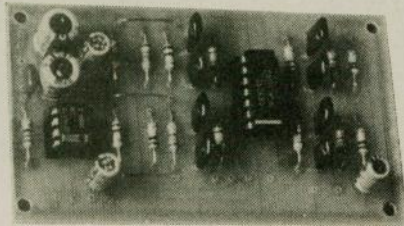
Talk-in (English) on 147.39 and (Spanish) 146.70.

For more information and flea market reservations, contact Dr. David Woolweaver, K5RAV, 2210 So. Sunshine Strip, Harlingen, TX 78550; (512) 425-7744 or 425-3128. □

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Vermont QSO Party

The Central Vermont ARC (W1BD) announces its 1988 Vermont QSO Party, to be held from 0001Z, February 6 to 2400Z, February 7.

Suggested frequencies: *Phone* — 80-15M; the first 25 kHz up from the beginning of the General phone band edge; *Novice 10M phone* — 50.110, 144.2; *CW*—3540, 3720, 7040, 7120, 14040, 21040, 21140, 28040; *RTTY*—3620 and 90 kHz from lower edge of other bands.

Exchange: VT stations send RS(T) and county (CW two-letter county designators: AN, BN, CA, CN, EX, FN, GI, LA, OG, OL, RU, WA, WM, WR. Other stations send RS(T) and state, province or ARRL country.

Scoring: *VT stations* — 1 pt. per phone contact; 2 pts. per CW or RTTY contact. Multiply by number of VT counties plus states, plus Canadian provinces, plus ARRL countries (non-W/VE). 20 bonus pts. for working W1BD. *Other stations* — 1 pt. per phone contact; 2 pts. per CW or RTTY contact. Multiply by number of VT counties. 20 bonus pts. for working W1BD.

Operation: A station may be worked three times per band; once each on phone, CW, or RTTY, CW and RTTY contacts must be on CW and RTTY sub-bands. Duplicate and repeater contacts invalid.

Awards: *Non-VT*—Certificate to highest-scoring station in each state, province and country (non-W/VE). *Vermont*—Certificate to each station submitting a log. *Plaque* (annual) to highest-scoring VT station. *W/VT Award*

to stations working 13 of Vermont's 1 counties.

Send SASE now for official score and log sheets. SASE for results. Send logs/facsimiles, name, address, county (Vermont), no later than March 1, 1988, to: D. Loverin WA1PDN, 50 Liberty St., Montpelier, VT 05602. □

Crazy 8's HF, VHF and UHF Contest

The Cuyahoga Falls ARC of Ohio (W8VPV) announces the Crazy 8's HF, VHF and UHF Contest, to be held from 1400Z, February 6 to 2300Z, February 7. This is a fun contest for all amateurs everywhere, with every type of Amateur Radio interest. This is your chance to try out all those new holiday gifts or to dust off all that old equipment in your shack.

Operation: Operators in the 8th call district work everyone; those outside work only 8's.

Exchange: *HF*—state, province or DX country; *VHF/UHF* — grid locator.

Scoring: Each QSO = 1 pt. You may use all bands 1.8-1296 MHz. There are two groups of multipliers. Add total of both groups and then multiply by total number of QSO's for final score.

Group 1—number of bands operated (minimum of 3 QSO's per band), number of VHF/UHF grid squares worked, and number of HF states and countries worked. **Group 2**—each multiplier = x8. Minimum of 3 contacts to get each: SSB, CW, RTTY/AMTOR, FM, SSTV/ATV, packet, satellite, AM, QRP (HF only, 5W), 160M, 12M, 6M, 220 MHz, Novice, ragchew (at least 10 minutes each), repeater (any band), mobile (HF only), and homebrew (receive and/or transceive).

Score sheets available for SASE. Use ARRL or equivalent-type log sheet and note type of contact for multiplier credit (QRP, mobile, ragchew, etc.) in comments column.

Suggested frequencies: *HF*—10 kHz up from bottom of each General and Novice sub-band.

Awards: All entrants receive a certificate if SASE enclosed. Highest score receives a plaque. Everyone else who submits a large SASE with 2 units of postage will receive a certificate describing their accomplishments (i.e., highest score in Maine, most multipliers in Texas, most UHF contacts, etc.). We told you there was something for every ham, and everyone is a winner! Join in the fun. Work a new mode, a new grid, a new friend. This time there is no excuse!

Send logs and score sheets to: Anthony Luscre, KA8NRC, 5441 Park Vista Ct., Stow, OH 44224. Deadline for entry is March 15, 1988. □

YL-OM Contest

The Young Ladies' Radio League (YLRL) is sponsoring a YL-OM Contest during two weekends in February. The phone portion lasts from Saturday, February 13, 1400 UTC, to 0200 UTC, Monday, February 15. The CW portion lasts from 1400 UTC, Saturday, February 27 to 0200 UTC, Monday, February 29. All licensed men and women radio amateurs throughout the world are invited to participate.

Procedure: OM's call "CQ YL" and YL's call "CQ OM."

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Operation: All bands may be used. No crossband operation. Net contacts and repeater contacts do not count. A station may be worked and counted once on each band. Participants may work only 24 hours of the time. Operating breaks must be indicated in the log.

Exchange: Station worked, QSO number, RS or RST, state/province/country.

Scoring: A) Phone and CW will be scored as separate contests. Submit separate logs for each contest. B) Score each band separately. 1 pt. is earned for each different station worked on each band; YL's count only OM's and OM's count only YL's. Add together the QSO points earned for each band. That is your total number of QSO's. C) Multiply the number of QSO's by the total number of different states/provinces/countries worked. D) Contestants running with a power output of 100W or less on CW and 200W PEP or less on SSB, at all times, may multiply the results of (C) by 1.50 (low-power multiplier). The maximum power output that may be used at any time during the contest is 750W on CW and 1500W PEP on SSB.

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/state/province 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 QSO's, 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 be postmarked by March 15, 1988, and received no later than March 30, 1988, or they will be disqualified. Please send logs to: YLRL Vice President Carol Shrader, WI4K, 4744 Thoroughgood Dr., Virginia Beach, VA 23455, USA.

Duplicates: For each duplicate contact that is removed from the log by the vice president, a penalty of 3 additional and equal contacts will be exacted.

Awards: 1st place phone — YL cup, OM cup; 1st place CW — YL cup, OM cup. The 2nd and 3rd place YL and OM winners in each

contest will receive certificates. The winner of the phone contest cup is also eligible to win the CW cup. Certificates will be awarded to the high YL and OM phone and YL and OM CW winners of each U.S. and VE call district and country, provided there are at least 10 valid contacts on the log.

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

Operation Search Contest 1988

Operation Search is sponsored by the Council for the Advancement of Amateur Radio in the New York City Schools in association with the ARRL Hudson Division Education Task Force.

Object: All stations to exchange QSO information as below with as many other stations as possible, especially school clubs.

Contest period: Monday through Friday, February 22-26 (third full week in February), 0800-2000 EST. Operate no more than 24 of the 60 hours. Logs must clearly show on and off times. Off periods must be at least 30 minutes.

Classes: (I) Individual or Single Operator (non-club), (C) Non-school club or group, and (S) School club (grades K-12)

Exchange: Your call sign, RS(T), class ("I", "C" or "S"), U.S. state or DX country. For example, W2CXN answers N2RQ's call by sending N2RQ DE W2CXN 579 S NY.

Scoring: Stations may be contacted once

each on phone and CW (packet and RTTY count as CW). No repeater contacts except satellite and "real time" packet. 1 pt. for each phone QSO, 2 pts. for each CW QSO.

Multiplier: Number states + DX countries + 2x "C" class QSO's plus 5x "S" class QSO's. **Final score**—Multiply QSO points by multiplier.

Reporting: Entries should be mailed to Operation Search, Martin Smith, KA2NRR, 1021 E. 81 St., Brooklyn, NY 11236. Logs must include exchange information, bands and signature of all operators (and authorized club official or trustee). Manual or computer dupe check sheets required for entries over 100 QSO's. Postmark by 30 days after end of contest (March 27, 1988).

Awards: Certificates for top three entries in each class. Send large SASE or sufficient IRC's for complete results and more info about CAAR/NYCS. — de Lew Malchick, N2RQ □

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Solar power supply

AntennasWest announces the introduction of its QRV-SOLAR 23 Power Supply designed specifically to provide mains-independent power for remote repeaters, portable or RV-based stations, and home Amateur Radio installations. The heart of the system is an easily installed unbreakable and bullet-tested solar panel with unique linear current boosting circuitry. The QRV-SOLAR 23 Power Supply, rated at 23W, delivers 1.65 amps at 14V and increased current at lower voltages.

To power a radio station, the energy

generated by the QRV-SOLAR 23 is accumulated in a user-supplied storage battery so that it can be drawn off as needed. During daytime power generating periods, the QRV-SOLAR 23's linear current boosting circuitry increases charging current in response to lowered battery voltage, speeding the charging cycle and increasing available system power by 25%.

In a typical repeater installation, a single QRV-SOLAR 23 Power Supply will support normal 24-hour usage while maintaining a full charge on the battery. Of particular importance at remote sites is the shatterproof, and unbreakable construction of the solar panel, which under test continued to function even when punctured by bullets fired at close range.

In a typical home installation with a standard 100W HF transceiver, a single QRV-SOLAR 23 Power Supply generates enough power to support up to 15 hours per week of normal CW or SSB operation or a full 24-hour contest binge every two weeks. When additional panels are added to generate more power, the current boosting circuitry of the basic solar power supply will increase battery charging power by 15 to 30% for the total system.

A technical manual explains optional mounting methods, battery selection, panel connection, orientation and angle adjustment for maximum power efficiency, and adjustment of the linear current boosting circuit for maximum system output.



Future Novice Arwen Rasmussen installing AntennasWest Solar Power Supply and QRV 160-10 emergency antenna system for Scout Jamboree on the Air.

The QRV-SOLAR 23 Power Supply is available for immediate delivery from AntennasWest at \$289.95 postpaid. An optional kit for mounting on vertical masts is available at \$34.95. □

Dual-band power amplifier

Dual-band amplifier? Yes, you are reading correctly. The HL-725D is a dual-band power amplifier for 144/440 MHz bands with low-noise GaAs FET RX pre-amps.

The HL-725D uses a large heatsink and the circuits of THL's well-established HL-62V and HL-60U models, which have already proven to be highly reliable and stable. You can enjoy not only an effective amplifier but simultaneous pre-amp operation of both the 144/440 MHz bands. Various combinations of dual TX and RX amplifiers can be used, as IN/OUT connectors are installed for both amplifiers.

Suggested list price is \$329.95. The HL-725D's are currently available from any Encomm dealer. Contact Encomm, Inc., 1506 Capital Ave., Plano, TX 75074; (214) 423-0024 for more information. □

All Mode and KPC packet update

Kantronics, Inc. announces the Version 2.70 feature enhancement update for existing Kantronics All Mode units and KPC packet units.

The Version 2.70 update adds the three KISS commands that make the KAM and KPCs TCP/IP Networking compatible. Additionally, the update adds the popular Personal Packet Mailbox feature to each unit, allowing you and others to leave and retrieve messages in your packet or All Mode unit.

The update is available for the KAM, Packet Communicator, KPC-2, KPC-2400 and KPC-4 units for \$15. (The update is free to those who purchased lower level units after July 1, 1987 and can show a dated sales receipt.) For more information, contact Kantronics, Inc., 1202 E. 23 St., Lawrence, KS 66046; (913) 842-7745. □



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Morse Tutor[©]

GGTE announces Morse Tutor[©], Version 2.1, for learning the International Morse Code or for improving the skills of those already familiar with the code.

Morse Tutor is available for IBM PC, XT, AT and equivalents. This unique program features both the Standard Method (uniform dits, dahs and spaces) and the "FARNSWORTH" method (spaces lengthened relative to dits and dahs). For the Farnsworth Method, the user specifies the word and character speeds (for example, 5 and 13) and the computer does the rest.

Morse Tutor introduces each of the letters, numbers, punctuation marks and special combination characters required by the FCC in 11 easy lessons (using giant block characters). Each lesson also features review of the characters taught in the current and then in all previous lessons.

Lesson 12 provides random QSO (conversa-

Bob's Corner

(continued from page 52)

general experimentation. Their performance at lower frequencies is even better.

Therefore, even if you don't have calibrated test equipment to check out your pads, I dare say they will be reasonably close if you follow the pointers given in this article and the resistor values presented in *Table 1*. Again, additional design information can be obtained in the previously mentioned ARRL publication. □

Bob's Corner

Exhilaration is that feeling you get just after a great idea hits you, and just before you realize what's wrong with it. — *Unknown.*

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The first electronic gain controls were rheostats controlling the filament voltage of the tubes. — *SCCARA-Gram, San Jose, CA*

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tion) practice of user-specified durations of up to 10 minutes per QSO. (For speeds of greater than about 50 wpm, the maximum duration is reduced.) Morse Tutor can create billions of QSO's, making memorization and anticipation inconsequential.

Character display, regardless of the lesson, can be selected to occur simultaneously with the sending of the code or after the lesson has been presented. This is user-changeable as desired. A self-calibration utility, to account for the clock speed of the computer, assures accurate code for speeds ranging from 1 to over 100 wpm.

Morse Tutor provides for setting the tone frequency over the full audible frequency range. All selectable variables — tone frequency, code speed, display mode and calibration values — are remembered from session to ses-

sion, so the user does not have to reset them each time the program is used.

Morse Tutor is truly user-friendly. For example, the user may individually select the segment of the lesson to be studied. Segments can be rerun as many times as desired (with new sets of random characters or words each time) before moving on. During the course of a lesson, code sending can be interrupted simply by striking a key. If interrupted, it can be continued (once the user is ready) or the segment can be terminated.

The license fee for Morse Tutor is \$19.95 plus \$2 for shipping and handling (California residents please add \$1.20 sales tax). To order, send check or money order to GGTE, 21881 Summer Circle, Dept. MTW, Huntington Beach, CA 92646. Dealer inquiries are welcomed. □

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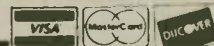


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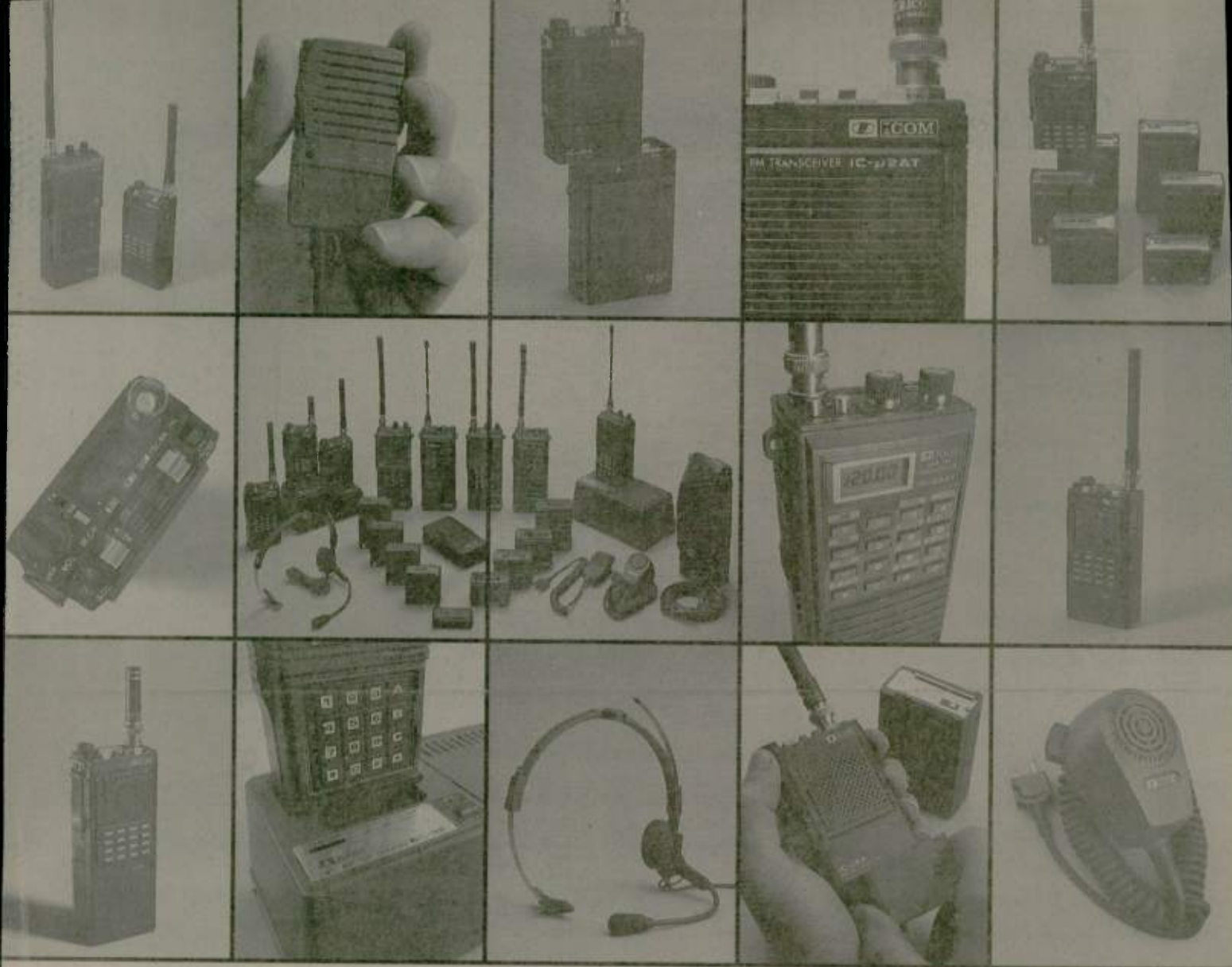
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