Worldradio

February 1981 • Year 10, Issue 8 • 80¢

Ubaldo DiBenedetto sits at his station, WA1TJW. (*Photo by Bruce Kelley.*)

True dedication takes no holidays

Mr. DiBenedetto has informed us here at **Worldradio** *that the running of this article in our February issue "would meet the needs of worldwide radio if it could champion one cause — the allocation of emergency frequencies on 10-15-20 meter bands by action of an international congress of amateurs and government officials. I would be more than happy to chair such an event.*

"The experience of trying to communicate with Italian operators to relieve the anxiety of relatives crying for news from the earthquake region, and failing to do so because of operators tuning on the frequency or just caring little for what was going on, was tellingly revealing. Emergency frequencies on a worldwide scale are needed! I'm presently working on a possible agenda and suggestions for consideration."

Sylvester J. Connolly, W1MD

Ubaldo DiBenedetto's Thanksgiving turkey dinner sat untouched, second in importance to the task of keeping communications open to earthquake-ravaged Naples.

Instead of sitting at his Cohasset (Massachusetts) dining room table, DiBenedetto, WA1TJW — who left his native Italy as an exchange student in 1948 — sat in his study before a 2000-watt radio transmitter collecting information about the damage and rescue efforts half a world away.

"It's the least I can do. This is my Italy, and there are people for whom we want to ease the anxiety," said the 50-year-old DiBenedetto. "I'm lucky, I'm thankful I wasn't there."

From 9:00 a.m. on into the evening, DiBenedetto spoke into his microphone and listened through earphones to the reports of his Italian counterparts.

"He hasn't eaten a thing. He's been so nervous," said Celia DiBenedetto about her husband, a writer and part-time professor of linguistics at Harvard University.

One of only 10 to 15 Boston-area Amateur Radio operators with a knowledge of Italian and transmitters powerful enough to reach Italy, DiBenedetto relayed to the Ancona and Fossanova operators, several hundred miles from the earthquake-stricken area, the questions and concerns of friends and other American operators.

When there were conflicting reports in the American media about the status of 20 young children removed from an orphanage in Senerchia, DiBenedetto contacted his associates overseas. Within minutes, the crackling radio voices answered in Italian.

DiBenedetto translated into English, saying the children were dead, contrary to early reports. But he smiled when noting that one woman was rescued in that same village after being buried under rubble and the bodies of relatives for 96 hours.

DiBenedetto was introduced to radios in the Army during the Korean War. About five years ago, he got his own ham equipment, and gradually built up a group of long-distance friends with whom he made regular radio appointments to chat.

Two of those friends are his chief sources of Italian news.

This was DiBenedetto's second experience relaying information during an emergency.

In the 1978 blizzard, he worked with

(please turn to page 3)

Fire — help needed

Ralph Swanson, WB6JBI
North Orange County EC

The North Orange County Amateur Radio Service had barely recuperated from the devastating Yorba Linda-Carbon Canyon fire when another holocaust broke out. All of Southern California was on pins and needles because this summer and fall was one of the driest on record. So when the fires began, most people were more than a little bit prepared. The hot dry Santa Ana winds which seasonally blow through the Southern California area at 50 to 60 mph certainly set the scene.

At 0600 on Tuesday morning, 25 November, I received a phone call from Ralph Alexander, W6RE, who was at the Red Cross Disaster Center in Santa Ana. He informed me that dreaded brushfires had broken out in a rather isolated part of the county — Modjeska and Trabuco Canyons. The Orange County Fire Department, in conjunction with California Department of Forests and the National Forest Service, were on the scene and Red Cross was requested to set up for possible evacuation of the few residents and also to support a First Aid Station.

Activation of the ARES was immediate. I notified all of the Assistant Emergency Coordinators, either by telephone or on the local repeater, WR6ACB. Jim Farley, WB6UIG, started scheduling volunteers for ARC Disaster Center as well as for an evacuation center and fire camp. As Emergency Coordinator, I reported to ARC Disaster Center with one of the AECs, Archie Miller, WD6CSL, to appraise the manpower needs and also to relieve Ralph, W6RE.

The ARC soon set up an evacuation center at El Toro High School and Wayne Zike, WB6AXT, was dispatched there to set up communications. The Fire Department and Forest Service also mobilized a fire camp at O'Neil Park, just south of the fire scene.

Unfortunately, due to the hills surrounding the park and the canyonous topography, the WR6ACB repeater could not reach into O'Neil Park. The only repeater that was full quieting into the area would be W6TIO/R in Laguna Hills and it was down for maintenance!

Meanwhile, Gordon Cole, WB6GUC, and Bob Reitzel, KD6DA, headed for the fire camp to try to establish a communica-

(please turn to page 50)

Moped covers Rose Parade

Dr. Norman L. Chalfin, K6PGX

This year, the Tournament of Roses annual parade in Pasadena, California was once again serviced by amateur volunteers providing communications via 2 meters and ATV for the Parade Operations Committee.

There were nearly 100 operators positioned along the parade route, the assembly area and at the float construction barns to keep parade officials advised of the progress of floats from the barns to the assembly area, the arrival of various floats at their designated positions in the parade, and of the equestrian and band units in their places along the assembly area. Along the parade route itself, the communicators provided details of float failures and other emergencies, as they arose. One emergency involved the assembly and noisy activities of a political activists' group, which necessitated a number of police units to dissipate the crowd and disperse them.

Several communicators were aboard the people movers that carried parade personnel and amateurs to their positions. The people movers also served as ambulances.

The ATV group was positioned at five locations, one of which was MOPED MOBILE. This is believed to be a first for both amateur TV and for the parade route. It may even be the first time anyone attempted to transmit TV images from a motorbike.

The Voice and overall amateur operations were under the direction of Fred Edmunds, WB6OJK, and Bud Boulton, WA6AAD. The ATV operations were organized and directed by Ernie Williams, WB6BAP.

Below are listed the ATV locations and their operators:
Command Trailer: (net control)
Bill Tarn, WB6OFG
Under Grandstand Monitor:
Steve Sparks, WA6BJP
Grandstand Camera #1
Ernie Williams, WB6BAP
Hugo Annas, KA6CGF
Camera #2 (Crocker Bank Roof)
Gary Eldridge, WD4SQZ
George Svet, WA6AQV
Camera #3 (Lloyds Bank Bldg.)
Mike Collis, WA6SVT
Phil Smith, WB6LQP
Camera #4 (Van at Colorado and Sierra Madre)
Doug Brutsche, KA6AGO
Hank Landsberg, WB5MEU
Camera #5 Moped
Tom O'Hara W6ORG
Marianne O'Hara, WB6YSS (Mrs. Tom O'Hara)

Signals from each of the camera units were transmitted on 434 MHz to Mount Wilson, where WA6SVT's ATV repeater retransmitted on 1241 MHz. All positions were equipped with either ring yagi for 1241 MHz reception or a dish. Each ATV transmitting unit on the parade route used crossed dipole 14-element beams for 434 MHz. The Moped operated with a 434 MHz-loaded vertical whip that produced successful images.

(See photos, page 3 and 34)

STAFF
Armond Noble, N6WR
Chris Wilson
Jeanette Inouye
David Tykol, WA6RVZ
Jack Schwartz, WA6TRZ
Norm Brooks, K6FO

Worldradio™
is published monthly by
Worldradio, Inc.
Offices at 2120 28th Street
Sacramento, CA 95818 USA
Telephone: (916) 457-3655

February 1981 Vol. 10, No. 8

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.

Morality support

Rev. Orval Dunkeld, ZE1EF, a missionary in Zimbabwe (formerly Rhodesia), needs two 75-meter monobander rigs for use in a missionary radio net on 3880 kHz. Heath HW-12 or Swan 175 units are suitable for conversion to crystal control, and will work fine. Contributions of such a rig to The Evangelical Alliance Mission is tax deductible.

If you have a rig you wish to donate, or which you would sell for nominal cost, call George Goldstone, W8AP, at (313) 647-3399; he will arrange for pick-up, conversion to crystal control, and shipment to Zimbabwe. □

Want a pen pal?

In our December issue, page 17, we ran a letter from Marc DeMoor, ON1GR — a Belgian Amateur Radio operator who said he was collecting radio-related publications from all over the world. He asked if some of our readers could send him copies or addresses of such.

He was also looking for a pen pal who is a radio amateur or, at least, interested in radio. His full address was not given, however, which could make it difficult for Marc to receive letters! His full address is:

Marc DeMoor
Vredestraat 13
B-9720 DePinte
Belgium, Europe □

ARARAT NET

ARARAT NET = ARmenian Amateur Radio And Traffic Net

Present sked:

ARARAT Net #1 — Sat 9:00 am, ET — 3.970+
ARARAT Net #2 — Thu 10:30 pm, ET — 14.340+

For additional info contact:
Stefan Karadian, N8BGD
7127 Brookridge Drive
West Bloomfield, MI 48033
(Tel: 313/851-1357)
We speak Armenian es English! □

Price correction

The August issue of **Worldradio** contained a book review of C. Schwartzbard's *Vertical Users.* The price quoted for the book at that time was $5.95. Dr. Schwartzbard has informed us of a change in that price to $3.95, plus $1 for postage and handling.

The book can be ordered by writing to Danrick Enterprises, Dept. 27, 213 Dayton Ave., Clifton, NJ 07011 □

Protect your gear

Gene Gazzola, KA7AFW

The FBI in Washington, D.C., maintains a computer file listing of stolen property — the National Crime Information Center (NCIC). Any police department with a computer terminal can check a serial-number in a matter of seconds to see if it's in the NCIC file as stolen.

The number you need to engrave on your rig is an OAN (Owner Applied Number) and it should be the one that's already in the NCIC computer — i.e., your state driver's license number, preceded by your state's two-letter code. Example: Your driver's license number is T123456. So, your OAN is AZT123456. (AZ is for Arizona). By using your driver's license number, you have automatically linked your gear with your name and address.

The way this engraved number is actually most often used is when a local detective nabs someone with what looks like "loot." If he sees what he recognizes as an Arizona OAN engraved on it, he goes into the computer and runs a check on the owner, who then can testify in court against the suspect.

Sorry to say, the local police may be more interested in making a court case than in getting your rig back to you, but it sometimes works out that you do get it back anyhow.

P.S. Your Social Security number doesn't mean anything to NCIC, so don't use it.

—Desert AIRE Waves, Arizona □

Computer/Amateur Radio nets

Listed below are some computer-oriented Amateur Radio nets. They may help you with any problems or programs:

Computer	Day	Time EST	Frequency
Apple	Sun.	9 pm	14,329
Apple (East)	Sat.	8 am	7,260
Atari	Sun.	8 pm	14,329
Dig. Group	Sat.	11 am	14,281
	Sat.	5 pm	7,190
SWTP-6800	Sun.	9 pm	14,250
TRS-80 Tandy	Sun.	3 pm	14,342
	Sun.	6 pm	14,342

November 1980 — AMRAD Newsletter, Washington, D.C. □

Licensee figures

As of 31 October, the total number of FCC Amateur Radio licensees numbered 380,547. The breakdown follows:

Novice	71,659
Technician	69,309
General	124,170
Advanced	38,556
Extra	26,144

INDEX

FEATURES

COLUMNS

Worldradio to the rescue!

Jerry Boyd, WA6CUP

The City of Laguna Beach City Council at its 16 December 1980 meeting voted unanimously to reject a restrictive antenna ordinance, which city staff had proposed following the receipt of one citizen's complaint regarding an Amateur Radio transmitting antenna.

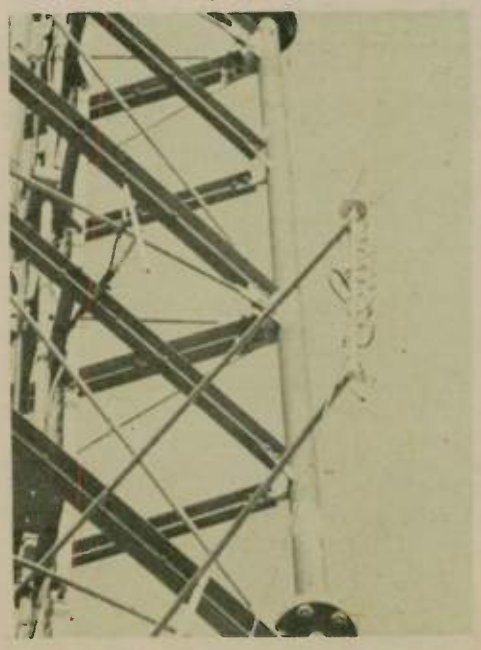
The proposed ordinance, had it been adopted, would have imposed a 25-foot maximum antenna structure height in residential areas and 36-foot maximum in commercially zoned portions of the city. While conditional use permits could have permitted taller structures, the language of the proposed legislation made it almost impossible for antenna structures anywhere in the city to exceed 36 feet. The ordinance which city council considered also failed to contain an exemption for existing antenna structures, most of which exceed the proposed height limitations.

City council accepted both written and verbal input from several members of the south Orange Amateur Radio Association. Club repeater Trustee Bob Sackett, W6TIO, stressed the role which Amateur Radio has played over the past two years in several major brushfires and two large landslide disasters. The success of Amateur Radio communications in Laguna Beach, which is characterized by hilly terrain with numerous deep canyons, was tied directly to reasonable antenna heights.

The case on behalf of Amateur Radio was significantly assisted by providing city council with copies of **Worldradio**, which contained articles dealing with recent court cases as well as articles documenting assistance rendered to the City by Amateur Radio operators during time of disaster.

City council instructed city staff to completely re-write the proposed ordinance to eliminate the 36-foot maximum height limitation and to allow for the construction of antenna towers less than 25 feet in height without the need for any special permit.

The successful opposition to this restrictive ordinance was due to the presence and well-reasoned arguments of many long-time Laguna Beach amateur operators. Especially valuable were the comments of Bill Montgomery, WA6ZSS, and Bill Robb, W6REE. □



This 1241 MHz transmitting antenna on Mt. Wilson, along with Mike Collis, WA6SVT's ATV repeater, provided ATV coverage of the Rose Parade in Pasadena, California on New Year's Day. ***(K6PGX photo)***

True dedication

continued from page 1

South Shore Hospital and amateur operators who had skimobiles to get rides to work for doctors and nurses.

Not only is DiBenedetto kept busy with his radio, writing (he's written *Three Faces of Don Quixote*), and teaching (he teaches a graduate course in Comparative Linguistics at Harvard), he is also makeup artist for Cohasset Playhouse and D'Orly Carte opera company, an amateur filmmaker, and guest commentator on Channel 5 TV. He holds a B.A., M.Ed., M.A. and a Ph.D. In 1976, he was given the "Jose Vasconcelos" Gold Medal Award for literary criticism. UPI has called the award the Pulitzer of Latin America.

"I have been an amateur since 1976," writes DiBenedetto. "I love it. The dynamics of the hobby, the humanitarian aspect, the extension of vision and knowledge in the area of human relationships which Amateur Radio gives me have no equals."

— Boston Herald American; additional information from The Patriot Ledger, Quincy, MA □

If you received this publication and are not a subscriber of WORLDRADIO, it was no accident. Please consider it an invitation to join. We can be very friendly.

Figure 1

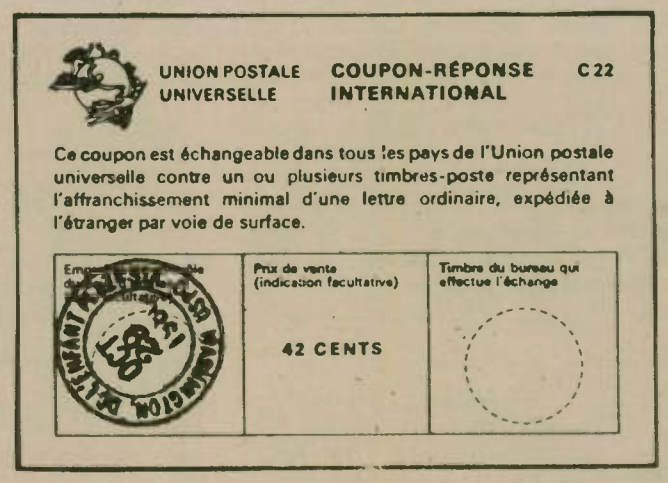


Figure 2

Old-style IRC's no longer valid

As of 1 January 1981, the old-style international reply coupons are no longer redeemable for postage in the United States.

The old-style coupons, as can be seen in *Figure 1*, are easy to recognize because they are always imprinted with the name of the selling country and have an issue date prior to 1 January 1975. The new-style coupons, redeemable for postage stamps, were issued on or after 1 January 1975 and are not imprinted with the name of the selling country — see *Figure 2*.

International reply coupons are issued by countries that are members of the Universal Postal Union to provide a convenient method for sending reply postage with letters. The coupons can be exchanged for postage stamps at a post office in the destination country.

People who possess the old-style reply coupons sent by correspondents in foreign countries may return them to the sender for replacement or redemption through the sending office. Unused old-style coupons issued in the United States may be exchanged at the post office.

— Article containing this information sent by John S. Forchtner, W6MUL, Camarillo, CA

U.S. QSL service

Laryl Myers, N7BMY

Hello again from USQS! Every month since October 1980, we have had an article here in **Worldradio** to let fellow amateurs know about us and about the QSLs we have on file. We are here again, and for those of you who have missed our article or ads, a description will follow. For our customers and those who already know about USQS, you can skip down to the list of calls, and THANK YOU!

USQS is a domestic bureau that allows USA and Canadian amateurs to do their QSLing with a minimum of cost and effort. We handle cards that are going to amateurs in the USA/Canada, or those with domestic addresses (or managers). Our system works like the DX bureau in that we request **self-addressed stamped envelopes** (SASEs) from you so we can forward any QSLs which come in for you. There is no fee or charge for the handling of your SASE.

We file by call, so always include yours on any correspondence. We have no objection to sending QSLs for several people in one envelope as long as we are given calls for each. If your radio club has members who would like to receive their QSLs through one envelope, just list the calls and we will be glad to forward them. Better yet, send a club roster and we will check for all members' QSLs! Don't forget to include old call signs if anyone has upgraded and changed calls.

If you send QSLs to the bureau to be forwarded, we ask a 25¢ per 20 QSL fee. We request you sort the calls by area, 0-9, as we file alphabetically within call area.

When you do any QSLing, with USQS or any other way, we would like to suggest you be very careful with the information and especially the call of the party to receive the card. PLEASE make a definite difference in V's and U's, and in I's and L's! Oftentimes we sit and wonder which letter is intended and end up guessing. Be sure to list the information that may be needed for those award hunters also. It is very frustrating to receive a needed card and find facts missing.

Following is a list of calls for those with QSLs on file. If your, or someone else's call is listed, please send a SASE. If your call is not here, you can send one anyway and be prepared! HI HI.

Thank you all again and we will see you next month.

Don't forget our address: **USQS, P.O. BOX 814. MULINO, OR 97042**

VE1AO
WB1ARF
KA1ATP
WB1AUE
W1BD
K1BT
K1DPB
VE1FO
K1JNQ
VE1JV
KA1KF
AI1O
K1PR
W1WHQ
WA1ZDW
K1ZZ
KA2BWV
N2CU
WA2ECA
VE2ERU

KA2HUY
WB2JUF
W2RQ
WA2STM
K2TR
K2XU
VE3AH
N3AIZ
KA3AQF
N3ATQ
K3AYT
N3BAY
K3CR
WB3DMW
KA3EMG
VE3EPG
KA3FHD
WB3FXX
WB3GDA
K3GYD

KB3HB
K3HBP
K3HFL
WA3HLN
WA3IRG
W3ISR
K3KG
KB3LF
WB3LNZ
N3MG
K3PI
WA3QCY
WA3RCH
WA3RID
N3WR
W3YOZ
W3YY
K3ZA
K3ZHO
KA4CYT

WB4DIY
W4DU
KA4DZV
KA4EKO
KC4EQ
VE4GF
W4GUJ
KA4HEZ
WD4HFM
WA4HTP
K4KZZ
AJ4L
AI4M
WA4MOS
KA4MPO
WD4MWJ
KA4NIJ
WD4NRX
WD4OFC
WA4PAS

W4PLB
W4POS
KA4QVF
AI4R
WD4RCO
W4RYZ
W4TJM
W4UC
KY4Y
N4ZC
N5ACN
N5ALA
N5ANN
N5AOC
N5ATC
AA5B
KA5BOR
KA5BYF
WA5CTD
KA5DCT

N5DP
W5DRZ
N5DU
W5EJK
W5FC
KC5G
KM5H
W5HNS
W5HTK
WD5IAF
K5IAG
K5IID
N5JB
KB5JO
W5JSV
W5JW
W5KA
N5KW
K5LIB
W5LM

W5NGU
W5NS
K5OCM
KA5OQC
K5OS
K5QHD
K5RC
W5RIN
WB5ROD
W5RU
W5SC
K5TS
W5TSV
WB5TXP
WB6ASD
W6BIP
N6BT
AA6C
WD6CIO
W6CX
WA6DIL
KB6F
W6GNS
N6HC
K6IS
W6JBT
K6KB
W6LFJ
K6LL
WB6LRU
KN6M
N6MG
WB6NCB
W6NWG
KI6O
K6PJY
W6PW
N6RO
W6SF
WA6SFM
K6SG
W6THS
W6TPH
K6TZ

WA6VNN
K6YA
KA6YLD
W6YRA
KA7BEX
W7CB
VE7CVA
N7DD
W7DK
KA7ENY
KA7FEL
W7GV
WB7HEO
KA7ILA
VE7IP
K7IR
KA7IWM
W7JPG
K7LED
W7LQT
K7OAL
K7OSJ
KA7Q
WB7QIW
VE7SAR
W7TYN
WB7VVL
W7YN
K7ZAA
WD8AAQ
KA8ADV
KA8AOC
K8AZ
K8BL
WD8BPB
N8BYE
WD8CRY
N8GG
W8GPZ
WD8IEL
WD8IFL
WD8ISG
WB8JAO
WD8JRG

K8LP
WD8OEP
AD8P
KA8POK
W8RMY
N8RW
N8UM
WB8VPA
KE8X
WA8YDE
W8YGQ
W8ZXN
N9ASR
N9AUB
K9BED
K9DR
K9EAM
KA9FYI
KA9GNW
W9IKN
KA9IMZ
W9JZ
W9LM
KB9OK
W9SM
W9VYW
W9WLA
W9YB
WA0AFH
K0AL
N0AOD
N0BG
N0BQF
W0BXR
WB0CMM
W0CS
N0CY
W0DK
K0DX
W0EBE
K0FRP
W0IA
KA0JDV
W0LAC

K0LIR
KB0N
W0NOZ
WB0OQV
W0PRQ

WD0QLI
N0RJ
AB0S
AC0S
W0TX

K0UK
W0ZSJ
W0ZSW

AMRAD wants to experiment

The Amateur Radio Research and Development Corporation (AMRAD) presented its request on 18 December for a Special Temporary Authorization (STA) for spread spectrum experimentation to Mr. Carlos Roberts, Chief of the FCC Private Radio Bureau in his Washington, D.C. office. Representing AMRAD were its president, Paul L. Rinaldo, W4RI, and Spread Spectrum Special Interest Group secretary, Hal Feinstein, WB3KDU. Also participating was Dr. Michael Marcus of the FCC's Office of Science and Technology.

AMRAD's request, written on behalf of 24 participating radio amateurs, covers four experiments. One is use of a commercially available HF frequency-hopping transceiver. The second is for amateur-fabricated systems for frequency hopping in the 10-meter band. The third outlines direct-sequence spread spectrum experiments in the 420 MHz band. The fourth experiment is for experimental moonbounce operation in the 420 MHz band using the 84-foot dish at Cheltenham, Maryland.

The purpose of these tests is to help determine whether spread spectrum techniques can be made practical and economical for civil applications.

FCC action on AMRAD's STA request is expected in early 1981. □

NEW TEN-TEC
OMNI-C 9 Band Transceiver + HERCULES Solid-State KW Linear

TEN-TEC SUPER RIG IS READY. For every band, every band condition. With the latest in solid-state hf technology, the latest in features. To make communications easier, more reliable — super.

OMNI-C

The new model in this famous series. With new coverage and new features to make it better than ever!

All 9 HF Bands. From 160 through 10 meters, including the new 10, 18 and 24.5 MHz bands. Coverage you can live with—for years and years.

3-Mode, 2-Range Offset Tuning. Offset the receiver section or the transmitter section or the entire transceiver! In 2 ranges: ±500 Hz or ±4 kHz. For complete flexibility in fine tuning, a DX work, or net operations.

Seven Response Curves. Four for SSB, three for CW. With new switching to select the standard 2.4 kHz filter, optional 1.8 kHz SSB filter, 500 Hz or 250 Hz CW filters, and standard 450 and 150 Hz CW active audio filters. Up to 16 poles of i-f filtering plus audio filtering to handle any situation.

Built-In Notch Filter and Noise Blanker. Notch is variable from 200 Hz to 3.5 kHz with a depth of more than 50 dB. New noise blanker reduces ignition and line noise. Both standard equipment.

"Hang" AGC. New, smoother operation.

Super Specs. *Optimized sensitivity*—a balance between dynamic range and sensitivity (2 μV on 160 to 0.3 μV on 10 meters) *Greater dynamic range*: better than 90 dB. And a PIN diode switchable 18 dB attenuator. *200 watts input* on *all* bands! *100% duty cycle* on *all* bands for up to 20 minutes.

Super Convenient. *Built-In VOX* with 3 up-front controls. *Built-In PTT* control at front and rear jacks. *Built-In Zero-Beat* switch puts you on exact frequency. *Built-In Adjustable Sidetone* with variable pitch and level. *Adjustable ALC* for full control from low power to full output. *2-Speed Break-In*, fast or slow speeds to fit operating conditions. *Built-In Speaker* eliminates desk clutter. *Automatic Sideband Selection*—reversible.

Super Design. *All Solid-State and Broadbanded*—from the pioneer, Ten-Tec. *Modular* plug-in circuit boards. *Functional Styling* with convenient controls, full shielding, easy-to-use size (5¾"h x 14¼"w x 14"d).

Super Hercules Companion. Styled to match, plus separate receiving antenna capability, plus transceiver front panel control of linear's bandswitching (one knob does it all).

Full Accessory Line including filters, remote VFO, power supplies, keyers, microphones, speech processors, antenna tuners—all in matching color.

Model 546 OMNI-Series C.... $1189.

HERCULES

Amateur Radio's first full break-in solid-state kW linear amplifier. With the reliability you'd expect from the pioneer in high-power solid-state technology—TEN-TEC.

All Solid-State. No tubes. Instead, HERCULES uses two 500-watt push-pull solid-state amplifier modules with an output combiner. Super solid.

Broadband Design. No knobs, no tuning. From the pioneer, TEN-TEC. For fast, effortless changing of bands. Super easy.

Automatic Bandswitching when used with OMNI (the OMNI bandswitch also controls HERCULES bandswitching through a motor driven stepping switch). Super convenient.

Full Break-In. HERCULES puts the conversation back into high power CW operation—you can hear between every character you send.

Full Coverage. 160 through 15 meters plus four "AUX" positions for 10-meter conversion by owner and future band additions.

Full Gallon. 1000 watts input on *all* bands, 600 watts output, typical. Built-in forced-air cooling. Driving power: 50 watts, typical. Adjustable negative ALC voltage. 100% duty cycle for SSB voice modulation; 50% duty cycle for CW/RTTY (keydown time: 5 minutes max.) Continuous carrier operation at reduced output.

Full Protection. *Six LED status indicators* continuously monitor operating conditions and shut down the amplifier whenever any one exceeds set limits (the exciter automatically bypasses the amplifier under amplifier shut-down for barefoot operation). The six parameters monitored are: 1) overdrive; 2) improper control switch setting; 3) heat sink temp.; 4) SWR; 5) overvoltage/overcurrent; 6) rf output balance. *Two meters* monitor collector current, voltage, and forward/reverse power. And a highly efficient *automatic line voltage correction* circuit (patent applied for) eliminates the need for selecting transformer taps, prevents applying too high a voltage to final amplifier devices, becomes operative under low line conditions.

Super Power Supply. Provides approximately 45 VDC @ 24 amperes, operates on 105/125 VAC or 210/250 VAC. Tape wound transformer and choke reduce weight (50 lbs.) and size (7½"h x 15¾"w x 13½"d). Separate enclosure.

Super Styling. Designed to match OMNI, the HERCULES has the same height as OMNI, plus matching bail and matching colors. The front panel is simplicity in itself with two push-button switches (power and mode) plus two knobs (meter and bandswitch), and a "black-out" monitor panel (when unit is off, meters are unobtrusive). Amplifier size is 5¾"h x 16"w x 15½"d.

Model 444, HERCULES amplifier & power supply.... $1575.

Experience SUPER RIG at your TEN-TEC dealer, or write for full details.

TEN-TEC, INC.
SEVIERVILLE, TENNESSEE 37862
EXPORT 5715 LINCOLN AVE., CHICAGO, ILL. 60646

DXpedition celebrates early Viking trek

Greetings from Alexandria, Minnesota, the birthplace of America, and the Home of the Kensington Runestone!

In order to promote public awareness of the activities of radio amateurs and public interest in Amateur Radio, the Runestone Radio Club will be conducting a DXpedition to the Viking Plaza in Alexandria, Minnesota on 28 February 1981. We will be operating our club station, WA0VVM, for a period of 12 hours, from 8:00 a.m. to 8:00 p.m. Anyone contacting this station during that period can request a special commemorative certificate by sending us their QSL card. Listen for our call on 3940, 7240, 14.340, and 21.340.

The Kensington Runestone is a 200-pound slab of graywacke which is covered on two faces with ancient Norse runic carvings. The stone was unearthed in 1898 on a farm near Kensington, Minnesota, and now resides in the Runestone Museum in Alexandria. The runic inscriptions, which were translated in 1907, describe a Norse voyage of exploration westward from Greenland in the year 1362. The party, consisting of 8 Goths and 22 Norwegians, had progressed to western Minnesota when they were attacked by Indians, who killed 10 of the group. There is no record of any of the party having returned to Greenland.

The stone, which is the oldest written evidence of the presence of Europeans in America, clearly establishes the Vikings as the first explorers in America. □

Thank you from Father Moran

Armond —

Thanks to your note in **Worldradio** (page 1, October issue), I collected $476 from nearly 40 generous hams from all over the United States. This was forwarded to 9N1MM via his QSL manager, Ed Blaszczyk, N7EB, and arrived just a day before Father Moran left for Manila!

Many thanks & 73,
Phil Frazier, K6ZM
Danville, California □

ST. XAVIER'S GODAVARI SCHOOL

G.P.O. BOX 50 • KATHMANDU • NEPAL

Phil Frazier K6ZM. Nov 23 1980

Dear Phil.

Dear Ed - N7EB has sent the money for the Manila Sea Net Trip. Many thanks, almost $500.00 Thanks to World Radio Magazine for the space and kind words.

God Bless - Merry Christmas Happy 1980.

Best to the No. California DX Club - all 73s.

P.S Adefart from Live today for Manila Rush!

Marshall D. Moran 9N1MM

Historic ship looks for contacts

Submitted by Sam DeDonatis, WB2BWL

The Cruiser Olympia Association is proud to announce the opening of the first amateur station aboard a United States naval shrine. The cruiser *USS Olympia* at Penns-Landing on the Deleware River in Philadelphia, Pennsylvania is currently on the air on weekends. Bands operated are 80, 40, 15, 10 and 2 meters, in the General portions of both CW and phone.

A special QSL card will be exchanged, confirming two-way contacts with Admiral Dewey's flagship of 1898. Communications and inquiries about the ship's history or its newly formed amateur operations should be directed — with an SASE — to Cruiser Olympia Association, c/o Olympic Amateur Radio Club, P.O. Box 928, Philadelphia, PA 19105. □

Check 10 meters

Bob McGarvey, WB2EVF

The Pacific Northwest has been booming in on 10 meters long after dark. If you need any states in that area, 10 is the band to check. British Columbia and Alaska also are very much in evidence and some of the signals from Japan are the best I've ever heard.

The Home News □

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

Operation Icebox

The Robbinsdale Amateur Radio Club, KØLTC, Robbinsdale, Minnesota is planning a fun-expedition to the cold-spot of the continental United States. Operation will take place fron International Falls, Minnesota. The dates of the expedition are 6 February 2400 local through 7 February 2400, 1981.

Frequencies used will be 10 kHz up from the bottom of the General Class phone privileges. An attractive commemorative QSL will be available for confirmation with an SASE. Operation will occur on 80m through 10m with some Novice operation also.

For further information, please contact Bob Reid, NØBHC, 19725 Jackie Lane, Rogers, MN 55374. President Robbinsdale ARC. □

Ripley's Believe It or Not Expedition

Members of the Sonoma County Radio Amateur Club will operate their club station W6LFJ from the historic "Church of One Tree" in Santa Rosa, California.

This historic church was built circa 1860 from the lumber produced by a single redwood tree. The church is now a historic monument and houses the many relics of the famous Robert Ripley of Ripley's Believe It or Not. The operation will begin at 2000Z 14 February 1981 and end at 200Z 15 February 1981. Frequencies will be 28.650, 21.360, 14.280, 7.260 and 3.960.

For a nice certificate, send a legal-size SASE to Sonoma County Radio Amateurs, P.O. Box 116, Santa Rosa, CA 95402. □

A link to the past

George Stevens, WD6GUD, is a watchmaker who lives in Granada Hills, California. What connection could he possibly have with a decision made by the lords of the British admiralty 200 years ago?

The decision was to send a small ship into the far South Pacific to gather saplings of breadfruit trees in Tahiti and carry them to the West Indies. The idea was to plant the trees in Jamaica and thus feed the slaves there more cheaply than they were being fed at the time.

The voyage would have been just another routine business trip except that the ship dispatched was *HMS Bounty*, the captain was William Bligh and the first officer was Fletcher Christian.

Bligh was so abusive and Christian so sensitive that the famous mutiny occurred on the *Bounty* on 28 April 1789, after the ship had left Tahiti with its cargo of breadfruit saplings.

Each member of the *Bounty* crew had bought his own supply of coconuts in Tahiti to eat on the long voyage to the West Indies. The coconuts were in individual piles on deck and, on the second morning out of Tahiti, Bligh expressed a strong feeling that his pile had been somewhat diminished overnight. He accused Christian of stealing coconuts.

That did it. Christian and supporters set Bligh and 18 other crewmen adrift in the *Bounty's* launch, dumped all the breadfruit trees into the sea and headed back to Tahiti to join the girls. Some of the mutineers, including Christian, sailed the *Bounty* from Tahiti to Pitcairn Island — a place so small and remote that, even today, it is inhabited by only about 60 people. All of them are descendants of seamen of the *Bounty* and the women they brought with them to Tahiti. One of these is Tom Christian, great-great-great-grandson of Fletcher, and the last male in the line.

About once a week, Tom Christian, VR6TC, speaks over short-wave radio with George Stevens — some 7,000 miles away. George became acquainted with Tom through the Pitcairn Islander's QSL manager, Dr. Mert Moser, W6HS — a neighbor of George's.

While talking to Tom one day in the fall of 1979, George learned that the Pitcairn amateur's watch needed repair, and offered his services.

Along with his brother Richard Stevens in Des Moines, Iowa — also a watchmaker — George was able to completely repair the watch. "It was interesting," he said; "a brush with something that happened a long time ago."

Speaking of Tom Christian, George writes: "He has the watch looking like new and running accurately — and very pleased it only took 10 months (February to November)." The speedy service was due to Dr. Moser and his wife, Ruth, stopping at Pitcairn during a world cruise in January 1980, when the watch was picked up. The Japanese Seiko was returned in a box of other items Dr. Moser sent to Pitcairn at the end of August, via New Zealand.

George adds that he and several other amateurs kept in touch with Dr. Moser on the doctor's TS 120S Kenwood as he operated maritime mobile during the round-the-world cruise.

As for Captain Bligh and Fletcher Christian: Bligh survived a 4,000-mile trip in the Bounty's open launch, lived through two more mutinies in his career and became an admiral before he died.

The Bounty mutineers who stayed too long in Tahiti were captured by the British navy and three of them were hanged in England. Fletcher died on Pitcairn and is buried somewhere on the island — no one knows exactly where.

Des Moines Register, "& Finally . . . " by Robert Hullihan, 3 November 1980. □

Repeater quiz

1. The proper way to enter into a QSO on a repeater is to:
   (a) say "breaker seven-six".
   (b) just say, "break".
   (c) insert your call during a pause.
   (d) just talk over the other guy; you're at a base station anyway.

2. The main purpose of a repeater is:
   (a) to keep technical types on their toes.
   (b) to enhance the range of mobile stations.
   (c) to provide a soap box for long, one-sided monologs.
   (d) to allow non-amateur housewives to keep track of their wandering husbands, or anyone else for that matter.

3. One of the most important uses of a repeater is to:
   (a) provide good mobile-to-mobile communications when driving adjacent to each other on the expressway.
   (b) enhance the range of base stations located less than three blocks from each other.
   (c) extend the range of mobile and low-power portable stations.
   (d) none of the above.

4. You should sign your call letters:
   (a) any time the spirit moves you.
   (b) after every other word.
   (c) at the beginning and end of each transmission.
   (d) once coming on and once leaving the frequency, and once every 10 minutes.

5. You are required to mention at least one of the call letters of the stations with whom you have been talking:
   (a) at the beginning and end of each exchange.
   (b) at the beginning and end of a series of transmissions, and once each 10 minutes during the exchange.
   (c) only at the end of a series of transmissions, when signing off.
   (d) none of the above.

6. It is permissible to sign off, "W9MOL signing off":
   (a) when you can't remember the call(s) of the station(s) with whom you were talking.
   (b) after making an autopatch call.
   (c) after calling another station and hearing no response.
   (d) none of the above.

7. Repeaters:
   (a) don't cost anything to operate as everything is donated.
   (b) cost a bundle, but are paid for by a small group of wealthy amateurs and supporters.
   (c) cost a bundle and are financed by club member dues and contributions.
   (d) shouldn't expect any donations from users since the air-waves are free.

8. When you talk to a regular user of the repeater who is not a member of the club or a financial supporter, you should:
   (a) tell them they are deadbeats and refuse to talk to them.
   (b) notify the control operator to turn off the repeater.
   (c) try to find out if they understand how the club/repeater operates and invite them to participate.
   (d) try to embarrass them into paying or leaving.

Adapted by Lee Knirko, W9MOL, from ADC Associates Newsletter. K8UCH, British Columbia FM Communications Assn. and probably many other sources.

(Answers on page 9)

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

QUEMENT ELECTRONICS
Serving Your Needs Since 1933

Proudly Annouces the Addition of BIRD Electronic RF Measuring Equipment

SEE THE HAM MATE WATTMETER FOR 1.8 TO 30 MHZ OR 140-180 MHZ. ONE UNIT, NOTHING MORE TO BUY.

BIRD ACCURACY FOR UNDER $100.00

CHECK WITH QUEMENT FOR OUR YEAR-END SPECIALS. BIG DOLLAR SAVINGS ON OVERSTOCK ITEMS, PLUS SOME DISCONTINUED UNITS. WE HAVE IN-DEPTH STOCK OF CURRENT GEAR FOR YOUR CONVENIENCE. LET US WORK WITH YOU TO "YOUR" ADVANTAGE.

Price - Quality - Service

THAT MEANS QUEMENT ELECTRONICS

40,000 SQ. FT. OF ELECTRONIC PARTS, COMPONENTS, TUBES AND ACCESSORIES.
- ANTENNAS • NEW SERVICE DEPT
- HAM GEAR • ACOUSTIC SOUND DEMONSTRATION ROOM
- CITIZEN'S BAND • COMPLETE STEREO HI-FI DEPT.
- COMMERCIAL AND INDUSTRIAL PARTS SUPPLY
- BANKAMERICARD • FIRST NATIONAL • MASTERCHARGE

1000 SO. BASCOM AVE.
SAN JOSE, CA 95128
408-998-5900

P.O. BOX 6000, SAN JOSE, CA 95150

VHF model 4362
HF model 4360

Repeaters — how to use them

Paul Sperbeck, WB9HCO

Nothing breaks the monotony of driving like a nice conversation. The only problem with this is we often find ourselves alone in our vehicle. If a nice dialogue is struck up with the occupant, it often brings stares and doubts of sanity when we are observed talking to ourselves. Enter 2m FM.

Being able to strike up a conversation while driving alone is always a pleasant relief of tedium, and carries the added advantage of not being required to turn your head and look at the person with whom you're speaking, thereby removing your eyes from the concrete fairyland you're traveling on. SAFETY FIRST! Besides, staring at a radio is not very entertaining.

On the way back and forth to work, you may either engage in or eavesdrop on many discussions of any number of subjects. But, thankfully, eavesdropping in Amateur Radio has neither ill meaning nor malice. As with any group discussion, there are a few ground rules.

Over-identification is not conducive to the listening pleasure of those of us who often monitor, but seldom speak. Besides, how much yacking can you squeeze in if every other breath is taken by call letters? I hope you are not so forgettable that you must re-establish your identity more than once every 10 minutes. We eavesdroppers prefer gossip to I.D.'s.

It is likely that nothing is more frustrating than hearing two base stations carrying on about whatever during drive time. Base to mobile, or mobile to mobile is more fun anyway; it's always refreshing to hear someone besides me missed their freeway exit. Let us mobiles have our momentary lapse of routine and be thrown onto a maze of streets that have become unfamiliar through long disuse.

Topics suitable for discussion on repeaters are numerous, and often include the driving habits of the deaf and dumb (to radio) drivers around you. (Sometimes these comments are delivered in a spontaneous burst of somewhat less than proper decorum), but please — whatever the subject — strive to maintain the interest of all the silent participants of your QSO.

Above all, try to turn over the conversation to those unsuspecting drivers of stick shifts at a time well-judged to be near an upshift or downshift. Even if you can't see the juggling act, it's easy to picture. (Note: this brings a more interesting scenario to mind if your partner in QSO is drinking a cup of coffee).

But most important, please take this treatise in the same humor as it is offered. Seriousness has no place on the public airways. There are enough depressing subjects in our times, and we needn't concern ourselves with them here.

Repeaters are a good place to meet old friends and make new ones. With our two common bonds, Amateur Radio and a perverse desire to work as far from our homes as the gas lines will allow, we travel our various paths always in good company.

So, join the fun from 7 to 9, and 3:30 to 5:30, never forgetting that Amateur Radio and working are both hobbies, and never take anything you hear too seriously. Live a little. But if repeaters and friendly chatter get on your nerves, remember you have two options: you can either turn the box off, or hold your own conversation regardless of the stares of your fellow travelers of the concrete fairyland.

— *Kettle Moraine Radio Amateurs, Wisconsin* □

Repeater ideas

Here is an idea picked up in California. One of the repeaters there (220 band) was having trouble with kerchunkers, touch-tone players, and other assorted nuts. The solution was to put a delay of 8/10ths of a second between the input and the output of the repeater, plus a delay between carrier reception and repeater activation.

The second item prevents kerchunks and other assorted short glitches from bringing up the machine. The 8/10ths second delay is said to discourage certain types of jammers, as the people causing the trouble evidently liked to talk and at the same time, listen (full duplex) to themselves. It drives you slightly bananas to listen to yourself with the delay!

Lastly — there is a chip that throws out a flag when a touch-tone is heard and with the delay, there is plenty of time to tell the repeater not to transmit upon reception of the tone. The machine is evidently not an autopatch repeater or maybe during autopatch ops the tones activate the equipment but are not heard by the users?

— *220 Notes — West* □

Mobile repeater

The Salinas Amateur Radio Emergency Corps had a chance to test their readiness for responding to emergencies. Recently, an "unfriendly" fire got out of control along Highway 9 between Santa Cruz and Saratoga. They were called out to provide back-up communications.

As it turned out, the fire burned about 330 acres of brush and was quickly contained. The Salinas Amateur Radio Emergency Corps used a 2-meter repeater mounted on a vehicle owned by Clif Wiley, WB6HUK. Emergency Coordinator was Ed Gribi, Jr., WB6IZF. This approach to their communications problem was very effective, due to the steep hilly terrain, since the mobile repeater band could be moved to a point more accessible than existing repeaters in the area.

— *Skip, Fresno ARC, CA* □

Answers to Repeater quiz (*continued from page 7*)

1. c
2. b
3. c
4. d
5. c
6. d
7. c
8. c

An alternative

Robert R. McKay, N8ADA

One of the greatest fears most parents face is the environment their children encounter when they send them off to school. The statistics on drug and alcohol use, sex and theft in elementary and high schools are enough to scare anyone. Most of us can still remember the pressures we faced as children to get involved in things we shouldn't. These kids face the same, if not worse, pressures with the results a lot deadlier. It's difficult to guide them or even help them withstand the pressures they are bound to encounter.

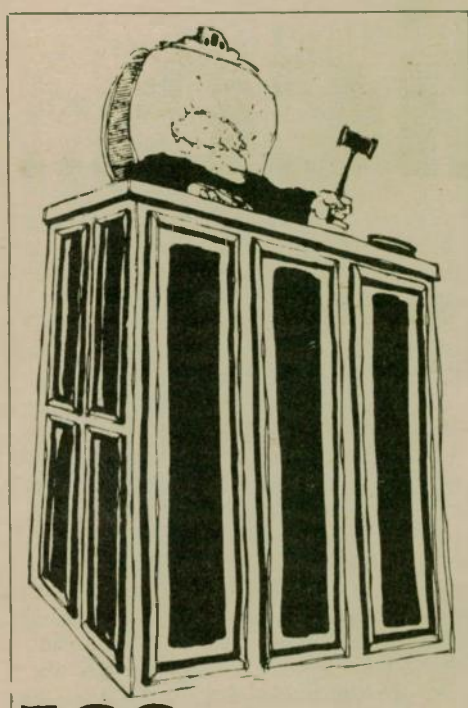
While a good moral home background is a good building block, the kids need more. They need something to set them apart, something they can do that lifts them out of the crowd. They can't all be class presidents, football/basketball stars, etc., but they need something to allow them to be individuals and receive recognition without having to join the "fast" gang. Amateur Radio certainly fits here. It gives them a skill that few others have. The ability to talk to other amateurs around the world gives them a place of their own in any group and a certain amount of admiration from those around them. Further, it keeps them busy.

Amateurs have more important things to do than congregate in hang-outs where much of the trouble begins. Just staying away from these environments on their own without being forbidden is a big step to success. It is our opinion that "selling" Amateur Radio to young people is one of the best community activities we could possibly get involved in. There is no assurance that a young amateur won't get into trouble, but the odds are all on our side.

— *Editorial in RF Carrier, January 1981, Dayton OH* □

Hope we can serve you. Your comments and suggestions are welcome.

Chris Wilson



FCC HIGHLIGHTS

Bill Grenfell, W4GF

The proposed "plain language" amateur rules were released by FCC on 19 December 1980. A copy of the Notice, PR Docket No. 80-729 may be obtained from the FCC Consumer Assistance Division, Room 258, 1919 M Street NW, Washington, D.C. 20554. Quantities of the 210-page document are limited. It should also be reproduced in the 19 December issue of the Federal Register. Original comments on the proposed rules are due on or before 19 June 1981.

A "plain language" statement of the rules as they now exist is given by FCC as its principle interest in proposing this revision. However, a few substantive major changes are proposed. Elimination of all logging requirements is proposed. Instead, certain station records must be kept, including copies of the license, of the up-to-date rules, correspondence to and from FCC, etc. Amateur stations will be specifically required to be made available for inspection "at reasonable times," that is, "... any time during the business day or any time your station is transmitting or has just finished transmitting." (Rule 56). The power input to the station final amplifier stage is proposed to be limited to 1000 watts CW and 2000 watts PEP for phone and includes everything but filament power, if a tube is used.

Credit for any of the amateur operator license exam code tests would be given for holders of current commercial radiotelegraph operator's licenses of any class. Proposed Rule 57(a)(1) is incorrect in that it includes a change of address or name notification procedure which has been eliminated by proposed Rule 23. Rule 23 would require filing an application for modification of the license, for such changes.

•

Certain call sign changes are now available upon request by licensees who now have calls not in accordance with FCC's call area table and/or not in accordance with the license class groups (A, B, C and D). This became effective with applications received on or after 14 December 1980. All classes of licensees are eligible to apply for a different call sign if their station mail address is, or is to be, located in a different call sign area than that indicated by their present call sign. All new and changed call signs are assigned in accordance with the licensee's operator class grouping (A, B, C, D) and mailing address call sign area.

All licensees (except Novice) with a call sign which does not indicate their current license class may apply for a call sign which does. Licensees already holding call signs conforming to their class group are not eligible for call sign changes except upon change of mail address to a different call area or except upon qualifying for a higher class of operator license. If a licensee does not want a call sign change when the mail address is changed to a new call area or upon qualifying for a higher class license, the current call sign may be retained by not marking the box for the "CHANGE CALL SIGN", item 2F on the application. Only Form 610 dated August 1980 or later may be used for applications received by FCC on or after 14 December 1980. Previous issues of Form 610 are now obsolete.

A secondary station call sign may be assigned to the primary station upon request, anytime prior to the expiration date of the secondary station license. The secondary station license will be cancelled at that time. Secondary station licenses are no longer issued, renewed or modified. No schedule has been established for recovering formerly assigned call signs now unassigned. It is unlikely that FCC will make these calls available for reassignment before April 1983.

Finally, even though a licensee is eligible for a new call sign or a change in call sign in accordance with the foregoing, choice of the specific letters making up the prefix or the suffix of the call sign is not permitted.

•

Amateur station call sign sequences are as follows:

Extra Class (Group A): A single-letter prefix, K, N or W/a digit/a two-letter suffix; A two-letter prefix AA-AL, NA-NZ, or WA-WZ/a digit/a single letter suffix; A two-letter prefix AA-AL/a digit/a two-letter suffix.

Advanced Class (Group B): A two-letter prefix KA-KZ*, NA-NZ or WA-WZ/a digit/a two-letter suffix.

General Technician Class (Group C): A single-letter prefix K, N, or W/a digit/a three-letter suffix.

Novice Class (Group D): A two-letter prefix KA-KZ ** or WA-WZ/a digit/a three-letter suffix.

For the non-contiguous United States, only two-letter prefix calls are currently being assigned and only from the following prefix groups: PacificArea; AH, KH, NH, or WH; Alaska; AL7, KL7, NL7 or WL7; Caribbean Area; KP, NP or WP. All of the foregoing prefix groups are used for Extra Class (Group A) calls, followed by a digit and by a single-letter suffix. AH (Pacific), AL7 (Alaska), and KP (Caribbean) prefixes are for Advanced Class calls followed by a digit and a two-letter suffix. Similarly, KH, NH or WH (Pacific), KL7, NL7 or WL7 (Alaska) and NP or WP (Caribbean) prefixes followed by a digit and a two-letter suffix are for General/Technician Class calls. KH, WH (Pacific), KL7 or WL7 (Alaska) and, KP or WP (Caribbean) prefixes, a digit followed by a three-letter suffix are assigned to the stations of Novices. EXCEPTIONS: *KC6, KG4, KX6; **KC4AAA-AAF, KC4USA-USZ.

Amateur call sign area digits for the contiguous USA are: 1) CT, MA, ME, NH, RI, VT; 2) NJ, NY; 3) DC, DE, MD, PA; 4) AL, FL, GA, KY, NC, SC, TN, VA; 5) AR, LA, MS, NM, OK, TX; 6) CA; 7) AZ, ID, MT, NV, OR, UT, WA, WY; 8) MI, OH, WV; 9) IL, IN, WI; 0) CO, IA, KS, MN, MO, ND, NE, SD.

Non-contiguous USA call sign digits are: 1) Navassa, Baker, Howland; 2) Virgins, Guam; 3) Quita Suena, Johnston; 4) Puerto Rico, Midway; 5) Kingman; 6) Hawaii; 7) Alaska, Kure; 8) Samoa; 9) Wake, Wilkes, Peale; 0) Northern Marianas.

Last call signs assigned as of 1 December 1980, by class group: **A. Extra:** KB1D, KJ2J, KB3Y, NG4H, KN5L, KT6J, KF7E, KJ8I, KD9I, KG0A. **B. Advanced:** KA1MR, KB2VB, KB3MU, KC4RX, KC5DW, KD6NT, KB7RT, KB8XH, KB9TB, KB0TC; **C. General/Technician:** N1BKG, N2CEZ, N3BOW, N4DXU, N5CPF, N6DSA, N7CEH, N8CFS, N9BVA, N0CDS; **D. Novice:** KA1GFX, KA2KTW, KA3GRI, KA4SPA, KA5KOG, KA6NXC, KA7JFO, KA8LMK, KA9JRQ, KA0JWA.

•

A Yugoslavia-United States reciprocal amateur operating agreement is now in effect. Interested USA amateurs may obtain further information from: Savez Radio-Amateria Jugoslavije, P.O. Box 48, 11001, Belgrade, Yugoslavia. (See QST, January 1981, page 10).

•

Applications for new amateur licenses or for modification or renewal must be made on the new, August 1980, FCC form 610. Older 610s are now obsolete and should not be used. The new 610 may be obtained from the nearest FCC Field Office or from FCC at 1919 M Street NW, Washington, D.C. 20554.

•

An amateur call sign with an international "Q" signal suffix is a phony! *HR Report*, 5 December 1980, tells of an attempted credit card fraud by a purchaser claiming the WA4QSB call. FCC's computer is normally programmed to omit assignment of a three-letter suffix in the QRA-QUZ block. However, early in the Commission's use of computer processing of applications (back in the '60s), about 40 "Q" signals were issued as the suffix of amateur calls and had to be hastily retrieved when the error was discovered!

•

FCC will continue the linear amplifier type acceptance requirement, including prohibiting any built-in 10-meter band function by the manufacturer. (The current requirement would have otherwise expired.) Further details were not available at this writing. □

Voice your opinion

You are welcome to comment on the plain-language Amateur Radio rules proposed 18 November by the FCC.

Using simply-worded questions and answers, the proposed rules would guide ham operators, many of whom are children. There is no age minimum for an Amateur Radio license.

The proposed "Amateur Telecommunications Services" would become part 97 of the FCC rules. There would be four subparts: **Subpart A**, Amateur Radio Service (AR). **Subpart B**, Radio Amateur Civil Emergency Service (RACES). **Subpart C**, Amateur Satellite Service (ASAT). **Subpart D**, Technical Standards (TEC). This last subpart consolidates the technical standards for the three services, saving printing costs.

important notice...

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

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

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

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.

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

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

(SOURCE) ☐☐☐☐ (59-60)

Name _____

Call _____

Address _____

City _____

State _____ Zip _____

☐ NEW	☐ Renewal	☐ Gift
12 issues	(72¢ per issue)	$8.64
24 issues	(69¢ per issue • save $1)	$16.28
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.

☐ Check enclosed ☐ BankAmericard ☐ Master Charge ☐ Visa

Card # _____ Exp. date _____

Signature _____

Please clip and mail to . . .

Worldradio
2120 28th Street • Sacramento, CA 95818

Thank you!

The proposed rules include these substantive changes:

Logging requirements would be abolished, though many amateur operators might continue logging for their own purposes.

Each amateur licensee would have to keep a current copy of the rules.

Licensees would be told explicitly in the rules that FCC representatives can inspect stations "at any time during the business day, or any time your station is transmitting or has just finished transmitting."

You can get information from:
FCC Consumer Assistance Office
Room 258
1919 M St., N.W.
Washington, D.C. 20554
phone (202) 362-7000

John B. Johnston, Chief
Personal Radio Branch
FCC Private Radio Bureau
Room 6329
2025 M St., N.W.
Washington, D.C. 20554
phone (202) 254-6884

How can I comment on this proceeding?

If you want to comment on this proceeding, send an original and five copies of your comment to the Secretary, FCC, 1919 M St., N.W., PR 80-729, on your comments. Comments are due by 19 June 1981, and reply comments are due by 19 August 1981.

Do you know?

When you mail order equipment, the Federal Trade Commission has some rather strong rules to protect you, the buyer. If you order over the telephone, you forego this protection.

The entire text of mail-order merchandise rules can be obtained from the Government Printing Office. Ask for CCH Booklet #4803. Cost is $1.50 each.

Sheboygan County ARC, Wisconsin ☐

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 December 1980.

Radio District	Group A	Group B	Group C	Group D
0	KG0A	KB0TC	N0CDS	KA0JWA
1	KB1D	KA1MR	N1BGK	KA1GFX
2	KJ2J	KB2VB	N2CEZ	KA2KTW
3	KB3Y	KB3MU	N3BOW	KA3GRI
4	NG4H	KC4RX	N4DXU	KA4SPA
5	KN5L	KC5DW	N5CPF	KA5KOG
6	KT6J	KD6NT	N6DSA	KA6NXC
7	KF7E	KB7RT	N7CEH	KA7JFO
8	KJ8I	KB8XH	N8CFS	KA8LMK
9	KD9I	KB9TB	N9BVA	KA9JRQ
N. Mariana Is.	AH0A	AH0AA	KH0AC	WH0AAE
Guam	AH2J	AH2AG	KH2AM	WH2ACR
Johnston Is.	None	None	KH3AB	WH3AAB
Midway Is.	None	AH4AA	KH4AC	WH4AAF
Hawaii	NH6I	AH6CD	KH6LA	WH6ANG
Amer. Samoa	AH8A	None	None	WH8AAK
Wake Wilkes Peale	None	None	None	WH9AAA
Alaska	NL7Q	AL7BN	KL7KX	WL7AOM
Virgin Is.	KP2B	KP2AC	NP2AH	WP2ACH
Puerto Rico	NP4E	KP4BV	NP4BO	WP4BRN

Henry Radio's New World Headquarters

After more than 30 years in the same location, Henry Radio in Los Angeles has moved to a beautiful new "World Headquarters" to better serve our amateur, commercial and industrial customers in Southern California, all over the United States and indeed the world.

Our new headquarters are just a few blocks from the Olympic Boulevard location where we have been meeting and assisting our good friends for these many years. All the famous Henry services are still available...only more so. The world's broadest line of amateur communication equipment plus the Henry line of high power HF linear amplifiers, solid state VHF and UHF amplifiers, our own Tempo line of synthesized hand helds for amateur use at 144, 220 and 440 MHz as well as commercial channelized handhelds and solid state amplifiers all FCC type accepted, and finally a broad line of industrial and medical RF power supplies and plasma generators providing reliable continuous duty HF and VHF in the power range of 500 to 10,000 watts.

Henry Radio has come a long way in the 53 years since we first began serving the amateur fraternity. In the same personalized manner we have always greeted our customers, we say "thank you" to all of our thousands of loyal customers whose support has allowed us to come so far and we say "hello" from our new "world" headquarters to all those thousands of customers throughout the world that we intend to serve in the years to come.

Please let us know how we can assist you.

Henry Radio

2050 S. BUNDY DRIVE, LOS ANGELES, CALIFORNIA 90025 (213) 820-1234

931 N. EUCLID, ANAHEIM CA 92801 (714) 772-9200
BUTLER, MISSOURI 64730 (816) 679-3127

TOLL FREE ORDER NUMBER: (800) 421-6631
For all states except California. Calif. residents please call collect on our regular numbers.

Name change

The Board of Directors of the Carolinas-Virginia Repeater Association has voted to change the name of the Association to: CVRA — Southeastern Repeater Association to reflect the addition of Tennessee and West Virginia into the organization.

CVRA — an association of repeater owners and users, numbering over 3,500 and covering five states including Virginia, North Carolina, South Carolina, Tennessee and West Virginia — has under its territorial coverage over 750 amateur UHF-VHF repeaters.

CVRA was conceived in 1971 by several repeater owners who visualized the need for frequency coordination. The original North Carolina FM Repeater Association grew in 1972 with the addition of Virginia and South Carolina; thus the name Carolinas-Virginia Repeater Association, Inc. (CVRA). In 1979-80, Tennessee and West Virginia became the fourth and fifth states to join.

The new name, CVRA-Southeastern Repeater Association, Inc., will maintain the nationwide identity of CVRA, yet give the organization a name that will not be isolating any particular geographical location.

The voice of CVRA is the **Repeater Journal**, published quarterly and mailed to CVRA membership in the five-state area the organization represents. Other copies of the **Journal** are exchanged with numerous clubs, repeater councils, and officials across the nation. Major publishers, government officials, ARRL and the FCC are also included on the **Journal** mailing list.

Each state (district) of the CVRA is governed by elected Directors and Vice Directors who coordinate frequencies and cooperate and communicate with CVRA officers. Directors are provide with computer printouts of all repeaters in CVRA territory. □

North Carolina Repeaters

Two meters

AHOSKIE	WR4AFB	146.31	146.91	N
AHOSKIE	WB4YNF	146.49	147.49	N
ALBEMARLE	WR4BBX	146.385	146.985	
ASHEBORD	WR4AOE	147.855	147.255	
ASHEVILLE	WA4QCO	146.235	146.835	
ASHEVILLE	WA4QCO	146.34	146.94	N
ASHVL/MT PISGAH	WA4BVW	146.16	146.76	
ASHVL/SPVY MT	WB4PLA	146.31	146.91	
BENSON	WR4ARL	147.87	147.27	N
BOONE	WR4ATQ	147.96	147.36	
BRYSON CITY	K4BBF	144.70	145.30	N
BURGAW	K4LZY	146.34	146.94	
BURLINGTON	WR4AKY	146.07	146.67	N
BURLINGTON	W4VGZ	146.475	147.075	
BURNSVILLE	WA4LLR	147.975	147.375	N
BUTNER	WA4IZG	144.57	145.17	N
CHARLOTTE	WR4AEU	144.63	145.23	N
CHARLOTTE	WB4HTR	144.75	145.35	N
CHARLOTTE	WD4LCF	144.85	145.45	
CHARLOTTE	WR4AEU	146.34	146.94	N
CHARLOTTE	WR4ALO	146.46	147.06	N
CHARLOTTE	WR4AWQ	147.99	147.39	
CHIMNEY ROCK	WA4KNI	147.735	147.135	N
CONCORD/KANNAP	K4CEB	146.055	146.655	
DUNN	WB4FXM	146.10	146.70	
DURHAM	WA4WTX	146.22	146.82	
DURHAM	WA4BFT	146.34	146.94	
DURHAM	W4PVI	146.415	147.015	N
EDEN	WA4ACP	147.84	147.24	N
EDEN	WD4DIP	147.99	147.39	
EDENTON	WA4JOK	147.99	147.39	N
ELIZABETH CITY	WA4VTX	146.46	147.06	N
ELIZABETHTOWN	W4DCD	146.175	146.775	N
ERWIN	WR4ALY	146.43	147.03	N
FAYETTEVILLE	WR4ANN	146.31	146.91	
FAYETTEVILLE	W4LPL	147.93	147.33	
FOREST CITY	WR4AHA	146.07	146.67	N
FRANKLIN	WB4YAO	147.84	147.24	
FRANKLIN	N4AC	147.96	147.36	N
GAST/SPCR MT	WR4ATP	147.72	147.12	
GASTONIA	K4ZFD	146.205	146.805	N
GASTONIA	WD4KGM	147.87	147.27	N
GASTONIA	WR4	147.90	147.30	N
GOLDSBORO	K4CYP	146.25	146.85	
GREENSBORO	N4AZM	144.66	145.26	N
GREENSBORO	K4SNI	146.01	146.61	
GREENSBORO	WR4AOD	146.16	146.76	N
GREENSBORO	WD4IPZ	147.63	147.03	
GREENSBORO	WR4ANL	147.81	147.21	N
GREENVILLE	WD4JPQ	147.81	147.21	N
GREENVILLE	WR4	147.96	147.36	N
GREENVL/ESTN NC	W4GDF	147.69	147.09	
GRIFTON	W4NBR	146.085	146.685	
GRIFTON	WR4ABP	146.16	146.76	
HAYESVILLE	WD4KTG	147.69	147.09	
HENDERSONVILLE	WB4YAO	146.025	146.625	
HENDERSONVILLE	WB4YAO	146.04	146.64	
HICKORY/BRT. MT.	WR4ACM	146.25	146.85	N
HIGH POINT	N4XO	144.51	145.11	N
HIGH POINT	WA4ZXA	146.256	146.865	
HIGH POINT	K4AZA	146.40	147.00	
HIGH POINT	K4AZA	147.60	147.00	
HILLSBOROUGH	WA4WTX	147.825	147.225	
JACKSONVILLE	WD4FVO	146.40	147.00	
JACKSONVILLE	WR4ATW	147.90	147.30	
KINGS MTN.	WR4YN	146.37	146.97	
LAKE TOXAWAY	WR4AGH	147.795	147.195	
LAURINBURG	WR4AOX	146.025	146.625	
LENOIR	WR4ARG	147.93	147.33	
LEVEL CROSS/GBO	K4VUW	146.19	146.79	
LEXINGTON	WD4NTE	144.81	145.41	N
LEXINGTON	K4IZM	146.31	146.91	
ILLINGTON	WA 4FKI	144.87	145.47	
INCOLNTON	WD4PLY	144.85	145.45	
UMBERTON	WR4BDQ	147.96	147.36	N
MACO	K4OVA	147.66	147.06	
MANTEO	W4PCN	146.34	146.94	
MONROE	K4BGU	147.30	147.90	N
MONROE	WR4BBN	147.705	147.105	
MORGANTON	WB4PML	144.57	145.17	
MORGANTON	K4AI	147.75	147.15	
MT AIRY	AA4RW	144.73	145.33	N
MT AIRY	WB4UJH	146.37	146.97	
MT AIRY	WA4CQK	147.78	147.18	N
MT PISGAH	WA4COS	144.65	145.25	N
N. WILKESBORO	K4ITL	144.77	145.37	
NEW BERN	WD4JMS	146.01	146.61	
NEWPORT	K4GRW	144.85	145.45	
NEWTON	N4AWV	144.83	145.43	N
PINE BLUFF	WR4BAR	147.84	147.24	N
RALEIGH	N4BEA	144.89	145.49	
RALEIGH	WR4ACF	146.04	146.64	
RALEIGH	WR4	146.13	146.73	
RALEIGH	WR4AOE	146.28	146.88	
RALEIGH	W4PVI	146.415	147.015	N
RALEIGH	WR4AOE	147.75	147.15	
REIDSVILLE	K4YFT	146.25	146.85	N
ROANOKE RAPIDS	K4PUV	147.63	147.03	
ROARING GAP	WB4PZA	146.22	146.82	
ROBBINSVILLE	WR4BAN	146.445	147.045	
ROCKINGHAM	WA4ULA	146.355	146.955	
ROCKY MOUNT	WD4HIG	147.72	147.12	
SALISBURY	W4EXU	146.13	146.73	
SANFORD	WB4EJJ	147.78	147.18	N
SAURATOWN MT.	WB4SNA	144.79	145.39	N
SHELBY	KB4AF	146.28	146.88	
SHELBY	WR4AWU	147.84	147.24	N
SHELBY	KB4AF	147.945	147.345	
SMITHFIELD	WR4BBO	146.37	146.97	
SPRING LAKE	WR4BCA	146.115	146.715	N
STATESVILLE	WR4AZS	146.085	146.685	
SYLVA	KA4V	147.90	147.30	N
TRINITY	WD4KUN	144.69	145.29	N
TUCKASEGEE	W8MOV	147.90	147.30	N
UNION CROSS	WB4RGV	147.915	147.315	N
WADESBORO	W4USH	146.235	146.835	N
WASHINGTON	WB4GMI	146.205	146.805	N
WAYNESVILLE	N4SM	147.87	147.27	
WILLIAMSTON	WA4TKJ	144.81	145.41	
WILMINGTON	WR4AVF	146.13	146.73	
WILMINGTON	WR4AHL	146.22	146.82	
WINSTON-SALEM	W4HKB	144.69	145.19	N
WINSTON-SALEM	WA4GIC	146.04	146.64	

220 MHz

ASHVL/MT PISGAH	WR4AEV	222.34	223.94	
CHARLOTTE	WR4AEU	222.36	223.96	N
CHERRYVILLE	WB4UDS	223.20	224.80	N
FAYETTEVILLE	WR4ADK	222.42	224.02	
GREENSBORO	KZ40	223.22	224.82	
HICKORY	WR4ACM	222.42	224.02	N
HIGH POINT	K4AZA	222.32	223.92	
HILLSBOROUGH	WA4WTX	222.34	223.94	
LOCUST	WR4BBA	222.40	224.00	
MORGANTON	WB4PML	223.36	224.96	
RALEIGH	WA4PEN	223.04	224.64	
SALISBURY	W4EXU	223.16	224.76	
SAURATOWN MT	WR4AOW	223.28	224.88	
STATESVILLE	WA4WRS	222.70	224.30	N
SYLVA	KA4V	223.34	224.94	N
TRYON	WB4BYH	222.86	224.46	N
WINSTON-SALEM	WB4UGW	222.44	222.04	N
WINSTON-SALEM	WA4YHH	223.04	224.64	N
WINSTON-SALEM	WA4GIC	223.10	224.70	

Virginia Repeaters

Two meters

ALEXANDRIA	W8LMB	144.83	145.43	M
ALEXANDRIA	WR4AXB	146.055	146.655	M
ALEXANDRIA	W4HFH	146.085	146.685	M
ALEXANDRIA	W4HFH	147.72	147.12	M
ALEXANDRIA	WA4CCF	147.915	147.315	M
BARREN SPRINGS	WR4AFQ	146.07	146.67	
BERRYVILLE	WR4APE	147.90	147.30	M
BLACKSBURG	WA4YRJ	146.43	147.03	
BLAND	N4AZJ	144.75	145.35	N
BLUE RIDGE	WA4MCP	147.765	147.165	N
BLUEFIELD	WD4RPT	144.89	145.49	
BLUEFIELD	WD8OGY	146.415	147.015	
BRIARPATCH MT.	WR4AHR	147.69	147.09	
BRISTOL	K4ILW	146.07	146.67	
BRISTOL	W4SZP	146.28	146.88	
BRUMLEY MT	WR4ATJ	146.01	146.61	N
BUFFALO MT	N4AZI	144.61	145.21	N
CHARLOTTESVILLE	WR4ATL	146.16	146.76	
CHARLOTTESVILLE	WR4	146.325	146.925	N
CHESAPEAKE	WR4ACN	146.19	146.79	
CLIFTON FORGE	K4QEL	147.90	147.30	
COLE MTN	WR4BCI	147.93	147.33	N
COVINGTON	WB4CAV	146.22	146.82	
CRIMORA	W4PNT	147.675	147.075	
CULPEPPER	WR4BCS	147.72	147.12	M
DAN/WHT. OAK MT	WR4BDN	146.10	146.70	
DANTE	WD4CYZ	146.235	146.835	N
DANVILLE	WR4AHG	147.95	147.35	N
DANVILLE (DCC)	WB4GJG	146.325	146.925	
DUBLIN	WB4UQZ	147.78	147.18	
ELLIS KNOB	W4WRN	147.645	147.045	N
FAIRFAX	WR4AAD	146.19	146.79	
FARMVILLE	WR4ASW	146.31	146.91	
FOREST	WR4ADY	146.16	146.76	
FRANKLIN	K4SPS	147.90	147.30	N
GALAX	WR4HR	144.53	145.13	N
GALAX	WA4ZIV	144.83	145.43	N
GATE CITY	WD4GTA	147.945	147.345	N
GRUNDY	K4HWQ	147.90	147.30	N
GUM SPRINGS	WR4BBI	147.87	147.27	N
HAMPTON	WR4ALW	146.13	146.73	
HAMPTON	WR4AFT	146.34	146.94	N
HAZEL MT	WD4CYZ	146.235	146.835	N
HIGH KNOB	K4AXO	147.81	147.21	N
JOHNSONS MT	WB4JBJ	147.705	147.105	
JONESVILLE	WA4OVC	146.31	146.91	
KLMNRK/SALUDA	WA4UAF	147.93	147.33	
LEXINGTON	WA4WBD	146.07	146.67	
LYNCHBURG	WR4AXO	146.01	146.61	N
MANASSAS	WB4HHN	146.37	146.97	
MARTINSVILLE	WB4HAD	147.885	147.285	
MCLEAN	WR4APC	147.81	147.21	M
NEW MARKET	WR4ATG	146.025	146.625	M
NORFOLK	WB4LJM	146.10	146.70	
PETERSBURG	K4SII	147.78	147.18	N
PETERSBURG	WR4BBU	147.84	147.24	
PETERSBURG	WR4AWC	147.99	147.39	N
PORTSMOUTH	K4LMY	146.25	146.85	N
RICHMOND	WB4QEY	146.04	146.64	
RICHMOND	WR4BBZ	146.28	146.88	N
RICHMOND	W4ZA	146.34	146.94	
RICHMOND	WA4DMO	147.66	147.06	N
RIPPLE MEADE	K4TUE	146.31	146.91	N
ROANOKE	WR4AHT	146.34	146.94	N
ROANOKE	W4CA	146.385	146.985	
SALEM	WR4AFE	146.28	146.88	N
SHENANDOAH	WB4DAK	147.855	147.255	N
SOUTH BOSTON	WR4AYU	146.46	147.06	N
STAUNTON	WD4JEK	147.975	147.375	N
STERLING	WA4TXE	146.115	146.715	M
SUFFOLK	WR4AKS	146.40	147.00	N
TAZEWELL	WD4DZE	147.75	147.15	N
TYSONS CORNER	K4VYN	146.31	146.91	
VIRGINIA BEACH	WB2YVN	146.01	146.61	N
VIRGINIA BEACH	WA4KXV	146.37	146.97	
VIRGINIA BEACH	WA4SBC	147.645	147.045	N
VIRGINIA BEACH	WA4SBC	147.645	147.045	N
WARRENTON	WB4FJT	147.765	147.165	M
WAYNESBORO	W4BLD	147.63	147.03	
WILLIAMSBURG	W4NTG	146.07	146.67	N
WINCHESTER	W4RKC	146.22	146.82	
WOODBRIDGE	WR4AII	147.84	147.24	M

220 MHz

TYSONS CORNER	K4GCM	222.34	223.94	

South Carolina Repeaters

Two meters

ANDERSON	WR4AIO	146.37	146.97	
ANDSN/SASFRAS MT	WR4AIO	146.19	146.79	
CAROWINDS	WR4ABK	147.78	147.18	
CHARLESTON	K4ILT	146.16	146.76	
CHARLESTON	WR4AUV	146.19	146.79	N
CHARLESTON	N4SC	146.34	146.94	N

CHARLESTON	WR4BCP	147.87	147.27	N
CHERAW	WD4HEH	147.735	147.135	
COLUMBIA	WR4AYE	146.16	146.76	
COLUMBIA	K4AVU	146.28	146.88	N
COLUMBIA	WB4URY	146.34	146.94	
COLUMBIA	WR4AYE	147.84	147.24	
COLUMBIA	WB4VLY	147.93	147.33	
COLUMBIA	WB4URY	147.96	147.36	
DILLON	KA4BGA	146.145	146.745	N
DORCHESTER	W4NAT	147.78	147.18	N
FLORENCE	W7ULH	146.25	146.85	
FLORENCE	WA4ISM	146.37	146.97	
GASTON	WB4NEP	144.61	145.21	
GREENVILLE	W4AZT	146.10	146.70	
GREENVILLE	WR4	147.675	147.075	N
GREENWOOD	WR4AUE	147.765	147.165	
GREER	W4IQQ	146.34	146.94	N
GRNVLE/CSRS HD	W4NYK	146.01	146.61	
GRNVLE/PARIS MT	W6NYK	146.22	146.82	
HODGES	KB4YF	144.53	145.13	N
LANCASTER	W4PAX	146.10	146.70	
LAURENS	WA4UZA	146.25	146.85	
LEXINGTON	WR4AGK	147.255	146.835	N
LITTLE MT	K4AVU	147.81	147.21	
LONG MT	WA4JRJ	147.87	147.27	
LYMAN	KS4I	147.885	147.285	
LYONS (GA)	K4HAO	146.22	146.82	
MARION	W4YLX	146.40	147.00	
MYRTLE BEACH	WA4KGN	146.01	146.61	N
MYRTLE BEACH	WR4	147.72	147.12	N
N. AUGUSTA	K4FKJ	146.13	146.73	
N. AUGUSTA	WR4ALS	147.72	147.12	N
ORANGEBURG	WR4AQY	147.69	147.09	N
PICKENS	WR4ADP	146.40	147.00	
ROCK HILL	WC4ABD	146.43	147.03	
SAVANNAH (GA)	W4HBB	146.28	146.88	
SAVANNAH (GA)	W4HBB	146.37	146.97	
SPARTANBURG	K4JLA	147.69	147.09	N
SUMMERVILLE	WR4	146.25	146.85	N
SUMTER	WR4AOI	146.04	146.64	
SUMTER	WD4ECQ	147.615	147.015	
SUMTER/SHAW	WR4AUS	147.66	147.06	N
SWAINSBORO (GA)	K4VYX	146.19	146.79	
TOCCOA (GA)	KA4DIP	147.93	147.33	
WHITE HALL	WR4AQL	146.31	146.91	N

220 MHz

COLUMBIA	WB4URY	222.30	223.90	
GREER	W4ILY	222.38	223.98	N
SASSAFRAS MTN	W4FHJ	222.46	224.06	

Tennessee Repeaters

ALCOA	WR4APM	146.25	146.85	N
ALTAMONT	WR4AWN	146.37	146.97	N
BRISTOL	K4ILW	146.07	146.67	
BRISTOL	W4SZP	146.28	146.88	
BRISTOL	WR4AXQ	147.60	147.00	N
BRISTOL/HLSTN MT	WR4ADO	146.16	146.76	
BROWNSVILLE	WR4ASI	146.655	146.055	N
CHATTANOOGA	KB4TZ	144.79	145.39	
CHATTANOOGA	K4CMY	146.01	146.61	
CHATTANOOGA	W4DSK	146.19	146.79	
CHATTANOOGA	WA4ZOK	147.60	147.00	
CLARKSVILLE	WR4AOO	147.60	147.00	N
CLEVELAND	WR4AQV	147.78	147.18	N
COLUMBIA	WR4AIX	147.72	147.12	N
COOKEVILLE	WR4ANW	146.07	146.67	N
COOKEVILLE	WB4QSJ	147.81	147.21	N
COVE MTN	WA4KJH	146.25	146.85	N
CROSSVILLE	WR4	147.93	147.33	N
DAYTON/RHEA CTY	N4OU	147.99	147.39	
FAYETTEVILLE	WR4BAQ	147.63	147.03	N
GALLITIN	WR4BCX	147.84	147.24	N
GREENEVILLE	W4ANB	146.10	146.70	
GREENEVILLE	WA4LYF	147.66	147.06	
HENDERSONVILLE	W4KKO	144.89	145.49	N
HENDERSONVILLE	WR4BCX	147.63	147.03	N
JACKSON	WR4AQN	147.81	147.21	N
JOHNSON CITY	WB4IKB	146.19	146.79	
JOHNSON CITY	WA4DIU	147.87	147.27	
JONESBORO	WB4SQC	147.99	147.39	
KNGSPT/BAYS MT	W4TRC	146.37	146.97	
KNOXVILLE	WB4JSD	144.51	145.11	
KNOXVILLE	WR4APU	146.13	146.73	
KNOXVILLE	K4HXD	146.34	146.94	N
KNOXVILLE	WR4AHF	146.40	147.54	N
KNOXVILLE	K4HXD	147.675	147.075	
KNOXVILLE	W4BBB	147.90	147.30	
LAFOLLETTE	W4TZG	146.07	146.67	
LAKE CITY	WB4OAH	146.22	146.82	N
LEBANON	WR4BBM	146.13	146.73	N
MADISON	WR4AKN	146.04	146.64	N
MANCHESTER	WR4ACI	146.10	146.70	
MEDINA	K4BEZ	146.37	146.97	N
MEMPHIS (MARS)	AAA4TN	148.01	143.99	
MEMPHIS	WR4AZK	144.89	145.49	N
MEMPHIS	WR4AHK	146.01	147.51	N
MEMPHIS	W4GYS	146.04	146.64	N
MEMPHIS	WR4AOG	146.10	146.70	N
MEMPHIS	WR4AGR	146.13	146.73	N
MEMPHIS	WR4ABS	146.19	147.51	N
MEMPHIS	WR4AHO	146.22	146.82	N
MEMPHIS	WR4AZK	146.25	146.85	N
MEMPHIS	WA4ETE	146.28	146.88	N
MEMPHIS	K4BN	146.34	146.94	N
MEMPHIS	K4FZJ	146.40	147.00	N
MEMPHIS	WR4AXF	146.46	147.06	N
MEMPHIS	WR4BCU	147.63	147.03	N
MEMPHIS	WR4AWT	147.67	147.09	N
MEMPHIS	WB4DAZ	147.72	147.12	N
MEMPHIS	WR5AII	147.75	147.15	N
MEMPHIS	WR4AZK	147.78	147.17	N
MEMPHIS	WD4APK	147.84	147.24	N

MEMPHIS	WR4AZC	147.87	147.27	N
MEMPHIS	WR4ASF	147.90	147.30	N
MEMPHIS	WR4ATA	147.96	147.36	N
MEMPHIS	WR4ASR	147.99	147.39	N
MORRISTOWN	WB4AOH	147.63	147.03	N
MORRISTOWN	WB4AOH	147.825	147.225	N
NASHVILLE	WR4AWV	146.01	146.61	N
NASHVILLE	WR4AKN	146.07	146.67	N
NASHVILLE	WR4ACS	146.16	146.76	N
NASHVILLE	WR4AFA	146.19	146.79	N
NASHVILLE	WR4ABV	146.25	146.85	N
NASHVILLE	WR4ACY	146.28	146.88	N
NASHVILLE	WR4AGX	146.34	146.94	N
NASHVILLE	AI4P	147.615	147.015	N
NASHVILLE	WR4AUX	147.75	147.15	N
NASHVILLE	WB4HFS	147.78	147.18	N
NASHVILLE	WA4YQC	147.87	147.27	N
NASHVILLE	WB4ZSA	147.90	147.30	N
NASHVILLE	WR4BBT	147.945	147.345	N
NASHVILLE	WR4AKN	147.96	147.36	N
NASHVILLE	WR4	147.975	147.375	N
NASHVILLE	WB4DLQ	147.99	147.39	N
NEWBERN	AA4HF	146.745	146.145	N
OAK RIDGE	WR4ADQ	144.85	145.45	N
OAK RIDGE	W4SKH	146.28	146.88	
OAK RIDGE	W4SKH	146.37	146.97	
OAK RIDGE	K4EAJ	147.72	147.12	
OAK RIDGE	K4EAJ	147.75	147.15	
PARIS	WR4AYM	147.96	147.36	N
POPLAR BLUFF (MO)	W0BIU	146.31	146.91	
PULASKI	W4JVO	146.715	146.115	N
SAVANNAH	WA4HGN	146.31	146.91	N
SHELBYVILLE	WR4AQM	147.66	147.06	N
SHORT MT.	WR4AZF	146.31	146.91	N
SPARTA	WR4ASV	147.69	147.09	
SPRINGFIELD	WR4AGH	147.63	147.03	N
UNION CITY	WR4AUQ	146.10	146.70	N
UNION CITY	K4MVE	146.655	146.055	N
WAVERLY	WR4AYB	146.685	146.085	N
WINCHESTER	WR4AFH	146.22	146.82	N

220 MHz

CHATTANOOGA	K4VCM	223.18	224.78	
CHATTANOOGA	WA4ZOK	223.30	224.90	
GREENEVILLE	WB4NKM	223.34	224.94	
KNOXVILLE	WA4YON	222.86	224.46	N
LAFOLLETTE	K4BGW	222.80	224.40	N
NASHVILLE	WR4	223.38	224.79	N

West Virginia repeaters

ALDERSON	WR8AKZ	146.13	146.73	
BECKLEY	WR8ACO	146.34	146.94	N
BKLV/FLAT TOP MT	WR8AKZ	146.25	146.85	
BLUEFIELD	WD4RPT	144.89	145.49	
BLUEFIELD	WD8OGY	146.415	147.015	
BRIDGEPORT	WR8ALC	147.705	147.105	
BRIDGEPORT	WR8ALC	147.72	147.12	
BUCKHANNON	WD8LWI	145.93	147.93	
BUCKHANNON	K8WYH	146.25	147.85	N
CHARLESTON	WR8AER	146.22	146.82	N
CHARLESTON	WB8CQV	146.28	146.88	N
CLARKSBURG	WB8ZVS	146.22	146.82	
COTTAGEVILLE	WR8AKV	146.31	146.91	N
EAST RIVER MTN	WR4AXS	146.16	146.76	N
ELKINS	WR8AOH	146.04	146.64	N
FAIRMONT	W8JM	146.31	146.91	
HUNTINGTON	WB8EZR	146.04	146.64	N
HUNTINGTON	WR8AGH	146.16	146.76	N
HUNTINGTON	KA8BKX	147.90	147.30	N
KINGSTON/LICK KB	W8FG	144.87	145.47	
LOGAN	WR8ADD	146.37	146.97	N
MARTINSBURG	WB8VUZ	147.855	147.255	N
MCMECHEN	W8WUX	146.31	146.91	N
MORGANTOWN	K8LG	144.83	145.43	
MORGANTOWN	WB8YZT	146.085	147.955	N
MORGANTOWN	W8CUL	146.16	146.76	
MULLENS	WR8AKX	147.63	147.03	
NEW MARTINSVLLE	WR8ABY	146.34	146.94	N
OAK HILL	WD8OQJ	146.19	146.79	
PARKERSBURG	WR8ACJ	146.37	146.97	
PARKERSBURG	WR8ACJ	147.96	147.36	
PARSONS	N8ER	144.73	145.33	N
PENNSBORO	WA8CND	147.90	147.30	N
PRINCETON	WB8NRK	146.46	147.06	
RAVENSWOOD	WA8USO	146.07	146.67	
RICHWOOD	K8VKB	146.34	146.94	
SCOTT DEPOT	K8SLI	147.87	147.27	N
SPENCER	WB2HVN	146.01	146.01	
ST ALBANS	WR8AJS	146.40	147.00	
TERRA ALTA	WB8PHU	147.60	147.00	
WEIRTON	WR8AQA	146.34	146.94	
WELCH	N8ACQ	144.85	145.45	
WHEELING	W8JDH	146.16	146.76	

Friends across the Stream

Linda M. Turner, WD4OCI

Little did we know three years ago, when we first added Amateur Radio equipment to the gear aboard our cruising ketch, *Moon Shadow*, that our enjoyment of sailing would be so enhanced. At times we wondered if the long hours of classes and tedious study and the subsequent fears at facing the formidable FCC examiners would be worth it. Looking back to the summer of '78 I can clearly remember our Gulf Stream crossing to the Bahamas and our wonderful new friends who accompanied us along the way.

Tuesday, 20 June — it was a beautiful starry night, with a gentle easterly wind and a bright full moon to light our path as we steered our 42-foot ketch across the sometimes capricious Stream. Our destination — 61 nautical miles away from our departure point in West Palm Beach — was West End, Grand Bahama Island. We had made four previous crossings, all of them without falling prey to the perils of that infamous, dreaded Bermuda Triangle, and all of them with no other communication than our marine VHF radio.

This year, in addition to a whole host of radio and navigation equipment including marine VHF, CB, RDF, and Loran A, we had, for the first time, Amateur Radio gear and, in particular, an ICOM 22S 2-meter radio. Our antenna was a 6dB "Wonder Whip" from Layton Industries in North Quincy, Massachusetts which, oddly enough, gives us a lower SWR with our 2-meter rig than with our marine VHF radio for which it was designed.

We always watch the weather carefully so that our annual Gulf Stream crossings are made in calm seas, thus minimizing any dangers the ocean, much respected by judicious sailors, could have in store for us. However, there is one insurmountable problem — FATIGUE — that, even in ideal weather, is ever present. With a crew of only two persons, staying awake for 12 to 18 hours becomes a real challenge and certainly a serious concern for us, as there is usually a certain amount of shipping in our route. We want no surprises, such as a mammoth seagoing tanker, to suddenly loom before us in the early hours of the dark morning.

That summer, thanks to Robert Wilson, WB4IWL; Milton Lowens, N4ML; Emanuel Papandreas, W4SS; Richard Johnson, WB4TIM; and Stanley McMillan, WA4YCH, of the West Palm Beach repeater organization, staying awake was absolutely no problem. They stood by their radios faithfully to keep us company during those long "tricks" at the wheel, starting at 9:30 p.m. when we said farewell to the last blinking light marking the entrance of Lake Worth inlet. In a previous conversation, Mr. McMillan, WA4YCH, the trustee of the repeater, had told me that they generally shut the 146.07/67 machine down at 12:30 a.m.; but this morning proved to be a most welcome exception. Each hour on the half hour I called the boys on the repeater, reported our position and the state of the seas, and received, in turn, many kind words to boost our morale as we embarked upon the first leg of our summer cruise.

With a little sadness, I called in at 12:30 a.m. expecting this to be our last QSO. Mr. McMillan said, "Well, Linda, I just might stay up for one more hour this morning, so go ahead and give us a shout at 1:30." I did, and not only was he there but also some of the others from the repeater club who heard we were enroute to the Bahamas. "You're coming in 20dB over 9 with full quieting," were their reassuring words, as they encourage me to check back in another hour. I knew they were getting tired as they waited for each succeeding schedule with me, but at our ocean-going radio shack, the opposite effect was taking place. Instead of growing sleepier and sleepier with each passing hour, I became more wide awake and excited as I eagerly anticipated my next contact with my friends ashore; and so fatigue did not have a chance to work on me as it usually had done.

Finally, at 3:30 a.m. not really expecting anyone to hear me, I made what turned out to be my final call. Sure enough, Dick, WB4TIM, was still there to greet me. However, my signal was now breaking up due to the steadily growing span of miles between us. After we said our final 73's, I turned on our Loran A and in a few minutes plotted our position which was roughly 26° 51'N, 79° 27'W, or nearly 40 statute miles from the repeater site. We were well over halfway to the Bahamas by this time, and the long awaited daylight was a mere 2½ hours away. The most difficult part of our long passage was now behind us and the warm thoughts of all our new friends back in West Palm Beach would keep our spirits high until our landfall, now less than four hours away.

Since that summer of '78 many nautical miles have passed beneath our keel. We have, through Amateur Radio, made numerous friends in the Bahamas, Turks and Caicos, Dominican Republic, Puerto Rico, and the American and British Virgin Islands, not to mention the countless number of helpful amateurs who have come our way through the maritime mobile nets on 20 meters. We have enjoyed the use of dozens of repeaters, and the one group that is mentioned foremost in our log is the club affiliated with the 146.07/67 repeater in West Palm Beach, the home of our "friends across the Stream." □

Solar information

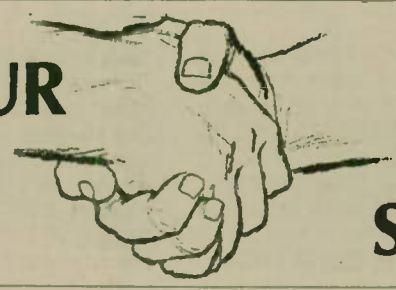
A few notes on the new service to Amateur Radio — the Solar Flare Hotline Service. NASA has just announced this service, which provides information on solar flares, geomagnetic activity, solar flux levels and sunspot activity on a 24-hour basis. The reports will also include, when appropriate, an assessment of the impact of the sun's behavior on radio transmission. Solar flares often disrupt ionospheric propagation on all HF bands for up to an hour or so at a time.

The number to call for this service is 301-344-8129. This is a TOLL call, but the service is free. There is a great deal of scientific information given in very technical terms, but it also gives solar assessments which should be very useful in determining day-to-day conditions on the HF amateur bands.

Now that the winter contest period is approaching, this info might be of some use to any serious contester out there.
QUA RAE, Erie, PA □

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

AMATEUR RADIO IN PUBLIC SERVICE



Mexican amateurs assist HMCS Yukon in emergency

Bob Wheaton, W5XW-XE2XW-VP1XW

Details in a personal letter from Manuel Tellaeche, XE3RT, provide the following account of a medical emergency in which several Mexican amateurs reacted quickly to provide aid to the Canadian Navy destroyer *HMCS Yukon*, and were honored by the ship's crew and Canadian ambassador in Acapulco.

Manuel was casually listening to a Spanish language QSO on 40 meters on 30 October. A breaker, speaking only English, identified himself as VE0NWK/MM, mentioning a medical emergency aboard his vessel, but his plea for assistance was not understood by those in contact there. Manuel asked them in Spanish to please stand by, as he coordinated with VE0NWK/MM to move off frequency.

A Canadian sailor was diagnosed as having acute appendicitis, and the ship was enroute to Panama, at 14° 34'N and 96°11W, approximately 180 miles SSW of the Port of Salina Cruz, Mexico, in the Gulf of Tehuantepec. The ship's Captain had already set course for Salina Cruz, but had been unable to establish any radio communication with Port Authority there. The ship requested that, if possible, a helicopter be dispatched to evacuate the stricken sailor.

Manuel quickly established communications with XE1SDN, the station at the Secretary of National Defense, operated by Abel. Abel then notified the Canadian Embassy in Mexico City of the situation aboard the Yukon, and the *Yukon's* Captain spoke by phone patch with the Embassy's First Secretary to clarify the assistance needed. While Abel attended this aspect of communications, Manuel, XE3RT, and Mario, XE1MCK, telephoned Port Authority at Salina Cruz to alert them about the emergency, and the fact that the *Yukon* had been unable to contact them on standard frequencies. Luis Villanueva, XE1CRM, contacted various rescue groups and the Mexican Red Cross, but was unable to locate a helicopter capable of such a rescue at night, and so far from the coast.

Meanwhile, the Canadian Embassy was arranging for a swift medical evacuation from Salina Cruz to Mexico City by private plane, should it be required; and the Mexican amateurs arranged for the sailor to be granted emergency treatment at the Navy hospital in Salina Cruz immediately upon arrival, obtained Mexican government permission for the *Yukon* to put in at Salina Cruz, and continued their efforts to notify the Port Authority by phone.

At 0600 (XE), the *Yukon* finally made the Port of Salina Cruz, and in spite of the fact that no direct communications between the Yukon and Port Authority had ever materialized, the sailor was quickly evacuated. After medical examination determined the advisability of returning him to Canada for surgery, he was sent home by plane, and at last word was recovering satisfactorily. The *Yukon* then departed for Panama, and all the amateurs said goodbye. VE0NWK is the *HMCS Yukon* Amateur Radio Club station, and the ship's operators were identified as Chaplain Fr. John Hunt, and the radio operator only as "Mike."

A week later, the Canadian Embassy notified the Mexican amateurs involved that they would be officially cited for their assistance, and their presence was requested at an official reception aboard the Yukon, at Acapulco, on 29 November. XE1CRM, XE1MCK and XE3RT were able to attend, and in addition to being the guests of honor at a ship's party, they were awarded Citations of Gratitude of the Canadian government by Capt. Hope of the Canadian Military Training Squadron, Capt. Boivin, C.O. *HMCS Yukon*, and Canadian Ambassador Claude T. Charland. □

Always ready

Vivian Douglas, WA2PUU

A few amateurs were leaving a radio club meeting, while others were settled for the night. The date was 9 October 1980.

A call came out over the usually quiet repeater frequency as the day drew to a close. Help was needed to handle communications during an emergency. A normally peaceful and quiet residential area had been shaken by a loud noise; then a wall of water roared through, wrecking property and threatening lives.

A main water line had broken in the Onondaga-Geddes section of Syracuse, New York. Several families had to be

evacuated to safety. Gas and lights were cut off and an emergency shelter was set up in a nearby school.

The first call on the Onondaga County Repeater WR2AOC, 90/30, asked for two operators. The American Red Cross needed communications between their Warren Street headquarters and the emergency location. Within 24 minutes, operators Earl Kletsky, WA2LCO; Scott Reagan, WA2CHJ; and Chuck Sawner, WA2ZON, were on location.

As soon as one amateur was placed in position, more calls were issued for communications assistance. More than a dozen amateurs were activated as the early morning hours progressed. Operators with hand-helds were essential, since they could keep up with the disaster teams.

Covering the shelter was Sue Rugelis, KA2DQN, requesting food, milk for the children, coffee, blankets, cots and other essentials to accommodate the 150-200 unexpected guests. All Red Cross requests were directed immediately through Sal Yorks, WD4NZX; George Smith, AE2K and Charles Sawner, WA2ZON, acting net controls at the Warren Street headquarters.

At the command post and other major site locations, some in two feet of water, were John Lybrook, N2AZU, and Dick Erhardt, WA2FWW. During the eight hours the net was open, net control was manned by Vivian Douglas, WA2PUU, who turned it over to Nita Soper, WB2HGO, at midway point. Returning to the NCS position, she then passed the control sites over to Paul Dunn, WA2IDA. Amateurs who were connected directly and worked with the Red Cross Disaster Team were Al Crocker, W2HOS; Kevin Walsh, WB2JOD; and Francis Waddington, KA2IVK. George Smith, AE2K, covered a dual role throughout the emergency.

The amateur operators lost a full night's sleep to volunteer their skills for the safety and welfare of several families needing help. It's always easy to say you would help when needed, but if you were called at 1:00 or 2:00 a.m. when you have an important workday within a few hours . . . would you respond quickly and cheerfully? Are you prepared to work for an unlimited time? Is your identification material readily available, batteries fully charged? Emergencies don't warn in advance. □

Thanks go to Texas amateurs

Bill Vernor, Jr., WB5FTG
Red Cross Shelter Communications

From 1:00 p.m. Friday, 8 August, until 2:00 p.m. Monday, 11 August, 1980, the San Antonio Amateur Radio Community worked with the American Red Cross to handle emergency traffic in and out of the Red Cross headquarters and to and from 22 shelters. We never expected more than about six shelters to be opened at most. How were we to know almost the entire coast of Texas was headed this way!

About 60 amateurs worked with Red Cross in shelter communications and to those, I wish to express my sincere thanks. I know the Red Cross feels the same.

One big lesson I feel we all learned is: you must have a good antenna, a power supply, and a rig that can be used by you for an extended amount of time; also, you must have coax at least 50-100 feet long.
— *San Antonio Repeater Org. Bulletin, Texas* □

Simulated evacuation a success

Amateur Radio's participation in the practice evacuation of the McGuire Nuclear Plant area (Charlotte, North Carolina) was declared a complete success by the Red Cross's Mike Howes, Director of Disaster Services. He was lavish in his praise of the communications provided by the amateurs.

The operation for most of the members began at 8:00 a.m. on Saturday, 6 December, when they reported to one of four locations: the Red Cross Building, the Law Enforcement Center, the Air National Guard at the airport, or the University of North Carolina at Charlotte. Amateur Radio operations were carried out on the 34/94 repeater and simplex frequencies from all four locations and Red Cross portable units were established at the Air National Guard and at UNC-C. Operators for all units were amateurs.

The actual evacuation was begun at 9:00 a.m. and approximately 50 volunteer evacuees showed up at the UNC-C shelter. Simulated emergencies such as heart attacks and overflowing shelters, etc. were cause for messages passing back and forth. A second shift of operators reported at 12:00 noon at which time bag lunches were available for those who wished them. The "all clear" came at about 1:30 p.m.

The group was organized by Jerry Malin, WB2LEI, assisted by Gerry Hutchinson, KD4E.
— *Mecklenburg ARS News, Charlotte, NC* □

Exxon hams are all EARS

In case of an emergency, Exxon Corp. employees may call on members of the Exxon Amateur Radio Society — EARS.

About 35 Exxon employees and retirees belong to the Linden or East Coast chapter, maintaining a network with other members throughout the nation.

"We're ready to help anywhere during an emergency," said Al Roehm, an instrument engineer in the facilities development department at Exxon's Bayway Refinery. He is the founder of EARS and past president of the East Coast Chapter.

The East Coast members keep in touch with those on the Gulf Coast. "During the great Northeast blackout of 1965, the refinery's operations were interrupted," Roehm recalled. "We needed additional ways to communicate with our people who were in Houston."

The blackout prompted the idea for EARS, which now has two main functions: Providing emergency backup to the company's own communication system, and relaying messages for police and civil

(*please turn to page 42*)

AWARDS

Work Montana

The Lower Yellowstone Amateur Radio Club of Eastern Montana announces its Big SKY Worked All Counties Award to increase Amateur Radio activity among and with Montana operators.

To qualify for this award, any licensed amateur applicant must QSO and QSL all 56 counties in Montana on any band/mode. No repeater contacts are accepted. All QSOs since 1 January 1980 count, and applicants need only have their QSL list verified by two other amateurs, send the list with $1 and two first class stamps to Dorothy Barber, WB7UTJ, or Ron Martini, N7BMR. □

British benefit from these awards

Brian Summers, VE3JKZ

The Radio Society of Great Britain (RSGB) sponsors several awards of interest to the HF operator, particularly to the "ex-Brits" or to those living in one of the Commonwealth countries. Most of the awards date back to the early days of radio when they were known as Empire Awards.

Worked British Commonwealth (WBC) is similar to the IARU-sponsored Worked All Continents, except the requirement is to work a Commonwealth country in each of the five continents. with North and South America counting as one. While this is not a particularly difficult award to achieve, Asia is sometimes a little troublesome.

The British Commonwealth Radio Transmission Award (BCRTA) is available to those who work 50 Commonwealth call areas. As all the VE and VK prefixes count separately, this is not too difficult. Being close to the Caribbean also helps us. If you want a real challenge, try for the five-band endorsement which is available.

The Commonwealth DX Certificate (CDX) is really beautiful, consisting of a multi-colored world map and the words "Commonwealth DX" boldly printed across it. The requirement is to work 50 Commonwealth call areas on the 20-meter band and 50 on the other bands. Of course, for the other bands, you can claim a particular call area only once; for example, you might claim VE3 on 10 meters as well as 20 meters, but you cannot claim it again on any other band.

All these awards can be endorsed for a specific band or mode. Shortwave listeners are not forgotten by the RSGB — there is the British Commonwealth Radio Reception Award for confirming 50 call areas, and the DX Listeners Century Award for confirming 100 countries.

Cards do not have to be sent away for validation. A statement by an official of a national society verifying that the cards have been checked is sufficient.

You can obtain complete up-to-date information and application forms from: RSGB HF Awards manager; P. Miles, G3KDB; P.O. Box 73; Lichfield, Staffs, England, WS13 6UJ.

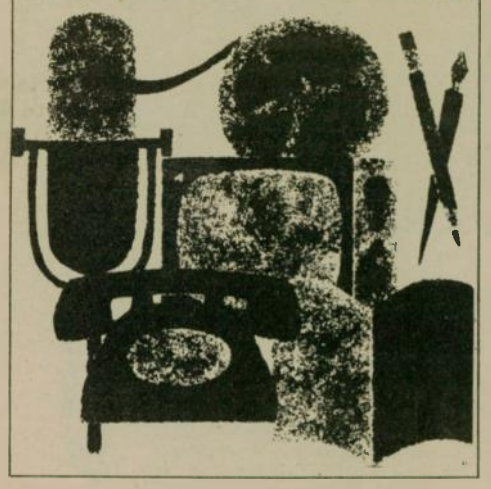
— *The Groundwave*

To the optimist, all doors have handles and hinges; to the pessimist, all doors have locks and latches.

—William Arthur Ward

The arm of Amateur Radio reaches around the world; **Worldradio** is out to reach you.

PUBLIC RELATIONS



Metuchen YMCA boosts AR in Central Jersey

Bob McGarvey, WB2EVF

Central Jersey would be a much poorer place as far as Amateur Radio is concerned if it were not for the Metuchen YMCA Amateur Radio Club.

It has reflected credit on George Russell, W2SJU, who directs the activity, and on the many other experienced radio men who have worked with him during the near quarter of a century the club has indoctrinated new amateurs and helped others upgrade.

Additionally, the club has brought distinction to the Y and has put Metuchen on the radio map.

Honors won by the Metuchen YMCA amateurs in the annual American Radio Relay League Field Day exercises have resulted in international publicity, through QST, the journal of the ARRL.

Just looking over the roster of the club brings back a lot of reminders.

Offhand, I spot four names of holders of amateur Extra Class licenses — and I probably missed a few. At least three of them are direct products of the Y organization.

And there are quite a number of Advanceds, invariably people who came to the club to find out how to go about getting a Novice license and stayed around to upgrade.

There are Generals galore and a sprinkling of Technicians.

Among the newcomers, you'll find holders of the Novice license and others who are studying to take their first tests to get that opening wedge ticket.

There are teen-agers, YLs, men of all ages, including some who have retired and for the first time have discovered they are in a position to satisfy a lifelong ambition — to get an amateur license.

There are other clubs and there have been classes and courses in schools and colleges, but year in and year out, there has always been the Metuchen YMCA Amateur Radio Club.

When radio enthusiasts embraced CB back in the early 1970s and earlier and were disillusioned after it began to show signs of becoming a vocal cesspool, many of them were already committed to communications.

They looked for a place to go — and found it in the Metuchen YMCA club.

Dozens of the better sideband CBers attended classes in the middle '70s and qualified for their amateur licenses.

They were the CBers who prompted others to say all the good operators had become amateurs or gone off the air.

The Metuchen club was filling this need before the existence was recognized nationally.

Long before the amateur publications and national organizations knew what was happening, George Russell had stepped in to share his knowledge with newcomers to the amateur scene and do what he does best — teach.

George produced good amateurs. If you were willing to work at it and learn, he was prepared to help you all the way to Extra, if you wanted to go that far.

The decline that was evidencing itself in amateur licensing totals was reversed in Central Jersey.

Eventually, the tide was turned in other states as well, and the back-patting became epidemic. Amateur Radio's hierarchy had done a great job. The public's interest in Amateur Radio had been restored.

But the job was done by the George Russells and the Metuchen Amateur Radio Clubs of the country.

We were a lucky bunch to be right in the middle of it, here in Middlesex County, New Jersey.

— *The Home News* □

OFF THE AIR

10 meters increases in popularity

Just received your November copy of **Worldradio** and I noticed on page 35, the listing for 10-meter beacons.

I have been interested in this particular phase of radio propagation for many years and have run beacons from time to time. I am now in the process of setting up a permanent coordinated beacon on 28287.5 kHz. This frequency has been assigned by Alan Taylor, G3DME, who is the coordinator of the 10-meter International Amateur Radio Union (IARU) Beacon Project. They adopted a band plan at the 1975 Warsaw Conference which provided for beacons in the 28.250 MHz band segment. Then in 1978, the Hungary Conference extended the ham band to 28.300 MHz.

In corresponding with Alan Taylor, he has sent me the latest up-dated list of international 10-meter beacons, and I am enclosing a copy. This list, I believe, is the latest one he has put out. It is revised upwards to 1-1-81.

As you no doubt know, there has been a lot of interest in the International Beacon Project. Many of us are using it on a daily basis. I think that one area I would like to work in is the analysis of reception reports. Perhaps later on, we could furnish you a list of QSL addresses for beacon reporting. I would like to get into that later.

We do know there are many operators in the world using the beacon spectrum as path indicators and as the interest and activity picks up even further, we are sure many interesting propagation conditions will surface. I know at my QTH in past years, I have been able to successfully log many of the beacons in the early days — even when there was absolutely no amateur activity on 10 meters. With the complete lack of activity, the beacons were heard practically around the world running low power on a day-to-day basis.

We all have much to learn about the 10-meter section of the spectrum. I am positive we are getting less than a 10 percent utilization out of these frequencies, and we can credit the increased activity, to a large extent, to our international TEN-TEN program. Naturally all of us who are interested in beacons and 10-meter propagation owe a lot to the TEN-TEN group for the fine job they have been doing to increase the activity on 10 meters. Best regards.

Sincerely,
Tom Harrington, W8OMV
Columbus, Ohio □

In appreciation of a fellow amateur

I have been getting your paper for about five years, and notice you are always asking for interesting articles from your readers. I thought you would be interested in an amateur who helps people here in Jacksonville, Florida.

I live in Jacksonville and have been an amateur for about four years. Not long after becoming an amateur, I met Josiah M. Jordan, Jr., W4GRQ. Jordan is a retired person who likes to stay up all night, and if he sleeps at all, does it during the daytime.

This man, who monitors the local 16/76 repeater about 24 hours a day, goes out of his way to aid people in trouble. If an amateur operator is passing through town and wants information on which way to go, W4GRQ is there. If a person has a flat tire and no spare, W4GRQ is there. If a mother has lost her child, W4RGQ is ready to help.

Many amateurs who monitor the repeater late at night will pretend not to hear a distress call or do not want to get involved, since they would have to leave their nice warm homes at night. So when there is a call for help, it is a welcome sound to hear "QRZ the station calling for help or assistance. This is W4GRQ. What can I do for you?"

Jordan will get out of his bed, turn off his TV, and go out to help these people — whoever they may be.

It's nice to know there are still people like Jordan around — people who like to practice being human beings and act as friends to someone in need. I am speaking from first-hand knowledge of W4GRQ's kindness, because I have been broken down late at night, myself.

I thank you, W4GRQ, for the experience of knowing you, and hope you continue to practice the fine art of being a friend to those in need for many years to come. Perhaps the enjoyment you get out of giving a helping hand to others will rub off on someone else!

Sincerely,
Jack P. Johnson, WB4BYO
Jacksonville, Florida □

Never too old

I recently obtained my Amateur Certificate in Kitchener (Ont.) They gave me call letters VE3MAA, but later phoned me to say they would like to change them, with my permission, to VE3ROB. The reason given for the change was my age (I was 84 on 19th May last). They thought that I was perhaps one of the oldest persons to sit an amateur exam and pass.

I belong to the Peel Amateur Radio Club, where some of my friends are attaching words to my ROB call like 'Rugged Old Boy, etc. They seem to get a big kick out of these sallies.

My XYL is an Advanced amateur (she is very much younger than I). Nevertheless, she urged me to study and try, which I did and was successful.

Apparently one is never too old to learn. My wife and fellow club members were tireless in their urgings and help.

Robert Drummond, VE3ROB
Brampton, Ontario
— *TCA, Canada* □

Hello from the Colvins

16 December 1980

Dear Friends;

We have completed our operation as W6KG/4X. For the first time in our trips, we operated from a place different from where we slept. We operated from an old farmhouse that had not been occupied for

five years, and slept in another house about 1,000 feet away.

We were surprised to learn, upon our arrival in Israel, that all Amateur Radio operators there are prohibited from working any Arab country. The licenses issued to us state: "It is strictly forbidden to communicate with stations of the following countries: 7X, JY, HZ, 7Z, 8Z, A9X, A4X, YI, 9K2, OD, 5A, CN, 5T, A6X, YK, ST, 3V, 4W, 70, and A7X."

In addition, we found out that, since 1967, the USSR has forbidden all Russian amateurs to communicate with Israeli stations; but the USSR amateurs have interpreted this to mean that it is OK for them to work foreign amateurs, like ourselves, in Israel.

The rules tend to be a real restriction in making a big score in several contests; however, the fact that Israel is in Asia makes it easy for Israeli stations to gain extra points in working the relatively near-by amateurs in the continent of Europe.

We had an opportunity to visit most of the historic and biblical towns and areas of Israel. It is an experience everyone should have, sometime, if possible.

From W6KG/4X, we contacted some 5,000 amateurs in 120 countries. We participated in the CQ-WW-CW Contest and probably made the highest score in the multi-operator single-station category for Israel.

By the time you read this, we should have returned to the USA and left immediately for French St. Martin, where we will operate as FG0FOL/FS until mid-January 1981. Please pass this information to all interested.

73
Lloyd Colvin, W6KG
88
Iris Colvin, W6QL □

He praises Worldradio columnists

I thought that you had two great articles in the January '81 issue.

Chuck Clark's on what not to do on a traffic net was very informative to a new amateur. I have been very critical of traffic editors such as Clark, because they generally are not very helpful, but are super-critical of inexperienced operators. I thought his column was exceedingly helpful.

Will Oar (??) did the same type of thing in his column, which I thought was very good. Many new amateurs do not have Elmers, nor choose to affiliate with a club. They get their education by reading **Worldradio, QST, 73,** etc. They don't know how to "tune an antenna," yet the phrase is used as if it was universal knowledge, like the law of gravity. "Zero beat" is another phrase that isn't necessarily a thing of common knowledge to the common folk. So if someone says "rotate until you get a null," they might as well have said "rotate until you get a dolis," unless "dolis" is defined. So why use jargon? Why not say "rotate for a minimum signal"??

Certainly, it makes it very hard for the writer to create in this fashion, especially if he is highly competent in his field. It is also hard to identify the possible audience for the work too.

But the fact that someone doesn't know what a "null" is, or what a "dolis" is, is not all that bad — so long as, from time to time, our esteemed columnists devote a paragraph or two to the "obvious" things.

Keep up the good work.

I wish that President Reagan could read the January '81 issue of **Worldradio.** It would concisely fill him in on what Amateur Radio operators do, and how well they do it. It might help when he considers his upcoming FCC appointments.

Thank you.

Respectfully,
Charles Colin, KA6EVN
Coulterville, California □

Silent key

I am sorry to report that Ray Hoare, VK9RH, of Norfolk Island in the South Pacific passed away in his sleep on 11 December 1980. Ray was the first Amateur Radio operator on Norfolk Island to operate Slow Scan Television, and as far as I know, to this date, no one else has done so.

73.
Ralph Cabanillas, Jr. W6IL
Hollywood, California □

Belgian story enjoyed

Very pleased with Worldradio!

The December 1980 issue has an article I liked vary much: "Life in Belgium", page 35. This article is very different and very interesting, as well as enjoyable. All your articles and advertisements are interesting, but I want to point out that the "Life in Belgium" article was "the icing-on-the-cake".

I have an article that I plan to write, describing my antenna situations in the apartment complex in which I live — some success and many failures.

Happy New Year,
Bernie Lavezza, KA4RBD
West Palm Beach, Florida □

American Radio Relay League

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

After reading this column a few weeks ago, a friend of mine commented that I sure know a lot about the history of the ARRL. Well, having been a League Official for over 25 years, one would expect to learn at least something about the League. But history? That's another matter.

It's always amazed me in my 25 years as a high school teacher, how many students do not like to study history. And I suspect this is true of many adults.

And yet a study of history is often the best way to find answers for today's problems. How often we humans seem to make the same mistake over and over again, not caring to look back to the time before, when we made the same mistake.

When I was considerably younger, just after WWII, I remember having this point made clear to me when I heard a commentator discussing history's importance on the radio.

He said, "The trouble with your generation, is that you have failed to read the minutes of the previous meeting."

He was talking about my generation at the time, but the statement could very well apply to any generation.

And so having this ideal, I made up my mind I would always try first to gather a background — history, if you will — of any particular area that I might be involved with.

In my activities with the ARRL, I have always been interested in its history and the knowledge I've acquired through this study has always paid off.

Where does one acquire a knowledge of history of the League? Well, there are many ways to learn about what has happened in the past.

The first source that comes to the minds of many who have already acquired some personal history of the League through experience, is *Two Hundred Meters and Down*, by Clinton DeSoto.

This book, which is the result of considerable study and research by the author, appeared in 1936 and was published by the ARRL. After the original publication, there were no reprints for many years. Unless you knew someone who had a copy of the original edition, it was impossible to read the book.

A few years ago, however, the League Headquarters reprinted the book in a new form and it is still available from Headquarters. Many amateurs and League members do have copies.

Of course, this book only covers through the year 1936, and a lot of history has gone on since that time. Where does one obtain information beyond 1936?

A major source of this history, at least through 1964, is in the pages of QST. In 1964, the 50th year of the League, a series of historical articles appeared which updated much of *Two Hundred Meters and Down* as well as adding information on the pre-1936 years.

To make it easier for members to have this history, the League published a book in 1964, containing the articles in one collection. The book, *Fifty Years of ARRL*, is "a reprint of historical articles from the 1964 issues of QST."

This publication, in addition to *Two Hundred Meters and Down*, has been my own major source of information on the history of the League and Amateur Radio.

What about the years since 1964? Well, fortunately for me, I've lived all these years and so have some personal knowledge of what has happened during this time period.

Don't think that having lived through a period of history gives you that history at your fingertips. We all tend to forget, and our own minds often "color" what happened. Perhaps at the time, we did not really see what was happening. How often today do we really know what is going on?

So where can one find this history in written form? I've found, again, that the pages of QST are a valuable source of later information; and after all, that's what *Fifty Years of ARRL* really is.

My own collection of the back issues of QST has proven of great value in finding out "what really happened" in a given situation. Unfortunately, my own collection only goes back as far as 1946, when I first joined the League; but other collections are also available which go back to the first issue in 1914.

One day while doing research in the library at San Jose State University, I discovered that the SJSU Library has a collection of QST that goes back nearly to the beginning.

I suspect that the University library has this collection due to the efforts of the late Harry Engwicht, W6HC, Past ARRL Director and a professor of engineering at the University.

Of course, there are other publications on Amateur Radio that can give some background information. (I'm sure some will say that QST is slanted in viewpoint.) CQ, Ham Radio and other amateur publications, some now defunct, are also a source of information and some "misinformation."

As a matter of fact, I often enjoy going back through history as seen through various publications, to see how wrong predictions can be and how misinformed some individuals turned out to be.

Another important source I have found for information on the history of the League and Amateur Radio is to talk to those who were there and are still here.

When I first became a Director, I found talking to individuals such as the late Ken Hughes, W6CIS, a Past Director; the late Harry Engwicht, W6HC, Past Director; and Mac McCargar, W6EY, Past Director, Vice President and now Honorary Vice President, of great value in understanding past history.

During my years of activity as a League official, I've talked to many others who "were there" when certain happenings took place, including Directors, Vice Directors and Officers of the League, and other amateurs who were involved.

These personal contacts, along with readings from many sources, can give one a good background in understanding the history of Amateur Radio and the League. Such research will help you in understanding at least "how we got here."

Another book I've just read (although I've had it for two years) is *Hiram Percy Maxim*, by Alice Clink Schumzcher. Maxim has been called the father of Amateur Radio, a car builder, author and inventor — all of which he was.

While the book is not specifically about the early years of the ARRL, it does give background to understand why Maxim worked so hard to build a strong national Amateur Radio organization.

So don't be guilty, as so many are, of not "reading the minutes of the previous meeting." At least try to get some understanding of what has already happened in Amateur Radio and League affairs before repeating history's mistakes.

The League is a strong organization today, and if you bother to look back, you can see the path that has lead us to this position of strength. □

Fund-raising is a BIG success

Mike Reik, WB9YJF
Trustee IRS, Inc

Vermilion County, Illinois is situated in far East Central Illinois — 130 miles south of Chicago, 90 miles due west of Indianapolis. The 95,000 residents are out of effective range of two NWS radar systems, one located southwest of Chicago, and one located at St. Louis, Missouri. Since this county sits in "tornado alley" in Illinois, 95 percent of our early warning system is dependent upon the human eye for indications of severe storms or actual tornadoes. This situation is not too bad in the daylight hours, but after dusk, you no longer are looking for a tornado; you are listening for it!!

About two years ago, the Danville (Illinois) Safety Council decided to try and raise money from the public and county business to buy a Sperry-Rand Model 16 radar system to be installed in the county Public Safety Building, which houses county ESDA offices and communications systems. This would afford the county a realistic and professional radar system, which would give our citizens better and precise advance warning of severe weather. This group approached mainly businesses and raised about $7,000. Then for some reason, they ran out of steam.

In early summer of 1980, the Danville Exchange Club, which had just formed, took upon itself to continue this project as its first public service goal. The Illiana Repeater System, being a forerunner in advance communication services to the public and to ESDA, lent its support to this project. The goal was to try and get $1 per household county-wide. This was done as, at the time, there were no federal or state funds to be made available towards this project.

On 7 September 1980, the county-wide project started for one week. With kids just back to school, getting door-to-door help was a bit hard; and a lot of people had put out donations for Jerry Lewis, United Way, and spent a bundle on getting young ones back to school. Although the Exchange Club did not reach its goal, they did collect another $7,000.

Area Amateur Radio operators and members of the Illiana Repeater System who gave many hours of help were: WB9YJF, WD9AFB, KB9GS, WD9AFD, K9BJM and K9ZKA.

Then in December of 1980, the County board voted to give $5,000 towards the project. So the county is now at the $21,000 mark and this is about $2,000 short of the purchase price. It now looks like we should have the unit in the next two to four months.

In the future months and years, the Amateur Radio operators will continue to play a most important role in advance weather warning. With the radar unit in operation, their task will be made a lot easier and the advance warning to the public will be greatly increased. □

Book Review

Guide for prospective amateurs

Chuck Clark, K4ZN

Under the title *Amateur Radio Super Hobby,* Vince Luciani, K2VJ, has written a guide for those who are interested in Amateur Radio. While not intended for those already licensed, it is quite likely that many licensed amateurs will buy it, read it, enjoy it, and even learn from it.

Vince touches on many aspects of our avocation, beginning with traffic handling, and going through DXing, contesting, public service, rag chewing, television; just about every interest is covered. He also has much to say about how to get started, how to get a Novice license, about purchasing or building gear and a realistic estimate of what it will cost. No actual course of study is included, however. The reader is, instead, advised how to get in contact with a local amateur or amateur club, and Vince adds a list of currently available study guides.

Many readers may find the brief biographical sketches of several amateurs the most interesting part of the book. There are well-known people like Senator Barry Goldwater; others not so well-known, such as people with handicaps who have succeeded in earning their licenses; and one chapter where Vince's paternal pride makes no effort to conceal itself as he tells how his 15-year-old son Jim, WA2JNN, picked up an SOS on CW one morning and handled it with all the cool competence of an old spark, and stood by until the Coast Guard had things in hand. The story is also told in December 1980 **Worldradio**, page 4.

His theme throughout the book is, if all these people can do it — busy, famous people, handicapped people, men and women, and even a five-year-old — the reader should also be able to work Amateur Radio.

Vince is to be commended for stressing the public-service aspects of Amateur Radio throughout, without losing sight of the fact that Amateur Radio is fun, has therapeutic value, and is a great way to meet and keep in touch with wonderful people. He did miss one possible chance to push the public service angle, however, when he mentions PICONET on page 87, "whatever that means." The name comes from "Public interest, convenience, or necessity," the criteria established by the Communications Act of 1934 by which the FCC is directed to decide whether or not to issue a license; hence the ultimate norm for justifying the existence of the Amateur Radio Service.

It's also good to see the author encourage beginning amateurs to become really proficient in the use of CW, and to build at least some of their own gear. In short, an amateur who follows this as a guide will be one who will get the most out of Amateur Radio, precisely because they will put so much into it.

Amateur Radio clubs will find this book a good investment if they donate a copy to their public library, with their own address pasted inside. It's sure to bring people to their Novice classes.

The author explains why he included no photos. He says they prevent people from reading the text. He may be right: how many people read the **National Geographic**? But readers will find the many cartoons by Joe Chris, WA1LES, a highlight of the book — in much the same spirit as those of Gil Gildersleeve, W1CJD, which adorned the pages of **QST** for decades.

Amateur Radio Super Hobby, 144 pages of 8½ × 11 inches, available only from the publisher: Cologne Press, $8.95 paper, $14.95 hardcover, plus $1 for shipping and handling. Autographed by author on request. Available in January 1981. □

Club offers courses

In response to current interest in personal radio communications, the Tri-Town Radio Amateur Club is inviting Chicago and suburban residents to attend either of two 12-week courses in Amateur Radio. One is for beginners, or Novice, and the other is for the Technician/General license study. Children and adults are welcome.

In cooperation once again with the Homewood-Flossmoor Park District program, instruction will be provided to enable the students to pass the examinations required by the Federal Communications Commission. Three areas of study are covered: (1) basic radio theory, (2) FCC regulations, and (3) International Morse Code.

Classes will be held each Wednesday from 7:30 to 9:30 p.m. at the **Flossmoor Junior High School** starting 11 February and concluding 6 May.

Students are encouraged to bring a portable tape recorder to class to record the code practice tapes used by the instructors.

Although the Tri-Town services are free, the Park District charges (for use of their facilities) a fee of $4.50 for either course. Non-residents are charged $6.75. Registration can be made by mail or in person at the Merchants Park Administration Building, 18350 Harwood Ave., Homewood, IL 60430.

The Park District phone number is 957-0300. Students registering by mail must include their name, address, phone, correct fee, and specify that it is for the Amateur Radio course. □

STATION Appearance

A Very Good Citizen wins this month's subscription. John Walter, W5VGC, of Albuquerque, New Mexico takes the prize.

The neat display of framed certificates gets some points. Then comes what almost seems "de rigeur" for station appearance winners -- the scope, just to the right of the lamp on the top shelf.

We always like to see an equidistant azimuthal map in radio rooms; not only is it quite useful, but it gives a non-amateur visitor something to ask a question about, and the answer can be easily understood. "That funny-looking map" is usually good as an ice-breaker in conversation.

W5VGC has just completed WAS on 5 bands (certified #685), and just finished WAS on the 160-meter band. That's a real accomplishment!

He has RCC, WAC CP-25, Old-Timer Club membership, QCWA Public Service Award, and is a former Emergency Coordinator and Official Observer.

He made the desk the equipment is on, since another hobby of his is woodworking. His antenna is a 23-foot top-loaded vertical for 160 meters. A Butternut vertical is used on 80, 40, 20, 15 and 10 meters. A Gem Quad up 29 feet is used on 20, 15 and 10 meters. Some 2-meter FM activity is enjoyed. He works a lot of CW, as well.

John works at the Veterans Administration Medical Center in Albuquerque, New Mexico in the supply center.

EQUIPMENT: Yaesu FT 101E; Kenwood TS520; Ten-Tec 540 and Century 21, all analog. Drake TR22C for 2 meters; Ameco pre-amp PT-2 and Anteck 1C active filter Model QF-1; Heath SB614 monitor scope. The Ten-Tec 540 and 160 converter is used most of the time on 160, as well as the FT101E.

The elevation of John's QTH is 5,370 feet, so that helps in getting out.

We'd like to see a picture of your station. Send in a description and a bit about yourself. □

Boulder is eager for Amateur Radio Clubs

Amateur Mary Bauer — Bill Bauer, WØHIM'S XYL — is looking for a radio amateur to demonstrate Amateur Radio and get boys interested in it. The Denver Boys Club as an active program, and it is hoped that this could get started in Boulder (Colorado).

The Boys Club is for boys in Boulder, ages 7-17, and is especially aimed at boys with both parents working or with single parents. Persons interested in working with boys and Amateur Radio should call Mary Bauer, 494-5328, or the Boys Club director, Bob Quinanez, at 449-4111. □

New directory

Garry Hammond, VE3GCO, has released his new *Amateur Radio Awards Directory*. This new Gestetner publication contains rules, check-lists, maps and application form for over 150 of the most popular, prestigious, attractive and sought-after awards in the world. Cost of the *Directory* is $7.50.

For more information, or how to order a copy, write to Garry at 5 McLaren Avenue, Listowel, ON N4W 3K1. □

Happy Flyers

HAMS & PILOTS

"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

Is a life "worth" saving?

As I contemplated continuing the explanations concerning the part the Amateur Radio Community can play in saving lives through participation in the ELT program, I took a long hard look backward. Since 1976, hardly a month has passed without some mention of the ELT (Emergency Locator Transmitter) in the pages of Worldradio. The HAPPY FLYERS column has been but one of the mediums used to draw attention to its life saving possibilities.

Using a lead-in heading asking if a life is worth saving, could give the impression of an attempt at sensationalism. Certainly if I were a paid journalist, it might be possible. My job might be affected. If I had a product to sell related to this field, the lead-in might have commercial value. (The advertisement by L-Tronics that appeared with our January column was coincidental. We have no affiliation with them other than we are all interested in saving lives. Bruce Gordon, the owner, is a fellow Amateur Radio operator and a major in the Civil Air Patrol.) The HAPPY FLYERS have no product or service to "sell."

To the contrary, our regular readers are well aware that Janie (WB6ODQ) and I, along with numerous other amateurs, have spent well over $10,000 of our own personal funds and nearly four years of our lives traveling the United States, Canada, and New Zealand in an attempt to assist other volunteers in mastering the art of VHF Direction Finding (DF), so they could more easily save lives and locate illegal transmitters.

Why, then, the question? As I prepared to share more details and print schematics with this column, I re-read last month's column. I came to the realization that all of this information would be a waste if people were not interested (motivated). Reviewing those nearly four years of work brought interesting observations.

"Whose" life is worth saving?

Obviously, no one in their right mind would wish to intimate a life is not worth saving. However, whose life it is does have a direct bearing on our own personal involvement.

If it is a loved one's life in jeopardy, most would "move heaven and earth" to help. Our employment, and nearly every other facet of our lives, would take second place. Not necessarily so when one considers saving the lives of unknown individuals. Our priorities are different, somehow.

What about the effect of other people's existence upon our own personal lives? What if someone we do not know were to die an untimely death? In the Christmas season, a TV movie featured Jimmy Stewart playing the part of someone who wished he had never existed. An angel showed him what would have happened to others around him if he had not been there to do the things he had done. It was very illuminating and thought-provoking, even though he was supposedly "no one" in the community. His life had greatly changed the lives of others.

How would our lives be affected if certain other individuals did not live to complete their life's work? You would not be reading this were it not for the invention of the printing press — and the improvements on the original design by others. At night you walk into your home and flick a switch to give you light. We take it for granted, but none of us would like to return to the days prior to the development of electricity and lights. Where would society be without the Edisons, Bells, Pasteurs, Wrights, etc.? Who would like to choose whose life is more valuable — who should live and who should not?

Actions speak louder than words!

There is an old saying: "Your actions speak so loudly, I can't hear a word you're saying." During those four traveling years, many said wonderful things to us about saving lives. However, since (hopefully) very few will ever have their own loved ones in a position needing to be saved, nothing is "required" of them as a result of our visit (unless they were already involved in Search and Rescue (SAR).

I now realize that no amount of information printed in this column is worth much unless YOU the reader can see the need for something to be done in your own area of life. Very few of you are in the position to be able to do the actual installing of an ELT receiver at your repeater site. However, you ARE in a position to talk about it to the right people (who might not read Worldradio). You CAN continue to push for its rapid installation, pay some costs, do some leg-work — or whatever! Remember, no one can take your place in life. No one can do exactly what you can do. You ARE important! If everyone would do something, a nationwide ELT Monitor and Alert System could be effective by the end of 1981.

Our thanks to AIRINC!

In response to our ELT appeal in 1976, and while speaking in Los Angeles, Ron Plummer, K6GJN, was able to make arrangements for us to purchase used Collins receivers for repeater sites. We bought several, which are now on hilltops in many areas. This past year, they began giving them to us to help save lives. I have been released from my vow of silence and wish to thank AIRINC for their many donations. Please do not bother their local offices. They should only be contacted by leaders of organized groups ready to install a receiver as soon as received and tuned. Too often, groups took receivers, and a year later they were not yet installed!

President Reagan and the Air Safety Fund

We have written to our new President concerning the billions of dollars sitting in the treasury that were collected from the public for air safety. The AOPA magazine published some almost unbelievable figures on how much could be spent daily without touching the principal. The daily interest accumulation on such a large sum is staggering. Imagine, $1 million spent each day would not appreciably dent this fund in our entire lifetime — if ever.

This taxation was levied in the name of safety in response to cries for help to alleviate dangers in our air traffic. Very little has been spent at all, with almost nothing (percentage-wise) spent on safety, as originally intended. The mid-air San Diego collision brought forth many misleading stories, criticisms and public outcries. Mike Loenig (President of the

NPA) and his two passengers froze to death on a mountain top near Salt Lake a few years back. There was one common denominator — none of these people should have died!!! As Monday morning quarterbacks, many are able to point out how these people could still be alive.

I was amazed to learn how poorly the ELT (legislated by Congress) had been utilized. I did a story on the Loenig crash, stating that a properly operating ELT monitor system, combined with trained DF searchers, could have saved those three uninjured people who froze to death because they were not found in time. One excuse has been that almost 6,000 false alarms had occurred that year. To me, that meant 6,000 opportunities to test our readiness for the real thing. Opportunities to test our listening systems; our call-out systems; to verify our DF equipment was properly installed and working; and the opportunity for search personnel to hone their skills to a fine edge.

Full-time leader needed!

As much as we need your help to install these now available ELT monitors at repeaters, we need someone to take up the reins and bring organization and direction into the search field. The public is largely unaware that most SAR in the United States is done by volunteers. Not only air SAR, but jeep patrols, ski patrols, underwater rescue, dog teams, etc. As qualified as each of these organizations are, there is no single Federal Administrator with SAR coordination authority. Cott AFB in Illincis has major control over inland SAR and works with the CAP, FAA, and state law enforcement agencies to achieve coordination.

No one is available to help you with special problems. When I found that about three-quarters of the installed DF units in SAR did not work properly, no one had the authority to do anything about it, and no one knew how to end the problem. I made an offer to the Air Force to tour the major search groups around the United States and fix DF units for free (while I was off work recuperating.) As much as two generals and a number of colonels wished to see the DFs work, none of us could find (or did find) a way to use even free services.

Someone is needed to take charge. The money exists for salary and necessary expenses. It should be someone from the search community — not a politician, an FAA employee or a military officer. I mean no offense to any of the foregoing. We need a totally independent SAR administrator/coordinator, with no political ties or organizational axes to grind — someone free to make decisions solely to save lives. I belong to the National Association for Search and Rescue. It contains many who might fill the need. It would appear a new position needs to be created. I once wrote to former President Carter with these suggestions, and offered to help find such an individual. I offered my services for free until one could be found. A ham pilot involved in SAR would certainly recognize the necessary qualities. I hope each reader will be moved to do whatever possible to minimize the unnecessary loss of life that presently continues. Let's make 1981 a turning point!

ELT installation used in first week

Ed Gribi, Jr., WB6IZF, ARRL Emergency Coordinator, reported that the Salinas/King City area repeater installed their monitor receiver and had their first ELT alert that week. Local amateurs were involved and the ELT was located while Ed was on the phone with Scott AFB. Congratulations! We are interested in as many of these reports as possible. Also, still wish pictures of some of the installations. □

Pilot "given a hand" over the airwaves

We had a real live emergency on .41. Lloyd Broersma, WA7JAZ, enroute to Modesto, lost all electrical power in his Cessna 182. Richard Dillman, N6VS, contacted flight services and Lloyd was given a straight-in. It was still a sticky situation to get him down in darkness, as the electrical failure had affected everything but engine ignition.

John Widener, WB6UMT, called Modesto tower and, via phone patch, the tower was able to talk Lloyd in for a safe landing. Christopher Russell, W6RBT, and Edward Lampel, W6LDP, kept the frequency clear during the emergency.

— *ADC Associates, San Francisco, CA* □

"Fog-Watch" program to begin

An Amateur Radio traffic and weather advisory network (Fog-Watch) will be activated on mornings when the weather conditions yield unusually dense fog. As they are driving in the area, Amateur Radio operators will check in by radio and report their location and the present road and driving conditions. These will be relayed to radio station KONG (1400) in Visalia, California, and rebroadcast as a much-needed public service.

The "Fog-Watch" will be coordinated on the 146.850 MHz repeater (K6OGX/R), and is sponsored as a public service by the Amateur Radio Emergency Service (ARES) and the local Public Information Office of the American Radio Relay League (ARRL).

Any participation by radio amateurs in this program will be welcomed. For additional information, contact Scott Thompson, KB6CC, at (209) 733-4715. □

People reaching people. Amateur Radio is what **Worldradio** is all about.

WITH THE HANDI-HAMS

Bruce L. Humphrys, KØHR

Courage Center

Over the past year we have been talking about the Courage HANDI-HAM System and our services. From time to time, we have mentioned Courage Center — but have never really told you anything about our "parent" organization.

Courage Center is a regional rehabilitation agency located in a suburb in Minneapolis, Minnesota. Originally founded in 1928 as the Minnesota Society for Crippled Children and Adults, the organization changed its name in 1973 to better reflect the types and areas of services provided.

Besides the HANDI-HAM System, Courage Center programs include: a residence for handicapped young adults, residential camping, medical and vocational rehabilitation, education and residential services, athletics and recreation. Each year, more than 10,000 people receive services through Courage Center.

Here are details of some of the more than 70 services available through Courage Center:

Camp Courage — this 275-acre camp is located 55 miles from the Twin Cities. The camp consists of two residential campuses and 35 buildings: one for people with physical handicaps and one for those with speech and hearing impairments. There are also two 17-acre islands for overnight camping.

Courage North — camping in a more rustic setting is conducted on the 95 wooded acres at this camp. Located on Lake George, about 200 miles north of the Twin Cities, Courage North emphasizes leadership programs for teenagers with profound hearing loss as well as sessions for campers with physicial disabilities.

Rehabilitation services — Courage Center provides out-patient services for people with physical handicaps and for those with vision, speech and hearing impairments. The primary goal is increased independence at home, at work and in the community. These services are available to people of all ages in two major program areas: medical rehabilitation and vocational rehabilitation. Medical rehabilitation services include evaluations, physical and occupational therapy, aural rehabilitation, speech therapy, counseling, therapeutic preschool, home health services, equipment loan, rehabilitation engineering, and transportation services.

Educational services — A variety of programs fall under this class, including: Life Enrichment classes, library services, Drivers Education Program, architectural barrier elimination, and, of course, the Courage HANDI-HAM System.

One of the reasons I'm mentioning the other services at Courage Center has to do with our ability to draw from each of these services in trying to overcome problems which HANDI-HAM students and handicapped members may have in Amateur Radio.

For our Radio Camp sessions, we use Camp Courage and Courage North - drawing not only upon the physical sites, but the fantastic Camp staff to provide personal care.

If someone has a problem with knob rotation on a transceiver, we can use our Rehabilitation Engineering team to help with the answer. Often, several departments may get involved with a HANDI-HAM's particular needs. More than once we (HANDI-HAMS) have taken an idea from the Occupational Therapy department and adapted it to our own use! Or have asked a physical therapist the best way to overcome a particular person's problem with his grasp release (see December column) as it relates to being able to operate an Amateur Radio.

Our biggest help, however, is knowing that "out there" we have over 1,700 Amateur Radio volunteers willing to come up with unique ideas to overcome difficulties. Just plain hams, using a bit of ingenuity, are our greatest resource. Keep those ideas coming!!

Importance of radio clubs

You belong to a radio club, right? Sure — almost everyone does. What does that club do for you? You can exchange ideas, be brought up-to-date on new concepts, have maybe a fox-hunt or two, swill some coffee and chomp on donuts, show off your new QSL's, see movies, take tours of electronic places, hold classes in Amateur Radio, Field Day, etc. Pretty nifty stuff. You know, the biggest part of working a really rare DX station is being able to brag about it! No better place than the radio club meeting.

But does your radio club present itself to newcomers? I can remember my early days in Amateur Radio when I would go to the Minneapolis Radio Club meetings and get absolutely lost. The only thing I enjoyed were the donuts. The old-timers gabbed on end about the "good ole days"; the college kids talked endlessly about the new SSB mode, using words not yet invented; the experimenters gave long,

The Amateur Radio Association of Bloomington, Minnesota meets to hear about HANDI-HAM services.

HANDI-HAMS serve the world

Patricia Cooney
Submitted by Dennis Freeman, WB6MBF

You might say that Marlin Gilman, 42, of rural Earlham has the whole world in his hands.

Gilman hasn't walked since 1954, but from his wheelchair at the family's farm home he checks in daily with other Amateur Radio operators around the state, the nation, and some days, around the world. Gilman is a **Handi-Ham**.

Handi-Hams are both handicapped and able-bodied persons. Those with physical handicaps have their Amateur Radio licenses or are working toward licenses. Membership also includes disabled and able-bodied hams who volunteer their services to help the students.

Gilman describes the membership as "horizontals and verticals. The horizontals can't climb towers."

Handi-Hams also loan equipment, when available, to students who are just getting their feet wet learning the Morse code and other technical know-how necessary to get a Novice license.

Gilman, who is president of the Iowa **Handi-Hams**, emphasizes that the equipment is not free, but neither would anyone be turned away for lack of funds. There are about 30 members in Iowa.

Gilman got his Novice license 19 years ago, after encouragement from a radio amateur neighbor. Until then his chief interest was collecting novelty pencils. A year later he earned a General license and since 1974, has held an Advanced license.

His day starts around 6:00 a.m., when he checks into the Breakfast Club, with amateurs across the United States who are "waiting for their second cup of coffee."

After the Breakfast Club, he may check into the weather nets, traffic nets, relay some messages, greet old friends and pick up some new ones until he cuts off about 10:00 p.m.

Some days he is so busy his meals get cold.

Amateur Radio is a lot more than chewing the rag, although visiting with dozens of persons each day, and sharing opinions and experiences, confirms "there is no such thing as a lonely ham."

On a recent Saturday, Gilman checked into the Military Amateur Radio System, then relayed a message from a serviceman to his family, telling of new orders and a change of address. The same day he talked with a fellow from Venezuela and another in Japan, plus Karl Koppelman, 33, of Cleveland, Minnesota —**Handi-Ham** who has been blind since birth.

Gilman has talked with persons in 50 countries and has cards with their call signs to verify the contacts. His goal is 100 countries and 100 cards. Then he will receive a certificate. His own card, with his call sign, WA0AUX, says he is from "Madison, the Covered Bridge County."

His Radio room takes on the look of a weather station. On the paneled walls are bar meters and an indoor rain gauge. Part of the reward in being an amateur is to provide service to others. Gilman once got a sheriff to an accident scene in Missouri after he picked up an emergency call from an injured trucker.

The **Handi-Ham** System was "born" in Rochester, in the early '60s in response to a need for more recreational activity for handicapped persons in that community. It is now a service of Courage Center, in Golden Valley, Minnesota, a suburb of Minneapolis. Courage Center is a nonprofit organization providing medical and vocational rehabilitation to the handicapped.

Maurice Dougal, Rural Route 1, Lake Park, is not handicapped. He is coordinator for the Iowa group. Russ Edwards of West Bend is treasurer and Duane VanVickle of Sheldon is secretary.

Recently, Gilman spent a day at Camp Sunnyside in Des Moines with some of his Amateur Radio equipment. He makes the trip about four times each summer to demonstrate to handicapped persons there just what Amateur Radio is all about. He sums up his experiences as a **Handi-Ham:**

"I'm happy to be part of an organization that helps others like myself open a door to a new world — a world that takes me for what I can do and not for what I can't do.

Des Moines Register, Iowa □

Donation helps handicapped

A donation of $100 was sent by the Illiana Repeater System to the HANDI-HAMS Courage Center in Golden Valley, Minnesota. HANDI-HAMS is a very dedicated group of people who teach severely handicapped people the material needed to obtain their OWN amateur license.

This donation was a fine example of Amateur Radio operators helping their own.

— Illiana Repeater System, Inc., Illinois

KENWOOD
...pacesetter in amateur radio

Hand-shack.

Synthesized, big LCD, 10 memories, scanning, DTMF Touch-Tone®

TR-2400

Put a ham shack in your hand. The TR-2400 is the ideal hand-held for 2 meters FM. It features a large LCD readout that can be read in direct sunlight or in the dark, 5-kHz-step PLL synthesized operation, 10-channel memory, scanning, and 16-button autopatch DTMF encoder.

TR-2400 FEATURES:

- **Large LCD digital readout**
  Readable in direct sunlight (better than LEDs). Readable in the dark (with lamp switch). Virtually no current drain (much less than LEDs) and display stays on. Rugged and dependable in hot or cold temperature ranges. Shows receive and transmit frequencies and memory channel.
- **5-kHz-step frequency selection**
  PLL synthesized keyboard channel selection system. No "5 up" switch needed. Selects from 144.000 to 147.995 MHz.
- **UP/DOWN manual scan**
  Single or fast continuous 5-kHz steps from 143.900 to 148.495 MHz for Amateur and MARS or CAP simplex or repeater operation.
- **10 memories**
  Retained with battery backup (only 2.0 mA). "M0" memory may be used to shift the transmit frequency any desired amount to operate on repeaters with nonstandard split frequencies.
- **Built-in autopatch DTMF (Touch-Tone®) encoder**
  Uses all 16 buttons of keyboard while transmitting.

- **Automatic memory scan**
  Checks all 10 memory channels. Programmable to lock automatically on either BUSY (signal present) or OPEN (no signal) channels.
- **Subtone switch**
  Activates subaudible tone encoder (not Kenwood-supplied).

- **Repeater or simplex operation**
  Convenient mode switch shifts transmit frequency +600 kHz or -600 kHz or to the frequency stored in "MO" memory.
- **Reverse operation**
  Push-button switch shifts receiver to transmit frequency and transmitter to receive frequency.
- **Extended operating time**
  With LCD and overall low-current circuit design. Only draws about 28 mA squelched receive and 500 mA transmit (at 1.5 W RF output), for longer operating time between charges.
- **Two lock switches**
  Prevent accidental frequency change and accidental transmission.
- **BNC antenna connector**
  Easy to connect external antenna.
- **LCD "arrow" indicators**
  Show "ON AIR," "MR" (memory recall), "BATT" (battery status), and "LAMP" switch on.
- **High-impact case and zinc die-cast frame**
  Extremely rugged with antenna counterpoise.
- **External PTT microphone and earphone connectors**
  Easily accessible on right side of transceiver.
- **Compact and lightweight**
  Only 2-13/16 inches wide, 7-9/16 inches high, and 1-7/8 inches deep. Weighs only 1.62 pounds (including antenna, battery, and hand strap).

Microphone PTT and audio terminals

Charger terminal

Earphone Jack

STANDARD ACCESSORIES INCLUDED:

- Flexible rubberized antenna with BNC connector
- Heavy-duty (450-mAh) NiCd battery pack
- External-standby (PTT) plug
- AC charger
- Hand strap
- External-microphone plug
- Earphone

NOTE: *Price, specifications subject to change without notice and obligation.*

OPTIONAL ACCESSORIES:

- ST-1 base stand (shown) which provides 1.5-hour quick charge, 4-pin connector for dynamic microphone, and SO-239 antenna connector.
- BC-5 DC quick charger (1.5 to 2.0 hours)
- SMC-24 speaker/microphone
- LH-1 deluxe leather case (top-grain cowhide)
- PB-24 extra battery pack with charger adapter
- BH-1 belt hook

TRIO-KENWOOD COMMUNICATIONS INC.
1111 WEST WALNUT / COMPTON, CA 90220

Small wonder.

Processor, N/W switch, IF shift, DFC option

TS-130S/V

An incredibly compact, full-featured, all solid-state HF SSB/CW transceiver for both mobile and fixed operation. It covers 3.5 to 29.7 MHz (including the three new Amateur bands!) and is loaded with optimum operating features such as digital display, IF shift, speech processor, narrow/wide filter selection (on both SSB and CW), and optional DFC-230 digital frequency controller. The TS-130S runs high power and the TS-130V is a low-power version for QRP applications.

TS-130 SERIES FEATURES:

- **80-10 meters, including three new bands**
  Covers all Amateur bands from 3.5 to 29.7 MHz, including the new 10, 18, and 24-MHz bands. Receives WWV on 10 MHz. VFO covers more than 50 kHz above and below each 500-kHz band.
- **Two power versions . . . easy operation**
  TS-130S runs 200 W PEP/160 W DC input on 80-15 meters and 160 W PEP/140 W DC on 12 and 10 meters. TS-130V runs 25 W PEP/20 W DC input on all bands. Solid-state, wideband final amplifier eliminates transmitter tuning, and receiver wideband RF amplifiers eliminate preselector peaking.
- **Built-in speech processor**
  Increases audio punch and average SSB output power, while suppressing sideband splatter.
- **CW narrow/wide selection**
  "N-W" switch allows selection of wide and narrow bandwidths. Wide CW and SSB bandwidths are the same. Optional YK-88C (500 Hz) or YK-88CN (270 Hz) filter may be installed for narrow CW.
- **SSB narrow selection**
  "N-W" switch allows selection of narrow SSB bandwidth to eliminate QRM, when optional YK-88SN (1.8 kHz) filter is installed. (CW filter may still be selected in CW mode.)
- **Sideband mode selected automatically**
  LSB is selected on 40 meters and below, and USB on 30 meters and above. SSB REVERSE position is provided on the MODE switch.
- **Built-in digital display**
  Six-digit green fluorescent tube display indicates actual operating frequency to 100 Hz. Also indicates external VFO or fixed-channel frequency, RIT shift, and CW transmit/receive shifts. Also analog sub-dial for backup frequency indication.
- **IF shift**
  Allows IF passband to be moved away from interfering signals and sideband splatter.
- **Single-conversion PLL system**
  Improves stability as well as transmit and receive spurious characteristics.
- **Built-in RF attenuator**
  For optimum rejection of intermodulation distortion.
- **Built-in VOX**
  For convenient SSB operation, as well as semi break-in CW with sidetone.
- **Effective noise blanker**
  Eliminates pulse-type interference such as ignition noise.
- **Built-in 25-kHz marker**
  Accurate frequency reference for calibration.
- **Compact and lightweight**
  Measures only 3-3/4 inches high, 9-1/2 inches wide, and 11-9/16 inches deep, and weighs only 12.3 pounds. It is styled to enhance the appearance of any fixed or mobile station.

Optional DFC-230 Digital Frequency Controller
Allows frequency control in 20-Hz steps with UP/DOWN microphone (supplied with DFC-230). Includes four memories (handy for split-frequency operation) and digital display. Covers 100 kHz above and below each 500-kHz band. Very compact.

Ask your Authorized Kenwood Dealer about the compact, full-featured, all solid-state TS-130 Series.

NOTE: Price, specifications subject to change without notice and obligation.

MATCHING ACCESSORIES FOR FIXED-STATION OPERATION:

- PS-30 base-station power supply (remotely switchable on and off with TS-130S power switch).
- SP-120 external speaker
- VFO-120 remote VFO
- MC-50 50kΩ/500Ω desk microphone

Other accessories not shown:

- YK-88C (500 Hz) and YK-88CN (270 Hz) CW filters
- YK-88SN (1.8 kHz) narrow SSB filter
- AT-130 compact antenna tuner (80-10 m, including 3 new bands)
- MB-100 mobile mounting bracket
- MC-30S and MC-35S noise cancelling hand microphones
- PC-1 phone patch
- TL-922A linear amplifier
- HS-5 and HS-4 headphones
- HC-10 world digital clock
- PS-20 base-station power supply for TS-130V

- SP-40 compact mobile speaker
- VFO-230 digital VFO with five memories

DX WORLD

John F. W. Minke III, N6JM
6230 Rio Bonito Drive Carmichael, CA 95608

Activities calendar

07-08 February	RSGB 7 MHz Contest (Phone)
14-15 February	Dutch PACC Contest
14-15 February	SRJ Yugoslavian DX World Wide Contest
21-22 February	ARRL International DX Contest (CW)
28-01 February	French (REF) DX Contest (Phone)
28-01 February	CQ Magazine 160-Meter World Wide DX Contest (Phone)
28-01 February	RSGB 7 MHz Contest (CW)
07-08 March	ARRL International DX Contest (Phone)
21-22 March	Bermuda Contest
28-29 March	CQ Magazine Worldwide WPX contest (SSB)

W-100-N

We are approaching 100 in the number of certificates for the Worked 100 Nations Award that have been issued. Five more have been issued during the month of December, bringing the total up to 93. Congratulations go to the following radio amateurs for successfully completing the requirements:

89. WB3IVL John F. Zapf
90. KA2BYC John J. Cimo
91. N6APW Bob Dymond
92. WB9UKS James Wild
93. K6BIA Orlando Benincasa

Perhaps by the time you read this, number 100 will have been reached.

Morocco

There is a bit of activity from this one. Hans Dankerl, W3JRL, reports he has been assigned the call CN8AT and will be operating from Tangier, Morocco. He will be sporting a 3-element beam and slopers for 80 and 40 meters, both sloping towards the Strait of Gibraltar. The location is on a hilltop overlooking the Mediterranean Sea and the southern coast of Spain. Look for CN8AT on 14.305, 21.305 and above 28.900 MHz. Hans reports he can operate SSB, CW and RTTY. The only other licensed station on RTTY from there is CN8BI.

Hans wishes to thank the following for the help in obtaining his CN8AT license: K7UGA, W4KFC and CN8MC. Hans has held other past DX calls such as SV0WZ from Dodecanese, DU1AT and ZB2GF.

Hans Dankerl is not the only person active from Morocco. Look for Sjoerd, CN8AQ, who works the deserving on CW on 14.035 MHz daily from 0530 UTC.

That CN5AMN you may have worked was on from El Aaiun celebrating its 5th anniversary of being annexed by Morocco.

Mongolia

If you are working toward your WAZ award you probably know this one as Zone 23, one of the difficult zones to work. There are several stations on from this one. Probably the most popular is JT1AN, or JT1KAA, but there are others. JT1KAF maintains regular appearances on CW from 0600 to 0700 UTC on 14.040 MHz to satisfy the deserving. He has also been found on 14.029 MHz at 0900 UTC. In addition to this one, you may find JT1BH on 14.025 MHz at 1200 UTC, or JT1KAA near 14.030 MHz from 0200 UTC.

That young man in the "T" shirt is Dag Traasdahl, LA3TQ, during a visit in July 1980 with Charlie Keil, AA4CK, on the left. Sorry, Charlie, that you are clipped. Nice collection of equipment in that shack. Can you find the dog in the photo? ***(Photo courtesy of John Parrott, Jr., W4FRU.)***

The Gambia

Bill Eckels, W8ZNH, sent me a note regarding a contact he thought he had with C5AJ in The Gambia. He received a reply from the former C5AJ which stated he was C5AJ in 1975 from 26 November to 06 December and in 1979 from 07 August to 17 August. For three years, there seems to be a pirate (Slim) in the United States using C5AJ and C5AW using the name of Hal. The real holder of the call has been busy explaining the situation to those who have sent him cards. So, if you have worked either of those two calls, don't waste your time and money, as you have worked Slim.

That's the negative news. The positive news is that there is an active station on from this one. Ville Hiilesmaa, C5AZ, has been reported to be very active. Look for him on 10 meters from 28.501 to 28.506 MHz from 1330 UTC, or higher in frequency at 28.540 MHz from 0900 UTC. The operator is Rod, 9G1RT.

Tanskie

The S8 prefix for Tanskie has been modified to S83 for General Class licenses, S84 for Novice Class licenses and S88 for YL operators. S8AAT and S8AAW are now S83T and S83W respectively.

Willis Island

Dave Shaw, VK9ZD, is the new operator on Willis Island, replacing Graeme Mears, VK9ZG. Dave will be working 10 through 80 meters, with some activity on 6 meters. The following schedules should be watched:

0500 UTC 21.202 MHz Sked with VK3PA

0630 UTC 14.265 MHz Pacific DX Net (Tuesday and Thursdays)

0700 UTC 14.220 MHz VK9NS Net (formerly P29JS Net)

1000 UTC 14.175 MHz Sked with VK9CP

Other frequencies to watch are 28.595, 21.295, 14.195 and 7.095 MHz, usually during the evening times in Australia. QSL manager for both VK9ZD and VK9ZG is Stephen Gregory, VK3OT.

Campbell Island

Warwick Latham, ZL3AFH, has been busy operating from Campbell Island signing ZL3AFH/A, (A for Auckland and Campbell Islands). He has been working the deserving on 20-meter CW — rather slow-speed CW. The slow-speed CW should give you phone die-hards an opportunity. Look for Warwick from 0700 UTC, who is using an FT101E and a dipole. He expects to be there for a year.

Note that ZL stations signing /C are on Chatham Island. The /A signifies they are either on Auckland or Campbell Island.

SMOM

A station signing 1A0KM is operating from the Sovereign Military Order of Malta. This country is reported to be of the same status as that of Vatican City, issues postage stamps, passports and maintains diplomatic relations with several countries. Its traditions and history go back hundreds of years. 1A0KM has been reported on 28.596 MHz at 1515 UTC, 21.293 MHz at 1745 UTC, 14.225 MHz at 1530 UTC and 14.208 MHz at 2000 UTC. He has also been on CW at 2130 UTC on 14.017 MHz and on 7.005 MHz at 2200 UTC.

You will not find this country listed in the ITU frequency allocations, as the figure "1" is unofficial. The same applied for Spratly Island, 1S1DX. An application for DXCC status has already been mailed to Newington. As for Nation Criteria for the Worldradio W-100-N Award, I am confused myself. It would appear that it would not qualify due to Criteria 3, regarding ITU call signs. Therefore, do not submit a 1A0KM QSL for nation credit at the present time.

While we are at DXCC status countries, there is a possibility that a new USSR DXCC country will surface in Siberia. Nothing more on this one at the present time.

PA0GMM Pacific Islands DXpedition

Guido, PA0GMM, has returned from his Pacific Islands DXpedition after completing 6725 contacts with the following breakdown: FO0GMM 1100 QSO's; ZK1AXE 700 QSO's; ZK2BM 2600 QSO's; 3D2GM 1100 QSO's; A35BG 900

QSO's; PA0GMM/KH8 425 QSO's.

Guido reports that his contact rate with Europeans was especially low, due to their inability to follow instructions when working by call areas. Perhaps this is an unfair observation, as there are many different languages in Europe and not all are fluent in English.

Abu Ail

About 16,000 contacts were made by the Abu Ail DXpedition team signing J20/A. The team, which terminated operations 10 December, consisted of Dave Gardner, K6LPL; Franz Langner, DJ9ZB; Pierre Reissian, J28AZ; and Didier Le Duc, TU2IR. Of those contacts, around 800 were made on 80 meters. All QSL cards are to be sent via K6LPL. Expect a delay of a couple of months, as full-color QSL cards are to be printed.

Nets

Afrikaner Net	21.355 MHz	1700 UTC Daily
Arabian Nights Net	14.250 MHz	0500 UTC Friday
Brown Sugar Net	14.310 MHz	0330 UTC Daily
Caribbean DX Net	14.175 MHz	1000 UTC Daily
DK20C DX-to-DX Net	28.750 MHz	1130 UTC Daily
DK9KE DX Net	21.155 MHz	1100 UTC Daily
JA DX Net	21.220 MHz	1400 UTC Daily
Latin DX Net	7.095 MHz	0600 UTC Sunday
Novice DX Net	28.103 MHz	1430 UTC Saturday
Pacific DX Net	14.265 MHz	0530 UTC Tues-Fri
Portuguese Counties Net	14.345 MHz	2100 UTC Friday
Round Table Net	14.175 MHz	2030 UTC Daily
Safari East African Net	14.174 MHz	1700 UTC Daily
Southeast Asia Net (SEANET)	14.320 MHz	1200 UTC Daily
Triple H Net	7.250 MHz	0900 UTC Daily
USSR Net	3.645 MHz	2400 UTC Daily
VK DX Net	21.180 MHz	0600 UTC Sun-Wed-Fri
VK-European Net	21.183 MHz	1200 UTC Daily
WA2NHE DX Net	21.275 MHz	1800 UTC Daily
	14.280 MHz	2200 UTC Daily
WB6LED DX Net	14.285 MHz	0500 UTC Sun-Thur-Sat
W7PHO Family Hour(s)	14.250 MHz	1500 UTC Daily
	14.225 MHz	2300 UTC Daily
	28.575 MHz	2315 UTC Daily
	21.345 MHz	2330 UTC Daily
40-meter DX Net	7.180 MHz	0200 UTC Sunday
	7.080 MHz	0200 UTC Sunday
Zone 18 and 19 USSR Net	7.085 MHz	1900 UTC Friday
75-meter DX Net	3.795 MHz	0630 UTC Sat-Sun

Note that several of these nets are outside the American Phone Band boundaries and, most likely, located there to avoid stateside contacts.

Often associated with nets are list operations. Jim Cain, K1TN, editor of "*The DX Bulletin*" reports: "One of the locals called recently to report he had been officially placed on the 'Crap List' of one of the famous list operations. Wishing to hear for ourselves, we tuned into the frequency and sure enough, it was not 15 minutes before some poor confused K9 station made a mistake and was placed on the same list. Maybe next time they'll offer certificates of honor for those making this 'Crap List.' Seems to us that saying 'crap list' is redundant."

There seems to be much list operation activity on recently. Personally, I wonder if most of it is necessary. Methinks it is a big ego-builder for many amateurs with a big mouth. The best operation I have seen is that of Leslie Dale, SV0AW/9, on Crete. He makes his own list by standing by and picking out several calls in the pileup. After he has collected several, he announces who he has and proceeds to work the bunch before standing by for a new list. That way, one has a chance to leave his rig to do other things instead of screaming for hours on end.

Club news

The 1981 officers of the North Jersey DX Association include Richard Wujciak, K2RW, as president; Ed Berzin, W2MIG as vice president; Bill Schweitzer, W2KG as secretary; and Charles Moraller, Jr., K2CM, as treasurer. The NJDXA also handles the Second Call Area QSL Bureau.

It's always nice to have a photo of a YL operator, especially if she is a DX'er. Here we have Beatrix Allot, FH8YL, on the air with her FT-707 from Mayotte. ***(Photo courtesy of "QRV.")***

The Western Washington DX Club now has over 560 members. Of that number, 20 members have each confirmed over 300 countries for their DXCC standings. Top of the bunch is John Dack, W7KH, with 362 closely followed by Bill Bennett, W7PHO, with 358 and Vernon Phillips, W7OF, with 357.

CHC Awards Program

With the passing of Clif Evans, K6BX, of CHC fame (Certificate Hunters Club), not much has been heard regarding CHC functions. Paul Schuett, WA6CPP, has reactivated the US-CHA. This was the county hunters award of the CHC program. Paul has made some minor changes and will have new brochures available. Paul states that the US-CHA is not designed to be a competition to the "CQ Magazine" USA-CA. For what it is worth, it was K6BX who created the USA-CA program when he was still a columnist for the magazine. When he left, he created the new CHC US-CHA to compete with the USA-CA. As for the CHC award, record forms are available at three for $1.25 postpaid, or 6 IRC.

The fee for the basic award is $4 or 20 IRC; endorsements are 50¢ or 3 IRC. An initial application at a higher class does not require the additional endorsement fee. Additional information can be obtained by writing: Paul Schuett, WA6CPP, 13779 North Wells Lane, Lodi, CA 95240.

Paul is looking for custodians to take over some of the various other CHC awards he acquired. I suggest you write to him to see what he has to offer.

SARL Award

A special award will be issued to celebrate the 21st anniversary of the New Highveld Branch of the South African Radio League.

To qualify for this award, you must work at least three Highveld Branch members during the period 11 April 1981 through 20 April 1981. Amateur stations in South Africa must work at least five members.

Send log extract and your QSL card along with the fee of $1 (or 3 IRC's) to: Awards Manager, Highveld Branch SARL, P.O. Box 10188, Johannesburg 2000, Republic of South Africa.

The first DX station to work 10 of these stations will receive a special award, as well as one year free membership in the SARL. At least one of these contacts must be on CW. The ZS stations which must be worked for the award will all have the suffix /HVB following their call. The final filing date for this award is 30 May 1981.

Swiss Bear Award

This is not a DX award, but I thought I would include it in here anway. The award is offered by the New Bern Amateur Radio Club of New Bern, North Carolina, for contacting at least three radio amateur stations within the area of New Bern, North Carolina, between 23 October 1980 and 23 October 1981.

The Black Bear shown on the certificate is the symbol of both Berne, Switzerland and New Bern, North Carolina. This was the first colonial capitol of North Carolina and was settled by Baron Christopher De Graffenreid of Berne, Switzerland, in 1710.

The Worked All GM Award

This award is offered by the Aberneen Radio Club working the following stations in Scotland: 15 GM3 prefixes, 1 GM2 prefix, 1 GM4 prefix, 1 GM5 prefix, 1 GM6 prefix, and 1 GM8 prefix. The cost for United Kingdom applicants is one pound, which includes return postage for your QSL cards. Applicants from overseas should not send QSL cards, but must include a list of confirmed contacts

with a fee of 10 IRC's.

All applications should be sent to: S. Sutherland, GM4BKV, 67 Greenfern Road, Aberdeen AB2 6TP, Scotland.

Dutch Wadden Islands Award

The Wadden Islands include Vlieland, Texel, Schiermonnikoos, Terschelling, Greind and Ameland. This award is issued to any radio amateur who has worked at least four stations on two different islands, (European stations must work nine stations on three different islands). All contacts must have been made since 01 January 1980.

To apply for this award, send log data with a fee of $2 (U.S.), DF19 or DM9 to: Award Manager, P.O. Box 2, 3330 AA West Terschelling, Netherlands.

Taroh Yagi J2GX

In the December issue of **Worldradio**, the QSL card of Taroh Yagi, J2GX, and his station were shown. This dated back to the 1930's. I had wondered if he was the same Yagi who had invented the famous array. I received at least three responses on the present activity of Taroh Yagi, who is now signing JH1WIX. He has also held the calls of J1ZB, AJ4ZZ and J1DO. John Harley, Jr., KA6CTI, reports there is also a photo of him on page 49 of the December 1934 issue of **QST**. Thanks also to W6VD and W6OL for responding. But, I still don't see the relation of the two Yagis, Taroh, and Hidetsugu, the engineer who invented the Yagi.

Novice DX

I received a note from our **Worldradio** Novice Editor, Armond Brattland, K6EA, regarding a request he had received from Chris Hursta, KA9FCZ. Chris is interested in Novice DX stations, but can't find any information on them. Well, that is a hard one. Although some DX stations do enter the Novice frequencies to specifically work the Novices, most of the activity is just not there.

All I can add is that if you are a Novice and have the DX bug, study and work hard at your theory and code speed so that you can upgrade to a higher class license. In fact, why not go all the way to Amateur Extra? Most of the active DX'ers do hold that class of license.

In the meantime, you can still look for DX. Just listen, listen and listen. A good antenna system is the ticket. As the Novices today are no longer restricted to 75 watts, you should have no trouble with the 250 watts. Most likely, that is more power than the DX station you'll be working will be running.

Postage stuff

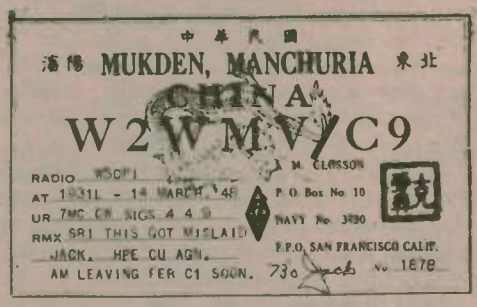
As of the first of the year, there has been an increase in overseas mail rates. The former 31 cents per half-ounce has gone up to 40 cents per half-ounce. So be aware of that when sending out those direct air-mail overseas cards. Also, make sure you do not use any of those old style IRC's, as they are no longer of any value. The old style were the type that had the originating country printed on them in red. Perhaps they may have some value as collector's items. There is also an older style of IRC that preceded this one; they have no value either.

Antique QSL department

One of the interesting things of running these old QSL cards here is that it stirs up the nostalgia in our "Senior Amateur Radio" citizens. I received a letter from Leonard Robinson, W6WO, who had some interesting things to say about some of the past strange DX calls. Some of the calls included multi-digit call letters such as X29A in Mexico, or EAR-228 in Madrid, Spain. The contact with the latter station was made by W6WO back in 1933 at 2200 GMT. The card does not indicate as to what frequency the contact took place on, but most likely it must have been on 20-meter CW.

OM Leonard goes on further to state that he had a four-letter suffix in his call at one time. He held the call W6ZZAJ, which was a portable call to be used anywhere in any of the 48 states. He has held the call W6WO for over 50 years.

Jack Harkins, W5CPI, of El Paso, submitted the QSL from Manchuria. He had worked W2WMV/C9 on 40-meter CW in 1948. This was when Manchuria still counted for DXCC purposes.



The last card was submitted by Warren Snyder of Milan, Tennessee. Warren did not give his present call, so I cannot credit him with that. The card is for a contact he had made with EP3H in South Persia "under cover" when he was operating D4AFA in Germany in 1948. Phil Williams, EP3H, whose former call was G3LK/VS1, was only running 14.7

(*please turn to page 37*)

AMSAT OSCAR K6PGX

Dr. Norman L. Chalfin

Phase IIIB

Work continues on the Phase IIIB spacecraft looking toward a Launch on an ESA "Ariane" booster on 24 February 1982. Recent tests of the engines of the Ariane rocket boosters have located the cause of the anomaly which led to the failure of the LO 2 Ariane on which AMSAT/OSCAR Phase IIIA went into the drink last May.

At the present time, the U.S. AMSAT group, AMSAT Deutschland and JAMSAT are putting together the major components. The Phase IIIB and Phase IIIC are being put together at the same time.

As we reported last month, there is a strong possibility that a 23cm up and 70cm down transponder will be aboard the Phase IIIB, but it is almost a certainty that the UHF/Microwave Mode M transponder will be aboard the Phase IIIC.

AMSAT/OSCAR Nets

W6CG also wants us to inform you of the Saturday AMSAT/OSCAR net which is being well attended. The time is 2200 Zulu on 28.878 MHz.

Another net which is accessible for West Coast listeners or participants is the AMSAT/OSCAR net at 7:00 p.m. Local time on 3.850 MHz on Tuesdays. The other regions can also listen at their local times of 7:00 p.m. because the nets are run sequentially as the Earth's Terminator moves westward and darkness sets in over each time zone.

ZL1OAX and ZL3WN are running tests of their AMSAT/OSCAR control systems down under. They will be manning the control stations jointly.

1981 anniversaries

OSCAR-1, the Project OSCAR Amateur Radio satellite beacon, was launched 12 December 1961. This year, celebrations are planned by Project OSCAR, AMSAT, and others. As we get the details we'll advise through the column. Another significant 20th anniversary is that of Col. Yuri Gagarin's first orbital flight about the Earth. Gagarin was an Amateur Radio operator. Thus, the first man in space was a radio amateur. Many other examples are known where amateurs were "first." This ought to make an interesting future column.

UOSAT

The fittings for mounting the UOSAT to the Delta rocket, on which it will be launched in August 1981 (earlier by a month than previously announced), were tested during December at the McDonnell-Douglas Facility in Huntington Beach. Jan King, W3GEY, and Martin Sweeting, G3IOR, of AMSAT UK were at the facility to perform the test. John Fail, KL7GRF, was also among those present.

For those of our readers who may not have heard of UOSAT before, it is a downlink-only amateur band satellite which will transmit science data and slow-scan TV cloud cover images. It is the design of a University of Surrey amateur satellite group. Among its other attributes is that it will send beacon signals on all of the principal HF, VHF, and UHF amateur bands so that amateurs can learn to track satellites and learn techniques of following signals with doppler shifts. It is the first AMSAT UK satellite effort. The spacecraft is under construction at the University of Surrey.

OSCAR-7 and OSCAR-8

At the time of this writing, OSCAR 7 and OSCAR 8 are both operating normally.

SYNCART

Plans are well-formulated now for the cooperative effort of Project OSCAR, AMSAT and AMSAT CANADA on the SYNCART Amateur Radio geostationary transponder program. An amateur transponder operating in 23cm and 12cm regions will be included in a future geostationary orbiting satellite, with a general coverage pattern of the Western Hemisphere.

"How did we get into the idea about space communication and travel anyway?" someone asked.

That is a good question and the answers go back to Biblical times. Remember the story of Ezekiel? How he saw an object in a fiery chariot descending from the heavens? He also saw beings emerging from the chariot.

In two different references — attributed to a 100 B.C. and a 100 A.D. source — the story is told of a tale by Menippus, in which he was carried up into the moon on a windstorm while aboard a ship. The title of the book in which this appeared is *Menippus, the Loftie Traveller,* the work of Lucian.

Cyrano de Bergerac is familiar to most of you as the large-nosed swashbuckler who spouted poetry as he dispatched his adversaries, portrayed in the play by Rostand. Cyrano de Bergerac de Savignon was a science fiction writer of the mid-17th century who produced a book entitled *The Comical History of the Worlds of the Sun and the Moon.*

In this history, Cyrano describes how his character was borne up on "dew" in vials about his waist which, when warmed by the sun, lofted him up to the moon.

The following quotation from the history will show you that even 250 years prior to Edison's phonograph, sound-reproducing devices were being thought about.

Cyrano wrote in French. The reproduction is from the first English translation published in 1687. It is preceded by a description of a visit to a Lunar Grandee where, while Cyrano's character was waiting, he was given a box to amuse himself with.

There were lots of other historical space stories written before Arthur C. Clarke's

AMSAT — OSCAR 7 Orbital Data

Because the calendar is generally printed in the last weeks of each quarter, there will always be a difficulty in lack of adequate lead time with the first month's data for publication in **Worldradio.** □

As I opened the Box, I found within ſomewhat of Metal, almoſt like to our Clocks, full of I know not what little Springs, and imperceptible Engines: It was a Book, indeed; but a Strange and Wonderful Book, that had neither Leaves nor Letters: In fine, it was a Book, made wholly for the Ears, and not the Eyes. So that when any Body has a mind to read in it, he winds up that Machine, with a great many little Strings; then he turns the Hand to the Chapter which he deſires to hear, and ſtraight, as from the Mouth of a Man, or a Muſical Inſtrument, proceed all the diſtinct and different Sounds, which the *Lunar* Grandees make uſe of, for expreſſing their Thoughts, inſtead of Language.

Excerpt from the first English translation of Cyrano de Bergerac de Savignon's book, *The Comical History of the Worlds of the Sun and the Moon.*

Synchronous Communications Satellite, described in October 1934 (?) Wireless World. The only detail Clarke missed in his foretelling of what did actually occur in the future was that he didn't anticipate crystals and figured that repeated visits to the satellite would have to be made "to change vacuum tubes."

Joe Kasser, G3ZCZ/W3 wants suggestions for a historical article on AMSAT/OSCAR, to be printed in Orbit Magazine. □

Tom O'Hara, W6ORG, and his wife Marianne, WB6YSS, operated an ATV set aboard a moped during the Tournament of Roses Parade on New Year's Day. *(See story on page 1)* ***(K6PGX photo)***

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

AMSAT - OSCAR 7 ORBITAL DATA

SUN. 1 FEB. 1981 (32)

UTC	LONG	ORBIT
49'41	88.5	28430
244'37	117.3	28431
439'34	146.0	28432
634'30	174.7	28433
829'27	203.5	28434
1024'23	232.2	28435
1219'20	261.0	28436
1414'16	289.7	28437
1609'13	318.4	28438
1804'09	347.2	28439
1959'06	15.9	28440
2154'02	44.6	28441
2348'59	73.4	28442

MON. 2 FEB. 1981 (33)

UTC	LONG	ORBIT
143'55	102.1	28443
338'52	130.8	28444
533'48	159.6	28445
728'45	188.3	28446
923'42	217.1	28447
1118'38	245.8	28448
1313'34	274.5	28449
1508'31	303.3	28450
1703'28	332.0	28451
1858'24	0.7	28452
2053'21	29.5	28453
2248'17	58.2	28454

TUE. 3 FEB. 1981 (34)

UTC	LONG	ORBIT
43'13	87.0	28455
238'10	115.7	28456
433'07	144.4	28457
628'03	173.2	28458
823'00	201.9	28459
1017'56	230.6	28460
1212'53	259.4	28461
1407'49	288.1	28462
1602'46	316.9	28463
1757'42	345.6	28464
1952'39	14.3	28465
2147'35	43.1	28466
2342'32	71.8	28467

WED. 4 FEB. 1981 (35)

UTC	LONG	ORBIT
137'28	100.5	28468
332'25	129.3	28469
527'21	158.0	28470
722'18	186.8	28471
917'14	215.5	28472
1112'11	244.2	28473
1307'07	273.0	28474
1502'04	301.7	28475
1657'00	330.4	28476
1851'57	359.2	28477
2046'53	27.9	28478
2241'50	56.7	28479

THU. 5 FEB. 1981 (36)

UTC	LONG	ORBIT
36'47	85.4	28480
231'43	114.1	28481
426'40	142.9	28482
621'36	171.6	28483
816'32	200.3	28484
1011'29	229.1	28485
1206'26	257.8	28486
1401'22	286.6	28487
1556'19	315.3	28488
1751'15	344.0	28489
1946'12	12.8	28490
2141'08	41.5	28491
2336'05	70.2	28492

FRI. 6 FEB. 1981 (37)

UTC	LONG	ORBIT
131'01	99.0	28493
325'58	127.7	28494
520'54	156.4	28495
715'51	185.2	28496
910'47	213.9	28497
1105'44	242.7	28498
1300'40	271.4	28499
1455'37	300.1	28500
1650'33	328.9	28501
1845'30	357.6	28502
2040'26	26.3	28503
2235'23	55.1	28504

SAT. 7 FEB. 1981 (38)

UTC	LONG	ORBIT
30'19	83.8	28505
225'16	112.6	28506
420'12	141.3	28507
615'09	170.0	28508
810'05	198.8	28509
1005'02	227.5	28510
1159'58	256.2	28511
1354'55	285.0	28512
1549'52	313.7	28513
1744'48	342.5	28514
1939'45	11.2	28515
2134'41	39.9	28516
2329'38	68.7	28517

SUN. 8 FEB. 1981 (39)

UTC	LONG	ORBIT
124'34	97.4	28518
319'31	126.1	28519
514'27	154.9	28520
709'24	183.6	28521
904'20	212.4	28522
1059'17	241.1	28523
1254'13	269.8	28524
1449'10	298.6	28525
1644'06	327.3	28526
1839'03	356.0	28527
2033'59	24.8	28528
2228'56	53.5	28529

MON. 9 FEB. 1981 (40)

UTC	LONG	ORBIT
23'52	82.3	28530
218'49	111.0	28531
413'45	139.7	28532
608'42	168.5	28533
803'38	197.2	28534
958'35	225.9	28535
1153'31	254.7	28536
1348'28	283.4	28537
1543'24	312.2	28538
1738'21	340.9	28539
1933'17	9.6	28540
2128'14	38.4	28541
2323'10	67.1	28542

TUE. 10 FEB. 1981 (41)

UTC	LONG	ORBIT
118'07	95.8	28543
313'04	124.6	28544
508'00	153.3	28545
702'57	182.0	28546
857'53	210.8	28547
1052'50	239.5	28548
1247'46	268.3	28549
1442'43	297.0	28550
1637'39	325.7	28551
1832'36	354.5	28552
2027'32	23.2	28553
2222'29	51.9	28554

WED. 11 FEB. 1981 (42)

UTC	LONG	ORBIT
17'25	80.7	28555
212'22	109.4	28566
407'18	138.2	28557
602'15	166.9	28558
757'11	195.6	28559
952'08	224.4	28560
1147'04	253.1	28561
1342'01	281.8	28562
1536'57	310.6	28563
1731'54	339.3	28564
1926'50	8.1	28565
2121'47	36.8	28566
2316'43	65.5	28567

THU. 12 FEB. 1981 (43)

UTC	LONG	ORBIT
111'40	94.3	28568
306'36	123.0	28569
501'33	151.7	28570
656'29	180.5	28571
851'26	209.2	28572
1046'23	238.0	28573
1241'19	266.7	28574
1436'15	295.4	28575
1631'12	324.2	28576
1826'09	352.9	28577
2021'05	21.6	28578
2216'02	50.4	28579

FRI. 13 FEB. 1981 (44)

UTC	LONG	ORBIT
10'58	79.1	28580
205'55	107.9	28581
400'51	136.6	28582
555'48	165.3	28583
750'44	194.1	28584
945'41	222.8	28585
1140'37	251.5	28586
1335'34	280.3	28587
1530'30	309.0	28588
1725'27	337.8	28589
1920'23	6.5	28590
2115'20	35.2	28591
2310'16	64.0	28592

SAT. 14 FEB. 1981 (45)

UTC	LONG	ORBIT
105'13	92.7	28593
300'09	121.4	28594
455'06	150.2	28595
650'02	178.9	28596
844'59	207.6	28597
1039'55	236.4	28598
1234'52	265.1	28599
1429'48	293.9	28600
1624'45	322.6	28601
1819'41	351.3	28602
2014'38	20.1	28603
2209'34	48.8	28604

SUN. 15 FEB. 1981 (46)

UTC	LONG	ORBIT
4'31	77.5	28605
169'27	106.3	28606
354'24	135.0	28607
649'21	163.8	28608
744'17	192.5	28609
939'13	221.2	28610
1134'10	250.0	28611
1329'06	278.7	28612
1524'03	307.4	28613
1719'00	336.2	28614
1913'56	4.9	28615
2108'53	33.7	28616
2303'49	62.4	28617

MON. 16 FEB. 1981 (47)

UTC	LONG	ORBIT
58'46	91.1	28618
253'42	119.9	28619
448'39	148.6	28620
643'35	177.3	28621
838'32	206.1	28622
1033'28	234.8	28623
1228'25	263.6	28624
1423'21	292.3	28625
1618'18	321.0	28626
1813'14	349.8	28627
2008'11	18.5	28628
2203'07	47.2	28629
2358'04	76.0	28630

TUE. 17 FEB. 1981 (48)

UTC	LONG	ORBIT
153'00	104.7	28631
347'57	133.5	28632
542'53	162.2	28633
737'50	190.9	28634
932'46	219.7	28635
1127'43	248.4	28636
1322'39	277.1	28637
1517'36	305.9	28638
1712'32	334.6	28639
1907'29	3.4	28640
2102'25	32.1	28641
2257'22	60.8	28642

WED. 18 FEB. 1981 (49)

UTC	LONG	ORBIT
52'18	89.6	28643
247'15	118.3	28644
442'12	147.0	28645
637'08	175.8	28646
832'05	204.6	28647
1027'01	233.2	28648
1221'58	262.0	28649
1416'54	290.7	28650
1611'51	319.5	28651
1806'47	348.2	28652
2001'44	16.9	28653
2156'40	45.7	28654
2351'37	74.4	28656

THU. 19 FEB. 1981 (50)

UTC	LONG	ORBIT
146'33	103.1	28656
341'30	131.9	28657
536'26	160.6	28658
731'23	189.4	28659
926'19	218.1	28660
1121'16	246.8	28661
1316'12	275.6	28662
1511'09	304.3	28663
1706'05	333.0	28664
1901'02	1.8	28665
2055'58	30.5	28666
2250'55	59.3	28667

FRI. 20 FEB. 1981 (51)

UTC	LONG	ORBIT
45'51	88.0	28668
240'48	116.7	28669
435'44	145.5	28670
630'41	174.2	28671
825'37	202.9	28672
1020'34	231.7	28673
1215'30	260.4	28674
1410'27	289.2	28675
1605'23	317.9	28676
1800'20	346.6	28677
1955'17	15.4	28678
2150'13	44.1	28679
2345'10	72.8	28680

SAT. 21 FEB. 1981 (52)

UTC	LONG	ORBIT
140'06	101.6	28681
335'02	130.3	28682
529'59	159.1	28683
724'56	187.8	28684
919'52	216.5	28685
1114'49	245.3	28686
1309'45	274.0	28687
1504'42	302.7	28688
1659'38	331.5	28689
1854'35	0.2	28690
2049'31	29.0	28691
2244'28	57.7	28692

SUN. 22 FEB. 1981 (53)

UTC	LONG	ORBIT
39'24	86.4	28693
234'21	115.2	28694
429'17	143.9	28695
624'14	172.6	28696
819'10	201.4	28697
1014'07	230.1	28698
1209'03	258.8	28699
1404'00	287.6	28700
1558'56	316.3	28701
1753'53	345.1	28702
1948'49	13.8	28703
2143'46	42.5	28704
2338'42	71.3	28705

MON. 23 FEB. 1981 (54)

UTC	LONG	ORBIT
133'39	100.0	28706
328'35	128.7	28707
523'32	157.5	28708
718'28	186.2	28709
913'25	215.0	28710
1108'21	243.7	28711
1303'18	272.4	28712
1458'14	301.2	28713
1653'11	329.9	28714
1848'08	358.6	28715
2043'04	27.4	28716
2238'00	56.1	28717

TUE. 24 FEB. 1981 (55)

UTC	LONG	ORBIT
32'57	84.9	28718
227'54	113.6	28719
422'50	142.3	28720
617'47	171.1	28721
812'43	199.8	28722
1007'40	228.5	28723
1202'36	257.3	28724
1357'33	286.0	28725
1552'29	314.8	28726
1747'26	343.5	28727
1942'22	12.2	28728
2137'19	41.0	28729
2332'15	69.7	28730

WED. 25 FEB. 1981 (56)

UTC	LONG	ORBIT
127'12	98.4	28731
322'08	127.2	28732
517'05	155.9	28733
712'01	184.7	28734
906'58	213.4	28735
1101'54	242.1	28736
1256'51	270.9	28737
1451'47	299.6	28738
1646'44	328.3	28739
1841'40	357.1	28740
2036'37	25.8	28741
2231'33	54.5	28742

THU. 25 FEB. 1981 (57)

UTC	LONG	ORBIT
26'30	83.3	28743
221'26	112.0	28744
416'23	140.8	28745
611'19	169.5	28746
806'16	198.2	28747
1001'12	227.0	28748
1156'09	255.7	28749
1351'06	284.4	28750
1546'02	313.2	28751
1740'58	341.9	28752
1935'55	10.7	28753
2130'51	39.4	28754
2325'48	68.1	28755

FRI. 27 FEB. 1981 (58)

UTC	LONG	ORBIT
120'45	96.9	28756
315'41	125.6	28757
510'38	154.3	28758
705'34	183.1	28759
900'31	211.8	28760
1055'27	240.6	28761
1250'24	269.3	28762
1445'20	298.0	28763
1640'17	326.8	28764
1835'13	355.5	28765
2030'10	24.2	28766
2225'06	53.0	28767

SAT. 28 FEB. 1981 (59)

UTC	LONG	ORBIT
20'03	81.7	28768
214'59	110.5	28769
409'56	139.2	28770
604'52	167.9	28771
759'49	196.7	28772
954'45	225.4	28773
1149'42	254.1	28774
1344'38	282.9	28775
1539'35	311.6	28776
1734'31	340.4	28777
1929'28	9.1	28778
2124'24	37.8	28779
2319'21	66.6	28780

AMSAT - OSCAR 8 ORBITAL DATA

SUN. 1 FEB. 1981 (32)

UTC	LONG	ORBIT
4'52	58.8	14834
148'03	84.6	14835
331'15	110.4	14836
514'27	136.2	14837
657'39	162.0	14838
840'51	187.8	14839
1024'03	213.6	14840
1207'15	239.4	14841
1350'27	265.2	14842
1533'39	291.0	14843
1716'50	316.8	14844
1900'02	342.6	14845
2043'14	8.4	14846
2226'26	34.2	14847

MON. 2 FEB. 1981 (33)

UTC	LONG	ORBIT
9'38	60.0	14848
152'50	85.8	14849
336'02	111.6	14850
519'14	137.4	14851
702'26	163.2	14852
845'37	189.0	14853
1028'49	214.8	14854
1212'01	240.6	14855
1355'13	266.4	14856
1538'25	292.2	14857
1721'37	318.0	14858
1904'49	343.8	14859
2048'01	9.6	14860
2231'12	35.4	14861

TUE. 3 FEB. 1981 (34)

UTC	LONG	ORBIT
14'24	61.2	14862
157'36	87.0	14863
340'48	112.8	14864
524'00	138.6	14865
707'12	164.4	14866
850'24	190.2	14867
1033'36	216.0	14868
1216'48	241.8	14869
1359'59	267.6	14870
1543'11	293.4	14871
1726'23	319.2	14872
1909'35	345.0	14873
2052'47	10.8	14874
2235'59	36.6	14875

WED. 4 FEB. 1981 (35)

UTC	LONG	ORBIT
19'11	62.4	14876
202'23	88.2	14877
345'35	114.0	14878
528'46	139.8	14879
711'58	165.6	14880
855'10	191.4	14881
1038'22	217.2	14882
1221'34	243.0	14883
1404'46	268.8	14884
1547'58	294.6	14885
1731'10	320.4	14886
1914'21	346.2	14887
2057'33	12.0	14888
2240'45	37.8	14889

THU. 5 FEB. 1981 (36)

UTC	LONG	ORBIT
23'57	63.6	14890
207'09	89.4	14891
350'21	115.2	14892
533'33	141.0	14893
716'45	166.8	14894
859'57	192.6	14895
1043'08	218.4	14896
1226'20	244.2	14897
1409'32	270.0	14898
1552'44	295.8	14899
1735'56	321.6	14900
1919'08	347.4	14901
2102'20	13.2	14902
2245'32	39.0	14903

FRI. 6 FEB. 1981 (37)

UTC	LONG	ORBIT
28'43	64.8	14904
211'55	90.5	14905
355'07	116.4	14906
538'19	142.2	14907
721'31	168.0	14908
904'43	193.8	14909
1047'55	219.6	14910
1231'07	245.4	14911
1414'19	271.2	14912
1557'30	297.0	14913
1740'42	322.8	14914
1923'54	348.6	14915
2107'06	14.5	14916
2250'18	40.3	14917

SAT. 7 FEB. 1981 (38)

UTC	LONG	ORBIT
33'30	66.1	14918
216'42	91.9	14919
359'54	117.7	14920
543'05	143.5	14921
726'17	169.3	14922
909'29	195.1	14923
1052'41	220.9	14924
1235'53	246.7	14925
1419'05	272.5	14926
1602'17	298.3	14927
1745'28	324.1	14928
1928'40	349.9	14929
2111'52	15.7	14930
2255'04	41.5	14931

SUN. 8 FEB. 1981 (39)

UTC	LONG	ORBIT
38'16	67.3	14932
221'28	93.1	14933
404'40	118.9	14934
547'52	144.7	14935
731'04	170.5	14936
914'15	196.3	14937
1057'27	222.1	14938
1240'39	247.9	14939
1423'51	273.7	14940
1607'03	299.5	14941
1750'15	325.3	14942
1933'27	351.1	14943
2116'39	16.9	14944
2259'50	42.7	14945

MON. 9 FEB. 1981 (40)

UTC	LONG	ORBIT
43'02	68.5	14946
226'14	94.3	14947
409'26	120.1	14948
552'38	145.9	14949
735'50	171.7	14950
919'02	197.5	14951
1102'13	223.3	14952
1245'25	249.1	14953
1428'37	274.9	14954
1611'49	300.7	14955
1755'01	326.5	14956
1938'13	352.3	14957
2121'25	18.1	14958
2304'37	43.9	14959

TUE. 10 FEB. 1981 (41)

UTC	LONG	ORBIT
47'49	69.7	14960
231'00	95.5	14961
414'12	121.3	14962
557'24	147.1	14963
740'36	172.9	14964
923'48	198.7	14965
1107'00	224.5	14966
1250'12	250.3	14967
1433'23	276.1	14968
1616'35	301.9	14969
1759'47	327.7	14970
1942'59	353.5	14971
2126'11	19.3	14972
2309'23	45.1	14973

WED. 11 FEB. 1981 (42)

UTC	LONG	ORBIT
52'35	70.9	14974
235'47	96.7	14975
418'58	122.5	14976
602'10	148.3	14977
745'22	174.1	14978
928'34	199.9	14979
1111'46	225.7	14980
1254'58	251.5	14981
1438'10	277.3	14982
1621'22	303.1	14983
1804'33	328.9	14984
1947'45	354.7	14985
2130'57	20.5	14986
2314'09	46.3	14987

THU. 12 FEB. 1981 (43)

UTC	LONG	ORBIT
57'21	72.1	14988
240'33	97.9	14989
423'45	123.7	14990
606'56	149.5	14991
750'08	175.3	14992
933'20	201.1	14993
1116'32	226.9	14994
1259'44	252.7	14995
1442'56	278.5	14996
1626'08	304.3	14997
1809'20	330.1	14998
1952'31	355.9	14999
2135'43	21.7	15000
2318'55	47.5	15001

FRI. 13 FEB. 1981 (44)

UTC	LONG	ORBIT
102'07	73.3	15002
245'19	99.1	15003
428'31	124.9	15004
611'43	150.7	15005
754'54	176.6	15006
938'06	202.4	15007
1121'18	228.2	15008
1304'30	254.0	15009
1447'42	279.8	15010
1630'54	305.6	15011
1814'06	331.4	15012
1957'18	357.2	15013
2140'29	23.0	15014
2323'41	48.8	15015

SAT. 14 FEB. 1981 (45)

UTC	LONG	ORBIT
106'53	74.6	15016
250'05	100.4	15017
433'17	126.2	15018
616'29	152.0	15019
759'41	177.8	15020
942'52	203.6	15021
1126'04	229.4	15022
1309'16	255.2	15023
1452'28	281.0	15024
1635'40	306.8	15025
1818'52	332.6	15026
2002'04	358.4	15027
2145'15	24.2	15028
2328'27	50.0	15029

SUN. 15 FEB. 1981 (46)

UTC	LONG	ORBIT
111'39	75.8	15030
254'51	101.6	15031
438'03	127.4	15032
621'15	153.2	15033
804'27	179.0	15034
947'39	204.8	15035
1130'50	230.6	15036
1314'02	256.4	15037
1457'14	282.2	15038
1640'26	308.0	15039
1823'38	333.8	15040
2006'50	359.6	15041
2150'01	25.4	15042
2333'13	51.2	15043

MON. 16 FEB. 1981 (47)

UTC	LONG	ORBIT
116'25	77.0	15044
259'37	102.8	15045
442'49	128.6	15046
626'01	154.4	15047
809'13	180.2	15048
952'25	206.0	15049
1135'36	231.8	15050
1318'48	257.6	15051
1502'00	283.4	15052
1645'12	309.2	15053
1828'24	335.0	15054
2011'36	0.8	15055
2154'48	26.6	15056
2337'59	52.4	15057

TUE. 17 FEB. 1981 (48)

UTC	LONG	ORBIT
121'11	78.2	15058
304'23	104.0	15059
447'35	129.8	15060
630'47	155.6	15061
813'59	181.4	15062
957'11	207.2	15063
1140'22	233.0	15064
1323'34	258.8	15065
1506'46	284.6	15066
1649'58	310.4	15067
1833'10	336.2	15068
2016'22	2.0	15069
2159'34	27.8	15070
2342'45	53.6	15071

WED. 18 FEB. 1981 (49)

UTC	LONG	ORBIT
125'57	79.4	15072
309'09	105.2	15073
452'21	131.0	15074
635'33	156.8	15075
818'45	182.6	15076
1001'57	208.4	15077
1145'08	234.2	15078
1328'20	260.0	15079
1511'32	285.8	15080
1654'44	311.6	15081
1837'56	337.4	15082
2021'08	3.2	15083
2204'20	29.0	15084
2347'31	54.8	15085

THU. 19 FEB. 1981 (50)

UTC	LONG	ORBIT
130'43	80.6	15086
313'55	106.4	15087
457'07	132.2	15088
640'19	158.0	15089
823'31	183.8	15090
1006'42	209.6	15091
1149'54	235.4	15092
1333'06	261.2	15093
1516'18	287.0	15094
1659'30	312.8	15095
1842'42	338.6	15096
2025'54	4.4	15097
2209'05	30.2	15098
2352'17	56.0	15099

FRI. 20 FEB. 1981 (51)

UTC	LONG	ORBIT
135'29	81.8	15100
318'41	107.7	15101
501'53	133.5	15102
645'05	159.3	15103
828'17	185.1	15104
1011'28	210.9	15105
1154'40	236.7	15106
1337'52	262.5	15107
1521'04	288.3	15108
1704'16	314.1	15109
1847'28	339.9	15110
2030'40	5.7	15111
2213'51	31.5	15112
2357'03	57.3	15113

SAT. 21 FEB. 1981 (52)

UTC	LONG	ORBIT
140'15	83.1	15114
323'27	108.9	15115
506'39	134.7	15116
649'51	160.5	15117
833'02	186.3	15118
1016'14	212.1	15119
1159'26	237.9	15120
1342'38	263.7	15121
1525'50	289.5	15122
1709'02	315.3	15123
1852'14	341.1	15124
2035'25	6.9	15125
2218'37	32.7	15126

SUN. 22 FEB. 1981 (53)

UTC	LONG	ORBIT
1'49	58.5	15127
145'01	84.3	15128
328'13	110.1	15129
511'25	135.9	15130
654'37	161.7	15131
837'48	187.5	15132
1021'00	213.3	15133
1204'12	239.1	15134
1347'24	264.9	15135
1530'36	290.7	15136
1713'48	316.5	15137
1856'59	342.3	15138
2040'11	8.1	15139
2223'23	33.9	15140

MON. 23 FEB. 1981 (54)

UTC	LONG	ORBIT
6'35	59.7	15141
149'47	85.5	15142
332'59	111.3	15143
516'11	137.1	15144
659'22	162.9	15145
842'34	188.7	15146
1025'46	214.5	15147
1208'58	240.3	15148
1352'10	266.1	15149
1535'22	291.9	15150
1718'33	317.7	15151
1901'45	343.5	15152
2044'57	9.3	15153
2228'09	35.1	15154

TUE. 24 FEB. 1981 (55)

UTC	LONG	ORBIT
11'21	60.9	15155
154'33	86.7	15156
337'45	112.5	15157
520'56	138.3	15158
704'08	164.1	15159
847'20	189.9	15160
1030'32	215.7	15161
1213'44	241.5	15162
1356'56	267.3	15163
1540'07	293.1	15164
1723'19	318.9	15165
1906'31	344.7	15166
2049'43	10.5	15167
2232'55	36.3	15168

WED. 25 FEB. 1981 (56)

UTC	LONG	ORBIT
16'07	62.1	15169
159'18	87.9	15170
342'30	113.7	15171
525'42	139.5	15172
708'54	165.3	15173
852'06	191.1	15174
1035'18	216.9	15175
1218'29	242.7	15176
1401'41	268.5	15177
1544'53	294.3	15178
1728'05	320.1	15179
1911'17	345.9	15180
2054'29	11.7	15181
2237'41	37.5	15182

THU. 26 FEB. 1981 (57)

UTC	LONG	ORBIT
20'52	63.3	15183
204'04	89.1	15184
347'16	114.9	15185
530'28	140.7	15186
713'40	166.5	15187
856'52	192.3	15188
1040'03	218.1	15189
1223'15	243.9	15190
1406'27	269.7	15191
1549'39	295.5	15192
1732'51	321.3	15193
1916'03	347.1	15194
2059'14	12.9	15195
2242'26	38.7	15196

FRI. 27 FEB. 1981 (58)

UTC	LONG	ORBIT
25'38	64.5	15197
208'50	90.3	15198
352'02	116.1	15199
535'14	141.9	15200
718'26	167.7	15201
901'37	193.6	15202
1044'49	219.4	15203
1228'01	245.2	15204
1411'13	271.0	15205
1554'25	296.8	15206
1737'37	322.6	15207
1920'48	348.4	15208
2104'00	14.2	15209
2247'12	40.0	15210

SAT. 28 FEB. 1981 (59)

UTC	LONG	ORBIT
30'24	65.8	15211
213'36	91.6	15212
356'48	117.4	15213
539'59	143.2	15214
723'11	169.0	15215
906'23	194.8	15216
1049'35	220.6	15217
1232'47	246.4	15218
1415'59	272.2	15219
1559'10	298.0	15220
1742'22	323.8	15221
1925'34	349.6	15222
2108'46	15.4	15223
2251'58	41.2	15224

PRINTED BY HENRY RADIO.

AMSAT - OSCAR 7 ORBITAL DATA

SUN. 1 MAR. 1981 (60)

UTC	LONG	ORBIT
114'17	95.3	28781
309'14	124.0	28782
504'10	152.8	28783
659'07	181.5	28784
854'04	210.3	28785
1049'00	239.0	28786
1243'56	267.7	28787
1438'53	296.5	28788
1633'49	325.2	28789
1828'46	353.9	28790
2023'43	22.7	28791
2218'39	51.4	28792

MON. 2 MAR. 1981 (61)

UTC	LONG	ORBIT
13'36	80.1	28793
208'32	108.9	28794
403'29	137.6	28795
558'25	166.4	28796
753'22	195.1	28797
948'18	223.8	28798
1143'15	252.6	28799
1338'11	281.3	28800
1533'08	310.0	28801
1728'04	338.8	28802
1923'01	7.5	28803
2117'57	36.3	28804
2312'54	65.0	28805

TUE. 3 MAR. 1981 (62)

UTC	LONG	ORBIT
107'50	93.7	28806
302'47	122.5	28807
457'43	151.2	28808
652'40	179.9	28809
847'36	208.7	28810
1042'33	237.4	28811
1237'29	266.2	28812
1432'26	294.9	28813
1627'22	323.6	28814
1822'19	352.4	28815
2017'15	21.1	28816
2212'12	49.8	28817

WED. 4 MAR. 1981 (63)

UTC	LONG	ORBIT
7'08	78.6	28818
202'05	107.3	28819
357'01	136.1	28820
551'58	164.8	28821
746'54	193.5	28822
941'51	222.3	28823
1136'47	251.0	28824
1331'44	279.7	28825
1526'40	308.5	28826
1721'37	337.2	28827
1916'33	6.0	28828
2111'30	34.7	28829
2306'27	63.4	28830

THU. 5 MAR. 1981 (64)

UTC	LONG	ORBIT
101'23	92.2	28831
256'20	120.9	28832
451'16	149.6	28833
646'13	178.4	28834
841'09	207.1	28835
1036'06	235.9	28836
1231'02	264.6	28837
1425'59	293.3	28838
1620'55	322.1	28839
1815'52	350.8	28840
2010'48	19.5	28841
2205'45	48.3	28842

FRI. 6 MAR. 1981 (65)

UTC	LONG	ORBIT
0'41	77.0	28843
155'38	105.7	28844
350'34	134.5	28845
545'31	163.2	28846
740'27	192.0	28847
935'24	220.7	28848
1130'20	249.4	28849
1325'17	278.2	28850
1520'13	306.9	28851
1715'10	335.6	28852
1910'06	4.4	28853
2105'03	33.1	28854
2259'59	61.9	28855

SAT. 7 MAR. 1981 (66)

UTC	LONG	ORBIT
54'56	90.6	28856
249'52	119.3	28857
444'49	148.1	28858
639'45	176.8	28859
834'42	205.5	28860
1029'38	234.3	28861
1224'35	263.0	28862
1419'31	291.8	28863
1614'28	320.5	28864
1809'25	349.2	28865
2004'21	18.0	28866
2159'17	46.7	28867
2354'14	75.4	28868

SUN. 8 MAR. 1981 (67)

UTC	LONG	ORBIT
149'10	104.2	28869
344'07	132.9	28870
539'04	161.7	28871
734'00	190.4	28872
928'57	219.1	28873
1123'53	247.9	28874
1318'50	276.6	28875
1513'46	305.3	28876
1708'43	334.1	28877
1903'39	2.8	28878
2058'36	31.6	28879
2253'32	60.3	28880

MON. 9 MAR. 1981 (68)

UTC	LONG	ORBIT
48'29	89.0	28881
243'25	117.8	28882
438'22	146.5	28883
633'18	175.2	28884
828'15	204.0	28885
1023'11	232.7	28886
1218'08	261.5	28887
1413'04	290.2	28888
1608'01	318.9	28889
1802'57	347.7	28890
1957'54	16.4	28891
2152'50	45.1	28892
2347'47	73.9	28893

TUE. 10 MAR. 1981 (69)

UTC	LONG	ORBIT
142'43	102.6	28894
337'40	131.3	28895
532'36	160.1	28896
727'33	188.8	28897
922'29	217.6	28898
1117'26	246.3	28899
1312'22	275.0	28900
1507'19	303.8	28901
1702'15	332.5	28902
1857'12	1.2	28903
2052'08	30.0	28904
2247'05	58.7	28905

WED. 11 MAR. 1981 (70)

UTC	LONG	ORBIT
42'01	87.5	28906
236'58	116.2	28907
431'55	144.9	28908
626'51	173.7	28909
821'47	202.4	28910
1016'44	231.1	28911
1211'40	259.9	28912
1406'37	288.6	28913
1601'34	317.4	28914
1756'30	346.1	28915
1951'27	14.8	28916
2146'23	43.6	28917
2341'20	72.3	28918

THU. 12 MAR. 1981 (71)

UTC	LONG	ORBIT
136'16	101.0	28919
331'13	129.8	28920
526'09	158.5	28921
721'06	187.3	28922
916'02	216.0	28923
1110'59	244.7	28924
1305'55	273.5	28925
1500'52	302.2	28926
1655'48	330.9	28927
1850'45	359.7	28928
2045'41	28.4	28929
2240'38	57.2	28930

FRI. 13 MAR. 1981 (72)

UTC	LONG	ORBIT
35'34	85.9	28931
230'31	114.6	28932
425'27	143.4	28933
620'24	172.1	28934
815'20	200.8	28935
1010'17	229.6	28936
1205'13	258.3	28937
1400'10	287.1	28938
1555'06	315.8	28939
1750'03	344.5	28940
1944'59	13.3	28941
2139'56	42.0	28942
2334'52	70.7	28943

SAT. 14 MAR. 1981 (73)

UTC	LONG	ORBIT
129'49	99.5	28944
324'45	128.2	28945
519'42	156.9	28946
714'38	185.7	28947
909'35	214.4	28948
1104'31	243.2	28949
1259'28	271.9	28950
1454'25	300.6	28951
1649'21	329.4	28952
1844'17	358.1	28953
2039'14	26.8	28954
2234'10	55.6	28955

SUN. 15 MAR. 1981 (74)

UTC	LONG	ORBIT
29'07	84.3	28956
224'04	113.1	28957
419'00	141.8	28958
613'57	170.5	28959
808'53	199.3	28960
1003'50	228.0	28961
1158'46	256.7	28962
1353'43	285.5	28963
1548'39	314.2	28964
1743'36	343.0	28965
1938'32	11.7	28966
2133'29	40.4	28967
2328'25	69.2	28968

MON. 16 MAR. 1981 (75)

UTC	LONG	ORBIT
123'22	97.9	28969
318'18	126.6	28970
513'15	155.4	28971
708'11	184.1	28972
903'08	212.9	28973
1058'04	241.6	28974
1253'01	270.3	28975
1447'57	299.1	28976
1642'54	327.8	28977
1837'50	356.5	28978
2032'47	25.3	28979
2227'43	54.0	28980

TUE. 17 MAR. 1981 (76)

UTC	LONG	ORBIT
22'40	82.8	28981
217'36	111.5	28982
412'33	140.2	28983
607'29	169.0	28984
802'26	197.7	28985
957'22	226.4	28986
1152'19	255.2	28987
1347'15	283.9	28988
1542'12	312.7	28989
1737'08	341.4	28990
1932'05	10.1	28991
2127'01	38.9	28992
2321'58	67.6	28993

WED. 18 MAR. 1981 (77)

UTC	LONG	ORBIT
116'54	96.3	28994
311'51	125.1	28995
506'47	153.8	28996
701'44	182.5	28997
856'40	211.3	28998
1051'37	240.0	28999
1246'34	268.8	29000
1441'30	297.5	29001
1636'27	326.2	29002
1831'23	355.0	29003
2026'19	23.7	29004
2221'16	52.4	29005

THU. 19 MAR. 1981 (78)

UTC	LONG	ORBIT
16'12	81.2	29006
211'09	109.9	29007
406'06	138.7	29008
601'02	167.4	29009
755'59	196.1	29010
950'55	224.9	29011
1145'52	253.6	29012
1340'48	282.3	29013
1535'45	311.1	29014
1730'41	339.8	29015
1925'38	8.6	29016
2120'34	37.3	29017
2315'31	66.0	29018

FRI. 20 MAR. 1981 (79)

UTC	LONG	ORBIT
110'27	94.8	29019
305'24	123.5	29020
500'20	152.2	29021
655'17	181.0	29022
850'13	209.7	29023
1045'10	238.5	29024
1240'06	267.2	29025
1435'03	295.9	29026
1629'59	324.7	29027
1824'56	353.4	29028
2019'52	22.1	29029
2214'49	50.9	29030

SAT. 21 MAR. 1981 (80)

UTC	LONG	ORBIT
9'45	79.6	29031
204'42	108.4	29032
359'38	137.1	29033
554'35	165.8	29034
749'31	194.6	29035
944'28	223.3	29036
1139'24	252.0	29037
1334'21	280.8	29038
1529'17	309.5	29039
1724'14	338.3	29040
1919'10	7.0	29041
2114'07	35.7	29042
2309'03	64.5	29043

SUN. 22 MAR. 1981 (81)

UTC	LONG	ORBIT
104'00	93.2	29044
258'56	121.9	29045
453'53	150.7	29046
648'49	179.4	29047
843'46	208.1	29048
1038'42	236.9	29049
1233'39	265.6	29050
1428'36	294.4	29051
1623'32	323.1	29052
1818'28	351.8	29053
2013'25	20.6	29054
2208'22	49.3	29055

MON. 23 MAR. 1981 (82)

UTC	LONG	ORBIT
3'18	78.0	29056
158'15	106.8	29057
353'11	135.5	29058
548'08	164.3	29059
743'04	193.0	29060
938'01	221.7	29061
1132'57	250.5	29062
1327'54	279.2	29063
1522'50	307.9	29064
1717'47	336.7	29065
1912'43	5.4	29066
2107'40	34.2	29067
2302'36	62.9	29068

TUE. 24 MAR. 1981 (83)

UTC	LONG	ORBIT
57'33	91.6	29069
252'29	120.4	29070
447'26	149.1	29071
642'22	177.8	29072
837'19	206.6	29073
1032'15	235.3	29074
1227'12	264.1	29075
1422'08	292.8	29076
1617'05	321.5	29077
1812'01	350.3	29078
2006'58	19.0	29079
2201'54	47.7	29080
2356'51	76.5	29081

WED. 25 MAR. 1981 (84)

UTC	LONG	ORBIT
151'47	105.2	29082
346'44	134.0	29083
541'40	162.7	29084
736'37	191.4	29085
931'33	220.2	29086
1126'30	248.9	29087
1321'26	277.6	29088
1516'23	306.4	29089
1711'19	335.1	29090
1906'16	3.9	29091
2101'12	32.6	29092
2256'09	61.3	29093

THU. 26 MAR. 1981 (85)

UTC	LONG	ORBIT
51'05	90.1	29094
246'02	118.8	29095
440'58	147.5	29096
635'55	176.3	29097
830'51	205.0	29098
1025'48	233.7	29099
1220'44	262.5	29100
1415'41	291.2	29101
1610'38	320.0	29102
1805'34	348.7	29103
2000'30	17.4	29104
2155'27	46.2	29105
2350'24	74.9	29106

FRI. 27 MAR. 1981 (86)

UTC	LONG	ORBIT
145'20	103.6	29107
340'17	132.4	29108
535'13	161.1	29109
730'10	189.9	29110
925'06	218.6	29111
1120'03	247.3	29112
1314'59	276.1	29113
1509'56	304.8	29114
1704'52	333.6	29115
1859'49	2.3	29116
2054'45	31.0	29117
2249'42	59.8	29118

SAT. 28 MAR. 1981 (87)

UTC	LONG	ORBIT
44'38	88.6	29119
239'35	117.2	29120
434'31	146.0	29121
629'28	174.7	29122
824'24	203.4	29123
1019'21	232.2	29124
1214'17	260.9	29125
1409'14	289.7	29126
1604'10	318.4	29127
1759'07	347.1	29128
1954'03	15.9	29129
2149'00	44.6	29130
2343'56	73.3	29131

SUN. 29 MAR. 1981 (88)

UTC	LONG	ORBIT
138'53	102.1	29132
333'49	130.8	29133
528'46	159.6	29134
723'42	188.3	29135
918'39	217.0	29136
1113'35	245.8	29137
1308'32	274.5	29138
1503'28	303.2	29139
1658'25	332.0	29140
1853'21	0.7	29141
2048'18	29.5	29142
2243'14	58.2	29143

MON. 30 MAR. 1981 (89)

UTC	LONG	ORBIT
38'11	86.9	29144
233'07	115.7	29145
428'04	144.4	29146
623'00	173.1	29147
817'57	201.9	29148
1012'53	230.6	29149
1207'50	259.3	29150
1402'46	288.1	29151
1557'43	316.8	29152
1752'39	345.6	29153
1947'36	14.3	29154
2142'32	43.0	29155
2337'29	71.8	29156

TUE. 31 MAR. 1981 (90)

UTC	LONG	ORBIT
132'26	100.5	29157
327'22	129.2	29158
522'19	158.0	29159
717'15	186.7	29160
912'12	215.5	29161
1107'08	244.2	29162
1302'04	272.9	29163
1457'01	301.7	29164
1651'58	330.4	29165
1846'54	359.1	29166
2041'51	27.9	29167
2236'47	56.6	29168

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

AMSAT - OSCAR 8 ORBITAL DATA

SUN. 1 MAR. 1981 (60)

UTC	LONG	ORBIT
35'10	67.0	15225
218'21	92.8	15226
401'33	118.6	15227
544'45	144.4	15228
727'57	170.2	15229
911'09	196.0	15230
1054'21	221.8	15231
1237'32	247.6	15232
1420'44	273.4	15233
1603'56	299.2	15234
1747'08	325.0	15235
1930'20	350.8	15236
2113'32	16.6	15237
2256'43	42.4	15238

MON. 2 MAR. 1981 (61)

UTC	LONG	ORBIT
39'55	68.2	15239
223'07	94.0	15240
406'19	119.8	15241
549'31	145.6	15242
732'43	171.4	15243
915'54	197.2	15244
1059'06	223.0	15245
1242'18	248.8	15246
1425'30	274.6	15247
1608'42	300.4	15248
1751'54	326.2	15249
1935'05	352.0	15250
2118'17	17.8	15251
2301'29	43.6	15252

TUE. 3 MAR. 1981 (62)

UTC	LONG	ORBIT
44'41	69.4	15253
227'53	95.2	15254
411'05	121.0	15255
554'16	146.8	15256
737'28	172.6	15257
920'40	198.4	15258
1103'52	224.2	15259
1247'04	250.0	15260
1430'15	275.8	15261
1613'27	301.5	15262
1756'39	327.4	15263
1939'51	353.2	15264
2123'03	19.0	15265
2306'15	44.8	15266

WED. 4 MAR. 1981 (63)

UTC	LONG	ORBIT
49'27	70.6	15267
232'38	96.4	15268
415'50	122.2	15269
559'02	148.0	15270
742'14	173.8	15271
925'26	199.6	15272
1108'37	225.4	15273
1251'49	251.2	15274
1435'01	277.0	15275
1618'13	302.8	15276
1801'25	328.6	15277
1944'37	354.4	15278
2127'48	20.2	15279
2311'00	46.0	15280

THU. 5 MAR. 1981 (64)

UTC	LONG	ORBIT
54'12	71.8	15281
237'24	97.6	15282
420'36	123.4	15283
603'48	149.2	15284
746'59	175.0	15285
930'11	200.8	15286
1113'23	226.6	15287
1256'35	252.4	15288
1439'47	278.2	15289
1622'58	304.0	15290
1806'10	329.8	15291
1949'22	355.6	15292
2132'34	21.4	15293
2315'46	47.2	15294

FRI. 6 MAR. 1981 (65)

UTC	LONG	ORBIT
58'58	73.0	15295
242'09	98.8	15296
425'21	124.6	15297
608'33	150.4	15298
751'45	176.2	15299
934'57	202.0	15300
1118'09	227.8	15301
1301'20	253.6	15302
1444'32	279.4	15303
1627'44	305.2	15304
1810'56	331.0	15305
1954'08	356.8	15306
2137'20	22.6	15307
2320'31	48.4	15308

SAT. 7 MAR. 1981 (66)

UTC	LONG	ORBIT
103'43	74.2	15309
246'55	100.0	15310
430'07	125.9	15311
613'19	151.7	15312
756'30	177.5	15313
939'42	203.3	15314
1122'54	229.1	15315
1306'06	254.9	15316
1449'18	280.7	15317
1632'30	306.5	15318
1815'41	332.3	15319
1958'53	358.1	15320
2142'05	23.9	15321
2325'17	49.7	15322

SUN. 8 MAR. 1981 (67)

UTC	LONG	ORBIT
108'29	75.5	15323
251'41	101.3	15324
434'52	127.1	15325
618'04	152.9	15326
801'16	178.7	15327
944'28	204.5	15328
1127'40	230.3	15329
1310'51	256.1	15330
1454'03	281.9	15331
1637'15	307.7	15332
1820'27	333.5	15333
2003'39	359.3	15334
2146'51	25.1	15335
2330'02	50.9	15336

MON. 9 MAR. 1981 (68)

UTC	LONG	ORBIT
113'14	76.7	15337
256'26	102.5	15338
439'38	128.3	15339
622'50	154.1	15340
806'01	179.9	15341
949'13	205.7	15342
1132'25	231.5	15343
1315'37	257.3	15344
1458'49	283.1	15345
1642'00	308.9	15346
1825'12	334.7	15347
2008'24	0.5	15348
2151'36	26.3	15349
2334'48	52.1	15350

TUE. 10 MAR. 1981 (69)

UTC	LONG	ORBIT
118'00	77.9	15351
301'11	103.7	15352
444'23	129.5	15353
627'35	155.3	15354
810'47	181.1	15355
953'59	206.9	15356
1137'11	232.7	15357
1320'22	258.5	15358
1503'34	284.3	15359
1646'46	310.1	15360
1829'58	335.9	15361
2013'10	1.7	15362
2156'21	27.5	15363
2339'33	53.3	15364

WED. 11 MAR. 1981 (70)

UTC	LONG	ORBIT
122'45	79.1	15365
305'57	104.9	15366
449'09	130.7	15367
632'20	156.5	15368
815'32	182.3	15369
958'44	208.1	15370
1141'56	233.9	15371
1325'08	259.7	15372
1508'20	285.5	15373
1651'31	311.3	15374
1834'43	337.1	15375
2017'55	2.9	15376
2201'07	28.7	15377
2344'19	54.5	15378

THU. 12 MAR. 1981 (71)

UTC	LONG	ORBIT
127'30	80.3	15379
310'42	106.1	15380
453'54	131.9	15381
637'05	157.7	15382
820'17	183.5	15383
1003'29	209.3	15384
1146'41	235.1	15385
1329'53	260.9	15386
1513'05	286.7	15387
1656'17	312.5	15388
1839'29	338.3	15389
2022'40	4.1	15390
2205'52	29.9	15391
2349'04	55.7	15392

FRI. 13 MAR. 1981 (72)

UTC	LONG	ORBIT
132'16	81.5	15393
315'28	107.3	15394
458'39	133.1	15395
641'51	158.9	15396
825'03	184.7	15397
1008'15	210.5	15398
1151'27	236.3	15399
1334'38	262.1	15400
1517'50	287.9	15401
1701'02	313.7	15402
1844'14	339.5	15403
2027'26	5.3	15404
2210'38	31.1	15405
2353'49	56.9	15406

SAT. 14 MAR. 1981 (73)

UTC	LONG	ORBIT
137'01	82.7	15407
320'13	108.5	15408
503'25	134.3	15409
646'37	160.1	15410
829'48	185.9	15411
1013'00	211.7	15412
1156'12	237.5	15413
1339'24	263.3	15414
1522'36	289.1	15415
1705'47	314.9	15416
1848'59	340.7	15417
2032'11	6.5	15418
2215'23	32.3	15419
2358'35	58.1	15420

SUN. 15 MAR. 1981 (74)

UTC	LONG	ORBIT
141'46	83.9	15421
324'58	109.7	15422
508'10	135.5	15423
651'22	161.3	15424
834'34	187.1	15425
1017'45	212.9	15426
1200'57	238.7	15427
1344'09	264.5	15428
1527'21	290.4	15429
1710'33	316.2	15430
1853'44	342.0	15431
2036'56	7.8	15432
2220'08	33.6	15433

MON. 16 MAR. 1981 (75)

UTC	LONG	ORBIT
3'20	59.4	15434
146'32	85.2	15435
329'43	111.0	15436
512'55	136.8	15437
656'07	162.6	15438
839'19	188.4	15439
1022'31	214.2	15440
1205'43	240.0	15441
1348'54	265.8	15442
1532'06	291.6	15443
1715'18	317.4	15444
1858'30	343.2	15445
2041'42	9.0	15446
2224'53	34.8	15447

TUE. 17 MAR. 1981 (76)

UTC	LONG	ORBIT
8'05	60.6	15448
151'17	86.4	15449
334'29	112.2	15450
517'41	138.0	15451
700'52	163.8	15452
844'04	189.6	15453
1027'16	215.4	15454
1210'28	241.2	15455
1353'40	267.0	15456
1536'51	292.8	15457
1720'03	318.6	15458
1903'15	344.4	15459
2046'27	10.2	15460
2229'39	36.0	15461

WED. 18 MAR. 1981 (77)

UTC	LONG	ORBIT
12'50	61.8	15462
156'02	87.6	15463
339'14	113.4	15464
522'26	139.2	15465
705'38	165.0	15466
848'49	190.8	15467
1032'01	216.6	15468
1215'13	242.4	15469
1358'25	268.2	15470
1541'37	294.0	15471
1724'48	319.8	15472
1908'00	345.6	15473
2051'12	11.4	15474
2234'24	37.2	15475

THU. 19 MAR. 1981 (78)

UTC	LONG	ORBIT
17'36	[illegible]	15476
[illegible]	[illegible]	15477
[illegible]	[illegible]	15478
[illegible]	[illegible]	15479
[illegible]	[illegible]	15480
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	12.6	[illegible]
2239'03	[illegible]	[illegible]

FRI. 20 MAR. 1981 (79)

UTC	LONG	ORBIT
22'21	64.2	15490
205'33	90.0	15491
348'44	115.8	15492
531'56	141.6	15493
715'08	167.4	15494
858'20	193.2	15495
1041'32	219.0	15496
1224'43	244.8	15497
1407'55	270.6	15498
1551'07	296.4	15499
1734'19	322.2	15500
1917'30	348.0	15501
2100'42	13.8	15502
2243'54	39.6	15503

SAT. 21 MAR. 1981 (80)

UTC	LONG	ORBIT
27'06	65.4	15504
210'18	91.2	15505
353'29	117.0	15506
536'41	142.8	15507
719'53	168.6	15508
903'05	194.4	15509
1046'17	220.2	15510
1229'28	246.0	15511
1412'40	271.8	15512
1555'52	297.6	15513
1739'04	323.4	15514
1922'16	349.2	15515
2105'27	15.0	15516
2248'39	40.8	15517

SUN. 22 MAR. 1981 (81)

UTC	LONG	ORBIT
31'51	66.6	15518

MON. 23 MAR. 1981 (82)

UTC	LONG	ORBIT
36'36	67.8	15532

TUE. 24 MAR. 1981 (83)

UTC	LONG	ORBIT
41'21	69.0	15546

WED. 25 MAR. 1981 (84)

UTC	LONG	ORBIT
46'06	70.2	15560

THU. 26 MAR. 1981 (85)

UTC	LONG	ORBIT
50'51	71.4	15574

FRI. 27 MAR. 1981 (86)

UTC	LONG	ORBIT
55'36	72.7	15588

SAT. 28 MAR. 1981 (87)

UTC	LONG	ORBIT
100'21	73.9	15602

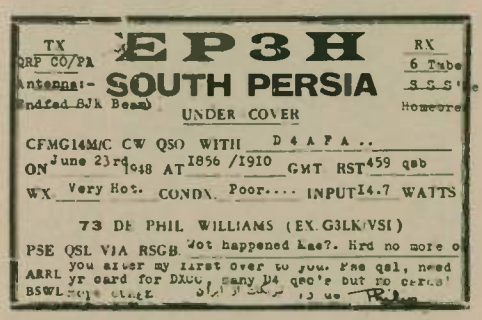
215°03	92.4	15519	219°48	93.6	15533	224°33	94.8	15547	229°18	96.1	15561	[illegible]	[illegible]	[illegible]	238°48	98.5	15589	[illegible]	99.7	15603
358°15	118.2	15520	403°00	119.4	15534	407°45	120.6	15548	412°30	121.9	15562	[illegible]	[illegible]	[illegible]	422°00	124.3	15590	426°45	125.5	15604
541°26	144.0	15521	546°12	145.2	15535	550°57	146.4	15549	555°42	147.7	15563	[illegible]	[illegible]	[illegible]	605°12	150.1	15591	609°58	151.3	15605
724°38	169.8	15522	729°23	171.0	15536	734°08	172.2	15550	738°53	173.5	15564	[illegible]	[illegible]	[illegible]	748°23	175.9	15592	753°08	177.1	15606
907°50	195.6	15523	912°35	196.8	15537	917°20	198.0	15551	922°05	199.3	15565	[illegible]	[illegible]	[illegible]	931°35	201.7	15593	936°20	202.9	15607
1051°02	221.4	15524	1055°47	222.6	15538	1100°32	223.8	15552	1105°17	225.1	15566	[illegible]	[illegible]	[illegible]	[illegible]	227.5	15594	1119°32	228.7	15608
1234°14	247.2	15525	1238°59	248.4	15539	1243°44	249.6	15553	1248°29	250.9	15567	[illegible]	[illegible]	[illegible]	1257°53	253.3	15595	1302°44	254.5	15609
1417°25	273.0	15526	1422°10	274.2	15540	1426°55	275.4	15554	1431°41	276.7	15568	[illegible]	[illegible]	[illegible]	1441°10	279.1	15596	1445°55	280.3	156
1600°37	298.8	15527	1605°22	300.0	15541	1610°07	301.2	15555	1614°52	302.5	15569	[illegible]	[illegible]	[illegible]	1624°22	304.9	15597	1629°07	306.1	15
1743°49	324.6	15528	1748°34	325.8	15542	1753°19	327.0	15556	1758°04	328.3	15570	[illegible]	[illegible]	[illegible]	1807°34	330.7	15598	1812°19	331.9	15612
1927°01	350.4	15529	1931°46	351.6	15543	1936°31	352.8	15557	1941°16	354.1	15571	[illegible]	[illegible]	[illegible]	1950°46	356.5	15599	1955°31	357.7	15613
2110°12	16.2	15530	2114°57	17.4	15544	2119°43	18.6	15558	2124°28	19.9	15572	[illegible]	[illegible]	[illegible]	[illegible]	22.3	15600	2138°42	23.5	15614
2253°24	42.0	15531	2258°09	43.2	15545	2302°54	44.4	15559	2307°39	45.7	15573	[illegible]	[illegible]	[illegible]	2317°09	48.1	15601	2321°54	49.3	15615

SUN. 29 MAR. 1981 (88)			MON. 30 MAR. 1981 (89)			TUE. 31 MAR. 1981 (90)		
UTC	LONG	ORBIT	UTC	LONG	ORBIT	UTC	LONG	ORBIT
105°06	75.1	15616	109°51	76.3	15630	114°36	77.5	15644
248°18	100.9	15617	253°03	102.1	15631	257°48	103.3	15645
431°30	126.7	15618	436°14	127.9	15632	440°59	129.1	15646
614°41	152.5	15619	619°26	153.7	15633	624°11	154.9	15647
757°53	178.3	15620	802°38	179.5	15634	807°23	180.7	15648
941°05	204.1	15621	945°50	205.3	15635	950°35	206.5	15649
1124°17	229.9	15622	1129°02	231.1	15636	1133°48	232.3	15650
1307°29	255.7	15623	1312°13	256.9	15637	1316°58	258.1	15651
1450°40	281.5	15624	1455°25	282.7	15638	1500°10	283.9	15652
1633°52	307.3	15625	1638°37	308.5	15639	1643°22	309.7	15653
1817°04	333.1	15626	1821°49	334.3	15640	1826°34	335.5	15654
2000°16	358.9	15627	2005°00	0.1	15641	2009°45	1.3	15655
2143°27	24.7	15628	2148°12	25.9	15642	2152°57	27.1	15656
2326°39	50.4	15629	2331°24	51.7	15643	2336°09	52.9	15657

DX World

(*continued from page 32*)

watts.



QSL routes

A7XAH	DJ9ZB	VK3DCA/LH	K2UO
A9XDB	AF4K	VK4NIC/3X	W4FRU
A9XDD	K7DVK	VK9ZD	VK3OT
A35DF	FO8DF	VK9ZG	VK3OT
A35VU	DL2RM	VP1DOM	W8MHX
C5ACJ	DL1LD	VP2KAA	N4PN
C5AZ	KB7HB	VP2KAC	N4RJ
C6AEP	W0CP	VP2KAE	K4UEE
CN5AMV	CN8DF	VP2MW	VE3HD
CN8AD	F8JL	VP2VGF	NP2AF
CN8AT	*(See Note 1)*	VP5B	N4KE
CN8CO	WB3KGY	VP5GCM	NP2AF
CR9CT	G3KDB	VP8PK	JA0BFZ
CT2DIV	WB3IFD	VP8PP	W6TKV
DJ7CV/EA9	DK3NP	VP8QI	G4CHP
EA8AK	W3HNK	VP8SB	G3ZMF
EA9EU	I8UDB	VP8SSI	G3BZU
EA9GT	WA2JOC	VS6CT	KB9N
EC9AQ	EA9GN	VU2JPN	JR1HKT
EI2VCH	K2PG	VU2RX	W2LOG
EL2AM	WD4NBX	W1CDO/C6A	WA1LXP
EU2ATM	UK2ABC	W6KG/4X	Yasme
F9UW/3A	F9UW	WP2ABZ	NP2AF
FC2CH	WD9EJE	WP2ABZ/C6A	NP2AF
FG0FWK/FS	W1HCS	XT2AU	WA1ZEZ
FK8CR	W7OK	XT2AW	KN1DPS
FM0FJD	W2GHK	YB9ADM	DF3KK
FM0GBL/FS	K8PBX	YJ8JA	JA8KWJ
FM0GDE	F6AOJ	YZ3K	YU3AE
FO0ALN	K4II	YZ7Q	YU7BPQ
FO0RB	W8LCZ	ZB2CF	WA2MVQ
GJ4IFE	PA0KHS	ZD7HH	W4FRU
HB0CBJ	DJ1BP	ZD7WT	ZD8TM
HH2VP	N4XR	ZF2AA	W8LUI
HI8XBH	KA2APZ	ZF2CC	N4RA
HL9RD	WD4NBX	ZF2DV	WB4OSN
HL9WM	K9KLR	ZF2DW	N4BP
HL9WW	K9KLR	ZF2DY	N4UM
HM5KY	W4KGH	ZK2PF	K9KB
HZ1SH	DJ9ZB	1A0KM	I9MGM
HZ1UN	I8YCP	3A0PN	DF4PN
J3AAC	W2BJI	3B8DB	KB4DX
J20/A	K6LPL	3B8RS	DJ6QT
J20CN	K2FV	3D2AF	DJ7YE
J73CB	J7DAO	3D2FJ	JA7SGV
J73D	W2OB	3D2MK	JA2JSF
JY8LP	K6LPL	4N1K	YU1ABH
K5LBU/ST0	KC4CD *(See Note 2)*	4N3P	YU3ZV
		4N5M	YU5JQR
K0WS/KX6	KX6BU	5B4JU	SK2AU
KC6EF	WA2FZY	5N6ATT	HB9WU
LX1BW	W3HNK	5R8AL	WA4VDE
OA4DW	N4DW	5N0ALE	DK2OC
P29NBF	K6UJV	5W1CY	JA7SGV
P29SU	JA7SGV	5W1DB	K9KB
PJ2CC	K4BAI *(See Note 3)*	6W8AR	*(See Note 5)*
		6W8HL	KB4GQ
RG6G	UK2BAS *(See Note 4)*	6Y5YL	N2MM *(See Note 6)*
ST2FF	YU2DX	7P8BI	WB0MSZ
T2AAF	JA7SGV	8J3JCI	JA1RL
T3AF	JA7SGV	8P6J	8P6CC
T3LAA	W7OK	8P6JW	W3HNK
T3LAB	W7OK	8Q7BD	DL1KS
TA2FM	VE1BBS	9J2BO	W6ORD
TG4RM	WD8MOV	9J2TJ	N8JW
TJ1GH	DL1HH	9K2AH	JA8BI
TL8RP	F3EA	9M2KG	JA3XYM
TL8WH	W5RU	9Q5CRI	I1KFB
TU2HW	WA8RTF	9X5DX	DL2OP
TU4AT	HB9BTQ	9X5MH	WB2YXV
TU20GA	K9KXA	9Y4XX	WA6KZI

A6XJA	Jan Keur, P.O. Box 5708, Dubai, United Arab Emirates
EA9IE	P.O. Box 417, Ceuta, North Africa, via Spain
N5AK	P.O. Box 147, Mafeking 8670, Baphuthatswana, RSA
HK1MY	P.O. Box 1823, Barranquilla, Colombia
HK0FBF	P.O. Box 842, San Andres Island, Colombia
HP5FI	P.O. Box 153, Chitre, Panama
JD1AEV	S. Kikuchi, P.O. Box 2, Ogasawara, Tokyo 100-21, Japan
SV0AW/9	P.O. Box 299, Iraklion, Crete, Greece
SV0BP	P.O. Box 301, Iraklion, Crete, Greece
TA2TAT	Talat Turgay, P.O. Box 133, Ankara, Turkey *(See Note 7)*
TG9HH	P.O. Box 69A, Guatemala City, Guatemala
TI9PN	P.O. Box 4355, San Jose, Costa Rica
VP1BEH	P.O. Box 111, Orange Walk, Belize
VP2MZ	G. Irish, P.O. Box 211, Plymouth, Monserrett
VP2SAM	P.O. Box 39, St. Vincent
WB5SNA/HR1	P.O. Box 726, Tegucigalpa, Honduras
4V2B	P.O. Box 38, Port-au-Prince, Haiti
4X4OQ	P.O. Box 1047, Beersheba, Israel 184110
5N0WNL	P.O. Box 3197, Lagos, Nigeria
6W8IH	P.O. Box 3024, Dakar, Senegal
7P8BJ	P.O. Box 39, Maseru, Lesotho
8R1RBF	P.O. Box 10932, Georgetown, Guyana

Notes:
1. Stateside stations may send their cards to Hans Dankerl, Tangier-USICA, Department of State, Washington, DC 20520. All others via OE3NH.
2. The address for KC4CD: W. Lane Tarleton, 105 Hickory Nob Ct., Fort Mill, SC 29715.
3. This applies for contacts made during the 20-meter November World Wide contest only.
4. The QSL address given for UK2BAS: P.O. Box 71, 235400 Siauliai, Lithuania, USSR. I don't know the reliability of this as Soviet cards all go via P.O. Box 88, Moscow.
5. Cards for 6W8AS go to WB4LFM for statewide stations; DJ3AS for Europeans, and JH1ARJ for Japanese stations.
6. This applies for contacts made during the period 27-30 November 1980 only.
7. In addition to sending your QSL send $1, taking care to not indicate any call letters on the envelope.

Contributors for the February column include: KC4CD, W4FRU, K4RYJ, W5CPI, WA6CPP, KA6CTI, K6EA, W6OL, W6VD, W6WO, W8ZNH, KA9FCZ, W9LNQ, CN8AT, NP2AF, the Southern California DX Club, the Western Washington DX Club, South African Radio League, *QRV, Radio Communication* (RSGB), *DX News Sheet, The DX Bulletin, The DXers Newsletter,* and *The Long Island DX Bulletin.*

It is the first day of the year and here I sit preparing this column with my ear tuned to the DX repeater on 2 meters. I finally broke down and got myself a 2-meter rig to monitor the repeater so I won't miss anything. In addition to that, I replaced the broken balun and replaced my feed line to my beam. Now I should be in fine shape for the new year. Hope the DX is good in 1981! 73 de John N6JM. □

U.S. via South Pole

Bob McGarvey, WB2EVF

Conditions on 20-meter phone have been up and down and the QRM has been worse when conditions have been better, but some operators seem able to overcome everything. Ivor Stafford, VK3XB, in Melbourne, Australia, worked much of the United States on 18 December — long path. His signal reports ranged from 57 to 59. Aiming over the North Pole sometimes works wonders from here (New Jersey), so I guess Ivor can use the South Pole just as effectively when conditions demand it.

The Home News □

This net is not just for YL's

Bob McGarvey, WB2EVF

There's more, much more, to amateur systems than sitting back waiting for some DX to check in.

Consider the YL International Single Sideband System, founded in 1963 by Miss V. Mayree Tallman, who is active on it to this day.

At first it was an organization of just what its name says — YLs. But that has changed over the years and male voices now are a part of every system session.

Casual listeners who jump in occasionally when they hear a fairly rare station may know little of the work done by the YL system.

Emergency traffic was the reason it was founded and regular participants know emergencies don't follow schedules. That's why the service stays operational hour after hour on its principal frequency in the 20-meter phone band.

When nothing is happening, the members participate in an awards program and continue communications. Nonmembers are welcome at any time, of course. They have full access to the service, including making non-emergency calls to stations they may have heard and would like to log. But the awards are limited to members, who pay dues and participate as often as they can.

Those are the reasonably tangible aspects of the YLISSB. But there are other aspects. It's a place where you can meet people and get to know them. A place where a signal translated into sound by your transceiver is not an unknown quantity coming from an unknown source.

People, voices and even characteristics of transmission fuse together into human beings.

Once a year the system holds a convention and members come from all over the world. They come to meet the voices that have helped to make their lives fuller.

The service began as an effort to help humanity. Over the years, it has expended far beyond its original concept.

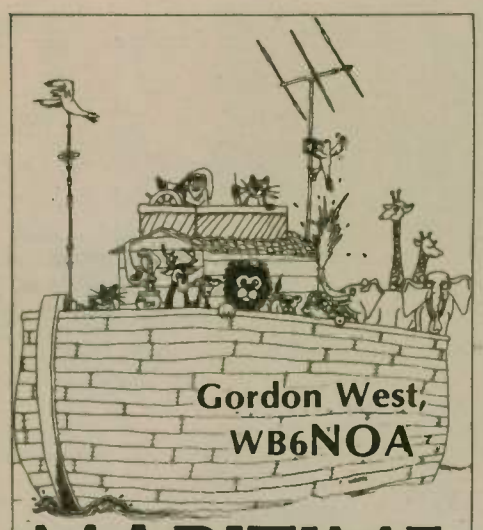
Some of its members are ministering to the sick in the tropics or in the upholstered jungles of the cities; serving God in His cloth, regardless of sect, in missions in the odd corners of the earth — bringing joy and understanding into thousands of lives.

But most of them are just men and women like yourselves.

The frequency of 14.332(3) MHz isn't just a set of numbers.

It is a place to come back to.

It is home. — *The Home News* □



MARITIME MOBILE

Looking for an exciting place to travel to on you next vacation? How would you like to sail down to the South Seas and bring all of your Amateur Radio equipment for an all-expenses-paid three-week stay? Amateur Radio operators working with local yacht clubs are doing just that — receiving a free vacation while providing necessary communications for a yacht club ocean sailboat race. Yacht clubs throughout the country host both local and long-distance ocean races. A race might be just a weekend affair, such as a run around the Long Island sound or a race to Catalina Island and back. On "short haul" races like these, the club will be looking for radio amateurs to help provide 2-meter race standing results as the vessels round pre-determined check points.

Other clubs may wish to sponsor a three-week, 1,500-mile race where they will be looking for HF SSB Amateur Radio communications along the race route, as well as communications at the finish line to broadcast the names of those who finish first.

Marine channels

Marine communications on both VHF and single sideband should be used whenever possible for the actual race communications. Most race committees on long distance races require vessels to contain VHF as well as HF marine single sideband equipment with back-up emergency antennas for each band. Marine communications are coordinated throughout the race on precise schedules. Here is an example of the traffic that would be handled on marine frequencies during a typical 1,500 mile race:

0945 hours: weather report
1030 hours: weather forecast
1230 hours: participants contact escort vessels giving their calculated position and weather conditions
1250 hours: a re-broadcast of individual weather conditions
1300 hours: roll call to escort vessels and finish line
1830 hours: contact with escort vessels
1905 hours: bed check, weather, and race standings
2020 hours: final bed check

These communications are held on 2 and 4 MHz single sideband marine frequencies. When a sailboat is near an escort vessel within sight, VHF communications are used. The whole idea is for escort vessels to keep an accurate check on each participant to insure her safety while traversing the long race course. There is usually one escort vessel for every 10 race participants.

Ham frequencies

Once the escort vessels pool their information about the race participants, it will be necessary to broadcast the race standings back to the hosting yacht club as well as to the finish line. Here is where Amateur Radio takes over to relieve the marine frequencies of non-essential ship traffic.

One Amateur Radio station will be located on the escort vessel that has all the weather reporting equipment. This station will be manned by a guest Amateur Radio operator looking for some exciting, fun times at sea. A second Amateur Radio station will be located at the finish line, aboard the finish line committee boat. Since Mexico does not allow Amateur Radio operators to broadcast from their shore lands — and because many races finally end up finishing in Mexico — it will be necessary to broadcast from the finish line on the high seas. The Amateur Radio operator picked for the finish line usually has the most fun — he gets to sleep until all the vessels are in sight, and then his work is cut out as each vessel crosses the finish line! Then when it's all over, he can go ashore with the rest of the fellas and have a great time.

The third Amateur Radio set-up is usually at the hosting yacht club. This may not be the most desirous position to operate from, in that you daily have to answer hundreds of questions as to where the racing vessels are, and is Jerry aboard the vessel Mahia having a good time and would you mind communicating a short message from his wife!

Temporary installation of equipment aboard

For the lucky Amateur Radio operators chosen to man the communications package aboard the escort vessel as well as the finish line vessel, a good installation is essential. If you're going to be operating on 2 meters for a short race, you've got it made with either portable or mobile equipment. Plug it in, run your coax, and feed your signal into a good half-wave antenna that will require no ground plane. Try and stay away from beams because you never know which direction the captain is going to be heading the vessel! Remember, mobile antennas — such as a ⅝ wavelength whip — generally require a good ground plane to effectively radiate a 2-meter signal with low SWR — and chances are you're not going to find too much flat metal surface aboard day yachts.

If you're using 2-meter portables, insure you never loan a portable to someone else who may, in turn, loan it to a non-licensed Amateur Radio operator. Many times, race committee men feel that since you're the guest, they can just grab a unit and go on the air. Don't let them!! Explain ahead of time that the only time a non-licensed Amateur Radio committee person is allowed to speak over the microphone is in the direct supervision of the licensee, and the licensee must start and end all communications. Make this a firm rule lest you get non-amateurs on 2 meters.

For HF operation, 80 and 40 meters are

Donald Gumpertz, K6OF/m, aboard *M.V. Westward*, sits at the controls.

usually chosen for races that may run out as far as 1,500 miles. On 3,000-mile races, such as the Trans Pacific Yacht Race from Los Angeles to Hawaii, 20 and 15 meters might also be added. Installing a temporary station aboard a race committee escort vessel or finish line vessel must be done precisely when dealing with HF propagation.

The radio room

The first consideration is where can you go to get away from everyone else. You want to be close enough to the marine sideband equipment so you can hear the participant check-ins, yet you still want to be separated enough so you can carry on your own communications without interfering with theirs. Remember that everybody on board will crowd around your Amateur Radio installation as you broadcast the race results back to the yacht club, or to the finish line. They'll be talking, smoking, drinking, setting their cocktails atop your equipment, and knocking over ashtrays into your antenna tuner. Be prepared! Somehow, find a corner where it will be almost inaccessible to get to by the casual observer, and plan to install your HF or VHF equipment there.

Equipment selection

For temporary ship assignments, I prefer to use solid state transceivers, rather than tube-type "separates." The ICOM 720, Kenwood 130, Swan, Ten-Tec, Yaesu, and Heath equipment are but a few excellent pieces to bring aboard. They're compact — most are completely transistorized — and they consume small amounts of 12 volt DC voltage, the most prevalent voltage found on committee boats. Make sure the equipment you select is suited for marine use and can take a bit of spray and abuse.

I recommend using the equipment off of the ship's 12 volt system, rather than depending on the ship's 110 volt AC generating system that usually fails when you need it most. On important long races, I even bring along my own sealed 12 volt battery in case their battery system should fail or be run down by an errant refrigeration system that went wild! This way, I'm always assured of my own power independent of the ship's power.

Once the equipment is in place and lashed down securely, anticipating 40 degree rolls, make sure you have a good plastic cover that will fit snugly over it. Just plan on water leaking down from the top of the cabin! It's bound to if seas get rough — and it always seems to leak exactly where you place your equipment.

Now run your 12 volt DC power leads and once again insure that your power source is going to stay operational. Locate your extra 12 volt back-up battery in a convenient location so that you can make your power switch immediately if the ship's power fails.

Ground connections

Poor results will occur, unless a sizable ground connection is made on your race committee vessel. If it's a sailboat, and if they have a medium frequency marine single sideband aboard, take a look and see how that equipment operates. If their marine sideband equipment seems to operate fine on 4, 6, and 8 MHz, try and tap into the ground system feeding that sideband. It usually terminates at the keel of a sailboat — an excellent ground point.

However, most race committee boats that escort vessels in large and long races are power boats. They usually have the worst ground system in that they don't have that nice keel to latch on to. Look again for the maritime sideband ground connection, and grab on to it. Since the boat is a race committee vessel, it has to have marine SSB gear aboard.

If you find the committee vessel's gear also performs poorly and has an inadequate ground system, it's up to you to make your own. Look around for large metal surfaces ideally suited below the water line of your host's power boat. Water tanks are generally located below the water line and offer a sizable amount of ground. Lifelines that connect to one another around the outside of the vessel are another source of ground. Some fiberglass power boats have a metal ground plate — add this to your ground system. Finally, go ahead and add the engine and shaft assembly for the final ground, remembering that the engine is somewhat isolated from the sea water through the oil in the gear box.

Make sure each ground connection is run separately to your transceiver, not all in series. Try and keep your ground connections as "sanitary" as possible so as not to worry the vessel owner about electrolysis! Once you've picked up every bit of metal for your ground connection, it's time for your antenna run.

Next month: **Temporary antennas** □

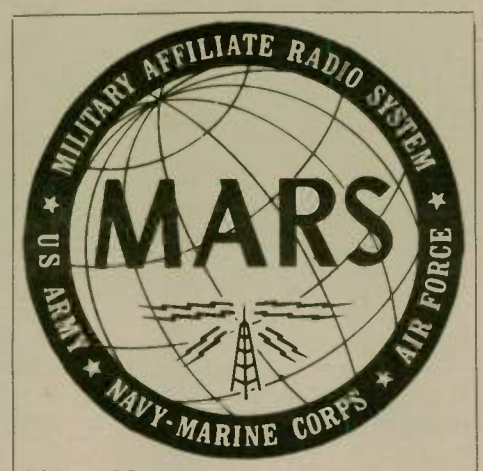
Did you know?

— That Prince Albert amateurs broadcast code practice on cable TV?

— That Regina amateurs air ARRL films on cable TV?

— That Saskatchewan amateurs claim they have more repeaters per square amateur than any other province in Canada?

— CRRL Newsletter □



Vern Hansen,
WB6UWQ/AAA9W

Hello . . . this is MARS calling

Leon Rosenthal, W6VNY/AAR9ZX

How would you react if your phone rang and when you lifted the receiver a voice said, "Hello, this is a call from MARS. Is Mr. or Mrs. Buddy there?"

For more than three decades, thousands upon thousands of Amateur Radio operators the world over have been spending long hours — day and night — bringing a service to families from their sons, daughters, relatives and friends in the military. If you were to stop a man on the street and ask, "Are you aware that if you have friends or family in the government service, you can send messages to them via radio by simply picking up your phone and calling any one of several numbers and at no personal cost?" you would get an amazed look followed by, "I didn't know that!"

MARS — Military Affiliate Radio System! Generally speaking, the mission is to provide an auxiliary emergency radio communications system as an adjunct to or extension of normal military communication service. While this program is multi-faceted, this article is about just one aspect — MARS' capacity to provide world-wide support to health, welfare and morale. It also provides a method of exchanging quasi-official record message traffic for armed forces and authorized U.S. government personnel.

For a sneak preview of how MARS functions, let's look over the shoulder of MARS station AAR9ZX here in San Diego. It's about 7:00 in the evening. The operator has his Amateur Radio equipment warmed up and is waiting for the Net Control Station operator to advise that the net is open and messages from almost anywhere in the United States or world are on hand for the following addressees. Very quickly and efficiently the messages are listed. Our San Diego operator notes there are four for San Diego proper and three for the surrounding areas.

These messages are from soldiers, sailors, airmen and Marines, and are addressed to loved ones at home. Bear in mind that while AAR9ZX is preparing to receive, a large number of other amateur operators engaged with MARS are also listening, ready to take traffic. By choice, AAR9ZX is a member of the Army MARS; others may be checked into Navy, Air Corps or Marine MARS nets. These nets convene at many different hours of the day and night. In all major cities and small towns from coast to coast and border to border, civilian and military Amateur Radio operators are giving their time and using their equipment to bring words of love or need to and from families of government personnel.

Quickly making certain adjustments, the equipment is ready to go. The traffic will be sent by radio teletype, so the teleprinter is warmed up and at the ready. On other nights, depending on circumstances, the messages may be read by voice and, under more severe conditions, the information will be sent by International Morse Code. Fifteen minutes later, AAR9ZX reaches for the telephone to call the families who were the addressees. Messages will be mailed early the next morning to those who can't be reached by phone.

Individual reactions of people who hear the call is from MARS vary from a moment of silence to "What is this — some kind of joke?" Those who have received a call from a MARS operator before usually respond with a gasp of delight.

After a few words of explanation to the uninitiated about the reason for the call, the operator can often hear a little flutter in the addressee's voice as a tinge of fear creeps into their minds — maybe all is not well with their son or daughter. The message is read quickly to dispel any fears, and then the excitement starts to boil over.

Many times, this message is the first word a family has received since a son or daughter, spouse or friend has been sent overseas. Many recipients of these calls won't let the radio operator hang up. They want to know exactly how he came into the information contained in the message. Is there a cost? Can a message be sent back? Why does he do this service and how can he afford the time, for no compensation? All these questions must be answered.

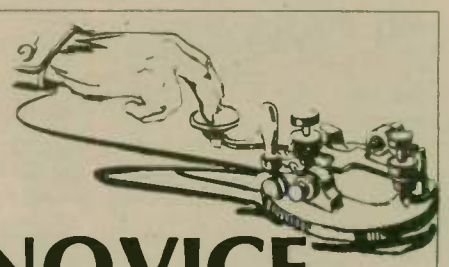
Occasionally there is a parent who receives a message from a loved one who has never been away from home before and is having a difficult time adjusting. This parent seems to think the MARS operator can give good advice about military life and the questions they ask are surprising. In this area MARS operators proceed very cautiously.

This simple but extremely important morale function being carried out by thousands of amateur operators every day and night is an application of skill and a labor of love which, in turn, brings together families separated by thousands of miles. The postal service from overseas can be devastatingly slow. Often two to three weeks pass before letters find their destinations. The dedicated civilians who operate their stations bring these messages to their addressees in a relatively short time. If the message is outgoing, it may announce to a new father that he has a son or daughter. Regardless of prevailing conditions, MARS operators get the messages through. It may be necessary to relay through several stations and geographical areas. No one rests until the message arrives at its final destination.

Naturally, when you have such a chain of events happening almost around the clock, there are always certain people who take on the heaviest loads. Many times, out of idle curiosity, as the operator of station AAR9ZX I've turned on the receiver late at night — long after the nets are quiet — and I would hear conversations between MARS net members who are still busy preparing incoming traffic for dissemination at the next net time. Quietly "reading the mail," as it is called in the world of Amateur Radio, I would listen to their conversation and come to realize these individuals have been hard at it for 10 to 12 hours, paying no attention to the time gone by, but just interested in passing an unusually heavy load of messages on their way.

Oddly enough, in spite of the tremendous service being dispensed, the MARS profile is not highly touted. There are no listings in the telephone book that one can turn to if a message is to be sent. Most of the families using the MARS program learn about it by receiving their first call from a participating amateur. MARS members are so busy getting their traffic to its final destination, they often forget to advise the families that they can return messages, via MARS, to their overseas or domestically located sons, daughters and friends. If you should be on the receiving end of a MARS-GRAM be sure and ask for the operator's phone number.

So now you know . . . not all things from MARS are UFO's. □



NOVICE

Armond Brattland, K6EA

On the air and the Novice, too

Per correspondence with Chris Wilson, our Managing Editor, it has been considered that some future change of title might hold more readers, since Novices are amateurs — there being no greater reason to devote a column to Novices than to Technicians, Generals or higher licensees. Well, nil has been decided along such line as yet; we shall not forsake the Novice! However, many Novices do forsake the Novice bands, Novice Nets and anything that is considered such, **just as soon as they acquire a general license.** That is not being very helpful, and who should better know what might help a beginner than one who just recently held such title?

Within the broad title, "amateur" — as applied to our fraternity — we have mentioned the various facets covered, except perhaps, **the non-operating amateur.** By that, I mean one who never operated, never owned any equipment to operate and did not intend to become so involved. So that you can be forewarned and have your emotions under control, you may find such persons here and there, especially at radio conventions and social activities. I used to meet one or two of such breed at conventions and noted they seemed to enjoy the company of amateurs. I boldly asked one, at SAROC in Las Vegas, why he had struggled to obtain a license and never used it. He stated it had been no struggle whatsoever for him and, in fact, he had helped a couple of his amateur friends, so they could upgrade. He claimed that learning the code caused him very little effort **because he really didn't care,** while his friends were tense and "fit to be flunked," worrying about results.

It appears that such individual just wanted to show his friends it was not as "tough" as they made it appear. While in the past, I've considered the antics of such intellectual clowns as sort of a menace to our hard-working, serious-minded amateurs, and felt that the FCC should divest them of their licenses, now thinking back, I must chuckle — **maybe they have an angle for us to consider?** We've mentioned it before — i.e., Technicians who "just can't learn code." Of course they could, **but they don't make efforts along the right direction.** Many such Technicians have held the same grade license for about the same length of time, as there has been such classification — how many years? Some radio clubs make a special effort to put them OVER THE LINE, some don't. Perhaps when putting out a roster, a few clubs fail to list their license?

Not a few of such Technicians are really interested in radio, eat up theory and help others upgrade, or obtain General licenses — actually they are now becoming "old-timers — all while only holding a Technician license. In years, many of them are at retirement age. What should the FCC do about them? How about "grandfathering" the better, long-licensed old-time Technicians into the General Class? That question was asked in this column before, but there was no response. Is it true that older amateurs do not read anything entitled Novice? We can't go it alone — **are we not our brother's keeper in Amateur Radio?**

Exploring further myths

About that "head copying" previously mentioned — "If you copy in your head, you can't write it down!" The answer to writing it down at higher speeds: you must learn to copy behind, BUT you can't copy behind, unless you can hold some code in your head — so where are we, with such myth?

An amusing contest at a convention years ago — amusing because the contesters worked so hard — was a "stick" code copying contest. Pencils, only! The winner at 45 wpm came from the great state of Minnesota, but has perched for years on top of a hill, with 13 acres of Rhombics. When the tape stopped, the winner kept on writing for some considerable time, and you could read it too, but what a rough way to copy at 45 wpm.

Who speaks up first against you?

If you've learned to THINK WHILE TYPING, how long has it taken you? Did the first teacher insist that you type slowly, so as to make fewer mistakes? Now some teachers tell the students to WHOOP IT UP, type as fast as possible — clear up the mistakes later. Or do they? How about learning to copy code the same way? If you suggest the beginner might be better off, in the long run, learning code with a keyboard, it's usually the elders that first shake their heads. A number of Novices have written: "If you get a net going, for goodness sake, keep the speed down — suggest 7 to 8 wpm." They have not handled traffic, but only send "QRU". Most likely, if they have heeded the advice to listen religiously to W1AW, this means only up as far as they can then copy . . . should we say "solid?" Even the FCC, with new tests, does not ask for "solid copy" — only comprehension. If the Novice can copy "solid" at 8 wpm, comprehension should be good up past 10 wpm!

"Murphy strikes"

Once in 46 months is not a usual or very strong record for "Murphy". Even if you were not interested in radio, you may have become acquainted with this diabolical, fictitious character that tries to mess up our good intentions. On 25 October, the December column — along with a letter from Peter Sutter, WD6GHZ, was mailed. On 5 November, a long-distance call uncovered the fact that the column was missing, so copies were arranged; but the letter was not to be printed at that time. Therefore, attention is called to the letter from WD6GHZ, printed on page 20 of the January issue. Now that he has his General, **we hope Peter continues to help the Novices!**

Correspondence

Since the publisher of **Worldradio** has always stressed having this Amateur Radio publication serve as a place to exchange ideas, an appropriate heading for this column might be **THE EXCHANGE.** Only one piece of feedback arrived here concerning a change of name; that suggestion was "Operating Notes and Beginner's Exchange". Having heard so many "myths" over the past four years, it may please slang-slingers if we simply call this column, "The Hide Bender". It seems that upon certain subjects, we are **all** — both young and old — a bit "hide-bound".

I did it again — mentioned "servicing back" without fully explaining it. In the way it was used, it merely means sending a radiogram marked "service" back to the originating station, stating why you were unable to deliver, or any other useful information concerning a radiogram, to expedite delivery. It is noted the word "service" is not used by some traffic handlers, but it really should be so designated. I hope this answers the question fully?

A YL with a sense of humor, signed "The OW", asked if a woman should be expected to repair a certain radio transceiver? It appeared to me she had been chided by the "OM" — that's only my guess. Anyhow, don't feel downgraded. Actually the percentage of amateurs who have either the intricate equipment or know-how to be able to effect repairs to their compact solid-state transceivers would be very small. The manner in which much of this gear is "poured-into" mini-rigs at the factory, makes it sensible to ship it back to the factory. In fact, some factories demand such procedure. **CHECK YOUR WARRANTY!** Not long ago, a factory sales and service manager told me they sometimes receive back a piece of equipment, wherein the amateur has "dug-into-it" and the product is still in warranty. If you are not sure about being able to "fix it", you better ship it.

The Thanksgiving doublet

When Cousin Ken Kirkland, W4EPD, of Kentucky wrote, asking for help to "restore" his CW — he having been on SSB "much, much too long" — the long wire failed to give the good reports on the agreed frequency. He mentioned that during his early radio days, he had to search for signals, but now he has to search for ways to avoid too many signals.

Winter is a rough time to put up new antennas here in Minnesota, but it was done — and on the agreed frequency. The reports were good after "getting around" the compromise set-up by the transmatch. These modern solid-state rigs have very little of what we call "tunability", being "very sot in their way" about a 50-ohm impedance. AND when you "con it", by a transmatch, into "thinking" there's a 50-ohm impedence, it clamps down and your RF out to your antenna is diminished, much like bending a garden hose and pinching off the flow. AND IF the antenna covers a wide range of frequencies/bands, etc., it takes a real slick-tricker of a transmatch to try and "fool" the rig, so it **compromises.** The deception of a relatively low SWR emerges when your reports don't follow.

If you are confined to a small space, that sort of a "shell game" with compromise antennas are a must, but space here in the "sticks" is ample — Thanksgiving #1 and a moment of silence for those without enough space. Trees properly spaced for a doublet, broadside to the direction you wish to reach, plus a coax through a basement vent at 90 degrees from the center, gave pause for further thankfulness. But **why a doublet-dipole?**

It is noted that such antennas are used when comparing results with beams. A doublet should have the middle at about the same height as the ends. If the middle is higher and the ends much lower, it becomes an "inverted vee" and if the angle of the slope is severe, (results indicated by testing), it gives you patterns of radiation similar to a vertical. To hold the middle level, or close to that, is a problem if you do not have a middle support. One way is to use lighter coax from the middle of the half-wave antenna, down to join the larger coax into your operating

position. However, if you plan to run high power above 500W, it would be better to have a middle support and use heavier coax all the way. Remember, heat loss increases with frequency, and if that run of coax is more than 50 or 60 feet, the losses begin to add up. Although most of the loss charts cover lengths around 100 feet, if you are QRP (with low power) it is important. You then look longingly at the table for open line feeding — BUT, how can you bring such lines into a basement and up through the floor to your rig? All good reasons to stick with coax!

One way to "cut" a dipole, and how about baluns?

For strength, so-called copper-clad antenna wire is excellent, but only expect to approximate the frequency you choose. Use soft-drawn copper on the ends through the insulators to "cut and try". Actually, you merely bend the soft-drawn wire back on itself to shorten or let it out. Don't use your transmatch when wishing to hit a specific frequency, but do use low power; find a time when the band is dead and by a quick check up and down, you can get close, with a good helper. The whole check can be accomplished in minutes, if your rig is resonated to the desired frequency with a dummy load. Even then, don't fail to identify.

In principle of operation, a balun is somewhat like a transformer with two windings of equal size — usually called 1 to 1 transformer; however, with the exception that the windings are tied together, your meter reads a "short". Any half-wave dipole, either wire; or as part of a beam when fed by a balanced feeder; open wires in parallel; or otherwise — the whole antenna system then is hot and radiating. To stop radiation from the feeders, sometimes the practice is to attach stubs — "tune-out" radiation from the feed line. When the frequency varies greatly, it must be done again and again, which — for the sake of convenience — has been eliminated by using coaxial line. However, the coaxial line itself presents an unbalanced condition, and there is little cancellation within such coax of unwanted RF on the feeder; so it backs up at times, on certain frequencies, all the way back to your rig. Such RF is radiated by the shield in the coaxial line, possibly causing TVI or other types of interference to your own equipment and to that of your neighbors. If you can clear the coax of such stray RF, which in some cases causes parasitic outputs, you have some chance of obtaining almost a total transfer of energy from your antenna. Almost, of course, has to do with many other conditons, but having the RF up in the antenna is of prime importance and a balun helps to obtain that.

One problem, with using a balun at the center of a doublet-or so-called dipole: it swings with the wind and sags in the middle of the antenna, out of plane with the ends. Having a support at the middle of such half-wave antenna is about the only way of eliminating such problem.

Using trees to support your antenna

Before pulling up the antenna, put screen door springs in parallel, at least on one end. This gives some "give and take" when the trees sway in the wind. □

General class

General Class theory classes begin 8 January 1981 and continue through 1 April 1981. The Thursday night classes will be held at Oak Lawn Public Library, 9427 S. Raymond, Oak Lawn, Illinois. □

Ohio ARES bulletin

The Central Ohio ARES (COARES) bulletin is published monthly at Columbus, Ohio by the Central Ohio Amateur Radio Emergency Corps Membership, Inc., as its official journal. Officers are: Robert Adams, W8BKO, Emergency Coordinator; John Chapman, WB8INY, Editor and Membership Services; Bill Duemmel, WD8AMX, Treasurer; and Ruth Smith, WB8VLR, Net Manager.

The COARES Net meets Wednesday evenings at 8:00 p.m. local time, except for the third Wednesday of each month, which is reserved for general meetings.

The Net meets on the COARES 147.66/.06 MHz repeater. Address all correspondence to: John Chapman, WB8INY, 5463 Worthington Terrace, Columbus, OH 43214. When quoting or reprinting, please give source credit. □

All EARS

(continued from page 16)

defense — for worried relatives — during an emergency.

In 1970, Hurricane Celia ravaged the Texas coast around Corpus Christi, wiping out Exxon's microwave and telephone system.

Several Exxon operators set up radio links between Houston and Corpus Christi. One of the Houston-based amateurs patched his station through the phone into the Exxon building, aiding employees in the area.

That Amateur Radio network was the beginning of EARS. Upon the group's receiving a charter in 1972, it formed headquarters on the top of the 45-story Exxon building in Houston.

A total of about 130 employees belong to the two EARS chapters in Houston, two in Baton Rouge, La., and the East Coast chapter at the Bayway Refinery, which was chartered Jan. 1, 1975. It is based at the firm's Research Center.

When Hurricane Allen recently aimed its fury toward the Texas coast, EARS members, including those at Linden, remained on alert for two days in case help was needed.

Contact is maintained between emergencies, and most of the air time is spent talking about sports, travel, "or just about anything," said Roehm, whose ham nickname is "Al."

He said it has been a lifelong hobby with him. "Hams just love to talk."

— *The Home News, New Jersey* □

VISIT YOUR LOCAL RADIO CLUB

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.

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

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

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
Financial Savings & Loan Community Room
205 S Church Street — Grass Valley
2nd Monday/monthly — 7:30 p.m.
(916) 265-5958 for information

North Hills Radio Club, Inc.
St. Michael's Episcopal Church
2140 Mission Ave.
Carmichael, CA 95608
3rd Tuesday/monthly — 7:30 p.m.

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.
PO Box 116
Santa Rosa, CA 95406
1st Wednesday/monthly — 8:00 p.m.
Red Cross Building

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

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

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.
Gen. Telephone Aud. E of I-69 off U.S. 24W
Fort Wayne, IN
Talk-in: 146.28/88, 147.255/855
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

MONTANA

Great Falls Area ARC
Joe Heyde, WB7TNH
6000 2nd Ave. N.
Great Falls, MT 59405
1st Monday/monthly — 7:30 p.m.

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.

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

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

OREGON

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

Northern Ohio ARS, Inc. (NOARS)
PO Box 354
Lorain, OH 44052
Mike K8US (216) 988-2345
Carl N8BKX (216) 282-2828

PENNSYLVANIA

Radio Assoc. of Erie, Inc.
PO Box 844
Erie, PA 16512
John Lindvay, WB3IFD

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.

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.

TRAFFIC

Chuck Clark, K4ZN

QN signals — why change 'em?

Under this caption, Bob Schreibmaier, K2PH, and Doug Zuckerman, W2XD, discussed a proposal made by AF0OL, to change the QN signals. Probably with tongue in cheek, they went through the list and added comments to each, in their article in the New Jersey Traffic Bulletin for November and December 1980. Readers of this column may find the comments interesting:

QNA (Answer in prearranged order). This one is hardly ever used. Can cause long net sessions with hardly anyone having a chance to check in.

QNB (Act as relay between . . . and . . .) Confusion reigns when this one is used, and it scares away newcomers.

QNC (All net stations copy). **QST** would serve the same purpose.

QND (Net is directed). By definition, nets are always directed.

QNE (Entire net stand by). Stations check into a net to pass traffic, not to stand by for a disappearing net control who hides behind this one. And stations returning to frequency often think the net has cleared.

QNF (Net is free). A net is never free. Rigs are expensive and so is electricity.

QNG (Take over as net control station). Coups are counterproductive. This one encourages anarchy.

QNH (Your net frequency is high). Unnecessary. Good procedure dictates being right on frequency.

QNI (Net stations report into net, or I am reporting into net). Net control can use a simple "K." Stations calling net control for the first time are obviously reporting into the net. This one is unnecessary, but nobody could think of anything else for the letter "I."

QNJ (Can you copy me? or Can you copy . . .?). Why not use the standard Q signal, QRK?

QNK (Transmit messages for . . . to . . .). This isn't used very much, but when it is, it's guaranteed to get "???"

QNL (Your net frequency is low). Same comments as for QNH.

QNM (You are QRMing the net). The standard Q signal, QRM, can be used instead.

QNN (Net control station is . . ., or Who is net control?). It should be obvious who the net control station is. There is no reason for it to be used as a question. Only the net manager and the net control station need to know who NCS is. Its use clutters up the net frequency.

QNO (Station is leaving net). This one really encourages insubordination. No one should leave unless commanded to do so by the net control station.

QNP (Unable to copy you or Unable to copy . . .). It's futile using this one. If you can't copy another station, why should that station be able to copy you?

QNQ (Move frequency to . . . and wait for . . . to finish handling traffic. Then send traffic for . . .). This is worse than QNK. Untold scores of neophytes have fallen victim to this one.

QNR (Answer . . . and receive traffic). Same comments as for QNK.

QNS (Following stations are in net, or Request list of stations in the net). Nonsense. Any net control worth his salt will know which stations are in the net. And does anyone else really need to know?

QNT (I request permission to leave the net for . . . minutes). When you sign into a net, you are expected to stay there, no matter what. A lax attitude is encouraged by this one.

QNU (Net has traffic for you. Stand by). It is understood that if net control hasn't dismissed you from the net it is because there is more traffic for you and you should stand by.

QNV (Establish contact with . . . on this frequency. If successful, move to . . . and send traffic for . . .). Has same problems as QNQ, but not quite as bad.

QNW (How do I route messages for . . .?). A real time-waster. Traffic routing should be known before signing into the net.

QNX (You are excused from the net, or Request to be excused from the net). Like QNO and QNT, this one also encourages insubordination and a lax attitude among the troops. Stations are never "excused" by net control.

QNY (Shift to another frequency (or to . . . kHz) to clear traffic with . . .). Totally unnecessary. However, if you insist, try using QSY.

QNZ (Zero beat your signal with mine). This one belongs in the same trash heap with QNH and QNL.

These gents go on to say that restricting them to CW nets discriminates against people who handle traffic on phone, and then they proceed to draw up their own list of nine QN signals, which are supposed to cover all possible situations and are guaranteed to generate confusion where it is missing. Samples:

QNK: Move frequency to . . . and wait for . . . then send traffic for . . . Next move to . . . and transmit messages for . . . to . . . After that. . .

QNL: You may not leave the net.

QNW: What is the name of this net? (For use by the net control station only).

They conclude by insisting these Q signals are still not permitted on SSTV nets. Say it with pictures.

More seriously, the QN signals have been around a long time — since the late 1930's. While many of the meanings are also provided by either regular Q signals internationally recognized or by the Z signals used on military and commercial fixed circuits, it's handy to have this group of signals designed for our specific amateur needs. Actually, they are not used as much as they could be, because often they are either not needed or not expected to be understood.

If stations on the net have been following the action, they usually will anticipate the directions of the net control station, and all that is necessary is for the latter to say something like, "Up 5 JDH after JUJ," which could mean "Go up 5 kHz and give (or receive, or both) traffic to (and/or from) JDH after the latter finishes with JUJ."

On the other hand, when a net has many inexperienced traffic handlers, it may save time if the net control station spells out the instructions without any Q signals, because it would be necessary to do so anyway when the inexperienced operator does not understand them.

Telephone numbers, another angle

Frequent reference to the need to include telephone numbers in formal traffic has been made in this column. Charles B. Colin, KA6EVN, points out there is another side to the story. He says that operators who will not accept traffic without phone numbers are discriminating against people who do not have phone service. There are some and KA6EVN is one such. He says, "I am an Amateur Radio operator because it is the only reliable communications link that we have with the outside world during emergencies. I do not have phone service (retired from Ma Bell — 25 years service) because the closest commercial phone is 23 miles away and I will never see a phone line here in my lifetime."

Time and date

Finishing up our discussion of the ARRL standard message preamble, we come to the time and date. The filing time is optional with the originating station. Should we use it?

Ordinarily it's not needed. Our messages usually take a day or two to reach their destination, sometimes longer. And the exact time the message was filed really doesn't matter that much in most cases. One time it should be included, however, is in emergency situations. It gives emergency coordinators, net managers, and other officials a way to monitor the speed of traffic through the system and to pinpoint any bottlenecks. It also enables officials of the agencies we are serving to know which messages contain the most recent information, and this may be of vital importance when messages are coming in fast and furious.

If the time is given, it is customarily given in UTC (or GMT or Z, all of which mean essentially the same thing here), although occasionally you'll hear EST or CST or the like. Usually we add Z to the time, expressed in four figures from 0000 to 2400. If the time given is anything other than UTC, however, it is imperative that the time zone be given; otherwise, the time is meaningless. CST, EDST or the like may be used, or the letter time indications — Q for EDST, R for EST and CDST, S for CST and MDST, T for MST and PDST, and U for PST. But I'll guarantee you'll almost certainly get a ??? if you use these letters. Few amateurs are acquainted with any of the letter time-zone designations other than Z.

In most cases, the time is not needed. But every message should carry a date. If the time is given, the date should correspond to the time zone. Thus, traffic originated in the evening in the United States and Canada will carry tomorrow's date if the time is given in UTC. If the time is not given, you may use either UTC or local time to determine the date. Usual practice is to spell out or abbreviate the month, followed by the day in figures, such as FEB 4. The year is not ordinarily given (we hope no traffic is around that long!). You may encounter some odd ones here too, however. Some amateurs don't bother to indicate the month, merely give the number of the day.

Incidentally, this is standard practice in the maritime mobile radiotelegraph service. Then there are those who follow European and military practice and give the figure for the day first, followed by the month: 4 FEB. Some also add the year to that: 4 FEB 81. And some will use the all-figures approach: 2/4/81. The last is especially not recommended, as it is ambiguous: Does it mean February 4 or 2 April? To an American it's February 4, but to a European it's 2 April. If you don't get replies to your DX QSLs, see if you are using this all-figures means of indicating dates. It's possible the DX station looked up the date you have in the

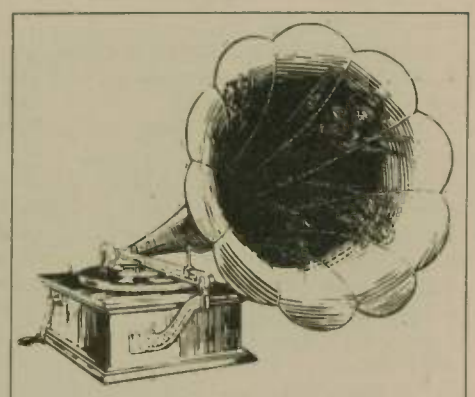
log, didn't find your call listed, and so threw your request into the circular file with a remark about these guys who cheat and try to get QSLs without working people.

If you are sending the message for a third party, the date should indicate the date the third party gave you the message to send. If it's your own origination, you can use either the date you decided to send the message or the date you actually put it on the air. I'd suggest you use the latter, as it doesn't look too good for our service to be handling messages several days old, so why have it start out with a handicap like that? I make one exception to that in my own case. When sending the report to the net manager of a session where I have acted as net control, I give the date as the date of the session, the same date I'll give in the text of the message. It gives a double check, and also prevents a bleary-eyed net manager trying to piece together the monthly report from looking at the wrong date and fouling up his work, since only one date is given.

The space

People usually think of Morse code as composed of dots and dashes, or dits and dahs. The third element, the space, is overlooked. And it is often overlooked in sending traffic, too. Did you ever hear anyone send PD for AND? PXIOUS for ANXIOUS? PATHER for WEATHER? For many years I used to find it hard to know whether I was listening to WAX or WPA on the commercial bands, until they closed one of these stations. Their calls sounded almost exactly the same. It's interesting to make a tape recording of one's sending, then try to copy it several days later after one has forgotten what one sent.

To improve one's sending, listen to machine sending, like W1AW's. If you can copy a bulletin, rig up an audio oscillator and key, and try to send the bulletin in step with W1AW on a later transmission. It will give you an idea of what a real space should sound like, and an appreciation of how much we tend to omit them — especially when we are in a rush, andruneverythingalltogether. □



OLD-TIME RADIO

Carl C. Drumeller, W5JJ

In Canada, as in the United States, Amateur Radio was a popular activity in the cruel days of the Depression. It was an activity that gave a great deal of pleasurable response in relation to the dollar spent. Canadians, like their neighbors to the south, built their equipment with whatever was at hand . . . or whatever could be procured at near-zero cost.

Here is a story, largely pictorial, of how one Canadian radio amateur, A. H. "Al" Miller, VE5KC (later VE7KC) coped with the challenge. Al sent **Worldradio** a number of pictures depicting his radio equipment of the mid-thirties. All but one are quite small, possibly unsuited for reproduction in the magazine. I'll comment on the larger one and two of the smaller ones; the reason for my commentary is to point out details that may not be readily seen in a reproduction.

Picture No. 1 shows Al at his station in 1934. The receiver is either a Pilot Super Wasp or a home-constructed version of one; note the Super Wasp plug-in coils hanging alongside the operating desk. This type of receiver used a type UX-224 regenerative detector, a type UX-227 first audio stage, and a type UX-247 audio power amplifier. I'll make a guess that Al's speaker was home-constructed; note the careful off-center mounting in the cabinet, which reputedly enhanced audio quality. A common power supply ran both receiver and transmitter and usually supplied between 180 and 250 volts; Al didn't mention what his put out. He did point out one factor, though — one that would excite a life insurance agent: the open-knife switch controlling primary power to the supply, situated all too handy to a swinging arm or leg!

Picture 1

Picture No. 2 displays Al's transmitter, built breadboard style, as was the custom in those years. It was the far-famed "TNT" (Tuned Plate Untuned Grid), which was simple to build, almost certain

(continued on next page)

ANTENNAS

- THEORY
- PRACTICE
- QUESTIONS
- ANSWERS

Curt Sterba

One subject that has been cussed and discussed is the vertical antenna. Some folks delight in mouthing the old saw that "Verticals radiate equally poor in all directions." If so, why are they the antenna system used for broadcast stations?

You can bet your bottom Susan B. Anthony dollar that if any industry as greedy as the broadcast industry could come up with a way to burn their call letters into one more jackrabbit another microvolt out, they would do it.

The difference is that your local 250-watt jukebox does it right and we, alas, do it wrong. Seems that Ned Novice reads an ad somewhere that says "no radials needed" and believes it. He is also a candidate for "Learn to be a Brain Surgeon in a Weekend School." But it's not his fault, really. He saw it in the big magazine.

As the song goes, "It Ain't Necessarily So," or to be more precise, ain't true at all. Last month we promised you the truth about verticals. Here it is, straight and cheap. A vertical without radials is a total DISASTER. And, a vertical tied into a ground rod is almost worse because one's hopes were raised.

Baffling how one manufacturer tells Ned that if you roof mount the vertical, one or two radials is all you need. Never could figure that one out, except maybe the manufacturer figured that after Ned spent all that money on the aluminum he'd have to dig into the milk money to afford a decent radial system.

The minimum is **four.** Nothing less. You may cringe trying to figure out how to put four 80-meter radials on your house. Well, you can run them out to the edge of the roof and then run them along the edge.

They don't have to be all straight, dressed right and covered down. Our usual jumble of wires is good enough. Now, I'm not going to suggest you take a page from KRAZY radio's book and lay out 180 radials. But, that's what they do and it works for them. (By the way, I once worked at the radio station described above and we got an SWL card from Australia.)

The more radials you can get out, the better. The more radials you can get out the better. No, the word processor didn't have the hiccoughs. I thought if I said it twice, it might make an impression.

The extra radials don't even have to be resonant length. Just get as much metal under the antenna as possible. A very good trick is to get a square of chicken wire (as big as possible), lay it under the vertical and tie to that.

Caution: this is a great idea for big signal but not so great if you have a curious cat that gets on your roof. If such animal is standing on ground screen with nose on vertical and you go key down you will have one unhappy kid on your hands yelling and screaming about how "Daddy killed the kitty."

Any kind of wire — fence wire, guy wire — anything. Just get out as much as you can. If you run NON-insulated wire, do not get the end near the rain gutter. Sparks may jump and set dry leaves on fire, burning down the house. (Keep pulling stuff like that and Gladys will never get her license!)

But if properly done, a vertical antenna will give a very good account of itself. Where does one stop before the cost of wire equals the cost of a chauffeured limousine which can take you to everyone you would care to talk to? Sixteen is a good place to stop. Unless, of course, this vertical is up on a 50-foot pole and you wish to dazzle the neighborhood with your Christmas light display.

How will the optimum vertical perform? Be aware — crazy things can happen! You may cry woefully, "I'm 5×9 in Tokyo but they can't hear me in San Diego."

You may be asking, "Which vertical should I buy?" There is the Hustler, a guy you want to stay away from in pool halls. There is a Hy-Gain. The only person I ever knew named Hy used to smoke smelly cigars behind the counter at the pool hall. There is the Butternut. Great antenna, funny name. What's this world coming to? Would Eitel and McCollough start a tube company today and call it Chocolate Chip Tube Company?

Get the Butternut. At least if you take it on a DXpedition to the desert island of San Serife and you run out of food, you won't starve to death.

Next subject: shortened dipoles and the like. Rule of thumb . . . you can paint your Volkswagen 'racing green' but that still won't turn it into a Ferrari. (That's Bob Ferrari, he runs a bunch of radio stores).

I was talking to a man who makes antennas. One of his customers bought one and put it in the attic, bending it every which way back on to itself, running next to the house wiring and all that. He pulled it out of the attic and shipped it back, saying it didn't work as well as the dipole he used to have about 40 feet up. This is a true story, so help me Sgt. Friday.

Bongo, Bongo. If all these hide-away antennas could work as well (or even cloze) to real antennas, there wouldn't be real antennas. We'd all run around with little sticks, bedsprings, garbage can lids, and the like.

(*please turn to page 53*)

OLD-TIME RADIO

(*continued from page 44*)

to work at first trial, and uncomplicated to operate. Those coils you see toward the back would handle a kilowatt (as transmitters are built nowadays), but probably never were called upon to take over 25 watts! Why so husky? In a search for high Q. The Q of the plate tank determined the stability of the transmitter; therefore resistive losses were kept as low as possible.

Picture 2

Like many other radio amateurs of the day, Al ran whatever tubes he could scrounge in this rig. It might be a pair of UX-245s, a pair of UX-171As, or even a pair of UX-201As . . . although many operators put in a higher value of "gridleak" when switching in the low-mu UX-171As. And let no one believe that a pair of such tubes, working in push-pull TNT, couldn't "get out" well! Cross-country DX was not uncommon.

Do you recognize the home-built wavemeter sitting beside the transmitter? I wonder if Al used it much. Most of us who used such transmitters tuned them against our receivers, which were tuned to some station we hoped had the ability to ascertain band edges!

By the time *Picture No. 3* was taken, Al had upgraded his transmitter. Now it had a type UX-247 oscillator, two type UX-246 buffer/doublers, and a Western Electric 211-E final. Those 211-Es were

Picture 3

relatively inexpensive (quite so, if you knew some chap who could "liberate" them from a theatre equipped with Western Electric sound system), but contained built-in RF chokes in the grid and plate leads. These cut parasitic oscillations when the tube was used in audio service, but they detracted from its ability to handle radio frequency effectively! Oh, they worked, but not as well as the UX-203As. The cards on the wall suggest it served Al quite well . . . that ZL3DJ contact didn't come easy in 1936!

After the Hitler War, Al moved from VE5 to VE7, where he now lives. His YF, Margaret, is VE7DKC. All old-timers will join in wishing the two many more years of enjoying Amateur Radio! □

CONSTRUCTION

Chuck Clark, K4ZN
Assistant Director, Roanoke Division, ARRL

Increased audio selectivity

The ARRL Board triggered an uproar last summer when it voted to petition the FCC to open 7075-7100 kHz to voice operation. The uproar surprised no one. CW operators have never taken kindly to the continual nibbling away at their bands that has taken place over the years. "Why we used to have the whole 40-meter band all to ourselves! And there are ten times as many amateurs on the air now as there were then!" Of course, no mention is made of the fact that most amateurs operated CW back then, and now it's mostly voice. And, as the QST editorial pointed out in December in an attempt to soothe the troubled waters, CW is getting an additional 50 kHz when the 10.1 MHz band opens — probably next year.

Still, it is true that our bands are getting more crowded, the CW bands included, even though most of the time the CW bands are wide open spaces when compared to the phone bands open to General Class licensees. But crowding is not an unmixed evil. Trees make better lumber when grown in dense stands, and Amateur Radio produces better operators and better equipment when stations are squeezed together — i.e., operators who can perform under difficult conditions, and equipment that can economize on use of the spectrum.

And many CW operators don't take full advantage of the spectrum economy of their mode. Many of us use transceivers designed for voice operation with a passband of 3 kHz or so. This makes for poor spectrum utilization in both transmitting and receiving. In receiving, obviously because any station within the passband is a potential source of interference. But in transmitting, too, because you're not so likely to be careful to be on the same frequency as the other station if you can get good copy a kilohertz either way; hence, your signals may interfere with someone else where the other station's would not.

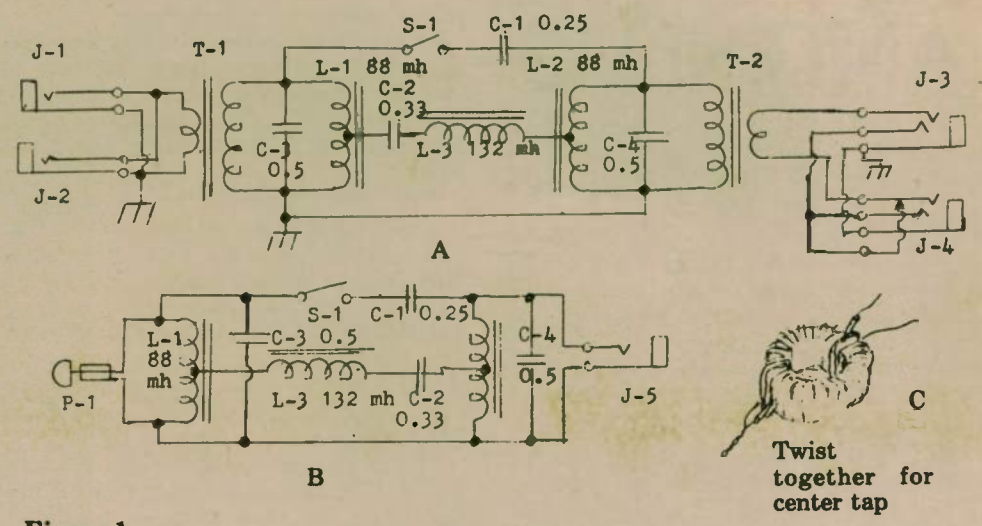


Figure 1

A CW signal occupies a bandwidth in Hertz of at least eight-tenths of the speed in words per minute. Thus a 20 signal would require a passband of at least 16 Hertz. Actually, such a narrow passband would make the keying too soft — a gradual rise and fall of the tone instead of a crisp make and break. A much better characteristic is secured when the third harmonic is passed, 48 Hertz in this example; and under fading conditions passing the fifth harmonic, 80 Hertz, can make the signal readable when otherwise it would not be. So a filter able to chop the passband down to 50 to 100 Hertz will enable us to make better use of CW's capabilities, and, if use of such filters became general, would allow several times as many amateurs to use our CW bands.

Most manufacturers of amateur gear build transceivers with sideband operation in mind, and so equip them with filters with 2 to 3 kilohertz passbands, and offer sharper filters as an optional extra. But the price tag on these filters can be rather steep, and purchasers with limited funds may be discouraged from buying them.

Fortunately, there is a low-cost alternative. It is not as good as a built-in filter, but a vast improvement over reception with voice bandwidth. This alternative is using more selectivity in the audio circuit. It can be made up in an outboard unit, plugged into the headphone jack of the transceiver, with a jack on the unit to receive the headphone plug. Its chief disadvantage over the built-in filter is that it does not prevent overloading the receiver by the nearby stations that it filters out of the audio signal. Such stations can cause the receiver's gain to drop as they key their signal, but this can often be minimized by turning down the RF gain and turning up the audio.

Passive filter

Currently, audio filters are classified as active and passive. Active filters use amplifiers, passive filters do not. Active filters require a power supply, passive filters do not. Both make use of inductors, capacitors and/or resistors. Each design has its good and bad features, and each has applications where it is the preferred type. Passive filters, requiring no power supply, are simpler, and are inherently stable because they do not amplify. Their main disadvantage is that, for a sharp cutoff, they must use inductors, and at audio frequencies inductors can be large, heavy, bulky items. Also, any passive filter introduces losses. Normally, however, this is not a serious disadvantage, as most receivers have more gain than is ever needed, so the loss can be compensated for by simply turning up the gain control a bit.

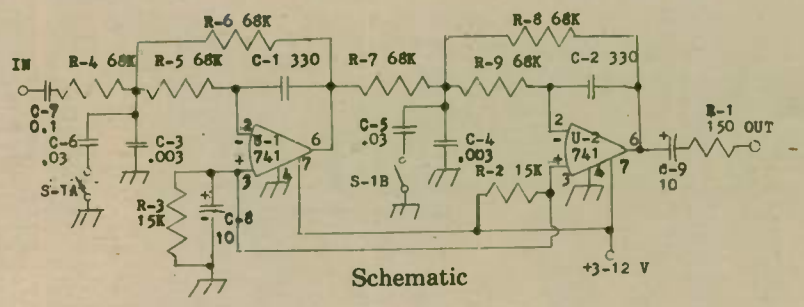
The main advantage of active filters is their compactness. It is possible to build a sharp filter that occupies only a cubic inch or so, that has performance comparable to one that requires 10 or 20 times that volume to accommodate the half dozen or so large inductors and capacitors needed. Designs for both types will be given here.

Figure 1 shows the circuit for a filter I've used here for several years with entirely satisfactory results. Often, stations I'm working will complain of interference I don't hear until I pull the plug out of the headphone jack on the rig and listen to the unfiltered audio coming out of the speaker.

The inductors are 44 and 88 millihenry toroids, available from several sources — in particular, from people who deal in Teletype gear. Capacitors should not be too hard to find. But you can't usually trust their markings to indicate their actual capacitance in these large sizes. You can easily measure the capacitance with your volt-ohm-milliammeter if it has an AC scale. Connect a variable resistor of about 25,000 ohms in series with the capacitor, and connect the two across the secondary of a low-voltage transformer (anything below 30 volts will do). Adjust the resistance until the voltage drop across the resistor is equal to that across the capacitor. Both should be equal to 71 percent of the transformer secondary voltage. Disconnect the power and use the meter to measure the resistance. The resistance will be numerically equal to the reactance of the capacitor. If you have 60 Hertz power, the capacitance is equal to 2.65 divided by the measured resistance in thousands of ohms. For 50 Hertz, change 2.65 to 3.18.

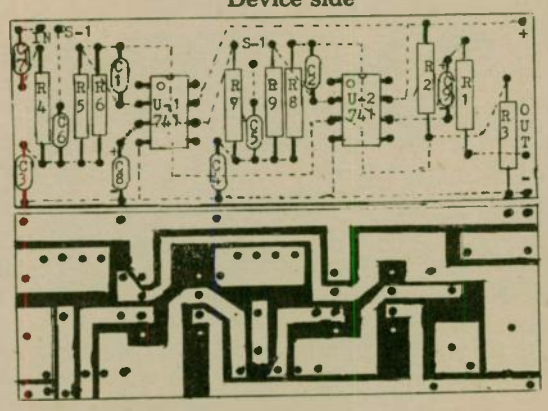
For best performances, fairly close tolerances are required, and this becomes more important as additional filter sections are added to give sharper cutoff. You could extend the filter shown in *Figure 1B* by changing C-4 to 1 microfarad, adding a second 88 millihenry toroid in parallel with L-2 and another filter section like *Figure 1B*. The design shown in Figure 1 should give about a 200-Hertz passband centered on about 800 Hertz, with 400 and 1600 Hertz down about 40 decibels. The filter I made turned out to have two peaks about 640 and 810 because the capacitors were somewhat larger than their nameplate ratings. But it proved to be an adequate performer, and the two peaks 170 Hertz apart came in handy when I incorporated the filter in a RTTY converter.

Figure 1A shows the circuit as I actually built it; transformers T-1 and T-2 were used as part of the RTTY converter. If you're just building a filter, you can dispense with the transformers by simply winding about 30 turns of small wire on L-1 and L-2 to match the circuit to a low-impedance speaker circuit. If you're put-



Schematic

Device side



Notch or dot indicates pin 1

Foil side

Figure 2

ting the filter into a headphone circuit, use *Figure 1B* instead. It is designed to match about 600 ohms, and should be good for any headphones except the very low impedance types.

When switch S-1 is closed, the filter has a much broader passband — about right for good voice reception, but also clipping off higher and lower frequencies that could impair reception. The use of the extra jacks J-2 and J-4 will be discussed later under the heading Simulated Stereo.

Active filter

The active filter shown in *Figure 2* takes up about as much space as one of the toroid inductors of the passive filter in *Figure 1.* It's easily tucked away into a corner of a small portable rig and can help greatly in reception. I included one in an outboard unit for a Heath HW-7 and found it gives good CW selectivity, where the original audio circuit is better suited for voice reception. As a bonus, it cleans up the keying sidetone and the resulting sound is much easier on the operator's ears.

This outboard unit also includes a keyer like the one described last month, and a set of frequency converters to extend the range of the HW-7 to 160 and 80 meters and the new bands. I hope to describe these in a future column.

Active converters have one additional advantage besides compactness. A passive filter has to be matched to its source and load impedance for best performance. But an active filter is not nearly so particular. You can use it with almost any source and load.

The circuit in *Figure 2* is obviously more complicated than that of the passive filter in *Figure 1,* and it would look even more complicated if the internal workings of the operational amplifiers were shown. These little gadgets have a lot of wizardry packed into a few cubic millimeters, and are handy tools for almost any electronic job. A few additional resistors and capacitors can tailor their performance to fit just about any function one can desire. In this case, the result is a bandpass filter roughly equivalent in performance to the passive filter of *Figure 1.*

A circuit-board layout is shown for those who wish to use this type of construction. If you have the equipment to transfer the design photographically to the board, you can simply copy it. Or you can do it the way I do: place the design over the board to be etched, mark the location of the holes with a center punch, then cut pieces of electrician's plastic tape to cover the areas of copper that are not to be etched away. After making sure all the tape is securely stuck down, and that the areas to be etched are properly exposed, put the board into the etching solution. After the copper is etched away, remove the board, rinse it off, remove the tape, drill the holes, and you're ready to mount the parts. Be careful with the etching solution. Best to wear rubber gloves — it might etch your fingers.

Switch S-1 in *Figure 2* performs the same function as switch S-1 in *Figure 1;* it widens the passband to allow good reception of voice signals while still cutting out the noises outside the passband. Connect leads from the holes marked "S-1" on the board to the switch, with the other two terminals connected to the negative side of the battery.

Simulated stereo

Additional improvement in CW reception can come from using simulated stereo techniques. Using a stereo headset, you feed the output of the receiver into one side, and the output of the filter into the other. In *Figure 1B,* this is accomplished by using a patch cord, a piece of wire with a phone plug on each end to connect from J-2 to J-4, thereby feeding the unfiltered audio into one side of the phones. When this is done, the interference is still heard, but it seems to be off to one side, while the desired signal seems to be straight ahead. This has two advantages: it makes it possible to hear stations that are slightly off frequency, and makes it possible to use much greater selectivity. In fact, a much more selective circuit could be used than shown here. Highly selective audio circuits tend to give a ringing sound that makes CW hard to copy. But when simulated stereo is used, the ringing seems to be off to the opposite side from the interference, and the desired signal straight ahead. This procedure makes it possible for the ear and brain to use all their capabilities to concentrate on the desired signal.

If you have a second receiver and want to monitor another frequency, simply pull the patch-cord plug out of J-2 and plug it into the phone jack on the second receiver. Then you can listen to both signals, one coming through each ear.

Commercial filters

There are several manufacturers who put out active filters like these — MFJ Enterprises, Autek, Palomar Engineers, and others. Hildreth Engineering has a simulated-stereo filter, but one that works on a different principle from that described here. Don Hildreth, W6NRW, described it in November 1975 **Ham Radio,** and in the November 1976 issue told of an addition he made. He uses a high-pass filter for one ear and a low-pass filter for the other, so that signals seem to move from left to right or vice versa as you move across the band. It also gives you stereo effect on voice signals, pushes the interference off to the side and the signal you want to hear right in front of you. The addition in the November 1976 issue is what he calls a Tone Tag. There is an additional sharp filter tuned to the crossover frequency between the two filters, and the output of this filter is modulated at 170 Hertz. This gives the desired signal a tone modulation, making it stand out even more sharply.

Buy or build? That's a question that confronts us all the time. Many have already decided. The fact that the parts for a home-brew filter cost only a fraction of what a commercial product costs decides the question for some of us, and the fact that others don't have time enough both to operate and to build decides it for those others. I'd suggest, however, that if you buy, you give first

consideration to adding CW filters offered by the manufacturer of your rig.

They give better results than any audio filter can. But the addition of an audio filter will still improve reception notably if you can afford both, even with the best available IF crystal filters.

Parts list for Figure 1
C-1 0.25 microfarads.
C-2 0.33 microfarads.
C-3 and C-4 0.5 microfarads.
J-1, J-2, J-5 two-wire open-circuit jacks.
J-3 three-wire open-circuit jack.
J-4 three-wire closed-circuit jack.
L-1 and L-2 88-millihenry toroids.
L-3 88 and 44 millihenry toroids in series.
P-1 Two-wire phone plug.
S-1 SPST switch.

T-1 and T-2 Transistor output transformer 500 ohms to 4 ohms. Radio Shack 273-1380 is suitable.

Parts list for Figure 2
C-1, C-2 330 picofarads.
C-3, C-4 .003 microfarads.
C-5, C-6 .03 microfarads.
C-7, C-8 10 microfarads.
R-1 150 ohms.
R-2, R-3 150,000 ohms.
R-4 to R-9 68,000 ohms.
U-1, U-2 741 or equivalent operational amplifier. □

Fiddling with power supplies

Carl Drumeller, W5JJ

Too often, power supplies are considered the most prosaic part of one's station equipment. Oh, there are some small variations, but if one limits the field to rectified alternating current power supplies involving a transformer not having a center tap, there are only four configurations commonly used. These are shown in *Figure 1*. They are the half-wave, the full-wave bridge, the "half-wave" voltage-doubler, and the "full-wave" voltage-doubler.

Of these, let's take the full-wave bridge and play with some possible variations. "Possible" does not mean they exist only on paper or as thoughts in someone's mind. I've tried them, and they work.

Want a full-wave bridge rectifier that uses only two diodes? Simple. Just replace two of the four with resistors, as shown in *Figure 2*. Don't use this in supplies providing heavy current, as there'll be too much voltage drop across the resistors. For low-current requirements, it works quite well. The size of the resistors is a trade-off between voltage regulation and just how much current you can spare to be dissipated in heating the resistors!

Want two voltages from the same power transformer, each of equal voltage, each wholly independent? Try the configuration of *Figure 3*. The isolating capacitors must be of a non-polarized type. Select ones with a large capacitance, keeping in mind that there's an IX_C drop across capacitors. Most non-polarized capacitors are sold for motor starting and have quite high capacitance, so that shouldn't be a point to worry about.

As each of the two voltage sources is wholly independent of the other, you may stack them for twice the voltage. That done, using the common point as "ground," you have both positive polarity and negative polarity from the same transformer.

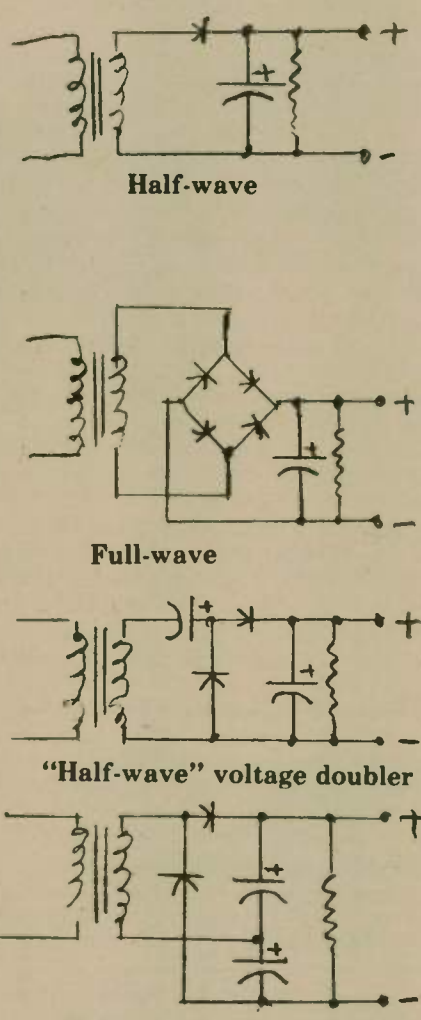


Figure 1 — Four common rectifier types for use with transformers having no center tap.

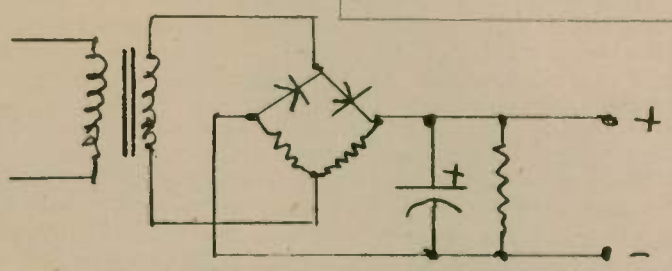


Figure 2 — Full-wave bridge with only two diodes.

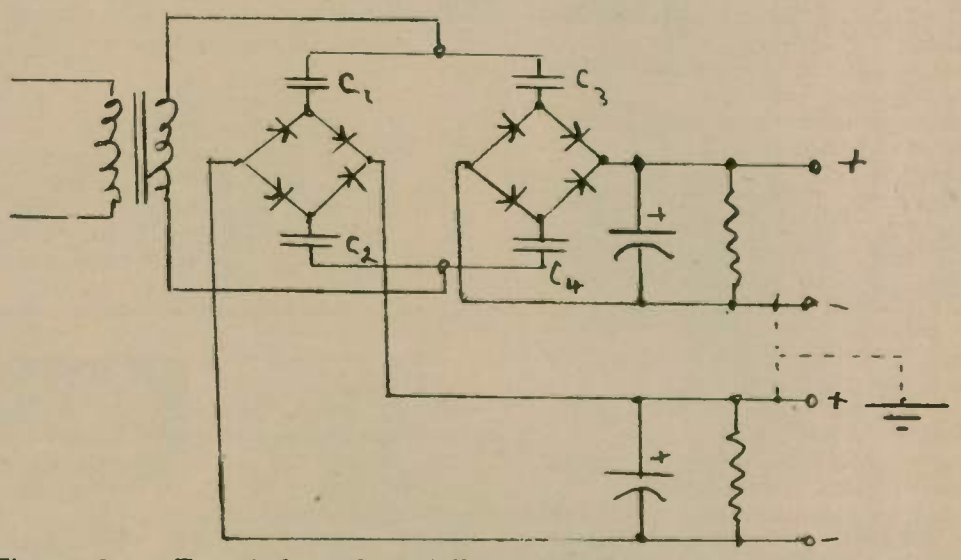


Figure 3 — Two independent full-wave bridges from a single power transformer. C_3 and C_4 may be omitted with no ill effect.

It's possible one of these rectifier circuits may fulfill a need of yours. If so, don't hesitate to try one! □

TVI

TVI — television interference — may be due to too long a ground wire, perhaps 30 feet or so, which could be resonant at 10, 15, 20 and 40 meters. Use RG8U as the ground wire using the center conductor. Connect a HV type 1000pF disc ceramic from the braid to the center conductor at each end. They claim it works.
— Oak Ridge, Tennessee ARC □

Protect your beam

The following information comes from Hy-Gain relative to wind resistance.

1. The best position is sideways to the wind. This allows the wind to only "see" the boom. It blows over the boom and creates a turbulence that has nothing to hit.

2. The worst position is cornerways into the wind. The wind sees the boom and all elements with turbulence hitting the elements.

3. The next worse position is for the beam to point into or backwards to the wind. The more elements in line, the more turbulence resistence.
— The Electron, Sterling, IL □

Maier's law — If the facts do not conform to the theory, they must be disposed of.

THE AMATEUR'S WORKBENCH

Joe Carr, K4IPV
5440 South 8th Road, Arlington, VA 22204

Power supplies and digital electronics seem to have dominated the mail bag at K4IPV this month! I received several different queries on both of these topics, so will devote part of the space to each.

Three-terminal regulator specs

There seems to be some confusion in the minds of several readers over the correct rating for some of the three-terminal voltage regulators that we see in so many electronics projects. One reader wrote and asked, "How much current will an LM-309 handle?" The LM-309 is a 5-volt positive regulator that is used frequently in digital electronic projects. The answer to this question must be prefaced with another question: "In which package style?" It seems there are three different types of LM-309 available, and they vary in current rating from 100mA to 1 ampere!

The LM-309H is in a TO-3 transistor package. This package is the metal can about ⅜ inch in diameter that was once "the" package for small signal and medium power transistors. The LM-309H is rated at 100mA.

The LM-309T is a rare bird, but is housed in the plastic package often used for power transistors. This package is sometimes called the "P-66" package in replacement line catalogs, but is more properly called the TO-220 package. It is the package that has a black or gray epoxy body mounted on metal backplate that is fitted with a metal tab at one end. There is a hole in the metal tab to allow mounting. The T-package LM-309 is rated at 750mA in free air, and up to 1 ampere if properly heat-sinked.

The most common variety of LM-309 is the LM-309K, which is packaged in a diamond-shaped TO-3 transistor case. This case is the one that most audio power transistors use, so should be familiar to most of us. The free-air rating of this package is 1 ampere, and it will pass up to 1.5 ampere if heat-sinked.

There are also two other series of three-terminal voltage regulator that are popular with amateurs: LM-3xO-xx and 7xxxx. Both of these types are available in T-packages and K-packages, with the same ratings generally as given above for the LM-309. The part number in each case tells us the polarity and the voltage. The LM- series includes a positive voltage regulator (LM-340-xx) and negative voltage regulator (LM-320-xx). The 7xxx series also has positive (78xx) and negative (79xx) voltage regulators. In both cases, the last two digits tell us the voltage at the output. For example, a 7305 is a 5-volt regulator, and is thus equivalent to an LM-309 device. The 7812 is a 12-volt positive regulator and the 7912 is the same in negative voltage. The LM-340-05 is also a 5-volt regulator, while the LM-340-12 is a 12-volt equivalent to the 7812. There is essentially no difference between LM-series and 7xxx series for the same voltage and polarity. We find, for example, that the LM-309K, LM-340K-05, and 7805K are all equivalent devices.

Be careful when using the negative voltage regulators! The pinouts for input and output are NOT the same as for the positive regulators! In the positive regulators (LM-340-xx, 78xx and LM-309), the pinouts are as follows (see *Figure 1*): input from rectifier (pin no. 1), regulated DC output (pin no. 2), and ground (pin no. 3, or case — or both). But, on the negative regulators (79xx and LM-320-xx), the input and ground are reversed: input from rectifier is pin no. 3, or the case (or both), while ground is pin no. 1. The output is still taken from pin no. 2. These pinouts are shown in *Figure 1*.

Failure to observe the proper pinouts in negative regulators will cause it to burn out immediately! Watch out.

Maximum output current ratings on most regulators depend upon the device being properly heat-sinked. In most cases, this means being mounted to the metal chassis rather than a printed circuit board. Alternatively, a finned heat sink, such as the type available from Radio Shack, or almost any electronic parts store, can be used either on a chassis or on printed-circuit board. Mount the T- and K-packages with a thin layer of silicon heat transfer grease between the bottom of the regulator package and the heat sink. Next, bolt the package and the heat sink surface, and make sure the mounting is tight.

Replacing a K-type with T-type regulator

One reader from Kansas wrote and asked about replacing a TO-3 package ("K") regulator with a TO-220 ("T") device. This same replacement problem exists for some audio power transistors, such as using a 2N5240 in place of a 2N3055 device. The question arose because the reader went to buy a replacement for one of the K-devices at his local parts emporium. The company only carries one relacement line, and no original type number parts. The replacement catalog listed a certain number which turned out to be a 5-volt regulator in a TO-220 package. In other words, they asked us to replace soemthing like an LM-340K-05 with an LM-340T-05. Will it work? Yes, provided that the current rating is not exceeded. I would not want to replace a K-device in a 1.5 ampere power supply, because the T-device rating is only 1 ampere when properly heat-sinked.

It turns out that the mechanical mounting of the TO-220 device in a TO-3 slot is actually quite simple. First, cut off lead no. 3, leaving only leads 1 and 2 (the outer leads — see *Figure 1*). Next, bend leads 1 and 2 at a right angle toward the back of the device. The position of the bend should be such that the leads can be placed into the holes of the TO-3 mounting when the hole in the mounting table is lined up with one of the original case mounting holes. Of course, it is necessary to use silicone heat transfer grease.

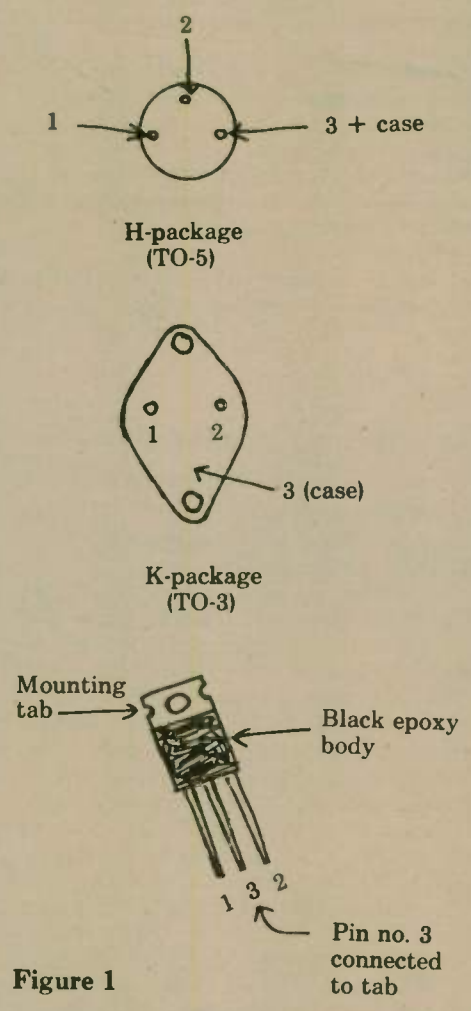


Figure 1

Keep in mind that the rates of these two devices are not the same, and one must be aware of the differences before replacing a K-device with a T-device.

Oh yes, one other point regarding three-terminal IC regulators. The case on positive regulators is ground, while in negative regulators, it is the DC input terminal. If you ground the mounting tab on a negative voltage regulator, you will effectively ground the negative "hot" lead from the rectifier. Bye-bye rectifier, and maybe the regulator too! (sigh).

Three-terminal regulator circuit

Figure 2 shows the basic circuit for a three-terminal regulator. Voltage Vin is the voltage from the rectifier, while Vo is the output voltage. In most cases, the input voltage (from the rectifier) must be 2 to 2.5 volts higher than the expected output voltage. In a 5-volt regulator, for example, the input voltage must be 7 to 7.5 volts, or more. Note that the DC from a rectifier connected to a 6.3-volt filiment transformer will be approximately 8 volts. This fact enables us to use a 6.3VAC transformer for 5-volt power supplies.

Capacitor C1 is the main rectifier filter, and should have a value of at least 1000uF/ampere output current, with some authorities believing that 2000uF/ampere is best. I personally try for 2000uF/ampere.

Capacitor C4 is optional, but is used to improve the transient response of the circuit. It should have a value of 100uF/ampere.

In most simple 1-ampere power supplies used in amateur projects, the values of C1 should be 2000uF, or more, while C4 should be 100uF.

The capacitors labeled C2 and C3 are used to improve the immunity from noise signals that may be present on the input voltage line. These capacitors usually have a value of 0.1uF to 1.0uF, with 0.33uF being the most popular. Mount these capacitors as close as possible to the body of the regulator. Most people prefer to use the terminals of the device as the mounting for the capacitors.

Three-terminal regulator for 2-meter FM rigs

I talked to a fellow at the hamfest in Virginia Beach, Virginia (held in a new convention center that looks like a bunch of giant white quonset huts in tandem!) who wanted to know whether there is a three-terminal regulator for use with 2-meter CB rigs. Some people try to use 12-volt regulators, but this does not always lead to success: the 2-meter rig requires 13 to 14 volts, not 12 volts. Most people are unaware that the "12-volt" battery in their car is actually a 13.6-volt battery (14.4 volts in GM cars). The cur-

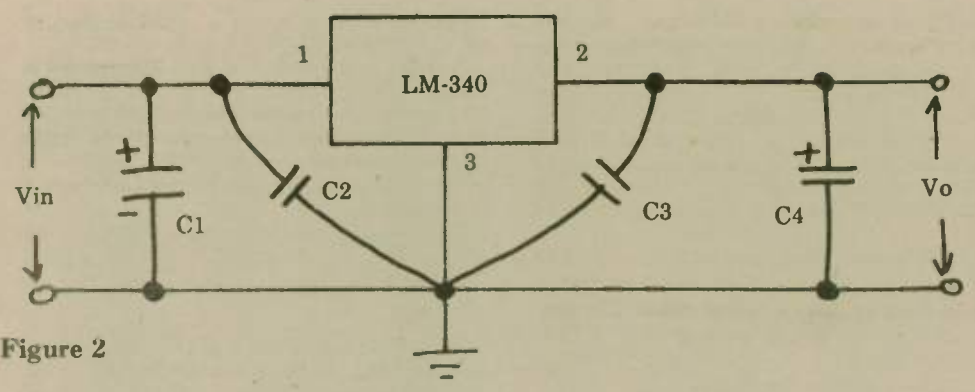


Figure 2

rent requirement is anywhere from 2 to 5 ampheres for the average medium power 2-meter rig (sans amplifier). There is at least one three-terminal regulator for this application: the Lambda Electronics type LAS-19CB device was intended for use with CB rigs, but works as well for our 2-meter FM rigs. It produces an output potential of 13.6 volts, and passes 5 amperes if properly heat-sinked.

ALDA 103 drift

Last month, I asked for any information you might have on curing the excessive drift in the Alda 103 three-band SSB HF transceiver. Thus far, there have been no answers, so please, if you know a cure, send it to me at this address: Joe Carr, K4IPV, 5440 South 8th Road, Arlington, Va., 22204. (703) 931-7132.

This is YOUR column!

Much of the material in this column comes from readers — which means you. If you have a question to be answered, or if you have some contribution to make, please write to me at the above address (K4IPV is good in any callbook of the past four years). I cannot guarantee to answer your question personally, but will try to (time and XYL permitting) if you include a #10 business envelope SASE. 73 □

Suggestions

Listed below are suggestions which we have received within the past few months. We're running them on the chance that some of you readers might want to comment, or make contributions in answer to these suggestions.

"I think we should have more info on the higher bands because if something isn't done about the jamming and interference on 40 meters real soon, we won't have it much longer. Everyone is too scared of their ticket to do something about it." — **Jay Farnsworth, Fallon, Nevada**

"With all the various computers in the hands of the hams, how about some articles, or a section on hams involved in and using RTTY and ASCII on the HF bands?" —**Robert Meyer, W6SJE, Fort Bragg, California**

"Do amateurs, other than I, have interest in scanners? How about rigs for backpacking (light!)." — **Jay MacIntyre, WA6BXB, Placerville, California**

"This is my first subscription to a radio publication. I like yours better than the slick mags. As a new Novice, I have my hands full right now with CW on one band. However, I think the ultimate fun must be QRP with home-brew equipment, and I would like to read more about what the guys are doing in that field. Thanks." — **Don Neal, KA3GDF, Russell, Pennsylvania**

"Please include more articles and news on ATV (fast-scan UHF) in your magazine. Thanks." — **Douglas W. Moon, K6KMN, Lancaster, California**

"I enjoy general news, much as **Worldradio** has now. Especially like low-cost projects. An antenna article often enjoyable. I have 2-meter FM and HF equipment. Am shortly going to get into ATV and 2-meter SSB. How about a page a month devoted to regional news (e.g., Northwest, Rocky Mountains, Southwest desert area, etc.), and have extended coverage from Amateur Radio clubs or whatever." — **Richard Mangum, WB7VMQ, Longmont, Colorado**

"I will be brief! I enjoy your paper. Regarding the Bash book, CW is still 50 percent of being a ham operator. Establish a code speed of 16 wpm for Advanced — all the cheating and memorizing won't help you.

"Chairman Ferris should study for a code exam — he might not think that CB'ers and hams are the same. Hi. Thanks again for a good paper." — **Howard Menge, KA0DFV, Bemidji, Minnesota**

"This is the first issue of **Worldradio** that I can recall seeing. Read it from cover to cover and knew I had to subscribe! I like your overall approach to the hobby and find it hard to come up with any suggestions. One thing — how about a **recommended** list of educational books? I find the ARRL books leave a lot to be desired." — **Charles Butz, WD4SCO, Fort Thomas, Kentucky** □

Fire

continued from page 1

tions link. Ray Frost, WA6TEY, and Charlie Knapke, WB6LKW, suggested we make the WR6ACB repeater portable; that is — pick up the machine, load it into Charlie's truck and relocate it somewhere down near the Laguna Hills to provide the needed coverage. Roger Denny, WB6ARK, volunteered to bring a portable generator and a 2-meter Ringo antenna.

Just as all the pieces were being gathered together, Ray, WB6LST, reported that W6TIO/R was now back in service — jury rigged with two ICOM 22S back to back — but in service.

By noon, the fire camp, evacuation center and Red Cross Disaster Center were in full communication. Communications continued smoothly on into the evening. Traffic dealt with setting up of field kitchens at the fire camp, serving of dinner at the evacuation center, and first aid needs at both. At 1800 hours, Jim, WB6UIG, had relief operators for all bases of operation on into the following day.

It was decided that the North Orange County ARES would schedule operators for the Disaster Center; the South Orange County ARES — under the leadership of Ed Ireland, WA6TLE — would man the fire camp and evacuation center. At 2000 hours, most of the evacuees left the high school to join relatives or neighbors, so it was secured.

However, the vigil continued at O'Neil Park and the Red Cross Disaster Center through Wednesday, 26 November and Thursday, 27 November. On Thanksgiving night, the decision was made by the Red Cross that operation of the Disaster Center would go into the "Home Monitor" mode from 1800 to 0600 hours the following morning. So it went. Red Cross was operated from the Red Cross Amateur Radio Station by day and monitored by night on a scheduled basis by volunteers from their home base stations.

The fire camp was staffed by volunteers going to O'Neil Park. Ed, WA6TLE, drove his motor home to the park and made it more comfortable for the operators. This operation continued until 1600 hours on Wednesday, 3 December. Eight days plus of coverage utilizing over 70 radio amateurs working around the clock at home, fire camp and Red Cross finally came to an end. The fires were finally contained — until next year.

The list of names and call signs is lengthy — only a few have been mentioned. But their help was certainly appreciated by all of the non-communicating participants, such as over 3,700 fire-fighters from four states and hundreds of other disaster workers. And last, but not least, by the people whose lives and property were threatened. □

PRODUCTS

LL DC/DC charger

Richard Freedman, N2HH

The LL DC/DC Charger is designed to quick-charge a handi-talkie battery from an auto cigarette lighter plug. When the engine is running, you can charge a dead TR-2400 90 percent of the way in three hours (if it is not turned on).

The LL charger is more than just a diode and a dropping resistor, which many of the units like it employ. It has a regulator built in which decreases the charging current to a trickle as the battery "fills up." A different model charger is available for all the popular handi-talkies. A red light lets you know that it is properly plugged in and making contact with your car's DC. The whole thing is built into a cigarette lighter plug so there are no dangling parts. A 5-foot lead comes out of the unit with the appropriate plug for your handi-talkie.

Since the charging rate depends upon how dead your batteries are, there is no need to time the charge. The intial charging rate is at about 150mA, when the input voltage is 14-15VDC. When fully charged, a trickle of about 35mA will be had. If you leave it plugged in when you shut off the car, the charge rate will drop to 5 to 25 mA, depending on how dead the batteries are. The batteries will not be harmed if trickle charged at this rate indefinitely and the drain on your car battery will be negligible, even if you leave the rig in the car and do not start the car for a week.

I am informed that the Engineering Department of Union Carbide, Eveready Division, has advised LL that the high-rate charge batteries used in today's H/T's can be charged at up to 170mA and are designed to not be damaged too easily by overcharging. The charging rates of the LL charger should therefore not harm your batteries. Even if your DC input should rise above 15VDC, no harm will be done as the charger will accept voltages up to 20 volts, bypassing all over 15VDC.

The unit is presently available for the TR-2400, FT-207R, IC-2A, S-1, S-2 and S-5 for $21.95 plus $1 postage and handling from LL Electronics, 12001 N.W. 29th Manor, Sunrise, Florida 33323. While you can power this unit from any AC to 13VDC power supply, I understand that LL is presently testing an AC adaptor so that the charger can be usd as an AC quick-charger for your home.

— Long Island Mobile ARC, New York □

Transmatch

Is it worth $218.50 list price to be able to turn any metal object into a workable antenna on 160 through 10 meters? The Murch UT-2000B Transmatch will do that and much, much more. This is a full-feature, quality piece of antenna matching gear. This transmatch features a built-in 4:1 balun, a husky roller inductor, an SWR bridge, and full in/out switching capability.

How she work?? With one exception, this tuner is excellent. The combination of the roller inductor and the two tuning capacitors offer total flexibility in presenting a 1:1 SWR match to the rig. In this era of transistor finals, the Murch makes the difference in getting an impromptu or out-of-tune antenna working. Otherwise, any SWR mismatch over 2:1 will shut your transceiver down (or worse!).

There is one major flaw. The function switch used to put the tuner in and out of line, or select a dummy load, feels rough and works poorly. Investigation showed that the switch was in reality several pieces of plexiglass and metal cobbled together in the woods of Maine. The replacement of this substandard component with a 4kV ceramic switch would make this transmatch a top choice for the ham shack.

— Gallatin Ham Radio Club, Montana □

ETCO catalog — winter edition

Our sixth edition — and without question, our most exciting and with the most items ever — is 96 pages long, packed with bargains, discounts, unusual items and thousands of hard-to-find parts.

In this issue, ETCO offers what could be the world's largest assortment of cable TV converters and accessories. Cable TV is enjoying explosive growth and ETCO is one of the few sources for these converters and information on their use.

Other new items include: microwave radiation detector, wireless intercoms, wireless microphones and wireless telephones. Also, fascinating long distance parabolic and shotgun microphones, VTR accessories, disco items, TV screen magnifiers, educational kits, hundreds of new surplus offerings, metric hardware, printed circuit materials and one of the world's largest assortment of receiving and transmitting tubes — including hundreds of impossible to find obsolete types.

An extremely exciting new item (on the cover) is one of the world's finest "Wireless remote control cable TV converters" — a brand new model! ETCO sells it for $189 and is in a position to make immediate shipment.

This "K" issue of the ETCO catalog is available to you free. For information, write to: ETCO Electronics, Dept. 280, Box 796, Plattsburgh, NY 12901. □

New Hamtronics® kits

Hamtronics, Inc. has announced a new single channel UHF FM exciter called the model T451. Patterned after the popular T450 exciter, the new unit is rated at 2 watts continuous output and is contained on a 3 × 5½-inch PC board. It is designed for the 50, 144, and 220 MHz bands and may be modified for use on adjacent commercial and government bands. It is ideal for control links, repeater service, telemetry, and other applications for which a small unit is required. A multi-channel adapter is also available to extend operation up to five channels.

Features include low-impedance dynamic mike and high level audio inputs; crisp, clear modulation; low spurious output; pre-wound coils; adjustable output level; and built-in test points for easy alignment. A commercial grade frequency stability option is available. Best of all, the price of the T451 is only $59.95.

Another new development at Hamtronics is the abailability of XV2 2-meter and 1¼-meter transmitting converter kits with 6-meter inputs. This is another illustration of why Hamtronics holds the claim of having the widest range of transmitting and receiving converters in the industry.

For further information, contact Hamtronics, Inc., 65F Moul Rd., Hilton NY 14468; (716)-392-9430. □

Plastic COAX-SEAL

A new, quick and positive way to seal coax fittings from moisture and corrosion damage is now available. COAX-SEAL is a pliable,

plastic material which is wound over coax fittings of any size or shape and then handmolded, giving a long-lasting, flexible, waterproof and dustproof seal. This new material stays flexible at temperatures from −25°F. to 350°F.

COAX-SEAL maintains its sealing qualities regardless of movement of the coax. It also adheres to poly-vinyl or vinyl outer coax jackets. The material allows the quick decoupling of a coax fitting and also the re-sealing of the fitting using the same material. Application is by hand — simply roll off approximately 6 inches of COAX-SEAL, remove backing paper, begin wrapping at outer covering and work towards fitting, allowing a ½ inch overlap as you go. After the wrap is completed, gently knead to form a smooth surface and to force out any air.

COAX-SEAL comes in rolls, 60 inches long, ⅛ inch thick and ½ inch wide on backing paper. Packaged for pegboard display. 50-foot industrial rolls are also available. □

Microprocessor crystal guide

Sentry Manufacturing Company is offering a new *Microprocessor Crystal Guide* free to its customers. The *Guide* contains the most complete line of gold-plated crystals in the microprocessor industry.

Sentry, who recently introduced a new microprocessor line of high-test crystals, maintains a most exacting standard of quality. The calibration tolerance is ±0.005% at 26°C and

the temperature tolerance is better than ±0.005% from −30° to +60°C.

The *Microprocessor Crystal Guide* provides information on frequencies available and their application. Sentry can also manufacture most frequencies not listed in the *Guide*.

Sentry maintains a large semi-finished crystal bank, along with complete correlation data to give you emergency service. If the emergency request is received by 10:00 a.m. CST, normally the order can be shipped in 24 to 48 hours. Regular shipping time is from 10 to 21 days.

To request the free *Guide* or to place an order, you can call toll free at 1-800-654-8850, or use TWX number 910-830-6425. Sentry's address is Crystal Park, Chickasha, Oklahoma 73018. Contact Jim Bennett, Sales Manager. □

New 1981 Radio Shack Catalog

Radio Shack's new 176-page 1981 catalog is now available free on request from more than 6,000 participating stores and dealers nationwide.

The catalog has 120 full-color pages and features the latest in everything electronic from computers and stereo components to toys and electronic games, parts and accessories for home entertainment, hobbyists and experimenters.

Among the products being offered for the first time are the TRS-80 Pocket Computer, the TRS-80 Color Computer and the TRS-80 Model III Desk Top computer; six new stereo receivers, two with digital quartz tuning; and five stereo cassette tape decks featuring Dolby noise reduction circuitry.

Radio Shack has also expanded its line with the addition of 12 new telephone products including a cordless handset telephone. In the area of home security, Radio Shack will offer the latest in home alarm systems. One microprocessor-controlled system enables homeowners to protect all openings without any wiring required.

The new catalog includes the company's world-famous TRS-80 line of microcomputers, Realistic stereo components, CB equipment, radios, tape recorders, 13 new electronic calculators, 6 digital clocks, 17 electronic games, Archer antennas, Micronta test instruments and ArcherKit and Science Fair hobby kits.

In addition, Radio Shack's catalog lists an extensive selection of specialized electronics items, tools, tubes, transistors, IC's, parts, plugs, cables and more. □

Missouri

The Jefferson Barracks Amateur Radio Club will hold their annual auction and hamfest on 31 March 1981, at the Electricians Hall, 5850 Elizabeth Ave., St. Louis, Missouri. Our attendance continues to grow each year and certainly 1981 will be no exception.

This event is well publicized all over the Midwest with our attendance representing three or four surrounding states. In addition, this is the first event of the season in this area. □

Nebraska

South Sioux City, Nebraska's 5th Annual Hamboree will be held on Saturday, 21 March 1981, at the Marina Inn. The event will be sponsored by the 3900 Club and the Sooland Repeater Association. Talk-in on 2 meters —

37/.97.

Doors will open at 9:00 a.m. There will be more than 7,500 square feet for exhibits and a flea market. Reserve 3 × 8 foot table for $2. Those wishing to make table reservations, contact Al Smith, W0PEX, 3529 Douglas Street, Sioux City, Iowa 51104.

Other features planned for the Hamboree are: two CW contests, more than 10 programs, including the QSL Bureau and ARRL Forum; commercial exhibitors; and old-time radio and amateur exhibits. Numerous booths run by various organizations will be set up. QST's Stuart Leland, W1JEC, Editor of "Hints and Kinks," will present two different programs. Prize drawings will be held all day — must be present to win.

John Daniels, WA0GQK, will be toastmaster at the dinner banquet, to be held at 6:00 p.m. Special programs and room for ladies.)

For more information, contact Dick Pitner, W0FZO, or Glen Holder, K0TFT. For advance tickets and motel reservations, contact Jerry Smith, W0DUN, P.O. Box 14, Akron, Iowa 51001. Advance registration including banquet is $10. At the door $12. Hamboree only (no dinner) $2.

Please get your reservations in as soon as possible. □

North Carolina

The 1981 Charlotte, North Carolina hamfest will be held 21-22 March 1981 at the Charlotte Civic Center. □

Ohio

The 3rd Annual Lake County Hamfest will be held Sunday, 29 March 1981, at Madison High School in Madison, Ohio. Featured will be commercial exhibits for Amateur Radio and computers, an inside flea market, excellent food and great prizes! A computer raffle drawing will be held at 3:00 p.m. Main prize drawing will be at 3:05 p.m. Winners need not be present to win. There will be door prize drawings hourly.

Admission fee is $2.50 in advance (send SASE before 14 March 1981); $3.50 at the gate. Display space is 85¢ per lineal foot, including tables, if desired. Table rent with reservation will hold space until 10:00 a.m.

There will be plenty of overnight accommodations available within a 15-minute drive of the fest, for out-of-town exhibitors.

Talk-in on 147.81/21. Check-in on 146.52/52. Check-in cut-off is at noon; check-in drawing is at 1:30 p.m.

For further details, call (216) 953-9784, or write: Lake County Hamfest Committee, 5555 Anaconda Road, Mentor, Ohio 44060. □

Wisconsin swapfest

The 9th Annual Madison, Wisconsin swapfest will be held on Sunday, 5 April 1981 at the Dane County Expo Center Forum Building in Madison. The event is being sponsored by the Madison Area Repeater Association, WR9ABT.

Exhibitors and table purchasers will be admitted at 8:00 a.m. — one hour prior to general opening time of 9:00 a.m. Attractive booths will be provided with colorful drapery and upholstered chairs.

Other features include free movies, an all-you-can-eat pancake breakfast and a beef barbecue luncheon. Admission is $2.50 in advance, $3 at the door (children 12 and under are free). Tables are $4 in advance, $5 at the door. Reserve early — there was a sell-out last year! Booth prices are $80 for 16-by-8 feet deep (includes two tables); $95 for 24-by-8 feet (includes three tables and one rear storage table).

For information on exhibitor booths, contact MARA, Box 3403, Madison, WI 53704. Ticket and table reservations will be confirmed by return mail. Reservations not accepted after 5 April 1980. □

Antennas

(*continued from page 45*)

Moral of the story: if you go to the pet shop and buy a Chihuahua it ain't going to get to ride in the back seat of the police car.

Guy I know runs a radio store. (Honest, some of my best friends run radio stores.) Guy tells me (his name is Guy) that Harry Ham comes in the store and says the neighborhood he's moved into is so ritzy, they don't allow antennas of any kind. Harry is looking for an 80-meter antenna that will really get out but that can't be seen. (Guy tells him about putting a tooth under his pillow.)

If anyone comes up with such antenna, please let me in on the deal for however much you want for 1 percent of the action. I don't care if you call it the Chewy Nougat antenna. Our follow-up product can be the anti-gravity machine.

There is also a Plak antenna. (I thought that was what you got it you didn't brush your teeth.) They are good for antennas, not wrapping around your yo-yo.

Old-timers should not laugh at Ned and Harry. A long time ago, the books all showed aerials running from the house to a tree in the backyard. Some thought you could not have an aerial without a tree because it was the tree that radiated. Big funny! Now the U.S. Army says trees can radiate! They also say the volunteer army is successful. So much for radiating trees.

Where were we? Oh, yes — an exclusive neighborhood where antennas now allowed. My 811-A bleeds for him. The area I live in? They invite amateurs to move in. The way this place looks, the antennas are an improvement!

(Curt Sterba is obviously a nom de plume. Curt said his true identity had to be protected as he works with a lot of hams. He doesn't want them coming up to him and saying, "I know more about antennas than you do." Such may be true but he comes cheap.) □

Anyone familiar with pacemakers vs. RF? If so, kindly write to **Worldradio.** People are inquiring!

ADVERTISERS' INDEX

CONTESTS

Happy 40th!

The Edison Radio Amateur's Association (ERAA), WA8SVA, of southeastern Michigan will host a QSO party to commemorate ERAA's 40th anniversary. Operations will begin 1400Z on 14 March 1981 and will end 0200Z, 15 March 1981 (0900 to 2100 EST, 14 March).

Those wishing to participate should exchange signal report and state with the ERAA QSO party group. Phone operation only; suggested frequencies (MHZ) — 3.930 7.240 14.300 21.400 28.800 146.52 simplex and 144.73/145.33 (ERAA repeater).

The ERAA QSO party group will be operating from Thomas Edison's first power station, Station A, in the historic Greenfield Village, Dearborne, Michigan. QSO via WA8SVA, 12806 Royal Grand, Detroit, MI 48239.

Participants will receive a certificate by enclosing a business sized SASE. □

Tennessee QSO Party

The 11th Annual QSO Party, sponsored by the Tennessee Council of ARC, will be held Saturday, 21 March 1981, 2100Z to 0500Z Sunday 22 March, and from 1400Z to 2200Z on 22 March.

Exchange: Tennessee stations give signal report and county. Out-of-state send signal report and state, province or country. You may work same station on different bands, modes or counties.

Scoring: Phone — 1 point per contact; CW — 2 points on 80, 1½ on other bands. Combine phone and CW score as one contest. Out-of-state stations (QSO points times different counties in Tennessee); Tennessee stations (QSO points times sum of following (different states plus Tennessee counties plus VE VO provinces).

Frequencies: CW approximately 50 from bottom each band. Phone: 3980 7280 14280 21380 28580. Novices within their bands.

Miscellaneous: Repeater contacts not allowed. Mobiles compete against mobiles. Portables against portables. Single transmitter entries only. No county line operation for multiple contacts. Portable stations must set up per field day rules. Phone stations call CW TN QSO Party; CW call CQ TN. Bonus points-200 to each county outside of home county minimum of 10 contacts in each county to qualify. Power bonus — multiplier of 1.5 for all stations operating at 200 watts DC or less — must remain on high or low power entire contest. No list operation permitted.

Logs: Date/Time in GMT, station worked, band, mode, exchange and score. Use separate log sheet for each band over 50 contacts and must submit cross check sheet similar to ARRL check sheet CD77, if work over 200. Logs must be legible to avoid disqualification.

Awards: Plaque to Tennessee winner, Tennessee mobile, portable and out-of-state winner. Certificates with complete contest summary to every station sending in log with at least 15 contacts.

Deadline: 1 May 1981. Send business size addressed envelope with your log to Dave Goggio, W4OGG, 1419 Favell Dr., Memphis, TN 38116. □

Wisconsin QSO Party

The 1981 Wisconsin QSO Party will be held Sunday, 5 April from 1800Z to 0200Z 6 April. Stations may be worked once per mode on each band. Mobiles may be worked again when changing counties.

Wisconsin stations send RST and county; others send RST and state/province or country. Score 2 QSO points for CW and 1 QSO point for Phone contacts. Multiplier is counties + states & provinces + countries. Final score is QSO points × multiplier. No repeater QSOs. Suggested frequencies: 3550, 3990, 7050, 7290, 14050 and 14290 kHz.

Send results showing time, mode, call, RST and section. Please indicate any Wisconsin club affiliation. Send to West Allis Radio Amateur Club, P.O. Box 1072, Milwaukee, Wisconsin 53201. All logs must be postmarked before 1 May 1981. □

ABOUT YOUR SUBSCRIPTION

When does it expire?
Printed on your address label in the upper right-hand corner is a 4-digit number, such as 0281. This tells you that the last issue of your subscription is February, or the second month of 1981.

Why does my renewal notice come so early?
Advance planning is essential in producing a periodical. We have to plan for the time the issue will be in the mail, the time it takes to get ready to mail, and also the time it takes to process new subscriptions and renewal information at the computer house. If you wish uninterrupted service, we need to have your renewal instructions at least six weeks prior to the beginning of the month in which your subscription expires.

How can I ensure that my renewal will be added to my present subscription?
By making sure your include your subscriber number, the 6-digit number that precedes your expiration date, in all correspondence about your subscription. It enables us to service you better.

THE MART

Buy
Sell
Trade
Inform

CLASSIFIEDS

Private individuals, 8 cents a word.
Business firms, 15 cents a word
The MART — *Worldradio*
2120 28th Street, Sacramento, CA 95818

Worldradio on cassettes — Worldradio for blind amateurs on cassettes. To receive this free service send $3.00 (one-time only contribution for tapes) with your name, address and call to George Hickin, W4GH, Box 7453, Macon, GA 31209.

Auto-Call keeps up with the latest ham info from Washington, DC. Subscription $4.50 a year, sample copies 50 cents. Address: Auto-Call, 7223 Wickford Drive, Alexandria, VA 22310.

INTRODUCING: Beautiful natural full color photo QSL cards, made from your color negative or slide. From $224.00 for 3,000 cards minimum. Free samples, stamps appreciated. K2RPZ, Box 412, Dept. NCW, Rocky Point, NY 11778, (516) 744-6260.

SSTV: Robot 70A monitor and 80A camera with macro lens. All manuals included. Excellent. $400 postpaid. Steve Carlozzi, KA1BIN, 40 Market St. Brockton, MA 02401.

ELECTRONIC CMOS KEYER $14.95 kit (PCB & Parts), $19.95 assembled and tested. Include $1.50 postage. Send for free information. DGM ELECTRONICS, INC. 787w Briar Lane, Beloit, WI 53511 (608) 362-0410.

EIMAC 4-1000A, SPECIAL PRICE! Sub/extra heavy duty, 2KW+, only $59.95 — limited quantity. Tested and guaranteed to run legal limit, used tubes, draw about 5 amps more than 4-1000A, most all transmitters will handle easily. Cash, check, MO, or COD. Add $5 shipping & handling. **Bob (I pay cash for tubes) Chase. 4131 Phoenix Street, Concord, CA 94521.** (415) 689-8228.

Reconditioned Test Equipment. $1.00 for catalog. Walters, 2697 Nickel, San Pablo, CA 94806.

SELL/TRADE: DRAKE MSR-1 Communications Receiver, Hal 2010 Keyboard, 4-1000 A, Test Equipment. SASE for large list. George Churpek, 839 Cambon Circle, Ojai, Calif 93023. Tel (805) 646-5296.

Editing a club paper? Need one for your club? Interested in Amateur Radio public relations? Need some help? Amateur Radio News Service would like to hear from you. For info write Fran Norrick, WB9WPS, Route 6, Box 239, Kankakee, IL 60901.

Rubber stamps fast — 3 lines or 1" call only $3.00. W6LXW, 905 Pine Tree Lane, Aptos, CA 95003.

Subscribe to the *DXers Magazine* Gus Browning, W4BPD, editor. Only $13.00 per year. The DXers Magazine, Drawer DX, Cordova, SC 29039.

Mobile ignition shielding provides more range with no noise. Available most engines in assembled or kit forms, plus many other suppression accessories. Free literature. Estes Engineering, 930 Marine Drive, Port Angeles, WA 98362.

TELETYPWRITER gears, ribbons, manuals, parts, supplies and toroids. SASE list. Buy all unused parts, late machines. TYPETRONICS, Box 8873, Ft. Lauderdale, FL 33310 W4NYF.

Collect stamps? Write for our latest mail auction catalogue. Is there an old stamp collection in your attic? Send it for my fair offer. Old Dominion Stamp Sales, Inc., Phil Sager, WB4FDT, 380 Maple Avenue West, Vienna, VA 22180, (703) 938-5959.

Distinctive QSLs — Largest selection, lowest prices, top quality photo and completely customized cards. Make your QSLs truly unique at the same cost as a standard card, and get a better return rate! Free samples, catalogue. Stamps appreciated. Stu, K2RPZ, Box 412, Rocky Point, NY 11778. (516) 744-6260.

Free QSL samples — Stamp appreciated. SAMCARDS, 48 Monte Carlo Dr., Pittsburgh, PA 15239.

Burglars beware — Make your own Auto Protection System. Send $3 for booklet of five easy circuits. Use junk-box or new parts. Omni Enterprises, PO Box 2572, Muscle Shoals, AL 35660.

Need help for your Novice or General ticket? Complete recorded audio-visual theory instruction. Easy, no electronic background necessary. Write for free information. Amateur License, PO Box 6015, Norfolk, VA 23508.

QSL CARDS: $14.95 per thousand. SASE for samples. A1 QSL, 1310 A Ave M Plano, Texas 75074.

We have something different in a code prac-

ce tape for you. Our tape is composed of 00 *high frequency words* which constitute ne-half (50%) of all writing. Why practice ith low frequency words which you seldom se, or with code groups which you never se? Practice with the words you use one-half f the time. For information write to El Don nterprises, PO Box 3404, Redondo Beach, A 90277.

QSLs by W6BA — "Customized" $17.50 per 00. Star Route 2, Box 241, 29 Palms, CA 2277.

UYING OR SELLING? An ad in Worldradio makes it happen FASTER.

Generalize yourself the easy way! Revolu-onary new word method to learn radio code y Russ Farnsworth. No books to read, no isual gimmicks to distract you — just listen nd learn! Based on modern psychological echniques. This course will take you beyond 3 wpm in *less than half the time!* Album ontains three 12" LPs, 2½ hours of instruc-on — $9.95; cassette — $10.95. CA add tax. 1C and VISA. DANA, PO Box 161723, acramento, CA 95816.

Amateur Radio Station belt buckles, western yle, brass finished — $12 includes calli graving. Hi-quality 60-min. code practice assettes: 0-5 wpm, 5-13 wpm, 13-15 wpm, 0-22 wpm, 25-30 wpm, 30-35 wpm — $3 ach, 4/$10. Royal, PO 2174, Sandusky, OH 4870.

AUTOPATCH — now receive or place elephone calls through your Amateur Radio ncoded mobile, either manually or com-letely automatic. Commercial grade 2-Tel-2 terconnect with complete instructions, SER NET $539 . . . OUR PRICE $295. end check or money order to Electronic Ser-ce, Inc., Box 128, Mansfield, IL 61854, or se VISA or Mastercharge. (217) 489-3241. his offer is limited to present stock only . . . Ve also have acoustically-coupled encoders or $95.

Wrightapes. Code practice. Greatest selec-on. Three to 40 wpm. On quality Scotch 3M 0-minute cassettes. Still only $2.95 each ostpaid. Thousands of satisfied customers. ostcard brings details. Wrightapes, 235 E. ackson St., Lansing, MI 48906.

S QSL Service — A DOMESTIC QSL UREAU — Incoming and outgoing for US d Canada QSLs only. 25¢ per 20 outgoing. ASE claims your incoming FREE. USQS, O Box 814, Mulino, OR 97042.

est equipment repair, calibration — ex-erienced, reasonable. R. Hall, W6BSH, 81 Taper Ct., San Jose, CA 95122, (408) 2-6000.

SL CARDS — $10/500. Free 400 — il-stration catalogue. Bowman, 743 Harvard, Louis MO 63130.

ustom embroidered emblems, your design, w minimum. Free booklet design hints and ide. Emblems, Dept. 87, Littleton, New ampshire 03561.

Wanted ... tubes: Super high power microwave or anything strange. Pay cash or trade. WA6LHR, (415) 530-8840.

Build Antenna Tuner from brand new ARC-5 transmitters. Conversion data included. $18.95. Send for Gov't Surplus Catalog, 50¢. G & G Radio 45W Warren St. New York, NY 10007.

STOP LOOKING for a good deal on Amateur Radio equipment — you've found it here — at your Amateur Radio headquarters in the heart of the Midwest. Now more than ever, where you buy is as important as what you buy! We are factory-authorized dealers for Kenwood, Drake, Yaesu, Collins, Wilson, Ten-Tec, ICOM, Dentron, Hewlett-Packard Calculators and HP-85 Computers, MFJ, Tempo, Regency, Hy-Gain, Mosley, Alpha, CushCraft, Swan and many more. Write or call us today for our low quote and try our personal and friendly Hoosier service. HOOSIER ELECTRONICS, P.O. Box 2001, Terre Haute, IN 47802 (812) 238-1456.

Learn code the easy W6PHA way! — Former USAF code champ gives unique, simple system allowing all ages to learn quickly. Booklet, $4.00 ppd. $2.00 discount coupon and information with booklet for GLOBALMAN Lifetime hand keys, chromed, non-slip with transparent dust cover, $19.95; code practice oscillators, batteries installed, $7.00; electronic keyers. 100% money back guarantee! You can't lose! New back-dated Amateur magazines, $1.00 each plus postage. Request dates list. GLOBAL AMERICA, Box 400WR, El Toro, Calif. 92630.

CODE PROFICIENCY DRILLS are transmitted from WB3IVO, Brass Pounders ARC, each Saturday and Sunday starting 2000 GMT on 7060 kHz, and each Saturday and Tuesday starting at 0200 GMT on 3560 kHz. Speed ranges from 20-60 wpm.

25% discount on all teletype equipment. SASE for list. Machines reperf's, TD's, perf's, cabt's, tables, winders, modems etc. Goodman, 5454 South Shore Chicago, IL 60615. (312) 753-8342.

MACK'S TUBES. $1.26 per tube, new or used. Guaranteed 90 days. "Old" radio types, too, at special prices. 5 tubes or more, 10% discount. With order add $2.00 postage and handling. No C.O.D. Send SASE for list. 2565 Portola Dr., Ste 4, Santa Cruz, CA 95062.

DXers — Get new DX tables computed for your exact QTH — all DX prefixes, beam headings, reverse headings, distances, time differences, U.S. cities, country/prefix listings, QSL checklists. Send call sign, $3.00 to Willcomp, Inc., PO Box 86, South Salem, NY 10590.

ATTENTION ICOM, KENWOOD OWNERS! If you're not receiving our monthly NEWSLETTERS your equipment is not tuned into a wealth of information! Details S.A.S.E. USERS' INTERNATIONAL RADIO CLUBS, 606 BRACK ROAD, FORT PIERCE, FL 33450.

ROHN TOWER — Buy direct from worldwide distributor of all Rohn products. Sample prices — 25G sections $38.72 each, 45G sections $88.00 each, FK2548 foldover tower with freight paid $693.00, BX48 free standing $218.90. Hill Radio, Box 1405, Bloomington, IL 61701, 309-663-2141.

SERVICE your own radio gear without expensive test equipment. Save money and shipping hassles. Still only $8.70 postpaid. **CLUB DISCOUNTS.** "Owner Repair of Radio Equipment" book to use in conjunction with your present equipment manuals. Order from K6RQ, 14910 LG Blvd., Los Gatos, CA 95030.

TR2400 OWNERS' Mobile Adaptor. Save your nicads for portable operation. EZ mod. Adaptor $19.95 ppd. Telstar Ent., East 16109 Longfellow, Spokane, WA 99216.

Scanning disc televisions or parts wanted by collector. Bill Russell, 6463½ Fulton Ave, Van Nuys, CA 91401.

The SOCIETY OF WIRELESS PIONEERS, Inc., invites all professional operators, active or retired, military or commercial, to join the world's largest organization of its kind. Many active nets. Write Box 530, Santa Rosa, CA 95402 for details or send $1 to pay postage on sample SPARKS JOURNAL.

STATION CERTIFICATE — display your hand-lettered name, call & amateur awards with this striking Amateur Radio Station Certificate. Black Olde English lettering on parchment-type paper makes this 10"-14" certificate an impressive addition to your shack. Certificate ready to frame — $4.75 ppd. Send name, call, & awards list to Susquehanna Amateur Radio Society, PO Box 326, Montoursville, PA 17754.

REPLACE RUSTED ANTENNA BOLTS with stainless steel. Small quantities, FREE Catalog. Elwick, Dept. 401, 230 Woods Lane, Somerdale, NJ 08083.

EMBROIDERED EMBLEMS, customer designed club pins, medallions, trophies, ribbons. Highest quality, fastest delivery, lowest prices anywhere! Free info: NDI, Box 6665 L, Marietta, GA 30065.

Beautiful redwood plaques (6" × 16"). Specify lettering (max. 6). Engraved — $9.95, raised plastic — $8.95. Save . . . order any 2 for $12.95. Anthony Vitolo, 1967 Tanglewood Dr., Snellville, GA 30278.

WANTED: TV sets built before 1956 and old TV GUIDES (1948-68). W3CRH, Box 90-W, Rockville, MD 20850, (301) 654-1876.

CERTIFICATE FOR PROVEN TWO-WAY RADIO CONTACTS with amateurs in all 10 USA call areas. Award suitable to frame and proven achievements added on request. Send $2 (USA) or $3 (DX) to cover certificate cost. W6LS, 2814 Empire Ave., Burbank, CA 91504.

Wrightapes. Good news. You can still get Wrightapes at $2.95 postpaid, but our first price increase since 1976 becomes effective April 1, 1981. You will still get the same high quality tapes and instant service. Try us. You will see why over 30% of our customers order more than once, and why many tell us that Wrightapes are the best. After March the price is $3.95. Wrightapes, 235 E. Jackson St., Lansing, MI 48906.

COAX CONNECTORS: SO-239 and PL-259. Brand new. 10 for $6.50. LC Electronics, 10338 Sageplum, Houston, TX 77089.

MICROWAVE TV downconverters, preamps parabolic dish antennas, remote tuning. Covers 2000 MHz band. Write for information. LAB-TRONICS, INC., Box 171, Rogers, MN 55374.

NOTICE — Our unique product can be used by anyone, anywhere at anytime. Curious send a large SASE for free details. Ed Narwid, 61 Bellot Road, Ringwood, NJ 07456.

Learn the code — a course for family members and friends who don't know the difference between a dot or a dash: Monday-Friday, 0630-0700 Pacific local time, ±3780 kHz, A2/A3/LSB, March-April-May, September-October-November. K6RAU. Starts first Monday of each month.

RTTY JOURNAL, international news and information on RTTY. Ten issues per year $5.00. Outside USA please send SASE for rates. RTTY Journal, PO Box RY, Cardiff, CA 92007.

QSLS. QUALITY AND FAST SERVICE FOR 21 YEARS. Include call for free decal. Samples 50¢. Ray, K7HLR, Box 331, Clearfield, UT 84015.

Beginners' RTTY Handbook still only $4.50. Bibliography of RTTY articles $1.00, both plus large SASE (41¢ stamp). RTTY JOURNAL, POB RY, Cardiff-by-the-Sea, CA 92007.

MIRROR IN-THE-LID, and other pre-1946 television sets, picture tubes, parts, magazines wanted for substantial cash. Especially interested in any RCA "TRK", G.E. "HM", or Westinghouse "WRT" series set. Arnold Chase, 9 Rushleigh Road, West Hartford, CT 06117. (203) 521-5280.

Standoff brackets — assorted styles. Clamp to towers, screw to side of house, etc. Perfect for Ringo Rangers. Also custom made to solve your problems. Info — Box 9, Oaklawn, IL 60454. WD9IIX.

"TOP SECRET" REGISTRY of the U.S. Government radio frequencies (25 to 470 MHz), by K2AES. Expanded Third Edition lists 15,000 frequencies used by FCC, FBI, Border Patrol, Immigration, ATF, Treasury, Secret Service, NASA, FAA, military, etc. 400 call signs now listed. Only book of its kind! $5.95 from CRB Research, Box 56-WR, Commack, NY 11725.

Picture QSLs made from your photo-slides. 250 B/W $21.00. Single 1,000 full color $70.00. Subject to discount. Write for samples & prices. Picture Cards, Box 5471, Amarillo, TX 79107. (806) 383-8347.

WHOLESALE MICRO-80 CASSETTES!!!!100% error-free, fully guaranteed! The #1 choice of serious programmers, leading software firms and numerous recording studios nationwide. Sold in lots of 24 each: C-10 59¢; C-20 79¢; C-30 94¢; C-60 $1.24; Add $1.50 shipping. See our product review in August **Worldradio.** MICRO-80 INC., W-2665 Busby Road, Oak Harbor, WA 98277.

TRS-80 16K MODEL III, $859.00!!!! Regularly $999.00 — 32K Expansion Interface, Regularly $549, now only $369.00. No COD. MICRO-80 INC., W-2665 Busby Road, Oak Harbor, WA 98277.

FREE SAMPLE! INSIDER HAM/COMPUTER HOBBYIST NEWSLETTER Published every two weeks. Also 4-line Rubber Stamps with ARRL emblem $3.95. THE W5YI REPORT; PO Box #10101; Dallas, TX 75207.

WIRING DIAGRAMS, PARTS LISTS, alignment instr. or complete instruction books for used ham gear; antennas. SASE for list. W6HVN, Box 833, Altaville, CA 95221.

WANTED — GAVIN SIX-METER TUNEABLE low pass filter. W8FDN, 371 Claymore, Cleveland, OH 44143.

Wanted: Motorola S1059A portable test set with manual. K4VDT, Roy Barnett, 5552 12th Ave., South Birmingham, AL 35222.

NEW ROHN FK 25-58 Foldover Tower, thrust bearing, rotor plate, $650. WB8WBW 1610 Reynolds Road, #294, Lakeland, FL 33801. (813) 665-3023.No collect calls, please.

ANNOUNCING: A New Ham Radio Recognition and Reference Volume. "WHO'S WHO IN AMATEUR RADIO". Details SASE. Users International Radio Clubs, 606 Brack Rd., Ft. Pierce, FL 33450.

COMPUTER, brand new, TI 99/4 by Texas Instruments, with color monitor, $800. (714) 659-3825.

Wanted: 4-400A tubes. Must be reasonable; will trade gear or cash. W7RBF 2523 West Orangewood Ave., Phoenix, AZ 85021.

QUALITY QSLs PRINTED — Specials: 300 — $5; 500 — $9. White & Colored! Include 20% ship. Samples — 30¢; D. TESTA, Box 9064-W, Newark, NJ 07104.

SAVE SAVE up to 50% on your electric bill. Proven publication shows how. Satisfaction guaranteed. Send $5.98 shipped First Class to NARWID ELECTRONICS 61 Bellot Road, Ringwood NJ 07456.

WANTED: COLLINS X455KQ-200HZ FILTER. Will trade ICOM 215 two-meter rig. Joh, 227 Las Miradas Drive, Los Gatos, CA 95030. (408) 356-5949.

FOR SALE: AX-190 rcvr., mint with matching speaker, operation and service manuals — $160. HO-10 scope, clean — $55. Radiola III with matching amp. Original as new, no tubes — both $125. Leon Stetzler, RD 2, Box 137-S, Hamburg, PA 19526. (215) 562-2973.

VIDEO SPECIALS! Magnavox video disc, $599. RCA portable VCR, $699. Hitachi color zoom TV camera, $549. Sony projection TV, $1799. Much more! J.V. Electronics "The Video Specialists", 7 Plane St., Stanhope, NJ 07874. Phone evenings — (201) 347-3206.

SELL/TRADE: KLM-1 w/manuals, P/S, case and HB control Box — $180. Johnson MSG III w/AC — $35, and Ampenhol Mod 675 — $25. Want 2-mtr 10W transceiver. W7MAF. CBA OK.

COLLECTORS. Hallicrafter's SX-28 'Super Skyrider' receiver. Very good condition, original manual. $150 or best offer. N6DJR, Rt #1, Box 330, Morgan Hill, CA 95037.

FOR SALE: TEKTRONICS 545 DUAL TRACE 30 MHZ SCOPE WITH C.A. head. Synch modified by Tek. to 585 standards, $400; Tek. low-level differential head for above, useable to microvolt level, $180. Both in excellent condx. with manuals. Will ship. (714) 481-8469.

Heathkit HW104 Xcvr. w/ps, spkr. 100W PEP, D104 mike, MFJ 10-20M pre-amp manuals. Excellent condition. All — $425. Bill, KA4FLS, Rt. 5, B482, Asheville, NC 28803. (704) 684-6019.

Atlas RX-110 80-10M receiver $150.; Icom IC3PE 13.8VDC 3 Amp power supply $35.; Icom mobile mount $10. New; Drake touchtone mic 1525EM $30. New; Drake SPR4 XTAL sets MARS $20., CB $5. TROPO BC $10. New; Drake SPR4/FS4 split freq. adapt #1524 $5. New; Harper Accusplit III digital electronic stopwatch $50.; Drake MN-7 ant. matcher w/balun $125.; Solfan Guardian Microwave motion detector $150. New; Grundig TR-807 Solid State Shortwave eleven band LW, MW, SW, H & L VHF, AIRCRAFT, AM, FM BC $150.; Burroughs LSI/IC desk calculator, tape readout EA2000/EA2101 $150.; ANTIQUE Grebe MU-1 Synchrophase radio receiver Serial ZHWY, original, intact, w/01A tubes and schematic $500./offer. W6HVN PO Box 833, Altaville, CA 95221.

QSLs & Rubber Stamps — Top Quality! Card samples and stamp info — 50¢ — Ebbert Graphics, Dept. 1, Box 70, Westerville, OH 43081.

YAESU FT-301, analog dial 200 watts, 12 crystal positions, with matching dual meter FC-301 antenna tuner. (mint). Make offer. John Stevenson, Box 5562, Redwood City, CA 94063.

For Sale: Collins 75S-3B receiver, 32S-3 transmitter, 312B-4 station control, 516F-2 power supply, DX engineering speech processor and a beautiful custom-made desk for all of the above equipment. Price: $1300.00. Jack Chapman, W6DQE, (213) 767-4422.

SELL: HEATH SB-201 (new) — $325. Century 21 plus calibrator — $225. Curtis EK-420 keyer — $50. Shure 444 — $25. Low-Pass filters, SWR bridges, etc. All mint. N6DW, (Dale), (415) 685-7364, Concord, CA.

Using a vertical? Buying one? Then order "Vertical Users: Novice to Extra" — a book praised by **Butternut, Hustler, Worldradio, 73, Ham Radio Horizons** and Bill Orr. $3.95 plus $1 postage/handling. Danrick Enterprises, 213 Dayton Ave., Clifton, NJ 07011.

Cruise with other amateurs for 2 glorious weeks on a real love boat. The British-registered Island Princess sails March 14 from San Juan through the Panama Canal. Act now!!! Call Nancy at Travel Network, (415) 941-4360.

New and never used — Kenwood TL922A Linear Amplifier — Sacrifice $900.00. (415) 349-9390. San Mateo, CA.

ANTIQUE MICROPHONE LIGHTER: From the 40s. MINT, IN ORIGINAL BOX. $47.50 PP. Limited supply. K6UDG, PO Box 6154. Torrance, CA 90504.

ESTATE SALE — Johnson Ranger II, $80, Johnson 6N2, $30, both $100. Yaesu FT-224 2M-FM transceiver with all accessories, $235. Model 28ASR fully equipped, $600. Model 28 KTR reperforator, $60. Beckman Frequency Counter, $35. Gonset Comm IV & VFO, $65. All gear mint with manuals plus shipping. Much more. Send SASE for list. Glenn Malme, 9337 Gotham St, Downey, CA 90241. (213) 869-3292 eves.

Collins-312 B-4 Station consol — speaker — directional watt meter — phone patch. $175.00 Lattin antenna — new — all band $35.00. Ted Brix 5573 No. Van Ness Blvd., Fresno, CA 93711.

HY-GAIN TH3-MK2 — $85; 205BA — $150; 155BA — $100; 105BA — $85 (all in excellent condition). ASTATIC D-104 new — $24. Henry 2KD-3 (desktop/floor version of 2K-3) 2KW 80-10m. linear (pr. 3-500Z's) mint condition — $850. 50' lengths of new surplus 3/16" stranded stainless — $7.50 each or $70 for 10. Derek, KI6O, (916) 366-3892 days or msg. (916) 965-4904 eves. Sacramento, CA.

WANTED: Johnson Viking Ranger or Ranger II and National NC300 or NC303. Must be very clean with no mods. Also want clean Navy WWII bug (looks like Vibraplex with black base). Derek, KI6O, (916) 366-3892 days or msg. (916) 965-4904 eves. Sacramento, CA.

Obsolete miniature and octal glass tubes, $1.25 each. 1¼ and 3 amp. Variacs, $8 and $15 each. Other old-time items. SASE. W2FPL, RD1, Box 265, Bishopville, MD 21813.

WYOMING AND UTAH RANCH LAND. Wild horses, antelope, deer. Near paved road. 10 acres — $60 down, $60/month. FREE information, maps, photographs. (Offer void in Calif.) Will trade equity for ham gear, home computer, test equipment, etc. Owner — Dr. Michael Gauthier, K6ICS, 9550 W. Gallatin Road, Downey, CA 90240.

NEW SUPER-LOG II machine language program for TRS-80 Model I & Model III Computers. Whether you're a rag-chewer, contester, DXer or award hunter, SUPER-LOG II will overwhelm you with "Lightning Search & Sort" capability — the absolute ultimate in computerized logkeeping! Instant recall of typical logbook information at your fingertips. Cassette based. Regularly $19.95, Special Offer $16.95 plus FREE Contest program, SUPER-DUPER II. Complete disk version, add $8.00. MICRO-80 INC. W-2665 Busby Road, Oak Harbor, WA 98277.

MC-50 MICROPHONE DX — pileup voice accentuater — $9.95. KD7X 405 Whittier, Silverton, OR 97381.

Atlas 350X1, DD6 Readout, VFO 350, PS350, Mobile mount. System in excellent condition — $859. AE5E Bill — 713-898-1743.

EMPLOYMENT

Classified ads for jobs wanted or positions offered will be run free of charge in Worldradio's MART.

WORK WANTED — Subcontractor, electronics and electronic assembly. Post Office Box 708, East Hampton, NY 11937.

CHIEF ENGINEER: Are you waiting for someone to retire so you can move up to Chief? Join us now and be responsible for 24-hour AM, 100 KW FM, with aggressive ownership dedicated to quality engineering. Candidate should possess First Class Radiotelephone ticket, have working knowledge of state-of-the-art circuitry. Offices, studios, transmitters and tower all in park-like setting in town of 30,000 on banks of Mississippi River. Present Chief with health problems retiring from active engineering and will show you the ropes. Salary open . . . Good benefits, super staff! Resume to John Weir, KBUR/KGRS, Box 70, Burlington, IA 52601.

JOB WANTED as Video Manager, 32 years electronics and communications experience, 6 years producing in house television programs. Can do anything and everything in the video field. Masters in Instructional Technology. FCC 1st and much more. Practice "ideal leadership style". Not gamesman. Frank Jerome, W5AT, 90 Holoway, Midwest City, OK 73110. (405) 732-7878 after 4 PM — anytime weekends.

ELECTRONIC TECHNICIAN WANTED to maintain and repair educational audio visual equipment — movie projectors — cassette players — TV cable head — TV cameras — monitors — clock system — language labs etc. Submit resume or SF171 or similar form. Apply to: TELEVISION STUDIO — LEARNING RESOURCES 6420 S.E. 15th Street, Midwest City, OK 73110. (405) 733-7541, 7-4 CST. Salary and job are open. Imposters and phoneys need not apply. FCC 1st desired. Must read and write.

INSTRUCTIONAL TECHNOLOGIST WANTED to operate in-house television studio and supervise media center. Skilled in all work areas-maintenance-operations-budgeting-supervision-scriptwriting-course design. Send resume or SF171 or similar form to: TELEVISION STUDIO — LEARNING RESOURCES, 6420 S.E. 15th Street, Midwest City, OK 73110. Master's degree preferred. (405) 733-7541.

VIDEO TECHNICIAN WANTED. Great opportunity with bright future if willing to work hard. Experience with SONY camera, Umatic and Betamax players and recorders. Apply to Smut Smith, 119 Northwest 23rd Street, Oklahoma City, OK 73103. (405) 521-8282. Must pass electronic technician test.

Sales Manager: 2-way communications company in the Denver area needs manager for overall operations of sales division. Minimum of two years' experience in communications equipment sales required. Excellent salary plus commission and benefit package. Resume preferred. Mile-Hi Communications, 1970 S. Navajo, Denver, CO 80223. (303) 936-7108.

CAMP COUNSELOR — Over 20 preferred with General or Extra Class ticket. Boys camp in Maine. July/August. Exc. salary & ben. Allowance to bring own rig. Write: Box 178 Carle Place, N.Y. 11514.

A classified ad placed in Worldradio will reach the most active Amateur Radio operators. Your ad will be seen here before it will be seen in any other Amateur Radio publication. We get the news out first. Get results fro

Worldradio