Worldradio

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Danger in new FCC rules

Hal Crispell, W6TZV

FCC Docket 80-729 is the FCC proposal to revise the Amateur Radio Service rules into "plain language." Preliminary analysis ARRL and individual amateurs find that the docket, as proposed, contains several major substantive adverse changes to existing rules and the structure of Amateur Radio — despite statements therein of FCC intensions to the contrary.

The deadline for comments is 19 June 1981. The document is complex — 50 pages, with more than a year in preparation at the commission, the Amateur Radio community needs more time for studies and for publishing of analysis and progress, as well as preparation of letters of comment.

This article is intended as a plea to all amateurs to take immediate actions to defend the Amateur Radio Service against adverse changes. First, write a letter to the FCC urging extension of the date for comment by a reasonable period — say, six months. It will take many letters to effect this, so your letter is critical. Second, send $1 to ARRL for a copy of Docket 80-729. Or see if your local library has a copy of the Federal Register, pages 83592 through 83642 under date of 19 December 1980. Also, the February 1981 **QST**, page 49, contains an outline of the proposed rules.

Third, study the docket when received and be ready to utilize results of analysis such as those underway in San Diego and Santa Barbara ARRL sections. These will be published in forthcoming **Worldradio** issues and elsewhere.

Fourth, pass the word. Remember, everybody is not yet a subscriber to **Worldradio**. Tell your friends and clubs about it. Fifth, based on the above steps, write a second letter to the FCC. Better, an original and 11 copies so that each commissioner may have an individual copy. Keep your letter constructive and positive -- avoid non-constructive emotional criticism. Also make additional copies for your ARRL Division Director and for ARRL headquarters staff.

Preliminary studies have revealed the following adverse substantive changes.

A) The basis and purpose of the Amateur Radio Service is plainly expressed in existing rules 97.1. This would be subplanted by an inadequate three-sentence statement including the following phrase: "They (amateur operators) use the service only for their own personal satisfaction . . ."

B) Permission of the FCC would be required for placing your antenna "higher than 20 feet above a building you mount your antenna on" or "higher than existing antenna." This is dictated by proposed rules AR-25 and AR-30 in combination, even if your station is far away from an FAA or military agency airport or heliport.

C) Although the drafters' deny intension to change the structure of the Amateur Radio Service in paragraph 7 of the supplemental information (introduction), in paragraph 4 they describe restructuring of Part 97 in such a way as to bring together "the FCC requirements for a particular radio service into a subpart describing only that service." That restructuring would separate the existing Amateur Radio Service into three new services. These are a new lesser "Amateur Radio Service," a radio amateur civil emergency service, and an amateur satellite service. In the drafters' own words these would each be a "particular radio service." Is this not restructuring of the Amateur Radio Service?

D) Note the schizosemantic confusion of the proposal drafters in treating the word service and its plural in the docket. Beginning at the title of the docket it is singular, consistent with existing Part 97. Just below the title, in the summary, it has become plural. But in the legal format of the opening paragraph of supplementary information, it has returned to singular. is this an example of "plain language" communication, or an unintentional revelation of the drafters' philosophy directed toward restructuring the existing Amateur Radio Service?

E) In paragraph 5 of the supplementary information, the drafters attempt to explain the need for the restructuring, described above in (C), as being required "to conform with the terms used in the international regulations." They then propose retitling of the Amateur Radio Service to become the Amateur Telecommunication Services. Further study will be required to see if this interpretation of international regulations is warranted. But the essence of the Amateur Radio Service is the use of bands within the radio portion of the electromagnetic spectrum, not the telecommunications media such as land lines.

F) While clarity of existing Part 97 rules can undoubtedly be improved in several instances, the overall picture is by no means foggy. It is a gratuitous insult to the intelligence of amateurs and candidates to presume that such "spoon feeding" is much needed. While appropriate to the less selective services such as citizens band, the use of precious resources to draft and implement such marginal regulatory changes for the Amateur Radio Service is questionable.

Some comfort may be derived from the news that those most responsible for the concepts of this proposal have left or are leaving under the present change of administration, but don't let that slow you in doing your part. And finally, if you are not now taking at least a small part in the Amateur Radio Emergency Service (ARES), the National Traffic System (NTS), and/or club teams which bring to life the leading phrase of Part 97.1 Basis and Purpose . . . "Amateur service to the public as a voluntary non-commercial communication service, particularly with respect to providing emergency communications," consider how you can rebudget your time to do so. □

Volunteer amateurs may assist FCC

You can help push this bill through by sending a QSL card to Washington!

Gordon West, WB6NOA

Ray Frost, WA6TEY, like other Amateur Radio operators throughout the country, doesn't like jammers or other stations that cause deliberate interference. Ray has a complete 2-meter direction finder setup in his mobile that will rival any commercial setup around. However, finding a station doesn't necessarily mean the interference is going to stop.

Meetings with Congressman William (Bill) Dannemeyer, Republican, 39th District, California, brought to light the subject of an alarming increase in interference on the Amateur Radio bands. Of special interest to Congressman Dannemeyer was the apparent inability of the Federal Communications Commission to take any meaningful action against these violators. The problem? The FCC indicates they could not legally use any information provided them from outside sources, such as the interference committees made up of Amateur Radio operators.

What good is an interference committee if it doesn't have any real "bite"? The information collected by interference committees, although extremely accurate, could only be used as tips. This means that the tremendous amount of expertise available in the Amateur Radio ranks was actually being wasted.

The FCC representative at the meeting with Congressman Dannemeyer readily admitted that the amateurs had the equipment, the knowledge, and the ability to accurately locate and identify sources of interference. However, he also indicated that the law required that any violations had to be verified personally by an FCC employee.

Mr Dannemeyer's reaction was that if this expertise was available to the government — free of charge — and a law prevented it from being utilized, we should look toward changing that law.

Congressman William (Bill) Dannemeyer, Republican, 39th District, California.

This is what H.R. 2203 is all about.

H.R. 2203

H.R. 2203 is designed for qualified Amateur Radio operators to assist the FCC in tracking down rule violators. For

(*please turn to page 25*)

New county in New Mexico

Submitted by Lee Mitchell, KC5C

U.S. county hunters now have one more from New Mexico to put on the list. Cibola County, New Mexico, was signed into law 17 March 1981. It will be the 33rd county. □

Conversation Guide cassettes available

Naoki Akiyama, JH1VRQ — who contributed the Japanese words and phrases to the *Radio Amateur's Conversation Guide* (see April **Worldradio**, page 33), published by Jukka, OH1BR, and Miika, OH2BAD, Heikinheimo — has made available a C-60 cassette in which all those Japanese numbers and phrases are recorded by himself, assisted by Shigeo Kanehira, JA1VDJ.

If interested, send $3.70 (U.S.) or eight IRC's to Naoki Akiyama, 4-1-4-210 Shakujiidai, Nerima, Tokyo 177, Japan; he will be pleased to airmail you a copy of the cassette (U.S. $5.45 or 12 IRC's for registered airmail). This special offer expires on 30 June 1981. □

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Worldradio (USPS 947000) is an international conversation. You are invited to take part. Our newspaper is written by its readers.

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

Our readers are participants — an alliance of active radio amateurs who are concerned with reality, who use radio as a communications tool. We ask your cooperation in helping us develop the skill, quality and full potential of Amateur Radio.

We are positively-oriented. We print all the news of this great activity, and particularly desire an input of stories dealing with the dramatic, the personal and humanitarian uses of Amateur Radio.

Worldradio needs your help to reflect the invaluable service of Amateur Radio.

Through **Worldradio** you can make contact with other individuals who share your interests.

Worldradio is an independent newspaper. It is not affiliated with any other firm, group or organization. Its pages are open to all. Permission is hereby automatically granted to reprint from this publication. If there is something useful, we wish to share it.

Subscription rates: $8.64 per year, $16.28 for two years, $22.92 for three years and $86.40 for life; $1.50 extra per year for surface mail delivery outside the U.S. Overseas, please remit international postal money order. IRCs and local currency will be accepted.

Controlled circulation postage paid at Sacramento, CA.

Operate Gabilan ARC

The Gabilan Amateur Radio Club would like to announce that they will put San Benito County, California on the air on Sunday, 31 May 1981.

Times of operation will be from 0800 PDT to 1600 PDT. Times will be extended if activity is good. Operating frequencies will be 28.775 and 21.400 USB, and 28.175 and 21.175 slow speed CW.

A special certificate and QSL card will be sent to those who confirm with SASE. QSL to John Daudet, KB6IT, 2001 Scenic Circle, Hollister, CA 95023.

Field Day award

The Puget Sound Council of Amateur Radio Clubs will issue a handsome certificate for contacting any three of the six participating council clubs in the 1981 Field Day. Those clubs and their calls are: Boeing Employees Amateur Radio Society, K7NWS; Hams Amateur Mobile Service Club, WA7LAW; Mike and Key Amateur Radio Club, K7LED; Mt. Baker Amateur Radio Club, K7SKW; North Seattle Amateur Radio Club, W7DA; and Radio Club of Tacoma, W7DK.

To qualify for the certificate, you must exchange QSL cards with those three Field Day stations you have contacted. Send those QSL's and $1 to Scotty Huntley, K7CYZ, 802 S. Lawrence St., Tacoma, WA 98405. Your QSL's will be returned with the certificate. □

Contact a historic ship

Submitted by Sam DeDonatis, WB2BWL

The Cruiser Olympia Association proudly announces the opening of the first amateur station aboard a United States naval shrine. The cruiser *U.S.S. Olympia* at Penns-Landing on the Delaware River in Philadelphia, Pennsylvania is currently on the air.

A special full operating weekend is planned for 30-31 May 1981. Times will be: 1300Z Saturday to 2000Z Sunday. Frequencies for CW will be: 3590, 7050, 14050, 21090 and 28150 kHz ± 10 kHz. Frequencies for phone: 3890, 7235, 14285, 21360 and 28600 kHz ± 10 kHz. Novice operations are planned as well as local 2 meters.

A beautiful certificate has been prepared for contacts with the Olympia Amateur Radio Club on board the *U.S.S. Olympia* (C-6) — Admiral Dewey's flagship of 1898, fully restored. Stateside contacts please remit 25¢ for postage and foreign contacts remit one IRC to obtain special certificates of contact.

Additional inquiries about the ship's history or its newly formed amateur operations should be sent with a SASE to: Cruiser Olympia Association, c/o Olympia Amateur Radio Club, P.O. Box 928, Philadelphia, PA 19105. □

Celebrate submarines

Submarine Memorial Day will be celebrated on 13 June 1981, and Mancorad Amateur Radio Club, Station W9DK, will be on the air all day, 0900-1600 GMT, bottom of all general bands — 10-80 meters — calling direct from submarine, Cobia.

A special commemorative QSL card will be exchanged for an SASE. Send to W9DK, c/o Red Cross, 1816 Washington Street, Manitowoc, WI 54220. □

Grant Wood

On Sunday, 14 June 1981, the Jones County Amateur Radio Club will be operating Special Event Station AC0Z from the site of the Grant Wood Art Festival in Stone City, Iowa from 1100 to 2300 UTC on or near 7.235 MHz. The club sponsors the Grant Wood Award and will issue this certificate to all amateurs contacting the Special Event Station.

Send your QSL and an award fee of $1 to: Lawrence Greenawald, AC0Z, 801 South Haven Drive, Monticello, IA 52310. □

The Old West lives again!!

At a week-long celebration — NEBRASKALAND DAYS! A statewide event held the third week of June every year in North Platte, Nebraska — the home of "Buffalo Bill" Cody — featuring the Buffalo Bill Rodeo named after North Platte's famous resident who started rodeo as we know it today right here in North Platte.

In honor of "Buffalo Bill", and to celebrate NEBRASKALAND DAYS, the North Platte Amateur Radio Club will operate a special station, W0CXH, from 1800 to 0000Z on 13 and 14 June 1981. Frequencies used will be SSB 21.400, 14.290 and 7.250 MHz and CW 21.150 plus or minus QRM.

A handsome certificate will be available for contact with the station.

Send legal-size SASE to North Platte Amateur Radio Club, P.O. Box 994, North Platte, NE 69101. □

Hamfest, contest and special information must be submitted by the 15th, two months prior to the issue month in which you wish the information to appear. (For example a July hamfest would have to be sent by 15 April to appear in the June issue).

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FEATURES

COLUMNS

SW Division holds confab

Lenore Jensen, W6NAZ

They came from Santa Babara to Riverside, Inyo to San Diego for the annual get-together of ARRL Southwest Division "League Officials" on 28 February at the JPL auditorium, Pasadena.

Fifty-four concerned amateurs met with Director Jay Holladay, W6EJJ, prior to his flying to Orlando for the ARRL Board meeting and National Convention. He and Vice-Director Peter Matthews, WB6UIA, explained matters of urgency and sought their suggestions during a five-hour meeting.

Assistant Directors, SCMs, SECs and other appointees exchanged views on vital Amateur Radio matters such as the proposed "plain language re-write" of the FCC Regulations. Consensus was that proper consideration would require an extension of the 19 June 1981 deadline.

Southwest Director Jay Holladay, W6EJJ

League officials meeting in Pasadena included ARRL appointees and reps from many Southern California clubs. Elected officers, seated in front row are (left to right): SCM Stan Brokl, N2YQ; Vice Director SW Division Peter Matthews, WB6UIA; Director Jay Holladay, W6EJJ; SCMs Bob Dyruff, W6POU; and Art Smith, W6INI. (*photo by Bob Jensen, W6VGQ*)

Radio had been altered. Unintentional "hidden changes" should be scrutinized, others felt. It was suggested that clubs devote their May meetings to consideration of the proposed re-write, followed by proper submission to the FCC of opinions, with copies sent to the League.

Emergency Communications were evaluated and proposals for improvements made. Also, it was agreed that increased intercommunication within the Division was desirable.

The frequency 3907 MHz (spot where League officials meet Sundays at 5:00 p.m. PST) was suggested as a focal point during emergencies.

Ways to strengthen links between affiliated clubs and Newington were urged and suggested. Members were reminded that renewal of membership via one's club nets $1.50.

The Director's new publication, **Communicator,** will be sent to club presidents (or secretaries), as well as to other appointees.

Precedent-setting antenna restriction cases caused great discussion due to their importance to all licensees. The point was made that "if we have good privileges in our community, we must be careful not to abuse them." Also, much stress was placed on the roles amateurs play in their own communities in civic affairs. "If we had amateurs elected to City Councils or appointed to Planning Commissions . . . "

One way to become important to local government might be to offer technical expertise to those lacking such advice. Small communities planning to bring in Cable T.V. might welcome such help. And, "Keeping abreast of local rules and restrictions about antennas, etc., is vital!"

The subject of malicious interference (and operating!) drew much interest, as expected. Recognizing the FCC's lack of personnel and budget for enforcement at the amateur level, some present believed amateurs would again be willing to pay fees for licenses if, this time, the money would go into the FCC's own budget, not to the General Fund as before.

It was hoped the bill allowing the FCC to use volunteers for certain activities would do well this time; last session it "died." All are urged to support and seek support for Rep. Bill Dannemeyer's bill, HR 2203 (new number.)

Director Holladay explained the six priority areas which have been identified by the ARRL's Long-Range Planning committee, of which he is a member. They are:

1. Expansion of public service involvement
2. Effective working relationship at all levels of government
3. Membership involvement in League affairs
4. Need for improvement of ARRL organizational structure
5. Enhancing technical interests and abilities of amateurs
6. International Amateur Radio policies: strengthening IARU and capitalizing on the good preparations made for WARC.

One member suggested ARRL establish a Court of Honor at W1AW to recognize those amateurs who have lost lives in the Amateur Radio Service.

It was urged that everyone carefully read the March **QST** editorial regarding dues structure.

Attendees were requested to "carry away the message" that all should keep the Director informed of activities and were provided with suggestions for continuing improvement of ARRL and club efforts.

Present were Assistant Directors Bill Baucum, WA6YWS; Paul Thompson, N6PC; Pete Hoover, W6ZH; George Riggins, WA6DZR; Irv Emig, W6GC; Irma Weber, K6KCI; Joe Merdler, N6AHU; Bob Thornburg, WB6JPI; Archie Willis, W6LPJ; and Dave Bell, W6AQ.

SCMs Bob Dyruff, W6POU; Stan Brokl, N2YQ; Fried Heyn, WA6WZO; Art Smith, W6INI; Assistant SCM Sandi Heyn, WA6WZN; SECs Dave Tucker, WB6FAK, and Joe Brown, W6WBQ; Assistant SEC Burl Bailey, N6RD; DECs Bob Mann, W6LKN, and Brooks Rettig, K6GGS; ECs Jim Thowns, WA6QMW; Len Drayton, WA6LAU; Marshall Burgh, WB6YIZ; John S. Benka, WA6DUB; Jim Fortney, K6IYK; Thomas Markley, WA6IKH; Jay Engberg, W6ZZZ; Scott Graham, KE6B; Cletis R. Boan, AK6Y; Jim Michaels, W6PGM; Jim Dunn, KB6EX; John English, WB6WKF; and Paul Ryan, WB6RVA; STM Gordon Wenz, N6GW.

Assistant EC Chuck Arnold, KD6BX; and representatives of various clubs Bob Jensen, W6VGQ; Nick Razum, WD6HBM; Jim Matthews, WA6RGH; Jim Varner, AE6N; George Morris, W6ABW; Lou Weber, K6GHU; Rosemarie Pitz, N6BCX; Bill Pasternak, WA6ITF; Art James, N6VP; L.G. Bingham, K6CBN; Rosemary Willis; Sam Lalande, W6OXX; Richard Belden, K6QYL; Jim Hoff, WB6PWA; PIAs Norman Chalfin, K6PGX, and Lenore Jensen, W6NAZ. □

CCC: Amateur Radio

Carl Drumeller, W5JJ

Note that colon. It's used only because my typewriter does not have the double arrows signifying a two-way equation. Its use would have indicated the dependency of the CCC (Civilian Conservation Corps) on radio amateurs for its communications service, as well as the boost to professional and amateur activities the CCC provided to its "enrollees" who were radio amateurs.

Several former CCC enrollees responded to the appeal, in **Worldradio**, for additional information. At this point, let thanks and appreciation be expressed to Ellard W. Foster, W5KE; Robert W. Brown, W0LNA; and Lee Craig, W0TSA. These gentlemen were most kind in providing personal experiences as well as background information. I will draw heavily upon their input for this article.

Let's take their stories in alphabetical order; this puts Robert W. Brown as the lead-off man. Bob got into the CCC in the summer of 1939, mainly to earn funds to finance his senior year in high school. His first duty post was at Larimore, South Dakota, where he discovered that the radio operator was leaving and a replacement was being sought. Being astute, Bob got the outgoing operator to teach him the International Morse Code and to show him how to tune the Stancor transmitter used (with a Hallicrafters SX-25 receiver) at station WUFG.

Now, please let me toss in a personal comment. Let the reader note how quickly these CCC chaps mastered the code; constrast their mastery to the moaning and groaning of some would-be amateurs who equate achieving 5 (or 13) wpm to building the Great Pyramid of Egypt!

To continue with Bob's account, he became "Sparks" for the camp, rating a combination radio shack/private quarters of his own. His duties centered upon a twice-daily schedule with Fort Lincoln to report camp statistics.

Of course, radio operator duties also included maintenance; so when a power transformer in the Stancor departed this life, Bob rebuilt the transmitter, adding — largely for his own benefit — radiotelephone capabilities. This entailed a Heising constant-current modulator plus, of course, a speech amplifier . . . no problem to an aspiring radio amateur! At odd moments, Bob would chat with the CCC radio operator at Kenmare, North Dakota — mostly for code practice. A friendship developed with Rollin Saponas, that other operator; he, too, became a radio amateur.

As a follow-up, Bob, like many other amateurs of radio communication and technology, progressed on into commercial involvement. He now operates an electrical and electronic supply house in Minot, South Dakota. But he has never deserted Amateur Radio. He operates W0LNA, which his YF laughingly says indicates "Lousy No-good Amateur." Hmmmm, how about "Low Noise Amplifier"?

Lee Craig, now W0TSA, had a double crack at the CCC, one in 1933 and the other in 1938. On that second tour he served as radio operator, after being checked out at the Little Rock, Arkansas headquarters to demonstrate his radiotelegraphy ability. As he then held the amateur call W5GDI, proving his ability was no problem! The duty station to which he was assigned departed from the ordinary: it was on a boat! The boat was tied up at a spot on the White River about eight miles from St. Charles, Arkansas. Like Bob, Lee had a combination radio shack/private quarters; that is, he shared his sleeping quarters with the radio station.

The transmitter of that station was a Clough-Brengle with what might be called the "standard" tube line-up for that day: a UX-247 crystal oscillator, a UX-246 buffer, and a pair of UX-246s in the final. It was mated with an RCA receiver — a 7-tube job, as Lee remembers. He's uncertain as to its model number, but I'll make a wild guess it was RCA ACR-136 or ACR-111. Lee had bought the receiver from Bob Henry, Butler, Missouri, in 1935; I bought an RCA ACR-136 there about that time, which accounts for my wild guess. Note that Lee furnished his own receiver; quite often gear designed for radio amateur use was superior to obsolete military or commercial equipment.

Lee's call was WUFV, and he held hourly schedules on 4610 kHz with station WUCA at Little Rock, Arkansas. Between schedules, he'd do a bit of chatting with operators at other CCC stations.

On 1 December 1938, Lee was transferred to the boondocks . . . a place now known as Buffalo River State Park. There was no commercial power there, so Lee took along a small gasoline engine power direct current generator plus an alternating current converter to power his equipment. Shortly afterwards, Lee departed the CCC in favor of the Army, becoming a radiotelegraph operator at WVU, Omaha, Nebraska. Lee doesn't say whether he pursued an electronics career after leaving the service.

Ellard W. Foster, now W5KE, is one who did pursue a career in electronics. I'll let him tell you about his CCC activities, as they're too well written to justify any rearrangement. Although Ellard mentions it only lightly, he has had a successful career in electronics. After retiring from the FAA, where he served as an electronics engineer, he established (and still operates) a business in the field of Surplus Electronics.

●●●●●

A CCC beginning

Ellard W. Foster, W5KE

In the late summer of 1934 I "enrolled" in the Civilian Conservation Corps. A new "company" was formed in the Black Hills of South Dakota and detailed to Presho, South Dakota to build earth dams.

Shortly after our arrival in Presho, a notice was posted on the bulletin board advising all Amateur Radio operators, or other enrollees with code ability, to apply for possible duty in future CCC radio stations. Nearly all of my radio experience had been in broadcast receiver repair, but I liked the idea. To learn the code, I needed some sort of machine. I found a moonlighting job to supplement my $5 per month allowance, and responded to a radio magazine article that rented a code sending and writing device.

That machine was different than any I've seen since. It wrote on a strip of paper with a broad pen. The ink was conducting type and it played back what was recorded. I can only guess the name was "Inkograph" or similar.

We moved to Pierre, South Dakota in late October 1934. A CCC radio station had already been set up there. A few days after our arrival, an operator — John Van Bockern — came around looking for "the guy with the code machine". He showed me the station and introduced me to Ray Stekley, the regular operator. John then went back to state headquarters at Fort Meade, where he and Denny Begley operated the combined Army and CCC station.

Ray Stekley and a TRF receiver I built soon replaced the code machine. Ray introduced me to amateur activity in his off-duty hours and coached me for a conditional license. After getting that license and proving my ability on CCC traffic, I was sent to camps near Custer and Chamberlain, South Dakota. At

(please turn to page 26)

Here's a Concept You Haven't Seen In Amateur Radio For A Long Time— Low Price.

The right design — for all the right reasons. In setting forth design parameters for ARGOSY, Ten-Tec engineers pursued the goal of giving amateurs a rig with the right features at a price that stops the amateur radio price spiral.

The result is a unique new transceiver with selectable power levels (convertible from 10 watts to 100 watts at the flick of a switch), a rig with the right bands (80 through 10 meters including the new 30 meter band), a rig with the right operational features plus the right options, and the right price for today's economy—just $549.

Low power or high power. ARGOSY has the answer. Now you can enjoy the sport and challenge of QRPp operating, and, when you need it, the power to stand up to the crowds in QRM and poor band conditions. Just flip a switch to move from true QRPp power with the correct bias voltages to a full 100 watt input.

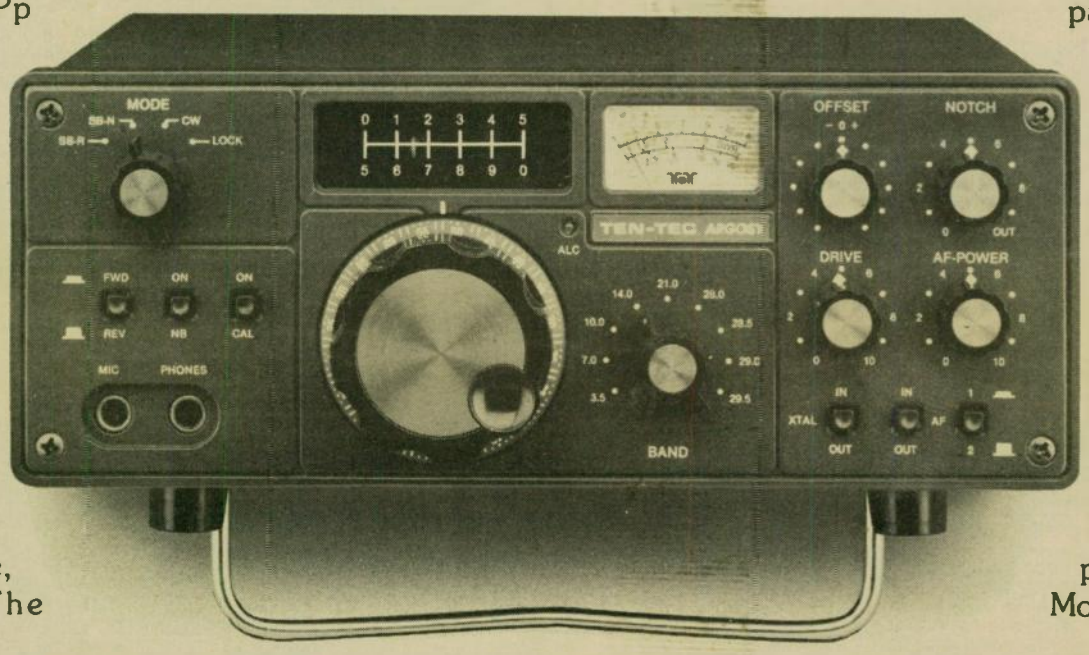
New analog readout design. Fast, easy, reliable, and efficient. The modern new readout on the ARGOSY is a mechanical design that instantly gives you all significant figures of any frequency. Right down to five figures (± 2 kHz). The band switch indicates the first two figures (MHz), the linear scale with lighted red bar-pointer indicates the third figure (hundreds) and the tuning knob skirt gives you the fourth and fifth figures (tens and units). Easy. And efficient—so battery operation is easily achieved.

The right receiver features. ***Sensitivity*** of 0.3 μV for 10 dB S+N/N. ***Selectivity:*** the standard 4-pole crystal filter has 2.5 kHz bandwidth and a 1.7:1 shape factor at 6/50 dB. Other cw and ssb filters are available as options, see below. I-f frequency is 9 MHz, i-f rejection 60 dB. ***Offset tuning*** is ± 3 kHz with a detent "off" position in the center. ***Built-in notch filter*** has a better than 50 dB rejection notch, tunable from 200 Hz to 3.5 kHz. An optional noise blanker of the i-f type has 50 dB blanking range. ***Built-in speaker*** is powered by low-distortion audio (less than 2% THD)

The right transmitter features. ***Frequency coverage*** from 80 through 10 meters, including the new 30 meter band, in nine 500 kHz segments (four segments for 10 meters), with approximately 40 kHz VFO overrun on each band edge. ***Convertible power:*** 100 or 10 watts input with 100% duty cycle for up to 20 minutes on all bands. ***3-function meter*** shows forward or reverse peak power on transmit, SWR, and received signal strength. ***PTT*** on ssb, ***full break-in*** on cw. PIN diode antenna switch. ***Built-in cw sidetone*** with variable pitch and volume. ***ALC control*** on "high" power only where needed, with LED indicator. ***Automatic*** normal sideband selection plus reverse. ***Normal 12-14V dc*** operation plus ac operation with optional power supply.

The right styling, the right size. Easy-to-use controls, fast-action push buttons, all located on raised front panel sections. New meter with lighted, easy-to-read scales. Rigid steel chassis, dark-painted molded front panel with matching aluminum top, bottom and back. Stainless steel tilt-up bail. And it's only 4" high by 9½" wide by 12" deep (bail not extended) to go anywhere, fit anywhere at home, in the field, car, plane or boat.

The right accessories—all front-panel switchable. Model 220 2.4 kHz 8-pole ssb filter $55; Model 218 1.8 kHz 8 pole ssb filter $55; Model 217 500 Hz cw filter $55; Model 219 250 Hz cw filter $55; Model 224 Audio cw filter $34; Model 223 Noise blanker $34; Model 226 internal Calibrator $39; Model 1125 Dc circuit breaker $10; Model 225 117/230V ac power supply $129.



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U.S. QSL Service via N7BMY

QSLing in the United States is alive and well. The files at the USQS are getting fatter every day with unclaimed QSLs. I will say, though, that the SASEs on file are also increasing in number each day, so the cards are moving. USQS has been in operation for over one year now and admittedly is still striving for a more efficient flow. We are growing steadily and wish to thank all who are a part of our system.

For those who are not aware of USQS, we are an incoming and outgoing QSL bureau for cards to be delivered to amateurs in the USA and/or Canada. To send your USA/Canada-bound QSLs to the USQS bureau, you:

1. Sort by call sign area (0-9).
2. Enclose 25¢ for each 20 cards you send.

It is not necessary to put addresses or postage on the cards — just the information to your Amateur Radio contact. The post office has informed us that if the QSLs are already filled out, they are first class material and therefore must come to USQS as first class mail. The QSLs received are put on file, hopefully to match self-addressed stamped-envelopes and to be forwarded quickly.

To receive your QSLs from the USQS office, you must have an SASE on file. You may either send your SASEs to USQS or send $1, and I will put five SASEs on file for you. PLEASE note the new postage rates. A note as to how many QSLs per envelope you want is appreciated.

With every contest, I receive a large number of QSLs; those — combined with the normal incoming cards — result in my almost begging for SASEs! If you don't have an SASE on file, please consider sending one or two. If you have sent one and have gotten it back, please send another! If you belong to a club and the members would like to send one envelope for the entire club, or if just a few neighbors would like to be really efficient I would be glad to send whatever calls are requested.

Following is a list of unclaimed cards which have been put on file within the last month. I have been submitting a list of calls every month since October, so if yours is not here perhaps it was in a back issue. Please send SASE!

USQS appreciates your patience and hopes to continue to grow. For the sake of convenience, you are welcome to tell others to QSL VIA N7BMY. The listing is good in the 1981 Callbook and will clue others that you are on file with USQS. Thank you and Happy Hamming!

Please post our address somewhere handy and we'll see you soon! 73 — Laryl Myers, N7BMY, USQS, P.O. Box 814, Mulino, OR 97042.

WB1AVA	WA4TNI	WA6MAM	N9BEM
N1AZL	WA4UIV	WB6MFE	N9BGZ
KA1BST	WB4YNL	KA6MSU	N9BWF
KA1DVC	WA4ZIE	KA6MZC	KA9CHP
K1DXA	WA4ZQF	WA6NOP	W9DS
KA1EBA	N5BYJ	KA6NVM	KA9EKG
KA1FVG	N5CCU	WA6OCU	W9ERZ
KA1GHR	KA5CIB	W6OEJ	WD9FMN
W1GUC	KC5CP	KD6OM	K9GH
K1GZM	WD5CLD	K6OYX	K9GHP
VE1UI	WD5DBT	W6PGM	KA9GIV
WA1WPJ	WD5DHF	WA6POZ	W9HCH
WD2AGY	KA5DYN	WB6POQ	KA9HRM
N2AHZ	KB5FP	W6PPQ	KB9I
K2ARO	WD5GCC	K6PTF	KA9IHG
KA2EFS	KA5GFJ	K6UD	WA9IVU
KA2EGO	KA5GIS	W6WPY	KA9JFY
KA2EYH	WD5HSP	K6YHL	K9QOF
KA2FEK	KA5IMO	WB6YQL	W9SQJ
KA2FKI	KA5ITU	W6YRJ	W9TIE
KA2HSF	KA5JAJ	K6YPY	WB9TJY
WA2HSQ	KA5JSA	WA6ZAX	K9VGE
KA2IML	KA5KPR	KB6ZO	WA9VNS
KA2JHN	KA5KSH	W6ZSL	WB9VXQ
KA2KGN	WN5MBS	KA7A	WA9WAC
KA2KLC	K5MRU	WB7ABX	K9WEY
KA2KWT	WB5NTI	WB7AGZ	AK9Y
WB2MHR	W5TTE	KA7AHN	KA0ANR
KA3ANJ	KS6A	N7ARG	W0ANX
KA3DAH	KU6A	KA7AWH	W0AUL
KA3EHF	N6AXU	WB7BQP	KA0BVK
KA3EOX	KA6AYR	N7BRV	KG0F
WB3FSB	N6BOK	KA7BSJ	WD0GFG
KA3GJT	WD6BPQ	KA7DQU	WD0GZE
KA3GWE	N6BTM	WB7DQW	KA0HGS
W3IR	KA6BTU	KA7DWW	KA0IAS
W3VBM	KA6BZE	AF7E	KA0IKD
VE4AES	N6CEX	KA7EGQ	KA0IQR
WD4AVY	WD6CFQ	WB7EXM	KA0IXE
KA4AXU	KA6CLK	AD7F	KA0JDT
KB4BC	W6CN	KA7FDL	KA0JNC
N4DFO	N6CSW	W7FFJ	KA0JQE
W4DNP	WB6CZO	K7GDN	KA0JTV
W4FRL	WB6DCB	K7GYP	KA0JUD
KA4GTH	WB6DCC	KA7HDE	W0PEL
K4GTK	WD6DDD	KB7IX	KB0PK
KA4HLT	WA6DGK	KL7JAI	KB0UJ
KA4HMV	K6DMN	K7JJS	
WD4HSA	KB6DP	KB7KV	
KA4ILJ	WD6ETA	KE7L	
WD4IXE	W6FAG	W7LT	
KC4KN	KA6FBG	WB7NGY	
K4KUZ	KA6FBK	WB7NKY	
W4KXP	WA6FFS	WB7NUU	
KA4LHG	WD6FMH	K7NV	
KA4MZV	W6FWK	WB7PVA	
KA4NEP	WA6GFV	K7QLC	
KA4NKC	KD6GO	WB7WOM	
W4NWN	WB6GOM	WB7SSS	
KA4OAS	WA6HLE	WB7UJU	
KA4OID	WA6HRN	WB7USJ	
KA4OLH	KA6HSM	WB7VDR	
WD4OOX	KA6HWA	WB7VVH	
W4ORH	AF6I	K7WTC	
WA4OTP	WB6IJY	W7YKN	
KA4OXQ	WA6IYN	W7ZVQ	
W4PCY	KD6JB	WA8AAQ	
W4PVP	KA6JHM	W8AEZ	
W4PXI	N6JM	WD8BFH	
K4QHH	W6JQC	WB8BJX	
WA4QHI	KD6JS	WD8BOK	
KA4QVY	AA6K	WA8DOV	
W4QXP	WA6KGV	KA8FXT	
KA4RJU	KA6KHZ	WA8GMT	
KA4RLT	WB6KRI	WD8ICO	
KA4RWC	W6KRO	WB8JET	
K4SCZ	W6LII	KA8JRI	
KA4SDU	KA6LKL	KA8KCN	
KA4SOD	KA6LNT	WD8LCD	
W4SPR	WA6LOD	WA8NQI	
W4STI	K6LR	KB8PO	
KA4STL	W6LUL	WB8WTZ	
KA4SYG	WA6LVM	W8ZTH	

Higher postage rates — more QSL bureaus

Bob McGarvey, WB2EVF

A byproduct of the increase in international postage rates may be a greatly accelerated use of QSL bureaus by amateurs wishing to send and receive overseas cards.

It now costs 40 cents to send a ¼-ounce air mail letter to the many parts of the world where the charge used to be 31 cents.

In the past, an International Reply Coupon — which still costs 42 cents in this country — was supposed to be good for one surface mail return from a foreign country belonging to the International Postal Union. Generally, an American amateur would include at least one IRC with his request for a return card. If he was a real good neighbor, he'd stick in two of them. But with the increase in postal rates, overseas amateurs say the value of the IRC has been deflated to such a degree they can't afford to accept them in return for correspondence.

If we have to write off the mails as a means of overseas postal communication, it is obvious QSL bureaus such as the American Radio Relay League's membership overseas bureau will become even more valuable. Couple that ougoing bureau with the incoming ARRL-affiliated state bureaus and you have gone a long way toward solving your mail problem as far as DX correspondence is concerned. That still leaves the domestic field, and many new private bureaus have been started to supplement those already in business. Some of the busier nets have had their own domestic bureaus for quite a while — the Century Club, for example.

The YL International Single Sideband Communication System has opened its own bureau, for members and those who have applied and are waiting for their numbers. It handles cards both ways, in and out, but limits itself to United States, Canadian and U.S. APO-FPO addresses.

Not to be overlooked, of course, is the role of the stateside QSL manager for foreign amateurs. A good one can solve a lot of problems.

Many amateur organizations issuing awards no longer require new members to submit verification cards as proof of contact. They are on an honor system.

Inflation has hit home as far as Amateur Radio is concerned. When it becomes too expensive to exchange cards, you have all the proof you need that the world is not the same anymore.

— *The Home News* □

Worldradio
Send your news to Worldradio at the same time you send it to other amateur publications and see who prints it first. We get the news out before anyone else.

AWARDS

QRP DXCC awards

DXCC Milliwatt trophy

Initiated by *The Milliwatt: National Journal of QRPp* and offered in its memory. Perhaps the most difficult award now offered to radio amateurs. To qualify, an operator must submit QSL proof of two-way contacts with stations in 100 ARRL DXCC list countries *while not exceeding one watt RF output from his transmitter.* All qualifying contacts must be initiated, maintained, and completed at this power level.

Special conditions apply with respect to contacts worked via net or "list" situations. In these cases, the DX station must locate, recognize the call of, and communicate directly with, the QRP station without assistance from the NCS or "list control station" other than the latter, informing the DX station that a QRP station is the next on the list. The NCS cannot relay the actual call of the QRP station; if he does, the contact is invalid toward the award.

Applications must include the following: 1) a log list of the 100 contacts alphabetized by prefix (i.e., A2, DL, G, PY, 4X4,9Y5), including the pertinent information such as dates, times, stations worked, bands, modes and RF power outputs; 2) one QSL verification for each listed contact; 3) a description of the method used to measure RF output power, and the measurements made — in the event that an un-modified stock commercial transceiver is used, and that unit is known to be unable to exceed the specified output power limit, the unit will serve as *de facto* proof of the power limit; 4) a signed affidavit attesting to the veracity of the applicant's claim that all contacts were completed with the given power limit according to the above conditions regarding power limit; 5) a $24 fee to offset part of the cost of the 28-inch trophy which constitutes the award, as well as postage.

Foreign applicants should submit equivalent currency. It is suggested the applications/QSL's be sent via certified mail — 33 mail transactions involving QSL's have been successful with no losses of extremely valuable cards yet. Murphy's Law being what it is, this is a remarkable stretch! **For applicants in Europe, Africa, and Western Asia, applications may be sent directly to the United States, or to the Official Milliwatt DX Awards Program DX Representative, A.D. Taylor (G8PG), 37 Pickerill Rd., Greasby, Merseyside, L49 3ND, ENGLAND.** Mr. Taylor will examine the QSL cards in combination with the list of qualifying 100 contacts, and will provide an affidavit as to veracity of the claim. Please submit only the cards and list to Mr. Taylor; once he returns them, they may be submitted along with the remainder of the application material to: Ade Weiss (K8EEG/W0RSP), 83 Suburban Estates, Vermillion, SD 57069 USA.

DXCC QRPp trophy

DXCC QRPp is awarded for working 100 DXCC list countries with an RF output *not exceeding five watts.* The rules detailed in regard to the DXCC Milliwatt award apply to this award also.

DXCC 200 QRPp, DXCC 200 Milliwatt

These awards are offered to any QRP operator who submits QSL proof of two-way contacts with 200 DXCC list countries. The rules are the same as detailed above for DXCC Milliwatt. The list of contacts qualifying an applicant for the 100 country level award is kept on record, and an applicant for the 200 country award need only submit a list and QSL verifications for countries 101-200. Or, an applicant may submit his initial application at the 200 country level. A handsome, suitably engraved plaque constitutes the 200 country award. □

CHC Awards

Scott R. Douglas, Jr., KB7SB

Here is a sample of one of the certificates issued in the CHC Western States County Award Program. All of the certificates in this program are of equal quality and should be a pleasure to receive and display.

Washington State: Issued in 5 classes
D=10 to 15 counties
C=15 to 20 counties
B=20 to 30 counties
A=30 to 43 counties
AA=44 counties

Oregon State: Issued in 4 classes
C=10 to 15 counties
B=20 to 25 counties
A=30 to 35 counties
AA=36 counties

California State: Issued in 5 classes
D=20 to 28 counties
C=30 to 38 counties
B=40 to 48 counties
A=48 to 57 counties
AA=58 counties

Arizona State: Issued in 3 classes
C=5-9 B=10-13 A=14

Nevada State: Issued in 3 classes
C=8-10 B=10-15 A=15-17

Utah State: Issued in 3 classes
C=7 to 10 counties
B=18 to 24 counties
A=22 to 29 counties

Wyoming State: Issued in 3 classes
C=7 to 10 counties
B=15 to 20 counties
A=20 to 23 counties

Idaho State: Issued in 4 classes
C=15 to 20 counties
B=20 to 30 counties
A=30 to 43 counties
AA=44 counties

Montana State: Issued in 5 classes
D=15 to 20 counties
C=20 to 30 counties
B=30 to 40 counties
A=40 to 55 counties
AA=56 counties

Alaska State: Issued by actual counties contacted. This award may be obtained for two or more counties confirmed.

Hawaii State: Issued by actual counties contacted. This award may be obtained for two or more counties confirmed.

Rules:

1) Awards are available to licensed amateurs and SWL's (on a heard basis)

2) Do not send QSL cards. A list showing full details of the contacts signed by your local club official or two licensed amateurs should be submitted

3) Certificates will be endorsed for various bands and modes as requested, providing such request accompanies application and necessary listings are made.

4) Award fee=$3 worldwide, or 15 IRC's

5) Endorsements after original application $1 or 5 IRC's

6) Send application to: **Awards Manager Scott R. Douglas, Jr., KB7SB, P.O. Box 46032, Los Angeles, CA 90046 USA.**

More CHC Award information

USA Award

All Districts — Contact all U.S. districts 1 through 0.

Prefixes — Issued for total amount of

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Capitols — Work U.S. State Capitols — Basic Award starts with 25 capitols.
States — Work all states.

Presidents Award

Issued for the total number of cities worked which bear the last name of present or former presidents; i.e., — Lincoln, Nebraska

All of the above awards are available upon request by licensed amateurs and SWL (on a heard basis).

There is no award fee, but $1 or five IRC's and SASE is required. The awards will be endorsed as requested and indicated on the log extracts sent with the application.

Also, Pacific 10K and 20K awards will soon be available again.

A-1 Operators Award

This award may arrive at your mailbox if your operation has been overheard by one of our official monitors or has been requested by your peers to acknowledge your better than average operating etiquette.

To request this certificate for an amateur you feel is worthy, just: 1) Send a letter describing why he or she should receive this award, signed by three licensed amateurs. 2) Enclose a SASE with the name and address of the amateur nominated. 3) Enclose $1 from each of the three signers. $3 total. The award will be forwarded rapidly.

Should you desire to have the nominators listed on the award, please so indicate. Any other necessary information you wish to appear must also be submitted at the time of application.

This award was started because it is felt that it is advantageous to recognize good amateur operating practice, and other awards of recognition such as the ARRL A-1 op are not readily available to deserving individuals. Also, with our A1-OP *you do not have to be a holder of the award to nominate.* □

Canadian awards

The Canadian Amateur Radio Federation is pleased to announce the following awards available to all radio amateurs, worldwide.

CANADAWARD — A colorful certificate will be issued to any amateur confirming two-way QSO's with all Canadian provinces and territories. All QSO's must be on one band only. Separate awards are issued for each band on which the applicant qualifies (12 cards per band). A mode endorsement is available if all QSO's are made on the same mode (CW, SSB, RTTY, SSTV).

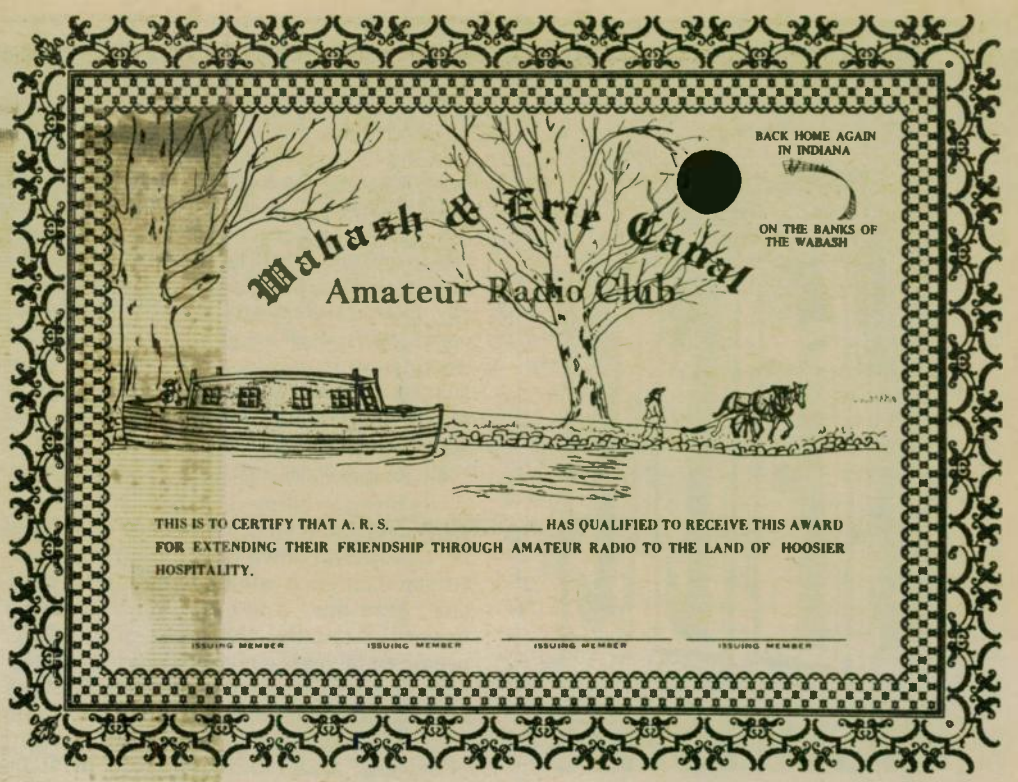
Only contacts made after 1 July 1977 will count for this award. Submit the cards with $2 Canadian or U.S. funds or 10 IRC's plus sufficient funds for return postage.

5 Band CANADAWARD — A special plaque is available to any amateur who confirms two-way QSO's with all Canadian provinces and territories on each of five separate bands. (Total of 60 cards — 12 per band.) Submit the 60 cards with $25 Canadian or U.S. funds plus sufficient funds for return postage.

Canadian provinces and territories are as follows: VO1/VO2 Newfoundland and Labrador; VE1 Prince Edward Island; VE1 Nova Scotia; VE1 New Brunswick; VE2 Quebec; VE4 Manitoba; VE5 Saskatchewan; VE6 Alberta; VE7 British Columbia; VE8 Northwest Territory; VY1 Yukon Territory.

NOTE: VO2, Labrador is part of the Province of Newfoundland and counts for Newfoundland. All amateur bands may be used. Each distinct satellite mode (432 in/144 out, 144 in/29 out, 144 in/432 out etc.) will count as a separate band. Mail applications for CANADAWARDS to POB 2172, Station D, Ottawa, Canada KIP 5W4.

— *RTTY Journal* □



New club, old site

Norm Allen, K9FAR

A new club — the Wabash & Erie Canal Amateur Radio Club — has been formed, and is located at Covington, Indiana.

The club is founded on the principal of giving a helping hand to people interested in Amateur Radio. Since the formation of the club, we have conducted three Novice classes and are now teaching the second Tech/General class. Our second goal is to promote activity among our group. At present we are running a club CW contest and it appears that, with any luck at all, several may be obtaining a WAS. Thirdly, we want to promote friendship and goodwill through Amateur Radio. We are doing this by awarding certificates to other amateurs for making contacts with three members of our club.

Shown here is a certificate, which — along with a history of the club's name — is sent to winners of the award. After making the necessary three contacts, send an SASE (and QSL's if not already exchanged) to: **Wabash & Erie Canal ARC, c/o Norm Allen K9FAR, 1313 Seventh St., Covington, IN 47932.**

Our membership consists of people from western Indiana and eastern Illinois.

A special event is being planned for on or about 4 July. We will have stations set up near the actual site of the old canal and certificates will be awarded to all participating stations.

Our meetings are held the third Wednesday each month at the above address. □

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HIGHLIGHTS

FCC changes power restrictions

At its meeting 11 February, the Federal Communications Commission made changes in the power restrictions which apply in certain parts of the United States with respect to the 420 to 450 MHz band. Amateurs in Florida, Arizona, parts of Texas, New Mexico, California and Nevada, and areas within a 200-mile circle of Cape Kennedy, Florida and Eglin Air Force Base, Florida continue to be restricted to 50 watts input in the 420 to 450 MHz band for terrestrial communications.

Two new areas will come under the same restriction, within a radius of 50 miles from either Beale Air Force Base, California or Otis Air Force Base, Cape Cod, Massachusetts. However, there will be an automatic exemption for amateurs attempting satellite communications only, on frequencies between 435 and 438 MHz, to facilitate future satellite communication. Provided that the half power point in the amateur station's radiation pattern remains at or above 10 degrees higher than the horizon, 1,000 watts effective isotropic radiated power may be used by amateurs operating from the restricted areas for satellite communications.

The new rules went into effect on 8 April 1981. With respect to the terrestrial limitations, waivers continue to be available after coordination with the FCC District Engineer in Charge and the Military Area Frequency Coordinator. □

Should we look more closely at the FCC?

Dick Stiern, K6REZ

Scarcely a day goes by that we don't hear about or read about some important decision from the FCC. Their directors make endless decisions affecting our entire Amateur Radio activity, not to mention commercial radio, TV stations, and the entire radio spectrum. We blithely accept these decisions, which encompass everything from the jargon of the CBers to the suitability of the programs and movies our children watch on the boob-tube.

In recent years, there has been an obvious down-grading of Amateur Radio by FCC decisions. One writer has said there is "a watering down of Amateur Radio into non-existence, making the marriage of the amateur and citizens' services easier." Actually, the focus of the FCC seems to be on the citizens' service. Their response to the abuses of the CBer has been to penalize Amateur Radio with the loss of frequencies, to revoke certain privileges, and to devise more difficult amateur examinations. Little recognition comes from the FCC toward the amateurs upgrading their skills, or who are active in public service.

Four-letter words and inappropriate subject matter are a "no-no" on amateur bands, but our children and grandchildren are subjected to an increasing barrage of language and sex in commercial and cable TV programming. Presumably, we are expected to accept such a paradox of governmental regulation without comment. We amateurs have been expected to be "good-guys" and are expected to avoid controversial subjects, like religion and politics; yet, we blithely accept the growing tide of anti-religion and anti-morality we are exposed to from the networks and cable companies.

None of us know very much about the actual make-up of the Commission. Who are these people? What about the background, experience and qualifications of its members? What are the duties, salaries and responsibilities of the Commission members themselves?

Maybe it's time for us to wake up. As licensed amateurs, of course we abide by sensible regulations, but aren't we also concerned citizens and parents? Is it not time to take a close look at the FCC governing body, as to its composition and deliberations? Are the Commissioners qualified appointees, or like some present day political boards and judicial appointees, has the FCC become a political dumping ground for unqualified bureaucrats?

As a starting point, I suggest the ARRL investigate, collect and publish facts about the FCC, including:

1. The names of FCC members, together with the professional skills, background, and political experience of each of them.
2. Their tenure of office.
3. Names, background and experience of their top-level advisors and legal counsels.
4. Available comments and opinions of individual Commissioners on recent FCC decisions relative to the Amateur Service.
5. And, recommendations for qualified appointments to the Commission at such time as vacancies shall occur.

What do you think? You say I'm getting too political? I think it's time to be concerned about the future of our Amateur Radio hobby — or we may wake up some morning and have no Amateur Radio hobby to worry about.

— *The Communicator, Shafter, CA* □

Jammer is fined

The Commission's Field Operations Bureau, under delegated authority, has fined Donald L. Rhoads of San Francisco $750 for deliberately interfering with the operation of an Amateur Radio 2-meter repeater station located on nearby Grizzly Peak.

An amateur repeater station, usually installed at a high elevation, is designed to receive weak signals from low power amateur stations and re-broadcast them over a wide area.

Rhoads, whose station was unlicensed, falsely identified it by using a call sign belonging to a licensed Amateur Radio operator, transmitted obscene, indecent, and profane language, as well as music and party records, which jammed the repeater and prevented its use by authorized Amateur Radio operators.

Engineers from the Commission's San Francisco District Office, using sophisticated direction-finding equipment, traced the jamming signal to Rhoads' apartment and closed the illegal station down. □

Take a card

Here's an idea your club might want to try. Paul Hower, WA6GDC, had several cards printed up (see below); they make for good publicity for Amateur Radio!

GLAD TO HELP . . . . .

. . . . you have been assisted by an Amateur Radio Operator (HAM) whose name and call is:

"Hams" have for many years assisted with relief in major disaster, emergencies of every kind and personal needs such as you have just experienced, by providing vital communications.

An Amateur Radio Operator (HAM) — *not to be confused with Citizens Band* — is licensed by the government (F.C.C.) after a very thorough examination on code (CW) and radio theory. A ham can then communicate with other hams throughout the world.

Anyone can become an Amateur Radio Operator. It is a voluntary, non-commercial radio service which contributes much, as a personal hobby, to the skills of communication and technical knowledge as well as good will. □

REMINDER. . . . . .

INCLUDE FIRST AND LAST NAMES WITH CALL SIGNS.

important notice...

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

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

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

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Tell us something:

So we may better serve you, this space is for your comments, suggestions and even criticisms. If you have any news and information, you are invited to share it. Tell us and we tell the world.

Tell us of your interests and what type of news, articles, features and columns you would like to see. Tell us of your activities. The more we know about you, the better we can tailor this publication to serve you.

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.

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

(SOURCE) ☐☐☐☐ (59-60)

5

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Call _____

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State _____ Zip _____

☐ NEW	☐ Renewal	☐ Gift
12 issues	(72¢ per issue)	$8.64
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36 issues	(64¢ per issue • save $3)	$22.92
Lifetime	(Be a WR super booster)	$86.40

Overseas Readers! Prices quoted are U.S. funds. Please include $1.50 extra/year for surface mail delivery outside the U.S.

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Card # _____ Exp. date _____

Signature _____

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Thank you!

Popular maritime nets

Time	Frequency		Net	Control
1500Z	7.235	Kates Navy-Local to Cedros Is.	Walt	W6IM
1530Z	14.295	Kates Navy-South of Cedros Is.	Stan	WA6WGN XE2ABC
1630Z	7.285	Serape Net-Sunday only		
1700Z	14.340	California-Hawaii Net	Howard Dave —	K6VDV WA7TIM KH6JJP
1900Z	14.340	Manana Net-Baja to Panama	Howard Bill Gil	N6ANT K6IKI W6FSG
1900Z	7.285	SHAMARU Net (Smitty's Net) Boats close to Hawaii	Smitty	KH6SFF
2200Z	21.404	Int'l Maritime Mobile South of Acapulco, Canal and Caribbean		
0500Z	14.313	Pacific Maritime Net	Noel	ZL1CU (Sydney)
All Day	14.313	Int'l Maritime Frequency Skipper's Net		

Contact Worldradio for hamfest prizes.

Amateur Radio Call Signs

Amateur Radio operators have continually expressed an interest in what are the latest call signs which have been systematically assigned. To further our policy of making the new call sign assignment system public, a list of the last call sign issued, by group, for each radio district and non-contiguous area is published. The following is a list of the last call signs assigned as of 1 March 1981.

Radio District	Group A	Group B	Group C	Group D
0	KI0I	KB0VW	N0CIQ	KA0KKW
1	KC1F	KA1NY	N1BIR	KA1GPX
2	KK2H	KB2WV	N2CHO	KA2LJB
	KC3M	KB3NU	N3BQZ	KA3HBK
	NJ4E	KC4WW	N4EEV	KA4TLR
	KQ5D	KC5HB	N5CUJ	KA5KYT
6	KV6N	KD6QQ	N6DZD	KA6OOG
7	KG7D	KB7TV	N7CHX	KA7JRZ
8	KK8N	KC8AJ	N8CKA	KA8MEF
9	KE9J	KB9VJ	N9BZF	KA9KFN
N. Mariana Is.	AH0A	AH0AA	KH0AC	WH0AAE
Guam	AH2K	AH2AH	KH2AO	WH2ACT
Johnston Is.	None	None	KH3AB	WH3AAB
Midway Is.	None	AH4AA	KH4AC	WH4AAF
Hawaii	NH6I	AH6CK	KH6LO	WH6ANY
Amer. Samoa	AH8A	None	None	WH8AAL
Wake Wilkes Peale	None	None	None	WH9AAA
Alaska	NL7T	AL7BS	KL7LU	WL7APD
Virgin Is.	KP2B	KP2AC	NP2AI	WP2ACK
Puerto Rico	NP4E	KP4BZ	NP4BW	WP4BTG

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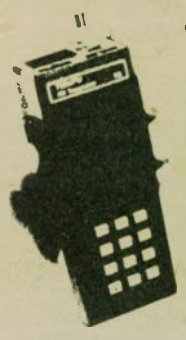
Tempo was the first with a synthesized hand held for amateur use, first with a 220 MHz synthesized hand held, first with a 5 watt output synthesized hand held...and once again first in the 440 MHz range with the S-4, a fully synthesized hand held radio. Not only does Tempo offer the broadest line of synthesized hand helds, but its standards of reliability are unsurpassed...reliability proven through millions of hours of operation. No other hand held has been so thoroughly field tested, is so simple to operate or offers so much value. The Tempo S-4 offers the opportunity to get on 440 MHz from where ever you may be. With the addition of a touch tone pad and matching power amplifier its versatility is also unsurpassed.

The S-4...$349.00
With 12 button touch tone pad...$399.00
With 16 button touch tone pad...$419.00
S-40 matching 40 watt output
13.8 VDC power amplifier...$149.00

Specifications:
Frequency Coverage: 440 to 449.995 MHz
Channel Spacing: 25 KHz minimum
Power Requirements: 9.6 VDC
Current Drain: 17 ma-standby 400 ma-transmit (1 amp high power)
Antenna Impedance: 50 ohms
Sensitivity: Better than .5 microvolts nominal for 20 db
Supplied Accessories: Rubber flex antenna 450 ma ni-cad battery pack, charger and earphone
RF output Power: Nominal 3 watts high or 1 watt low power
Repeater Offset: ± 5 MHz

Tempo S-I

The first and most thoroughly field tested hand held synthesized radio available today. Many thousands are now in use and the letters of praise still pour in. The S-1 is the most simple radio to operate and is built to provide years of dependable service. Despite its light weight and small size it is built to withstand rough handling and hard use. Its heavy duty battery pack allows more operating time between charges and its new lower price makes it even more affordable.



Tempo S-5

Offers the same field proven reliability, features and specifications as the S-1 except that the S-5 provides a big 5 watt output (or 1 watt low power operation). They both have external microphone capability and can be operated with matching solid state power amplifiers (30 watt or 80 watt output). Allows your hand held to double as a powerful mobile or base radio.

S-30...$89.00* S-80...$149.00*
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Tempo S-2

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Price...$349.00 (With touch tone pad installed...$399.00)
S-20...$89.00

Optional Accessories for all models

12 button touch tone pad (not installed): $39 • 16 button touch tone pad (not installed): $48 • Tone burst generator: $29.95 • CTCSS sub-audible tone control: $29.95 • Leather holster: $20 • Cigarette lighter plug mobile charging unit: $6

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Drive Power	Output	Model No	Price
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10W	130W	130A10	$189
30W	130W	130A30	$199
2W	80W	80A02	$169
10W	80W	80A10	$149
30W	80W	80A30	$159
2W	50W	50A02	$129
2W	30W	30A02	$ 89

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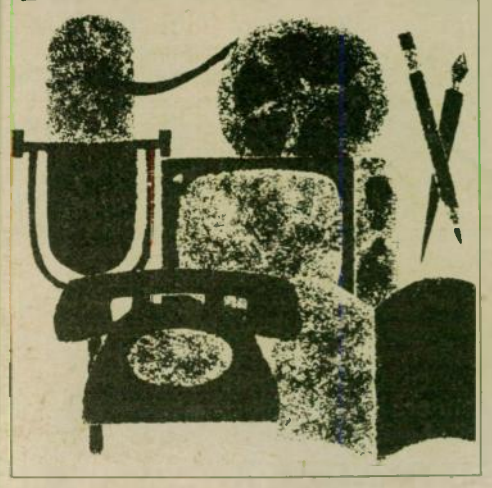


Why deny good citizens the right to listen?

Dick Stiern, K6REZ

You may have read in recent Amateur Radio publications of the efforts to restrict listeners from certain emergency frequencies in some of the Atlantic seaboard states. It seems that certain far-out politicians would make it illegal to own or use mobile radio equipment which would enable us to listen to police frequencies. The presumption seems to be that if we would listen to such broadcasts, we would use the information heard for extralegal purposes. Their myopia can best be illustrated by an event which occurred in our part part of California very recently.

On the afternoon of 16 December 1980, Ross Rehart, WA6YTG, from Simi Valley was driving southbound on Highway 99 just south of Fresno. Suddenly on his mobile scanner came a report from the Highway Patrol of a robbery and shooting which had just happened in Fresno, complete with a description and license number of the suspect's vehicle. The report went on to say that the suspect's car was heading north from Fresno. At this instant Ross recognized that the very same vehicle had just overtaken and passed him, heading *south* at high speed.

Ross increased his speed to stay in sight of the car and called for assistance on the local 146.31/91 repeater. Ken Beam, N6BSS, responded and telephoned the local CHP (California Highway Patrol) dispatcher. The dispatcher failed to grasp the seriousness of the situation and suggested he call the CHP in Fresno — a toll call.

Rupe Guy, W6FBT, then broke the frequency and called the Zenith 12000 emergency CHP number. The response was immediate, and the Highway Patrol advised WA6YTG to reduce his speed and to avoid the suspect vehicle.

Further down the highway, Ross passed a rest stop where four police vehicles had surrounded the fleeing car, the suspect's hands were against the windshield, and four shotguns were pointing in his direction.

Congratulations to three public-spirited amateurs. It's strange that those Eastern politicians can't recognize that a person listening to a scanner is most probably honest, and just occasionally may be of considerable public service.

—The Communicator, Shafter, CA □

Museum hosts Amateur Radio station

Jane Johnson, K3RIH

Roland E. Madara, W3PWG, is trustee of the Philmont Mobile Radio Club which is located within the confines of Philadephia's prestigious Franklin Institute at 20th and the Parkway. The station call is W3TKQ, and Madera is one of four operators who man the station each week and demonstrate the hobby to museum visitors.

Madara is the youngest of the four at age 70. The others are Frank Whitten, K3TEF; Fred Fowler, WA3AAL; and Sam Moskowitz, K3RTR.

Madara took the job at the Institute in 1972 where two days a week he presents six man-made lightning demonstrations and talks to the visitors who have questions about Amateur Radio. He tells the youngsters about the station from which he has made contacts all over the world, except China.

This remarkable station was originally set up by Haverford Emergency Radio Club. In 1962 its operation was taken over by the Philmont Club. Both the Franklin Institute and the Club share expenses of maintaining the station.

Madara could well be dubbed "Mr. Ham Radio". He has a marvelous face etched with character and a deep infectious voice that came straight from the heart of Texas.

He joined the Navy right out of high school. He served 23 years before retiring and went from chief electrician's mate to full lieutenant. He had a varied career. During World War II, he served 2½ years with the Brazilian navy where he taught electronics maintenance of destroyers. He served in the South Pacific in 1944-45 and was in the Battle of Okinawa and in Japan.

Madara and his wife Anna were married in 1939 and have lived in all four corners of the United States. They have eight children — six girls and two boys — and 10 grandchildren.

Madara said, "I've been playing with radio since 1919. I built a crystal set as a boy and a tube radio set in 1921. That one is showcased at the Institute." Does it work? "It sure does," he grinned.

He was in the Navy 20 years before he applied for a ham call. He still holds that license. His phonetics of "Poor Willie's Ghost" are not easily forgotten, especially when he rolls it out with that distinctive voice. He holds an Advanced Class license.

Roland E. Madara, W3PWG

On the wall in his shack is a classic picture. It shows a very young Madara (about 16) with his younger sister, seated in an Old Model T Ford which he built in his dad's garage with spare parts.

He has another consuming interest to which Amateur Radio has been able to contribute — genealogy. He has uncovered a remarkable family record which dates back to 1415 in Switzerland and 1739 in Philadelphia. His studies reveal that his family name has evolved into various spellings, yet all owe their beginning to the same family. They include Madori, Madery, Madary, Madeira, Madera, Maderi, and Medairy. He has uncovered four distinct histories in his investigation and has a book which documents many of the facts. One even contains a deed with his great-grandmother's name upon it. He has a second deed, signed by Ulysses S. Grant, that was his grandfather's.

A ham friend sent him a copy of a page from the phone book in Switzerland which contained the names living in his town. He has also picked up information from amateurs while discussing the interest.

Madara is a member of Navy MARS and spends some 30 hours per week passing messages and relaying bulletins. He is a radio officer in civil defense, and is the traffic manager for Navy MARS for a five-county area.

No other family member has been bitten by the ham bug, but his two sons do work in the electronic field.

Madara lives in suburban Philadelphia in a lovely residential section known as Lansdowne. He is active in several other radio clubs, including the Delaware County Amateur Radio Association .

He particularly enjoys relaying the holiday servicemen messages that come in. He has also been privileged to relay the details of new arrivals (babies).

If you hear those phonetics — Poor Willie's Ghost — give Roland a shout! □

Haggerty to lead amateurs during emergencies

Robert J. Haggerty of Hemet, California has been selected to lead Hemet and San Jacinto Amateur Radio operators to furnish organized emergency communications in time of disaster.

His assignment, which carries the title of assistant emergency coordinator of the Amateur Radio Emergency Service, is to band together Amateur Radio operators in this area to prepare for emergency radio communications by them in the event of a major natural disaster, such as another flood or an earthquake.

This activity will be part of the California Department of Forestry's new Volunteers In Prevention (VIP) program and will assist in reducing the amount of CDF radio traffic in emergency situations.

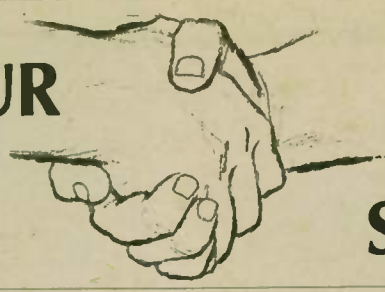
In announcing the appointment, Dr. Gerhard Schilling, emergency coordinator of the nationwide American Radio Relay League and liaison to the Riverside Ranger Unit of the CDF, pointed out that Haggerty will have the support of the more than 50 members of the Lee DeForest Radio Club of Hemet and San Jacinto.

Many of these amateurs participated in providing communications support to the CDF and Red Cross during the flood disasters last February. More recently, local radio amateurs provided assistance in connection with the dangerous fires in the Lake Elsinore area.

"Amateur Radio operators are well-prepared for potential emergencies which may occur in the Hemet-San Jacinto Valley in the future, but let us hope that we are not needed," said both Haggerty and Schilling.

— Lee DeForest RC, So. CA □

AMATEUR RADIO IN PUBLIC SERVICE



YV4BBG, we love you!

Linda Turner, WD4OCI

What do the call signs WD0CCE, K2JW, W1PFB, WA3QKM, WA3QKX, and DL8XG/W8 have in common? The amateurs to whom they belong have recently been heard at 2300Z on the 20-meter band, where (along with other amateurs) they have been meeting Bruno Mattern, YV4AYK, from Maracay, Venezuela. The calls belong to, respectively: Gene Silver, Joe Read, Glenn Wayne, Ralph Carbone, Rich Colwell, and Gerhard Paetzel. They come from, in the same order: Hazlewood, MO; Moorestown, NJ; Watertown, CT; Johnstown, PA; Pittsburgh, PA; and Cleveland, OH.

Let's back up a little to 11 January 1981 when, in Maracay, one of Amateur Radio's greatest friends and supporters — Bill Romine, YV4BBG — suffered a massive stroke. He was rushed to the hospital where, during the next few days, doctors gave him little chance for survival. However, in less than a week, Bill had miraculously beaten the formidable odds and was not only alive, but was well enough to be permitted to go home and be cared for by his XYL, Eloisa.

We must now introduce Bill's friend Bruno YV4AYK, who immediately assumed the responsibility of joining the intercontinental traffic net on 14.313 MHz to give Bill's friends in the United States daily reports on his progress. Most days Bruno visited Bill and Eloisa to provide assistance during what promised to be a long, difficult period of recuperation for Bill.

One of the strongest factors in boosting the morale of Bill and Eloisa was the frequent phone patches run by the above-mentioned amateurs to Bill's children — Marcy, Barbara, Billy, Mario and Ralph — and his brother, Charlie. Either Bruno spoke to them from his station, or he helped Eloisa talk directly to the children from Bill's station. It was amusing to hear Bruno talk about his self-appointed nursing duties as he patiently encouraged and helped Bill sit up, feed and shave himself, and gradually regain interest in the ham shack.

The most recent progress reports from Bruno have been encouraging. The doctors finally gave Bruno and Eloisa permission to bring Bill to his radio room. What a treat we had on Friday, 13 February, when Bill picked up the mike for the first time in over a month and said hello to his friends — many of them thousands of miles away.

On 21 February we witnessed the most heart-warming phone patch of all. Tom Churchill, W1KCY, had called Phyllis Romine in Connecticut and told her he had a surprise for her. In a few minutes, Tom arranged for Bill to be talking to his mother, and everyone on the band could hear Mrs. Romine's joy and gratitude as she listened to her son's well-known dynamic, enthusiastic voice.

Bill has weeks and possibly months of recuperation ahead of him before he gains back all of his strength and energy, but the time will surely seem easier and shorter through the support of his many friends — especially Bruno, who is helping everyone keep in touch with Bill and Eloisa. We look forward to the day when Bill will be strong enough to assume his duties on the 14.313 nets, which he so much enjoys. YV4BBG, we love you and wish you a speedy and complete recovery.

W7PJV aids rescue

A Pasco, Washington Amateur Radio operator participated Tuesday, 16 December 1980, in the rescue of two persons in a boat 90 miles southwest of San Francisco.

Harold Crockett, W7PJV, said he was talking by radio to a person in Texas when a woman on the boat broke in with a Mayday call.

The woman reported she and another person were aboard the boat, which had run aground on a coral reef near the Spider Islands.

Crockett took the information from the woman and relayed it to the Texas radio operator, who could not hear the woman clearly. The Texas man, who lived near the coast, called the Coast Guard.

The Coast Guard directed a Mexican minesweeper in the area to the site and rescued the two persons, Crockett said.

Crockett continued talking to the woman until the rescue was completed about 1½ hours after the first call.

— *The Tri-City Herald* □

A hospital station

Roy Devish, W7AZI

The Spokane Shriners Hospital for Crippled Children now has its amateur station operating and handling traffic for the patients as successfully as the Portland Hospital. Additional antennas will go up as weather improves.

Warren Triebwasser, W7YEM, and Bob Schwartz, W7EOC, had the pleasure of meeting Archie Hill, K7MII, of Yakima right after net time at the local Felts Field as Archie air-delivered a HT-41 Linear Amplifier he was donating to the Spokane hospital station.The offer, acceptance and delivery arrangements were made on net — very quickly!

Frank Piskur, W7FP, of Seattle — who came up with the idea and got the NWSARC started — continues to recruit members and handle messages with great pride of accomplishment.

The members plan to combine a mid-year meeting with Hospital Day and will gather in Portland on 16 May for dinner, and a visit to the hospital and radio station on 17 May. We all look forward to meeting some of the young message originators.

Some of the boys and girls are becoming very interested in Amateur Radio. Extra receivers have been put in the wards so they can listen, and the first one to get a license will win a complete station. □

Archie Hill, K7MII (left) and his wife Emma had a chance to meet Warren Triebwasser, W7YEM (center), and Bob Schwartz, W7EOC (right) after air-delivering the HT-41 Linear Amplifier he donated to the Spokane hospital station.

ARES aids runners on Maui

Melvin Fukunaga, KH6H

Maui Amateur Radio Emergency Service (ARES) members supplied communications support for the annual Maui Marathon on 8 March 1981. The 26.2 mile course took runners from the Maui Zoological Gardens in Wailuku to the finish line at Whaler's Village in Kaanapali, on the opposite side of the island of Maui.

The board of directors of the Emergency Amateur Radio club authorized use of its Mount Haleakala 146.34/.94 repeater, KH6AH/R, for marathon communications. The .34/.94 repeater, located at about 10,000 feet elevation, gave us excellent coverage over the entire race course. As the last runners neared the finish line, all Maui Marathon net stations switched to 146.52, as the terrain now favored simplex communications.

The hilly course took its toll, but no major problems surfaced. Thirteen amateurs supplied communications between 12 aid stations and the finish line. Aid station liaison George Newcomer, KH6JVD, did a fine job providing communications between the aid station supply truck and individual aid stations. Maui police radio technician Les Hieda, AH6AM, borrowed a police radio for the event to provide communications liaison with police dispatch and paramedic units. Luckily, his services were not needed this time.

Other ARES members who participated in the Maui Marathon Net were: Gary Fuchikami, WH6ACM; Shiro Yamato, WH6ACS; Donald Epler, WH6ACT; Ronald Takaki, WH6ADG; Courtland Trist, WH6AKS; Ronald Pitts, AH6AZ; Melvin Fukunaga, KH6H; Alexander Miguel, KH6HE; Stanley Yamato, KH6HHG; Howell Ching, KH6IJS, and Donald Higa, KH6JWB. □

Amateur is grateful

Brent Frey W3OZG
Submitted by Roland Slatkoff, W3RUN

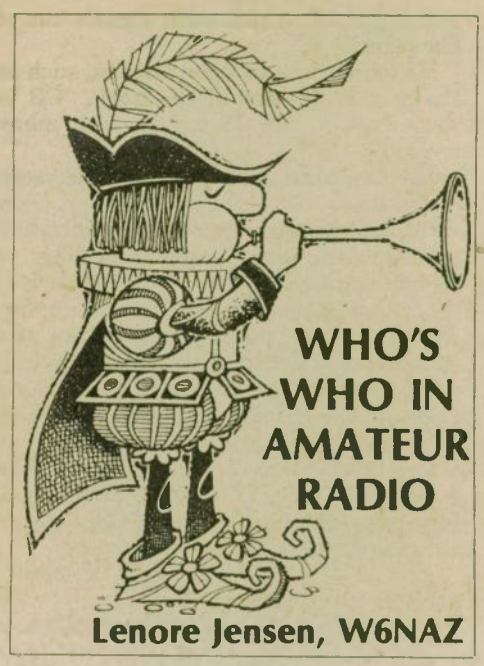
"While driving east on Greenspring Valley Road, Baltimore County, Maryland (one mile east of Stevenson Road), I observed in my rear view mirror a car out of control. It went off the road, hit and broke a telephone pole, and turned over — landing on its roof. The time was near 11:00 a.m. and traffic was very light. Almost completely off the road with its roof mashed down and one door flung open by the impact, the car, silent now, bode ill for its passenger.

I stopped, ran back and found a female driver enmeshed inside the car. Fearing a possible fire, I worked quickly to extricate her and noted deep facial cuts and broken facial areas. Holding her I tried to comfort and calm her as she was obviously in shock and needed much attention. Other drivers seeing the overturned vehicle also stopped and offered assistance. I asked them to take care of the accident victim while I used 2-meter radio, breaking into a conversation to ask for someone to call for fire department, ambulance and police help. I did not use autopatch myself, as I wanted to get back to the injured woman. I do not remember who made the calls for me, but Amateur Radio came to the rescue. Help was on the scene within *five* minutes.

The woman suffered lip cuts, a broken jaw, nose and tooth damage.

It should be noted that contrary to horror stories I have read, there are good Samaritans. Men and women who arrived at the scene removed their jackets or coats to place them on the woman to keep her warm until help arrived. The day was cold and windy.

My personal reaction is that every dime I have spent on Amateur Radio in 33 years has been repaid by my being able to be of assistance to a fellow human being in need of help. I feel Amateur Radio was fast and efficient to bring help so rapidly." □



Lenore Jensen, W6NAZ

Alan Kaul, W6RCL, works where many of us believe "the action is" in TV news. He's now the Associate Producer for NBC Nightly News on the West Coast and is a veteran of the busy, often exciting, search-and-report activities involving world news.

The past two years have found Alan in the midst of several very big stories.

Iran, for instance. He spent more than a month there on the hostage story — a period of frustrating experiences as well as opportunities for in-depth probing of the Iranian culture.

A producer/writer for network news requires mobility, a willingness to hurriedly toss a change of clothes into a carry-on bag, grab the passport and — along with a camera crew — head for "the action."

One time he even carried the camera himself. The crew working on the Cambodian refugee anguish needed an urgent replacement, as well as a producer.

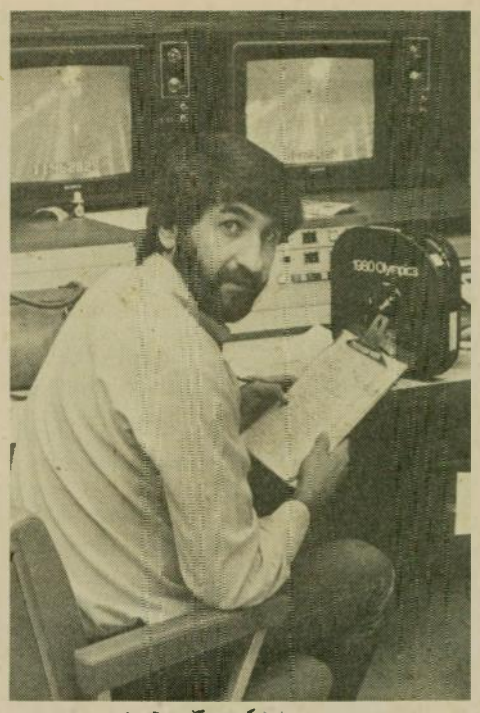
With but a few hours notice, Alan flew to the spot in Thailand, (He traveled for 24 hours before arriving at 4:00 a.m., and had to prepare a story for the satellite time two hours hence. Afterward, he collapsed and slept for another 24 hours.)

The refugee camp, 30 miles inside the Thai border, was a heartbreaking spot crammed with possibly 100,000 displaced persons. He had covered the visits to the camp by Rosalyn Carter and her visit to the king and queen of Thailand. Then came the shocking word that terrorists had taken over the U.S. Embassy in Teheran.

"That blasted the poor refugees off the front page," Alan comments.

A month later he was en route to Iran, having volunteered for the trip. (Incidentally, Alan could almost pass for an Iranian; his father was a Kashmiri from the "Switzerland of the Himalayas" in the north of India. Alan, however, was born in Spokane, Washington.

The network maintained four complete camera crews in Iran. One crew, of course, kept watch on the Embassy in case the excitable, noisy crowd of "students"



Alan Kaul, W6RCL, using "electronic journalism" equipment at NBC. On the screens are tapes of the burning Hilton Hotel, Las Vegas, Nevada. *(NBC Photo)*

should try going over the wall.

"The other crews rotated around the country, seeking out the feelings of the citizens," he explains, "such as those in the southeast corner who were opposed to centralized government, or to the area of Turkish-speaking minorities or even to the Holy City, where Muslim fundamentalists and the Khomeini reside.

"It's a very complex country. We tried to carry the whole story of Iran, its ethnic segments and the differing beliefs about Islam."

There were uneasy moments. One day Alan and three blonde Britons were walking. It was on a general strike day and streets were crowded with armed revolutionaries, women well-covered in black cloth, students, etc. Suddenly the small group realized they were being followed by a gang of young toughs who shouted taunting, jeering comments. Because Alan had spent hours editing video tapes of the crowds outside the Embassy, he recognized what was meant. It wasn't friendly. Fortunately, no harm was done that day except to the emotions. But the experience reinforced his understanding of what our hostages went through.

Naturally, he did not risk bringing a transmitter into Iran, but he did use a Panasonic digital receiver for monitoring worldwide short-wave newscasts — an essential task for keeping abreast of world happenings. The long wire dropped out his seventh-floor hotel room window also brought in exciting DX.

"Rolling in were exotic prefixes I'd never heard before — lots of Russians and many from Asia." (Imagine the frustration of not being able to respond to such rare DX!")

During his stay, the USSR invaded Afghanistan, increasing world tension as

well as tension within Iran itself. The satellite "hours" were filled with action and reaction. It was challenging to send home accurate information without tempting the censors to "pull the plug." He mainly worked with his company's own videotapes. The only time film was sent home was when the Iranians made those Christmas interviews, for which they charged each net a neat $20,000.

When the Iranians suddenly refused to allow American network newsmen to transmit their tapes home by satellite, it became obvious something was about to happen. It did: they were expelled.

But leaving Teheran turned out to be a tremendous headache for Alan. Because Iran Air handles all ticket sales, he purchased a flight to Zurich, Switzerland by a Chinese plane and made his way to the airport, toting all he could carry, including six videotapes. He planned to transmit them by satellite from Zurich. New York was waiting, in anticipation of a special program and the Today Show.

But when he tried to board the plane, the officials at the airport firmly declared it was to be only a refueling stop, no boarding allowed. They were adamant. His $300 ticket would not be honored. So they sold him another ticket, this time on a Pakistani flight headed for Karachi. Happily he remembered a satellite ground station was available in that city.

Only he had no visa for Pakistan! With great effort, he managed to obtain one; before the plane arrived, revolutionary guards subjected him to a thorough search, including his shoes. His tapes became the great problem. No tapes to leave! Phone calls back and forth, tension increasing. (No one seemed to be in charge of the country — but every individual considered himself in charge!) Fruitless efforts were made to find a videotape recorder, for inspecting the video tapes, etc. Incredible red tape of the "normal" kind. Finally, he convinced his detainers that the tapes were only being taken for recycling. The Pakistani plane was circling overhead . . . then it departed without landing. Too much snow on the ground.

There was another plane going to Prague, Czechoslovakia, but he passed that one, knowing there was no satellite ground station available in Prague. Fade out.

Fade in. Alan's back at the hotel wondering how to escape the hostile country and still transmit the tapes to New York.

In the middle of the night, a ticket turned up for Air France. He grabbed it and by now had acquired 1,100 additional pounds of videotapes, packed into a hurriedly made plywood box. The excess baggage fee was $5,000 but at that point — what did it matter?

"When I boarded that plane, they handed me a glass of champagne. Relief beyond belief!" he recalls. "In Paris I was able to transmit the news stories by landline to London for relay to the network. From then on, we obtained our news through services we have long used, plus newsmen of other countries who still were in Iran." But his personal ordeal was over.

Finally back in California, he'd hardly had time to check out his home station when a call came to pack a bag and follow Ted Kennedy's campaign.

"It was unpredictable; we never knew which unexpected visit the senator would decide to make, so it was highly stimulating. When he was winning, he was terrific to be around."

However, a campaign trip means constant travel, always packing and unpacking personal and professional gear, always needing to keep up on world develoments despite the rush . . . along with other hours of cooling one's heels before dashing to the next scheduled speech. They covered the Kennedy campaigns in Massachusetts, New York, New Jersey, Connecticut, Michigan, Montana, Ohio, California and Oregon!

It was during the latter that Mount St. Helens put on her disastrous show. "I was sleeping when a call from New York awakened me," he remembers. "I looked out my hotel window and sure enough, there was the plume of smoke in the distance. I chartered a plane, got our crew and flew as close as allowed to the volcano (10-15 miles)."

"It was astounding. The heat was very great and the difference in temperature produced a horrendous electrical storm. Lightning strikes would start at the top of the plume, about 61,000 feet, then run down through the smoke to the crater. Even for a newsman, it was hard to find sufficiently descriptive words for such a spectacular sight! But we got it all on videotape for the network."

He also arranged for interviews all over southwest Washington. One was with the sister of the elderly Harry Truman of Spirit Lake; Harry's fate was not yet known, and the lady was naturally under great stress as she waited for word.

Entirely different eruptions occurred at the two national political conventions which he was to cover in Detroit and New York. More travel, more hotels, more around-the-clock writing and producing of spots.

Alan Kaul often finds himself unexpectedly "where the action is." He'd gone to Hawaii last December to produce a story about pineapple crops (environmentalists vs. pesticides), as well as another on "talking dolphins." When word came with the distressing news that John Lennon had been killed by a man from Hawaii, naturally a background story on the assassin was wanted. No doubt the other networks wondered how Alan managed to turn one in so promptly!

An interesting diversion occurred the time he performed in the film, *The China Syndrome*, as a TV director in a control room such as he normally works in. He also wrote news copy for Jane Fonda's character.

He first entered TV while still in Whitworth College, Spokane. After acting as a statistician for football games at a local newspaper, he got a job with KREM-TV; by 1967, was transferred to the sister station — KING-TV, Seattle.

His move to NBC's Burbank local outlet, KNBC, came in 1973; he wrote for the 5:00 p.m. news show and produced the weekend programs. Five years later, he was shifted to the network newsroom as field producer. He was recently upgraded to his present position.

On the other hand, his Amateur Radio career dated to youthful fascination with broadcast DX on the family radio, seeking "faraway" stations in Salt Lake, Chicago and the like. He scanned catalogues and dreamed of owning receivers such as the Hallicrafters S38E. At age 15, he earned KN7EHW, dropping the N shortly after. He converted an ARC5 and built from the Handbook a 6V6 Tri-tet oscillator for 40 and 80. When he finally saved $35, it was sent immediately for a Heath DX 20. Thus started a career of trading up and down, back and forth in good old ham fashion. He was hooked.

"Anyone then working the world on 10 meters with 20 watts and 'zilchy' equipment could not help but be infected with Amateur Radio," he says. "The years of '58, '59, and '60 were wonderfully exciting for radio propagation.

"Even though I now have modern sophisticated gear, I still think it's fun to put together a little IARU Project Goodwill transmitter and receiver, even the winding of coils. You know, I couldn't believe how much one could do with just two watts out. And I'm still thrilled to find that a tiny circuit board with three dozen parts can pull such signals out of the ether!"

He found time to write articles, such as the first conversion of CB story, "CB to Ten, Part I" for 73, along with many more.

Has Amateur Radio affected his work or helped?

"Well," he answers, "it certainly has given me a better understanding of technological problems we run into. But there's a more subtle advantage. Following a schematic, for instance, teaches us a pattern of thinking, not necessarily technical. Like the old idea: 'If something is wrong, there must be a reason.'

"Amateur Radio taught me how to trace something analytically back to the weak point. I don't retain the geometry of high school, but I do retain the logic of radio circuits!" (Kaul's Law!)

And how about advice to amateurs wanting news coverage?

"Remember, a story in these days of heavy competition for air time requires a lot more than being interesting. It helps to have some sort of 'news peg.' For example, if you have something about a handicapped ham's exploits, try for that during National Handicapped Week. Or use Earthquake Awareness Week to gain coverage for your ARES drill. News pegs don't always exist, but look for them.

"You see, there have been studies to learn what people like to see. People like to see **people**, not equipment nor buildings. TV likes faces and hands. It's not only that the cost of living has gone up, but how much **more** is **peanut butter** going to cost?

"If you can't relate something in your news story to a person (or what it means to the people out there in TV land), then show us how those who lived through the event were influenced by it. Remember the unasked question, 'How did it make you feel?' "

Thus Alan Kaul, now W6RCL (resistance, capacitance, inductance), is both a radio buff and a "news junkie." He says, "I can think of nothing more frustrating than missing a major story." He was once the resident Patty Hearst expert in his newsroom. However, the SLA shootout occurred on his day off.

You are right if you think Alan Kaul now wears a beeper! □

Danny Moto's an amateur

The man who holds the world record for the most pinch hits showed up at a recent meeting of the Southern California DX Club. Finally he was recognized by fans of the Los Angeles Dodgers as Danny Moto, former popular player and now coach.

It was a happy surprise to most to realize that he is also HI8MMJ! □

American Radio Relay League

J.A. "Doc" Gmelin
W6ZRJ
Past Director, Pacific Division, ARRL
Honorary Vice-President

During my nearly 35 years of Amateur Radio operation, I have spent much of my time involved with emergency communications planning and "testing" operations. Note the word "testing" which I use because I have been involved in relatively few actual emergency or disaster communications operations.

I suspect this is normal for most amateurs, although having been an ARRL Emergency Coordinator, Section Emergency Coordinator and Section Communications Manager, I have probably put more time in on the planning end of emergency communications operation in Amateur Radio than most amateurs.

Nearly all of my emergency communications operations have been under the banner of the American Radio Relay League as a member of the Amateur Radio Emergency Service.

When I first became involved with emergency communications planning, the League's emergency communications arm was called the Amateur Radio Emergency Corp (AREC); but some 10-plus years ago, the AREC and the National Traffic System (NTS), both branches of the ARRL Communications Department, were organized together as the Amateur Radio Public Service Corps — the ARPSC.

One of the best and most detailed writings on the structure of the present ARES can be found in Chapter 5 of *The ARRL Operating Manual*, written and published by ARRL in 1980.

While I will not attempt here to explain the entire structure of ARES, I will give a briéf outline of the organizational structure, along with a few comments about the problems of organizing an efficient ARES operation.

The basic structure of the ARES is along the same lines as all ARRL Communications Department organizations, based upon the ARRL Section. There are, at present, 74 sections within the League field organization. The area of some sections consists of an entire state; other sections contain part of a state, large enough in area and/or population to warrant more than one section for the entire state.

In charge of the overall Communications Department operations in a particular section is the elected Section Communications Manager — SCM. Each SCM will, hopefully, appoint a Section Emergency Coordinator (SEC) who will take charge of operating the ARES in his section under the direction of the SCM.

The SEC is in charge of a larger area than any other emergency communications leader in the ARRL structure.

"**SPECIAL NOTE:** Actually, there is a position in the League Communications Department Structure for an ARES leadership appointment covering areas larger than an ARRL section. This is the special appointment of an Area Emergency Coordinator (AEC), covering many sections.

"However the AEC appointment is made only where there is some special need; the appointment is not a regular one in the Communications Department line structure."

SECs recommend District Emergency Coordinators (DECs) and ECs to the SCM, who actually makes all station and leadership appointments within his section. The ECs are the basic organizers of the ARES. ECs may appoint Assistant ECs, but have the final responsibility for their particular local organization. DECs are charged with organizational responsibilities for larger areas, such as a county or other large jurisdiction.

The ECs in an AEC's jurisdiction coordinate their local plans with the overall plan of the larger ARES operational jurisdication, so that hopefully there are no duplications in the overall operation.

The term EC, while used to designate an official ARRL field appointment under the Communications Department, is a term also used by many nets, amateur clubs and groups. Such organizations will often elect or appoint an "EC" for their particular operation, but such an "EC" — unless appointed by the SCM — is not under the ARES.

The ARRL EC *does not* have any particular authority to order or direct local amateurs to work or operate in a particular way, nor does he have the authority to tell other radio amateurs they *can or cannot operate on a particular amateur frequency.*

The EC does try to coordinate *ALL* Amateur Radio operation and perhaps help organize new amateur nets or lines of communications, if they are needed. The EC will often coordinate with local agencies such as the local police, the local Red Cross Chapter, and perhaps with Civil Defense — especially under the umbrella of the Radio Amateur Civil Emergency Service (RACES).

ECs are not automatically radio officers under RACES, although often "radio officers" appointed by local CD organizations will also be ARRL ECs.

The EC is responsible for reporting to the SEC of his section on a regular basis. There are two reasons for this regular reporting. The first is to let the SEC know how things are going in his section for his report to the SCM. The EC reports the number of members signed up in his ARES organization.

The second reason for regular reports is to help gather nationwide information on how active radio amateurs are in providing public service through emergency communications operation. After all, we amateurs often use the fact that *we do provide* such service as justification for the use of amateur frequencies, and to justify the need for radio towers and antennas.

Sometimes, neighbors do not agree with amateurs that we really do need such antenna structures. In other words, not everyone agrees with amateurs that a tall tower with a three-element 20-meter beam is really a thing of beauty.

When I first started working within the ARES (AREC at the time), most operation was done on 75 or 10-meter phone, and local nets were often organized on these bands. There were few mobiles, as this type of operation was just becoming popular.

In the early 1950s, much operation started to move to the amateur 2-meter band as AM equipment became available, especially through matching funds in the RACES program at the time.

In the 1960s, 2 meters FM was an often-used channel — especially through repeaters, which were becoming popular at that time. This is probably the most often-used channel and mode for local operation today. Long-range communications are still carried on through the low bands.

Deciding what frequencies and channels to use locally often leads to one of the first major problems I have encountered while working in the ARES. There is a problem with lack of real coordination between high and low bands, between various modes such as CW or phone, and with deciding *who* in each organization is going to be the "top leader".

I have worked with ECs and other ARES leaders who would not use or coordinate any operation that is on CW (they don't work CW and in fact don't like CW), and I have worked with leaders who will not work through repeaters, or who will only work with repeaters.

Most important of all, I often find ECs who will work with only one net, only one repeater, only one mode or only one band. Such ECs sometimes try to exclude other radio amateurs or amateur clubs and groups who are already on the air.

Sometimes local clubs in an area are competitive to the point of never working together for the good of Amateur Radio. Members of one or both clubs will sometimes not even *talk* to members of the other club or group. Often, harsh words have been spoken, which makes it almost impossible to coordinate such groups for the good of Amateur Radio.

The League and the League's elected and appointed officials have of course no real authority in such matters and cannot *order* anyone to do anything. After all, ARES operation is volunteer, and all amateurs have the same rights to the use of the amateur spectrum and various communications modes, depending upon their class of license.

Sometimes an EC is appointed who believes he does have authority to order other amateurs to operate in a certain way, or to operate (or not to operate) on a certain frequency.

Such "ordering" only leads to further conflict and sometimes to deliberate interference, which may even be legal. All of these problems are *counterproductive* to the aims of the ARES, which is designed to bring amateurs together in a common effort to show that we radio amateurs *can* and *do* provide emergency communications service to the public.

Another common problem I have found

is that many amateurs will not become involved with the ARRL or ARES simply because it is under the auspices of the League. There are many amateurs who do not like something about the League, are not League members, and who — in fact — often work against any and all efforts of the ARRL to organize Amateur Radio.

There are many reasons for such feelings among amateurs, ranging from disagreements with the League's stand on issues before the FCC to the feeling that "Nobody can tell me what to do in my amateur operations."

Many amateurs, I have found, feel that the League encourages ALL frequencies and modes for amateur operation, and many amateurs are narrow in their particular operation.

It's almost as if an amateur who operates a particular band or mode will not admit that any other operation exists, and sometimes I get the feeling that such amateurs wish that types of operation other than theirs would be "outlawed".

I often listen to amateurs who think CW should be eliminated from amateur operation, or who think all low-band operation should be eliminated. And since the ARRL does support any and all forms of Amateur Radio, some amateurs will not support the League. It's a situation where "If you are not 100 percent for us, you must be 100 percent against us."

Many amateurs who did not agree with the League's stand on "incentive licensing," repeater regulations or some other issue, will no longer do anything involving the ARRL. Thus, they will not become a part of ARES. This is unfortunate, because ARES membership does not depend upon League membership and anyone can become involved. If the basic philosophy of the ARES is followed, we will bring in ALL AMATEUR OPERATION IN ORDER TO PRESENT A UNITED FRONT IN SHOWING SERVICE TO THE COMMUNITY.

Also unfortunate is the fact that often in amateur disaster operational work, we amateurs work against each other and are not coordianted to any great extent. Sometimes two or three local organizations will be trying to work with a local jurisdiction or the Red Cross, and many channels and modes are vying for traffic and operation. Hard feelings are occasionally generated between individual amateurs, which leads to an even greater lack of operational coordination.

Some of the League leaders feel the problem is that there are 74 individual operating sections in the League, with no overall coordination. ARRL Directors, who represent divisions that include many sections, have no authority over the operations of the SCMs and the sections. There may now be a feeling that larger area coordination is needed all across the country. Just how this can be done is something the ARRL Board will have to tackle if they feel such coordination is indeed necessary.

Meanwhile, all of the counterproductive problems discussed above do cause amateurs to achieve far less than would be possible if we were all to work together.

Next month: some suggestions on how to work at the local level. □

One reason to . . .

Keith Dicker, N6CKT

After plotting the SWR curve on my antenna, I've found that I'll have to upgrade in order to fall into the 1:1.1 section of the curve.

— *The Propagator, So. CA* □

ARRL Board meets

The Board of Directors of the American Radio Relay League met in Orlando, Florida on 11 and 12 March 1981, just before the ARRL National Convention. Among Board concerns was the effect of continuing high rates of inflation on ARRL financial reserves. Following a Management and Finance Committee report on the outlook for the next three years, the directors voted to increase the annual dues rate from $18 to $25, effective 1 July 1981. However, to ease the impact on older members, licensed amateurs 65 years of age or older may request a special rate of $20 per year. Postal surcharges make the rates slightly higher for members in Canada and overseas. Before 1 July, members may apply for Life Membership or term membership for up to three years at the present rate.

In other matters the Board adopted recommendations of the Ad Hoc committee on Ethics for extensive changes in director and vice director election procedures. Directors Anderson, Powell, Stevens and Zak were elected to the Executive Committee for the coming year. The Phase I report of the Long Range Planning committee was accepted with the final report scheduled for the September meeting of the Board. ARRL co-founder Clarence Tuska was inducted into the ARRL Hall of Fame. An additional $10,000 was authorized for a matching fund drive for amateur satellites by the ARRL Foundation. League participation in the International Year of the Disabled Person was urged.

In FCC matters the Board has requested that the Commission once again issue new club station licenses. To curb abuses involving third-party traffic in the amateur bands, the Board directed that FCC be asked to not grant third-party privileges to holders of reciprocal operating permits except in emergencies. ARRL will continue to press for return of full privileges in the band 1.8 to 2.0 MHz. A plan for developing and submitting an ARRL response to the FCC Plain Language regulation proposal was adopted. The Plans and Programs Committee was asked to reconsider the proposal for limited phone privileges in the 7 MHz band below 7100 kHz and to consider opening of the segment 3825 to 4000 kHz to General Class operation.

A complete report on the meeting of the ARRL Board of Directors will appear in the May issue of QST. □

ARRL conventions

Ohio State	12-13 June 1981	Cincinnati, OH
West Virginia State	4-5 July 1981	Weston, WV (Jackson's Mill)
Indiana State	12 July 1981	Indianapolis, IN
N. Florida Section	1-2 August 1981	Jacksonville, FL
Illinois State	6 September 1981	Rockford, IL
Dakota Division	18-20 September 1981	Rochester, MN
Roanoke Division	26-27 September 1981	Virginia Beach, VA
S. Florida Section	2-4 October 1981	Clearwater, FL
Southeastern Division	12-13 June 1982	Atlanta, GA
New England Division	2-3 October 1982	Boxboro, MA
Pacific Division	8-10 October 1982	Santa Cruz, CA

Donations will help OSCAR

Remember: OSCAR Phase IIIB has gotten a go ahead on another Ariane Launcher!

You can help!

Your donations — large and small — will be matched dollar for dollar by the ARRL Foundation — Satellite Fund. Mail your tax-deductible check, made out to the Satellite Fund to: ARRL, 225 Main St., Newington, CT 06111. □

Silent Key

Submitted by Robert McKinley II, W2OMR

Harold-Baring Churchill, W2ZC, of New Jersey, died 22 February in the Lawrenceville Nursing Home after a long illness. Mr. Churchill was born in New York City.

Before retiring in 1960, he was employed at the U. S. Signal Corps Engineering Laboratories at Fort Monmouth. At various times, he also had been a syndicated newspaper writer, an editor at **Time**, a technical consultant to **Fortune**, and was a technical feature writer for **Life** and **Reader's Digest**.

He attended St. George's School in Newport, Rhode Island and graduated from Princeton University in 1933, after which he served as a major in the U.S. Army during World War II.

Mr. Churchill was a veteran Amateur Radio operator, and was a pioneer in amateur single sideband radiotelephone transmission. For a time, he operated his amateur station in Fair Haven by remote control from offices he maintained on Park Avenue in New York City.

Surviving him are his wife, Judith Chase Churchill, and two sons — Ted Chase Churchill and John Marlborough Churchill, both of New York City. □

OFF THE AIR

Malaysian amateur is now Silent Key

ED: We received this letter from a Life Member of ***Worldradio*** *— Al Smith W0PEX — to whom the letter was sent. Al had corresponded with Mr. Singh for several years, and first contacted him through an article in* ***Worldradio*** *several years ago.*

I am Mrs. Kushal Harvant Singh, and I have got very sad news for you. My husband Kushal passed away on 28 January 1981.

We lost two sons — both grown-ups and in their prime. Our youngest son passed away on 12 June 1978 (23 years of age) and last year, in the month of September (14 September 1980), we lost our eldest son, 33 years of age. This shock put my husband in a very bad state of depression. He could not get over the death of our eldest son.

My husband was 63 years old. Things happened so fast and sudden, I don't know what to say. Three deaths in two years and all the ages are ending with the number three.

I am all alone now in Malaysia. Please help me. I have two more children — a boy and a girl. They are in England and are citizens of England.

Will you please put this letter in your magazine? The reason is, so many of his friends from USA and Canada always send him books and magazines, and I won't need these books or radio magazines anymore.

I am still in the state of shock and all so confused and don't know what to do with myself.

Yours sincerely,
Mrs. Kushal Harvant Singh
Taiping, Perak, Malaysia □

New fan likes constructive challenges

Worldradio is a VERY informative magazine, well-layed out and well-written. It's nice to see a magazine that challenges the ARRL in a constructive way — will keep the ARRL democratic. (The ARRL is an excellent organization.)

Current events are easy to find in **Worldradio!** I'm glad you welcome written articles from subscribers — I'm sure I'll contribute sometime.

P.S. My parents live in Pleasanton, California. I've been in Sacramento quite a few times (and like it). Too bad I didn't know about **Worldradio** before.

Richard Hallock, WA2QHN
Lock Haven, Pennsylvania □

Are you prepared?

Howard Pletcher, N9ADS

One item I have never seen on equipment readiness lists relates to installing your rig in someone else's vehicle. Many of us carry cords to plug into a cigarette lighter, but what if the vehicle involved doesn't have one — at least one that works? A 10 to 12-foot length of cord with a plug to fit your radio on one end and two alligator clips and a fuse holder on the other should enable you to reach the battery of most vehicles if necessary. Under the item of tools, you should carry with you enough to be able to assemble and improvise a fix for a bad mike connector or broken antenna lead. A roll of tape would obviously have many uses.

Now, if the phone were to ring right now asking you to report to the EOC ASAP, how long would it take to get the essentials together? Would it take you a half hour of searching your bench, the garage and the car to get the required tools, jumper cables, and adapters together, or do you have them ready to go? Many members use an old brief case or a fishing tackle box to keep these items together and ready to grab.

It has been almost three years since we have activated the EOC here and I'm sure few are as ready to go now as we were in the fall of '78, following the blizzard. Why not take a few minutes right now to evaluate your own emergency preparedness?

— AC-ARTS, Fort Wayne, IN □

Let Worldradio know what you do in Amateur Radio; many others will be interested in your experiences.

CB conversion

I'm attempting to compile a list of 23 and 40-channel AM or AM/SSB CB's, and CB walkie-talkies that are convertible to 10 meters. Please include manufacturer, model number and name.

Gary Payne, WD6BJK
1347 East Dakota
Fresno, California 93704 □

He discovers Worldradio

I have been a ham for 21 years. Received my first license in November 1960 as a Tech., and upgraded to General in 1976. My interests currently are 2, 10 and 160 meters, and CW. I got the bug when I upgraded and find it a lot of fun.

I subscribe to **QST**. Am very interested in 10-meter FM, which I understand brings back the good old days of Amateur Radio.

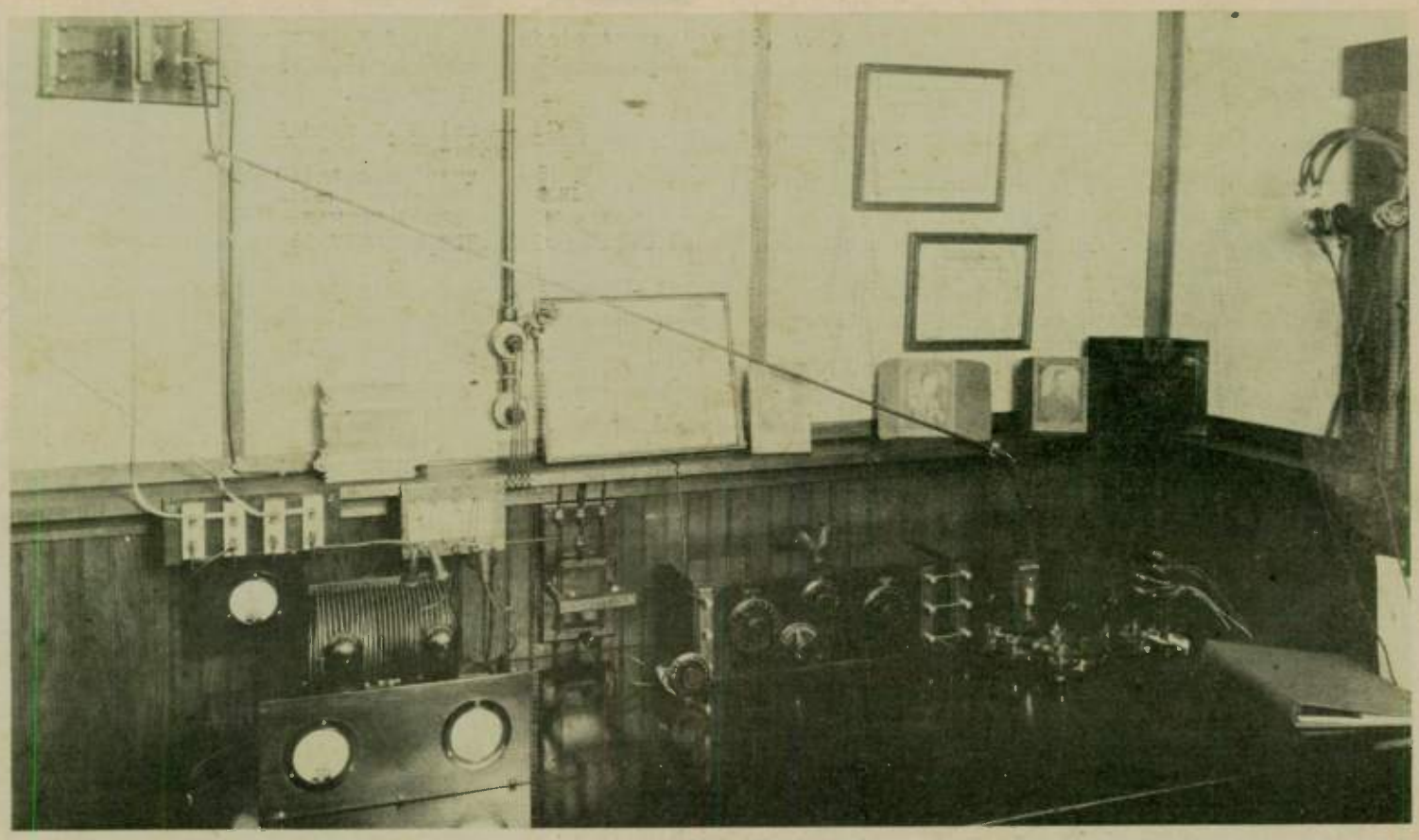
I dislike the attitudes of the amateurs who act like you have caused a lot of problems when you ask, "Is this frequency clear?"

While there are many good necessary nets, I think they should be restricted to a narrow part of the band. The use of phone patch in the United States makes me wonder if Bell (Telephone Company) might start policing this.

We all have our various interests and the bands can accomodate us all.

Now for the question — Where has your paper been? Until I was at H.R. Electronics in Muskegon, I had never seen your paper.

Thank you,
Dwight Sunday, W8ABX
Holland, Michigan □



Remember those 'Spark Forever' days?

You might be interested in this picture of Station 8AIB, taken in the very early '20s. The licensee was Charles Fertick, later W8BQT. Housed in a backyard shack at 62 Vincent Street, Dayton, Ohio and operated by the following amateurs: Charles Fertick, 8AIB (SK); Clinton A. Petry, 8AWN (SK); Robert E. Baird, W9NN; and Allen E. Apple, K4ILX.

On the floor beneath the CW rig is a lkW Spark set, Benwood Rotary gap, "Coffin" Transformer, 2-foot OT, 40-plate condenser immersed in oil, ½-inch glass plates. Antenna was 60 ft L, 6 wires with fan type feed line. 4" OT coupling running 5½ amps into ant. Best DX was a United Fruit boat off Brazil in late 1920, signing "DZ" . . . took till 1952 to confirm this when W9NN worked VP1AA, Belize, who confessed to being the operator at "DZ".

CW was pair 50 watt RCA, large chemical rectifier. RCA open inductance, resistance wire wrapped on piece of asbestos to drop filament voltage. Antenna matching by adjusting clips on the big induction coil. Home-made receiver used two Variometers and a vario coupler, two-filament Audiotron detector tube feeding two VT2 amplifier tubes. A series variable condin receiver antenna line. Our ground system was an acre of copper ribbon obtained from old Dayton streetcar field coils.

Each of us had our own keys, phones, etc. Note the unique antenna change-over switch, 110 and 220 AC line on wall, stack of spark and CW QSL's. Faded pictures are of W9NN, 8AIB and 8AWN.

We two remaining op's, W9NN and K4ILX, would love to hear from any old-timers who used to work us back in the "Spark Forever" days!

73
Bob Baird, W9NN
Charter Member QCWA #52
60 Year Award

Share your knowledge with your fellow amateur and Worldradio reader

Vern Hansen,
WB6UWQ/AAA9W

It's a challenge!

Leon Rosenthal, W6VNY/AAR9ZX

It was 0500 GMT time. I slowly came back to the present. For the last hour it had been the skills of six dedicated CW operators pitted against the elements. I couldn't help but wonder why six diverse individuals gathered together for one hour at 0401 GMT on this one night each week to handle CW traffic. Most of the time it's drill traffic; yet they all preferred to get on the air when they could be sitting in front of the TV or reading a good book.

As I reflected on the last hour of operation, I realized it was the rotten conditions we were up against that made this 60 minutes so satisfying. After operating steadily on the ham bands since 1946 using CW mode, an hour of brass-pounding is less than thrilling. The great part about the last hour was the obstacles, yet I don't think any of the other five operators gave this point any consideration. The tougher it was, the better they liked it! As the hour had progressed and the conditions deteriorated, everyone simply applied more skill to get the job done. Let's take a chronological look at what happened.

The AAR9ZX/A CW net opened at 0401 GMT with nine pieces of traffic, and it was immediately apparent that relaying techniques were going to be necessary if the drill messages were to be cleared tonight. The prepared drill traffic was purposely designed to prevent any second guessing by the receiving operators. The messages were filled with map coordinates, difficult technical expressions, etc., so that only precise copying of the incoming signal could be accepted. The messages were of the "G" or repeat-back type, and of a "T" or relay nature so the receiving operator knew he or she must be extremely accurate before giving a "receipt" for traffic.

As NCS I had this situation . . . AAR9IV San Mateo, was barely readable. AAR9TG Atascadero and AAR9WV Altadena were at the S3 level at this moment in time. These starting signals from the California stations didn't make for an auspicious beginning. AAR9EV Yuma, Arizona was very weak. His normally strong signal was just a whisper. The only redeeming feature of this night's check-ins was AAR8GS out of Lennox, South Dakota. He was a strong S4 and climbing. Maybe you are wondering why this strange mix of signal strengths. It's all because we are using a new, recently assigned frequency for CW nets — 6988 kHz — and at this time of the year, at our net time slot, the band acts up with a vengeance.

San Mateo, California reported strong commercial interference, a condition peculiar to his QTH. Yuma, Arizona relayed through another station that the NCS was at zero signal level at his location. So . . . with the help of Altadena and Atascadero — two California stations — and Lennox, South Dakota, I started the drill traffic on its way. Atmospherics in my location (San Diego) were kicking up a real fuss because an electrical storm was brewing, a very rare situation for San Diego, and the QRN level was something to talk about. I had lost contact with Altadena and Atascadero. Both had reported earlier that they could hear South Dakota loud and clear.

At this point I had traffic for Yuma, Arizona and San Mateo, California to clear and three pieces of information traffic for all net members. My only direct contact with the net members was through South Dakota and San Mateo, who was having very difficult copy. I advised the Dakota station to relay to all net members that all traffic would be sent through his station, both to and from NCS. Operating from between 18 and 22 wpm — because of the miserable conditions — the messages were cleared with 100% accuracy by 0455 GMT. There were moments when I could just make out some of the secondary stations and I could hear them reporting atmospheric interference equal to the signal strength. Even so, with a few fills, the traffic was accurately completed.

As I listened to these excellent CW operators, I couldn't help but feel a bit of pride as a member of the net, and wondered how many brass pounders there were around who could do the job of separating the signal from the noise like these MARS operators had just done.

Having operated on the ham bands for 34 years and still enjoying it very much, I

(*please turn to page 23*)

STATION Appearance

Jerry C. Woods, WB5POQ, sits in his "closet" ham shack. This photo is the same one WB5POQ uses for his QSL card.

Congratulations go to Jerry Woods, WB5POQ, for winning the Station Appearance award this month! The letter he sent us follows:

When I got into Amateur Radio in 1975, I faced the same problem other amateurs face — "where to put the shack." Like most homes, mine was being used to full capacity. I tried the garage for a time but found it unsuitable since there was no heating or cooling. With the permission of the wife, I finally decided on the front room entrance-hall closet. The closet is about four feet wide but only two feet deep and is closed off by bi-fold doors. The work was in building a desk, top and shelf to give me the most space. I also had to run electrical wires and coax into the closet. I installed pull-down maps by gluing maps onto window shades and hanging the shades from the ceiling.

As far as operation is concerned, the station is fairly comfortable. There isn't a lot of desk writing space or room for a large office chair, but there is room for all the necessary operating equipment. At present, I hold the "Worked All States" (WAS), "Worked All Continents" (WAC), and have submitted my DXCC to ARRL for processing.

My station equipment includes Kenwood TS-520 with remote VFO and speaker, Heath SB-200 amplifier, Mosley Classic 33 tri-band at 15 meters, Kenwood TR-7500 2-meter FM, and Yaesu FT-202R Handi. The next piece of gear will be a monitor scope to keep a check on my signal.

After five years of operation I feel the closet is not a bad compromise. When not in use, the station is closed off to public view but instantly available for show to friends. In time, when the kids move away and the house becomes larger, I will probably build the dream shack in an empty room; however, until then I'll talk to the world from my cozy closet.

73's
Jerry C. Woods, WB5POQ
Wichita Falls, Texas □

Dressing up that new rig

Doug Millar, K6JEY

Over the past several rigs(!) I have picked up a few techniques that help to make a good rig even better. If you are not afraid to take the cabinet off, you might try a few.

Newer VFO knobs, since the HRO series, seem to me to be pretty light and indefinite, so I pack them with modeling clay to weight them down and give them a little more heft. Other people also include bird shot or ball bearings. The knobs end up with a little more definite feel and have more inertia.

I take an old receiver and plug it into the antenna terminal of my new rig to check carrier suppression and neutralization. Load the transmitter up on 10 meters into a dummy load. Switch off the screen voltage, plug in the monitor receiver and tune it into the transmitter's frequency. Unplug the microphone. Turn it on and adjust the neutralizing capacitor for minimum signal into the receiver. Next turn the screens back on and switch to SSB. Without a microphone plugged in, the output should be zero. Chances are you will hear some carrier leaking through. By adjusting the resistor and capacitor in the balanced modulator, you should be able to completely null the carrier out. That should give you 90+dB carrier suppression and a very clean signal.

While I have the rig open, I usually check to see if the cabinet bonding areas are clean. Many times the manufacturers paint the entire cabinet. If the cabinet has no real metal to metal contact with the chassis, it does not act as any kind of a TVI shield. The fix is to scrape the paint off around the inside of the cabinet around the screw holes. It makes a whale of a difference.

Depending on how hard it is to get to from the outside, you might also want to zero your crystal calibrator to WWV. Remember to watch the meter to get it down to the last few cycles.

Since I also run a second receiver as a remote VFO, I usually run a length of RG 174 from the receiver input to the accessory jack so that I can use both receivers at the same time.

These are a few of the things I have found over the years that can help to make an already fine piece of gear a little better. They can be done with a minimum of hassle, and they do not end up drastically changing the rig.
—The Short Circuit, Southern CA □

SAROC '82

SAROC '82 will not be held the weekend following New Year's Day, as has been the case in years past. The date has been moved to 1-4 April 1982. The location will be the Aladdin Hotel, Las Vegas, Nevada.

The SAROC Prestige Radio Amateur Operators Convention is open to all Amateur Radio operators and those interested in becoming radio amateurs.

The Aladdin Hotel has reserved 600 rooms for SAROC registered guests at a special rate of $36 per night, plus room tax, single or double occupancy. The Aladdin Hotel SAROC accommodations request card will be sent to all exhibitors and SAROC paid registered guests. One night's room deposit must accompany each room accommodations request, mailed directly to the Aladdin Hotel.

Advance registration is $17 per person, and includes Friday night cocktail party, Aladdin Hotel buffet brunch on Saturday and Sunday (ladies who register will also receive a coupon for their Saturday program), admission to technical sessions and the prize drawing.

Non-paid registered guests will receive a pass for visiting the exhibit area only.

Advance registration checks should be mailed to SAROC Registration, c/o Travel Specialists, Aladdin Hotel, 3667 Las Vegas Blvd. South, Las Vegas, NV 89109. □

MARS

(continued from page 22)

often reflect on why I look forward to the MARS CW net each week. Every ham operator knows the feeling of picking up a rare piece of DX or even the nice afterglow of a good QSO with another station, but I can vouch for the truth of this statement: *It's very hard to match the personal satisfaction MARS operators get after handling difficult traffic with speed and accuracy, particularly when the elements are stacked against them.*

If there are any Amateur Radio operators out there who find they are going several weeks at a time without turning on their rigs, maybe the reason is that the challenge has gone out of hamming. If you want to put your skills to the test, listen in on 6988 kHz at 0401 GMT Thursday nights, (that's 8:00 p.m. Wednesday nights, local time) and see if you can copy the traffic through all the noise. IT'S A CHALLENGE.
P.S. If you do listen and like what you hear, please join up. □

Law of selective gravity — An object will fall so as to do the most damage.

Happy Flyers

HAMS & PILOTS

SERVICE

"THERE IS NO LIMIT TO WHAT YOU CAN DO – IF YOU DON'T CARE WHO GETS THE CREDIT"

INTERNATIONAL COMMANDER, Hart Postlethwaite, WB6CQW
1811 Hillman Ave., Belmont, California 94002 (415) 341-4000

International Vice Commander, Paul Hower, WA6GDC
Box 2323, La Mesa, California 92041 - (714) 465-5288

DF antenna information

It has been a couple of years since Corky Yant of the Texas Trackers discovered where the 3dB loss was in the HAPPY FLYERS DF antennas. You may remember our article which pointed out that the main culprit was the length of the cable from the PIN diode switching network to the antennas. They also commented that an additional benefit of this correction was a much cleaner pattern.

Their change was to make the coax length the same as the delay line length. If the antennas were placed 19 inches apart for 2 meters, the delay line was to be 19 inches times the velocity factor of the coax used. In the case of one that was 0.66, the length was about 12.5 inches. Originally we had been just making the connecting links about 10 inches since that was all that was required to reach from the delay network to the antennas. This was a mistake.

We have all been grateful to them for finding this error, and it surely has helped. However, we may have a new discovery (perhaps of an old fact). I have commented to a number of people that the DF in our present plane does not work nearly as good as it did in the old plane. It was the same DF, but had different antennas, and was connected to a King KX 170B instead of our old Bendix RT 221B. We have assumed all these years that the difference was due to the radio change.

While assisting Sam Gold, WA6HOE, in the installation of a Micro Electronics VH 12 DF in a Civil Air Patrol Helio, I made some interesting observations. I had flown for about a year and a half using the Micro unit and have always considered it one of the best ever produced. When we designed the HAPPY FLYERS DF so that everyone could build their own, I removed the Micro VH 12 and gave it to another member of the Sheriffs Air Squadron. I did not remove the antennas from my plane but made him up another delay network. It worked and he only missed his first DF target by 10 feet. He found his first ELT in less than 15 minutes.

Looking at the coax length on the Micro electronics switching box, I noticed they were much longer than I was accustomed to seeing. We carefully pulled them out and measured both the delay line and the coax to each antenna. Since this was set for the aircraft band, they were 24 inches apart. The delay line was quarter-wave times velocity factor (about 16 inches), and the two lengths of coax were half-wave times the velocity factor (about 32 inches).

Since our Skylane 21DF was all apart to replace the stolen radios, I took the opportunity to build a new inside antenna and delay network and have it installed by the avionics man. The weather was bad when I got the plane back, so I only made a brief test flight close to the airport. It sure appeared to be more like the old installation. I can hardly wait for the opportunity to go on some more extensive tests. Unfortunately, the new antenna connected to the old DF is now connected to a different radio (King KX 175B). This means I have two changes. Now we have no way to know if the antenna change was everything, or just a part of the problem.

This is where you can help. Those of you who have built a HAPPY FLYERS DF unit in the past could provide an invaluable service to all involved in Search and Rescue. You could run a test with your present radio and DF antenna system, and then build a new antenna as described (or just change the length of coax on your present one). If it makes an appreciable difference, we would like to hear from you.

Normally I would run more tests before writing a story like this; however, I held this story five days beyond deadline to at least make the flight I did. I talked to Dr. David Cook, W7VOM/6 who will be doing the operation on me, and the CAT scans and myelograms were all very good. There is now no question that the cause of my pain is in my back and not in my head. Chances are excellent for considerable pain relief with surgery. This means that as soon as the insurance company paying the bills from the accident gives its approval, the long-awaited operation can take place. I felt I had to write this to be sure someone investigated this in case I couldn't. Your help will be appreciated.

While on the subject of the operation — a bone graft will no doubt be a part of this operation, and therefore Dr. Cook says I will be laid up a little longer than the first operation. I have already been having trouble keeping up with our volunteer correspondence. Hopefully, by the time this is printed I will already have had the operation. If you need information from me personally, you might stand a better chance of response (until I am better) by telephoning me after the 5:00 p.m. rate change. I will be glad to answer any question, and probably will be very glad to talk to people.

Anyone wishing regular correspondence with the HAPPY FLYERS for the use of our free DF and Search and Rescue slide/sound shows, the DF kits or information, or starting a squadron in your area, should write to our International Vice Commander Paul Hower, WA6GDC, P.O. Box 2323, La Mesa, California. Remember, we are all volunteers — so please be patient.

I might also add that Ben Bohach, KØGVS, is no longer supplying parts for the DF kits. We will let you know if anyone does wish to supply a complete kit of parts. We only supply the PC boards and manuals.

Squadron #1 fly-in changes

Commander Dick Chilingarian was re-elected for his third term at the annual meeting. Since Dick is not an Amateur Radio operator. our by-laws require that the Vice Commander must be one. The new vice commander is Bill Cathcart, K6OPC. It is interesting to note that he was one one of the spark plugs in the recent installation of the ELT receiver at the WA2IBM/6 repeater.

Those attending the annual business meeting also voted on a number of other items. Our newsletter editor and treasurer, "Flash" Allen, WA6SCM, was unanimously re-elected. A major change in the fly-in plans was made and is worthy of consideration by other squadrons.

When HAPPY FLYERS was organized in 1972, a great deal of activity was taking place insofar as people working for different pilot's licenses. Everybody was interested in flying, and as a group we had never been to any of the places we visited for the first time. Now we have been to most of the nearby places. This has an effect on the size of our turnout. In addition, most of us now have all the licenses we can afford, and many of us have considerable flying hours now.

We used to have our fly-ins on the third Sunday of every even month. This made it easy to remember, and the regularity made it possible to sign up for planes at our local FBO rental establishments. Many now have their own planes. It was felt we should abandon the old method and plan to have our fly-ins at times and places best suited for those interested in going. It is the plan to have at least one fly-in activity each 90 days. This will keep the pilots legally current as per FAA regulations.

It was also voted to plan a fly-in to Catalina Island (Avalon) the last weekend in July. In the summer season they will not accept any group reservations. If you wish to join us, make your own reservations with any hotel. They are all very close together. Either Commander Chilingarian or my wife, Janie, and myself will have a large room for all of us to gather for socializing. We will plan to arrive Friday afternoon and depart on Sunday afternoon. This will be a fun trip. If you plan to join us, please drop a line to Flash WA6SCM, 508 Kay Ann Court, El Sobrante, CA 94803.

Stolen radios

We reported last month that our plane had been stolen, then recovered minus all radios except the ones that had been engraved on the front. This was interesting since the DME (distance measuring equipment) they left was worth over $4,000. They also did not take our special three-band HAPPY FLYERS DF.

In talking with the insurance adjuster, we learned that a trick of avionics thieves

is to steal the radios out of one plane and then put them in another plane down the line that has the same type of radios. This gives them radios that are not on the "hot" sheet.

It has become an increasing practice of late, to put our driver's license or amateur call letters on the inside or back of the radios. Our thought now is that putting any engraved identifications on radios that cannot be seen on the front panel probably have little deterrent value. We just received our plane back last Friday, with its new and expensive radios. This week we plan to slide them all out and take them to a professional engraver. We have decided to have N21DF put on each, in large 3/8" letters with white fill. Having such a large identification on the front panel will look very nice and custom for us, but will make the radios almost impossible to sell if stolen. I believe we will plan to put WB6CQW and WB6ODQ on all our Amateur Radios and our CAP calls on our CAP radios. A HAPPY FLYER bought a Regency with CAP crystals at a flea market for $10. It must have been stolen, but there was no identification for us to return it to the rightful owner.

The obvious disadvantage to engraving things on the front of equipment is the possible loss of value at resale. This need not be a problem. The new owner can have their call engraved on a nice plastic or metal piece, and attach it over the old engraving with glue backs usually supplied. If the radio was later stolen, and the thief pulled off their identification, the permanent one would remain. Perhaps we are a little tender on this subject because we have been robbed a number of times now, but a national campaign might slow up some of the thieves!!! □

Volunteers

(continued from page 1)

many years, the U.S. Coast Guard has used similar volunteers in the Coast Guard Auxiliary. There is no reason why this same principle cannot be applied to the FCC. It would be necessary for potential members of this "auxiliary" to meet strict qualification standards. The last thing needed is to have vigilante-type individuals creating more problems to the Amateur Radio Service than we presently have.

The bill would amend the Communications Act of 1934 to permit the FCC to employ voluntary services for purposes of monitoring violations of the Act by amateur and citizens band radio service station operators. This bill would also cover the administration of examinations for certain Amateur Radio station licensees. As you recall, the Novice program is now under scrutiny because we are presently using volunteer Amateur Radio operators to administer the exams.

Stations providing this service to the FCC will be uncompensated except for the knowledge they are providing a much-needed public service to help clean up the air waves. There are more than enough volunteers to go around for this uncompensated position!

How can we help?

The most important thing at this time is to support H.R. Bill 2203. This can be done by writing on a QSL card, "We support H.R. 2203" and sending the QSL card to your local congressman or senator.

"Speaking as one man that has devoted countless hours and a lot of effort, not to mention money, toward the goal of ending the malicious interference problems on the Amateur Radio bands, I consider this bill to be the single-most significant step forward that has been taken to date," comments Ray Frost, WA6TEY.

"Remember the potential problem of amateurs administering Novice tests to prospective amateurs. This bill would solve that problem as well," adds Ray.

"I urge all Amateur Radio operators to start a QSL card writing campaign. Write your representative in the Senate as well as in Congress, and urge their support. You may also send QSL cards to Congressman Dannemeyer, thanking him for his support of this new bill. He certainly deserves a hearty thanks from all of us," adds Frost.

QSL cards or letters may be mailed to Congressman William (Bill) Dannemeyer, 1032 Longworth Building, Washington, D.C. 20515, and also to Congressman Tim Wirth, Room B, 333 Rayburn Office, Washington, D.C. 20515. Write both congressmen today on your QSL card, and let them know your support.

Yes, there is something that we can do about malicious interference. Our thanks go to Ray Frost, WA6TEY, for his valued efforts to help push this issue through and to create H.R. Bill 2203.

CCC

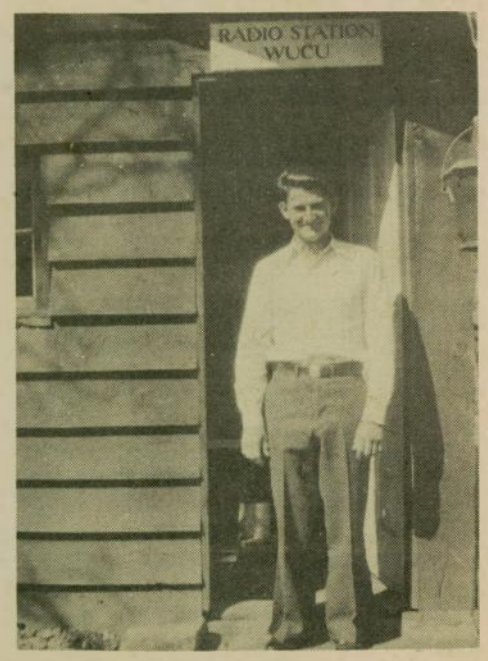
(*continued from page 4*)

Chamberlain, I somehow bought a portable typewriter and learned to "copy on the mill". It was also at Chamberlain, in the fall of 1935, that I met Jim MacAdam who visited there from the Huron, South Dakota camp.

John Van Bockern left Ft. Meade in the spring of 1936 to go to work for RCA. I was chosen as his replacement. I operated at Ft. Meade for a few months, but the operators at Corps Area Station WVU in Omaha, Nebraska lured me into the Signal Corps.

Although I had left the CCC, I still regard it as my initial step into a rewarding career and the interesting hobby of Amateur Radio. Occasional contact has been made, over the years, with most of my old CCC associates, and some of us have worked together later on other jobs. I have also met many who came from CCC stations in other states. An abbreviated listing of these operators and their careers follows.

Name	State CCC	Present call	Career
John Van Bockern	SD	—	RCA Communications, San Francisco
Ray Stekley	SD	—	Lost track of him
James MacAdam	SD		Military Quality Control Engineer
Denny Begley	SD	WB0MKI	FAA District Supervisor, Chicago
Fred Holsclaw	SD	N7BB	FAA Washington Office
Fred Hansen	SD	—	Pacific Telephone & Telegraph
Fred McBride	SD		FAA Sector Chief, Sioux Falls, SD
Frank Whittaker	SD	W5ZI	Engineer FAA SW Regional Office
Emil Gleitz	SD	Deceased	CAA Maintenance, Pacific Islands
? Gibbs	SD	—	Lost track of him
Wilford Rova	ND	Deceased	Chief, FAA Communication Station, Bismarck, ND
John Cartwright	AR	W5BED	Chief, CAA stations, WE Region City Inspector Siloam Springs, AR
Albert Hall	AR	W5EHF	Chief FAA Communications Station, Salt Lake City, UT
Lee Craig	AR	W0TSA	FAA Communicator, Kansas stations
Elmer Wingfield	AR	W5FD	Lt. Commander U.S. Navy
Jerry Broudy	MI	W5MCJ	FAA Flight Inspection Technician
Orin Covert	ID	N6AA	FAA Sector Chief, Ukiah, CA □



A Camp Doran CCC operator in Custer, South Dakota.

CCC radio station at Camp Doran, Custer, South Dakota. Commercial gear was manufactured by Clough-Brengle.

The Ozone Club — are you eligible?

When legal, did you operate a spark gap transmitter as a licensed amateur? You did? Then, if you are now a licensed amateur, contact Ralph Hasslinger, W2CVF, with such information. You can also contact a member in your call district. YOU MAY BE ELIGIBLE TO JOIN. It is a non-dues, no-officers group of the older old-timers in Amateur Radio today.

Members, listed by call letter districts, are: Frank Anzalone W1WY; Bernard Stahl, W2HL; Hobart Johnson, W3AC; Frank Lester, W4AMJ; H.A. Sears, W5NC; Don Wallace, W6AM; Melvin Goodwin, W7IXG; Damon Wilson, W8DHP; Robert Baird, W9NN; Gladys Brattland, W0MFW. Present Ozone Club Nets: Monday — 21,435 at 1800Z; Tuesday — 21,050 at 2130Z (kc, of course; the other, Hertz).

The nets are just getting into action — help is needed! Pass on the information, please. □

WITH THE HANDI-HAMS

Bruce L. Humphrys, KØHR

Take the easy way out

No matter how you cut it . . . regardless of how many classes you go to . . . irrespective of study guides . . . notwithstanding "last minute" cramming: **You've got to know electronics to be an amateur!**

There's just no way of getting around it — you've got to know formulae, designs, symbols and mathematical relationships. Not just to pass the exams, no siree! Once you get on the air, you'll want to be able to talk with some degree of understanding of that magic box pushing out a couple of thousand watts into the unsuspecting ether!

But we all know that learning can be tough — and *remembering* even tougher! I've got a lousy memory . . . I sometimes have a hard time remembering what I did yesterday. It's just not important enough to burn a permanent (maybe even a temporary) place in my memory banks. Sometimes, though, I can remember things that are so seemingly meaningless as to be rightfully forgotten immediately.

Take that big old oak tree down the road from my grandmother's house in Jacksonville, Florida. When I was a baby, my mom would take me out for a stroll in the baby carriage down Flagler Street to a park about a mile away. In this park is a huge oak tree. I can remember seeing that tree — the vision keeps cropping up in my mind — and yet, it was over 35 years ago when I saw that tree. (My folks went down home this past January and confirmed that the tree is still there!) I've probably remembered that big old tree because of a rich picture impressed permanently on my mind.

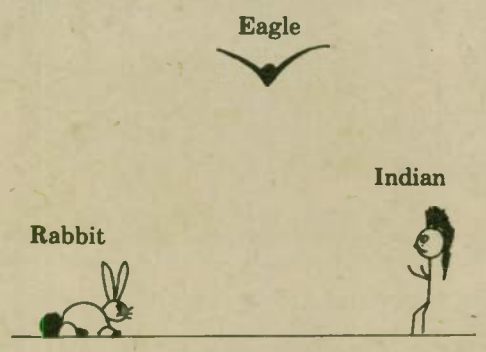
On the evening of 12 March 1960, I was watching the Johnny Carson show. He had a fellow on the program who was a memory expert (no, smart guy — I can't remember his name!). Anyway, he promoted a method of remembering using silly visual pictures. He gave the audience a list of things to remember, betting that not only would we remember them, we'd never FORGET them! He was right — here's the list: glass of water, living room ceiling, Eiffel Tower, primroses, automobile tire, yellow pencil, a tree, an ashtray, an earring, and a blade of grass.

Now I ask you — how silly can you get, remembering all those things, but not being able to remember something simple like Ohm's Law? Well, buckeroo, that's the question I asked myself some years ago. "You big oaf," I says to myself, "Why not use the same method?"

That's the way you keep things in your noggin which don't seem to have any other place to be. And one of the major aims of the Educational Service of the Courage HANDI-HAM System is to make it easier to learn and retain all the things you have to learn to be an amateur. Let's take Ohm's Law, for example:

Everyone probably has his own way of remembering it, but here's a way we teach at Radio Camp. Imagine a desert. An Indian is standing on that desert. Go ahead — close your eyes and actually *visualize* this. Now, a short distance away, a little bunny rabbit is sitting on the ground. See him? Cute little fellow — crunching on a carrot. Up in the air, there's a majestic eagle soaring on the hot air currents — wings spread wide, piercing eyes scanning the desert floor.

There you've got it — Ohm's law. If the Indian looks out, he sees the Eagle *over* the Rabbit (I=E/R); likewise, if the Rabbit looks out, he sees the Eagle over the Indian (R=E/I); and if the Eagle looks



Ohm's Law

down, he sees the Rabbit and the Indian ON THE SAME LEVEL (E=R x I)! What could be simpler than that?!?

Well, for one thing, Eli the Iceman could be . . . Have you ever been puzzled (especially around exam time) about the relationship of voltage and current in AC circuits? You know, the old "voltage leads current; or current leads voltage" deal? Our old friend, Eli, will tell you each time:

Take a look at the spelling of Eli: If you let the "L" stand for "inductive circuit", you can see that the "E" comes first, and the "I" comes last (in an inductive circuit, voltage — "E" leads current — "I"). Con-Conversely, the word "ICE"; if you let the "C" stand for capacitive, you can see that current leads voltage. ELI the ICEman! Simple, no?

And let's not forget the Morse code. Learning the code is a lot more than simply memorizing the relationships of some dits and dahs. You just simply cannot learn to copy the code until you get the rhythms down pat. Learning the code by rhythm is a lot easier. Take the letter "L" for example: di dah di dit. Most code learners will place equal emphasis on each component. But, if you think of the word "linoleum", you instantly get the rhythm of the thing. Try it — say "linoleum" out loud, then say di dah di dit in the same rhythm. Voila!

Almost everyone in Amateur Radio knows the little phrase: Big Boys Race Our Young Girls But Violet Generally Wins. (I learned a different version in the military, but this one works, too!!) This little sentence helps us to remember the color code for resistors and capacitors: black, brown, red, orange, yellow, green, blue, violet, gray, white.

There must be hundreds more little catch phrases that people have used to help them remember. If you have some, please send them in to the HANDI-HAM System!

Tricky math

Now that we've built up your confidence to remember all those electronic facts, let's knock it down again with some slick math. How'bout telling your students that you can prove one plus one equals zero? S'pose that'll do it? Here's how:

Let A = 1, B = 1; therefore A = B. Also, since an equation remains equal if you perform the same function to both sides, $A^2 = B^2$; therefore, $A^2 - B^2 = 0$.

Now, factoring $A^2 - B^2$, we get: $(A - B) \times (A + B) = 0$.

If we divide both sides of the equation by $(A - B)$ we get:

$$\frac{(A - B) \times (A + B)}{(A - B)} = \frac{0}{(A - B)}$$

The two $(A - B)$ quantities on the left side cancel, and anything divided into zero is zero, so we are left with: $(A + B) = 0$.

1 = 1 = 0!!

HAVE FUN! □

Aided through the 'grapevine'

Bill Mason
Submitted by Harry D. Thomas, KA1NH

When Amateur Radio operator Kenneth Buxton, VE3HXE, came from Toronto to the Guide Dog Foundation for the Blind's training center in Smithtown, he brought his radio set so that he and his wife, Elaine, could keep in touch. Buxton, who is blind, was alone, and the couple hadn't been apart in seven years of marriage.

The radio equipment broke down shortly after he arrived last week. He was faced with having to go through the four-week session — which will teach him to work with a guide dog — with home contact limited to expensive long distance phone calls. Then, with the help of several fellow ham operators, Buxton was on his way to solving his problem.

Adam Gromacki, KA2GOO, an amateur operator in Holbrook, knew through a mutual friend that Buxton was coming, and called him by phone to say hello. When Buxton told him of the breakdown, Gromacki set up a phone patch arrangement with Mike Ennis, VE3DJH, a radio buff in Toronto who knows Buxton. In the evenings, Gromacki contacts Ennis by radio, calls Buxton on the phone, and patches Buxton through to his wife, whom Ennis has called on the telephone. For the price of two local phone calls, the couple is able to talk at length.

Meanwhile, other Amateur Radio operators on Long Island who got word of Buxton's problem volunteered to help repair his unit, and it should be operable within a few days.

—*Newsday, Long Island, NY* □

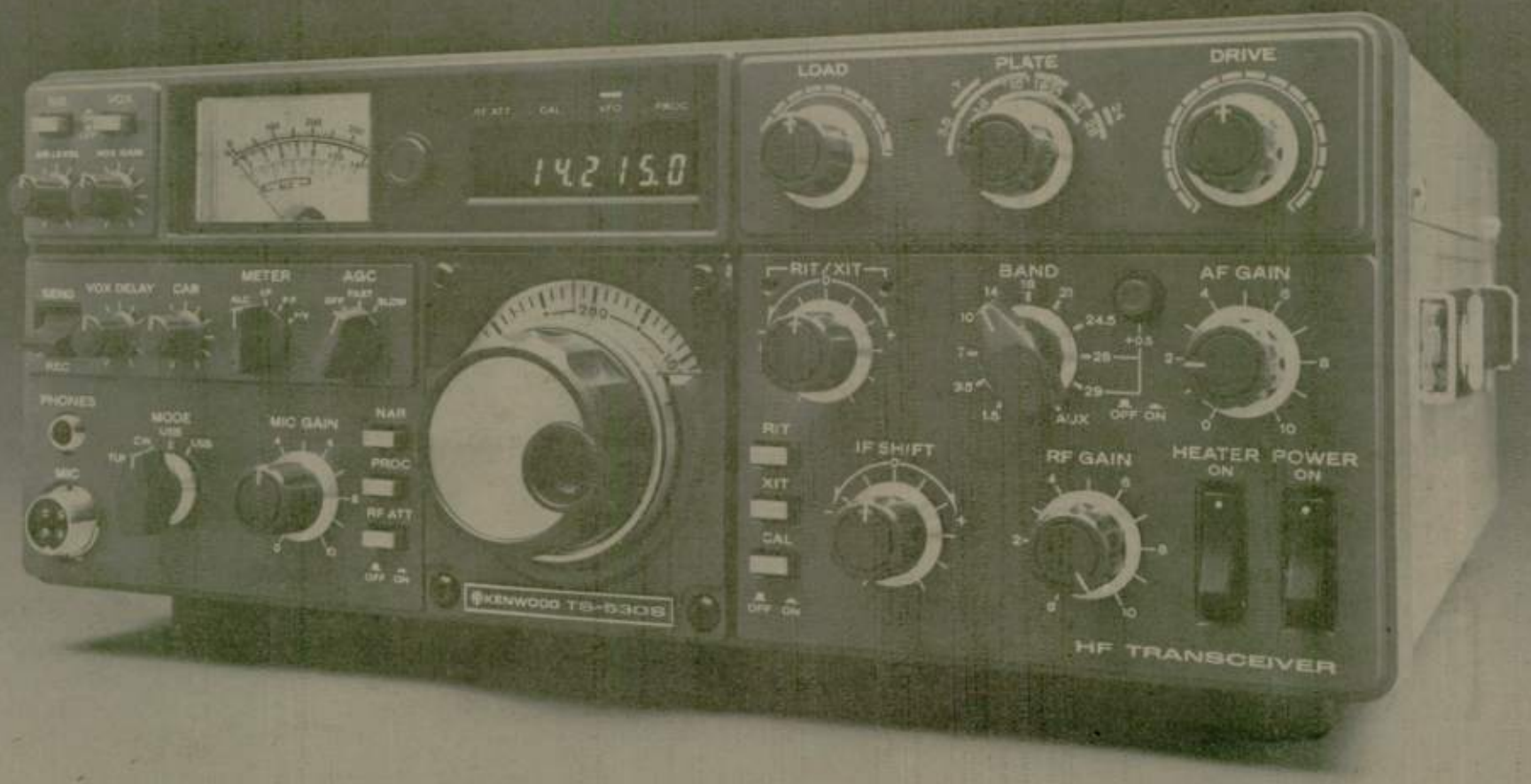
If your club is involved in any emergency situations, send the story and pictures to WORLDRADIO.

See your group in print — your story may help others be better prepared.

ARRL represented at charter signing

The Amateur Radio Club of Silverton (ARCS) of Silverton, Oregon recently formed a Charter Club. Thirty club members, including special guest Mary Lewis, W7QGP — Northwest Division Director of the ARRL — attended a dinner-meeting on Wednesday, 14 January 1981, where 19 club members signed the charter. Byron Richards, president of the Silverton club, was one of those who signed the charter. □

"Cents-ational."



IF shift, digital display, narrow-wide filter switch

TS-530S

The TS-530S SSB/CW transceiver is designed with Kenwood's latest, most advanced circuit technology, providing wide dynamic range, high sensitivity, very sharp selectivity with selectable filters and IF shift, built-in digital display, speech processor, and other features for optimum, yet economical, operation on 160 through 10 meters.

TS-530S FEATURES:

- **160-10 meter coverage, including three new bands**
  Transmits and receives (LSB, USB, and CW) on all Amateur frequencies between 1.8 and 29.7 MHz, including the new 10, 18, and 24 MHz bands. Receives WWV on 10 MHz.
- **Built-in digital display**
  Large, six-digit, fluorescent-tube display shows actual receive and transmit frequencies on all modes. Backed up by analog subdial.
- **IF shift**
  Moves IF passband around received signal and away from interfering signals and sideband splatter.
- **Narrow/wide filter combinations**
  Any one or two of three optional filters . . . YK-88SN (1.8 kHz) SSB, YK-88C (500 Hz) CW, YK-88CN (270 Hz) CW . . . may be installed for selecting (with "N-W" switch) wide and narrow bandwidths on CW and/or SSB.
- **Wide receiver dynamic range**
  Greater immunity to strong-signal overload, with MOSFET RF amplifier operating at low level for improved IMD characteristics, junction FETs in balanced mixer with low noise figure, and dual resonator for each band.
- **Built-in speech processor**
  Combines an audio compression amplifier with change of ALC time constant for extra audio punch and increased average SSB output power, with suppressed sideband splatter.
- **Two 6146B's in final**
  Runs 220 W PEP/180 W DC input on all bands.
- **Advanced single-conversion PLL system**
  Improved overall stability and improved transmit and receive spurious characteristics.
- **Adjustable noise-blanker level**
  Pulse-type (such as ignition) noise is eliminated by built-in noise blanker, with front-panel threshold level control.
- **RF attenuator**
  The 20-dB RF attenuator may be switched in for rejecting IMD from extremely strong signals.
- **Optional VFOs for flexibility**
  VFO-240 allows split-frequency operation and other applications. VFO-230 digital VFO operates in 20-Hz steps and includes five memories and a digital display.
- **RIT/XIT**
  Front-panel RIT (receiver incremental tuning) shifts only the receiver frequency, for tuning in stations slightly off frequency. XIT (transmitter incremental tuning) shifts only the transmitter frequency, for calling a DX station listening off frequency.

More information on the TS-530S is available from all authorized dealers of Trio-Kenwood Communications, Inc., 1111 West Walnut Street, Compton, California 90220.

Matching accessories for fixed-station operation:

- SP-230 external speaker with selectable audio filters
- VFO-240 remote VFO
- AT-230 antenna tuner/SWR and power meter
- MC-50 desk microphone

Other accessories not shown:

- VFO-230 remote digital VFO with 20-Hz steps, five memories, digital display
- TL-922A linear amplifier
- SM-220 Station Monitor
- KB-1 deluxe VFO knob
- PC-1 phone patch
- HS-5 and HS-4 headphones
- HC-10 digital world clock
- YK-88C (500 Hz) and YK-88CN (270 Hz) CW filters and YK-88SN (1.8 kHz) SSB narrow filter
- MC-30S and MC-35S noise-canceling hand microphones

KENWOOD
. . . pacesetter in amateur radio

Specifications and prices are subject to change without notice or obligation.

40 W, 15 memories/offset recall, scan, priority, DTMF touch-pad

TR-7850

Kenwood's remarkable TR-7850 2-meter FM mobile transceiver provides all the features you could desire, including a powerful 40 watts RF output. Frequency selection is easier than ever, and the rig incorporates new memory developments for repeater shift, priority, and scan, and includes a built-in autopatch touch-pad (DTMF) encoder. A 25-watt output version, the TR-7800, is also available.

TR-7850 FEATURES:

- **Powerful 40 watts power output**
  Selectable high or low power operation. High 40-watt output provides reliable signal for wide area coverage.
- **15 multifunction memory channels, easily selectable with a rotary control**
  M1-M13...memorize frequency and offset (±600 kHz or simplex). M14...memorize transmit and receive frequencies independently for nonstandard offset.
  M0...priority channel, with simplex, ±600 kHz, or nonstandard offset operation.
- **Internal battery backup for all memories**
  All memory channels (including transmit offset) are retained when four AA NiCd batteries (not Kenwood supplied) are installed in battery holder inside TR-7850. Batteries are automatically charged while transceiver is connected to 12-VDC source.
- **Extended frequency coverage**
  143.900-148.995 MHz, in switchable 5-kHz or 10-kHz steps.
- **Priority alert**
  M0 memory is priority channel. "Beep" alerts operator when signal appears on priority channel. Operation can be switched immediately to priority channel with the push of a switch.
- **Built-in autopatch touch-pad (DTMF) encoder**
  Front-panel touch pad generates all 12 telephone-compatible dual tones in transmit mode, plus four additional DTMF signaling tones (with simultaneous push of REV switch).
- **Front-panel keyboard**
  For frequency selection, transmit offset selection, memory programming, scan control, and selection of autopatch encoder tones.
- **Autoscan**
  Entire band (5-kHz or 10-kHz steps) and memories. Automatically locks on busy channel; scan resumes automatically after several seconds, unless CLEAR or mic PTT button is pressed to cancel scan.
- **Up/down manual scan**
  Entire band (5-kHz or 10-kHz steps) and memories, with UP/DOWN microphone (standard).
- **Repeater reverse switch**
  Handy for checking signals on the input of a repeater or for determining if a repeater is "upside down."
- **Separate digital readouts**
  To display frequency (both receive and transmit) and memory channel.
- **LED bar meter**
  For monitoring received signal level and RF output.
- **LED indicators**
  To show: +600 kHz, simplex, or -600 kHz transmitter offset; BUSY channel; ON AIR.
- **TONE switch**
  To actuate subaudible tone module (not Kenwood-supplied).
- **Compact size**
  Depth is reduced substantially.
- **Mobile mounting bracket**
  With quick-release levers.

More information on the TR-7850 is available from all authorized dealers of Trio-Kenwood Communications, Inc., 1111 West Walnut Street, Compton, California 90220.

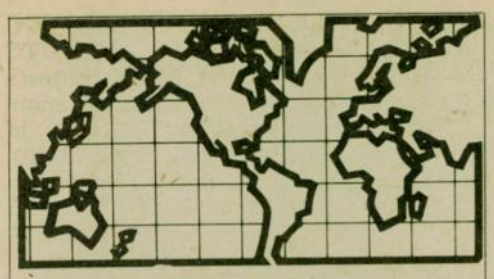
KENWOOD
...pacesetter in amateur radio

Matching accessory for fixed-station operation:
- KPS-12 fixed-station power supply for TR-7850

Other accessories not shown:
- KPS-7 fixed-station power supply for TR-7800
- SP-40 compact mobile speaker

TR-7850 is subject to FCC approval.

Specifications and prices are subject to change without notice or obligation.



DX WORLD

John F. W. Minke III, N6JM

6210 Rio Bonito Drive Carmichael, CA 95608

Activities calendar

11-12 April	International Gagarin Cup Competition (CW)
11-12 April	Common Market DX Contest
18-19 April	Polsk SP DX Contest (Phone)
18-19 April	YL ISSB'ers QSO Party (Phone)
25-26 April	Helvetia (HB9) H-26 Contest
25-26 April	King of Spain Contest
09-10 May	USSR CQ-M Contest
09-11 May	RSGB WAB HF Contest(CW)
23-24 May	**CQ Magazine** World-Wide WPX Contest (CW)
13-14 June	RSGB National Field Day
20-2 June	JARL All Asian DX Contest (Phone)
20-21 June	RSGB WAB LF Contest (Phone)
11-12 July	IARU Radiosport Championships
18-19 July	SEANET World-Wide DX Contest (CW)
18-19July	RSGB WAB Contest (CW)
25-26 July	Venezuela DX Contest (CW)

W-100-N

During the first half of March, only two Worked 100 Nations Awards were processed, which were as follows:
107. WB5CYK Sanford L. Fortner
108. VK2DEJ John Sanders

Afrikaner Group Award

The Afrikaner Group offers an award for working at least 25 new countries on their net which meets 21.355 MHz at 1800 UTC daily. That's what it says - 25 new countries! You must have worked them since the group started operations on 24 March 1972. The requirements are:
1) Work at least 25 new DX countries since 24 March 1972.
2) List date, time and call sign of the station worked on net.
3) Send certified list; do not send QSL cards.
4) Enclose a fee of $1 with your application to:
Alan Peers, WA2PUB, 61 Udalia Road, West Islip, NY 11795.

Sovereign Military Order of Malta (1A0KM)

More information on this one has been reported, one from Dave Siddall, K3ZJ, President of the Capitol Hill Amateur Radio Society in a letter to the DX Advisory Committee. His points summarized were as follows:
1) The National Geographic Atlas recognizes the SMOM as the smallest country in the world.
2) The SMOM has been in continuous existence since 1100 A.D., making it the oldest diplomatically recognized state in the world.
3) Its sovereignty was and is recognized apart from its former rule of Rhodes, Malta and Tripoli.
4) There are other "Knights of Malta" organizations claiming the same heritage which have no connection with the SMOM, which is the direct lineal descendant of the original entity. It is not to be confused with a number of lineal "branches" some of which are the result of the reformation and are considered "Protestant."
5) The courts of Italy, even when it would be in their interest to deny the SMOM's sovereignty, have recognized its status and therefore their lack of jurisdiction over SMOM property.
6) Full diplomatic relations were maintained by the SMOM with at least 45 countries on all continents in 1980.
7) SMOM passports are recognized even in countries not having diplomatic relations with SMOM.
8) The Prince-Grand Master, as head of the SMOM, is ceremonially accorded full head-of-state status when on official visits outside the SMOM.
9) Delegates from the SMOM have attended many international conferences, including those culminating in the Geneva Convention.
10) The SMOM has a complete functioning government structure.
11) The SMOM issues its own stamps and currency.

With all that, one can't see where the DXCC would not add this country to the list. Those applying for the **Worldradio** W-100-N award may use SMOM as one of the nations if desired.

Heard Island (VK0)

This DXpedition has been postponed. Jim Smith, VK9NS, had worked hard to get this one rolling and everything looked set to go. But with the approaching winter and the owners of the chartered vessel declining to sail, the deal was shut out for the time being. Try looking again at the end of the year.

Cameroon (TJ1)

John Vosnakis, TJ1BB, is a regular on the bands and can be found on CW near 14.010 MHz from 2100 UTC. The station is being operated by Gerard Rossano, N4JR, who plans to be there for two years and has applied for his own call. He has been reported as late as 2300 UTC a few kiloHertz higher, at 14.020.

SSB buffs should look for TJ1SB, who has been reported on 21.295 MHz at 2300 UTC.

Cuba (CO)

This little country isn't DX as far as distance goes, but could be classified as rare DX due to the conditions that exist in the little island country. On Sundays, near 28.505 MHz from 1500 UTC, there is the CO DX Group that is attempting to activate all of the call districts of Cuba for those who wish to qualify for the CO Award. So, if you need Cuba, there is the place to look.

Of course, this country is found on other bands, and has been represented by Ricardo Hernandez Garcia, CM1RH, on 1804 kHz at 0200 UTC; CM7KR on 7023 kHz at 0400 UTC; Aquiles Ortiz Martinez Fortun, CO2CI, on 14.218 MHz at 0200 UTC; and CM2JG on 28.654 MHz at 2300 UTC. Note that the CM and CO prefixes are Cuban, but the CN prefix is that of Morocco.

Burundi (9U5)

There is a new station on from Burundi that is a club station signing the call 9U5WR. The operator is reported to be Jerzey Stopa, SP6BAA, who is a telecommunications advisor assigned there. The rig consists of a TS-830 with a TH6DXX tri-band Yagi and is on CW only.

It is reported that 9U5WR is the only valid license there, but there has been a 9U5JM reported to have been active from Burundi. He has been found on SSB on 14.150 MHz at 1800 UTC and 21.170 MHz at 1730 UTC. Unfortunately, those frequencies are out of bounds for the U.S. SSB'ers.

Ascension Island (ZD8)

This little island is in the South Atlantic Ocean off the coast of Africa. Several stations have been reported active from this little nation. ZD8RH is one of the active ones and has been reported near 21.296 MHz after 1900 UTC. Not to slight the brass-pounders, he has been found down at 21.005 MHz at 2000 UTC.

Another active Ascension Island station signs ZD8TC and has been found at the low end of 15 meters near 21.026 MHz from 1300 UTC, near 14.022 MHz from 2100 UTC, 7.011 around 2050 UTC and 3.505 MHz at 0630 UTC. He has also been found on 10-meter CW. I don't know whether he operates SSB, as all reports have shown him only on CW.

Other active stations include Roy Foster, ZD8RCA, found near 28.508 MHz around 1900 UTC and 21.316 MHz at 2300 UTC; ZD8FS on 14.018 MHz at 2200 UTC; and ZD8RA on 21.282 MHz from 0100 UTC.

The above are report times of these stations. Most likely they will be found elsewhere and at different times, but this should give you an idea of what is on over there.

Feedback on 200 By 200

While on the subject of Ascension Island, I received a letter from Jim Neiger, N6TJ, who operated from Ascension Island back in 1968 as ZD8Z. Jim was interested in the accomplishment of Steve, KR6O, who had worked and confirmed 200 countries within 200 days. Jim writes:

"I arrived on Ascension Island on April 12, 1968, with a minor objective of working 200 countries in *2 months!* My first QSO as ZD8Z was DL8RE on April 17th. My *100th* country was ZD9BE on the tenth day (April 26th). At the end of the first month, I had 152 countries. On June 15th, (my 60th day), I worked YJ8BW for No. 200!!

"I want to emphasize that this was accomplished through normal operating days and *no contests* were involved. Most of my time was spent working the horrendous pile-ups of U.S. and European stations; of course, all my operating was during leisure hours available as I was on 24-hour, 7-days-a-week call for satellite tracking.

"No efforts were made to confirm these countries in record time as my QSL manager W6CUF, (now W6CF), was up to his elbows in alligators handling the thousands of cards headed this way.

"Some really juicy DX was worked during those 60 days, John, including: FB8WW, FB8XX, ZC4MO, MP4MBC, 5U7AN, 9X5IH, XW8BX, TN8BG, VQ9B/F, MP4TCD, 6O1GB, PX1JQ, 5A3TW, YK1AA, CR5SP.

The operators at J20/A (left to right): Pierre Reissian, J28AZ; Franz Langner, DJ9ZB; Joseph Cassaro, F6ATQ; and Dave Gardner, K6LPL.

"May 5th was a good day as it included EA0AH, 7Q7PAX and CR3KD. And May 11th wasn't too bad either, as I found FB8WW, 3A2CN, 9U5SK, 5N2ABH, DU7RZ, TL8DL and 7P8AB.

"All in all, it was great fun. Of course, it helped to be rare DX — like ZD8."

Most likely, many of you have already worked Jim, especially if you favor the contest route. One of Jim's most recent DX calls is 8P6J.

Prefixes

For the prefix hunters, there have been a few changes recently. Out in the Pacific the new nation of Kiribati has made changes to its T3 prefix. As of now, all T3A calls are replaced with T30, T3P with T31 and T3L with T32. Prior to the T3 and independence, the islands were using VR1 and VR3.

Georgia in the Soviet Union is presently using the EM6 prefix in lieu of the UF6 prefix to celebrate the 60th anniversary of the republic.

Additional changes include HL for South Korea and HM for North Korea. You may be hearing the HM prefix on the bands, but that probably will be by South Koreans who haven't phased over yet.

The VP2S prefix for St. Vincent has been substituted with the prefixes J87 for visiting amateurs and J88 for resident amateurs.

T4 is to replace CM and CO in Cuba, T5 is to replace 6O in the Somali Republic, and T6 is to replace YA in Afghanistan. What becomes of the CM, CO, YA and 6O prefixes I do not know. Perhaps they will be retained by the individual countries for other services.

It is reported in *The Long Island DX Bulletin* that the ITU has withdrawn the H5, S8 and T4 prefixes from the South African homelands (Bophuthatswana, Transkei and Vendaland), but there is no word as to replacement prefixes.

Franz Langner, DJ9ZB, submitted the photographs shown here, which were taken during the December DXpedition to Abu Ail. The pictures are in color, but — unfortunately — are only reproduced in black and white.

160 meters

Maybe it is a bit late in the season to list the DX found on the Top Band. E. Parkes, VS5RP, and John Fulmer, N4ADJ/KH2, are two of several DX stations reported on the band along with Billy Hatcher. KP4KK/DU2, usually found on 1822 kHz around 2200 UTC.

CM1RH has been found on 1804 kHz at 0200 UTC; FM0FOL on 1824 kHz at 0500 UTC; and Robert Denniston, VP2VI, on 1806 kHz and 0700 UTC. Don't bother to look for the FM0 as that call belongs to the Colvins, and more than likely they have left for California.

The DXCC award is still being issued with the 160-meter endorsement. Number 18 recently was issued to Dr. San Hutson, K5YY — a true-blue DX'er found on any band.

RTTY

Very few amateurs work DX via RTTY. But it is a mode of transmission used by radio amateurs and is very popular among these few. I was on RTTY about 15 years ago with a Model 15 that I had acquired through the MARS program. In those days one had to construct his own electronics to convert RF to DC to run the printer and vice versa. I never could seem to clean up the noise which interfered with the printer plus, I was crystal-controlled, which led me to lose interest and to not reinstall the gear when I moved into my present home.

The following is a selection of the calls found on RTTY as reported in *The DX Bulletin*.

EA2RE	21.094 MHz	1800 UTC
EI3CN	28.095 MHz	1500 UTC
EC4VH	21.092 MHz	1800 UTC
GI4AHP	21.091 MHz	1500 UTC
GM4BIT	21.090 MHz	1900 UTC
HA5KBM	21.080 MHz	1800 UTC
KX6QC	28.084 MHz	0300 UTC
Y39UO	14.086 MHz	1800 UTC
YJ8TT	14.096 MHz	1000 UTC

There are a couple of RTTY contests during the year. Two of them are sponsored by the Germans (DARC), in November. The first is the WAE RTTY Contest, followed the next weekend with the 10-meter RTTY contest.

Suggestions for the Novice DX'er

The following are comments from Carl Henson, WB4ZNH. His letter is partly in response to a recent comment of mine regarding DX in the Novice band. Carl has held calls such as 8Q7AF, 9Q5DH and WB4ZNH/5X. Carl comments: "On

The boat *Manly* is shown anchored off-shore in the Red Sea.

several recent DXpeditions I tried to work the Novice band. For the most part the attempt ended in failure."

The following are suggestions that Carl feels could apply for all Novice DX'ers, no matter what class license they hold.

1) Listen carefully for weak signals as they lose strength with each hop or skip.

2) Listen for "dahdididahdit" followed by something strange. Don't start listening for "RR" or "FB tnx fer call" or anything you might expect, because if something different comes along you won't be prepared for it. I QSO'ed a U.S. station in the Novice band for 15 minutes while in Swaziland recently and he never picked up the "/3D6"!

3) There are numerous good sources of QSL information. Don't keep asking for QSL information.

4) Give the DX station the option of determining the length of the QSO. Start out by making sure he has your call correct and a signal report. If he says "73" and goes one, that should be a signal to all on frequency that he doesn't want to hear your "QTH QTH is is", etc. On the other hand, he might very well want to get to know you.

5) Many successful DX'ers will insist you should never call "CQ DX". I disagree. Don't call "CQ DX" indiscriminately. Listen and make sure the frequency is not already being used by a DX station, or otherwise. You can't hear the DX if there is another QSO on frequency.

6) Offer the DX station the frequency. He will be grateful for the gesture and he very well might have been trying to work North America but could not attract anyone's attention. Your fellow DX'ers will also appreciate it, since they won't have to try and find him on another frequency. You will not appear selfish and inconsiderate.

7) Permanently remove from your vocabulary "I won't hold you."

8) Make your CQ and CQ DX calls brief. I measure the success of my DXpeditions by the number of QSO's I make, and it doesn't take me long to grow tired and spin the dial. Don't call "CQ DX long path Asia;" if the DX has a directional antenna, he will know where to beam. If he doesn't, what difference will it make?

9) Clocks are very inexpensive. Keep one at your station set on GMT. It will never be subject to Daylight Savings. Just remember the date changes at midnight. Make QSL'ing as convenient as possible for the DX station; he wants to help people get a new country and the less time he spends with the drudgery of answering thousands of cards, the more time he will have to work us. Searching for calls that aren't where they are supposed to be and addressing envelopes are two sure ways to kill his enthusiasm in a hurry.

10) Unfortunately, there are some people even in Amateur Radio who enjoy making people angry and frustrated more than anything else in our hobby. The best way to deal with them is not at all. They thrive on the response they can induce — no response equals no QRM. If you ever do have the chance to speak to one of these people, bite your lip and be friendly; make no mention of their activities. Amazingly, your gross dislike for the person will turn to pity. It works — I've done it.

So goes it with comments from someone at the other end. I need not add anything to Carl's comments. Many thanks for your suggestions, Carl.

List operations illegal?

In a past issue of *The DX Bulletin*, editor Jim Cain, K1TN, expresses a good point regarding list operations. Here it is, reprinted in his own words:

"As many have suspected for some time, list operations violate the law if there is not a third-party agreement between the list-maker and the DX station using the list, *if* the maker passes call signs to the DX station. *The DX Bulletin*, in a conversation with two FCC personnel, has learned that interpretations indicate U.S. amateurs are in violation of FCC rules when list operations are conducted in the manner described above.

"If the list-maker addresses other U.S. stations and has them, in turn, call the DX, the rules have *not* been broken. But if the list-maker addresses the DX station and gives the calls of those waiting for him, a third-party agreement must exist in order for the operation to be within regulations.

"While it is unlikely that any amateurs would be cited for these practices at this time, the FCC continues to monitor the situation. Government attitudes presently prevailing recognize DXing as in "the public interest" when operator skills are improved and polished; however, working a new country per se is not necessarily in "the public interest" and working DX via "nets" and lists does little to improve operator skill or radio knowledge.

"FCC sources also indicate it is not likely that stations participating in list operations by getting on the lists would be viewed as "accessories" to any unlawful act. However, a monitoring station observing a list operation would most likely note the call signs of all stations on frequency, not just that of the list-maker.

"It was also stated that the FCC is aware of the poor identifying practices on many of the list and "net" operations. Saying just the last letter (or two letters) of one's call sign is permissible, so long as the entire call of one's station — as well as the call sign of the station being addressed — is eventually transmitted."

I would like to add to Jim's comments something else related to the above. I have heard in the past where two stations communicating could not get a complete

call of one. In other words, if I were trying to make a contact with a DX station and he couldn't copy me well enough to get my full call, some good-intentioned operator comes along with a stronger signal and passes my call on to him. I would say that is in violation of FCC rules if no third-party agreement exists.

List operations or DX nets, therefore, are not necessarily in violation. Just be alert as to how they are operated. Use Jim's guidelines and you should be out of the fire.

Also, note that a DX station can take a list for another DX station that contains your call. Everything will be fine as long as the DX list-taker tells you to call the other DX station. After all, he made the list from a communication you had with him in the first place.

Nets

Afrikaner Group	21.355 MHz 1800 UTC Daily
American Safari DX Net	21.295 MHz 1830 UTC Daily
East-West Net	21.410 MHz 2130 UTC Saturday
French DX Net	28.500 MHz 1200 UTC
GD Net	7.090 MHz 1000 UTC Sunday
Jersey Island DX Group	14.210 MHz 0500 UTC Mon-Fri
Southern Oregon DX Club Net	21.370 MHz 0100 UTC Friday
DK2OC Net	28.750 MHz 1400 UTC Mon & Sat

The above are only a few of the many nets and groups found on the bands. I would suggest monitoring them before joining, to determine their method of operation.

VK1 Award

This award is for working stations in the Australian capital district of Canberra. To qualify for this award, you must have worked at least 10 VK1 stations since 1 January 1978. There are no band or mode restrictions, but endorsements for single band and mode are available.

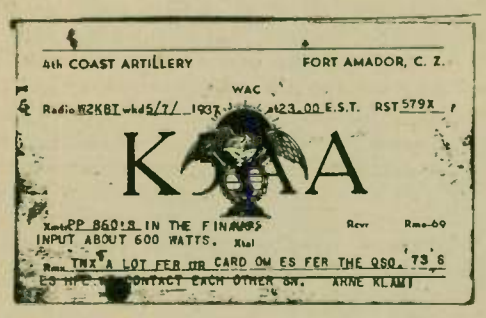
To apply for this award send log data and a fee of 5 IRC's to: **VK1 Award Manager, P.O. Box 46, Canberra, A.C.T. 2600 Australia.** The information I have did not state whether the contacts needed to be confirmed — only log data. This award is available to SWL.

Antique QSL Department

In the February issue, a copy of a QSL card of W2WMV/C9 in Manchuria was shown. This caught the interest of John Cartwright, W5BED, who also had worked W2SMV/C9 on the same day less than 30 minutes later. John was W7BED at the time, and both contacts were on 40-meter CW — 9 QSO's apart.

Evidently, W2WMV/C9 was very active as I have copies of his QSL from other readers. The station was operated by Jack Closson, but his whereabouts today is unknown. The oldest Callbook I have is 1954 and he is not listed under his W2WMV call.

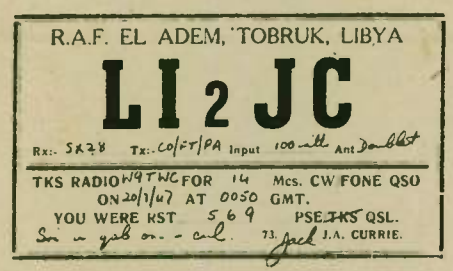
The NY1AD Canal Zone QSL card for 1938 caught the eye of Carl Todd, AE1H,



who provided another Canal Zone QSL card. John states the K5AA was the first call issued under the K5 prefix for the Canal Zone and worked him back in 1937 as W2KBT. The card was postmarked Balboa, Canal Zone with a 1¢ Canal Zone postage stamp. Carl was living at Briarcliff Manor in the New York City suburban area at the time.

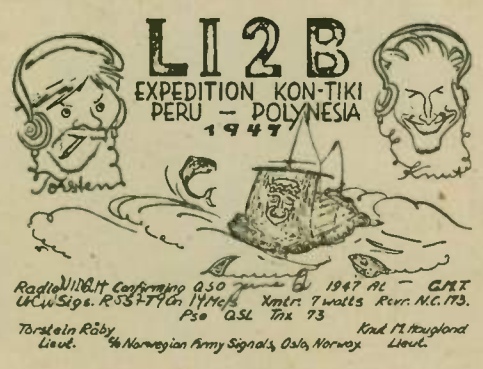
Jack Harkins, W5CPI, also submitted a card for K5AA that he had made on 20 meters back in 1932.

Dave Kennedy, N4SU, is the owner of the original of this LI2JC QSL card. This was the prefix for Libya back in 1947 when Dave worked the station when he was signing W9TWC. The call LI2JC was for R.A.F. El Adem, at Torbruk.



I thought I had run an old card from Korea some time back, but evidently I had not. The J8CA QSL was submitted by Orion Arnold, W2HN, who was signing W6PAR back in 1939 for his Korean contact made on 40 meters.

The fourth QSL this month is that of a DXpedition "Expedition Kon-Tiki" from Peru to Polynesia in 1947. The call LI2B was used by the Norwegian group sponsoring the trip. The card was submitted by Dick Mahler, W1DQH, who helped build the 7-watt transmitter that they used.



It is purely coincidental that I wound up with this LI2B card this month and had nothing to do with the LI2JC card for Libya for the same year! That is the way the "cards" fell. How come the same prefix assigned to different countries during the same year?

QSL information

About 7,000 contacts were made by PY0CW and PY0ZZ during the last Fernando de Noronha DXpedition. If you care to have one of their special color photograph QSL cards, include a couple of IRC's in your envelope. Cards mailed via the bureau will be acknowledged with a QSL card, but not of the special type.

It has been reported that VK4NIC/3X QSL's are in the mails and are now being accepted for DXCC by the Newington Radio Club.

Again, a reminder that overseas postal

(*please turn to page 37*)

AMSAT OSCAR K6PGX

Dr. Norman L. Chalfin

Codestore slows down

AMSAT/OSCAR 7 was loaded with codestore recently when it was discovered that the clock in the codestore system has probably aged to the point where the transmission back of the codestore was operating at only two words per minute. Should you hear such signals, you will know the reason for the slow rate.

Orbit predicts

OSCAR-7 and OSCAR-8 Orbital Prediction Charts for April-June 1981 are available from Project OSCAR Box 1136, Los Altos CA 94022. Send an SASE #10 envelope with 18¢ postage.

Project OSCAR meeting

A meeting was called for 11 April 1981 of the Project OSCAR group in Palo Alto at the Palo Alto Golf Course Country Club, Harry's HofBrau. It was to take place at noon and run to 4:00 p.m. The agenda calls for election of a Board of Directors for Project OSCAR. Candidates are N6OO, W6XN, KL7GRF, K6OPO, W6OLO, W6ASH and WB6JNN. Results next issue.

Shuttle commemoratives

By the time you read this, hopefully, the first orbital flight of the space shuttle will have occurred. WA3NAN at Goddard Space Flight Center (SFC), WA4NZD at Marshall SFC, and WB4ICJ at Cape Canaveral were the club stations running commemorative events during the flight. The Amateur Radio Club at Dryden at Edwards AFB also had a shuttle commemorative. If the flight has not yet occurred as you read this, try to listen for the stations. They are on all bands and announced they would provide commemorative QSLs.

Area coordinators needed

AMSAT has announced that it needs area coordinators for Arizona, Alaska, and for VE3, VE4 and VE6 areas in Canada. Anyone wishing to become involved in a rewarding activity should contact Verne Riportello, WA2LQQ, at his Callbook address or AMSAT (301) 589-6062.

Latest Orbit

Orbit issue No. 5, should be arriving in your mailbox about the time this issue arrives.

OSCAR in the classroom

The latest issue of *OSCAR in the Classroom* from ARRL includes instructions on how to build an OSCAR 8 model. If you should decide to build one after seeing the article, this writer can supply actual-size photographs of the solar panels that make them realistic. For information, write to: Norm Chalfin, K6PGX, P.O. Box 463, Pasadena, CA 91102. The photos were made during preparation for launch of OSCAR 8. Similar actual photos of the OSCAR 6, OSCAR 7 and Phase III solar panels can be obtained.

Draftsman and editor needed

Orbit Magazine editor Kasser has asked if we could help locate a draftsman and a tech editor for the AMSAT bimonthly. Any volunteers contact Joe Kasser, G3ZCZ/W3, at AMSAT headquarters, P.O. Box 27, Washington D.C. 20044.

QST space articles

The March **QST** carried a survey article (p. 13) in which a substantial interest was demonstrated in Amateur Satellite Communications.

Another story in the March issue of **QST** describes how Nick Laub, W0CA, worked all continents via satellite communications.

ARRL foundation

William Brown, K9LF, was elected to the ARRL foundation. He is special projects vice-president of AMSAT. Jay Holladay, W6EJJ, was also elected to the foundation. Jay is Southwest Division Director of ARRL and chairman of the Amateur Satellite Service Council.

W4PID wins

Roy Hill, Jr., W4PID, is the Life Member Survey winner. He gets to claim a Collins 75SBC. All he had to do was answer some questions in a survey questionnaire. Some folks have all the luck!

Volunteers needed

ARRL OSCAR Educational Director Mark Wilson, AA2Z, is looking for volunteers to participate in the ARRL satellite educational program to set up amateur ground stations to demonstrate amateur satellite communications and to give talks on amateur satellite programs. Contact him at ARRL headquarters, 225 Main Street, Newington, CT 06111.

AMSAT nets

There are AMSAT satellite information

(*please turn to page 48*)

AMSAT - OSCAR 7 ORBITAL DATA

DATA IS DERIVED FROM OBSERVATIONS BY MEMBERS OF PROJECT OSCAR. REPRODUCTION AUTHORIZED, SEND SELF ADDRESSED STAMPED ENVELOPE TO PROJECT OSCAR, P.O. BOX 1136, LOS ALTOS, CA 94022, FOR A COPY OF THE LATEST AVAILABLE DATA.

SUPPORT THE AMATEUR SATELLITE PROGRAM. JOIN AMSAT, P.O. BOX 27, WASHINGTON, DC 20044.

COMPILED AND COORDINATED BY JOHN PRONKO, W6XN, RANDY COLE, KN6W, AND JACK SOMERS, WA6VGS.

PRINTED BY HENRY RADIO.

SUN 31 MAY 1981 (151)

UTC	LONG	ORBIT
107'44	95.9	29921
302'46	124.7	29922
457'37	153.4	29923
652'33	182.1	29924
847'30	210.9	29925
1042'26	239.6	29926
1237'23	268.4	29927
1432'19	297.1	29928
1627'16	325.8	29929
1822'12	354.6	29930
2017'09	23.3	29931
2212'05	52.0	29932

FRI 1 MAY 1981 (121)

UTC	LONG	ORBIT
49'43	90.7	29545
244'39	119.5	29546
439'36	148.2	29547
634'32	176.9	29548
829'29	205.7	29549
1024'25	234.4	29550
1219'22	263.1	29551
1414'18	291.9	29552
1609'15	320.6	29553
1804'11	349.4	29554
1959'08	18.1	29555
2154'04	46.8	29556
2349'01	75.6	29557

SAT 2 MAY 1981 (122)

UTC	LONG	ORBIT
143'57	104.3	29558
338'54	133.0	29559
533'50	161.8	29560
728'47	190.5	29561
923'43	219.3	29562
1118'40	248.0	29563
1313'36	276.7	29564
1508'33	305.5	29565
1703'29	334.2	29566
1858'26	2.9	29567
2053'22	31.7	29568
2248'19	60.4	29569

SUN 3 MAY 1981 (123)

UTC	LONG	ORBIT
43'15	89.2	29570
238'12	117.9	29571
433'08	146.6	29572
628'05	175.4	29573
823'01	204.1	29574
1017'58	232.8	29575
1212'54	261.6	29576
1407'51	290.3	29577
1602'47	319.1	29578
1757'44	347.8	29579
1952'40	16.5	29580
2147'37	45.3	29581
2342'33	74.0	29582

MON 4 MAY 1981 (124)

UTC	LONG	ORBIT
137'30	102.7	29583
332'26	131.5	29584
527'23	160.2	29585
722'19	188.9	29586
917'16	217.7	29587
1112'12	246.4	29588
1307'09	275.2	29589
1502'05	303.9	29590
1657'02	332.6	29591
1851'58	1.4	29592
2046'55	30.1	29593
2241'51	58.8	29594

TUE 5 MAY 1981 (125)

UTC	LONG	ORBIT
36'48	87.6	29595
231'44	116.3	29596
426'41	145.1	29597
621'37	173.8	29598
816'34	202.5	29599
1011'30	231.3	29600
1206'27	260.0	29601
1401'23	288.7	29602
1556'20	317.5	29603
1751'16	346.2	29604
1946'13	15.0	29605
2141'09	43.7	29606
2336'06	72.4	29607

WED 6 MAY 1981 (126)

UTC	LONG	ORBIT
131'02	101.2	29608
326'59	129.9	29609
520'55	158.6	29610
715'52	187.4	29611
910'48	216.1	29612
1105'45	244.9	29613
1300'41	273.6	29614
1455'38	302.3	29615
1650'34	331.1	29616
1845'31	359.8	29617
2040'27	28.5	29618
2235'24	57.3	29619

THU 7 MAY 1981 (127)

UTC	LONG	ORBIT
30'20	86.0	29620
225'17	114.8	29621
420'13	143.5	29622
615'09	172.2	29623
810'06	201.0	29624
1005'03	229.7	29625
1159'59	258.4	29626
1354'55	287.2	29627
1549'52	315.9	29628
1744'48	344.7	29629
1939'45	13.4	29630
2134'41	42.1	29631
2329'38	70.9	29632

FRI 8 MAY 1981 (128)

UTC	LONG	ORBIT
124'34	99.6	29633
319'31	128.3	29634
514'27	157.1	29635
709'24	185.8	29636
904'20	214.5	29637
1059'17	243.3	29638
1254'13	272.0	29639
1449'10	300.8	29640
1644'06	329.5	29641
1839'03	358.2	29642
2033'59	27.0	29643
2228'56	55.7	29644

SAT 9 MAY 1981 (129)

UTC	LONG	ORBIT
23'52	84.4	29645
218'49	113.2	29646
413'45	141.9	29647
608'42	170.7	29648
803'38	199.4	29649
958'35	228.1	29650
1153'31	256.9	29651
1348'28	285.6	29652
1543'24	314.3	29653
1738'21	343.1	29654
1933'17	11.8	29655
2128'14	40.6	29656
2323'10	69.3	29657

SUN 10 MAY 1981 (130)

UTC	LONG	ORBIT
118'07	98.0	29658
313'03	126.8	29659
508'00	155.5	29660
702'56	184.2	29661
857'53	213.0	29662
1052'49	241.7	29663
1247'46	270.5	29664
1442'42	299.2	29665
1637'39	327.9	29666
1832'35	356.7	29667
2027'32	25.4	29668
2222'28	54.1	29669

MON 11 MAY 1981 (131)

UTC	LONG	ORBIT
17'25	82.6	29670
212'21	111.3	29671
407'18	140.1	29672
602'14	168.8	29673
757'11	197.6	29674
952'07	226.3	29675
1147'04	255.1	29676
1342'00	283.8	29677
1536'57	312.6	29678
1731'53	341.3	29679
1926'50	10.1	29680
2121'46	38.8	29681
2316'43	67.6	29682

TUE 12 MAY 1981 (132)

UTC	LONG	ORBIT
111'39	96.5	29683
306'36	125.2	29684
501'32	153.9	29685
656'29	182.7	29686
851'25	211.4	29687
1046'22	240.1	29688
1241'18	268.9	29689
1436'15	297.6	29690
1631'11	326.4	29691
1826'08	355.1	29692
2021'04	23.8	29693
2216'01	52.6	29694

WED 13 MAY 1981 (133)

UTC	LONG	ORBIT
10'57	81.3	29695
205'54	110.0	29696
400'50	138.8	29697
555'47	167.5	29698
750'43	196.3	29699
945'40	225.0	29700
1140'36	253.7	29701
1335'33	282.5	29702
1530'29	311.2	29703
1725'26	339.9	29704
1920'22	8.7	29705
2115'19	37.4	29706
2310'15	66.2	29707

THU 14 MAY 1981 (134)

UTC	LONG	ORBIT
105'11	94.9	29708
300'08	123.6	29709
455'04	152.4	29710
650'01	181.1	29711
844'57	209.8	29712
1039'54	238.6	29713
1234'50	267.3	29714
1429'47	296.1	29715
1624'43	324.8	29716
1819'40	353.6	29717
2014'36	22.3	29718
2209'33	51.0	29719

FRI 15 MAY 1981 (135)

UTC	LONG	ORBIT
4'29	79.7	29720
159'26	108.5	29721
354'22	137.2	29722
549'19	166.0	29723
744'15	194.7	29724
939'12	223.4	29725
1134'08	252.2	29726
1329'05	280.9	29727
1524'01	309.6	29728
1718'58	338.4	29729
1913'54	7.1	29730
2108'51	35.9	29731
2303'47	64.6	29732

SAT 16 MAY 1981 (136)

UTC	LONG	ORBIT
58'44	93.3	29733
253'40	122.1	29734
448'37	150.8	29735
643'33	179.5	29736
838'30	208.3	29737
1033'26	237.0	29738
1228'23	265.7	29739
1423'19	294.5	29740
1618'16	323.2	29741
1813'12	352.0	29742
2008'09	20.7	29743
2203'05	49.4	29744
2358'02	78.2	29745

SUN 17 MAY 1981 (137)

UTC	LONG	ORBIT
152'58	106.9	29746
347'55	135.6	29747
542'51	164.4	29748
737'48	193.1	29749
932'44	221.9	29750
1127'41	250.6	29751
1322'37	279.3	29752
1517'34	308.1	29753
1712'30	336.8	29754
1907'27	5.5	29755
2102'23	34.3	29756
2257'19	63.0	29757

MON 18 MAY 1981 (138)

UTC	LONG	ORBIT
52'16	91.8	29758
247'13	120.5	29759
442'09	149.2	29760
637'06	178.0	29761
832'02	206.7	29762
1026'59	235.4	29763
1221'55	264.2	29764
1416'51	292.9	29765
1611'48	321.7	29766
1806'44	350.4	29767
2001'41	19.1	29768
2156'37	47.9	29769
2351'34	76.6	29770

TUE 19 MAY 1981 (139)

UTC	LONG	ORBIT
146'30	105.3	29771
341'27	134.1	29772
536'23	162.8	29773
731'20	191.6	29774
926'16	220.3	29775
1121'13	249.0	29776
1316'09	277.8	29777
1511'06	306.6	29778
1706'02	335.2	29779
1900'59	4.0	29780
2055'55	32.7	29781
2250'52	61.5	29782

WED 20 MAY 1981 (140)

UTC	LONG	ORBIT
45'48	90.2	29783
240'45	118.9	29784
435'41	147.7	29785
630'38	176.4	29786
825'34	205.1	29787
1020'31	233.9	29788
1215'27	262.6	29789
1410'24	291.3	29790
1605'20	320.1	29791
1800'17	348.8	29792
1955'13	17.6	29793
2150'10	46.3	29794
2345'06	75.0	29795

THU 21 MAY 1981 (141)

UTC	LONG	ORBIT
140'03	103.8	29796
334'59	132.5	29797
529'56	161.2	29798
724'52	190.0	29799
919'49	218.7	29800
1114'45	247.5	29801
1309'42	276.2	29802
1504'38	304.9	29803
1659'35	333.7	29804
1854'31	2.4	29805
2049'28	31.1	29806
2244'24	59.9	29807

FRI 22 MAY 1981 (142)

UTC	LONG	ORBIT
39'21	88.6	29808
234'17	117.4	29809
429'14	146.1	29810
624'10	174.8	29811
819'07	203.6	29812
1014'03	232.3	29813
1209'00	261.0	29814
1403'56	289.8	29815
1558'52	318.5	29816
1753'49	347.3	29817
1948'46	16.0	29818
2143'42	44.7	29819
2338'38	73.5	29820

SAT 23 MAY 1981 (143)

UTC	LONG	ORBIT
133'35	102.2	29821
328'32	130.9	29822
523'28	159.7	29823
718'24	188.4	29824
913'21	217.2	29825
1108'17	245.9	29826
1303'14	274.6	29827
1458'10	303.4	29828
1653'07	332.1	29829
1848'03	0.8	29830
2043'00	29.6	29831
2237'56	58.3	29832

SUN 24 MAY 1981 (144)

UTC	LONG	ORBIT
32'53	87.1	29833
227'49	115.8	29834
422'46	144.5	29835
617'42	173.3	29836
812'39	202.0	29837
1007'35	230.7	29838
1202'32	259.5	29839
1357'28	288.2	29840
1552'25	316.9	29841
1747'21	345.7	29842
1942'18	14.4	29843
2137'14	43.2	29844
2332'11	71.9	29845

MON 25 MAY 1981 (145)

UTC	LONG	ORBIT
127'07	100.6	29846
322'04	129.4	29847
517'00	158.1	29848
711'57	186.8	29849
906'53	215.6	29850
1101'50	244.3	29851
1256'46	273.1	29852
1451'43	301.8	29853
1646'39	330.5	29854
1841'36	359.3	29855
2036'32	28.0	29856
2231'29	56.7	29857

TUE 26 MAY 1981 (146)

UTC	LONG	ORBIT
26'25	85.5	29858
221'22	114.2	29859
416'18	143.0	29860
611'15	171.7	29861
806'11	200.4	29862
1001'08	229.2	29863
1156'04	257.9	29864
1351'01	286.6	29865
1545'57	315.4	29866
1740'54	344.1	29867
1935'50	12.9	29868
2130'47	41.6	29869
2325'43	70.3	29870

WED 27 MAY 1981 (147)

UTC	LONG	ORBIT
120'40	99.1	29871
315'36	127.8	29872
510'33	156.5	29873
705'29	185.3	29874
900'26	214.0	29875
1055'22	242.8	29876
1250'18	271.5	29877
1445'15	300.2	29878
1640'11	329.0	29879
1835'08	357.7	29880
2030'04	26.4	29881
2225'01	55.2	29882

THU 28 MAY 1981 (148)

UTC	LONG	ORBIT
19'57	83.9	29883
214'54	112.7	29884
409'50	141.4	29885
604'47	170.1	29886
759'43	198.9	29887
954'40	227.6	29888
1149'36	256.3	29889
1344'33	285.1	29890
1539'29	313.8	29891
1734'26	342.5	29892
1929'22	11.3	29893
2124'19	40.0	29894
2319'15	68.8	29895

FRI 29 MAY 1981 (149)

UTC	LONG	ORBIT
114'12	97.5	29896
309'08	126.2	29897
504'05	155.0	29898
659'01	183.7	29899
853'58	212.4	29900
1048'54	241.2	29901
1243'51	269.9	29902
1438'47	298.7	29903
1633'44	327.4	29904
1828'40	356.1	29905
2023'37	24.9	29906
2218'33	53.6	29907

SAT 30 MAY 1981 (150)

UTC	LONG	ORBIT
13'30	82.3	29908
208'26	111.1	29909
403'23	139.8	29910
558'19	168.6	29911
753'16	197.3	29912
948'12	226.0	29913
1143'09	254.8	29914
1338'05	283.5	29915
1533'02	312.2	29916
1727'58	341.0	29917
1922'55	9.7	29918
2117'51	38.5	29919
2312'48	67.2	29920

MON 1 JUN. 1981 (152)

UTC	LONG	ORBIT
7'02	80.8	29933
201'58	109.5	29934
356'55	138.3	29935
551'51	167.0	29936
746'48	195.7	29937
941'44	224.5	29938
1136'41	253.2	29939
1331'37	281.9	29940
1526'34	310.7	29941
1721'30	339.4	29942
1916'27	8.1	29943
2111'23	36.9	29944
2306'20	65.6	29945

TUE 2 JUN. 1981 (153)

UTC	LONG	ORBIT
101'16	94.4	29946
256'13	123.1	29947
451'09	151.8	29948
646'06	180.6	29949
841'02	209.3	29950
1035'59	238.0	29951
1230'55	266.8	29952
1425'52	295.5	29953
1620'48	324.3	29954
1815'45	353.0	29955
2010'41	21.7	29956
2205'38	50.5	29957

WED 3 JUN. 1981 (154)

UTC	LONG	ORBIT
0'34	79.2	29958
155'31	107.9	29959
350'27	136.7	29960
545'24	165.4	29961
740'20	194.2	29962
935'17	222.9	29963
1130'13	251.6	29964
1325'09	280.4	29965
1520'06	309.1	29966
1715'02	337.8	29967
1909'59	6.6	29968
2104'55	35.3	29969
2259'52	64.1	29970

THU 4 JUN. 1981 (155)

UTC	LONG	ORBIT
54'48	92.8	29971
249'45	121.5	29972
444'41	150.3	29973
639'38	179.0	29974
834'34	207.7	29975
1029'31	236.5	29976
1224'27	265.2	29977
1419'24	294.0	29978
1614'20	322.7	29979
1809'17	351.4	29980
2004'13	20.2	29981
2159'10	48.9	29982
2354'06	77.6	29983

FRI 5 JUN 1981 (156)

UTC	LONG	ORBIT
149'03	106.4	29984
343'59	135.1	29985
538'56	163.8	29986
733'52	192.6	29987
928'49	221.3	29988
1123'45	250.1	29989
1318'42	278.8	29990
1513'38	307.5	29991
1708'35	336.3	29992
1903'31	5.0	29993
2058'28	33.7	29994
2253'24	62.5	29995

SAT 6 JUN. 1981 (157)

UTC	LONG	ORBIT
48'21	91.2	29996
243'17	120.0	29997
438'14	148.7	29998
633'10	177.4	29999
828'07	206.2	30000
1023'03	234.9	30001
1218'00	263.6	30002
1412'56	292.4	30003
1607'53	321.1	30004
1802'49	349.9	30005
1957'46	18.6	30006
2152'42	47.3	30007
2347'38	76.1	30008

SUN 7 JUN 1981 (158)

UTC	LONG	ORBIT
142'35	104.8	30009
337'31	133.5	30010
532'28	162.3	30011
727'24	191.0	30012
922'21	219.8	30013
1117'17	248.5	30014
1312'14	277.2	30015
1507'10	306.0	30016
1702'07	334.7	30017
1857'03	3.4	30018
2052'00	32.2	30019
2246'56	60.9	30020

MON 8 JUN. 1981 (159)

UTC	LONG	ORBIT
41'53	89.7	30021
236'49	118.4	30022
431'46	147.1	30023
626'42	175.9	30024
821'39	204.6	30025
1016'35	233.3	30026
1211'32	262.1	30027
1406'28	290.8	30028
1601'25	319.6	30029
1756'21	348.3	30030
1951'18	17.0	30031
2146'14	45.8	30032
2341'11	74.5	30033

TUE 9 JUN. 1981 (160)

UTC	LONG	ORBIT
136'07	103.2	30034
331'04	132.0	30035
526'00	160.7	30036
720'57	189.4	30037
915'53	218.2	30038
1110'50	246.9	30039
1305'46	275.7	30040
1500'43	304.4	30041
1655'39	333.1	30042
1850'36	1.9	30043
2045'32	30.6	30044
2240'29	59.3	30045

WED 10 JUN. 1981 (161)

UTC	LONG	ORBIT
35'25	88.1	30046
230'21	116.8	30047
425'18	145.6	30048
620'14	174.3	30049
815'11	203.0	30050
1010'07	231.8	30051
1205'04	260.5	30052
1400'00	289.2	30053
1554'57	318.0	30054
1749'53	346.7	30055
1944'50	15.5	30056
2139'46	44.2	30057
2334'43	72.9	30058

THU 11 JUN. 1981 (162)

UTC	LONG	ORBIT
129'39	101.7	30059
324'36	130.4	30060
519'32	159.1	30061
714'29	187.9	30062
909'25	216.6	30063
1104'22	245.4	30064
1259'18	274.1	30065
1454'15	302.8	30066
1649'11	331.6	30067
1844'08	0.3	30068
2039'04	29.0	30069
2234'01	57.8	30070

FRI 12 JUN. 1981 (163)

UTC	LONG	ORBIT
28'57	86.5	30071
223'54	115.3	30072
418'50	144.0	30073
613'47	172.7	30074
808'43	201.5	30075
1003'40	230.2	30076
1158'36	258.9	30077
1353'33	287.7	30078
1548'29	316.4	30079
1743'26	345.2	30080
1938'22	13.9	30081
2133'19	42.6	30082
2328'15	71.4	30083

SAT 13 JUN. 1981 (164)

UTC	LONG	ORBIT
123'12	100.1	30084
318'08	128.8	30085
513'04	157.6	30086
708'01	186.3	30087
902'57	215.0	30088
1057'54	243.8	30089
1252'50	272.5	30090
1447'47	301.3	30091
1642'43	330.0	30092
1837'40	358.7	30093
2032'36	27.5	30094
2227'33	56.2	30095

SUN 14 JUN 1981 (165)

UTC	LONG	ORBIT
22'29	84.9	30096
217'26	113.7	30097
412'22	142.4	30098
607'19	171.2	30099
802'15	199.9	30100
957'12	228.6	30101
1152'08	257.4	30102
1347'05	286.1	30103
1542'01	314.8	30104
1736'58	343.6	30105
1931'54	12.3	30106
2126'51	41.1	30107
2321'47	69.8	30108

MON 15 JUN. 1981 (166)

UTC	LONG	ORBIT
116'44	98.5	30109
311'40	127.3	30110
506'37	156.0	30111
701'33	184.7	30112
856'30	213.5	30113
1051'26	242.2	30114
1246'23	271.0	30115
1441'19	299.7	30116
1636'16	328.4	30117
1831'12	357.2	30118
2026'09	25.9	30119
2221'05	54.6	30120

TUE 16 JUN. 1981 (167)

UTC	LONG	ORBIT
16'01	83.4	30121
210'58	112.1	30122
405'54	140.9	30123
600'51	169.6	30124
755'48	198.3	30125
950'44	227.1	30126
1145'40	255.8	30127
1340'37	284.5	30128
1535'33	313.3	30129
1730'30	342.0	30130
1925'26	10.8	30131
2120'23	39.5	30132
2315'19	68.2	30133

WED 17 JUN. 1981 (168)

UTC	LONG	ORBIT
110'16	97.0	30134
305'12	125.7	30135
500'09	154.4	30136
655'05	183.2	30137
850'02	211.9	30138
1044'58	240.6	30139
1239'55	269.4	30140
1434'51	298.1	30141
1629'48	326.9	30142
1824'44	355.6	30143
2019'41	24.3	30144
2214'37	53.1	30145

THU 18 JUN. 1981 (169)

UTC	LONG	ORBIT
9'34	81.8	30146
204'30	110.5	30147
359'27	139.3	30148
554'23	168.0	30149
749'20	196.8	30150
944'16	225.5	30151
1139'13	254.2	30152
1334'09	283.0	30153
1529'06	311.7	30154
1724'02	340.4	30155
1918'59	9.2	30156
2113'55	37.9	30157
2308'51	66.7	30158

FRI 19 JUN. 1981 (170)

UTC	LONG	ORBIT
103'48	95.4	30159
258'44	124.1	30160
453'41	152.9	30161
648'37	181.6	30162
843'34	210.3	30163
1038'30	239.1	30164
1233'27	267.8	30165
1428'23	296.6	30166
1623'20	325.3	30167
1818'16	354.0	30168
2013'13	22.8	30169
2208'09	51.5	30170

SAT 20 JUN. 1981 (171)

UTC	LONG	ORBIT
3'06	80.2	30171
158'02	109.0	30172
352'59	137.7	30173
547'55	166.5	30174
742'52	195.2	30175
937'48	223.9	30176
1132'45	252.7	30177
1327'41	281.4	30178
1522'38	310.1	30179
1717'34	338.9	30180
1912'31	7.6	30181
2107'27	36.4	30182
2302'24	65.1	30183

AMSAT - OSCAR 8 ORBITAL DATA

SUN. 21 JUN. 1981 (172)

UTC	LONG	ORBIT
57'20	93.8	30184
252'17	122.6	30185
447'13	151.3	30186
642'10	180.0	30187
837'06	208.8	30188
1032'03	237.5	30189
1226'59	266.2	30190
1421'56	295.0	30191
1616'52	323.7	30192
1811'49	352.5	30193
2006'45	21.2	30194
2201'42	49.9	30195
2356'38	78.7	30196

MON. 22 JUN. 1981 (173)

UTC	LONG	ORBIT
151'34	107.4	30197
346'31	136.1	30198
541'27	164.9	30199
736'24	193.6	30200
931'20	222.4	30201
1126'17	251.1	30202
1321'13	279.8	30203
1516'10	308.6	30204
1711'06	337.3	30205
1906'03	6.0	30206
2100'59	34.8	30207
2255'56	63.5	30208

TUE. 23 JUN. 1981 (174)

UTC	LONG	ORBIT
50'52	92.3	30209
245'49	121.0	30210
440'45	149.7	30211
635'42	178.5	30212
830'38	207.2	30213
1025'35	235.9	30214
1220'31	264.7	30215
1415'28	293.4	30216
1610'24	322.2	30217
1805'21	350.9	30218
2000'17	19.6	30219
2155'14	48.4	30220
2350'10	77.1	30221

WED. 24 JUN. 1981 (175)

UTC	LONG	ORBIT
145'06	105.8	30222
340'03	134.6	30223
535'00	163.3	30224
729'56	192.1	30225
924'53	220.8	30226
1119'49	249.5	30227
1314'46	278.3	30228
1509'42	307.0	30229
1704'38	335.7	30230
1859'35	4.5	30231
2054'31	33.2	30232
2249'28	62.0	30233

THU. 25 JUN. 1981 (176)

UTC	LONG	ORBIT
44'24	90.7	30234
239'21	119.4	30235
434'17	148.2	30236
629'14	176.9	30237
824'10	205.6	30238
1019'07	234.4	30239
1214'03	263.1	30240
1409'00	291.8	30241
1603'56	320.6	30242
1758'53	349.3	30243
1953'49	18.1	30244
2148'46	46.8	30245
2343'42	75.5	30246

FRI. 26 JUN. 1981 (177)

UTC	LONG	ORBIT
138'39	104.3	30247
333'35	133.0	30248
528'32	161.7	30249
723'28	190.5	30250
918'25	219.2	30251
1113'21	248.0	30252
1308'18	276.7	30253
1503'14	305.4	30254
1658'10	334.2	30255
1853'07	2.9	30256
2048'03	31.6	30257
2243'00	60.4	30258

SAT. 27 JUN. 1981 (178)

UTC	LONG	ORBIT
37'56	89.1	30259
232'53	117.9	30260
427'49	146.6	30261
622'46	175.3	30262
817'42	204.1	30263
1012'39	232.8	30264
1207'35	261.5	30265
1402'32	290.3	30266
1557'28	319.0	30267
1752'25	347.8	30268
1947'21	16.5	30269
2142'18	45.2	30270
2337'14	74.0	30271

SUN. 28 JUN. 1981 (179)

UTC	LONG	ORBIT
132'11	102.7	30272
327'07	131.4	30273
522'04	160.2	30274
717'00	188.9	30275
911'57	217.7	30276
1106'53	246.4	30277
1301'50	275.1	30278
1456'46	303.9	30279
1651'43	332.6	30280
1846'39	1.3	30281
2041'36	30.1	30282
2236'32	58.8	30283

MON. 29 JUN. 1981 (180)

UTC	LONG	ORBIT
31'29	87.6	30284
226'25	116.3	30285
421'22	145.0	30286
616'18	173.8	30287
811'15	202.5	30288
1006'11	231.2	30289
1201'08	260.0	30290
1356'04	288.7	30291
1551'01	317.4	30292
1745'57	346.2	30293
1940'53	14.9	30294
2135'50	43.7	30295
2330'46	72.4	30296

TUE. 30 JUN. 1981 (181)

UTC	LONG	ORBIT
125'43	101.1	30297
320'39	129.9	30298
515'36	158.6	30299
710'32	187.3	30300
905'29	216.1	30301
1100'25	244.8	30302
1255'22	273.6	30303
1450'18	302.3	30304
1645'15	331.0	30305
1840'11	359.8	30306
2035'08	28.5	30307
2230'04	57.2	30308

FRI. 1 MAY 1981 (121)

UTC	LONG	ORBIT
12'11	62.9	16076
155'22	88.7	16077
338'34	114.5	16078
521'46	140.3	16079
704'57	166.1	16080
848'09	191.9	16081
1031'20	217.7	16082
1214'32	243.5	16083
1357'43	269.3	16084
1540'55	295.1	16085
1724'07	320.9	16086
1907'18	346.7	16087
2050'30	12.5	16088
2233'41	38.3	16089

SAT. 2 MAY 1981 (122)

UTC	LONG	ORBIT
16'53	64.1	16090
200'04	89.9	16091
343'16	115.7	16092
526'28	141.5	16093
709'39	167.3	16094
852'51	193.1	16095
1036'02	218.9	16096
1219'14	244.7	16097
1402'25	270.5	16098
1545'37	296.3	16099
1728'49	322.1	16100
1912'00	347.9	16101
2055'12	13.7	16102
2238'23	39.5	16103

SUN. 3 MAY 1981 (123)

UTC	LONG	ORBIT
21'35	65.3	16104
204'46	91.1	16105
347'58	116.9	16106
531'10	142.7	16107
714'21	168.5	16108
857'33	194.3	16109
1040'44	220.1	16110
1223'56	245.9	16111
1407'07	271.7	16112
1550'19	297.5	16113
1733'31	323.3	16114
1916'42	349.1	16115
2059'54	14.9	16116
2243'05	40.7	16117

MON. 4 MAY 1981 (124)

UTC	LONG	ORBIT
26'17	66.5	16118
209'28	92.3	16119
352'40	118.1	16120
535'52	143.9	16121
719'03	169.7	16122
902'15	195.5	16123
1045'26	221.3	16124
1228'38	247.1	16125
1411'49	272.9	16126
1555'01	298.7	16127
1738'12	324.5	16128
1921'24	350.3	16129
2104'36	16.1	16130
2247'47	41.9	16131

TUE. 5 MAY 1981 (125)

UTC	LONG	ORBIT
30'59	67.7	16132
214'10	93.5	16133
357'22	119.3	16134
540'33	145.1	16135
723'45	170.9	16136
906'57	196.7	16137
1050'08	222.5	16138
1233'20	248.3	16139
1416'31	274.1	16140
1559'43	299.9	16141
1742'54	325.7	16142
1926'06	351.5	16143
2109'18	17.3	16144
2252'29	43.1	16145

WED. 6 MAY 1981 (126)

UTC	LONG	ORBIT
35'41	68.9	16146
218'52	94.7	16147
402'04	120.5	16148
545'15	146.3	16149
728'27	172.1	16150
911'38	197.9	16151
1054'50	223.7	16152
1238'02	249.5	16153
1421'13	275.3	16154
1604'25	301.1	16155
1747'36	326.9	16156
1930'48	352.7	16157
2113'59	18.5	16158
2257'11	44.3	16159

THU. 7 MAY 1981 (127)

UTC	LONG	ORBIT
40'23	70.1	16160
223'34	95.9	16161
406'46	121.7	16162
549'57	147.5	16163
733'09	173.3	16164
916'20	199.1	16165
1059'32	224.9	16166
1242'43	250.7	16167
1425'55	276.5	16168
1609'07	302.3	16169
1752'18	328.1	16170
1935'30	353.9	16171
2118'41	19.7	16172
2301'53	45.5	16173

FRI. 8 MAY 1981 (128)

UTC	LONG	ORBIT
45'04	71.3	16174
228'16	97.1	16175
411'27	122.9	16176
554'39	148.7	16177
737'51	174.5	16178
921'02	200.3	16179
1104'14	226.1	16180
1247'25	251.9	16181
1430'37	277.7	16182
1613'48	303.5	16183
1757'00	329.3	16184
1940'11	355.1	16185
2123'23	20.9	16186
2306'34	46.7	16187

SAT. 9 MAY 1981 (129)

UTC	LONG	ORBIT
49'46	72.5	16188
232'57	98.3	16189
416'09	124.1	16190
559'20	149.9	16191
742'32	175.7	16192
925'44	201.5	16193
1108'55	227.3	16194
1252'07	253.1	16195
1435'18	278.9	16196
1618'30	304.7	16197
1801'41	330.5	16198
1944'53	356.3	16199
2128'04	22.1	16200
2311'16	47.9	16201

SUN. 10 MAY 1981 (130)

UTC	LONG	ORBIT
54'28	73.7	16202
237'39	99.5	16203
420'51	125.3	16204
604'02	151.1	16205
747'14	176.9	16206
930'26	202.7	16207
1113'37	228.5	16208
1256'49	254.3	16209
1440'00	280.1	16210
1623'12	305.9	16211
1806'23	331.7	16212
1949'35	357.5	16213
2132'46	23.3	16214
2315'58	49.1	16215

MON. 11 MAY 1981 (131)

UTC	LONG	ORBIT
59'10	74.9	16216
242'21	100.7	16217
425'33	126.5	16218
608'44	152.3	16219
751'56	178.1	16220
935'07	203.9	16221
1118'19	229.7	16222
1301'30	255.5	16223
1444'42	281.3	16224
1627'53	307.1	16225
1811'05	332.9	16226
1954'17	358.7	16227
2137'28	24.5	16228
2320'40	50.3	16229

TUE. 12 MAY 1981 (132)

UTC	LONG	ORBIT
103'51	76.1	16230
247'03	101.9	16231
430'14	127.7	16232
613'26	153.5	16233
756'37	179.3	16234
939'49	205.1	16235
1123'00	230.9	16236
1306'12	256.6	16237
1449'23	282.4	16238
1632'35	308.2	16239
1815'47	334.0	16240
1958'58	359.8	16241
2142'10	25.6	16242
2325'21	51.4	16243

WED. 13 MAY 1981 (133)

UTC	LONG	ORBIT
108'33	77.2	16244
251'44	103.0	16245
434'56	128.8	16246
618'07	154.6	16247
801'19	180.4	16248
944'30	206.2	16249
1127'42	232.0	16250
1310'54	257.8	16251
1454'05	283.6	16252
1637'17	309.4	16253
1820'28	335.2	16254
2003'40	1.0	16255
2146'51	26.8	16256
2330'03	52.6	16257

THU. 14 MAY 1981 (134)

UTC	LONG	ORBIT
113'14	78.4	16258
256'26	104.2	16259
439'37	130.0	16260
622'49	155.8	16261
806'00	181.6	16262
949'12	207.4	16263
1132'24	233.2	16264
1315'35	259.0	16265
1458'47	284.8	16266
1641'58	310.6	16267
1825'10	336.4	16268
2008'21	2.2	16269
2151'33	28.0	16270
2334'44	53.8	16271

FRI. 15 MAY 1981 (135)

UTC	LONG	ORBIT
117'56	79.6	16272
301'07	105.4	16273
444'19	131.2	16274
627'30	157.0	16275
810'42	182.8	16276
953'54	208.6	16277
1137'05	234.4	16278
1320'17	260.2	16279
1503'28	286.0	16280
1646'40	311.8	16281
1829'51	337.6	16282
2013'03	3.4	16283
2156'14	29.2	16284
2339'26	55.0	16285

SAT. 16 MAY 1981 (136)

UTC	LONG	ORBIT
122'37	80.8	16286
305'49	106.6	16287
449'00	132.4	16288
632'12	158.2	16289
815'24	184.0	16290
958'35	209.8	16291
1141'47	235.6	16292
1324'58	261.4	16293
1508'10	287.2	16294
1651'21	313.0	16295
1834'33	338.8	16296
2017'44	4.6	16297
2200'56	30.4	16298
2344'07	56.2	16299

SUN. 17 MAY 1981 (137)

UTC	LONG	ORBIT
127'19	82.0	16300
310'30	107.8	16301
453'42	133.6	16302
636'53	159.4	16303
820'05	185.2	16304
1003'16	211.0	16305
1146'28	236.8	16306
1329'40	262.6	16307
1512'51	288.4	16308
1656'03	314.2	16309
1839'14	340.0	16310
2022'26	5.8	16311
2205'37	31.6	16312
2348'49	57.4	16313

MON. 18 MAY 1981 (138)

UTC	LONG	ORBIT
132'00	83.2	16314
315'12	109.0	16315
458'23	134.8	16316
641'35	160.6	16317
824'46	186.4	16318
1007'58	212.2	16319
1151'09	238.0	16320
1334'21	263.8	16321
1517'32	289.6	16322
1700'44	315.4	16323
1843'56	341.2	16324
2027'07	7.0	16325
2210'19	32.8	16326
2353'30	58.6	16327

TUE. 19 MAY 1981 (139)

UTC	LONG	ORBIT
136'42	84.4	16328
319'53	110.2	16329
503'05	136.0	16330
646'16	161.8	16331
829'28	187.6	16332
1012'39	213.4	16333
1155'51	239.2	16334
1339'02	265.0	16335
1522'14	290.8	16336
1705'25	316.6	16337
1848'37	342.4	16338
2031'48	8.2	16339
2215'00	34.0	16340
2358'11	59.8	16341

WED. 20 MAY 1981 (140)

UTC	LONG	ORBIT
141'23	85.6	16342
324'34	111.4	16343
507'46	137.2	16344
650'57	163.0	16345
834'09	188.8	16346
1017'21	214.6	16347
1200'32	240.4	16348
1343'44	266.2	16349
1526'55	292.0	16350
1710'07	317.8	16351
1853'18	343.6	16352
2036'30	9.4	16353
2219'41	35.2	16354

THU. 21 MAY 1981 (141)

UTC	LONG	ORBIT
2'53	61.0	16355
146'04	86.8	16356
329'16	112.6	16357
512'27	138.4	16358
655'39	164.2	16359
838'50	190.0	16360
1022'02	215.8	16361
1205'13	241.6	16362
1348'25	267.4	16363
1531'36	293.2	16364
1714'48	319.0	16365
1857'59	344.8	16366
2041'11	10.6	16367
2224'22	36.4	16368

FRI. 22 MAY 1981 (142)

UTC	LONG	ORBIT
7'34	62.2	16369
150'45	88.0	16370
333'57	113.8	16371
517'09	139.6	16372
700'20	165.4	16373
843'32	191.2	16374
1026'43	217.0	16375
1209'55	242.8	16376
1353'06	268.6	16377
1536'18	294.4	16378
1719'29	320.2	16379
1902'41	346.0	16380
2045'52	11.8	16381
2229'04	37.6	16382

SAT. 23 MAY 1981 (143)

UTC	LONG	ORBIT
12'15	63.4	16383
155'27	89.2	16384
338'38	115.0	16385
521'50	140.8	16386
705'01	166.6	16387
848'13	192.4	16388
1031'24	218.2	16389
1214'36	244.0	16390
1357'47	269.8	16391
1540'59	295.6	16392
1724'10	321.4	16393
1907'22	347.2	16394
2050'33	13.0	16395
2233'45	38.8	16396

SUN. 24 MAY 1981 (144)

UTC	LONG	ORBIT
16'56	64.6	16397
200'08	90.4	16398
343'19	116.2	16399
526'31	142.0	16400
709'42	167.8	16401
852'54	193.6	16402
1036'05	219.4	16403
1219'17	245.2	16404
1402'28	271.0	16405
1545'40	296.8	16406
1728'51	322.6	16407
1912'03	348.4	16408
2055'14	14.2	16409
2238'26	40.0	16410

MON. 25 MAY 1981 (145)

UTC	LONG	ORBIT
21'38	65.8	16411
204'49	91.6	16412
348'01	117.4	16413
531'12	143.2	16414
714'24	169.0	16415
857'35	194.8	16416
1040'47	220.6	16417
1223'58	246.4	16418
1407'10	272.2	16419
1550'21	298.0	16420
1733'33	323.8	16421
1916'44	349.6	16422
2059'56	15.4	16423
2243'07	41.2	16424

TUE. 26 MAY 1981 (146)

UTC	LONG	ORBIT
26'19	67.0	16425
209'30	92.8	16426
352'42	118.6	16427
535'53	144.4	16428
719'05	170.2	16429
902'16	196.0	16430
1045'28	221.8	16431
1228'39	247.6	16432
1411'51	273.4	16433
1555'02	299.2	16434
1738'14	325.0	16435
1921'25	350.8	16436
2104'37	16.6	16437
2247'48	42.4	16438

WED. 27 MAY 1981 (147)

UTC	LONG	ORBIT
31'00	68.2	16439
214'11	94.0	16440
357'23	119.8	16441
540'34	145.6	16442
723'46	171.4	16443
906'57	197.2	16444
1050'09	223.0	16445
1233'20	248.8	16446
1416'32	274.6	16447
1559'43	300.4	16448
1742'55	326.2	16449
1926'06	352.0	16450
2109'18	17.8	16451
2252'29	43.6	16452

THU. 28 MAY 1981 (148)

UTC	LONG	ORBIT
35'41	69.4	16453
218'52	95.2	16454
402'04	121.0	16455
545'15	146.8	16456
728'27	172.6	16457
911'38	198.4	16458
1054'50	224.2	16459
1238'01	250.0	16460
1421'13	275.8	16461
1604'24	301.6	16462
1747'36	327.4	16463
1930'47	353.2	16464
2113'59	19.0	16465
2257'10	44.8	16466

FRI. 29 MAY 1981 (149)

UTC	LONG	ORBIT
40'22	70.6	16467
223'33	96.4	16468
406'45	122.2	16469
549'56	148.0	16470
733'08	173.8	16471
916'19	199.6	16472
1059'31	225.4	16473
1242'42	251.2	16474
1425'54	277.0	16475
1609'05	302.8	16476
1752'17	328.6	16477
1935'28	354.4	16478
2118'40	20.2	16479
2301'51	46.0	16480

SAT. 30 MAY 1981 (150)

UTC	LONG	ORBIT
45'03	71.8	16481
228'14	97.6	16482
411'26	123.4	16483
554'37	149.2	16484
737'49	175.0	16485
921'00	200.8	16486
1104'12	226.6	16487
1247'23	252.4	16488
1430'35	278.2	16489
1613'46	304.0	16490
1756'58	329.8	16491
1940'09	355.6	16492
2123'21	21.4	16493
2306'32	47.2	16494

SUN. 31 MAY 1981 (151)

UTC	LONG	ORBIT
49'44	73.0	16495
232'55	98.8	16496
416'07	124.6	16497
559'18	150.4	16498
742'30	176.2	16499
925'41	202.0	16500
1108'53	227.8	16501
1252'04	253.6	16502
1435'15	279.4	16503
1618'27	305.2	16504
1801'39	331.0	16505
1944'50	356.8	16506
2128'01	22.6	16507
2311'13	48.4	16508

MON. 1 JUN. 1981 (152)

UTC	LONG	ORBIT
54'24	74.2	16509
237'36	100.0	16510
420'47	125.8	16511
603'59	151.6	16512
747'10	177.4	16513
930'22	203.2	16514
1113'33	229.0	16515
1256'45	254.8	16516
1439'56	280.6	16517
1623'08	306.4	16518
1806'19	332.2	16519
1949'31	358.0	16520
2132'42	23.8	16521
2315'54	49.6	16522

TUE. 2 JUN. 1981 (153)

UTC	LONG	ORBIT
59'05	75.4	16523
242'17	101.2	16524
425'28	127.0	16525
608'40	152.8	16526
751'51	178.6	16527
935'03	204.4	16528
1118'14	230.2	16529
1301'26	256.0	16530
1444'37	281.8	16531
1627'49	307.6	16532
1811'00	333.4	16533
1954'12	359.2	16534
2137'23	25.0	16535
2320'35	50.8	16536

WED. 3 JUN. 1981 (154)

UTC	LONG	ORBIT
103'46	76.6	16537
246'58	102.4	16538
430'09	128.2	16539
613'21	154.0	16540
756'32	179.8	16541
939'44	205.6	16542
1122'55	231.4	16543
1306'07	257.2	16544
1449'18	283.0	16545
1632'29	308.8	16546
1815'41	334.6	16547
1958'52	0.4	16548
2142'04	26.2	16549
2325'15	52.0	16550

THU. 4 JUN. 1981 (155)

UTC	LONG	ORBIT
108'27	77.8	16551
251'38	103.5	16552
434'50	129.3	16553
618'01	155.1	16554
801'13	180.9	16555
944'24	206.7	16556
1127'36	232.5	16557
1310'47	258.3	16558
1453'59	284.1	16559
1637'10	309.9	16560
1820'22	335.7	16561
2003'33	1.5	16562
2146'45	27.3	16563
2329'56	53.1	16564

FRI. 5 JUN. 1981 (156)

UTC	LONG	ORBIT
113'08	78.9	16565
256'19	104.7	16566
439'30	130.5	16567
622'42	156.3	16568
805'53	182.1	16569
949'05	207.9	16570
1132'17	233.7	16571
1315'28	259.5	16572
1458'39	285.3	16573
1641'51	311.1	16574
1825'02	336.9	16575
2008'14	2.7	16576
2151'25	28.5	16577
2334'37	54.3	16578

SAT. 6 JUN. 1981 (157)

UTC	LONG	ORBIT
117'48	80.1	16579
301'00	105.9	16580
444'11	131.7	16581
627'23	157.5	16582
810'34	183.3	16583
953'46	209.1	16584
1136'57	234.9	16585
1320'09	260.7	16586
1503'20	286.5	16587
1646'32	312.3	16588
1829'43	338.1	16589
2012'55	3.9	16590
2156'06	29.7	16591
2339'17	55.5	16592

SUN. 7 JUN. 1981 (158)

UTC	LONG	ORBIT
122'29	81.3	16593
305'40	107.1	16594
448'52	132.9	16595
632'03	158.7	16596
815'15	184.5	16597
958'26	210.3	16598
1141'38	236.1	16599
1324'49	261.9	16600
1508'01	287.7	16601
1651'12	313.5	16602
1834'24	339.3	16603
2017'35	5.1	16604
2200'47	30.9	16605
2343'58	56.7	16606

MON. 8 JUN. 1981 (159)

UTC	LONG	ORBIT
127'10	82.5	16607
310'21	108.3	16608
453'32	134.1	16609
636'44	159.9	16610
819'55	185.7	16611
1003'07	211.5	16612
1146'18	237.3	16613
1329'30	263.1	16614
1512'41	288.9	16615
1655'53	314.7	16616
1839'04	340.5	16617
2022'16	6.3	16618
2205'27	32.1	16619
2348'39	57.9	16620

TUE. 9 JUN. 1981 (160)

UTC	LONG	ORBIT
131'50	83.7	16621
315'02	109.5	16622
458'13	135.3	16623
641'25	161.1	16624
824'36	186.9	16625
1007'47	212.7	16626
1150'59	238.5	16627
1334'10	264.3	16628
1517'22	290.1	16629
1700'33	315.9	16630
1843'45	341.7	16631
2026'56	7.5	16632
2210'08	33.3	16633
2353'19	59.1	16634

WED. 10 JUN. 1981 (161)

UTC	LONG	ORBIT
136'31	84.9	16635
319'42	110.7	16636
502'54	136.5	16637
646'05	162.3	16638
829'17	188.1	16639
1012'28	213.9	16640
1155'39	239.7	16641
1338'51	265.5	16642
1522'02	291.3	16643
1705'14	317.1	16644
1848'25	342.9	16645
2031'37	8.7	16646
2214'48	34.5	16647
2358'00	60.3	16648

THU. 11 JUN. 1981 (162)

UTC	LONG	ORBIT
141'11	86.1	16649
324'23	111.9	16650
507'34	137.7	16651
650'45	163.5	16652
833'57	189.3	16653
1017'08	215.1	16654
1200'20	240.9	16655
1343'31	266.7	16656
1526'43	292.5	16657
1709'54	318.3	16658
1853'06	344.1	16659
2036'17	9.9	16660
2219'29	35.7	16661

FRI. 12 JUN. 1981 (163)

UTC	LONG	ORBIT
2'40	61.5	16662
145'52	87.3	16663
329'03	113.1	16664
512'14	138.9	16665
655'26	164.7	16666
838'37	190.5	16667
1021'49	216.3	16668
1205'00	242.1	16669
1348'12	267.9	16670
1531'23	293.7	16671
1714'35	319.5	16672
1857'46	345.3	16673
2040'58	11.1	16674
2224'09	36.9	16675

SAT. 13 JUN. 1981 (164)

UTC	LONG	ORBIT
7'21	62.7	16676
150'32	88.5	16677
333'43	114.3	16678
516'55	140.1	16679
700'06	165.9	16680
843'18	191.7	16681
1026'29	217.5	16682
1209'41	243.3	16683
1352'52	269.1	16684
1536'04	294.9	16685
1719'15	320.7	16686
1902'27	346.5	16687
2045'38	12.3	16688
2228'49	38.1	16689

SUN. 14 JUN. 1981 (165)

UTC	LONG	ORBIT
12'01	63.9	16690
155'12	89.7	16691
338'24	115.5	16692
521'35	141.3	16693
704'47	167.1	16694
847'58	192.9	16695
1031'10	218.7	16696
1214'21	244.5	16697
1357'33	270.3	16698
1540'44	296.1	16699
1723'55	321.9	16700
1907'07	347.7	16701
2050'18	13.5	16702
2233'30	39.3	16703

MON. 15 JUN. 1981 (166)

UTC	LONG	ORBIT
16'41	65.1	16704
159'53	90.9	16705
343'04	116.7	16706
526'16	142.5	16707
709'27	168.3	16708
852'38	194.1	16709
1035'50	219.9	16710
1219'01	245.7	16711
1402'13	271.5	16712
1545'24	297.3	16713
1728'36	323.1	16714
1911'47	348.9	16715
2054'59	14.7	16716
2238'10	40.5	16717

TUE. 16 JUN. 1981 (167)

UTC	LONG	ORBIT
21'21	66.3	16718
204'33	92.1	16719
347'44	117.9	16720
530'56	143.7	16721
714'07	169.5	16722
857'19	195.3	16723
1040'30	221.1	16724
1223'42	246.9	16725
1406'53	272.7	16726
1550'05	298.5	16727
1733'16	324.3	16728
1916'27	350.1	16729
2059'39	15.9	16730
2242'50	41.7	16731

WED. 17 JUN. 1981 (168)

UTC	LONG	ORBIT
26'02	67.5	16732
209'13	93.3	16733
352'25	119.1	16734
535'36	144.9	16735
718'48	170.7	16736
901'59	196.5	16737
1045'10	222.3	16738
1228'22	248.1	16739
1411'33	273.9	16740
1554'45	299.7	16741
1737'56	325.5	16742
1921'08	351.3	16743
2104'19	17.1	16744
2247'31	42.8	16745

THU. 18 JUN. 1981 (169)

UTC	LONG	ORBIT
30'42	68.6	16746
213'53	94.4	16747
357'05	120.2	16748
540'16	146.0	16749
723'28	171.8	16750
906'39	197.6	16751
1049'51	223.4	16752
1233'02	249.2	16753
1416'14	275.0	16754
1559'25	300.8	16755
1742'36	326.6	16756
1925'48	352.4	16757
2108'59	18.2	16758
2252'11	44.0	16759

FRI. 19 JUN. 1981 (170)

UTC	LONG	ORBIT
35'22	69.8	16760
218'34	95.6	16761
401'45	121.4	16762
544'56	147.2	16763
728'08	173.0	16764
911'19	198.8	16765
1054'31	224.6	16766
1237'42	250.4	16767
1420'54	276.2	16768
1604'05	302.0	16769
1747'17	327.8	16770
1930'28	353.6	16771
2113'40	19.4	16772
2256'51	45.2	16773

SAT. 20 JUN. 1981 (171)

UTC	LONG	ORBIT
40'02	71.0	16774
223'14	96.8	16775
406'25	122.6	16776
549'37	148.4	16777
732'48	174.2	16778
915'59	200.0	16779
1059'11	225.8	16780
1242'22	251.6	16781
1425'34	277.4	16782
1608'45	303.2	16783
1751'57	329.0	16784
1935'08	354.8	16785
2118'19	20.6	16786
2301'31	46.4	16787

SUN. 21 JUN. 1981 (172)

UTC	LONG	ORBIT
44'42	72.2	16788
227'54	98.0	16789
411'05	123.8	16790
554'17	149.6	16791
737'28	175.4	16792
920'40	201.2	16793
1103'51	227.0	16794
1247'02	252.8	16795
1430'14	278.6	16796
1613'25	304.4	16797
1756'37	330.2	16798
1939'48	356.0	16799
2123'00	21.8	16800
2306'11	47.6	16801

MON. 22 JUN. 1981 (173)

UTC	LONG	ORBIT
49'23	73.4	16802
232'34	99.2	16803
415'45	125.0	16804
558'57	150.8	16805
742'08	176.6	16806
925'20	202.4	16807
1108'31	228.2	16808
1251'42	254.0	.5809
1434'54	279.8	16810
1618'05	305.6	16811
1801'17	331.4	16812
1944'28	357.2	16813
2127'40	23.0	16814
2310'51	48.8	16815

TUE. 23 JUN. 1981 (174)

UTC	LONG	ORBIT
54'02	74.6	16816
237'14	100.4	16817
420'25	126.2	16818
603'37	152.0	16819
746'48	177.8	16820
930'00	203.6	16821
1113'11	229.4	16822
1256'23	255.2	16823
1439'34	281.0	16824
1622'45	306.8	16825
1805'57	332.6	16826
1949'08	358.4	16827
2132'20	24.2	16828
2315'31	50.0	16829

WED 24 JUN. 1981 (175)

UTC	LONG	ORBIT
58'43	75.8	16830
241'54	101.6	16831
425'05	127.4	16832
608'17	153.2	16833
751'28	179.0	16834
934'40	204.8	16835
1117'51	230.6	16836
1301'02	256.4	16837
1444'14	282.2	16838
1627'25	308.0	16839
1810'37	333.8	16840
1953'48	359.6	16841
2137'00	25.4	16842
2320'11	51.2	16843

THU. 25 JUN. 1981 (176)

UTC	LONG	ORBIT
103'22	77.0	16844
246'34	102.8	16845
429'45	128.6	16846
612'57	154.4	16847
756'08	180.2	16848
939'20	206.0	16849
1122'31	231.8	16850
1305'42	257.6	16851
1448'54	283.4	16852
1632'05	309.2	16853
1815'17	335.0	16854
1958'28	0.8	16855
2141'40	26.6	16856
2324'51	52.4	16857

FRI. 26 JUN. 1981 (177)

UTC	LONG	ORBIT
108'02	78.2	16858
251'14	104.0	16859
434'25	129.8	16860
617'37	155.6	16861
800'48	181.4	16862
943'59	207.2	16863
1127'11	233.0	16864
1310'22	258.8	16865
1453'34	284.6	16866
1636'45	310.4	16867
1819'57	336.2	16868
2003'08	2.0	16869
2146'19	27.8	16870
2329'31	53.6	16871

SAT. 27 JUN. 1981 (178)

UTC	LONG	ORBIT
112'42	79.4	16872
255'54	105.2	16873
439'05	131.0	16874
622'16	156.8	16875
805'28	182.6	16876
948'39	208.4	16877
1131'51	234.2	16878
1315'02	260.0	16879
1458'14	285.8	16880
1641'25	311.6	16881
1824'36	337.4	16882
2007'48	3.2	16883
2150'59	29.0	16884
2334'11	54.8	16885

SUN. 28 JUN. 1981 (179)

UTC	LONG	ORBIT
117'22	80.6	16886
300'34	106.4	16887
443'45	132.2	16888
626'56	158.0	16889
810'08	183.8	16890
953'19	209.6	16891
1136'30	235.4	16892
1319'42	261.2	16893
1502'53	287.0	16894
1646'05	312.8	16895
1829'16	338.5	16896
2012'28	4.3	16897
2155'39	30.1	16898
2338'51	55.9	16899

MON. 29 JUN. 1981 (180)

UTC	LONG	ORBIT
122'02	81.7	16900
305'13	107.5	16901
448'25	133.3	16902
631'36	159.1	16903
814'47	184.9	16904
957'59	210.7	16905
1141'10	236.5	16906
1324'22	262.3	16907
1507'33	288.1	16908
1650'45	313.9	16909
1833'56	339.7	16910
2017'07	5.5	16911
2200'19	31.3	16912
2343'30	57.1	16913

TUE. 30 JUN. 1981 (181)

UTC	LONG	ORBIT
126'42	82.9	16914
309'53	108.7	16915
453'04	134.5	16916
636'16	160.3	16917
819'27	186.1	16918
1002'39	211.9	16919
1145'50	237.7	16920
1329'01	263.5	16921
1512'13	289.3	16922
1655'24	315.1	16923
1838'36	340.9	16924
2021'47	6.7	16925
2204'58	32.5	16926
2348'10	58.3	16927

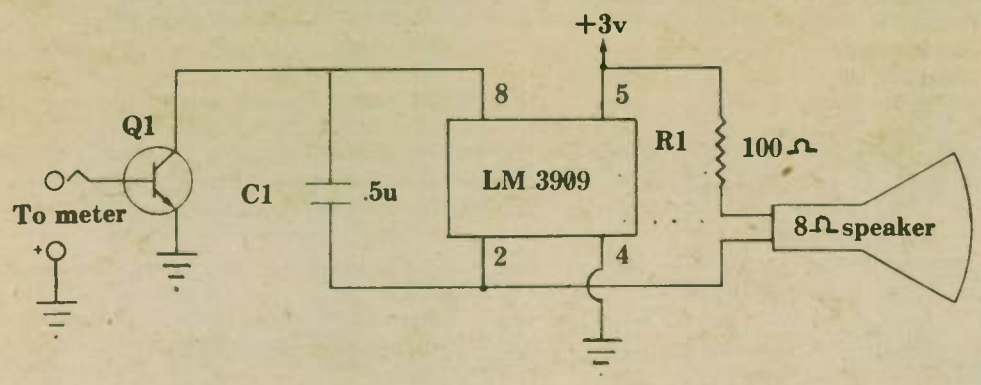
Audible meter deflection reader

Here is a little circuit designed by Bob Barker, WDØGOL, of Bloomington, Minnesota. Those radio amateurs wishing to help a blind amateur read meters (including a SWR bridge!) can duplicate this circuit for almost nothing.

The circuit will give an audible indication of deflection on a meter. The circuit was designed to be used with volt meters having full scale deflection of about .1 volt. If the circuit is to be used with meters having a full scale deflection of more than .1 volt, a resistor should be put in series with a base of Q1.

The value of C1 is not critical and can be changed to adjust the pitch. Q1 can be just about any NPN transistor.

— *HANDI-HAM World* □



DON'T FORGET . . .
Include first and last names with call signs.

DX World

(*continued from page 33*)

rates have gone up. It costs 40 cents now for an overseas airmail envelope. As for the IRC's, we have heard that some post offices are still accepting the old style of IRC that became worthless the first of the year.

Here is a suggestion to those of you who don't care to purchase IRC's at the post office and cannot obtain them at discount prices when available. **DX Stamp Service, 7661 Roder Parkway, Ontario, NY 14519,** offers mint stamps to send to your DX station for return postage. This beats the IRC route, especially if the DX station cares little for the IRC's. Write for details, and include an SASE. If you don't care to use either mint stamps or IRC's, you can send green stamps — and those are not the "S&H" type.

A large portion of my time in preparation of this column is spent is collecting the QSL routing information at the end of each month's column. Most DX columns in other publications also include these DX listings, with many of them not duplicated. Rather than search through past issues of these publications, wouldn't it be easier to make use of a consolidated list? The W6GO/K6HHD List is just such a list. Contact **Jay or Jan O'Brien at P.O. Box 700, Rio Linda, CA 95673** for details.

There was an error in the February issue concerning the holder of the call C5AZ. This call is assigned to Rod Hallen, 9G1RT, who works for the State Department in Accra, Ghana. When in The Gambia, Rod signs C5AZ.

Another important point is a comment from Rod's QSL manager, Bob Clay, KB7HB. He is amazed at the amateurs who cannot tell time on the East Coast. East Coast or elsewhere, I have seen this error many times. Always keep your logs in UTC. Be aware of the difference between your time zone and UTC; and if UTC changes date prior to your time zone, add that date to UTC, not your time zone date to UTC. Worst of all, never send a DX station or his manager your QSL card confirming the contact with your local time. Dumb!

VK9 AND VKØ

I received a listing of the present listing of all VK9 and VKØ stations from Neil Penfold, VK6NE, the bureau manager. With a few other calls added they are as follows:

VK9BS	W3HNK
VK9CCT	VK5QX
VK9CGR	VK5QX
VK9DIK	DJ5CQ
VK9EW	VK6RU
VK9FV	
VK9JJ	K9IL
VK9KK	WA3HUP
VK9MR	K9IL
VK9NA	Norfolk Island
VK9NI	P.O. Box 27, Norfolk Island
VK9NC	Norfolk Island
VK9NK	W6EDN
VK9NL	P.O. Box 103, Norfolk Island
VK9NM	DJ5CQ
VK9NNW	Norfolk Island
VK9NNI	P.O. Box 27,Woolgoolga 2450, Australia
VK9NS	P.O. Box 103, Norfolk Island
VK9NV	OTC, La Perouse
VK9NYG	VK6NE
VK9RH	Silent Key
VK9TR	N2IT
VK9TV	
VK9XI	VK6RU
VK9XS	VK9NS
VK9XT	VK3OT
VK9XW	VK6RU
VK9YJ	K9IL
VK9YK	WA3HUP
VK9YN	WA3HUP
VK9YR	K9IL
VK9YS	VK9NS
VK9YT	VK3OT
VK9ZG	VK6 Bureau
VK9ZM	VK4ABW
VK9ZR	VK2BJL
VKØAB	VK2BRN
VKØAC	VK3ZQK
VKØAE	
VKØAL	
VKØAP	VK3VPJ
VKØAS	VK3ZAT
VKØBA	VK2ACI
VKØBC	VK8VV
VKØCC	VK2BCC
VKØDB	568 St. Kilda Road, Melbourn, Australia
VKØDM	WA4NRE
VKØGS	VK2AOZ
VKØGM	VK6 Bureau
VKØGW	VK5GW
VKØHM	W7PHO
VKØHW	VK7HW
•VKØJC	OZ8AE
VKØJM	VK3BAF
VKØJS	VK9NS
VKØKC	VK4 Bureau
VKØKH	VK5WV
VKØKS	VK3 Bureau

(*please turn to page 38*)

For information on how to get your club listed in this column, plus receive many other benefits, write to Dave Tykol, WA6RVZ, Club Liaison, Worldradio, 2120-28th Street, Sacramento, CA 95818.

VISIT YOUR LOCAL RADIO CLUB

ARIZONA

Metropolitan Amateur Radio Club
J.C. Penny Restaurant, El Con
Tucson, AZ
Call in on 34/94 K7CC/R
Every Saturday morning - 8:00 a.m.

CALIFORNIA

Contra Costa Communications Club, Inc.
PO Box 661, San Pablo, CA 94806
Amateur VHF/UHF club and repeater
For info. call WA6KQB (415) 222-1523
Meets 2nd Sun. 9:00 a.m. Hickory Post

East Bay Amateur Radio Club
P.O. Box 6014, Albany CA 94706
Salvation Army Bldg., 36th & Rheem,
Richmond (415) 525-6200
2nd Friday/monthly — 7:30 p.m.

Fresno Amateur Radio Club, Inc.
P.O. Box 783, Fresno, CA 93712
Meets: 2nd Friday/monthly — 8:00 p.m.
Wawoha Middle School: 4524 N.
Thorne; Fresno. W6TO/R 146.34/94

Lake Elsinore Valley Radio Club
Wildomar Elem. Sch. (corner Palomar Rd. & Central)
Take Baxter Rd. turn off 71 Freeway
Monitor 146.55 simplex
3rd Thursday/monthly — 7:30 p.m.

Marin Amateur Radio Club (Founded 1933)
Coop Meeting Room
71 Tamal Vista Blvd
Corte Madera, CA 94925
1st Friday/monthly — 8:00 p.m.

Mt. Diablo Amateur Radio Club, Inc.
PO Box 23222, Pleasant Hill, CA 94523
Meets: Grace Presb. Church, 2100 Tice
Valley Blvd., Walnut Creek, CA 94595
3rd Friday/monthly — 8:00 p.m.

Nevada County Amateur Radio Club
Christian Church
135 Winchester Ave. — Grass Valley
2nd Monday/monthly — 7:30 p.m.
(916) 272-4873

North Hills Radio Club
Gethsemane Lutheran Church
4706 Arden Way
Carmichael, CA 95608
3rd Tuesday/monthly

San Gabriel Valley Radio Club, Inc.
Bowling Green Clubhouse
Arcadia County Park, Arcadia
1st Tuesday/monthly — 7:30 p.m.
(except June & December)

Satellite Amateur Radio Club, W6AB
PO Box 1615
Vandenberg AFB, CA 93437
1st Thursday/monthly — 8:00 p.m.
Building Z1160, Vandenberg AFB

Sonoma County Radio Amateurs, Inc.
3400 Chanate Road
Santa Rosa, CA 95406
Red Cross Building
1st Wednesday/monthly — 8:00 p.m.

Stockton Amateur Radio Club
University of the Pacific, Room 238
2nd Wednesday/monthly — 7:30 p.m.
Club repeater net roll call:
Wednesdays 8:00 p.m. — 147.165/765

CONNECTICUT

Tri-City ARC, Inc.
P.O. Box 686, Groton, CT 06340
Meets: Groten Public Library
Rt. 117, Groten, CT
2nd Tuesday/monthly — 7:30 p.m.

GEORGIA

Atlanta Radio Club
Box 77171 Atlanta, GA 30357
1st Thursday/monthly — 7:30 p.m.
Community Rm./Perimeter Mall Shopping Center
Call (404) 971-HAMS Net Sun. 9:00 p.m. 146.22/82

Columbus Amateur Radio Club (CARC)
David Nulty, N4ATI, Secretary (404) 687-3272
The Quonset Hut next to Food Stamp Center
Buena Vista Road at the "Spider Web"
2nd and 4th Thursday/monthly 7:30 p.m.

ILLINOIS

Illiana Repeater Systems, Inc. (IRS)
Palmer Amer. Nat. Bank Comm. Rm.
Danville, IL
3rd Monday/monthly — 7:00 p.m.
Call-in WB9YJF/R 146.22/82 "Super 82"

INDIANA

Allen Co. Amateur Radio Tech'l Society, Inc.
P.O. Box 10342, Ft. Wayne, IN 46851
Allen-Wells Chapter House • Amer. Red Cross
1212 E. California Rd., Ft. Wayne, IN 46825
3rd Tuesday/monthly — 7:30 p.m.

Fort Wayne Radio Club
Ron Koczor, K9TUS
2512 Glenwood Ave., Fort Wayne, IN 46805
The Salem Church
3rd Friday/monthly — 7:30 p.m.

MICHIGAN

The Eastern Mich. ARC (EMARC)
St. Clair County Comm. College
Student Center Building (Cafeteria)
Port Huron, MI (313) 364-9640
1st Tuesday/monthly — 7:30 p.m.

SE Michigan Amateur Radio Assoc. (SEMARA)
PO Box 646
St. Clair Shores, MI 48083
South Lake High School
1st Friday/monthly (excet July and Aug.)

MISSOURI

Heart of America Radio Club
3521 Broadway
Kansas City, MO
3rd Tuesday/monthly

NEW JERSEY

Delaware Valley Radio Association
Villa Victoria Academy
River Road (NJ 29) at I-95, Trenton
(609) 882-2240, call-in 07/67
2nd Wednesday/monthly — 8:00 p.m.

Glouster County ARC, W2MMD
PO Box 370, Pitman, NJ 08071
American Legion Post
Delsea Dr., Rt. 47, Clayton, NJ
1st Wednesday/monthly — 8:00 p.m.

Old Bridge Radio Assoc. (OBRA)
Cheesequake Firehouse — Route 34
Old Bridge Township, NJ
Daily 8 p.m. Net on 147.72/.12 MHz
3rd Thursday/alternate (odd) months 8 p.m.

NEW MEXICO

Eastern New Mexico ARC
First National Bank, Clovis
Box 206 • Clovis, NM 88101
(505) 763-6960/356-5993
2nd Tuesday/monthly — 7:30 p.m.

NEW YORK

Genesee Radio Amateurs, Inc. (GRAM)
PO Box 572, Batavia, NY 14020
State Civil Defense Center, Batavia
(behind NYS School for the Blind)
3rd Friday/monthly — 7:30 p.m.

Long Island Mobile ARC
H.B. Thompson Jr. High School, Syosset
Ken Denston, WB2RYC
(516) 379-6463/call-in 25/85
1st Tuesday/monthly — 8:00 p.m.

Staten Is. Amateur Radio Comm. (SIARC)
Northfield Savings Bank (side entrance)
Richmond and Castleman Avenues
Call KA2CUS (698-2006) or WA2KQN (981-0372)
3rd Thursday/monthly — 8:00 p.m.

OHIO

Ashtabula County ARC
Ken Stenback, AI8S (964-7316)
County Justice Center
Jefferson, OH
3rd Tuesday/monthly — 7:30 p.m.

C.A.R.S. (The Clyde Amateur Radio Society)
Gary A. Kauffman, WB8MUG, Secretary
2nd Tuesday/monthly 7:30 p.m.
Community Rm., City Building, Clyde, OH
Repeater 147.075/.675 MHz

NOARS (Northern Ohio ARS, Inc.)
P.O. Box 354, Lorain, OH 44052
K8US (216) 988-2345/near OH T.P. Exit 8
3rd Monday/monthly — 7:30 p.m.
K8KRG/R 146.10/70 — 144.55/145.15 —
449.8/444.8

OREGON

Clatskanie Amateur Radio Club
Route 2, Box 553
ClatsKanie, OR 97016
ClatsKanie Grade School Library
2nd Tuesday/monthly — 7:00 p.m.

TENNESSEE

Lakewood Amateur Radio Club
Harvey Cross, W4PKM, Activities Mgr.
Rt. 8 Box 460, Morristown, TN 37814
State Area Vocational School
Last Thursday/monthly — 7:30 p.m.

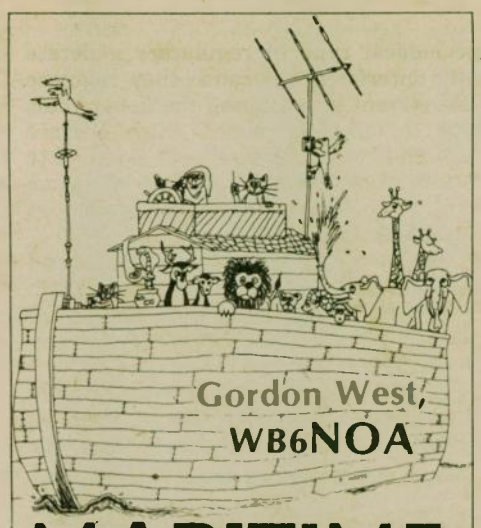
Oak Ridge Amateur Radio Club
Dick Church, N4ARO (615) 482-9054
Oak Ridge Civic Center
W4SKH/R 146.28/88
2nd and 4th Monday/monthly — 7:30 p.m.

VIRGINIA

Southern Peninsula Amateur Radio Klub (SPARK)
P.O. Box 9029, Hampton, VA 23670
Call Steve Silsby, WA4BRL (804) 599-6877
VEPCO Bldg. (Pembroke and G St.)
1st and 3rd Wednesday/monthly

WASHINGTON

Seattle Wash. Area Mike and Key ARC
305 S 43rd St. (across from VG Hospital)
Renton, WA 98055
The Good Neighbor Center
3rd Saturday/monthly — 10:00 a.m.



MARITIME MOBILE

Noise filters cut QRN

Ignition interference can kill many a good but weak contact on any amateur frequency. Half the problem of going mobile in a vehicle is filtering out all the pops and crackles from the engine compartment. Operating maritime mobile compounds the problems.

Aboard a boat, not only do you have to contend with motor noise from the engine, but also shaft noise from the prop, bait tanks, electronic tachometers, radar power supply converter noise, gear noise, and who knows what else!

Using the noise blanker on your high frequency transceiver will help a little. Noise blankers are effective in "nulling out" noise that is time repetitive. However, noise blankers have a hard time in working on non-repetitive type noise, such as pumps and tachometers.

It takes specialized tuned circuit filters to bypass noise impulses to ground. A simple capacitor or simple resistor spark plugs won't do the trick adequately. Special LC filters tuned precisely to the interference frequency is what it takes to quiet down the electrical interference. All noise sources must be filtered at the point where the noise is generated.

Take for instance an alternator whine filter. Sure, you can put one on at the power lead-in at your transceiver. It may work well. However, do it right and put the alternator whine filter right on the alternator where the noise source is generated. This will keep that noise interference from inductive coupling itself to other wires. Lick all noise problems at their source.

Many filters available

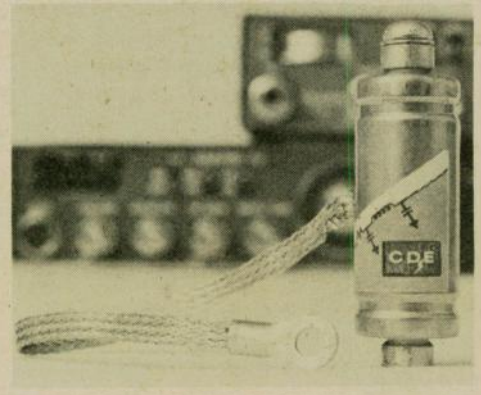
In order to cure a noisy electrical source, you first have to identify who is making all the racket. Let's review the common types of noise and the filter necessary to cure the noise.

Ignition noise

Ignition noise is perhaps the single most annoying type of interference from gasoline engines on all amateur high-frequency radios. The ignition circuit produces a "pop" in your ham set every time a plug is fired. There may be 40 pops per second from an 8 cylinder engine at 600 rpm idle. It will vary up to 200 pops per second at 3,000 rpm. At idle, the individual impulses may be clearly distinguished in your ham receiver. At higher speeds, they seem to blend in together into a continuous rough-sounding roar that will mask the mightiest signals on 20 meters. The correlation with engine speed is easily noted.

Ignition noise is generated at three different places. One place is at the points. Another is at the distributor. The last is at the plugs. They all sound the same.

Cures may be resistance or suppression type spark plug wiring. Belden markets excellent resistance type spark plug wires, available from Napa outlets. This



Filter

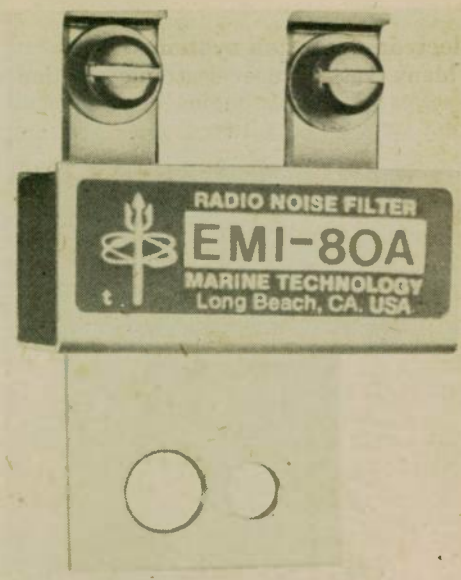
wire uses a conductive neoprene tube and seems to stand up better in boats.

Contrary to persistent rumor, the use of resistance wire to the plugs does not appear to involve any sacrifice in engine performance whatsoever if the balance of the ignition system is in good shape.

Register plugs are another way to go to reduce ignition noise. Finally, special coil filters that consist of a low-pass circuit, or feed-through capacitance filter at the coil in series with the connection to the key and any other connection made to the battery side of the coil are available. The ordinary pig-tail type capacitor, such as that used to cross the points, is acceptable at medium frequencies on the Amateur Radio bands, but is almost useless at 10 meters and above. A good low-pass pi-type LC filter rated at 5 amps works well from 100 Hz through 300 MHz.

Electronic tachometers

The electronic tachometers don't generate noise in themselves, but most have a wire going to the points on the engine, and that is where the interference comes from. This "points" terminal has a 400 volt impulse on it with plenty of RF energy, and the long wire from the coil up to the tachometer acts as a nice antenna for 15 and 20 meters. A special tachometer filter at the coil is necessary



Filter

in series with the lead-in to the tachometer. This is a low-pass RC filter which doesn't load the ignition circuit with additional capacitance, but it passes enough signal to operate the tachometer.

DX World

(*continued from page 37*)

VK0LD	VK2RS
VK0PK	VK5 Bureau
VK0RD	
VK0RM	VK3AKK
VK0RP	VK3YAP
VK0SF	VK3SF
VK0SJ	568 St. Kilda Road, Melbourn, Australia
VK0SW	VK4ATS
VK0TB	VK3ADD
VK0VL	VK3 Bureau
VK0WR	W7ZFY
VK0WW	VK5XX
VK0XX	WA7ABK

The calls are as given. In some cases, no QSL routing is given as none was supplied.

QSL Routes

A6XTH	—PA3AEI	KC6GZ	—W6TPC
A22PH	—A22BX	KC6KR	—JA8JL
A35EL	—OE2DYL	KC6VY	—W6TPC
A35JL	—K9AUB	KG4DI	—WB7NCF
A35JW	—KL7CQ	KL7KJ	—WL7AJN
A35PF	—K9KB	KP2A	—K2TJ
C5ADS	—DL1LD	KX6PI	—K1FNA
C5ADT	—G3VMK	LA1RR/ST0	—LA1RR (via bureau)
C5AZ	—KB7HB	M1C	—I2GVZ
C6ABA	—G3AMR	N2BVJ/LX	—DA1BM
C6ARD	—K2HFX	N2KK/J20	—K2FV
CN8AN	—WB3DNA	N6YK/VP2A	—N6NK
CN8AT	—OE3NH	OA8CP	—N4CQ
CP6EL	—W1BAN	OE2VEL/KH8	—OE2DYL
CR9EL	—OE2DYL	OI1AM	—OH2BBM
CT1ANO	—CT1ZA	OX3NB	—W7EDA
CT2DP	—W4PKM	P29GG	—VK2BUW
CT3DE	—WB3IFD	PJ7VL	—W2BBK
DL7ABY/ST2	—DF3NZ	PJ8DFS	—SM5AQD
EA8ZI	—SM5IWC	PY2ZTH	—JH1TIW
EM6F	—UF6FAA	PY0GP	—PY2CJW
EM6PB	—UF6PB	PY0ZZ	—PY7ZZ
F0FI/FC	—HB9ALN	SO5DW	—CT1DW
FG0FOO/FS	—N6RA	ST0AS	—DK2OC
FR7CE	—DF2OU	SU1BA	—K2IJL
FW0AA	—N0RR	T32AB	—W7OK
FW0VU	—DL2RM	TJ1BB	—AF4B
GB2SDD	—GW3EOP	TJ1SB	—DL6KB
H44MM	—K1MM	TN8QB	—DL7RP
HC1AV	—WD8KRU	U3ACM	—UV3FL
HI8KW	—VE3LNW	UG6GAF	—YU2RYV
HL9RB	—WD4NBX	VK4NIC/3X	—W4FRU (*See Note 1*)
HS4REL	—OE2DYL	VP1CW	—DK1PG
I8JN/FH8	—I8JN	VP1FB	—JA1ELY
J3AE	—K1EM	VP1WP	—G3YMD
J3AO	—W4YHB	VP2EV	—K8ND
J20/A	—W6ORD	VP2M	—W1CDC
J20CP	—DJ9ZB	VP2MDB	—W2WSE
J87BL	—W1JP	VP2MEA	—NE4R
J87BN	—W1JP	VP2MIX	—G6HC
J87BO	—W1JP	VP2SQ	—W2MIG
J88AB	—W2MIG	VP5FP	—WB4OSN
J88AG	—N0AFW	VP8PP	—W6TKV
J88AM	—VP2SAM	VP8PQ	—WA4GQS
JA1JWP/JD1	—JA1RJR	VP8PU	—WA4GQS
JH1NPX/JD1	—JH1NPX	VP8QG	—WA4GQS
JY9RC	—W1CKA	VS6IM	—K1MM
K3OX/VP9	—W2PD	VU2IG	—N7AGC
K4BF/CN8	—K4CEB	W9RBD/VP9	—W9VNG
K4FW/VP2K	—K4FW	W0RIF/CE0A	—W0RIF
K6LPL/CE0Z	—W6ORD	WA1SQB/ CE0A	—K1RH
KA3BLP/J6	—N2ATX	WN4FVU/A2	—N4NX
KA3BLP/ VP2A	—N2ATX	XW8HP	—JA3VLD
KA4DQR/TI2	—KA4FHG	YA1OS	—SM0DJZ
KA4EIN/TI4	—N5ANA	YB0AAG	—DL6FF
KC4USF	—WD4PGW	YC1GJ	—W2GBX
KC6DX	—W5UR	YJ8NPS	—KB2KN
KC6DY	—W5UR	YS1X	—DJ9ZB
		YT0R	—YU7BCD
		ZB2GR	—K2FJ
		ZD8RA	—N2FU
		ZD8RCA	—W8BLY
		ZD8RH	—G4DBW
		ZD8TC	—N2CW
		ZF2CK	—KA9EBG
		ZF2DX	—K0GVB
		ZF2EA	—K4LTA
		ZK1BD	—ZL1SZ
		ZP5GLS	—W3HNK
		ZS3AG	—WA2JUQ
		ZS3N	—DK2DZ
		3D2VU	—DL2RM
		4N7NS	—YU7BPQ
		4S7SL	—DL2SL
		5N0MAS	—JR1SSH
		5T5DX	—W2TK
		5T5ZR	—F2OO
		5W1DD	—OE2DYL
		5W1DE	—DJ0FX
		5Z4KL	—DL3WC
		5Z4YV	—JA2AJA
		6O6BW	—K4JLD
		6W8IC	—KB0QA
		6Y5KG	—VE3KGK
		6Y5MJ	—K8ZBY
		8P6CQ	—W2LZX
		9J2TJ	—N8JW
		9K2AH	—JA8BI
		9Q5AH	—DL5EW
		9Q5BS	—SM5CAK
		9U5JM	—F3LQ
		9U5WR	—SP6FER
		9V1RW	—SM5CAK
		9V1TK	—JA6RIL
		9X5AB	—ON8RA
		9X5FO	—DL5FX
		9Y4JA	—AC3A

A4XJH	—P.O.Box 981, Muscat, Oman
A9ZEX	—P.O. Box 22381, Muharraq, Bahrein
FG0FOK	—Yasme Foundation, P.O. Box 2025, Castro Valley, CA 94546
FM0FOL	—Yasme Foundation, P.O. Box 2025, Castro Valley, CA 94546
HI8XHJ	—P.O. Box 779, Santa Domingo, Dominican Republic
HM1SX	—P.O.Box 4736, Seoul, Korea
HT1KD	—P.O. Box 925, Managua, Nicaragua
JT0LAJ	—P.O. Box 180, Ulan Bator, Mongolia
LZ2EY/TU2	—P.O. Box 206, Uratza, Bulgaria
N2BA/HI8	—Brooke T. Allen, 132 E. 19th Street, Apt #6F, New York, NY 10003
P29NSF	—P.O. Box 165, Raboul, Papua New Guinea
PJ7ARI	—P.O. Box 142, Sint Maarten, Netherlands Antilles
TG9FU	—P.O. Box 2690, Guatemala City, Guatemala
TR8IG	—P.O. Box 740, Libreville, Gabon
TI9LI	—P.O. Box 4355, San Jose, Costa Rica
VP5RAC	—Pan Am, P.O. Box 4608, Grand Turk, Patrick AFB, FL 32925
VS5RP	—P.O. Box 413, Tutong Brunei
ZK1AC	—P.O. Box 529, Rarotonga, Cook Islands
ZS1ANT	—ZE1EQ, P.O. Box 2227, Bulawayo, Zimbabwe
5B4JK	—P.O. Box 1671, Nicosia, Cyprus
5B4IT	—P.O. Box 4872, Nicosia, Cyprus
5N0WNL	—P.O. Box 3197, Lagos, Nigeria
5T5JD	—Jose Dumoulin, P.O. Box 477, Nouakchott, Mauritania
6W8JU	—P.O. Box 971, Dakar, Senegal
9G1YS	—P.O. Box 7988, Accra, Ghana
9V1UH	—P.O. Box 2728, Singapore

Notes

1. For operations of VK4NIC/3X made by Karl Renz, K4YT, these should be sent to W2TK. All other contacts with VK4NIC/3X continue to go via W4FRU.

Thanks to contributors DJ9ZB, W1DQH, W2HN, N4SU, WB4ZNH, W5BED, N6TJ, KB7HB, W9LNQ, VK6NE, *The DXers Newsletter, The Long Island DX Bulletin, DX News Sheet,* and *The DX Bulletin,* for their support in preparing this issue.

Now that the weather is improving, it is time to check out the antenna systems. Check your coax. It may need replacing. Don't be like me and wait 10 years to replace it. My next project is to climb the tower again and find out why my control unit always points north no matter which way my antenna rotates. I'm tired of running out the front door to see where it is pointing — especially at night with a flashlight. 73 es much DX to you, de John, N6JM. □

Electronic ignition systems

Many vessels use electronic ignition systems for better engine performance. Some electronic ignition systems may or may not produce more severe radio interference than their Kettering predecessor. On some boats, the distributor, coil and pulse amplifier are physically widely separated. The interconnecting wiring is rich with noise. There are special filters to help reduce the amount of interference carried on these miniature high-frequency antennas in your engine compartment.

Alternator noise

Alternator noise makes an almost musical whining note on your Amateur Radio receiver, which varies in pitch with engine speed. Alternator noise is easily detected on any type of ham rig, whether it is a VHF 2-meter set, or a very expensive ICOM or Kenwood transceiver for high-frequency SSB.

Alternators are typically three-phase, 14-pole AC machines with a DC field and a 6-diode full-wave bridge rectifier circuit built in. The RF pulse repetition rate varies from 600 to 5,000 pps over the range of engine speeds. The amount or level of alternator noise varies with output current and is thus controlled by the regulator and by the amount of connecting load. When using high-frequency marine or Amateur Radio sideband gear when the engine is running, the alternator whine is easily detected on your *transmitted* signal.

There are alternator output filters available up to 60 amps. This is a low-pass filter in series with the heavy alternator output lead. There are also filters that feature a pi-section LC low-pass filter with low lead inductants. These are rated up to 60 amps continuous from 6 to 115 volts AC or DC.

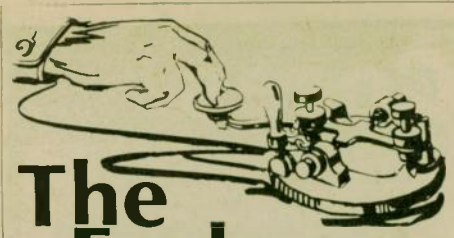
Voltage regulators

Voltage regulators, either mechanical or solid state, also will create a tremendous amount of noise. The older mechanical type of regulators generate radio interference because they regulate field current by chopping the field circuit with a vibrator, which may operate thousands of times a second. Solid-state regulators generate less noise, but some noise that sounds like a buzz or a hiss may be traced to them.

There is a time-warned suggestion about using a small 0.02mfd capacitor in series with a 10 ohm resistor across the field connection. This is ineffective at any frequency!

Relocation of the voltage regulator is one solution. Keep the leads as short as possible. It is usually easy to relocate the

(*please turn to page 40*)



The Exchange

Armond Brattland, K6EA

A National-International Net on the Novice 15-meter band

It is not possible to wait for results after the April issue to make further suggestions or offers of help. The numerous letters concerning the possiblity of reopening the 15-meter traffic net have at least one thing in common — all expect the subject will be publicized. However, all letters — with one or two exceptions — come from amateurs. These are Novices or higher, and have no actual experience in trying to organize such a net. Thus, the writers expect others to organize, merely giving them the "finished product" — an operating net. Several wanted two or more nets!

What we had in the National Novice Net

Several years ago, there were 67 names on the roster. Active members exchanged their telephone numbers and made some effort to handle written traffic. A few members did establish some liaison with the National Traffic System nets. A number of the members also kept in touch with each other by correspondence. One thing was lacking beyond the fact that members failed to bring traffic to the 15-meter net — there never was, and seemingly never could be, enough net control stations for all participants to be able to hear a net control.

If operations could have proceeded via relay stations, without need for regular net control stations, the net might have endured. Too many of the participants merely waited to hear a net control station and not hearing such, dropped out, not realizing that a short call on the net frequency might have given them a chance to pass on their traffic to a relay station, or volunteer.

Suggestions for a National-International Net/Novice 15-meters

The writer has even received several long-distance telephone calls from those who have written letters seeking the revision and rekindling of such a net. With limited time, I surely do not hold "the magic wand"; however, the reason given above appears to be the one thing that should not be repeated.

It is suggested that operation be carried out along the pattern established by ARTS (Amateur Radio Telegraph Society). Listen daily near 7060 kHz at 1400 Zulu, or ahead of such time in the East or Midwest. Determine the hour such groups are active and when you can hear them best. If you check the traffic count as given in QST, you will note that such net handles a large number of radiograms, in proportion to the number of stations that participate. It has also been suggested that you continue to listen to the National Traffic System nets you can hear. Learn everything possible about such various nets by listening, even if your license does not permit you to check into such nets.

Choose a snappy inclusive net designation

It is better to *not designate it a "Novice" net.* Holding net sessions on a Novice subband should be enough — Novices should need no other invitation! Some higher licensees need a special invitation to come to the Novice bands. Give it — publicize the frequency and explain that the net serves ALL AMATEURS; you need them all! Some amateurs seek other contacts at times, beyond those with written traffic. Amateurs on vessels at sea may have need of weather reports. There have been a considerable number of letters from amateurs who feel a National-International Net should and must serve beyond merely handling radiograms.

Study the ARRL Net Directory. Decide the purposes, and how narrow or broad the coverage should be to attract active participants. Decide the frequency to be publicized. There should be ample space above and below such net frequency for stations to go to from the net frequency. Remember, one purpose of all nets is to serve in case of emergencies. There are enough reasons to choose the middle of the Novice 15-meter sub-band besides merely a spot to "hit" by calibration. Just because YOU have a new, modern rig, don't forget that many others still determine a spot frequency by using a crystal calibrator and the demarcations on a dial.

1981 — another year, another chance for a new net

Although a considerable number of Novices and higher licensees plead for another net on the 15-meter Novice band and we all agree it is a good thing, compiling the pieces for such a net requires much more than mere wishful thinking. The fact that a few of you think in terms of separate nets to handle traffic, separate from other purposes, indicates that you expect others to do "the leg work!" *A nucleus must be established!*

Nucleus definition: "A central part or thing around which other parts or things are collected." A net nucleus is needed to assure future growth. This requires frequent repetition, so please bear with us. We do have stations that can help publicize the frequency and carry on schedules and correspondence on behalf of the net. All it will take is a self-addressed stamped envelope (SASE), and I shall gladly send you a list of those stations that will most likely respond favorably.

When writing and expecting an answer, kindly favor us with a SASE, as well as your telephone number and full address for radiograms. It is suggested that during the months of May and June you contact Sel Carlson, KA6ERF, 560 Greenbach St., Napa, CA 94558. Tel. 707 224-4274. Lists of those presently expressing an interest will be in his hands. I shall try to "surface" from a building project in July. The column is coming out on time and likely you've noted that date has been moved up! If you have something of interest for this column, mail it now at the earliest possible date!

The "Golden Rule" — There are a number of ways to help reduce QRM!

Be sure to thank thoughtful ones who call "QRL?" or "ie", or otherwise make inquiry on a frequency before they call "CQ." Also, thank those lazy, indifferent ones. *Just imagine anyone tuning up on the very net they expect to handle their traffic.* What about mess-kits? And did you ever hear a couple of loud stations on SSB, talking about their finals and high power; then, as they sign, realize they are within their same telephone exchange?! It

Maritime Mobile

(*continued from page 39*)

regulator within a foot or two of the alternator.

Rewiring of the voltage regulator will also help. Keep all the wires apart from other wiring harnesses. Try and use new shielded wires, making sure the shield of each is grounded at both ends.

Now add the special regulator filter. Filters need to be installed on each of the wires running from the regulator to the ignition key. Each of these leads should be bypassed to the regular chassis using capacitors rated approximately 0.2mfd at 200 volts, keeping the leads very short. It is important to remember not to bypass the field lead between alternator or generator and the regulator. Leave the field lead completely alone. Don't mess with it. If you try and use a filter on it, you're going to possibly ruin a component. Don't fool with the field lead.

Many varieties

There are filters for propeller shaft noise, filters for conducted motor interference, filters for your radar power supply, filters for your depth sounder, filters for your neon lights, and filters for just about any type of noise generation circuit you may have aboard. There is a specific filter for every type of noise found.

Filter locator

Your next question is probably where can you find a complete list of all the different types of filters for each different type of noise interference. It just so happens that two companies produce specific filters for marine and mobile Amateur Radio applications. Both companies are working closely with this author to offer our readers a comprehensive fact sheet and descriptive noise elimination pamphlets. These publications are available free to Worldradio readers.

For a free book on noise elimination, write Marine Technology Corporation, 2730 Temple Avenue, Long Beach, California 90806, attention Jack Honey.

For a descriptive pamphlet on specific noise filters for Amateur Radio, marine, and marine audio systems, write Pacific Accessory Corporation, 3613 West MacArthur Boulevard, Suite 603, Santa Ana, California 92704, attention Jack Patterson.

It *is* possible to eliminate noise in your mobile or on your boat. There is no one filter that will eliminate all types of noise. It takes specific filters at specific noise generation points in your electronic system. Eliminating noise from your mobile setup is like plugging leaks in a barrel. The job really isn't done until you have managed to detect every possible noise "leak" and plug it up completely with a specific noise filter. Good luck; you're going to be surprised at all of the signals lurking out there underneath the noise level you may now have! □

does seem there would be less QRM if all *believed in and practiced the Golden Rule of thoughtfulness in operating habits.* This subject bears further discussion!

"Buck Fever": possible therapy for chronic cases

Deer hunters get it. Some say they wouldn't be hunting if they didn't have a bit of it. But what's this got to do with Amateur Radio? Only this: you may have flunked code or theory exams because of it; you may have delayed going on the air because of it; and a few fear it is "terminal!" If you call "CQ" hoping none will answer; if your hands are sweaty, your eyes glassy; if at code speeds you usually copy, you miss much of what your contact said, you likely have something akin to "buck fever."

One hunting story tells of a hunter who pumped all cartridges from his rifle, never pulling the trigger, yet claims he felt the kick of his rifle. Sometimes amateurs break down and tell about their experiences during radio contacts, wondering if there is a "cure?"

This phenomenon is what actors call "stage fright." Every detail may be planned, but when it's your turn, you just can't perform as you planned. I remember a young man who was invited to operate the station in an office basement, when his parents objected to his operations at home. During one of his early contacts, he rushed up the stairs excitedly begging that I go down and finish the QSO. Upon doing so, I noted that the code speed of his contact was well within, or below, our friend's usual copying speed. Upon coming back upstairs, my father astutely remarked, "That must be strong medicine." Yes indeed, but why did the young man panic? It just must have been his turn to have "buck fever."

E.L. "Sandy" Sandefur, KA6LKD, advises that we can publish his letter. He writes: "I have been reading your articles in **Worldradio** and find them informative and entertaining. I have a problem and hope I'm alone? I have this thing I call "CW paranoia." I have been licensed since June 1980, but I can count on one hand the number of CW contacts from my own rig (solo). I've been told by other hams that we all go through this process.

I tune across the 40-meter Novice band; my dipole is on an apartment and my Hallicrafters only covers 80, 40 and 20 meters. I try to copy other Novices in QSO. At times I really become discouraged for, when I hear a QSO going at a comfortable rate, I find they have just signed off — I didn't even get calls!

Most Novices are trying to increase their CW speed so they can pass the code test for a General license. I think that's great, as I would like to trade my keyer for a microphone too, for I find that if I call "CQ" at the slow rate I can copy, no one seems to hear. I know my rig works, as I have made it to Utah and locally with 60 to 80 watts output into my dipole, with a SWR of 1.2:1. I had a lot a trouble with code when I took my class last winter — passed by the "skin of my teeth"; but the theory was easy, as was an A/C Electronic Tech. in the Marine Corps.

Now my XYL is planning to attend a class starting in February. I plan to attend with her, to help her with the theory and review the code myself. SO — guess what I'm asking is — PLEASE BEAR WITH ME WORLD! I hope someday to catch up with you. If any of you fellow Novices or Techs., (I passed for that in November) hear a "CQ" at a half or third your speed, please QRS. Give them a chance to practice, to build up speed and confidence. YOU WERE THERE ONCE. If there is anyone else out there with "CW paranoia" and you wish to start on the *second hand*, tune around 7.135 MHz and we'll panic together. I don't mean to leave the old-timers and super CW operators out; come down on the Novice bands — any band — some day or evening. Help a newcomer into the world of Amateur Radio. Who knows, you may be the very first contact. Do you remember yours? I do! It was KA5IRU in Macy, Indiana, from my "Elmer's" station, WB3GPR/6, as I did not then have a station. It was special for me, with my home state of Indiana. So please remember the newcomer, or those of us who are slower to learn. Please help us toward operating and enjoying our hobby!"

You tell it well, "Sandy!"

A letter from Utah, without permission to print, refers to the same problem. Such amateur tells about "falling apart" and "freezing up" so he cannot copy. That, without the pressure of a QSO, he copies at 14 wpm and much of it up to 18 wpm. In a QSO, he "falls flat on his face" and doubts at times if he can copy 3 wpm. He states that at times, "There is a little daylight," and is hopeful there might be "more sunshine." He continues, "I agree with your premise that one should do his or her practicing off the air, but sooner or later, one has to make the plunge." He concludes: "There is no way one can tell how good or bad they sound, except by being told by the other operator — friend, or foe." (Yes, there *is* a way.)

Have you a tape recorder?

In a number of past issues, it has been suggested that a tape recorder be used. "Send" to it and listen back, preferably after "letting it cool" for several days. Continue to listen to W1AW and you should be able to make up your own mind as to whether your performance is pleasing or not so pleasing. For practice, imagine yourself in QSO and record both sides. If you are inclined to "break up" try to figure out why — perhaps MORE PRACTICE will help. In trying to give an RST report, if the figure "9" bothers you, use "N". If you become frustrated because you have not determined the order you wish to use, make that determination before going into a QSO. One example: give a report during your second transmission instead of the first, unless it is going to be a "hit and run" contact. At least by then, you may know whether there is fading (QSB) and not be embarrassed by a previous "599".

No, Novices do not have exclusive space to practice!

Charles Colin, KA6EVN, understood that space for Novices was for them to work CW and upgrade. Fine, but it is not for them alone. As you indicate, if Novices don't upgrade — and even if Novices do upgrade — there is a continually growing space problem upon all the amateur bands! Also, another "shocker" for some — there are no restrictions against machine-sending if the output conforms to the requirements for legal code. Shocking to some, "heavenly music" to others!

Obtain a copy of Part 97, Rules and Regulations for the Amateur Radio Service. Every amateur should have it. Send $1.40 for Stock Number 004-000-00357-8 to Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Then decide for yourself. Do you still wish to try to introduce more laws, or insist that those we have be enforced? Do not forget — *there is much to be learned by listening!* □

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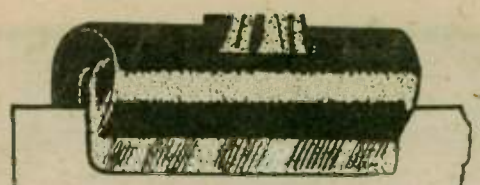
To the optimist, all doors have handles and hinges; to the pessimist, all doors have locks and latches.

—William Arthur Ward



TRAFFIC

Chuck Clark, K4ZN
Assistant Director
Roanoke Division, ARRL

Death messages

Writing in *Sparks,* the bulletin of the Carolina-Virginia Repeater Association, Ed Von Bergen, WB4ODZ, comments on what was said here in November of last year on death messages. He says, "My personal view is that an Amateur Radio operator has no business either in originating or delivering a death message and this applies equally to critical illness or serious injury reports. The only circumstances under which I would originate such a message at my station would be one verified by the American Red Cross and sent to another American Red Cross Chapter.

"Any such message received at my station, regardless of the addressee, will be immediately turned over to the local Red Cross Chapter for their verification and action. A priority service message will be sent to the originator advising of my action. The possibility of an error in identity or a 'lid' slipping a false message into the amateur traffic system, especially during an emergency, are far too great to take a chance."

Words of wisdom. While I would not be so absolute myself in following Ed's specific policy, I think it's a good guideline to follow. Amateur Radio is not a common carrier; we are not required by law to handle traffic the way Western Union is. If anyone presents a message to Western Union and pays the charges, the company is required to handle it. And as a result, the company is not responsible for the content of the message. As amateurs, we are free to accept or refuse any traffic that is offered to us; so if something turns out to be a hoax, we are involved.

Practically, what does this mean? If someone asks us to send a death message, or a message advising that someone is seriously ill or badly injured, it would ordinarily be best to use normal communication channels if any are available. If Amateur Radio is the only means of communication available, then of course we should accept the traffic, but only after satisfying ourselves that it is a legitimate message.

One reason I don't think we should make a hard and fast rule, however, is that much depends on who is asking us to send the message and to whom it is being sent. If these persons are amateurs or are regular customers of Amateur Radio's traffic service, there is much less danger of any problems connected with handling such messages. In fact, it is quite common for traffic to be passed informing other amateurs that someone has become a Silent Key. The point is, it's usually all right if you know the persons concerned or at least know they understand what Amateur Radio is all about, but you should be careful about handling traffic of this type for a stranger. You might be involved in more than you are bargaining for, and could also embarrass amateurs who handle and deliver the traffic.

Relaying poses no particular problem, except to be sure you pass the message on exactly as received. Don't, for example, let "Mother was hot" become "Mother was shot"!

It is the delivering amateur who has the delicate job, and if you have any doubt about your ability to handle it, better follow Ed's advice and let the professionals do it. His suggestion about contacting the Red Cross is excellent; in fact, I like it better than the directions contained in the Air Force MARS manual — letting a clergyman or law-enforcement officer make the delivery. As a clergyman myself, I am not aware of any special qualifications for this work that any mature and sympathetic person would not have, unless it were a case of delivering the message to persons with whom I regularly have dealings as a clergyman.

Law-enforcement people are more often called upon to break such news, and so have the experience to be able to do it properly. But many law-enforcement agencies are already greatly overworked and don't need any more burdens. The Red Cross is set up precisely for things like this, has the personnel and organization to verify the report and to communicate it to the addressees, so Ed's suggestion seems the best course to follow if you aren't sure.

If you do make the delivery yourself, you must give the impression of being a mature, competent, responsible person, sensitive to the feelings of others. In delivering these messages (and in delivering any messages for that matter), just tell the addressee what the message says, read the text word for word with no additions or comments. All you know is what is on the paper before you, and it is possible the words will mean something to the addressee that they do not mean to you. It is permissible to express your sympathy if that seems called for, but otherwise never forget you're an outsider — an intruder, even — in the private business of the originator and the addressee of the message.

It is debated whether Section 605 of the Communications Act protects traffic handled by Amateur Radio under its secrecy provisions. A recent FCC ruling says that Section 605 does apply to Amateur Radio's traffic, but many disagree. Since the FCC is not the official interpreter of the Communications Act, a court decision would be needed, and predicting how a court will decide is like predicting lightning flashes — you're almost sure to be wrong. Nevertheless, whether the secrecy provisions of the Communications Act cover our traffic or not, the conscientious traffic handler observes them, and makes it obvious to those we serve that we observe them, so that the people feel secure in letting us handle traffic for them.

Younger amateurs, moreover, should as a matter of course arrange for death notices and similar traffic to be delivered by an older person — preferably by one who is experienced in doing it — for the simple reason that many people will not find the word of a younger person credible, particularly in such circumstances.

Plain-language FCC rules

During World War II, the security people had posters in telegraph stations saying, "All telegrams except government messages must be in plain language." The meaning, of course, was that only government agencies were allowed to send messages in code. But several writers and new commentators remarked that government agencies don't know how to say anything in plain language. Indeed it does seem that one doesn't have to work long in a government job before one begins to speak in bureaucratese and legalese. And they seem to have a special course in how to properly split infinitives.

So the FCC deserves unstinting praise for having attempted to rewrite the Amateur Radio rules in plain language. The attempt in general was quite successful. They had already done it with the CB rules, to the astonishment of many who said it couldn't be done and that it was risky because legalese is a language that is the product of generations of experience in court interpretations and the like. The FCC is telling us they are not so concerned in telling the courts what they want us to do as in telling *us.*

If you want to see a copy, see any ARRL official, or any affiliated club. Or you can send a dollar to ARRL, 225 Main Street, Newington, CT 06111, and you will have your own copy. The new rules are indeed in plain English. But the Notice of Proposed Rule Making (PR Docket No. 80-729) is written in legalese, and the reprint of it in the **Federal Register** from which the ARRL's edition was reproduced contains a number of typos, misplaced headings and the like. In short, it's hard reading.

Here are some points of interest to traffic handlers:

It is too bad that they are proposing to eliminate Section 1, Basis and purpose. While it doesn't legislate anything, it is a splendid statement of what Amateur Radio is all about, and deserves to be retained.

The table of frequencies in Section 26 omits the 3300-3500 MHz band, but that seems to be an error, as the band is mentioned in other places in the new rules.

Section 97.34 of the new rules seems to exclude handling third-party traffic with maritime mobiles. It says third-party traffic may be transmitted only to amateur stations located where:

1. The FCC regulates the Amateur Radio Service.
2. Another U.S. Government Agency regulates the Amateur Radio Service.
3. The government regulating the Amateur Radio Service has a treaty with the United States allowing third-party messages.

That seems to leave out the high seas. And some of our most important traffic is handled with maritime mobiles. Radiograms and phone patches have proved an important morale builder for members of families kept apart for weeks and months by the need to serve at sea. I hope this will be corrected in the final Report and Order.

Section 97.33 of the new rules is even more frightening to traffic handlers. It tells us, "You may not use an AR station — (6) To retransmit, either live or delayed, transmissions of any station other than an AR station. (7) To retransmit, either live or delayed, transmissions of any AR station, except when your station is in repeater operation or auxiliary operation."

Paragraph (6) is simply a restatement of the rule already in force (Section 97.113 of the present rules), except that it adds the words "live or delayed" which make explicit what the FCC already did by dropping the word "simultaneous" when it amended the present rule about eight years ago. But the new rules also drop the phrase "by automatic means" which restricts us somewhat.

But Paragraph (7), if enforced strictly, would mean the end of the National Traffic System, as it forbids us to relay anything we receive from another amateur station. And it clearly forbids relaying traffic by making a recording and playing it back to send it to the next station. It also forbids using a reperferator to copy RTTY signals for relay, or re-transmitting another amateur's signals "so you can hear how you sound here." All this is a result of omitting the word "automatically" which is contained in the present text of Section 97.126.

We had better speak up and make ourselves heard on this point. After the FCC adopts the new rules it will be too late. And experience shows that FCC staffers tend to apply the rules in their most literal sense, so there will be citations for retransmitting messages sent by other amateur stations in violation of this rule "which clearly prohibits this."

Comments are due on or before 19 June 1981, reply comments by 19 August, 1981. A formal filing consists of an original and five copies (11 copies if you want each Commissioner to have one), but the FCC also encourages the general public to comment by filing informally, submitting only one copy. Address: Federal Communications Commission, Washington, D.C. 20554.

An encouraging note

It is good to see that the new rules in Section 97.36 have added to paragraphs (a) and (b) something that has always been tacitly understood — that in an emergency you may do whatever is necessary to help, even if it means bending the rules a bit. The FCC is not the kind of bureaucratic monster that insists on blind obedience even if it means letting a few people be killed.

"(a) You may use your AR station in any way possible to help a vehicle or ship in distress. When your station is on a vehicle or ship in distress, you may use it in any way possible to get help.

"(b) You must, at all times on all frequencies, give priority to emergency communications. Messages concerning the immediate safety of life or the immediate protection of property are emergency communications."

That should be plain enough. Now let's hope the people who disrupt emergency operations read this and realize it's illegal. It always was, but you had to look in Article 36, Section 2 of the ITU rules to find it, and few amateurs even know the rules exist. Now it's to be in the FCC rules, and everybody is going to be required to have a copy at the operating position or in the station records (New Rule Section 97.51).

Ready for the big shake-up?

Two physicists, John R. Gribbin and Stephen H. Plagemann, put their reputations on the line in 1974 when they published *The Jupiter Effect* (Walker, New York, also in paperback, Vintage Books). They showed, from a study of earthquake history and from recent findings in geology and astrophysics, that an earthquake is probable in the Los Angeles area in 1982, which will be more devastating than any other — anywhere — in this century. They also showed somewhat less of a probability of a severe earthquake in San Francisco.

In the early days of Amateur Radio, we were often called upon to provide communications over wide areas when disasters disrupted the commercial circuits. These days, with satellites, microwaves, buried cables and lots of redundancy, commercial circuits seldom are interrupted except locally; so we amateurs are usually called upon only for local emergencies that we can handle on VHF. But if Gribbin and Plagemann prove to be right, this year's Field Day and Simulated Emergency Test may turn out to be two of the most important exercises ever conducted on the amateur bands — a dress rehearsal for Amateur Radio's biggest relief operation in history. It may be that they are mistaken and we hope they are. But the arguments they marshal are impressive. □

Ever heard of the Geratol Net?

Bob McGarvey, WB2EVF

The Amateur Radio Service has so many services within its framework it is possible for licensed operators to spend decades scanning and listening and yet never find them all.

You may not be familiar with the Geratol Net, for example. And the originators didn't misspell the trademark. It's the acronym for "Greetings, Extra Radio Amateurs. Tired of Operating Lately?"

The Geratol Net operates at 3.787 MHz in the 75-meter phone band, on Friday and Saturday nights at 0100 UTC. If you're a horological purist, it's really Saturday and Sunday mornings by the Zulu clock.

The net for Extras had its beginnings in 1971, with Hank Clark Jr., K2DS, of New Jersey, and John Poepsel, WØNL, of Missouri — the originators. Its purpose was to keep the Extra sub-band, then between 3800 and 3825 MHz, busy enough so the FCC would leave it alone. The occupancy proved so successful the FCC gave the Extras an exclusive sub-band between 3775-3800 MHz and moved the Advanced licensees into the vacated 3800 spot.

The first award set up by the Geratolers was the 1×2 WAS. And that set the pattern, although Extras with calls other than 1×2s do check into the net and do work all states.

Barry Siegfried, K2MF, of New York City, is editor of the "*Geratol Net Newsletter*" and the man who has all the facts and figures at hand.

A Rutgers graduate, Barry worked on the board at WCTC in New Brunswick and now is chief control operator at WCBS Newsradio during its morning drive-time hours.

East Coast net control is John Ture, N4BA, of Virginia; Leo Knaust, WØGX, handles the duty in the Midwest from Missouri and Lloyd Hilbun, W7RQ, the West Coast, from Arizona.

Membership No. 1 is held by WØNL, and at last count there were 433 members.

Many Canadian and Latin-American Extras also participate in the net.

The Geratol Net obviously is not for everyone, but it's another indication of how Amateur Radio manages to provide for sub-sub-cultures within the sub-culture.

— *The Home News* □

TVI

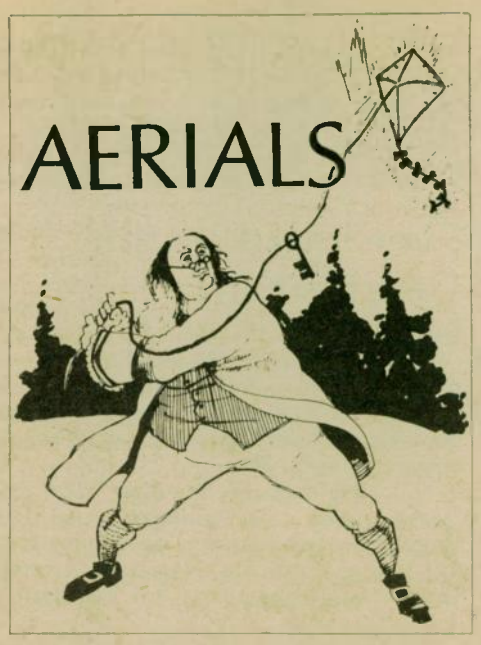
TVI — television interference — may be due to too long of a ground-wire. RG8U is recommended as ground-wire using the center conductor. Connect a high-voltage type 1000pF disc ceramic from the braid to the center conductor at each end.

— *Hualapai ARC Newsletter, Kingman, AZ* □

That's incredible!

J.A. Ross, W6JPS

On 21 March, Larry Ross, WA6PKI, of Fresno, California worked Larry Ross, WD8PKI, in Toledo, Ohio. Odds are quite long on this combo. □



Lil Paddle

I'm sure that seeing a woman's name on a technical column may start some teeth rattling among the more crusty curmudgeons of this audience. Before any of you misogynists go into apoplexy, let me point out that many of you two-letter types learned your CW at my knee.

During the era when the United States set out to *win* wars, I, as a civilian, was an instructor for the U.S. Army Signal Corps. I can't say at which base, for reasons that shall be revealed later.

I can copy code faster than Bill Eitel, am far to the right of Barry Goldwater and have climbed more towers than Bill Orr. (Lest you think I'm some sort of "Tugboat Annie," my boyfriend thinks I'm twice as pretty as Lenore Jensen.)

Let's get right down to some practical matters. I was talking to my oldest son the other night on 40-metre phone. (Although he runs a radio store, he is *terrible* on CW so I must go on phone to talk to him. It's awful to admit your own son is a lid, but that's the truth! The son from my second marriage turned out much better.) Anyway, he was telling me about a customer who had accused him of selling a "no-good" antenna tuner. Upon questioning, it turned out the customer had some 75-metre nets he liked to check into and stations told him his signal was weak. Seems his antenna was a 30-foot piece of wire in the attic. Now lads, don't blame the poor little tuner in a case like that. You cannot make chicken salad out of chicken feathers.

If you are not at least a quarter-wavelength on the band you wish to work, you will suffer for the effort.

Another oft-neglected item is the maximum importance of the ground in any form of end-fed wire. And, yes, good grounds are hard to come by in apartments. Alas, the only solution for our cliff dweller may be banishment to the purgatory that is 2 metres.

Speaking of grounds, there is some totally unmitigated balderdash in the radio (they called it wireless when I was a little girl) literature concerning grounds. For example, "If you are running a very short loaded vertical, the radials do not have to be as long as usual." Rubbish! More than ever, you need all the length you can get. If fact, the longer you can make the radials, in all circumstances, the better it is. Make them as long as you possibly can; the angle of radiation will lower.

Going back to tuners, if you should doubt the quality of the power transfer, here is how to test. (Kurt, you forgot this when telling about dummy loads.) Run the power output of your rig through a watt meter into a dummy load. Then hook the feedline to the coax input of the tuner. Take the single wire output and put that to the single wire post of the other tuner. Come out of the coax input to the watt meter and then to the dummy load. Adjust the first tuner to see 50 ohms back into the transmitter, adjust the second tuner to see 50 ohms of the dummy load, and match between tuners. If there is any power loss, you would see it by subtracting the reading of the second meter from the first.

But enough about coax. If you really want a good signal go OPEN-WIRE. (I suppose I'm dating myself when I talk like that.)

My son also told me about a customer who was very angry with him for several days because the customer claimed the purchased antenna was defective. It was discovered later that the customer had a short at the coax connector. Well, no idiot ever shorted open-line! The moral of the story is: before you open your mouth, ohm your meter.

It is possible for open-line to open. Once a cute lieutenant I was seeing was sent on a free trip to the Caribbean, as the military station there was not being heard well at all, and the staff manning it couldn't figure out the problem. After examining things, the lieutenant found a break in the open-line to the antenna. (No one ever accused Air Corps T-Sergeants of being overly bright.)

Now for some *real* garbage (I really shouldn't talk that way, but it is the only way to truly reflect the way I feel) I recently read. An article in a major radio magazine stated that reflected power was not lost power and was eventually radiated. If you believe that, I've got this great SBE-33 I will trade you for your Signal/One and you will be happy about the deal.

Look at it logically. *Why do the manufacturers reduce the power input on solid-state gear when the SWR goes up?* To protect the transistor. *From what?* From more current (forward AND reflected together) going through the transistor than it can handle. *How does this current show itself?* In heat!

Unless some marvelous thing has happened in the manufacturers' labs that they have not yet disclosed, the same energy cannot be dissipated in two different places. In other words, what is heating up the transistor is not being radiated. No way. In other words, you can't burn the same lump of coal forever.

The big bottles are not immune to the SWR damage either. U.S. taxpayers were nicked for a bundle when several very expensive 30L1 amplifiers were shipped from Thailand to Japan for repair. (The Thai station signal had been unreadable in Saigon.) A young officer was flown half-way around the world to check it out. It seems the NCOIC, instead of putting up two antennas — one for four megacycles and another for eight megacycles, switching to one during the day and to the other at night — decided to split the difference and put up one antenna for six megacycles. The result was more fireworks than usual during Tet.

You have seen the effect so you may accept the cause. There is a way to absolutely prove reflected power is not radiated, but it is quite involved, so we'll save it for a later time.

If you have any antenna questions, send them in; they will be forwarded to me and you'll see the answer here.

As a gift to the DXers who have read all the way through my first column, here are my predictions of the best nights for 20-metre DX in the Western hemisphere. These are local time nights, not Zulu: 19 April, 18 May, 17 June, 16 June, 15 August, 13 September, 13 October, 11 November and 11 December. Let me know how you did.

(Lil Paddle is not this columnist's real name, obviously. She works for a company whose policy is that all writing must be cleared through them. However, such transit time can be quite lengthy. She wants to write, is very near retirement and doesn't want to make waves.) □

Book Review

From Beverages Thru OSCAR

This book, as Ed McMahon might say, has "E-v-e-r-y-t-h-i-n-g you ever wanted to know about radio."

This is a bibliography which catalogs 30,000 articles from 292 different publications leaning heavily on Amateur Radio magazines.

It's 620 pages of every issue of CQ, **Ham Radio, 73 Magazine** and the last 34 years of QST. The publisher is Rich Rosen, K2RR/Ø. He's the son of the late Dr. Sam Rosen, WA2RAU, a well-known and enthusiastic DXer.

The subjects are broken down into 92 categories. Now anything you could ever want to know about Inverted-Vee antennas should be found in the 69 references listed.

The complete book is $29.95, including book rate postage. For $2 extra, you get it airmail from 6043 W. Maplewood Dr., Littleton, CO 80123.

Here's an interesting twist. If you should be interested in only a few subjects, you can order each one for $2 and 50¢ for handling.

For that reason we're going to list all the subjects here: Inverted-Vee antennas; Beverage and other wave antennas; Ground systems; Yagi-Uda parasitic antennas; Propagation-astronomy; Electronic scanning/steering; Super directive arrays; Miniature receiving antennas; Large loops: Quads, Deltas; Shunt excitation; Rhombics, Curtains (Bruce, Sterba); Ground plane verticals; Sloping antennas; Baluns; Wind loading-stress analysis; Collins receiver modifications (75A, 51J, S-line); Gamma/Omega match; Directive antennas, miscellaneous; Vee antennas; Measurements, techniques and instruments; Noise; Broadband antennas; Verticals; Siting; Log periodics; Miniature and reduced-size transmitting antennas; Helicals; DDRR antennas; Linear amplifiers and associated power supplies etc.

Eico 753 Transceiver modifications; Remote control devices; Preamplifiers; Heathkit SB series modifications; Phonepatch and telephone circuits; Noise blankers, limiters and indicators; Towers and masts; Stacking antennas; PC board fabrication and materials; Tuners-couplers-transmission lines and connectors; Alternate power sources; Converters; The Old Man; New Products (reviews); Squelch; Simple rigs and techniques (xmtr, rcvr, cpo); Signal enhancement techniques; Homemade consoles and construction hints.

Transformers, relays and triacs; Indices; Interference; Trap and stub matching; Radio regulations and licensing overseas; Tubes; Receivers; VLF-LF; SSB; Break-in; Loudspeakers, headphones and microphones; Solidstate circuits (xmtrs, amps, etc.); Hazards; Collinears; 50 MHz and up (VHF/UHF/microwave articles and ckts) & FM; Keyers, calling devices and readers; Antenna hardware; Surplus; Mobile (antennas, regs, etc.); Oscillators (including frequency synthesizers); Audio filters (passive and active); RTTY; Amateur TV — facsimile.

Solidstate pwr supplies-multivoltage tube power supplies; Repeaters; Counters-digital clocks; PC board artwork (specific circuits); Crystal-LC and mechanical filters; Interesting antennas; Theory; Components; OSCAR (satellites); Driven arrays — other than log periodics; 160-meter antennas and equipment; Computers, programming, microprocessors and peripherals; Writing; Binding magazines; 73 mag cartoons; Interesting circuits; Powerline circuits; Interesting articles; Yaesu improvements; Laser, optical signal processing.

There you have it, e-v-e-r-y-t-h-i-n-g you ever wanted to know about radio. Not quite, solder breath!

While there are a few notations marked "feedback" with articles referenced, what seems to be missing are the errata. Those three-month-later notations like "Sorry if you hooked it up as drawn, pin 7 and pin 9 were inadvertently reversed and it blew up." Or, "Oops, we left out three resistors and four capacitors and you went mad trying to get it to work," etc.

This book is a great service to radio amateurs, truly. Collecting all the wipe-outs would also be of great use.

Since this book now exists, there would be great value in central libraries of magazines maintained by amateurs, so the articles would be more accessible. Those of us with basements full of old magazines are in the minority.

This volume is obviously a true labor of love. A more complete listing of the addresses of the reference magazines would make it even more useful. How does one find *RTTY Bulletin, The Milliwatt, The Indian Radio Amateur, VHF Bulletin* of the Netherlands, etc.? How could I ever get a copy of "Proceedings of the ECOM-ARO Workshop, U.S. Army Electronics Command"?

For the amateur magazine references alone it is well worth the price, but locating some of the less familiar magazines would be difficult, as many might not be listed in *Books and Publications* at your local library.

From Beverages Thru OSCAR serves a real need. Clubs should consider a purchase for the benefit of their members. □

Book Review

Tornado-wise!

Chuck Clark, K4ZN

In February **Worldradio**, Vince Luciani, K2VJ, contributed an article on the Weller method of detecting tornadoes by using an ordinary TV set to pick up the VHF energy radiated by a tornado. He has published a more detailed study of the method — along with other information on tornadoes — in this 44-page 8½ × 11-inch booklet, telling what tornadoes are, what they can do, what is being done, what you can do, and about "your tornado detector."

The booklet concludes with four reader survey forms, which readers who use the Weller method and either detect a tornado by its use or fail to detect one that is within range are asked to send to the Iowa Weather Service.

If you are looking for a discussion of the physics of tornadoes, look elsewhere. Vince does touch incidentally on such questions, but the thrust of this book is not scientific. Its purpose is to tell us ordinary readers how to survive if a twister should head our way. Radio amateurs will be interested in the prominent notice he gives to the work of Amateur Radio in providing cooperative help to the National Weather Service both in furnishing additional eyes and ears to observe and report severe weather, and in providing communication when such storms disrupt regular commercial service.

Tornado-wise! is available from the publisher, Cologne Press, P.O. Box 682, Cologne, NJ 08213, for $3.95 plus $1 for shipping and handling. □

CONSTRUCTION

Chuck Clark, K4ZN
Assistant Director, Roanoke Division, ARRL

Keyer update

Several have written to say they have built or are planning to build the keyer described here in January. Although keyers are more likely to begin working immediately than some other types of electronic gear, they can have bugs too. Bill Graham, KB6XB, found one. In this design, if you send the letter N by shifting immediately to the dit after starting the dah, you will get the letter I because the contact on the dit side stops the dah. You get two dits instead of the dah-dit you want.

A quick fix for this problem is to add a diode (anything that will stand the supply voltage will do) between pins 2 and 4 of the 4013. This diode prevents pin 4 from going high when a dah is being sent. See *Figure 1*. Any readers who are planning to build the keyer are invited to contact your columnist for a copy of suggested modifications that have resulted from letters from others who have built the keyer. Address is Route 3, Box 800, Moncks Corner, SC 29461.

Vertical antennas

Even if fewer amateurs build their own gear these days, nearly all of us still have some construction to do on our antennas. If the only thing you have is a 2-meter hand-held with a rubber duckie antenna, or if you hire an engineer and a contractor to take care of your antenna, you are one of the few who have no antenna problems. The rest of us put up our own antennas, whether they are merely wires strung between convenient trees or commercially-built beams supported by purchased towers. It's hard to be a mere appliance operator when it comes to antennas. Even the most expensive ones listed in the catalogue have to be erected, and usually adjusted.

Another thing about antennas is that you have to fit them to the site and to the job. Some of us have acres of real estate, lots of convenient trees and and no neighbors within miles. Others have only a few rooms on the sixth floor of a high-rise. Some of us are mainly interested in chewing the rag, others are passionate pursuers of "real" DX. Some of us work all over the spectrum, others confine themselves to traffic schedules on a few spot frequencies, but want high reliability in meeting those schedules. And some of us live in mild climates while others have to contend with ice and wind. No less important, some of us don't have the wherewithal to purchase a 100-foot tower with a 40-meter beam on top, and may even have to dig deep in our pockets to buy the wire for an inverted vee. So the type of antenna we use is a decision each of us has to face.

There is no one best antenna. Each has its advantages and disadvantages. A beam gives you a stronger signal in its favored direction, but at the cost of weaker signals from other directions, so you need a rotator to secure the greatest advantage. A larger antenna is more efficient, but also requires more space. Selecting your antenna involves a number of trade-offs. You have to determine what you need and then try to find the best solution possible in your site, in your circumstances and within your means.

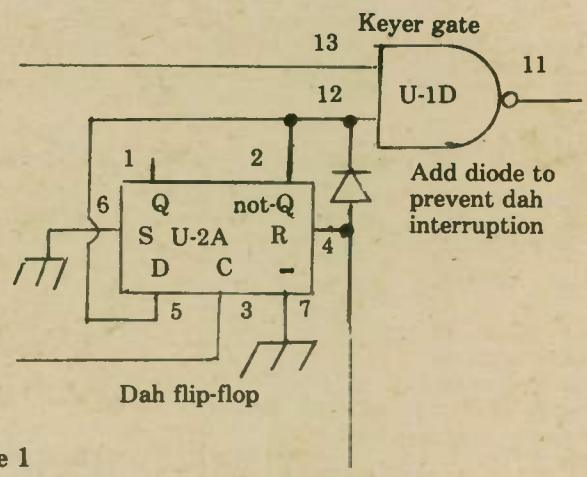


Figure 1

Most HF antennas are horizontal. Horizontal antennas tend to be more efficient in practice, are not greatly affected by ground resistance, and can be operated effectively on harmonic frequencies. Verticals can be used in some cases, such as in mobile operation, where they are the only practicable type of antenna. So here are some thoughts on vertical antennas.

Bigger and higher is not always better

It is axiomatic among amateurs that the bigger and higher your antenna, the better it will perform. For horizontal antennas, this is generally true. but not for verticals. In fact, size can even work against you. When a horizontal antenna is several wavelengths long, its pattern breaks up into a number of lobes, with the strongest running off the end of the wire, giving useful gain over a half-wave dipole. The same thing happens in the case of a vertical antenna, but this time the radiation goes almost straight up. The longest vertical antenna ordinarily used is ⅝ wavelength, which shows about 3dB gain over a half-wave dipole.

Putting the vertical high above the ground does not ordinarily bring better performance as it does with a horizontal antenna. As long as it is in the clear, a vertical antenna radiates as effectively at ground level as it does atop a high pole. The ground acts as a short circuit for a horizontal antenna, but as a reflecting mirror for a vertical.

Why, then, don't more amateurs use verticals? There is a saying that a vertical antenna radiates equally poorly in all directions. Over perfectly-conducting ground, a vertical antenna is fully equal in efficiency to any horizontal antenna. If you are aboard a ship on the ocean, you will find this to be true, because salt water is a good conductor of electricity. The same is true if your antenna is in a salt marsh. But terra firma is in general not so good. A quarter-wave vertical antenna has a radiating resistance of about 36 ohms. A ground connection could easily add another 36 ohms, and so half your transmitter's output would be expended in keeping the earthworms warm. In addition, poor ground interferes with low-angle radiation from a vertical antenna, and it's usually low-angle radiation that we want.

Grounds

It is standard practice today to bury wire in the ground near the antenna to im-

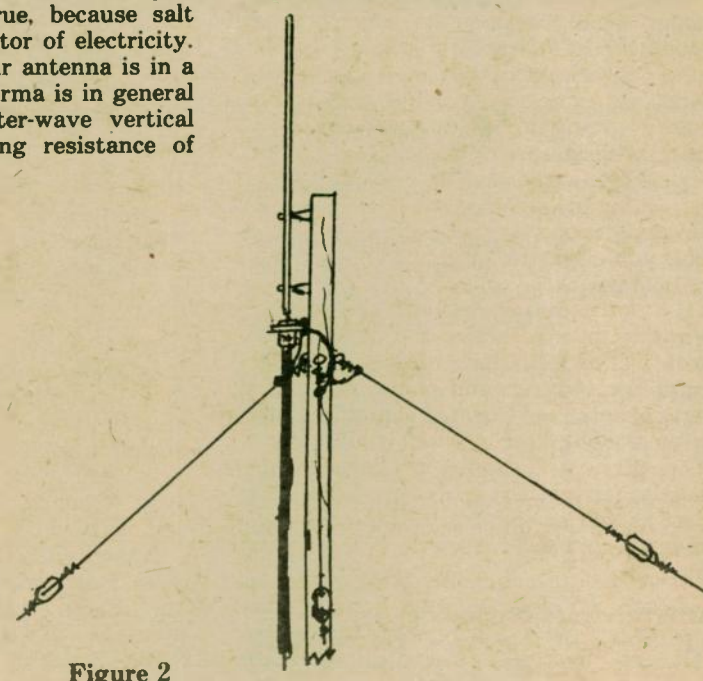


Figure 2

prove its conductivity. If possible, at least 16 pieces of wire a quarter-wavelength long should be buried if you want the antenna to have anything near the efficiency of a horizontal antenna. The wires should radiate from the base of the antenna and be connected to the shield of the coax. Copper is best, but any kind of wire will do. Many use aluminum clothesline. Some bury pieces of chicken wire instead of, or in addition to, radials.

Alternatively, you may be able to mount your vertical antenna atop a building with a metal roof, or atop a building with extensive grounded metal — such as piping, air conditioning ducts, electric grounding conductors, lightning rods, flashing, suspended ceiling supports — just below the roof. If you can locate the antenna so that it's a quarter-wavelength or more from the edge of the roof, you ought to be able to make your vertical perform.

It's not necessary to bury the radials. Wires suspended above the ground will work just as well. Such wires are called a counterpoise or ground plane. When the vertical antenna is located a quarter-wave or more above the ground, you can get good performance with as few as four radials. Often they are used to guy the mast as well (see *Figure 2).* Such an antenna can be an excellent match for a 50-ohm line.

Alterntives to grounding

If the need to have a low-resistance ground discourages you, there are other ways to make a vertical antenna radiate well.

A half-wave vertical antenna has a radiation resistance of about 2,000 ohms, so you can use a simple ground rod and still radiate with high efficiency. See *Figure 3.* Instead of using the parallel-tuned circuit shown, you can feed the antenna at the center with 50 or 75-ohm coax.

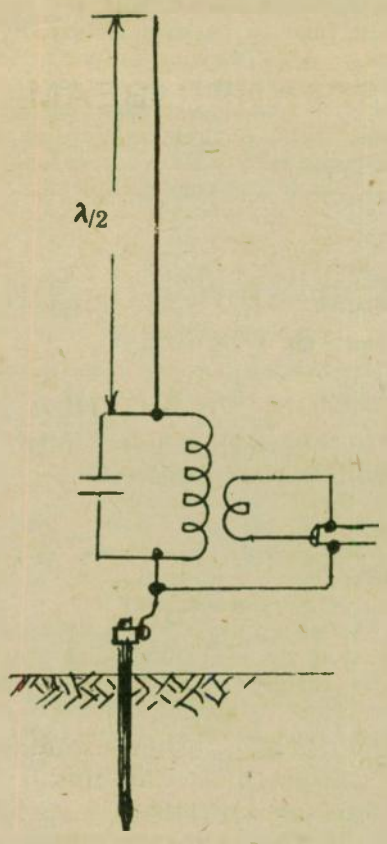


Figure 3

Using two quarter-wave verticals out of phase reduces the problem of poor ground considerably, as the ground is not part of the entire circuit. It does have some effect, however, as the radiating elements are still carrying a heavy current close to the ground. See *See Figure 4.*

An antenna of this type can give 3dB or more gain over a half-wave dipole because it tends to concentrate the radiated energy at low angles and in the plane containing the elements. But you don't get something for nothing; there's always the trade-off. A close-spaced pair of antennas like this, fed out of phase, has a low radiation resistance — usually only a few ohms — and this may make power lost in the circuit a sizeable part of the total, and may also cause problems matching the antenna to the transmitter output. If you're not careful, you might lose all that nice-looking gain.

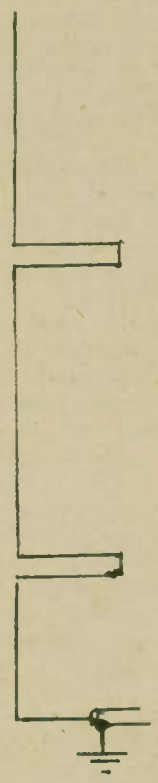


Figure 4

Gain antennas

It was mentioned above that a ⅝ wave vertical antenna shows gain over a dipole. Such an antenna is easy to feed: simply add a coil of 185 ohms reactance in series with the antenna and you can feed it with a 50-ohm line. That figures out to .105 microhenries per meter, so you use an inductance of 0.21 microhenries at 2 meters. The antenna is most popular on the 2-meter band, but can be used on any band — even on 160 meters, where it would be only 328 feet high!

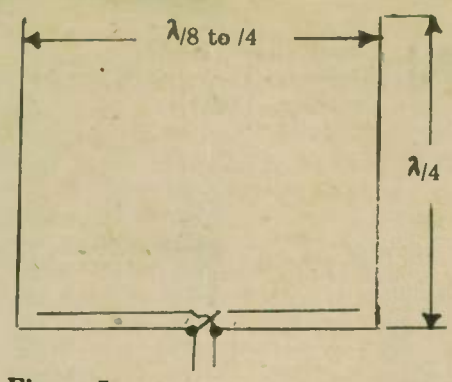


Figure 5

For additional gain, you can add half-wave sections separated by quarter-wave phasing stubs and have a collinear array. See *Figure 5.*

Another type of antenna that lends itself well to vertical construction was described in October 1978 73 by Harry Mills, W4FD, and Gene Brizendine, W4ATE. They call it "controlled current distribution." It involves simply inserting capacitors in series with the antenna radiating element at short intervals. For example, they built a horizontal antenna for 80 meters that was 280 feet long (85.34 m) with 48 sections each 70 inches (17.78 cm) long, with 46 capacitors in between the sections (none at the center where the feedline was attached).

In this antenna, the capacitors so change the phase of the current that the entire length of the wire is almost exactly in phase with every other part. This gives a maximum lobe broadside to the wire, and the minor lobes are less than those of a collinear array of the same length as depicted in *Figure 5. Figure 6* shows how such an antenna can be built as a vertical.

Finally, any amount of gain and horizontal directivity can be had by constructing an array of vertical elements properly spaced and phased. But there's no room to go into that here.

Multi-band antennas

Unlike horizontal antennas, verticals tend to be one-band radiators. That is one reason they have not been so popular among amateurs. Sometimes they can be made to work on more than one band, as, for example, a 7 MHz antenna will work quite well on 21 MHz, and a ⅝ wavelength antenna on the highest band can be used on lower frequencies by suitably loading it.

Many amateurs have used several vertical antennas cut for different bands, supported them all from a single mast, and connected them all to a common feed line at the base. The non-resonant antennas draw little power from the line, leaving it all to the resonant one. For best results, however, each antenna should be resonated in its final place with all the others connected, as they do mutually interact to a small extent.

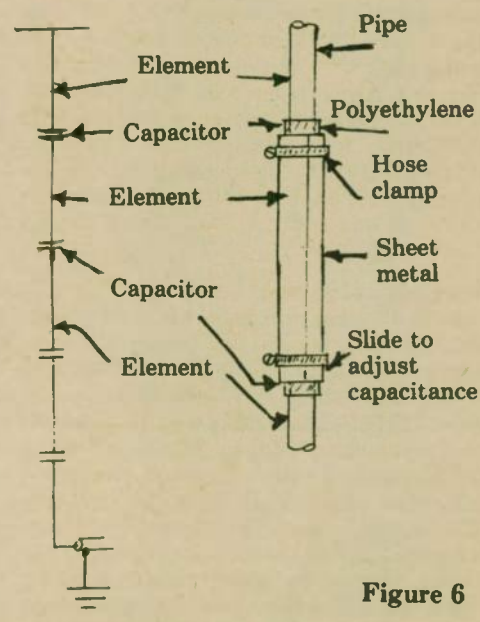


Figure 6

There is an all-band vertical antenna — the discone — shown in *Figure 7.* It can give a good match to a 50-ohm line over a 20-to-1 frequency range.

Short antennas

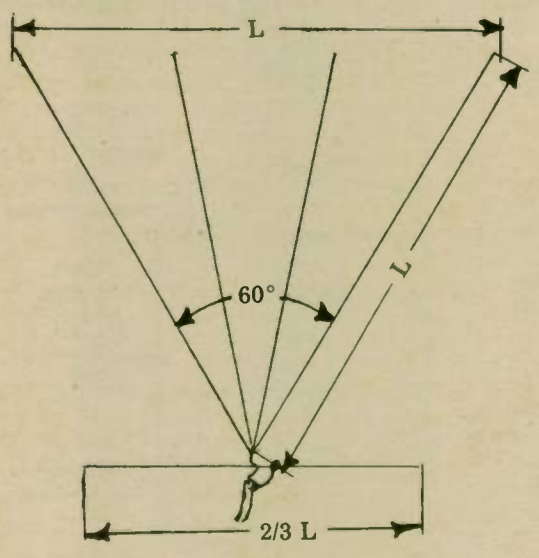
Vertical antennas are usually the only

practicable type for mobile service, and — on the HF bands — must usually be much shorter than a quarter-wavelength. To make them take power, it is necessary to tune out their reactance and to match their very low resistance to the usual 50-ohm output of the transmitter. There are several ways of doing this.

The simplest is to insert an L network between the transmitter and the antenna, a capacitor across the output of the transmitter and an inductance between the transmitter and the antenna. Other schemes use a loading coil in the middle of the antenna, a helical antenna with about a half-wavelength of wire wound around a plastic rod, top-loading hats adding capacitance, and various combinations of all these.

Some are more efficient than others, but all are poor radiators compared with a full-sized antenna. With a radiation resistance of an ohm or so, it's hard to get good results when the resistance of your matching network plus that of the ground is on the order of 15 ohms. There is no room to say more here, but you will find much on vertical antennas for HF mobile service in any number of handbooks.

One type of antenna for mobile service I'd like to try sometime is to put a vertical whip on front and rear bumpers and feed them out of phase with a loading coil in the line between them. The radiation resistance would be lower, but so would the ground losses. And the antennas would function as an end-fire array and have some gain. Has anyone tried it? □



L is about 0.3 wavelength at lowest frequency

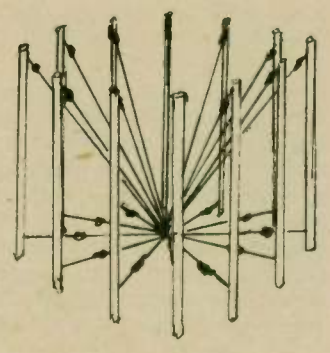


Figure 7

AMSAT/OSCAR

(*continued from page 33*)

nets on 3850 at 7:00 p.m. Local Time. Listen in. AMSAT needs 50 to 100 feet of RG 184 Teflon Coax. Can anyone help?

Coordinators

AMSAT needs two new coordinators for the Louisiana area.

UOSAT

The UOSAT magnetometer PC board has been completed and tested. W4PID is a new Southeastern U.S. AMSAT coordinator.

Ohm's Law

George Simon Ohm's *The Galvanic Chain, Mathematically Worked Out* was published in 1827. It was called a "web of naked fancies." Another critic wrote, "He who looks on the world with the eye of reverence must turn aside from this book as the result of an incurable delusion, whose sole effort is to detract from the dignity of nature." The German Minister of Education said that "A physicist who professed such heresies was unworthy to teach science."

Has it not ever been thus — that those in authority can't see the truth. I wonder how many students in courses in electricity would have agreed with these critics?

Lee DeForest

The inventor of the first electron tube triode (the "Audion"), Lee DeForest, was brought to trial on charges of using the mails to defraud when he sought to sell stock in his Radio Telephone Company. The district attorney, at the time, called the company a worthless enterprise and charged (in 1913):

"DeForest has said in many newspapers and over his signature that it would be possible to transmit the human voice across the Atlantic before many years. Based on these absurd and deliberately misleading statements, the misguided public . . . has been persuaded to purchase stock in his company . . ."

DeForest was acquitted. The judge in the case advised him to "get a common variety of job and stick to it."

What do lawyers know, anyway?

Lee DeForest's friends asked: "Well, of what possible use can your *radiotelephone* be? It can't compare with the wire phone, you say, and it can't cover the distances that the wireless telegraph can cover. Then what the h--- use is it anyway, Lee?"

The above anecdotes are from *Father of Radio, the Autobiography of Lee DeForest*, published by Wilcox and Follett Co., Chicago 1950.

The following sounds like something from the Reagan Budget Management Team:

"I am tired of all this thing called science here . . . We have spent millions on that sort of thing for the last few years, and it is time it should be stopped." But no, it was a quote from Senator Simon Cameron in 1861 in opposition to the budgeting of funds for the Smithsonian Institution in Washington.

If you appreciate these historical examples of the inability of the establishment in most fields to see the value of advancing technology, we'll try to gather more of them. You might let your congressman know of your interest in the advancement of space communications and space sciences, in this 20th anniversary year of the first amateur communications spacecraft and man's first orbit of Earth in the person Yuri Gagarin, the Russian astronaut and radio amateur. Perhaps you can persuade him to go lightly on the proposed cuts in science research budgets. The present attitudes in government spending might be tempered with the recollections of Sputnik and Gagarin's feat. We might be hearing a CQ DX from a UA on Mars.

Westlink

The Westlink Amateur Radio News Network has been broadcasting items of current interest to amateurs for the past five years. The programs are currently produced by Bill Pasternak, WA61TF, and Bill Orenstein, KH6IAF, and a news team from various parts of the country and around the globe. However, more reporters are needed for the Eastern, Southeastern and Gulf state areas. If you are able to provide inputs, send them to Westlink Radio News, 7046 Hollywood Blvd., Hollywood, CA 90028, or call (805) 251-7180. Westlink carries the latest reports on AMSAT/OSCAR activities among its news items.

The expenses of this operation have up to this point, been borne entirely by the two Bills — WA6ITF and KH6IAF. Rising costs of telephone lines and correspondence for its worldwide news gathering about Amateur Radio have made the operation a difficult one. Westlink has asked for help and set up a trust fund to be administered by this writer. A list of contributors to date is available to anyone interested. For contribution lists or to make a contribution, make checks payable to Westlink Radio News and send to Dr. Norman L. Chalfin, P.O. Box 463, Pasadena, CA 91102. □

'Star' shines brightly

Joan Ash, WD6BNH

One Sunday morning, in early January, Father Alberic Smith, OFM-WA6IMZ, solemnly approached the altar at the beginning of mass. As he looked down, Father Al saw a piece of paper on the altar with a message on it: "What's the monstrosity in the parking lot?" With a very straight face Father Al turned toward the congregation and made the following announcement.

"As we are here today, celebrating the Feast of the Epiphany, when the Three Wise Men followed the holy star to Bethlehem, I thought it would be nice to have a replica of that star for today's service. Unfortunately, we could not get it finished in time."

Then with a BIG smile, Father All added that the "star" was his brand new Amateur Radio Qubical Quad!! We are equally happy to announce that the "star" is now shining brightly and flying high near the bell tower at St. Anthony's Seminary in Santa Barbara, California. □

Gordon's first law — If a research project is not worth doing at all, it is not worth doing well.

THE AMATEUR'S WORKBENCH

Joe Carr, K4IPV
5440 South 8th Road, Arlington, VA 22204

This month we are going to open the column with a discussion on a certain feature found on certain oscilloscopes. A reader from Dallas (not J.R.) asked how the "A-INTEN" and "B-mode" sweep buttons on his Kikusui Model 5630 oscilloscope are used. These controls are found on recent-vintage triggered sweep oscilloscopes that have delayed sweep capability.

The delayed sweep method allows us to view small segments of a signal. Suppose we have a signal such as *Figure 1A*. Here we have a low frequency component with a pulse superimposed on it. There is also a small amplitude oscillation on the signal. How would we look at either the pulse or the oscillation? The triggering circuits of the oscilloscope will most likely see the low frequency component and initiate the sweep. In *Figure 1A*, the oscilloscope is triggering on the low frequency component, and the time base controls are set according to the frequency of the L.F. component. We can see the pulse clearly, but there could easily be some mystery about the minor oscillation on the left side of the picture.

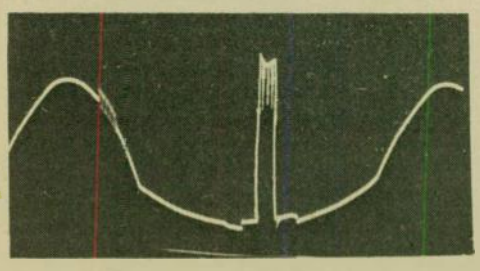


Figure 1A

On an ordinary delayed sweep oscilloscope, we would have to manually calculate the time between triggering (in *Figure 1A*) and the onset of the oscillation. We would then estimate the duration of the oscillation and set the time base controls of the oscilloscope accordingly. With the required time delay cranked into the delay control, we go to the delayed sweep mode and *presto!* the oscillation appears on the CRT screen! Right? Maybe — if you made all of those calculations correctly!

If you use the oscilloscope that is equipped with the B-mode sweep (you medical electronics buffs, please do not mistake the B-mode scan used in that field for this kind!), then you can be sure!

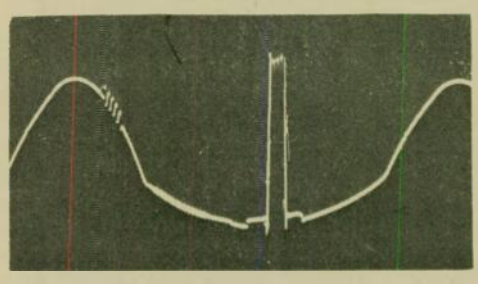


Figure 1B

When the A-INTENSIFIED button is pressed, a portion of the trace is made brighter than the rest of the trace. The intensified portion of our hypothetical signal is shown in *Figure 1B*, slightly to the left of the main pulse. In *Figure 1C*, we have moved the *trigger delay* control to position the intensified portion right over the pulse. This was done only for illustration purposes. We are actually going to look at the oscillation, but the photo was too dim and would not reproduce well on Worldradio's press.

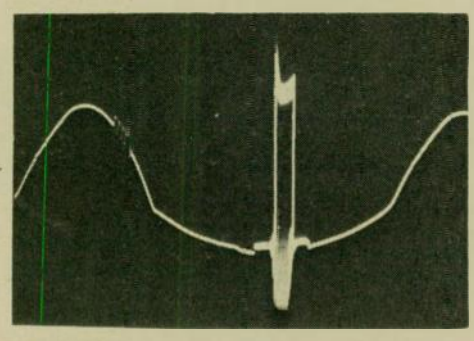


Figure 1C

The *position* of the intensified area is set by the *trigger delay* control. The width of the intensified area is set by an auxiliary time base control. On the Kikusui 5630, the B-mode time base control is concentric to the main time base control. These controls are varied until the intensified area is optimized over the feature on the waveform that is of interest. When this is done, the B-sweep switch is pressed, and the oscilloscope will display only the waveform of interest.

When bench testing one of these oscilloscopes, I made the waveform photos shown. The photo in *Figure 1D* is the oscillation that appeared on the left hump of the signal in *Figures 1A* and *1B*.

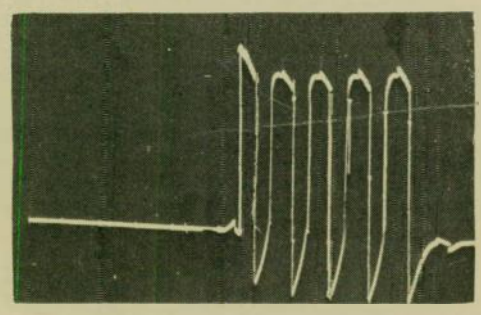


Figure 1D

Triggered sweep oscilloscopes are a lot more useful than the old-fashioned free-running sweep types. Similarly, having a delayed sweep capability makes the 'scope more useful than one that is merely triggered sweep. Add the extra dimension of A/B mode delayed sweep, and you have a very interesting and useful instrument.

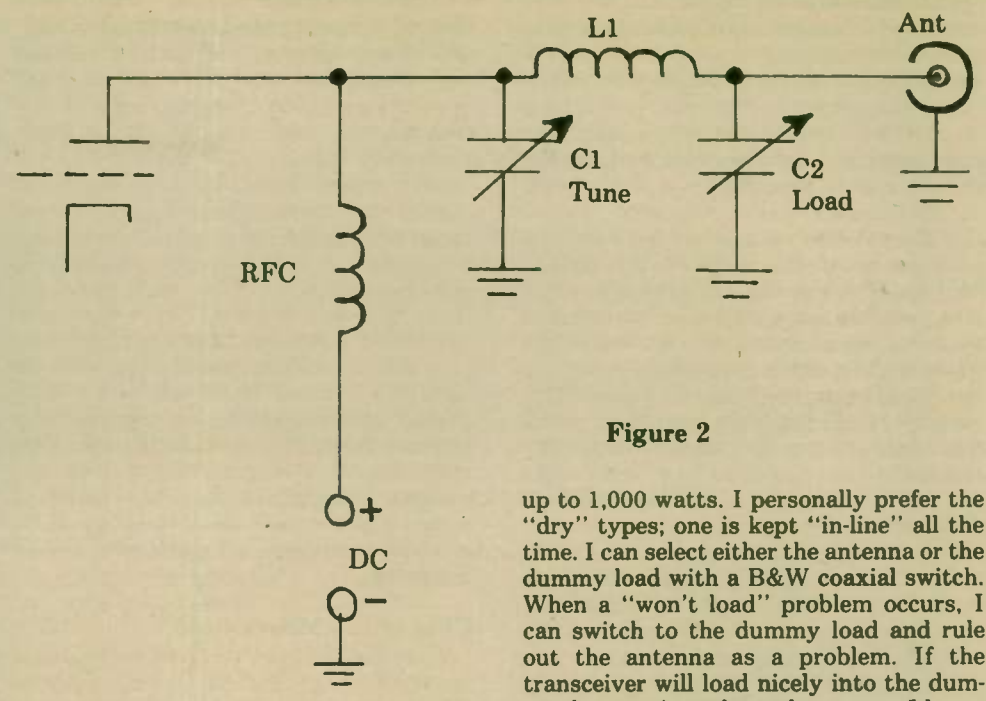


Figure 2

My rig won't load

This is one question that seems to pop up with a right fair regularity in the Workbench mailbag! I have seen it so often that I really haven't been able to answer everybody individually . . .so let's attempt to get at the source of the problem right here.

Let's make some assumptions first. The rig uses a vacuum tube final, and will have one or two tubes in the final amplifier. The output matching network will be the "pi" *(Figure 2)*, and will feed a coaxial transmission line of 50 to 75 ohms. These specs probably fit most of the rigs on the market today.

What do you mean by "won't load?" Does this mean the rig won't put out any power? That it won't tune up? I had one reader who told me the rig wouldn't load. On questioning, I found out the driver wouldn't tune either — it was not possible to peak the final amplifier grid current! The problem here was in the driver amplifier (a defective 12BY7, as it turned out), not in the final amplifier.

The first thing that comes to my mind when someone tells me his rig won't load is that there is something wrong with the antenna system, not the transmitter. This is one reason all amateurs should own a dummy load resistor. You can buy loads from MFJ, Dentron, Drake and Heath for very little money, and they will dissipate up to 1,000 watts. I personally prefer the "dry" types; one is kept "in-line" all the time. I can select either the antenna or the dummy load with a B&W coaxial switch. When a "won't load" problem occurs, I can switch to the dummy load and rule out the antenna as a problem. If the transceiver will load nicely into the dummy, but not into the real antenna, I know it's a fair bet that the problem is in the antenna — not in the transceiver! Of course, if the rig won't load into either the real or the dummy antenna, then the problem is in the rig.

But don't overlook the possibility that the line between the output of the transmitter and the dummy load is defective. It is possible, although not too frequent, to lose the ground connection on the coaxial shield. I have seen a case where the solder connection on the barrel of the PL-259 connector came loose and ungrounded the shield. This problem caused a "won't load" symptom.

Once it has been determined the problem is in the rig, it is necessary to figure out just where it might be. For the first step, I recommend swapping the final amplifier tubes. This is another thing most amateurs should keep on their workbench — a set of spare final amplifier tubes. Even the venerable 6146 goes soft from time to time. If your rig uses those insufferable TV sweep tubes, look for a

set of bad tubes on a periodic basis. I know one missionary who is nowhere near a local radio store. For a two-year assignment, he had to take six pairs of sweep tubes! Replace the tubes and try to load 'er up. I am assuming, of course, that you have already determined the grid current of the rig is working properly — indicating drive.

If the tubes were the problem, you are back on the air. But if the rig still fails to load up, look for other defects. Although it is possible for a capacitor to fail in a way that lifts the gound (dirt under the wiper contact of the rotor), this is not too likely. If the rig has a bandswitch, however, there might be a problem there! Switches wear out and become dirty. Try cleaning the switch with a residueless freon cleaner, and see if that makes a difference.

If your transmitter has an automatic load control (ALC), it is possible that something in the circuit is fouling up and causing the rig to mimic "won't load."

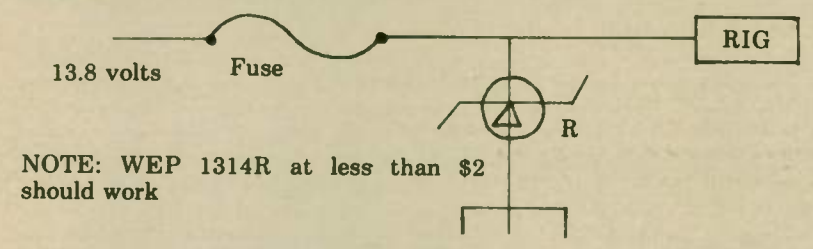
Another potential mimic problem is a shorted screen grid bypass capacitor. If all of the above have failed, measure the voltage on the screen grid(s) of the final while the rig is supposedly transmitting. Compare the reading with the value given by the manufacturer — it usually runs several hundred volts. NOTE: many electronic multimeters, with both analog and digital display, will not work properly around high power transmitters. For this reason, we need one of those lowly animals of yesteryear — the VOM.

Of course, if there is not screen voltage, replace the screen bypass capacitor — or the screen dropping resistor, as needed. Some rigs use a separate screen grid power supply.

Another potential failure is either loss of the high voltage power supply, or an open R.F. choke. If the choke (RFC in *Figure 2)* comes open, the rig will have screen voltage but no anode voltage. This may cause a slight "plate current" reading, especially if the plate current is metered in the cathode of the tube. Both of these conditions are detectable with a voltmeter.

Chip of the Month Club

Thus far, we have received no response for the Chip of the Month Club feature. While I realize it is a bit elementary, I believe a number of readers want it. So how about writing me and letting me know? □



NOTE: WEP 1314R at less than $2 should work

Save your mobile rig from damage

The following item was taken from the OH-KY-IN VHF ARS — Q-Fiver. Did you ever think what might happen to that expensive rig in your car if the voltage regulator went out? Modern alternators can put out more than 35 volts if uncontrolled. This would fry most rigs, even if only applied for a few seconds. The following idea for protecting your rig was found in the Jackson, Michigan Mini-Mag. All that is needed is a 15-volt 10-watt Zener diode and fuse that you probably already have.

12-volt systems operate at around 13.8 volts and should not get much above 14 volts. The device works like this: If the voltage rises above 15 volts, the Zener fires and attempts to bring the voltage down. As it does, it draws more and more current until the fuse blows. The Zener may be destroyed, but that is a small price to pay for saving your rig.

— *DARA R-F Carrier* □

PRODUCTS

License theory review

Announcing the new Amateur Radio License theory reviews, now available for the TRS-80 Model I and Model III computer systems. Absolutely nothing like them on the market! Now you can *upgrade successfully* — make your next trip to the FCC count! A recent survey indicates most of our customers (men, women and children alike) have already accomplished the task. Over 87% passed their first time up, each as a result of utilizing our Amateur Radio theory reviews!

Created by our in-house staff of licensed amateurs, MICRO-80 has eliminated the barrier which has hampered so many in their efforts to upgrade. Regardless of your license class or previous electronic experience, there is a software package designed expressly for you. Each review consists of 12 individual programs totaling over 160,000 bytes — all three license class reviews total 36 programs and nearly one-half megabyte!

Nothing is left to the imagination. All phases of Amateur Radio theory are segmented into a very comprehensive presentation: Rules and Regulations; Signals and Emissions; Practical Circuits; Circuit Components; Electrical Principles; Antennas and Feedlines; Amateur Radio Practice; Radio Wave Propagation; and Operating Procedures.

Over six months of research went into the development of these very popular study packages. Extreme caution was excercised to insure each program was consistent with the FCC examinations. To reinforce the user's knowledge of Amateur Radio theory, a unique scrambled answer routine was added to eliminate the possibility of memorizing answer patterns.

Have you had it with the hassle of trying to second guess the FCC or are disenchanted with the fact you have to spend so darn many hours preparing for the exam? Then the new Amateur Radio theory reviews are just what you've been waiting for!

Specify General, Advanced or Extra. Only $19.95 each, or the entire 3-pack set for only $39.95 prepaid.

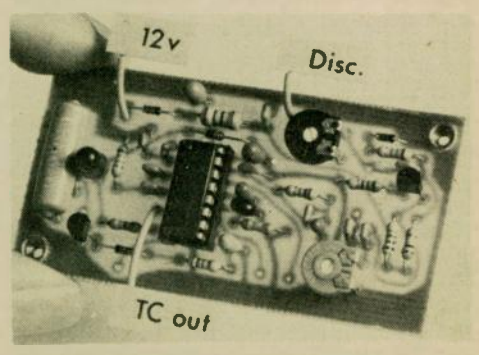
For further details about MICRO-80 (TM) products and services, write MICRO-80, Inc. W-2665 North Busby Road, Oak Harbor, WA 98277. □

Tail chopper

Circuit Electronics, Inc., of Salina, Kansas is introducing a new model — tail chopper, model TC-2200. Board size is 1.75″ × 3.75″. Features temperature-compensated op-amps and digital logic. 6dB sinad 10 milli/sec noise switch, maintains normal hysteresis, led to indicate squelching, an on-board 10-watt reed relay for tube squelch.

Model TC-2200 can be connected to most repeaters to eliminate squelch tails. Also has squelch enable-disable function for tone operation, simple hook-up: 12V DC — discriminator, and transistor or relay out.

The TC-2200 is a PC Board assembled with instructions for repeater or mobile use. Model TC-2200 $54.95.



For further information contact: Ray L. Hruska, 621 Bishop, Salina, KS 67401 (913) 827-4521.

The following is available from Circuit Electronics, Inc., 621 Bishop, Salina, KS 67401. Model TC-2300 — complete kit, including parts with PC Board and instructions, $39.95 plus $3 postage. Also, circuit board etched drilled, $9.50; IC-1, $8.25 □

'Mailbox' RTTY system

Macrotronics, Inc. has announced development of a disc-based "Mailbox" RTTY system for the TRS-80. This program transforms a TRS-80* disc system into a sophisticated RTTY communications terminal. The system has been designed for simplicity, yet contains many new features. Some of these are:

- Disc-based WRU with "Mailbox" storage and retrieval of messages.
- Disc-based programmable messages.
- Disc-based storage and replay of received text.
- Transmission and reception of 'BASIC' programs, Assembly Source listings, object code, and data files in INTEL Hex' format with error-checking and direct save on disc in executable form.
- Auto 10 minute ID timer.
- User-programmable end-of-line sequence.
- Word mode editing.
- On-line buffered ASCII printer-driver.
- Communications through the Macrotronics interface or the Radio Shack RS232C interface board.

It is expected the system will particularly appeal to:

- Repeaters — Set up in the WRU mode, it lets repeater users leave or play back messages. Special announcements, W1AW bulletins, propagation forecasts, DX bulletins, etc. can be made available. These may be created from the keyboard, created "offline" using the "Electric Pencil"* or "SCRIPSIT"* or saved off the air (and edited later with the "Electric Pencil" or "SCRIPSIT," if desired).
- MARS/Traffic handlers — The operator can save a message off the air to disc, replay it anytime on command, transfer it to another station's "Mailbox" and let him call it up later. With the "Electric Pencil" or "SCRIPSIT" disc program, he can edit the received text to correct "hits," insert "misses," add new text, rearrange paragraphs, etc. If his net requires a special "end-of-line" character sequence, he can program his own. Traffic can be originated by using either keyboard entry or the word-processing capabilities of the "Electric Pencil" or "SCRIPSIT" disc program to create text and save it to disc.

It can be transmitted at any time under keyboard control or transferred to a mailbox for automatic call-up by the destination station. For hard-copy of all traffic, the operator has to turn on a parallel ASCII printer connected to the Radio Shack parallel printer port, and all received and transmitted text is output to both video and the printer.

- Program Swappers — Programs and/or data files can be exchanged direct disc to disc. This includes BASIC, Assembly Source and object code. Using INTEL Hex format, the user can communicate in either Baudot or ASCII modes. A checksum gives automatic error-detection. Programs received in this way are directly executable from disc.
- High-speed ASCII buffs — The system allows communication through the Radio Shack RS232C interface board. The user can attach a conventional telephone modem and communicate over the air (or telephone) using Bell 103 tones and 300 Baud. The system will communicate through the RS232C board at Baud rates from 50 to 1200.

The M8000 disc-based RTTY system requires the Model I TRS-80 with at least 32K RAM and one Radio Shack Disc drive, plus a Macrotronics Ham interface — models M80, CM80 or TM80. List price is $150, or $100 with proof of purchase of M800.

The M8300 disc-based RTTY system requires the Model III TRS-80 with at least 32K RAM and one Radio Shack Disc drive, plus a Macrotronics Ham interface — Models M83, CM83 or TM83. List price is $150, or $100 with proof of purchase of M830.

Both systems come complete with customized program on disc, extensive User Guide in three-ring binder, quick reference card and conversion module. For complete ordering information or name of dealer closest to you, contact: Macrotronics, Inc., 1125 N. Golden State Blvd., Turlock, CA 95380; (209) 667-2888.

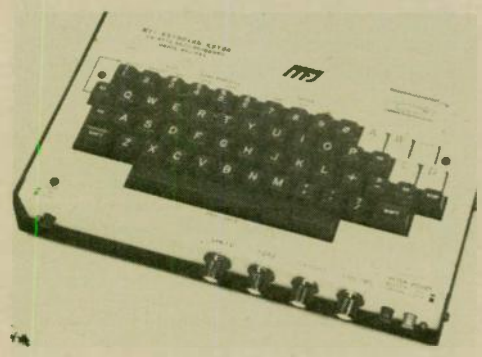
**TRS-80 is a recognized trademark of TANDY Corporation. "Electric Pencil" is a recognized trademark of Michael Shrayer Software. "SCRIPSIT" is a recognized trademark of TANDY Corporation.* □

Super Keyboard

The new MFJ Super Keyboard model MFJ-496 is a full-fledged keyboard that sends CW, Baudot and ASCII with a 256-character text buffer, 256-character programmable message memory, four automatic messages, two random code practice modes, speed and buffer metering, backspace delete function, buffer memory hold function, automatic serial numbering and repeat/delay function; just plug in your paddle and it's a full function keyer.

Simple one or two keystroke combinations execute all commands.

The 256 character text buffer can be filled prior to sending (pre-programmed) or it can be filled at any given speed if you type faster than the code is being sent. When the buffer approaches full, the sidetone pitch changes and the meter lights up red to warn you to slow down typing and avoid buffer overflow.



The 256 characters of programmable memory provide more than enough memory for a contester or DXer. The programmable memory is soft-partitioned for maximum efficiency, so no memory is wasted.

Four automatic messages let you call CQ, CQ TEST, QRZ, and identify your station without using up your programmable memory.

Two code practice modes let you increase your code proficiency. The first mode is pure random code with random length groups. The second mode is five-letter groups with eight separate repeatable lists (with answers to check your learning progress). Space between letters may be expanded to improve recognition, and you may select alphabet only or alphanumeric plus punctuation.

A meter tells you your sending speed (speed may be set before sending begins), or just push a button and the meter tells you how much buffer you have left.

The buffer memory hold function lets you hold the buffer memory or pause without loosing the buffer.

A push button lets you key your rig continuously for tuning and testing; a two-key stroke combination gives you continuous dits for tuning and testing that extends the life of your finals.

Automatic serial numbering from 0 to 9999 lets you number QSO's automatically for contests. You may easily program in any number to start.

The repeat/delay function lets you call CQ or anything that is in any memory and repeat it for as long as you want with from 0 to 99 seconds delay before repeating. You can call CQ while doing other things around the shack waiting for an answer.

To top it all off, the Super Keyboard is also a full-function memory keyer. Just plug in your paddles and it is ready to go with automatic and programmable memories and iambic operation with dot-dash memory.

The MFJ Super Keyboard, model MFJ-496, is available from MFJ for $339.95 plus $5 shipping and handling.

To order, call toll free 800-647-1800 or mail order with a check or money order to MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762. □

Arizona

The White Mountain Amateur Radio Association announces its first annual summer hamfest, to be held 5, 6 and 7 June at Blue Ridge High School in Lakeside, Arizona, just south of Showlow.

Commercial exhibits will be held in the cafeteria and a flea market swapfest will be all over the playgrounds. Also featured will be technical sessions in the classrooms, slow-scan demonstrations in the lounge, computer demonstration in the principal's office, bingo, raffles, prizes and more prizes! RV parking will be available (but no hook-ups).

For more information, write Harold Newman, Box 1042, Eagar, Arizona 85925. (Registration fee of $10 makes you eligible for big prizes.) □

California

Amateur Radio operators will gather in Fresno 15-17 May 1981 for the ARRL Pacific Division Convention and 39th Annual Fresno Hamfest sponsored by the Fresno Amateur Radio Club, Inc., at the Hacienda Inn, Fresno, California.

Activities begin with the annual golf tournament Friday afternoon, 15 May, wine-tasting and ARRL night in the evening.

Saturday will feature technical sessions on computers, antennas, construction and ARRL matters. There will be a CD (Communications Department) appointees meeting with emphasis on emergency communications, and a Public Information Workshop for all interested amateurs. (Clubs should be sure to have a representative at this one.)

There will be meetings of the various MARS branches for those belonging to this part of Amateur Radio. Sharpen your CW for QLF contest (left-foot CW) and your hunting skills for the transmitter hunt on 146.52 MHz. The latest in Amateur Radio equipment will be on display, and the Mermaid Patio will be loaded with goodies on the swap tables.

A men's and ladies' luncheon will be held from 11:30 a.m. to 1:30 p.m., featuring a live comedy act. (Please get your tickets in advance.) The ARRL Forum will conclude a busy day of activities.

The Saturday evening banquet will feature Roy Neal, K6DUE, as the keynote speaker. The Wouff Hong initiation will take place at midnight.

Come and meet ARRL First Vice President Carl Smith, WØBWJ; Ham Steinman, K1FHN, of membership services; Doug DeMaw, W1FB, of the technical department, and Director Bill Stevens, W6ZM.

Tickets are $18 per person for all activities including the banquet if purchased before 8 May, 1981, and $20 after. For those desiring to participate in technical sessions, commercial exhibits, contests, and swap tables, the price is $5 per person. Ladies program tickets are $7 per person.

Special rates for convention guests have been arranged with the Hacienda Inn. Make your reservation directly with the Hacienda Inn, 2550 W. Clinton, Fresno, CA 93705. Be sure to mention the ARRL Pacific Division Convention to get the special rate.

A talk-in station, W6TO/R; 146.34/146.94 will be available to assist those arriving from out of town. □

Contact Worldradio for hamfest prizes.

California

The North Hills Radio Club, K6IS, announces the 9th annual Sacramento Valley Amateur Radio Ham Swap, to be held Sunday, 31 May 1981, 9:00 a.m. to 3:00 p.m., at the Machinists Hall, 3081 Sunrise Blvd., Rancho Cordova, California.

The swap is free and open to the public. Club auctions, food and raffles will be some of the features. Bring your equipment and parts to swap or sell at the swap tables.

The grand prize to be given away is an Azden PCS 3000 — a 2-meter synthesized transceiver. Second prize will be a Tempo S2-T 220 MHz synthesized hand-held with touch-tone pad. Free door prizes will also be given away.

Talk-in on frequencies 144.59/145.19 and 223.18/224.78.

For further information, contact: Bill Musladin, N6BTJ, chairman — (916) 925-7814; or Ed Barstis, KA6GQW, co-chairman — (916) 483-1073. □

Colorado

The Rocky Mountain VHF Society will hold the annual spring hamfest on Sunday, 17 May, from 9:00 a.m. to 4:00 p.m. rain or shine. The hamfest will be at the Boulder National Guard armory at 4750 North Broadway. The admission donation will be $2 per family, and there is no sellers charge; set-up starts at 8:30 a.m. and we suggest you bring your own table. The door prizes will include a synthesized FM transceiver, and extra raffle tickets will be available.

In addition to the big ham swap, we are organizing formal technical demonstrations and seminars, covering topics such as fast-scan ham TV, microwaves, satellite communications, etc.

Food and drink will be available. The talk-in frequencies will be 146.16/.76 and 146.52 MHz. For more information, contact Richard Ferguson, KA0DXM, 1150 Albion Rd., Boulder, CO 80303. (303) 499-2871. □

Maine

The Yankee Radio Club will hold the Yankee Hamfest '81 on Saturday, 20 June 1981 at the Oxford County Fairgrounds in Oxford, Maine.

There will be: computer displays, talks on selected subjects, a ladies program, youth program, swap tables, flea market, manufacturers' booths, a CW contest, many prizes and a buffet dinner in the evening.

Registration will be $8, complete with dinner and prizes; $7 for early registration. Admission at gate will be $2.50 and includes prizes.

Camper hookups will be available for Friday and Saturday nights at $2 per night.

Talk-in by Don Dean, W1BYK, will be on 146.28/88 and on 146.52.

For more information and registration send SASE to Edward M. Fahey, Jr., W1OKS, 19 Farwell Street, Lewiston, ME 04240. □

Maryland

The fourth annual Frederick Hamfest will be held at the Frederick Fairgrounds on Sunday, 21 June 1981, from 8:00 a.m. to 4:00 p.m. Free parking will be provided. Included in the hamfest will be prizes, demonstrations, an FM clinic, exhibits, flea market tables and tailgating. Food and drink will also be available. Admission is $3, tail-gating $2 extra. YL's and children are free.

Talk-in on 146.52.

For information, contact hamfest directors Rick, N3RO, and Peg Ogden, N3AIJ, 9425 Glade Avenue, Walkersville, MD 21793; 301-898-3233. □

Michigan

The Chelsea Swap and Shop will be held on Sunday, 7 June 1981, at the Chelsea Fairgrounds, Chelsea, Michigan. Gates will open for sellers at 5:00 a.m. and for the public from 8:00 a.m. until 2:00 p.m.

Admission is $1.50 in advance or $2.00 at the gate. Children under 12 and non-ham spouses are admitted free.

Talk-in on 146.52 simplex and 147.855 Chelsea Repeater.

For more info, write to William Altenberndt, 3132 Timberline, Jackson, MI 49201. □

Michigan

All are invited to attend the seventh annual Midland Hamfest, to be held at Valley Plaza's Great Hall in Midland, Michigan on Saturday, 13 June 1981. Sponsored by the Central Michigan Amateur Repeater Association, the event will last from 8:00 a.m. to 2:00 p.m.

Admission tickets are $3 per adult, children under 12 are free. Table space will sell for $6 per 8-foot table; trunk sales $2 per space. Door prizes will be given away (a major drawing will be held at 1:30 p.m.). Free parking available. Also featured will be videotapes of the Saturn flyby and the OSCAR launch.

Talk-in on 146.13/73 and 146.52 simplex. For information, write to Carol Hall, WD8DQG, club vice president, 4651 Cardinal Drive, Mt. Pleasant, MI 48858; 517-772-0363. □

Michigan

The annual Monroe County Radio Communications Hamfest is 14 June 1981 from 8:00 a.m. to 3:00 p.m. at the Monroe Community College on Raisinville Road, Monroe, Michigan. Tickets $2 at the gate, $1.50 advanced. XYLs and children free.

Free parking will be available. Contests, an auction and displays will be featured. Also plenty of table space.

Talk-in on 146.13/73 and 52.

Contact Fred Lux, WD8ITZ, for information: P.O. Box 982, Monroe, MI 48161, or call 1-313-243-1088 Hot Line. □

Montana

The Sidney, Montana Amateur Radio Club will hold the 26th annual Eastern Montana Hamfest on 20-21 June at the Richland County Fairgrounds in Sidney, Montana.

Overnight parking will be provided. Other features will include a flea market, used gear auction, prizes and contests for all. A potluck lunch will be held Sunday the 21st.

Talk-in on .52 and 7240 kHz.

For more information, contact Ron Martini, N7BMR, Box 449, Sidney, MT 59270. □

New York

The Long Island Hamfair '81 will be held on Sunday, 17 May 1981, 9:00 a.m. to 4:00 p.m., at the Islip Speedway, Islip, New York. Sponsored by the Long Island Mobile Amateur Radio Club, this is New York's largest electronic extravaganza. It will feature: a swap and shop, manufacturers' displays, exhibits by various dealers, CB equipment, computers, television, satellite communications, a VHF tune-up clinic (where you can get your rig checked) and ARRL information.

Admission is $2 for buyers (spouses, sweethearts and children free); $5 per exhibitor/per space. No advance reservations are needed. Free parking will be provided, as will food and door prizes.

Talk-in on W2VL 146.25/85 repeater station or 146.52 simplex in the area. For additional information, call at night only: Hank Wener, WB2ALW, 516-484-4322, or Sid Wolin, K2LJH, 516-379-2861. Rain date is 24 May; next hamfair is 20 September 1981. □

Ohio

The 14th Annual Goodyear ARC Hamfest will be held Sunday, 14 June 1981 from 10:00 a.m. to 5:00 p.m. at Goodyear Wingfoot Lake Park, near State Route 224 and 43, east of Akron. There will be flea market space available to ticket-holders at no additional charge, and dealer areas. There will be picnic tables for those who bring their picnic baskets, plus concession stands for the "travel light" people.

Price of family admission and donation $3. There will be major drawing prizes, plus hourly door prizes and ladies prizes too. Ample free parking.

Talk-in and direction information 04/64.

For further information, please contact Don Rodgers, WA8SXJ 161 S. Hawkins Ave., Akron, OH 44313. □

Pennsylvania

The Reading Radio Club announces its annual hamfest, to be held on Sunday, 24 May 1981, in the Hamburg field house. Gates will open at 7:00 a.m. (EST) for set-up, and at 8:00 a.m. for the general public. This is a rain-or-shine event with indoor space available. Door prizes (cash and equipment) will be awarded. Food will also be provided.

Donations are $2 per adult (16 and over), $3 per inside table, and $2 for tailgating space outside.

Talk-in will be on RRC repeater 146.31/91 and 146.52 MHz. Write to Reading Radio Club, P.O. Box 124, Reading, PA 19603 for reservations. □

Pennsylvania

The 10th Annual MARC (Milton Amateur Radio Club) Hamfest will be held on 14 June 1981, rain or shine at the Allenwood Firemen's Fairgrounds, located on U.S. Rt. 15, four miles north of Interstate 80.

Time is from 8:00 a.m. to 5:00 p.m. Advanced registration for sellers is $2.50; at the gate $3. XYL's and children are free. Flea market, auction and contests will be featured. Also, cash door prizes, free portable and mobile FM clinic and supervised children's activities.

For further details, call or write: Harold C. Dennin, AC3Q, c/o Milton Amateur Radio Club, P.O. Box 235, Milton, PA 17847. (717) 538-5455 □

Wisconsin

A swapfest/family picnic will be held Sunday 13 May 1981 at Stevens Point, in Wisconsin Bukolt Park.

Doors open at 8:00 a.m. Swap tables $2.50. Registration $2; kids free. Grand prize is an ICOM 2AT handi-talkie. Dealers tables are free. Also featured will be a raffle drawing with more than $1,000 worth of prizes.

For more information, call or write Wayne Johnson, K9MIF, or Greg Gustafson, WD9EMR. □

Let Worldradio know what you do in Amateur Radio; many others will be interested in your experiences.

CONTESTS

RTTY DX contest

The fourth VK/ZL/Oceania 1981 RTTY DX Contest, sponsored by the Australian National Amateur Radio Teleprinter Society, will take place on the 6th and 7th of June with three classifications of operation. Awards will be issued for first, second and third places on a world basis and also on a country basis.

Complete rules will be published later, and if further info is desired, contact Bill Storer, VK2EG, 55 Prince Charles Road, Frenchs Forest 2086, N.S.W. Australia, who is in charge of this contest, or the Teleprinter Society at P.O. Box 860, Crows Nest, N.S.W. Australia.

— *Canadian AR Teletype Group* □

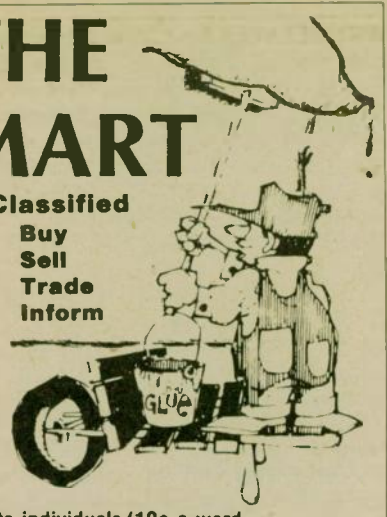
The Milliwatt Field Day Trophy — expanded program

The Milliwatt Field Day Trophy Award was initiated back in 1970 by *The Milliwatt: National Journal of QRPp* to encourage QRP operators to go out into the field and participate in the ARRL Field Day, and to provide them with a special form of recognition in the QRP world in addition to results published in **QST**.

With the tremendous increase in QRP activity, the two American QRP (under-five watts output) organizations — The Michigan QRP Club and the QRP Amateur Radio Club International (QRP ARC I) — have added their support to the Milliwatt program by sponsoring two new categories and an expanded awards offering. Participants in the ARRL Field Day can now compete in three categories: 1) The Milliwatt Field Day Trophy, for two operator/one transmitter class, under-five watts RF output; 2) the One Watt Field Day Trophy, for two operator/one transmitter, under-one watt RF output; and 3) the QRP Club Field Day Plague, for groups exceeding the two operator/one transmitter limit, under-five watts RF output.

In addition, certificates will be awarded to second through fourth places in each category (provided a minimum of 10 entries are submitted in that category). **SCORING:** QSO's X PWR MULT (5 watts - X4, 1 watt - X8) X 1.5 EMRG PWR (battery, solar, wind, etc.) ± 150 for full portable installation. **ENTRY:** Duplicate (Xerox, etc.) of ARRL Field Day entry or similar (summary sheet showing breakdown of QSO's by band, power used, type of power source, whether full portable or Class 1E, checklist of stations by band or log copy). Must be received by August 31 1981. Send to: Ade Weiss, WØRSP, 83 Suburban Estates, Vermillion, SD 57069. Results direct (include SASE or see QRP ARC I or MI QRP C newsletters, or QRP Column, CQ Magazine. □

THE MART



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Business firms/20¢ a word.

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2120 28th St., Sacramento, CA 95818

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FOR SALE: TEN-TEC CENTURY 21. Excellent condition, with manual, shipping carton and key, $200. Call 803/771-6746 or write, David, K4ZZB, 1113 Fairview Dr., Columbia SC 29205.

ROSS'S ALL NEW SPECIALS: AEA MM-1 morsematic $167., Isopole 144 VHF Antenna $39.90. Azden PCS-3000 $309.90. DSI 5612A-W $195, 5600A-K $139, 5510 $139, 3550-K $82. Dentron MLA-2500B $770, DTR-1200L $540, DTR-3KA $350, AT-3K $220; RT-3000 $260. Drake TR-7DR-7 $1250. ETO "ALPHA" 77DX $3820. ICOM IC-251A $595, IC-730 $789, IC-2A/NICD $200, IC-22U 2m FM 800ch $279.90. Kenwood TS-130S $669.80, TS-520 SE $550, TR-7800 $354.20. Yaesu Ft-901DM $1100, FT-901D $940, FT-207R $269, FTV901R $320, FSP-1 $16, NC-2 $60, FBA-1 $7, LCC-7 $28, FRG-7 $255. All prices cash plus shipping — $5 to $15. Any excess will be refunded. ROSS DISTRIBUTING COMPANY, 78 South State, Preston ID 83263. (208) 852-0830. Limited time offer.

WANTED FOR MEDICAL RESEARCH: Two Heathkit DX-60's. Will pay $120.00 each, Call Margaret or Bob, (415) 666-1593.

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Classified ads for jobs wanted or positions offered will be run free of charge in Worldradio's MART.

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