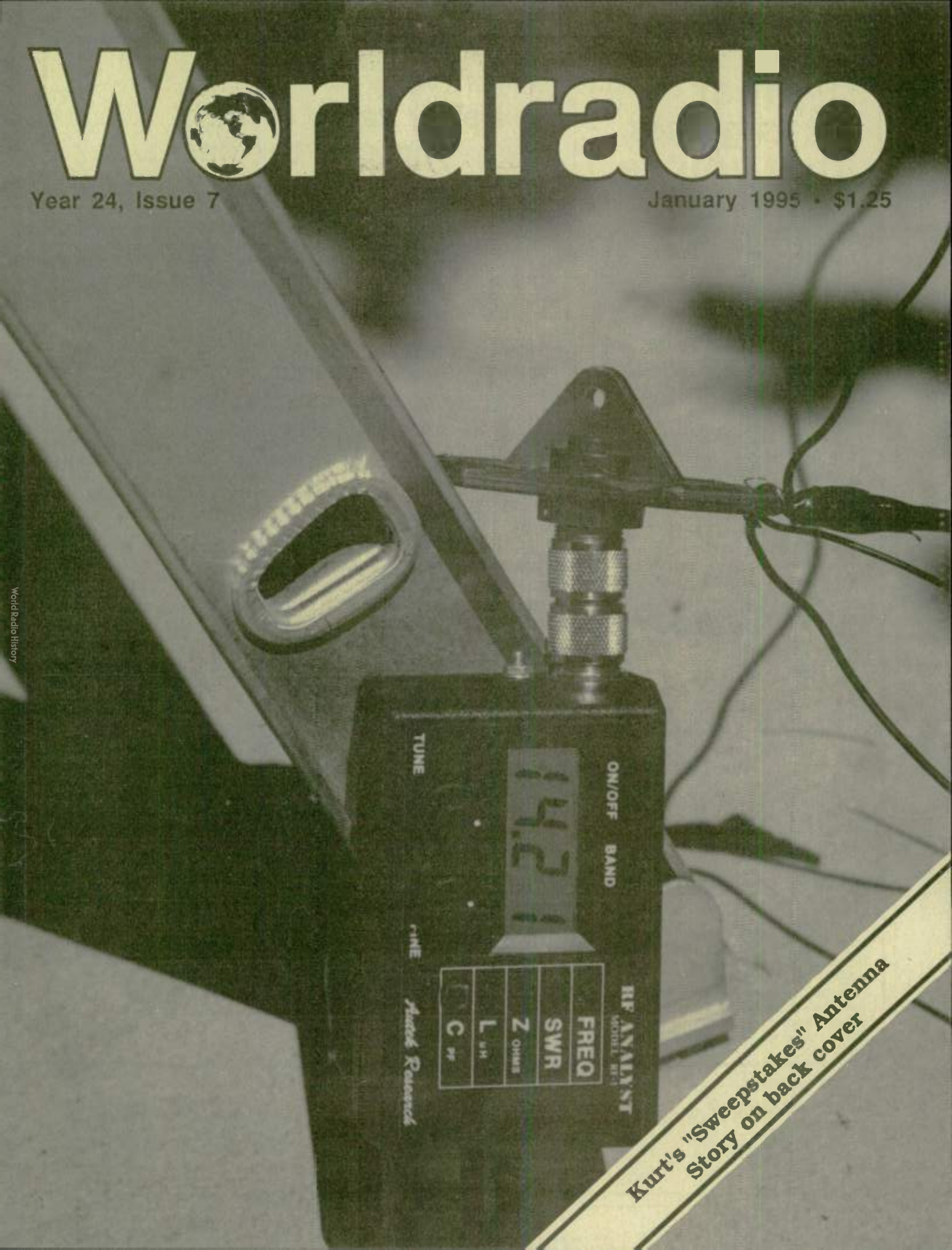
Worldradio

Year 24, Issue 7

January 1995 • $1.25



Kurt's "Sweepstakes" Antenna
Story on back cover

Hear signals that you've never heard before

with the Landwehr masthead amplifier

- ★ Negligible losses on transmit, the SWR is ≤ 1.1:1, with a 50 Ohm load at input.
- ★ Professional HF-VOX and PTT for short switching time between receive and transmit.
- ★ Because of the matched 50 Ohm output, a modern receiver with a GaAsFET-input-transistor will not oscillate.
- ★ VOX operation is possible up to 150 Watts PEP.

Available for 145 MHz, 220 MHz and 432 MHz

Specifications	145 MHZ	432 MHZ
Freq. Range	144-148 MHz	430-450 MHz
Noise Figure	F < 0.7 db	F < 1,1 db
N GAS xxx MA	typ. 0,6 db	typ. 0,9 db
Gain.....	18-20 db	17-19 db
Max. Switchable Power (PEP) VOC Operation...	150 Watt	150 Watt
Max. Transfer Power (PEP) PTT Operation	750 Watt	350 Watt
Connector....	Type N	Type N

The Landwehr masthead preamplifier, available only from Henry Radio.

. . .in fact, we have it all! We are OSCAR Henry Radio leads the way. Let us answer your questions and help you with your needs. Give us a call — ask for Jack (KK6OH)

Henry Radio offers more of the best...

We stock the premier brands in amateur radio. We also manufacture a top quality line of high power linear amplifiers for amateur use, two way business, military and government systems, scientific and industrial users and broadcast stations. For information on these or other special application equipment please call or write Ted Shannon.

COAXIAL RELAYS

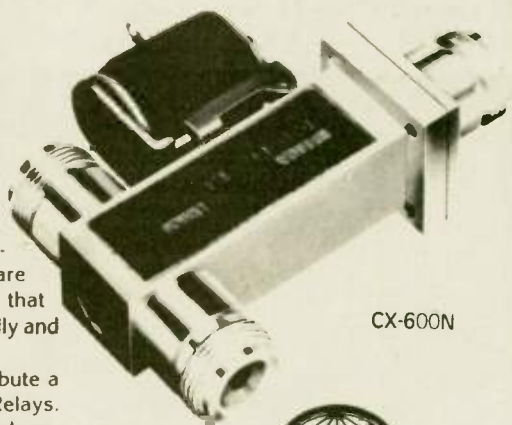
*Proven-Reliability

"Coaxial relay reliability has always been a problem. About five years ago, we switched to TohTsu Coaxial Relays in our high-power amplifiers. Since that time we have not experienced a single relay failure."

"TohTsu offers traditional Japanese quality and workmanship. The contact designs are exceptional, making a relay that has proven itself both electrically and mechanically reliable."

"Henry Radio will now distribute a full line of TohTsu Coaxial Relays. Most common configurations and connectors are available AT VERY REASONABLE PRICES. Please call or write today for complete information, prices and specifications."

— Ted S. Henry



CX-600N

Toh Tsu®

2050 S. BUNDY DR. LOS ANGELES, CA 90025 (310) 820-1234

Toll free order number: (800) 877-7979 FAX (310) 826-7790

Henry Radio

ARRL election results

The ARRL Committee of Tellers for the election of directors and vice directors for the 1995 through 1996 term met at ARRL Headquarters November 18 to count ballots. Here are the results:

Central division, director;
Ed Metzger, W9PRN, 2821
Neil Rapp, WB9VPG, 1793
Whit Brown, WBØCJX, 443
Northwestern division, director;
Mary Lou Brown, NM7N, 2955
Mary Lewis, W7QGP, 1505
Don Clower, KA7T, 471
Roanoke division, director;
John Kanode, N4MM, 3073
William Jacobs, WA8YCG, 509
Edward Dingler, N4KSO, 407
Rocky Mountain division, director;
Marshall Quiat, AGØX, 1371
Ted Colby, WØRA, 507
Whit Brown, WBØCJX, 443
Central division, vice director;
Howard Huntington, K9KM, 1951
Mike Hoshiko, W9CJW, 1579
Ken Ebneter, K9EN, 1059
Northwestern division, vice director;
Gregory Milnes, W7AGQ, 2506
Clay Freinwald, K7CR, 2301
Roanoke division, vice director;
Dennis Bodson, W4PWF, 2758
Robert Pattison, KM4DU, 1190

In each case the candidate receiving the greatest number of votes was declared elected. The terms of office are for two years, beginning at noon, January 1, 1995.—*ARRL Bulletin 92*

Need HV3?

Fr. Edward P. Schmidt (W9SI, OA4SS), writes to let ***Worldradio's*** readers know that a new tribander is being installed at HV3SJ, and that he will be operating from the Vatican City QTH again beginning either 3 or 9 January. Operation will continue through 25 March. "Thanks to the generosity of the folks at Yaesu, HV3SJ is now equipped with the following: An FT-1000 transceiver with an FL-7000 linear for 1.8 through 30 MHz; an FT-650 transceiver for 12, 10 and 6 Meters; and an FT-736R for VHF and UHF. Since I must work around my schedule as an interpreter, the most probable operating times in GMT are as follows: Monday through Friday: 1400 - 1530 and 1930 - 2300; Saturdays: 1400 - 1830; 1930 - 2230 and Sundays: 0800 - 1130; 1430 - 1830; 1930 - 2230.

The bands used will depend upon conditions. These operating times indicate when I may be on the air. I cannot guarantee that I will be on the air on any given day. QSLs should go to "Pino," IØDUD: One IRC for surface mail, and two for air mail. Should we be able to come by a TNC and an IBM compatible computer, I would like to operate packet. However, no packet operation is planned at present due to a lack of resources. Should anyone desire additional information, I have daily schedules, Monday through Friday, at 1740 GMT, with KD8WS, either on 21.435 MHz, or on the IMRA Net which meets on 14.280 MHz. 73 de W9SI." **WR**

DARA Scholarships

Application forms for the Dayton Amateur Radio Association's scholarships are now available. Amateur Radio operators graduating from high school in 1995 are eligible. Eight scholarships in the amount of $2,000 each will be available.

To obtain forms or further information, contact: Dayton Scholarship Committee, 45 Cinnamon Court, Springboro, OH 45066-1000. **WR**

Chinese New Year

The Uinta County ARC will operate 28-29 January, from 1500-2400Z, to celebrate the Chinese New Year in the only city in the Rocky Mountains observing this holiday. Phone on 28.395, 21.325, and 14.245 MHz. For certificate, send QSL and contact number with 9x12 SASE to Vranish, N7RPC, P.O. Box 2048, Evanston, WY 82931-2048.

On the cover...

A 13-foot aluminum ladder used on 20M during Sweepstakes by Kurt N. Sterba, photographed by Lil Paddle with her Leica. Story on the back cover.

CONTENTS

FEATURES

COLUMNS

Worldradio

January 1995
Vol. 24, No. 7

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

Subscription Dept.
Worldradio
520 Calvados Ave.,
Sacramento, CA 95815
1-800-366-9192

Second class postage paid at Sacramento, CA & additional offices.
POSTMASTER: Send address changes to **Worldradio Inc.**, P.O. Box 189490, Sacramento, CA 95818 USA

Worldradio (USPS 947000) is an international conversation. You are invited to participate.

Our goal is to be a valuable resource of ideas and experiences beneficial to the Amateur Radio community. We publicize and support the efforts of those who bring the flame of vitality to this avocation. You readers are participants — an alliance of active radio amateurs concerned with reality, using radio as a communications tool to develop the skill, quality and full potential of Amateur Radio.

We emphasize the positive aspects of this great activity, and desire your contributions dealing with dramatic, personal and humanitarian uses of Amateur Radio. ***Worldradio*** is an independent magazine not affiliated with any other firm, group or organization. Its pages are open to all.

Subscription rates: $14* per year; $27* for two years; $39* for three years; $140* for life; *$10 extra per year for surface mail delivery outside the U.S. Please remit international postal money order. IRCs will be accepted.

STAFF

Publisher ..... Armond Noble, N6WR
Editor ..... Lou Ann Keogh, KB6HP
Associate Editor ..... Norm Brooks, K6FO
Associate Editor ..... Wendy G. Green
Associate Editor ..... Kaye Schwartz
Advertising Director ..... Helen Noble
Advertising Manager ..... Rosalie Hernandez
Graphics Director/Advertising ..... Dianne Dunning
Circulation Manager ..... Marcia McZeek

PUBLISHER'S MICROPHONE

We now showcase those who decided to give themselves a really nice Christmas present. After deep thought they realized that they deserved nothing less than the very best and thus they became ***Worldradio*** SuperBoosters (Lifetime Subscribers):

•Arthur Cook, N1KTI, North Stratford, NH
•Gerard Kennedy, N2DP, North Plainfield, NJ
•Brian Harris, WB3GBT, West Chester, PA
•Margaret, KE4BJE, and David, KE4BJD, Brown, Lillington, NC
•R. J. Jones, Jr., KM4ZR, Smithfield, NC
•Michael Clark, N8WAH, Taylor, MI
•Charles Hardy, KA9CJA, Normal, IL
•James McGinnis, KB5CHA, Blevins, AR
•Dick Russell, KE4DCL, Oklahoma City. OK
•Olin Gary, WB5RJK, Arlington, TX
***D. Lanny Poteet, KB5VTB, Bellaire, TX**
•Paul Gobel, KC5DBR, San Antonio, TX
•Don McCoy, WAØHKC, Littleton, CO
•Ron James, NØCPE, Delta, CO
•Kenneth Kuenzli, AA7YX, Phoenix, AZ
•Paul Wolford, WA6QQX, Azusa, CA
•John Agrelius, KM6HG, Ridgecrest, CA
•James Branum, WB6PFJ, San Jose, CA
•Peter Hatton, N6JBV, Healdsburg, CA
•William Beckstrom, WH6AVF, Hilo, HI

And, last but not least,

•Jeff Spinler, N7VPN, Pasco, WA who waited nearly a full year before mentioning our neglect of his fine act.

•

Great news! An Amateur Radio operator has been elected to the House of Representatives. David Funderburk, K4TPJ, of North Carolina, was voted in. Holder of a doctorate degree, he had been teaching history at the college level before being tapped for the post of Ambassador to Romania.

As I remember, he did not endear himself to the State Department with his arguing against our policy of sending millions of dollars to one of the world's worst dictators.

A few years ago Funderburk gave a talk here in Sacramento. I attended (not knowing he was an amateur). He is a dynamic speaker.

Possibly something may be done about the susceptibilty of telephones, TV, burglar alarm systems, etc. to RF. A lot of grief would be avoided if a few 20 cent capacitors were added to the devices. There are laws that restrict the signal strength of the oscillators of the units. How about some laws that require stiffening their resistance to incoming signals? The manufacturers seem to feel that you don't need a roof until it rains.

Jim Kornacki, KS4DU, Jackson, SC, in a continuation of topics discussed here wrote: "Why should we be required to be technically competent? I can't think of a single good reason why a working knowledge of electronics should be a requirement for a ham license. Let's do away with that bothersome electronics theory! Now that I think about it, it's rather inconvenient to drive all the way across town to take an examination (and isn't requiring a written test a violation of my civil rights?) In keeping with the current trend in American standards, I believe that any class of Amateur license should be available to any individual, regardless of knowledge or skill level, as long as he/she can afford it.

"But seriously, I think a lot of hams (and all of the anti-coders) are missing the point. The CW requirement is not meant to exclude individuals from the extremely crowded and sometimes inhospitable HF bands; it's the lack of a CW requirement that is meant to encourage hams to populate the portions of other bands which are not being used. It's awfully lonely on VHF/UHF SSB around here. I wish somebody would take the hint.

"I really enjoy your (our?) magazine and hope to someday contribute a story or two."

I'm always pleased when when a subscriber refers to it as "our" magazine.

–Armond, N6WR

NEW HF

Compact HF Transceiver **FT-900AT**

Introducing an HF that's going places.

"With the small snap-off remote front panel design, it's an HF mobile."

"It's a great base, too. Direct keypad entry, built-in antenna tuner, CW keyer with adjustable speed, 100 Watts, Omni-Glow display... Wow!"

"Yaesu did it again!"

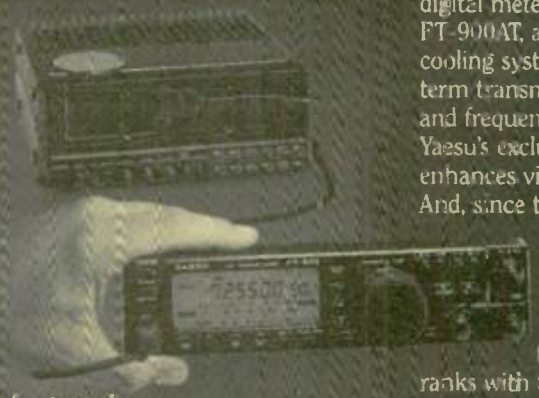
DX-CARIBE CRUISE '95 for details call or write Yaesu USA today!

Uncompromising HF quality that will change your lifestyle. It's the first transceiver with true HF technology to go mobile in any vehicle or stay at home as a compact base station.

With its revolutionary, small, snap-off remote panel, the controls of the FT-900AT can install almost anyplace in your car, truck or camper. Since the 100 Watt RF deck can be installed under a seat or in your car trunk, it's away from critical automotive electronic wizardry. And, for ultimate convenience, the built-in antenna tuner simplifies in-car operation.

As a base station, the compact full function FT-900AT includes direct keypad entry for pinpoint accuracy during quick band/frequency changes. Other features you'll like include CW keyer with front panel speed adjustment, speech processor, twin stacking VFOs, and IF Shift and Notch. No competitor offers this! Bonuses, such as signal strength, power output, SWR and ALC digital meters, add value to the FT-900AT, and the proven duct-flow cooling system provides excellent long-term transmit power output reliability and frequency stability. For ease of use, Yaesu's exclusive Omni-Glow display enhances viewing in any light condition. And, since the high speed antenna tuner is built-in, it means less clutter in your shack.

The FT-900AT controls mount almost anywhere in your car, truck or camper. 100 Watt RF deck can mount in trunk, or under seat.



Remote front panel control head measures only 2-1/4"H x 5-1/8"W x 1-1/4" D.

For sheer high-performance, anywhere, the incomparable FT-900AT ranks with the FT-1000 to further establish Yaesu as the choice of the world's top DX'ers.

Trust Yaesu to know what you want. True HF you can take with you or leave at home! Available now at your Yaesu dealer.

Specifications

- Remote Front Panel Design
- Built-In Auto Antenna Tuner
- Direct Keypad Entry when used as a Base Station
- Large, Bright Omni-Glow™ LCD Display
- 100W on SSB, CW, FM modes; 25W on AM
- IF Shift and 30db Notch Filter
- Digital S/RF, SWR & ALC Meters
- Programmable CTCSS Encode w/Repeater Offset
- Direct Digital Synthesis (DDS)
- 100 Memory Channels
- Frequency Range
  RX: 100 kHz-30 MHz
  TX: 160-10 meters
- CW Full Break-in Keying w/ Adjustable Speed
- Fast/Slow AGC Circuit
- Intercept Point Optimization
- Duct Flow Cooling System
- Twin Band Stacking VFOs
- Built-in Noise Blanker
- Built-in Adjustable Speech Processor

ACCESSORIES:
YSK-900 Remote Mount Kit
MMB-62 Controller Bracket
MMB-20 Mobile Mtg. Bracket
SP-7 Mobile External Spkr.
SP-6 Base Station External Spkr.
DVS-2 Digital Voice Recorder
FP-800 20A HD Power Supply
YH-77ST Headphone

YAESU

Choice of the World's top DX'ers

A NVIS refresher

STANLY HARTER, KH6GBX

Scheduled high frequency radio nets over large areas with only one frequency should be recognized as being generally unrealistic. Propagation may dictate that more than one frequency is necessary. Conditions over which the Net Control Station may have no control often can ruin a net. This is particularly true on Amateur Radio bands.

The main reason a statewide HF net in unrealistic over an area as large as California, for example, is that the typical emergency involves only one location or area. Thus, the best frequency dictated by propagation characteristics is selected. The requirement is to communicate between Point A and Point B — not the entire state.

This is why station operators shouldn't be too upset about poor conditions between other stations and excellent results between others. All too often it is simply the laws of marginal propagation being in charge.

If wide area nets are really necessary to disseminate information or assure total station participation, sub-nets are necessary. This means breaking the larger area into perhaps two areas and changing to a more appropriate frequency to do so.

Antennas for DX serve no purpose in our nets. Near Vertical Incidence Skywave — or NVIS — antennas will improve your nets more than any other step. The NVIS antenna is just a few feet off the ground. A fixed station NVIS antenna is always horizontal and is installed, for practical purposes, anywhere between 7 and 25 feet (no more) above the ground. The same is true of a mobile HF antenna; it is always horizontal and never vertical. Now, doesn't that make your garage happy?

The horizontal antenna is a dipole cut to the lowest operating frequency. If it must operate on more than one frequency (and I don't know a service that can), it must either be a broadband dipole designed for this service (B&W is notable) or a single wire dipole connected to an external automatic antenna tuner (SGC, Motorola and perhaps others). Antenna tuners built in to the HF transceivers do not qualify to do the job. The feedline required is beyond the scope of this brief paper.

NVIS is essential to anyone requiring reliable HF communication from one to 400 miles

This summary is based upon the assumption that the reader has some familiarity with the subject of Near Vertical Incidence Skywave HF-SSB propagation for communications between 1.8 MHz and around 10 MHz. NVIS is essential to anyone requiring reliable HF communication from one to 400 miles. Such users include the RACES, Operation SECURE, the Civil Air Patrol, FEMA, the U.S. Forest Service, MARS and others. This information is not found in conventional technical publications and least of all in the field of Amateur Radio. Having said that, here again are the highlights of NVIS (pronounced "niviss".

For practical communications plans and operations, NVIS functions between 1.8 MHz to 10 MHz. Much above that and the signal penetrate the ionospheric layer instead of the desired reflection back to earth.

Using a "NVIS antenna," provides total coverage for a radius of 300 to 400 miles from any such station.

A NVIS antenna is always horizontal. A vertical antenna can never be used, including mobiles.

A NVIS antenna has omnidirectional radiation; in other words, it makes no difference how you orient your antenna.

A NVIS antenna is low; it MUST be low. Attempt to keep it no more than twenty feet above electrical or earth ground.

A multi-frequency NVIS antenna requires a remote and automatic antenna tuner at the end of the coaxial cable and before the antenna system.

If you use a dipole antenna with an automatic antenna tuner to operate on more than one frequency, cut the dipole to the lowest frequency to be used with the conventional formula.

An existing dipole antenna over twenty feet high can be expediently modified to obtain a degree of NVIS performance. This is done by allowing the feedpoint to stay ten to fifteen feet below the ends of the antenna.

A horizontal broadband antenna may be used without an automatic antenna for a base station.

End-fed long wire antennas are NOT recommended. Unbalanced antennas are prone to creating interference to telephones and other electronic systems in the vicinity.

When the user has a choice of several frequencies, the best choice is generally ten percent below the MUF or Maximum Usable Frequency obtained from propagation programs.

Now, and for the next several years, solar activity will affect HF communicators in a manner to which most are not accustomed. Amateur Radio operators will find that 80 Meters will often work better in the daytime than 40 Meters and that 160 will be better than 80 at night. The Civil Air Patrol will find that it must use 2347 kH at night instead of 4585 for more reliable communications. Remember, we are talking about communications necessary up to about 400 miles away. This may mean some necessary equipment and antenna changes. One thing is certain — this condition will be with us for several years and justify the expense.

In summation, HF-SSB and NVIS will climb out of the deepest canyons, hop the highest mountains, never require any repeaters or other intermediate relays. And some thought high frequency radio was an ancient art! **WR**

Pacificon '94

NORM BROOKS, K6FO

Again this year, ***Worldradio*** attended Pacificon. This is the ARRL Pacific Division Convention held at the Hilton Hotel at Concord, CA October 21-24, 1994. The Mount Diablo Amateur Radio Club was the host organization, and their committee did a terrific job!

The Committee reported over 3000 tickets sold, and the indications were that there were about 3000 attendees.

The hotel facilities were adequate, however, so there was enough elbow room. The Saturday evening banquet was outstanding. The Committee allowed some original thinking to come in, and did a few things differently. For example, there was no head table at the banquet, simply a microphone at a podium. Those who were to speak were seated at their banquet tables nearby. The seating had been selected earlier in the day from a large chart that was available to all.

The Committee also departed from the usual ham-related or electronics-related speaker, and brought us Steve Odum, whom many remember as a wide receiver with the Green Bay Packers (#84). Steve is now a Sergeant with the Berkeley, California police department.

Steve told about his background after his football career. He has a Master's degree in psychology. He met many police officers in classes, and thought he would like to merge his psychological expertise with one of law enforcement. "The police academy was a lot tougher than football camp," he said, "primarily because it is more stressful."He was sworn in as a Berkeley police officer in a secret ceremony so that he could start his police career there in deep undercover. "I really learned a lot in the undercover role. I learned how and why crimes are committed. I learned how the criminal thinks," he added.

The title of Steve's talk was "Ducks, Wolves and Dens of Iniquity."

Most of us who have not been victims of criminal activities make no preparation to protect ourselves from crime. The further we are removed from these incidents, the less we think we can do anything about them. Steve wasn't talking about buying guns, or taking courses in Judo or things like that. There are some basic things people can do to keep themselves safe. One is to think ahead as to what to do in certain situations.

When you're walking down the street, don't forget that the wolves are out there, and they are watching the ducks. How do you walk? Is your head down? If so, lift it up so the wolves can see your forehead, where you might as well tattoo the word "victim." Instead, walk alertly, look around, take in the big picture and make eye contact with as many people as you can. The wolves will then not see you as a duck. When confronted by someone with a knife or gun, *comply*. This is not the time to question or to run or to stay and fight. Just comply.

One of your choices is to simply faint. This is especially effective if the assailant is behind you and has a choke hold on you. What can he do if you slump to the ground unconscious? There is a difference between hurting your assailant and incapacitating him. You do not want to just hurt him. That will make him more determined to hurt you. If you can, kick him with all your might in the groin. This will incapacitate him so that you will have a chance to get away.

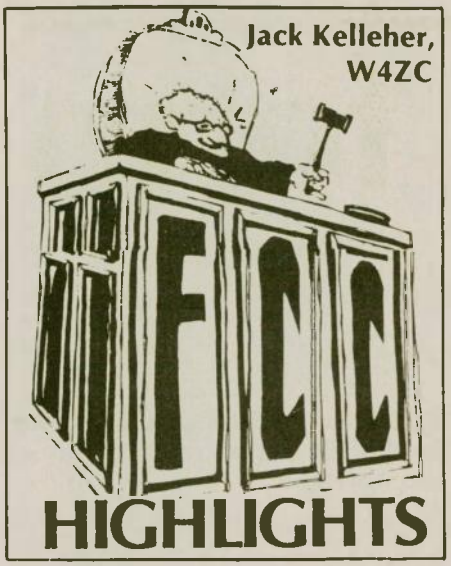
If the wolf wants to take you to his car, *do not comply!* It is now OK to fight and scream and kick. The best thing to scream is *Fire!* The words Help! or Police! are less effective than Fire! An unfortunate statistic is that victims who enter cars seldom come back alive. If you find yourself in a car with an assailant, attempt to negotiate. Negotiating may help you buy time.

It is presumptuous of me to think that I can recreate Sergeant Odum's talk with words on the printed page. He delivered it while walking around the audience. The audience participated enthusiastically. There was a wealth of excellent humor.

The "original thinking" idea also appeared in forum subjects. There were forums on Lasers, the Global Positioning System, Promoting Scientific Literacy, Fire Safety in the Home, and Personal Safety as well as the usual ham-related subjects. There was a "Foot and Fanny" Morse Code sending contest and three transmitter hunts.

Worldradio compliments the Mount Diablo Amateur Radio Club for producing Pacificon '94, in such an original and interesting manner. **WR**

Sgt. Steve Odum of the Berkeley Police department spoke at the banquet.



FCC proposes to auction spectrum shared by the amateur service

In previous columns, we discussed proposed allocation changes in the 2.4 GHz region of the spectrum, and their possible affect on use of Amateur Service secondary allocations at these frequencies (see November ***Worldradio*** on "Spectrum auctions - what can we amateurs expect?" On October 20 the FCC adopted a Notice of Proposed Rulemaking (ET Docket 94-32) to reallocate the 2390 - 2400, 2402 - 2417 and 4660 - 4685 MHz bands from federal government to commercial use. The proposal calls for licensing to be accomplished through competitive bidding.

These bands are part of the 200 MHz mandated by Congress for reallocation from federal government uses to the private sector. The auction winners are expected to use their licenses to provide fixed and mobile services, entertainment broadcasts to aircraft, wireless local loop telephone service, broadcast auxiliary services to support high-definition TV, or low-power communications.

A Commission engineer commented that "The Commission is sensitive to the usage of amateurs, and we intend to explore and consider the ability of services to share the bands with amateur uses, but it's something that we have to see what kinds of comments come in." He said further that during a previous round of comments in this proceeding: "A lot of the comments we received from manufacturers, a majority of them, didn't specifically address the need or ability to share with amateurs. So we hope to get feedback on that. Maybe that's something that the amateur community can really address, more specifically in reply comments to the manufacturers that are proposing services. You know, a lot of the amateur comments are very general about not being able to share with services. But I think we could get more specific."

Note: Specificity is a key factor in presenting the case for the amateur in these bands. Few of us, individually, can afford to conduct the kinds of experiments necessary to quantify the interference potential of a particular service to amateur users of a shared frequency band. Rather than making general comments, we would be well advised to support more sophisticated efforts to state our case. The American Radio Relay League, and some sympathetic commercial organizations can and have borne the brunt of this kind of defense in the past — and probably will do so in this and future cases. Maintaining the useability of these shared bands by amateurs is complicated by the fact that the Amateur service is a secondary service. Secondary services operate on a noninterference basis to the primary and permitted services. Stations of a secondary service:

1. Shall not cause harmful interference to stations of a primary or permitted service. . . .

2. Cannot claim protection from harmful interference from stations of a primary or permitted service. . . .

This proposed reallocation involves more than the Amateur Service. In its earlier comment to the Department of Commerce on this matter, the FCC said that, with regard to the 2402 - 2417 MHz band, "Reallocation of this band would jeopardize the significant private sector investment already made in developing new technologies operating under Part 15. Considering the potentially adverse effects on the Amateur Radio Service and on use of the band by devices operating under Part 15, as well as the difficulties in using this band because of the amount of noise from ISM (Industrial, Scientific and Medical) devices, we believe that reallocation of this band presents less value to the private sector than any other band

Amateur Radio Call Signs

Amateur Radio operators often ask the FCC what call signs have been assigned lately. This list shows the last call sign in each group to be assigned for each district, as of the first of November 1994.

For more information about the call assignment in the Amateur Radio Service, see Section 97.17(f) of the FCC Rules, or write to the FCC, Consumer Assistance Branch, Gettysburg, PA 17325-7245.

Radio District	Group A Am Extra	Group B Advanced	Group C Tech./Gen.	Group D Novice
Ø	AAØUA	KGØRD		KBØPLX
1	AA1LH	KD1XS	N1TKM	KB1BLE
2	AA2UO	KF2YO		KB2SFP
3	AA3IY	KE3PW	N3TSG	KB3BFG
4	AD4ZD	KS4HB		KE4SMC
5	AB5YQ	KK5EK		KC5KPV
6	AC6GZ	KO6KX		KE6NVP
7	AB7FV	KJ7FF		KC7GMT
8	AA8QX	KG8MV		KB8VMB
9	AA9MW	KF9YU	N9YZZ	KB9JBE
N. Mariana Is.	KHØO		KHØDO	
Guam	WH2H	AH2CY	KH2LO	
Midway Is.		AH4AA	KH4AG	WH4AAH
Hawaii		AH6NQ	WH6ZC	WH6CRL
Amer. Samoa	AH8L	AH8AG	KH8BJ	WH8ABB
Alaska		AL7PV	WL7YU	WL7CHV
Virgin Is.	WP2P	KP2CD	NP2HR	WP2AHU
Puerto Rico		KP4XS		WP4MUA

Subscription form

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

We sent it to you to acquaint you with our reporting on this great activity. Amateur Radio is exciting, challenging, stimulating, satisfying and very rewarding.
You are cordially invited to subscribe to, and be a part of Worldradio.

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

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

Name _____

Call _____

Address _____

City _____

State _____ **Zip** _____

☐ **NEW** ☐ **Renewal** ☐ **Gift**

			Non-US ZIP
12 issues	($1.17 per issue)	$14.00	$24.00
24 issues	($1.13 per issue • save $1)	$27.00	$47.00
36 issues	($1.08 per issue • save $3)	$39.00	$69.00
Lifetime	(Be a WR super booster)	$140.00	$240.00

Subscriptions may be paid in U.S. funds drawn on U.S. banks, by International Money Order, VISA, AmEx or MasterCard. Canadian Postal Money Orders (in U.S. funds) are also acceptable.

☐ **Check enclosed** ☐ **MasterCard** ☐ **AmEx** ☐ **VISA**

Card # _____ **Exp. date** _____

Signature _____

Please clip and mail to . . .

Worldradio™
520 Calvados Ave.
Sacramento, CA 95815

For Subscriptions
(charge cards only)
TOLL FREE 1-800-366-9192 8 a.m. to 5 p.m. Pacific Time

Thank you!

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

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

identified for reallocation."

(Note: Some of the foregoing was derived from a more lengthy article in the *W5YI Report* for November 1st 1994)

Amateur licensing procedures

On October 24 the FCC released an Order amending its Amateur Rules, effective December 20, 1994, as follows:

To permit electronically filed data from VECs (paper applications also will still be accepted);

•To authorize operation as soon as the new license data appears in the amateur service licensee data base, rather than (as now) when the license document has been delivered (details of how the new licensee can determine his call sign will be announced later);

•To add a new rules section, "Examinee Conduct," to emphasize that an examinee must comply with the instructions given by the administering VEs;

•To treat "Technician Plus" as a license class;

•To provide for a "renewal short form" which the FCC says will be mailed to licensees in advance of their expiration date beginning sometime in 1995. The FCC added that renewal applications would be accepted no more than 90 days before the expiration date.

Because of the nature of these rule amendments, there is no notice of comment period required by federal law.

Special licensing for visiting foreign amateurs

The FCC has terminated this proceeding without action. It was initiated in August 1992 (Docket 92-167), and proposed a special licensing procedure for visiting foreign amateurs. In dropping the proposal, the Commission cited comments filed opposing the plan, as well as suggestions for how better to accomplish what is a worthwhile goal. The FCC said it will "continue to explore other options and will work to ensure the reciprocal treatment of United States amateur operators — whether through bilateral or multilateral arrangements."

The FCC is sixty years old!

In early October the FCC observed its 60th anniversary. The FCC hosted a cake-cutting ceremony on October 6th, complete with Commissioner Rachelle Chong reading "A poem to the Communications Act."

In 1934 President Roosevelt approved the Communications Act of 1934, which replaced the Federal Radio Commission and expanded its duties to include telegraph and telephone. Now, some 60 years and more than 100 modifications and amendments later, the Act occupies about 200 pages of a six by nine inch book entitled "Compilation of Selected Acts within the Jurisdiction of the Committee on Energy and Commerce, U.S. House of Representatives."

In 1934 the FCC had 233 employees, and a budget of $1.14 million. It regulated a broadcast business consisting of 623 radio stations and a telephone industry with 14 million telephones and a revenue just under a million dollars.

Today the FCC has more than 1900 employees and a budget of $160 million. There are more than 21,000 broadcasting stations (radio, TV and low power TV), and the total revenues of the telephone industry are nearly $200 billion.

More on Morse

Rolf Jesperson, N3LA, of Spring City, PA has filed a Petition with the FCC for Reconsideration of his November, 1993, proposal for rulemaking (RM-8391) to reduce the Morse code speed requirements in the Amateur Extra and General license classes and to reduce the number of license classes from five to three. Jesperson asks the FCC to eliminate the Novice and Advanced Classes, leaving only the Technician, General, and Amateur Extra Classes. The minimum code requirement for the General Class would be 5 wpm; for Amateur Extra, 13 wpm. The written requirements for each of the proposed three classes would be 50 multiple choice questions.

Jesperson's petition concludes that "The benefits of adopting RM-8391 would be an increase in a much needed growth of the Radio Amateur community with a reduced burden to the Licensing Division in Gettysburg, and reduced delays in new and upgrade licensing."

Morse and ORACLE.

Our November column included a discussion of questions concerning the continuing need for Morse code proficiency as a requirement for an amateur license. Proposals such as Jesperson's (see the preceding item) appear from time to time seeking reduction or even elimination of the requirements for Morse code proficiency.

A New Zealand organization, ORACLE, proposes to eliminate the requirement from ITU Radio Regulation 2735, which now states that "Any person seeking a license to operate the apparatus of an amateur station shall prove that he is able to send correctly by hand and to receive correctly by ear texts in Morse code signals. The administrations concerned may, however, waive this requirement in the case of stations making use exclusively of frequencies above 30 MHz."

A comprehensive series of articles on the principles and objectives of ORACLE appears in three consecutive issues of Westlink Report; #681, September 1994; #682, October 13, and #683, October 27. WR

Joint adventure via Amateur Radio — Japan/USA, part 2

BRAD CARDER, KG7OK; BEVE HAMILTON, N7LAW; TOM HAMILTON, WD6EAW, BILL SHRADER, W7QMU

Last month, we featured the first part of this story of an international Amateur Radio friendship involving Nobuo Okazaki, JE5CBY, and Tom Hamilton, WD6EAW, among others. Since 1990, regular schedules on the air and a visit to Oregon by the Japanese amateurs was capped by the visit of four of the U.S. couples to Japan as the guests of the Otsuki Ham Radio Club.

On 2 August, 1994, Tom and Beve Hamilton, WD6EAW & N7LAW, Dick and Victoria Santoro, AA7NS & N7PGM, Tony and Sue Buzzard, N7QZH & N7QZG, representing Keno ARC and Bill and Judy Shrader, W7QMU & KA7OFM, from the Rogue Valley Radio Club headed for Tokyo to begin an 8-day odyssey.

We had packed small gifts for the Otsuki Radio Club members — a 1994 *Callbook*, Rand McNally road atlases, a dozen hats with Otsuki-Keno emblems, several dozen pins from Klamath County and Medford, Oregon, ARRL publications, and a set of *horseshoes*. Other mementos were donated by Bert Morgan, KC7FFA, Dennis Hurt, N7YIX, Dick Switzer, KB7DWX, Ron Spears, KA7WDM, and many others. The Keno ARC had also arranged for a 3-year subscription to *National Geographic* magazine for the local schoolchildren.

Dr. Nobuo Okazaki, JE5CBY, his wife Noriko, JE5CWE, Aoki, JE1FKU, and Hiroshi Oba, JA1LXR met us at Narita Airport. They had arranged for a bus to transport our group to the hotel in Tokyo for a two-night stay. It seemed to us weary travelers that the journey from the airport to the hotel was almost as long as the flight from San Francisco to Narita because of the heavy traffic into the city! The hotel, like the bus, was air conditioned; an important feature since the area was in the grip of a heat-wave that saw temperatures reach 41 degrees Celsius (105.8F°) with accompanying high humidity.

Shortly after arriving we had our first Japanese meal, never to see western-style food or silverware again for over seven days. The next morning the bus picked us up to spend the day sightseeing in the mountains north of Tokyo. At Nikko, in the middle of a National Park, we toured a spectacular temple complex dedicated to the shogun era. One building has the famous carving of the three monkeys representing "Hear No Evil, Speak No Evil, See No Evil."

Fascinated by the surroundings, we became immune to the intense heat. "Just drink a lot of cold water and don't worry!" became the slogan for the day. After a full day sightseeing, a fine Japanese dinner, and a shower, it was off to bed again, to rise early for the next days' flight to Kochi on Shikoku Island. Nobuo, JE5CBY, Noriko, JE5CWE, and Michiyo, a non-ham friend of Noriko's, accompanied us for the rest of the trip.

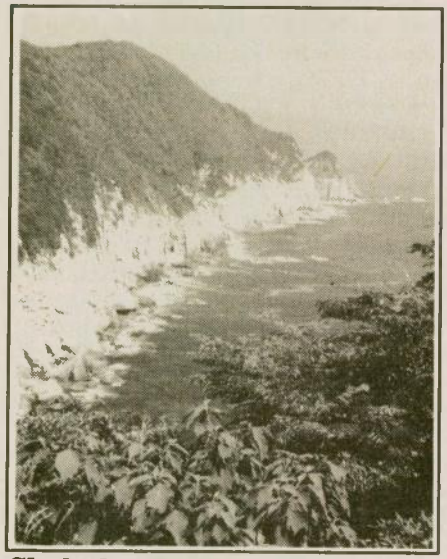
Representatives of the Otsuki town government greeted us at Kochi airport. Among them was Hanna Coen, a young lady from Kansas City, now Coordinator for International Relations for the Otsuki town government. She was to be our good right hand for the

next five days, and what a job she did! She had obtained the services and cooperation of countless people to insure our visit was memorable, and she outdid herself. She admittedly didn't understand "hams," but neither did others outside the radio community. They thought it amazing that we could develop relationships over the air, travel several thousand miles, and be old friends when we met "eyeball to eyeball" in spite of the language barrier.

The four-hour trip to Otsuki on a twisting, mountainous road revealed breathtaking scenery along the coast, but the occasional rest stop was certainly welcome. Just outside of Suzaki City lunched at a floating restaurant where members of the Suzaki Amateur Radio Club (who would later host us for a night) welcomed the group to Shikoku island. At about 1700 that evening we arrived in Otsuki with just enough time to meet our hosts, shower and change for the"Welcome to Otsuki" party at Shizuo Miyazaki's restaurant. Miyazaki, a master chef, had prepared most of the food when the Otsuki gang visited Keno, Oregon. There were about 40 in attendance, including city government officials and Amateur Radio Club members.

After speeches, introductions and presentations were made, everyone enjoyed a traditional banquet topped off with wonderful Japanese beer and sake. Miyazaki's XYL, Mutsuki, performed several traditional dances. Then, to the amazement of the locals, we Americans did "our thing" on stage, participating in the local dancing. Remember, we had only been in Otsuki about three hours, but already the residents had lost their concerns and concluded that the Americans would adapt readily to their newly-adopted lifestyle. The group then split up to their various host family homes and hit the hay for a much-needed night's sleep.

Early the next day, we went by bus to tour the nearby scenic spots along the southern Shikoku Island coastline, highlighted by a visit under the ocean to view fish life on the reef, a stop at a coral jewelry factory, and a drive through a monkey park. Late in the afternoon we arrived at a small fishing village on an island connected to the mainland by a newly constructed bridge. The streets were narrow and squid was hanging to dry everywhere. We were guided to a small coffee house in the middle of the village to sample a cold noodle dish, the specialty of the owner. How wonderful the cool treat was on that particularly steamy day. We returned to Otsuki with just enough time to change clothes for a festival being held in our honor. Several dance troupes from nearby communities, dressed in traditional garb, performed dances with grace and poise beyond belief. We were asked to join in, but it become apparent very quickly that we were not as coordinated or as musically proficient as they. Meanwhile some of the locals were introduced to the secrets of pitching horseshoes. It was quite a sight to see our kimono-clad hosts throwing horseshoes while balanced precariously on getas. At the conclusion of these activities another Japanese dinner was enjoyed by all and then we were off to bed. By the way, that "bed" was a mat *(futon)*, a pillow *(makura)*, usually filled with rice husks, on the floor (tatami mat) for all of us, due the temperatures of 32 to 38 degrees C (90-100°F) a blanket *(mofu)* was not needed.



Shokuku Coast

Sunday's activities started with a two-hour drive to Nakamura City, a tour of the restored Nakamura Castle, and an interesting boat excursion on the Shimanto River, noted to be the cleanest river in Japan. Several fishermen in boats plying the shores of the river demonstrated the local method of fishing for us as we putted along in the river. The demonstrations were staged, although it was awhile before most of us caught on. Our fantastic lunch banquet at a restaurant in the middle of Nakamura City featured fresh raw bonito. Displays of orchids, beautiful vases and art objects were everywhere. After lunch we toured a "Dragon Fly Museum." Who would have thought there were enough varieties of that insect to fill a museum? Not only are there enough varieties, but each one is on display and carefully documented. The museum also housed an aquarium of local Shimanto River marine life.

Back to Otsuki and again hurry, hurry, hurry to change clothes for Culture Night, which started with a tea ceremony performed by some of the local high school girls and ended with another feast of the best dishes of local food prepared by the local ladies' group. A performance on the *koto* (a stringed musical instrument), a martial art sword ceremony *(iyaido)*, a spectacular tiger dance *(shishimai)* and a presentation of the local taiko drum group followed the feast.

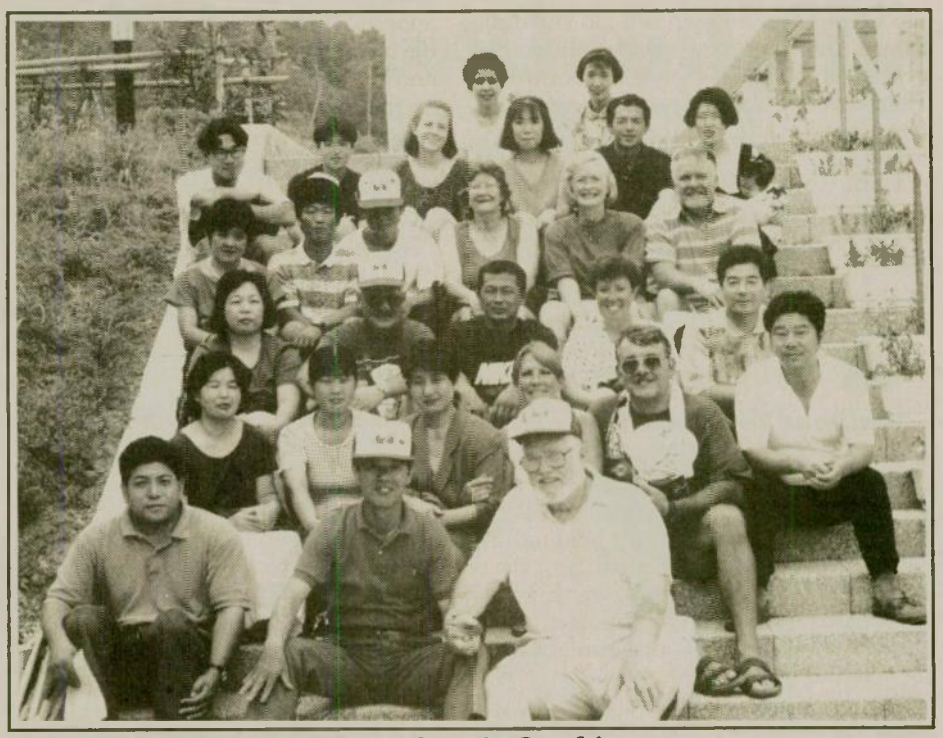
The next day, two couples went on a scuba/snorkel trip to the nearby ocean, while the other two couples went shopping in nearby towns. The diving group

was successful in capturing various sea creatures. At a barbecue that evening at our host's home, the day's bounty was rapidly devoured as great delicacies. The shoppers had productive visits to Sukumo City and Nakamura City. They saw markets, department and toy stores. The price of some of the food items were astonishing. Watermelons sold for $20.00, and meat cost a small fortune. That night, the Shikoku ARC president JE5GEF hosted a BBQ party dinner for both clubs. Early in the evening, special rice cakes were produced with the everyone's help. Cooked rice is pounded in a special concrete container and then rolled into cakes with a sweet bean paste in the center. The grill contained very few familiar items. Various vegetables were grilled along with sea snails, eel, octopus, and other seafood acquired by the diving expedition. The evening ended with a impressive display of fireworks. Finally, the entire group formed a circle, held hands and bid farewell to one another and sang "Auld Lang Syne."

The next morning our farewell breakfast, hosted by the Mayor of Otsuki, was a sad affair, knowing that we soon would be parting. The Mayor and the Superintendent of Education noted the beginning of the cultural exchange between our two areas. Each couple was presented a beautiful Japanese wall hanging to commemmorate our Otsuki visit. Noriyasu Tanioka, JF5GEF, presented the Keno Amateur Radio Club with an engraved plaque to recognize the fraternal relationship between our two clubs.

Some of the host amateurs supplied the transportation to Suzaki City, a three-hour drive. We were met by our new host ham families and taken to their homes to get ready for the dinner party in the evening. As usual, there was more to eat and drink than we could possibly consume, but we certainly did try. The evening ended with some superb karaoke singing by our hosts. This is one of the favorite pastimes of rural populations. Early the next morning we toured the Kochi Castle, a magnificent building on a hill overlooking the city, built in 1601 during the reign of the shoguns.

The day we left Kochi was the first day of the Obon Festival, a traditional holiday during which the ancestors are said to return to visit their families. It's a time for family gatherings. In Kochi by many youth groups in bright-colored uniforms danced down the streets of the city, accompanied by singers and drum groups on large flatbed trucks.



Nannansei and Keno ARC members in Otsuki

At the Kochi airport a scene of fond farewell took place, similar to that of our departure from Otsuki. Two of our group were staying on in Japan for an extra week to visit family members in another part of the country. We parted from them in Kochi. The rest of us departed for Osaka, and then, finally we were on our way back to Oregon. Of course, Murphy's Law came in to play and we had a missed connection on our flight home! Some 30 or so hours from the time we rose that morning, we arrived in Medford.

Now that it is all over, what comments can we make? First, wear slip-on shoes in Japan or you could wear out your fingers tying and untying laced shoes all day long. Make up your mind firmly that all food is good, and if you think you are not going to like something, don't ask what it is. Most of all don't appear to admire anything you don't want to carry home. These incredibly kind people are likely to give the item to you, no matter how much you protest.

We have had a wonderful opportunity to develop a deep, abiding friendship with the members of our now "sister" club, all as the result of a chance QSO with a nice JA station. So remember the next time that you are on the air, the next station you talk to may become a lifelong friend. **WR**

MFJ Dual Band Mobile Antenna

For an incredible $14.95, you get a dual band 2 Meter/440 MHz mobile antenna with strong magnet mount, stainless steel radiator, 15 feet of coax and BNC adapter for your handheld -- It's the fastest selling mobile antenna in ham radio!

MFJ-1724B
$14.95

For an incredibly low $14.95, you get an MFJ dual band 2 Meter /440 MHz mobile antenna!

It's the fastest selling mobile antenna in ham radio!

You get excellent gain for solid, noise-free QSOs. On 440 MHz, it's a high gain ½ wave over ¼ wave radiator. On 2 Meters, it's a *full size* ¼ wave radiator.

Its tough *stainless steel* radiator is only 19 inches tall -- won't knock off when parking in your garage.

An extra powerful magnet holds it steady -- even at highway speeds.

You get 15 feet of coax with a standard PL-259 coax connector for your mobile rig.

You get a BNC adapter so you can also use it with your handheld!

Your MFJ-1724B is protected by MFJ's famous one year *No Matter What*™ unconditional guarantee.

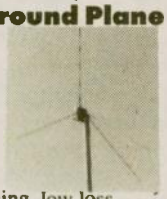
DualBand 144/440 MHz Ground Plane

MFJ-1754
$24.95 *New!*

Dual band ground plane antenna for 2 Meters and 440 MHz gives you extra long range on 440 MHz with a high gain halfwave over quarter wave radiator. On 2 Meters you get solid quarter wave performance. Mounts on 1 to 1½ inch mast with single U-bolt. Easy-to-tune.

1/4 Wave Ground Plane

MFJ-1740
$12.95



The MFJ-1740 brings up 2 Meter repeaters as well as any ¼ wave ground plane made!

You get easy tuning, low loss ceramic antenna insulator and strong lightweight aluminum construction.

Single U-bolt mounting for 1 to 1½ inch mast. Cutting chart included for 220/440 MHz. Made in USA.

MFJ Pocket Roll-Up™

2 Meter halfwave J-pole antenna

MFJ-1730
$14.95

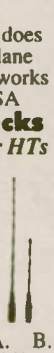
Roll up this *halfwave* 2M J-pole antenna and stick it in your pocket! It's the perfect *gain* antenna for traveling.

Get home station performance on the go. Just hang your *MFJ Pocket Roll-Up*™ in the clear and plug the BNC connector into your handheld.

It's omni-directional and has significant gain over a ¼ wave. It does not need a cumbersome ground plane so it's convenient for indoors and works great with handhelds. Made in USA

Dual Band *flexible* Ducks

144/440 MHz flexible ducks for HTs



A. *High Gain FlexiDuck*™. **MFJ-1717, $19.95.** Enjoy dependable QSOs when other rubber ducks give you noise. High gain ½ wave on 440 MHz, full size ¼ wave on 2M. Won't jab you -- bends, twists, flexes with you. 15¾ inches.

B. *FlexiDuck*™, **MFJ-1716,** A. B. **$16.95.** Similar to MFJ-1717. Full ¼ wave on 440 MHz, efficient loaded ¼ wave on 2 Meters. 8¾ inches.

Shorty Duck™ for HTs

Add this *short*, 4¼ inch *ShortyDuck*™ to your 2M handheld for a Q-5 signal! Impedance matched for maximum gain. High-Q helical wound radiator.

MFJ-1718
$12.95

5/8 Wave 2 Meter Mobile Antenna

MFJ-1728/B
$24.95

For *maximum range* while mobile, use MFJ's *Maximum Gain*™ 5/8 Wave 2 Meter Mobile Antenna. You'll get the maximum possible gain of any single element mobile antenna!

Competitive 5/8 wave mobile antennas can't work any better -- no matter how much more they cost.

You get low SWR so your rig can safely deliver maximum power into your antenna. It's rated at 300 watts PEP so you can use any mobile rig plus a mobile amplifier.

You get a heavy-duty magnet mount that holds your antenna tight at highway speeds and a black magnet base that'll look good for years.

You get a stainless steel radiator that'll endure years of harsh mobile use and 12 feet of coax cable.

You get MFJ's one year *No Matter What*™ unconditional guarantee.

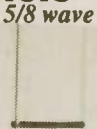
Order MFJ-1728 with standard PL-259 coax connector or MFJ-1728B that also includes a BNC adapter for your handheld.

Stacked 5/8 Wave for 2 Meters

gives twice the omni-directional gain of a single 5/8 wave

MFJ-1764
$34.95

MFJ's stacked 5/8 wave radiators give you *more than twice* the *omni-directional* gain of a single 5/8 wave radiator!



Wide 10 MHz 2:1 SWR bandwidth . . . excellent ferrite choke balun feedline decoupling . . . shunt choke for bleeding off unwanted static . . . strong lightweight aluminum.

Fully assembled -- simply attach radiators -- no tuning required. Mounts vertically for FM/Packet or horizontally for SSB. Installs with single U-bolt on 1 to 1½ inch mast or tower leg. 1½ lbs., two 47 inch radiators, 23 inch boom. Made in USA.

Also works as excellent *6 Meter* full halfwave centerfed antenna.

MFJ-1766, $89.95, gives you *four times* the gain of single 5/8 wave. Includes 2 MFJ-1764, phasing cables. Doubles gain on 6 Meters.

MFJ-1765, $29.95, phasing cables for 2 MFJ-1764s, other 2M ant.

MFJ dual band 144/440 MHz Yagi

5 elements on 440 MHz . . . 4 elements on 2 Meters . . .$49.95

MFJ-1768
$49.95 *New!*

Get two Yagis for the price of one . . . enjoy two Yagis in the space of one with single coax feed!

MFJ's *exclusive* dual band balanced feed with *FerriteChoke*™ decoupling prevents pattern skewing and gives you low SWR.

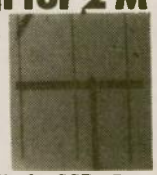
The MFJ-1768 is based on the *National Bureau of Standards* design that's optimized for maximum forward gain with high front-to-back ratio and a clean symmetrical pattern.

Mounts vertically for FM/Packet or horizontally for SSB with single included U-bolt on 1 to 1½ inch mast or tower leg.

High strength 6061-T6 aluminum 5 foot, 1⅛ inch diameter boom. 2 pounds. Elements are electrically isolated from boom. Made in USA.

Portable 3 element Yagi for 2 M

MFJ-1763
$39.95



You can set up or take down MFJ's *portable* 3 elements 2 Meter Yagi in seconds! Elements simply screw into the boom.

You can take it with you wherever you go and have the "oomph" and directivity of a beam.

It's easy to store and sturdy enough to use as your home station antenna.

Mounts vertically for FM/packet or horizontally for SSB. *Center* or *end* mounts with single U-bolt. Great for packet/PacketCluster™.

It's compact 2¾ foot boom gives you a calculated gain within 1 dB of a four element Yagi with a boom nearly twice as long.

Extra thick elements maintain high gain and directivity over entire 2 Meter band. MFJ's *FerriteChoke*™ decouples feedline.

Elements and boom are made from strong lightweight aluminum and protected by MFJ's *Permanent Molecular Bonding Technology*™.

Weighs just 2 pounds. Boom is 30½ inches. Made in USA.

5/8 Wave Ground Plane

MFJ-1750
$19.95

For a low, low $19.95, you get a *high performance* 2 Meter 5/8 wave ground plane home station antenna -- you'll get the maximum gain of any single element antenna.

More expensive 5/8 wave ground planes can't work any better -- no matter how much they cost.

You get . . . shunt fed matching that bleeds off unwanted static and gives you low SWR . . . strong lightweight aluminum construction . . . low loss ceramic antenna insulator . . . MFJ's *RapidTune*™ radiator . . . MFJ's one year *No Matter What*™ guarantee. It mounts on 1 to 1½ inch mast with single U-bolt and is Made in USA.

MFJ-1752, $19.95, for 220 MHz .

HT Range Extenders

Telescoping antennas for handhelds

A. *Long Ranger*™ 2 Meter Halfwave, **MFJ-1714, $16.95.** For really long range this MFJ endfed halfwave is hard to beat. It outperforms a ⅝ wave on a handheld because the ⅝ wave needs a ground plane. The MFJ halfwave doesn't. It's shorter, lighter, has more gain and places less stress on your antenna connector than a ⅝ wave antenna. When collapsed, it performs like a rubber duck. 40" extended, 10½" collapsed.

B. *Dual Bander*™ for 2 Meters and 440 MHz, **MFJ-1712, $14.95.** Got a new dual band handheld or separate units? One antenna fits all. It's a ¼ wave for 2 Meters and a ⅝ wave with gain for 440 MHz. 7¼" collapsed, 19" extended.

A. B. C.

C. *Pocket Linear*™ ⅜ Wave, 2 Meters, **MFJ-1710, $9.95.** Carry this pen size antenna in your pocket like a ballpoint pen. When you're using your rubber duck, on the fringe and noisy, put on the *Pocket Linear*™, extend it to 24½" and carry on your QSO. Has pocket clip. 5¼" collapsed.

144/440 MHz Duplexer

MFJ-916
$29.95

Lets you use dual band 144/440 MHz antenna with separate transceivers *or* separate 144/440 MHz antennas with dual band transceiver.

Nearest Dealer/Orders: 800-647-1800
Technical Help: 800-647-TECH (8324)

• 1 year *unconditional* guarantee • 30 day money back guarantee (less s/h) on orders from MFJ • *Free* catalog

MFJ ENTERPRISES, INC.
Box 494, Miss. State, MS 39762
(601) 323-5869; 8-4:30 CST, Mon-Fri
FAX: (601) 323-6551; Add s/h

MFJ . . . making quality affordable

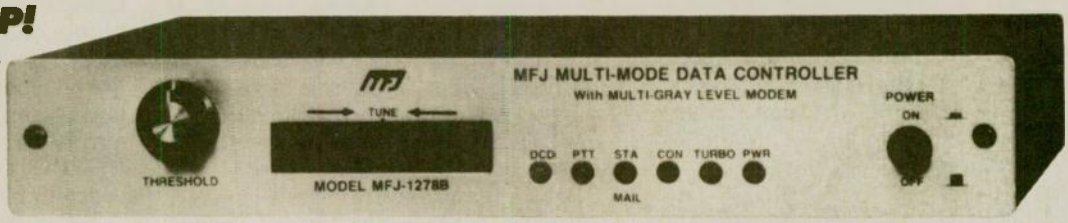
MFJ-1278B *with* DSP
multi-mode data controller

Only MFJ gives you DSP and 10 digital modes -- Packet, PACTOR, AMTOR, RTTY, Color SSTV, 16 Gray Level FAX/ Weather FAX, ASCII, Navtex, CW, and Memory Keyer . . . for only $379.95

Now with DSP!

MFJ-1278B/DSP with DSP
$379.95

MFJ-1278B less DSP
$299.95



Combining "brick wall" DSP filters with the *world class* MFJ-1278B gives you ham radio's most powerful multi-mode data controller -- the *new* MFJ-1278B/DSP -- for an incredibly low $379.95.

You won't believe your eyes when you see *solid* copy from signals completely buried in QRM!

This MFJ-1278B/DSP, your transceiver and computer are all you need for exciting digital QSOs!

You'll discover a whole new world of ham radio. You'll communicate in ways you never knew existed.

The MFJ-1278B/DSP and MFJ-1289 *MultiCom*™ software are packed with features available only from MFJ.

You get 10 digital modes . . . Packet, PACTOR, AMTOR, RTTY, color SSTV, 16 Gray Level FAX/Weather FAX, CW, ASCII, Navtex and Memory Keyer . . . plus an enhanced 32K mailbox that's expandable to 512K.

You'll have fun joining worldwide packet networks and exchanging color SSTV pictures with your buddies.

You'll marvel at *full color* FAX news photos as they come to life on your screen, and you'll see weather changes on highly detailed weather maps in all 16 gray levels.

You'll eavesdrop on late breaking news as it happens on RTTY.

You'll enjoy error-free HF QSOs on PACTOR and AMTOR and enjoy receiving packet mail in your mailbox.

Wanna copy some CW? Just relax and read your screen.

MFJ-1278B, $299.95, no DSP.

MFJ-1278BT, $369.95, built-in 2400 baud modem, no DSP.

MFJ-780, $99.95,"brick wall" DSP data filter. Plugs into MFJ-1278B only.

MFJ-1289, $59.95, *MultiCom*™ PC software brings out the full power of MFJ-1278B series. Includes PC cable.

Only MFJ gives you all these features . . .

Exclusive MFJ-1278B Features

- Sharp "brick wall" DSP filters(MFJ-1278/DSP)
- Color SSTV, transmits and receives . .
  - -Robot Color: 36, 72 seconds
  - -Robot B/W: 8, 12, 24, 36 seconds
  - -Scotty Color: 1 and 2
  - -Martin Color: 1 and 2
- 16 Gray Levels FAX/SSTV Modem . . .
  - -receive all 16 gray levels of weather FAX, color AP wire photos, color SSTV
- Real-time Packet pictures . . .
  - -SVGA, VGA, EGA, CGA high resolution full color packet pictures
- Exclusive MFJ **hardware** features . . .
  - -20 LED precision tuning indicator
  - -Built-in parallel printer port
  - -Individual radio port output level controls
  - -TAPR internal modem header for high speed modem -- 2400 or 9600 baud
  - -Monitor amplifier, volume control, speaker jack for monitoring receive/transmit data
  - -10 user programmable message memories
  - -CW iambic paddle input
  - -IC sockets used throughout
  - -*Free* 110 VAC power supply
- Exclusive MFJ **software** features . . .
  - -*Automatic Digipeater*™ routing
  - -Built-in packet connect bell
  - -*Call Alert Beeper*™
  - -*AutoMonitor alarm*™ detects incoming character strings
  - -Simultaneous QSOing and file transfering
  - -*Automatic Signal Analysis*™ for packet, AMTOR, RTTY, ASCII
  - -Stored parameters for each mode
  - -Dedicated MARS mode

New Features

- PACTOR mode with mailbox
- 32K Packet mailbox expandable to 512K -- allows separate callsign, auto mail forwarding and reverse mail forwarding, Remote Sysop access, Sysop paging, chat mode, mailbox C-text
- *Mail-Waiting*™ LED indicator
- 64K battery backed up RAM
- 1 Megabit system EPROM
- External accessible reset
- Up to 19.2K baud terminal operation
- Color SSTV with VIS tones for picture autostart
- Selectable European RTTY tones
- Optional plug-in *crosspattern* scope tuning adapter

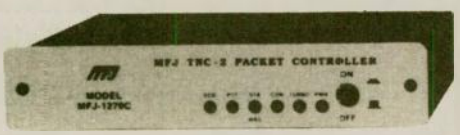
Standard MFJ Features

- Standard MFJ **hardware** features . . .
  - -Built-in 300 and 1200 baud packet modem
  - -Two software selectable radio ports
  - -Noise threshold control improves HF operation
  - -True DCD for excellent HF operation
  - -RS-232 and TTL serial ports
  - -*Fast-Start*™ Manual
- Standard MFJ **software** features . . .
  - -*Anti-Collision*™ gets packets through faster
  - -Auto terminal baud rate: 300, 1200, 2400, 9.6K, 19.2K
  - -KISS interface for TCP/IP, NetRom, MSYS
  - -Host mode
  - -Normal or reverse FSK output

MFJ *No Matter What* Guarantee™

- One year *unconditional* guarantee . . .
  - -MFJ will repair or replace your MFJ-1278B (at our option) *no matter what* for a full year

MFJ VHF/HF Packet TNCs



MFJ-1270C
$119.95

Enjoy Packet on VHF *and* HF at 1200 /300 baud with the *world famous* MFJ-1270C. Operate 2400 or 9600 baud with optional plug-in modems .

The MFJ-1270C is widely acclaimed as *the most reliable packet TNC in the world* -- many work 24 hours a day for years without failure!

Fully TAPR TNC-2 compatible, *free* 110 VAC power supply, mailbox expandable to 512K, WeFAX mode prints weather maps, KISS interface, Host mode, RAM/ROM each expandable to 512K, up to 19.2K terminal baud rate, monitor amplifier, external reset, *enhanced* DCD for HF.

MFJ-1276 $159.95, MFJ-1270C with PACTOR, precision tuning indicator, extra 32K mailbox memory.

MFJ-1270CT, $209.95, MFJ-1270C with 2400 baud modem.

MFJ-1270CQ, $229.95, MFJ-1270C w/ 9600 baud G3RUH modem.

Free MFJ Catalog
Write or call toll-free . . . 800-647-1800

Nearest Dealer/Orders: 800-647-1800
24 Hour FAX: (601) 323-6551
Technical Help: 800-647-TECH (8324)

MFJ ENTERPRISES, INC.
P.O. Box 494, Miss. State, MS 39762
(601) 323-5869; 8-4:30 CST Mon.-Fri.
7206.1763@compuserve.com

MFJ . . . making quality affordable

Eliminating POOP (Poor Operating on Packet)

Part 4 of a 5-part series

GREG JONES, WD5IVD

Much of this article was published in 1986, by Peter Eaton, WB9FLW, and Lyle Johnson, WA7GXD, in TAPR Packet Status Register Vol 4, Issue #19, April 1986. Although the information is over eight years old, it is still very much relevant to current packet operations. Packet has not changed that much since 1984, and I hope that seeing these statements will help you cut back on any POOP output you might be producing.

Overview

A lot of POOP has been discovered on packet frequencies across the nation and around the world! POOP is both unnecessary and oftentimes offensive. While other four-letter acronyms have been used to describe the characteristics of POOP, it is hoped that POOP is sufficiently recognizable by packeteers to eliminate the need to express the others! What, exactly, is POOP? How does one eliminate it? How can one help others to cause it to not be propagated?

POOP — What is it?

POOP is simply an acronym for Poor Operating On Packet. While it may evoke other thoughts in one's mind, the relationship between those other thoughts and poor operating practices is probably pretty clear and will not be further elaborated upon.

POOP — How does one eliminate it?

In order to eliminate POOP, one must simply not generate it. If it is generated, it will be passed onto packet channels, needlessly clogging them. While there are many varieties of POOP, it would be impossible to describe them all, several of the more obnoxious and prevalent forms of it are described.

If you have ever been around a pond, you have undoubtedly heard the loud and constant noise put on by frogs. It seems amazing that so small a creature can make such a disturbance! If you have ever monitored a busy packet channel (using your TNC), you have probably seen plenty of beacon messages. Here again, a large disturbance may be caused.

Beacon features were included in TNC software in the early days of packet when stations were few and far between. Like the frog on the pond, the noises were made to attract attention of like species - in this case, other packet stations. Unlike the frog, who settles down after he finds what he was looking for, many packeteers continue to send beacons, often on crowded channels. Some packeteers contrive clever beacons, to sound bells, clear screens, or print multi-line declarations on the screens of all who can decode the beacon.

The proper rules governing beacons are simple:

1) Determine why you need to beacon.

Beacons declaring that you are unavailable, or on vacation, are perfectly useless and mark you as a real POOPer. If the information you are attempting to convey is important, perhaps leaving it as a message addressed to all on the nearest packet bulletin board station (PBBS) is a better alternative. On the other hand, if you are living in tornado alley and see a funnel, an urgent beacon would be appropriate.

If the purpose of your beacon is to let folks know you are around and want to connect, it may be better to just turn on the radio and let your TNC decode a few packets from other stations. This way you can see who is on and then simply send a connect request rather than a beacon. Many TNCs support a MHEARD function, allowing you to see the contents of a buffer containing the last several packet stations heard by your station.

If you are convinced that you must transmit without listening for a few minutes (or if the channel really does appear dead), dropping into UNPROTO mode (CONVERSE mode from COMMAND mode without first connecting) and typing a short CQ message (which may be as simple as a carriage return if UNPROTO is set to CQ) is preferable to beaconing one.

2) Compose the briefest possible beacon text.

Cute beacons that fill a screen, sound bells, or clear screens will only mark your station as obnoxious. It is a classic way to lose friends and increase your count of enemies!

3) Use BEACON AFTER rather than BEACON EVERY.

If the channel is busy, one-way broadcasts (which is, after all, what a beacon really is) are not welcome. It's bad enough to try and maintain a connection through a digipeater or two without having a channel clogged by transmissions from unattended stations that come on the air every few minutes. Beacon AFTER with a value of thirty minutes will assure that you do not add to busy channel bedlam.

4) Don't send beacons more often than every thirty minutes, preferably even less frequently.

5) Digipeat beacons with care!

Digipeating may cause a large number of local packeteers to be subjected to screens full of your beacon text. This may be desirable. Then again, it may not. Consider your motive and objective for your particular beacon, then set up the path.

Bull POOP

Try entering a field containing a bull. While many bulls are mild mannered, some are very territorial and will chase you away. The same is true of a packet BULLetin board station. Many are mild mannered, aware of other packet stations on the channel and content to

share the channel with them. Others, however, are not. They will chase you away unless you came to feed them. They do it quite simply, and often are ignorant of their ferocity.

A skilled matador, however, can soon tame a ferocious bull. So can the operator of a PBBS tame his BULL. The keys are TNC setup files. Most PBBS software contains a file (or files) describing the characteristics of the TNC(s) attached to the computer serial port(s). The magic commands are PACLEN, MAXFRAME and DWAIT.

PACLEN describes the length of the information field and a setting in excess of 80 (the length of one line on most computer displays) is probably the longest needed.

MAXFRAME can be the cause of a lot of useful bandwidth reduction. If the PBBS is on a channel shared by other users, MAXFRAME 1 is reasonable. We have heard PBBSs sending packets of many frames to stations that were having a hard time decoding anything, and the channel was reduced to uselessness for other stations. Computers are infinitely patient, but humans wanting to use the channel may not be!

DWAIT is perhaps the strongest medicine to apply to an overly possessive BULL. PBBS stations should set DWAIT to 320 milliseconds or more. For a TNC 2 it is DWAIT 32. This allows other stations to get a packet in edgewise.

If you are not the owner of a BULL, but venture into territory where one lives, you can help tame the beast! The following suggestions are highly recommended:

1) DO NOT DX A PBBS! In this case, DX means multi-hop digipeating or networking to a PBBS on VHF. What you find on your local BBS is 99.9% of the time going to be exactly what you find on a BBS fifty or a hundred miles away. Since BBS stations are on 24 hours a day, they make good targets to try to test out long network paths — fight the temptation.

2) Don't send the PBBS a command before it has responded to your previous command! Hitting a key twice (or hitting it harder!) WILL NOT improve your chances of getting through! The nature of a packet system is that the message gets through accurately, or not at all. Sometimes it may take a while, especially if a digipeater or HF link is involved, but it will get through. If not, you will get a ***DISCONNECTED message.

Snake POOP

A snake has a fairly unique characteristic. A snake has no ears! Too many packeteers seem to have the impression that, by connecting a TNC to the speaker jack on their radio, they don't have to have a speaker connected!

The results can often be observed. Excessive retries on a channel because the antenna isn't oriented properly leads to multipath and poor reception. The other end of the link simply "goes away" for no apparent reason (unless you are listening!). The other station is overdeviating, or another user on another mode, or. . . And, on a shared-mode channel (or shared repeater), packet can get a bad name in a hurry!

Kangaroo POOP

A kangaroo jumps around. If you have long files to transfer, you should jump around, too! A busy channel during the early evening hours is not the place for file transfers, automatic message forwarding or similar bandwidth-hungry procedures. What can you do? Jump off to another frequency, perhaps. If this is not feasible, set your alarm for 3 a.m. and jump to another time, eating up the channel then. Just like a voice repeater, make your contact and if you can QSY to another simplex frequency to continue the conversation, you can really help everyone else on the channel.

The final scoop

The ultimate means to eliminate POOP is to SCOOP! By means of the SCOOP, no one will ever be able to detect packet POOP emanating from your station! SCOOP means Setting Correct Operating Parameters. If you heed the advice to avoid POOP given above, this final measure will permit you to have a full clean-air rating!

Happy Packeting!

References

Peter Eaton, WB9FLW and Lyle Johnson, WA7GXD. (1986). *Eliminating POOP from Packet*. TAPR Packet Status Register. Vol 4, #19, April.

This article is provided by TAPR, the Tucson Amateur Packet Radio Corp. For more information contact TAPR, 8987-309 E. Tanque Verde Rd #337, Tucson, AZ 85749-9399; 817/383-0000.

•••

Do it best!

WALTER R. OTTINGER, NS8N

When you are learning to send Morse code, instructors advise you to select an article and copy it over and over again. Good advice as far as it goes. You aren't actually copying characters. You are *spelling* words via Morse code.

Let's say the copy material begins with "Recently, there ...." In your mind you are not thinking of the character "R." You see the word "Recently" and copying is really Morse code spelling. Keep copying it, and in no time character recognition is long gone. My recommendations to avoid those pitfalls:

Select your article and copy it over and over again — but do it my way. Do it backwards. Your first character will be a "period." The last character will be the first letter of the article. You see every character and send it. You can't anticipate what is coming up next. Do it best. Do it my way. Do it backwards!

WR

PRODUCT REVIEW

Swiech 2M 3-element Yagi

STEVE HALL, WM6P

Gene Swiech, WB9COY, has been adding new antennas to his growing line of VHF and UHF products. Most are in the Yagi family with some omni-directional units built ruggedly for hostile environments and the users who want the best.

Swiech Communications Systems is located in San Diego, California. Gene Swiech is the owner and chief designer of his antenna products using computer aided design tools.

The latest antenna that I tested is the three-element Yagi for 2 Meters. The unique feature of this antenna is its ability to be broken down easily into its boom and three element segments for travel. Secondly, the unit is anodized black which makes it very distinctive and nearly invisible under some circumstances. Gene told me the antenna was designed primarily for studio remote microphone applications needing antennas requiring portability and low visibility.

Consistent with Gene's other products, the quality is tops. The coax balun is made of silver plated Mil-spec RG142/BU and is potted to prevent entry of moisture. And as with all of the Swiech products, all mounting hardware is stainless steel. No plated U-bolts here. All brackets are machined from solid aluminum stock.

Assembly is accomplished with thumb screws and takes less than one minute. I've found this ideal for use on T-hunts where a smaller and portable antenna is just right.

As with most small antennas it is rear mounted and drilled so that either horizontal or vertical mounting can be chosen.

While a three element antenna has only modest gain, I'm confident that this antenna is achieving the maximum available without additional elements. During tests during T-hunts, the side and rear lobes were easily distinguished from the forward lobe for unambiguous T-hunting direction finding. The ability to easily switch polarizations was also a plus.

The SWR was easily under 2 to 1 throughout the band and into the MARS frequencies adjacent to the 2 Meter band.

Conclusions

The Swiech antenna's mechanical quality of both design and material has not been matched by the more popular large antenna manufacturers. It gets an A+ in my book. List price for the COY2M3EL is $64.95.

For further information, contact SWIECH COMMUNICATIONS SYSTEMS at (619) 748-2286.

About the author: Steve Hall, WM6P has been an Amateur Radio operator since 1963 and currently holds an Extra Class License. He served in the U.S. Army Signal Corps and currently is employed in the aerospace communications industry. **WR**

Solder safety

MARK HUNTER, VO1MQ

Recently, in a hurry to finish a project, I didn't bother to run upstairs for my glasses. I needed to unsolder a wire to check it. When I touched it with the soldering gun it popped, sending molten solder flying. The same thing had happened many times before, but usually it just sparkles my hand, and I mutter "drat" or something. But this time it hit my left eye. Talk about pain! I thought, "I've done it now." I even considered passing out, but decided instead to try opening the injured eye. Next, I ran to a mirror to see if the solder was still in my eye, but all I saw was a very red upper eyelid. That's when I decided to go the hospital.

The doctor did some tests to see whether the eye was scratched. Luckily it wasn't, so he sent me home. The pain in the eye did go away, but then there was another pain in the wallet. The moral: Always protect your eyes when you solder. ALWAYS. If you don't wear glasses, get a pair of safety goggles at your friendly hardware store. They have models that are lightweight and cheap. If you don't heed my advice, you may learn the hard way, as I did.—*MARC BARK* North Little Rock, AR

DAYTON hamvention® '95

April 28, 29,30, 1995

General Chairman, Ken Allen, KB8KE — Asst. General Chairman, Dick Miller, N8CBU

✷ Giant 3 day Flea Market ✷ Exhibits ✷ Activities for the Non-Ham

When and Where
April 28, 29 and 30, 1995; Dayton, Ohio at Hara Arena

Communications
FAXMail (information sent to you via FAX): (513) 276-6934

BBS via America Online: Keyword "Ham", Select "Hamvention"

PHONE: (513) 276-6930. For fast response, please obtain the committee Voice Mail box numbers via FAXMail or BBS.

FAX (incoming): (513) 274-8369

MAIL: Hamvention, Box 964, Dayton, Ohio 45401-0964

Special Services
Lodging information and special award nomination forms are in our 1994 Program. Call FAXMail or BBS for more information.

License Exam by appointment only. Call FAXMail or BBS for details.

Deadlines
In order to have time to return tickets to you, we must have advanced reservation orders postmarked not later than April 8 (USA) or April 1 (Canada). Tickets will not be mailed before January 15th, 1995. Ticket requests that are received **AFTER** the deadline will be processed and **HELD** for pick-up at Hara Arena. Tickets can be picked up beginning Thursday, April 27 at 8:00 a.m.

Flea Market
Flea Market Tickets (valid all 3 days) will be sold IN ADVANCE ONLY. No spaces sold at gate. A maximum of 3 spaces per person (non-transferable). Electricity is available in a portion of the last Flea Market row for $40 additional per space. Rental tables and chairs are not available in the Flea Market. Vendors ***MUST*** order an admission ticket for each person when ordering Flea Market spaces. Please send a separate check for Flea Market space(s) and admission ticket(s). Spaces will be allocated by the Hamvention committee from orders received by February 1. Please use 1st class mail *only*.

Notification of Flea Market space assignment will be mailed by **March 15, 1995**. Checks will not be deposited until after the selection process is complete. Please indicate in the box below if you would like to attend regardless of Flea Market space assignment.

Free bus service
Free bus service will be provided between Hamvention, Air Force Museum, Salem Mall and Forest Park Mall parking areas. We are investigating ways to improve service to hotels. Please call our BBS or FAXMail for specific information.

Returned Checks
A $20 service charge will be assessed on all returned checks.

HAMVENTION is sponsored by the Dayton Amateur Radio Association Inc.

Advance Registration

Enclose check or money order for amount indicated in U.S. dollars and type or print your name and address clearly.

Make checks payable to:
Dayton HAMVENTION Mail to -
Dayton Hamvention Box 1446, Dayton, OH 45401-1446

Flea Market tickets *Please check one and enclose two checks.*
❑ Send admission tickets **only if flea market space(s) assigned.**
❑ Send admission tickets **regardless of flea market space assignment.**

		How Many	
Admission (valid all 3 days)	_____	@ $12.00*	$_____
Grand Banquet	_____	@ $23.00**	$_____
Alternate Activities			
Saturday Luncheon	_____	@ $9.00	$_____
Sunday Luncheon	_____	@ $8.00	$_____
Flea Market ‡ (Max.3 spaces)	_____	$35/1 space	
	_____	$70/2 adjacent	
	_____	$160/3 adjacent	$_____
Electricity add	_____	$40.00/space	$_____
Covered tent	_____	$230.00 ea.	$_____
		Total	**$_____**

Name _____ Call _____

Address _____

City _____ State _____ Zip+4 _____ – _____

Daytime Phone # ( ) _____ Evening Phone # ( ) _____

* $15.00 at door
** $25.00 at door, if available
‡ Admission ticket must be ordered with flea market spaces

Circuit breakers

NILS A. HALLSTROM, WB7TJK

As a boy, I remember my father instructing me on how to reset the circuit breakers in the power distribution panel. What a wonderful device it was. No longer did you have to unscrew the burned-out fuse and replace it with a new one. You simply pushed the switch to the right and then snapped it to the far left and the lights came back on. Fantastic! The progress in home lighting and related devices were awesome. The year was 1935, the modern age.

I was sitting in our living room reading the June issue of *QST* when I became aware of a barely detectable flicker the lamp I was reading by. I mentioned it to my wife and she said she had noticed the same thing for the past couple of weeks. I told her it was the same thing that happened when branches momentarily touched the secondary power lines during a strong wind storm. However, the wind was not blowing outside.

A couple of days later, while Jo was washing clothes, I started up my band saw in the shop. ZAP!, the main 60 amp breaker tripped and all the outlets in the house were disconnected. I opened the cover on the distribution panel and reset the breaker. Upon doing so, I noticed an arc emit from the inside of the breaker. Hmmm! Heavy load on the circuit, I thought to myself. A couple of evenings later, I observed an occasional flicker in the lights of my radio transceiver. It reminded me of the arc I had observed earlier and decided it was time to take action.

A call to the local power utility resulted in being informed that there was not way to test a circuit breaker to ascertain if it were internally defective. Checking with an ohm meter or HyPot would not guarantee anything.

Thirty five dollars and one new circuit breaker later, I disassembled the old one. What I observed was a set of points pitted like the face of the moon. Heat had discolored the woven copper wire connections within the breaker and the plastic body was heavily carboned and cracked from heat.

It prompted me to write this article to inform you. Shucks!, the 60 amp breaker was only 15 years old! Like I said when I started, WATCH YOUR CIRCUIT BREAKERS and avoid a fire.

—K7LED Relay

Silent Key

Hersh Daniel Miller, W3SWD

Hersh Daniel Miller, W3SWD, became a silent key on September 6, 1994. His career was in the field of communications with the U.S. Department of State from the early 1950s when he initially worked in Seoul, Korea, later traveling to Libya, Viet-Nam and Laos. He retired from public service in the 1970s.

In going through his personal effects and radio log, I discovered that he had been on the radio the day he entered the hospital for the last time. As an active member of the Department of State Amateur Radio Club, he was known as W3DOS, while his home call was W3SWD.

He had cards in boxes, saved over the years, from the many friends he had made while on the air. Radio and communication were my father's passion. He was a loving father who spread his love for life from his family to his friends to the world through his shared voice. I know that he would want his friends to know that his key has become silent.

—submitted by Michael A. Miller

Good idea

The Whitman ARC, Inc. in Massachusetts recently had a demonstration of the MFJ model 259 SWR analyzer, conducted by member Bruce Beaman, K1HTN.

Following a discussion of the logistics of sharing, etc., the members voted to purchase a model 259, power supply, grid dip accessory and carrying case for the use of the club's membership.

—Whitman ARC Newsletter

Off The Air

CW proficiency

This letter is for all those persons, licensed or non-licensed, who want to drop the code requirement in order that they may operate on the HF bands.

First, the requirement for some CW proficiency is mandated by international agreements and is not something that the FCC can simply drop.

Second, YOU CAN LEARN CODE! I used to be one of you. I would whimper about the code and whine that I could not learn it, and could think of no end of excused not to learn it. Then one day I found myself living in the sticks of New Mexico where my ten-year-old Technician Class license and my 2-Meter rig were next to useless. This gave me the needed incentive to "upgrade." You can do it also, providing that you put your mind to it!

DO NOT USE SLOW SPEED CODE FOR PRACTICE! Have the characters sent at a minimum of twenty words per minute so that you learn the letters and numbers as sounds and not as dits and dahs.

For those of you too lazy to do this, there is a way you can get on HF and talk all over the world without going through the code routine. Just go out and buy yourself a CB radio and get after it! The FCC can't police that band very well as they don't have the resources so you are relatively safe in "shooting DX." The 11-Meter band is an excellent DX band, and I wish we had it back. Just do the rest of us a favor, stay off our HF bands until you do upgrade, then "welcome aboard."

ROBERT J. BURCHARDT, AB5QH
Crescent, Oklahoma

Mobile antenna tuners

Gordon West and Cecil Moore, KG7BK (Off the Air, March 1994) are both correct. But if you want a mobile lashup that really works, all the time, any time plus quick band hopping — use the SGC230 antenna coupler with a 108 inch whip and you have it all. Using a tuner to force transceiver happiness is better than not having the tuner but does little to enhance communications. On the other hand a coupler (not tuner-coupler) actually makes a matching resonate antenna for your transceiver and gets the most you can get. For the recreation vehicle fans with all that roof space and an SGC230 coupler, you can rig up a horizontal antenna arrangement that rivals the home base dipole. I've done it and know how it works. By the way, the SGC230 can band hop as fast as you can push your buttons. My experience has been a tuned circuit in two seconds or less, often less than a second — I timed it.

As for Linda Reeder, N6HVF, and dual-band HT intermod. What intermod? I have used dual-band HTs since their beginning and suffered the problem only with those rigs that don't provide the feature that mutes both receivers while transmitting. I have experienced no intermod with my current Alinco 580 HT. Take the time to activate the cross band mute and the intermod should disappear. Keep the volume as low as possible with the mobile rig to minimize intermod. Or better still — use a low Z or noise canceling mic so it won't pick up and transmit speaker audio. Happy mobiling!

PHIL SALLEY, WB4OZN
Montgomery, Alabama

STATION APPEARANCE

Send Worldradio a picture of your shack and the staff will choose a winner to receive a free one-year subscription! Stations will be judged by neatness (wires tucked away, etc.) and accessibility of equipment. Monetary value of equipment is not a consideration.

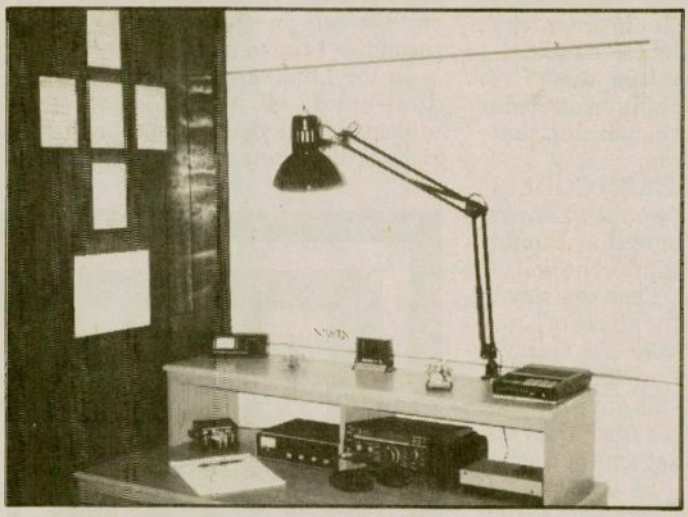
Winners will also receive a top quality, Laserjet-printed copy of the DXCC and WAS BeamHeadings list (a $15.95 value) compliments of Jack Hurray, W8JBU.

Terry Neustel, N7WZN

My station is a very basic low band station. The equipment from left to right on the desk top includes an MFJ electronic keyer, model 422B-X, MFJ model 941E versa-tuner II; the radio is a ICOM 725. Next is a tape recorder I use on DX so I can go back and check information if need be; on the far right is my CDE Autorotor control.

On the top shelf on the left is a field strength meter, then a 24-hour world map clock by MFJ, then a WWII Vibroplex bug that I bought for $20. I did some work on the contacts and with some TLC it works great, but I must admit that I like the electronic keyer the best. Last on the list is a scanner that I use to monitor the 2M frequencies.

The antenna that I use is a G5RV inverted "V" with the apex at 40 feet. The beam that I use is a Mosley 3 element tribander mounted on a 35-foot tower. These were also purchased used and like the bug, a little TLC and some minor repairs the beam works great.



I have been a ham since October, 1991, and as you can see the licenses on the wall are not yet completed. The one on top is my Novice; the one on the left is Technician, far right is General, and lower center is Advanced; the one in the middle is blank as of yet; it is my incentive to get my Extra Class which I hope to get this February, weather permitting as I have to travel 50 miles across the summit of the Blue Mountains.

I spend most of my time on CW, I enjoy it more than phone because of the challenge. I keep pressing myself to go faster and am now at about 22 WPM, I have set my goal at 40 WPM. I have found that this is a wonderful pastime and encourage anybody looking for a hobby that is unlimited and challenging and who want to meet people from around the world, to check out Amateur Radio. **WR**

Amateur "Hi"

*Ever had a funny or strange experience with Amateur Radio, either on or off the air? If so, type it up (or print neatly) and send it to us for consideration in our monthly AMATEUR "HI" contest. You could win a free year's subscription to **Worldradio**!*

Somebody up there...

JOE NEMECEK, KØJN

Living in a large city, a city lot isn't very conducive to low band DX. With much salesmanship from fellow ham Herb Koch, KZ6E, I was talked into getting interested in 160 Meters, "Where working DXCC was a real challenge."

I decided to try tying the top of my 80M antenna together and feeding one end against a 4-wire ground plane. I could get the ground wires to the south and west on my property, but the one to the east was mostly in my neighbor's yard, and the one to the north extended through the neighbor's yard behind me to the street in front of his house.

With the *CQ* 160M contest coming up, I wanted to be ready. The night before the contest I tied the two wires that went off my property to bricks and temporarily laid them out to tune the matching network. I was late getting home and didn't get the chance to ask my neighbors about laying the wires out across their yards.

About 10:00 p.m. I decided to go ahead and extend them and bring them back in before dawn. I would then talk to my neighbors on Saturday to get their permission to repeat the process Saturday night.

After one of the most enjoyable contests I have ever gotten into, I went out Saturday morning, just after 6:30, to discover that about 3" of snow had fallen overnight. Not wanting to leave tracks across my neighbors' yards, I pulled the wires back to my property dragging the bricks through the snow and making a kind of "s" pattern. I then went to bed.

About 10:30 that morning I got up, and took the dogs out in the back yard. I noticed the two neighbors in whose yards I had run the ground wires the night before, standing by the brick tracks talking. Then the neighbor to the north went to the west end of his lot and showed the other neighbor the tracks that led into the street. Then both neighbors walked along the tracks to the east and stopped where they ended—the spot where that brick had rested at the end of the wire the night before. After some discussion, they both looked straight up into the air in unison.

It came to me in an instant. They had come to the conclusion that some creature, dragging its tail behind it, had walked from the street to the lot of my neighbor to the east, made a right angle turn, walked about two-thirds of the way across his lot and then flew into the air.

Some thoughts are just too precious to destroy. I gathered the dogs and went back into the house with my original problem. "What type of DX antenna can I put up on a city lot for 160M?" On my list of priorities a few things are more important than DX—a chance to see your neighbors on "Unsolved Mysteries" is one of them. **WR**

GAP: THE PERFECT ANTENNA

We at GAP realize there isn't a perfect antenna. No singular antenna will scream DX on 80 and be the best for local nets on 10. If anyone tells you there is, beware! The perfect antenna does not exist, but the right one for you may. If you want something to bust the pile on the low bands, then consider the Voyager. Just starting out in ham radio and need a great general coverage antenna, the Challenger is easy to assemble and for little effort will yield superior performance, especially on DX. Maybe you knowingly or unknowingly moved into one of those "restricted areas" where the Eagle's limited visibility, but unlimited ability is desired.

Eagle DX

Challenger DX

Voyager DX

This chart helps you select the right GAP antenna. When comparing GAPs, bandwidth is not a concern. With few exceptions, a GAP yields continuous coverage under 2:1 for the **ENTIRE BAND**.

All antennas utilize a GAP elevated asymmetric feed. A major benefit is the virtual elimination of the earth loss, so more RF radiates into the air instead of the ground. This feed is why a GAP requires **NO RADIALS**. Just as elevating a GAP offers no significant improvement to its performance, adding radials won't either, making set up a breeze.

A GAP antenna has no traps, coils or transformers. This is important. The greatest sources of failure in multiband antennas are these devices. Perhaps you heard someone discuss a trap that had melted, arced or became full of water. Improvements to these inherent problems are the focus of the antenna manufacturer, while the basic design of the antenna remains unchanged. **GAP improved the trap by eliminating it!** Removing these devices means they don't have to be tuned and, more importantly, won't be detuned by the first ice or rain. The absence of these devices improves antenna reliability, stability and increases bandwidth.

Another major advantage to a GAP antenna is its NO tune feature. Screws are simply inserted into predrilled holes with a supplied nutdriver.

The secret is out and people in the know say:

CQ–"The GAP consistently outperformed base-fed antennas...and was quieter."

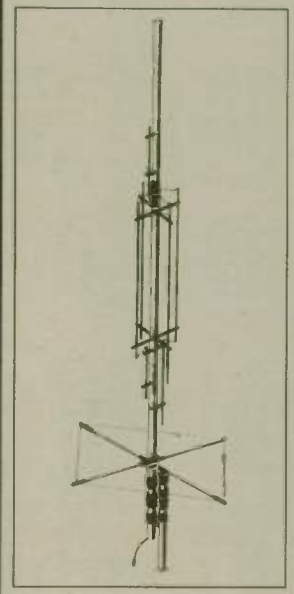
73–"This is a real DX antenna, much quieter than other verticals."

RF–"To say this antenna is effective would be a real understatement. Switching back and forth on 40m between another multiband HF vertical and the GAP, there was no comparison. Signals were always stronger on the GAP, sometimes by S units, not just DB's."

Worldradio – "These guys have solved the problem associated with verticals. That is, an awful lot of RF is wallowing around and dropping into the dirt instead of going outward bound. A half-wave vertical does need radials if it is end fed (at the bottom). But the same half-wave vertical does not (as much, hardly at all) if is fed in the center."

IEEE–"Near field and power density analyses show another advantage of this antenna (asymmetric vertical dipole): it decreases the power density close to the ground, and so avoids power dissipation in the soil below it. The input impedance is very stable and almost independent of ground conductivity. This antenna can operate with high radiation efficiency in the MF AM standard broadcast band, without the classical buried ground plane, so as to yield easier installation and maintenance."

New Release: TITAN DX



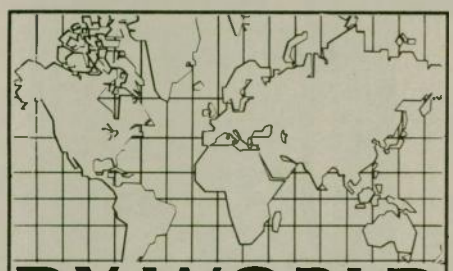
This all purpose antenna is designed to operate 10m-80m, WARC bands included. It sits on a 1-1/4" pipe and can be mounted close to the ground or up on a roof. Its bandwidth and no tune feature make it an ideal antenna for the limited space environment as well as a terrific addition to the antenna farm.

MODEL	BANDS OF OPERATION											HT	WT	MOUNT	COUNTER-POISE	COST
	2m	6m	10m	12m	15m	17m	20m	30m	40m	80m	160m					
Challenger DX	■	■	■	■	■		■		■	■		31.5'	21 lbs	Drop In Ground Mount	3 Wires @ 25'	$259
Eagle DX			■	■	■	■	■		■			21.5'	19 lbs	1-1/4" pipe	80" Rigid	$269
Titan DX (Just Released)			■	■	■	■	■	■	■	■		25'	25 lbs	1-1/4" pipe	80" Rigid	$289
Voyager DX							■		■	■	■	45'	39 lbs	Hinged Base	3 Wires @ 57'	$399

GAP ANTENNA PRODUCTS INC.
6010 N. Old Dixie Hwy.
Vero Beach, FL 32967

TO ORDER, CALL
(407) 778-3728

DISCOVER VISA MasterCard COD



DX WORLD

John F.W. Minke III, N6JM
P.O. Box 310 Carmichael, CA 95609-0310

W-100-N

Congratulations to the following DXers for completing the necessary requirements for ***Worldradio's*** Worked 100 Nations Award:

480. LU5EWO Jorge M. Logiovine
05 October 94
481. KC2Q Michael S. DiPersio
28 October 94

Guyana (8R1)

8R1J has been active on the bands from Guyana. Try 21.011 to 21.015 MHz or 14.010 MHz after 2100 UTC. 8R1Z has also been active, especially on 17 Meters SSB. Look for this one between 18.135 and 18.150 MHz after 1600 UTC. 8R1K was active during the *CQ* Worldwide DX Contest and finds time to get on during non-contest times. He was worked on October 15 at 1245 UTC near 14.087 MHz working Europeans on RTTY. Also on RTTY was 8R1TT. This was an effort by Eddie Schneider, GØAZT, and Glenn Vinsor, W6OTC, during an RTTY contest mid-October. Other calls reported from Guyana include:

8R1AK	3.791 MHz	0400 UTC
8R1AR	28.410 MHz	2045 UTC

Zambia (9J2)

A station signing with 9I3ØZIN has been on the bands the latter part of September and asks for QSL cards to be sent via the Zambia QSL Bureau. 9J2SZ has been very active from Zambia with much of the activity on the WARC bands. On 30 Meters look for him between 10.102 and 10.114 MHz after 1400 UTC, on 17 Meters near 18.145 MHz at 1700 UTC, and 12 Meters around 24.945 MHz at 1500 UTC. He has also been busy on 40 Meters in the lower regions of the Amateur Extra CW segment of the bands between 0300 and 0500 UTC. Other calls reported from Zambia include:

9J2EB	21.321 MHz	1700 UTC
9J2FB	21.337 MHz	1600 UTC
9J2FR	21.370 MHz	1300 UTC
9J2GA	21.265 MHz	1500 UTC

Much of the reporting has been that of the European DXers.

Botswana (A2)

QRZ DX notes that Dave Heil, A22MN, was to have been active on 160 Meters until mid-November when conditions were to have faded. Dave plans to leave Botswana this spring. Anyway, Dave is making sure that nobody will miss a contact with Botswana and has been reported on the following bands:

80 M	3.511 MHz	0200-0300 UTC
40M	7.003-7.025 MHz	0345-0500 UTC
30M	10.101 MHz	2000 UTC
20M	14.275 MHz	2015 UTC
17M	18.114-18.140 MHz	1700-1900 UTC
15M	21.297 to 21.330 MHz	1430-1830 UTC
12M	24.930 to 24.942 MHz	1300-1700 UTC
10M	28.480-28.491 MHz	1400-1630 UTC

You can't say that Dave didn't give it his best effort. Also active from Botswana is A22EX on 15M SSB. Try 21.240 to 21.330 MHz after 1200 and as late as 1800 UTC. A22CT has been active on 17M and can be found near 18.117 MHz after 1700 UTC. I found reports for two other calls. A22JR was on 15M October 9th near 21.355 MHz at 1900 UTC, with A22MC reported on October 15 on 75M at 0300 UTC working into the mid-west on 3.797 MHz.

Oman (A4)

Browsing through the weekly DX news bulletins we receive, the following reports of activity from Oman are:

A41KB	14.077 MHz	1600 UTC
A41LK	18.073 MHz	1000 UTC
A41LP	21.355 MHz	1500 UTC
A41LQ	14.205 MHz	1400 UTC
A45XC	14.088 MHz	1400 UTC
A45XJ	14.183 MHz	1530 UTC
A45ZZ	18.145 MHz	1345 UTC

Uruguay (CX)

There is never much activity heard from this South American country. So, if you hear one of them on, grab him quick. During the last reporting period we only found five DXers from Uruguay reported:

CX1TM	3.789 MHz	0200 UTC
CX2CB	3.797 MHz	0900 UTC
CX3ABE	14.084MHz	1900 UTC
CX4GL	7.006 MHz	0430 UTC
CX8BR	7.002 MHz	0030 UTC

Comoros (D68)

The activity from Comoros is even less. I found reports for activity by only three:

D68CG	14.137 MHz	1700 UTC
D68LC	21.270 MHz	1400 UTC
D68TM	21.292 MHz	1900 UTC

Franz Josef Land (R1F)

R1FJL has been very active from Franz Josef Land. Look for this one on 40M near 7.002 MHz after 0200 UTC, on 30M near 10.109 MHz around 0200 and 1900 UTC, and on 20M between 14.010 and 14.027 MHz after 1400 UTC. He has also been on 160M working Europeans at 2000 UTC. Try 1.826 to 1.830 MHz. Another call worked from Franz Josef Land is R1FJC who was usually on 20M the same frequency and time slot as R1FJL, but different days.

Chagos (VQ9)

Several calls have been reported active from Chagos, and I found activity for at least eight of them. Twenty Meters is a good place to check them out:

VQ9QM	14.017 MHz	1515 UTC
VQ9SS	14.077 MHz	1600 UTC
VQ9TN	14.087 MHz	1330 UTC
VQ9TT	14.014 MHz	1300 UTC

For some 17M activity listen for these calls:

VQ9HJ	18.138 MHz	1600 UTC
VQ9QM	18.089 MHz	1500 UTC
VQ9TN	18.142 MHz	1300 UTC
VQ9TP	18.083 MHz	1345 UTC
VQ9XX	18.078 MHz	1615 UTC

With the 160M season upon us VQ9QM has been reported on 1.829 MHz around 2345 UTC and VQ9SS on 1.830 MHz at 2245 UTC. The eighth call reported was that of a 15M contact into Europe on October 15th with VQ9ZX at 1400 UTC near 21.294 MHz.

IOTA

Stu Sephens, K8SJ, gives advance notice of an IOTA DXpedition to Bequia Island, in the Grenadines (NA-025). This will be a CW- only affair signing with J8/K8SJ, February 10 through 23, which will include the ARRL International DX Competition. The tentative schedule includes: 1.835 MHz at 0400 UTC; 3.502 to 3.512 MHz 0300-0600 UTC; 7.002 to 7.012 MHz 0200-0600 and 1100-1200 UTC; 14.002 to 14.027 MHz 1900-2100 UTC; and 18.077, 21.025, 28.025 MHz 1600-1700 UTC. These times should be daily with possible visits on 30M. Stu requests that an SASE be included for all direct QSL requests. IOTA types need not be reminded of this as all the requests I received for the

N6JM/KL7 operation did indeed include SASES. The following is a selection of the activity found on the bands recently. Much of the IOTA activity centers around 14.260 MHz.

AS-029	Stolbovoy Island	UAØQJG/Ø
AS-042	Severnaya Island	RØ/LY2BMV
AS-058	Langkawi Island	9M2/GMØDEQ
AS-070	GUSMP Island	UAØQBO/A
EU-028	Montecrist Island	IA5/IKØSX
EU-057	Ruegen Island	DFØFA
NA-034	Anna Maria Island	KF4WS
NA-045	Mujeres Island	XF3/XE3XE
NA-046	Nantucket Island	W1/G4DZC
NA-047	Baffin Island	VE2BQB/VE8
NA-135	Carmen Island	XE1BGM/3
NA-140	Kent Island	W3YN
NA-173	Long Island	KD2JR
OC-061	Minerva Reef	A35SS
OC-088	Borneo Island	9M6/GMØDEQ
OC-129	Cebu Island	DU7AF
OC-133	Selingan Island	9M6/GMØDEQ
OC-137	Lamb Island	VK4CY
OC-190	Rose Atoll	WA6BLQ/KH8
OC-201	Great Barrier Island	ZL6WA
SA-026	Santa Catarina Island	PP5AM

If you worked the *CQ* Worldwide DX Contest the end of October you may have collected several IOTA islands, such as VA2TA from Baffin Island (NA-047). IOTA chasers might be interested in a brand new newsletter published by Vance, W5IJU. This little publication, *Island News*, is published twice a month with subscription rates of $24 per year. Vance lists all the upcoming IOTA DXpeditions and other items of interest concerning IOTA. To subscribe write to Vance at 2618 McGregor Blvd, Fernandina Beach, FL 32034.

The IOTA Committee and Yaesu have entered into a sponsorship agreement in which Yaesu becomes the sole sponsor of the program. This agreement will run for three years from 1 October, 1994. Under this agreement Yaesu will inject funds into the IOTA program which will be used by the IOTA committee to finance its costs of running the program.

Yaesu will be making a portable station available on loan for the use of IOTA DXpeditions, together with QSL cards. The *1995 IOTA Directory* is now available and includes many new reference numbers since the last publication. In addition the IOTA committee has published a separate anniversary booklet, *IOTA - 30 Years On*. Included are a few writeups on the various IOTA DXpeditions, a list of those who have applied for the various IOTA awards, and very informative - *Most Wanted Islands*. If you have ever considered an IOTA DXpedition, this booklet will be quite helpful in choosing an IOTA island to visit. Both publications are available for $18.00 (U.S.) from Dewitt L. Jones, W4BAA, P.O. Box 379, Glen Arbor, MI 49636. This applies to North America residents only. The directory disk version is available from Datamatrix, 5560 Jackson Loop NE, Rio Rancho, NM 87124 for $8.50. The disk is for an IBM compatible PC in WordPerfect 5.1, WordStar 3.3 and plain ASCII. Please specify format and disk size, whether 720kB or 1.44MB. If you are interested in the IOTA program you should get your copy of the *Directory* now. The cost of each publication purchased separately is $10. Again, the two together is $18.

DXCC Desk

The Awards Committee voted 5 to 2 against a DXAC recommendation that would set a minimum size for new DXCC countries. Those voting against shared the feeling that a minimum size rule was not needed. Standard Operating Procedure for the committees allow the DXAC to resubmit a recommendation on appeal, which I understand the DXAC intends to do. Individuals may send comments to ARRL headquarters. Comments addressed to the DXAC will be read by members of both committes, (the DXAC and the Awards Committee). Chairman Bob Beatty, W4VQ, of the DXAC, has declared a moratorium on new DXCC country petitions that may be affected by a minimum size rule. This moratorium will continue until such time as the deliberations on this issue are complete.

The DXCC Desk reports that the number of unprocessed applications at the end of September was 925, which included 70,916 QSL cards. During the month, 1233 applications (82,831 QSL cards) were received for endorsements and new awards. Applications being sent out at the end of the month were received fewer than three weeks earlier. Some of the applications received prior to that time were waiting for paper records to be converted, or were being audited, and so had not yet been completed.

LOGPlus! Version 3

Last year I complained about another computer logging program and inquired if there were any real satisfactory logging programs available. As a result I received two programs. Our old computer was slow, could accept only 360K floppies, and was about to die, so we waited until a new machine was purchased. Well, we finally got the new computer and decided to try LOGPlus! Version 2, by Robert A. Winters, KD7P. In the meantime, I also sent off for Version 3.

I had problems installing the new version (I am not very computer smart). In one case, I ran the conversion program (Version 2 to Version 3) and wound up with twice as many records in the files. The program crashed a few times. Anyway, everything seems to be fine now.

I modified the AUTOEXEC.BAT and CONFIG.SYS files as recommended, which may have caused the crashes.

A good reason to use LOGPlus! is the feature of automatically tracking your DXCC records. LOGPlus! will check the call and decide what DXCC country and zone the call is in. The information may be modified, particularly those former Pacific calls such as KB6, KG6 and KJ6. LOGPlus! would treat those calls as California. A feature has been provided to correctly assign the former calls to their respective DXCC countries.

In addition to DXCC, LOGPlus! tracks some other popular awards such as WAZ, WAS, IOTA, and Russian oblasts. Interesting is the fact that only oblasts of the Russian republic are tracked, as the former Soviet W-100-O award is no longer available.

There is also a county hunting feature, although I have not tested this feature as yet. I am too busy updating my DXCC records and bringing them into the system.

Many DXers, including me, work towards various other awards. LOGPlus! has provisions for such as generic awards. Initially, the parameters must be set up which will include a unique symbol, such as "#", immediately followed by data of a predeterminded length. This information is entered in the "Note" field during the logging process. There is the option of having LOGPlus! automatically delete this information from the "Note" field after an automatic update has been initiated. This will avoid the nuisance of the automatic re-entry of the same information during additional updates. However, one may not want to remove the entire information in the "Note" field. I would recommend on future revisions of LOGPlus! that only the unique symbol be deleted. Such as the case for those 10-10 members who collect 10-10 numbers and wish to retain that information in the log.

When I converted my generic records from Version 2 to Version 3 as instructed, this feature did not convert. I tried to copy the old GENERIC.DBF file into the system and all seemed well. Then when I tried to run one of the generic awards programs, the system crashed. As a result, I had to re-enter all the generic programs. Version 3, however, is much improved in tracking the generic awards. Unfortunately, in modifying the "Information" field, only capitalized letters will appear with no lower case possible, just as with modifying an operator's name in the logbook record. If you are not a perfectionist, this is no problem, LOGPlus! has a conversion feature from contest logging programs such as CT. I was able to convert my contest logs that I ran during Version 8 of CT, but not Version 9. All I got was garbage. The manual for LOGPlus! claims the fault lies with CT. I wish they could work it out with each other.

As I stated, I am not very computer smart, but it seems to me that if the CT logs are printed when in DOS, why can't LOGPlus! read DOS files? My WordPerfect has no problem in converting them. LOGPlus! has a huge database of QSL Managers. During the logging process LOGPlus! automatically searches the database to see if there is a QSL route and enters the call in the manager field on the screen. If no manager is found the field will be blank.

One also has the option of searching the database for a QSL manager, either by the manager's call or the DX station's call. Just for the fun of it I entered W6KYA, a call I haven't used since 1977. What pops up? KY6ITU! That was a call I used during ITU week back in 1975 - the days when the FCC was generous with the issuing of special event calls. LOGPlus! has a feature where more than one call may be tracked.

Miscellaneous

Jim Muller, VK1FF, (home call WB2FFY), is with the U.S. Embassy in Canberra, writes that he is active on 40M CW and needs South Dakota to complete WAS on that mode/band. Jim is usually on the air between 0900 and 1300 UTC between 7.003 and 7.015 MHz. Of course, this is in the Amateur Extra part of the band, but the 7.025 to 7.035 MHz segment is busy with Japanese operators. Going higher in the band will cause Jim interference from SSB stations.

Anyone who can help Jim with his last state may contact him at PSC 277 Box 152, APO AP 96549. Jim is also a volunteer with the VK1 QSL Bureau, and has been receiving invalid QSL cards for such calls as VN1A, VN1Z and VK1F. The probable calls are probably 4N1A, 4N1Z and 4K1F, respectively. There are no single letter suffix calls in Australia.

QSL Information

The Salt City DX Association newsletter notes that Vasil Kasyanenko, RW6HS, is running the Russian 6th Call Area QSL Bureau and will handle all cards that have the first letter of the suffix beginning with: A, B, E, F, H, I, J, L, P, U, W, X, and Y. Again, this applies for the 6th area only. Incidentally, Salt City is Syracuse, and is not to be confused with that city near the big lake in the west.

4U/F5OWB/9U
UNSCF Radio Tech
P.O. Box 200
Bujumbura, BURUNDI

5NØHMA —Marc
P.O. Box 1117
Apapa Lagos, NIGERIA

5R8DY —Marian
P.O. Box 404
Antananarivo, MADAGASCAR

7P28LI —P.O. Box 333
Maseru, LESOTHO

7Z5OO —Harvard Wireless ClubW1AF
6 Linden Street
Cambridge, MA 02138

8R1TT —Eddie Schneider, GØAZT
P.O. Box 5194
Richmond, CA 94805

A71BI —Ibrahim
P.O. Box 9894
Doha, QATAR

BVØO —P.O. Box 222
Taitung 950, TAIWAN

E21AOY —P.O. Box 8
83150 Phuket, THAILAND

FY5GF —P.O. Box 6005
F-97306 Cayen
FRANCE

HKØER —Juan Antonio Luna Corcueba
P.O. Box 934
San Andres Island
COLOMBIA

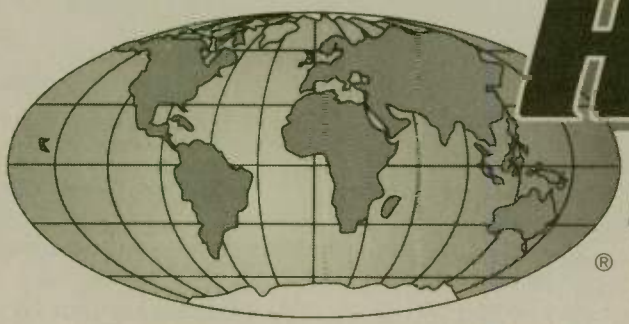
J28JJ —Jean Jacques Chatclard
P.O. Box 1076
DJIBOUTI

PJ7/K1VSJ —Howie Bromberg
21 Wingate Road
Providence, RI 02906

QSL Routes

3A/IK2DUW	IK2ECN	8Q7EB	DL2SEK
3A/IK4WMG	IK4PKZ	8R1K	OH6DO
3B8/JA1ELY	JA1ELY	9A9D	9A1GIJ
3B8/JA1ETQ	JA1ETQ	9G5TL	KG6XC
3B8/JA1IDY	JA1IDY	9H3JAM	9H1JP
3B8/JA1OEM	JA1OEM	9I3ØZIN	9J Buro
3B8/JL1UXH	JL1UXH	9J2SZ	SP8DIP
3D2PM	N6DQN	9K2HA	ON6BY
3D2XC	JE1DXC	9K2ZC	KC4ELO
3DA/SP2JYX	SP2JYX	9Q5AGD	SMØAGD
3ZØPLK	SP9KZ	9Q5TE	SMØBFJ
3ZØTEE	SP4ZSX	9V1YC	AA5BT
4K7FA	OE3SGU	9X5/VE3MJQ	VE2PR
4L1HX	IK2MRZ	9X5HG	DK2SC
4L8A	OZ1HPS	A22EX	N4CID
4M5I	I2CBM	A35SS	AA6BB
4N7ØAT	DC3SZ	A61AD	WB2DND
4N7ØDX	YU1DX	BP5Y	K4UTE
4S5PL	FG5BG	BT45PRC	BY1QH
4U1WB	KK4HD	BV/N4MQX	N4MQX
4U49UN	W3CZN	BVØO	BV3BC
4X/K6KLY	K6KLY	BZ1QL	BY1QH
4Z66MC	AA7WD	C53HG/E	W3HCW
5H3JD	DK9MA	C56/GØMRF	GØMRF
5NØGC	F2YT	C56DX	GØMRF
5N3NDP	IK5JAN	C6AFT	AA5NT
5R8DL	JH8YZB	C6AHM	N5TVL
5R8DP	JA1OEM	CK1TX	VE1TX
5U7Y	JG3UPM	CN8YB	N6EK
5V7DB	(See Note 1)	CO2JD	HI3JH
5W1GC	KE5GC	CO9OTA	CT1ZW
5W1MM	JE6IBJ	CR9WAG	DL8KWS
5X1HR	KF7E	CS8EGW	CT1EGW
5X1XT	WF5T	CT5GIL	CT1DJE
5Z4FO	KB4EKY	DL/IV3NVN/P	IV3TMW
6D2X	K5TSQ	DL3KUD/CT3	DL3KUD
6W1AE	F5THR	DL8KWS/CT3	DL8KWS
6Y5/V31VW	W7WY	DU6BG	AB6BG
7P28LI	7P8SR	EA8BYR	WA1ECA
7Z1AB	KN4F	EA9OB	EA5BY
7Z5OO	W1AF	EJ5ØJS	LY1DS
8Q7EA	DL2SEZ	EMØF	OE5EIN

> 12 STORE BUYING POWER! <



HAM RADIO OUTLET®

WORLDWIDE DISTRIBUTION

Phone Hours:
9:30 AM to 5:30 PM
Store Walk-In Hours:
10:00 AM - 5:30 PM • Closed Sundays

CALL TOLL FREE:

West	1-800-854-6046
Mountain	1-800-444-9476
Southeast	1-800-444-7927
Mid-Atlantic	1-800-444-4799
Northeast	1-800-644-4476
New England	1-800-444-0047

Toll free, incl. Hawaii, Alaska, Canada; call routed to nearest store. ***all HRO 800-lines can assist you, if the first line you call is busy, you may call another.***

ANAHEIM, CA 92801
933 N. Euclid St.
(714) 533-7373
(800) 854-6046
Janet, WA7WMB, Mgr.
Near Disneyland

OAKLAND, CA 94606
2210 Livingston St.
(510) 534-5757
(800) 854-6046
Rich, WA9WYB, Mgr.
I-880 at 23rd Ave. ramp

SAN DIEGO, CA 92123
5375 Kearny Villa Rd.
(619) 560-4900
(800) 854-6046
Tom, KM6K, Mgr.
Hwy. 163 &
Claremont Mesa

SUNNYVALE, CA 94086
510 Lawrence Expwy. #102
(408) 736-9496
(800) 854-6046
Jim, KE6ITS, Mgr.
Lawrence Expwy.
So. from Hwy. 101

VAN NUYS, CA 91411
6265 Sepulveda Blvd.
(818) 988-2212
(800) 854-6046
Jon, KB6ZBI, Mgr.
San Diego Fwy.
at Victory Blvd.

NEW CASTLE, DE 19720
1509 N. Dupont Hwy.
(302) 322-7092
(800) 644-4476
John, N1IFL, Mgr.
RT. 13 1/4 mi., So. I-295

PORTLAND, OR 97223
11705 S.W. Pacific Hwy.
(503) 598-0555
(800) 854-6046
Earl, KE7OA, Mgr.
Tigard-99W exit
from Hwy. 5 & 217

DENVER, CO 80231
8400 E. Iliff Ave., #9
(303) 745-7373
(800) 444-9476
Joe, KDØGA, Mgr.

PHOENIX, AZ 85015
1702 W. Camelback Rd.
(602) 242-3515
(800) 444-9476
Gary, WB7SLY, Mgr.
East of Highway 17

ATLANTA, GA 30340
6071 Buford Highway
(404) 263-0700
(800) 444-7927
Mark, KJ4VO, Mgr.
Doraville, 1 mi.
no. of I-285

WOODBRIDGE, VA 22191
Washington D.C. area
14803 Build America Dr.
(703) 643-1063
(800) 444-4799
Curtis, WB4KZL, Mgr.
Exit 161, I-95, So. to US 1

SALEM, NH 03079
Boston, MA area
224 N. Broadway
(603) 898-3750
(800) 444-0047
Chuck, KM4NZ, Mgr.
Exit 1, I-93;
28 mi. No. of Boston

AZ, CA, CO, GA, VA residents add sales tax. Prices, specifications, descriptions, subject to change without notice.

US TOWER CORPORATION

MA-40
40' Tubular Tower
REG. $809 ***SALE $679***

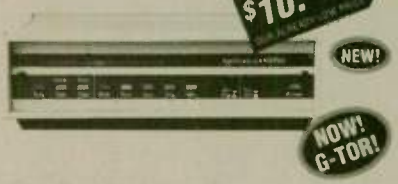
MA-550
55' Tubular Tower
Handles 10 sq. ft. at 50 mph
Pleases neighbors with
tubular streamlined look
REG. $1369 ***SALE $1069.95***

TX-455 *SALE $1499.95*
55' Freestanding Crank-Up
Handles 18 sq. ft. at 50 mph
No guying required
Extra-strength construction
Can add raising and
motor drive accessories

Towers Rated to EIA Specifications
Other Models at Great Prices!

KANTRONICS

KAM PLUS



True Dual Port Simultaneous HF/VHF Operation

NEW KAM Plus features 128K RAM, EPROM space for 1 MB, on-board clock, expanded personal mailbox and **Pactor! And G-TOR!** Operating modes include CW/RTTY/ASCII AMTOR/PACKET/PACTOR/WEFAX Terminal programs available for PC, Commodore and Macintosh computers.

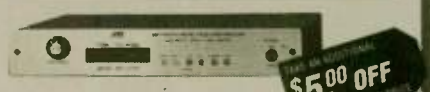
CALL FOR OUR SPECIAL PRICE!

MFJ

MFJ-949 E

Built-in dummy load
New peak and Average Lighted
2-color Cross-Needle SWR/Wattmeter
Built-in antenna switch, balun • Covers 1.8-30 MHz
All MFJ Packets Stocked!

MFJ-1278 B

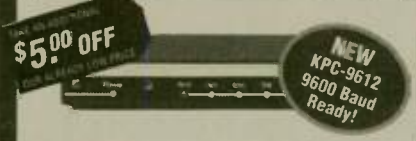


All 9 digital modes
Easy Mail ™ Personal Mailbox
20 LED Precision Tuning Indicator
Includes free power supply
One Year Unconditional Guarantee

Call now for all MFJ products...
Wattmeters, dummy loads, coax switches, keyers, clocks, speaker and mics, software, books and more!

KANTRONICS

KPC-3/KPC-9612



A high-performance, low power TNC for new and experienced users. Features dual level command set with 23 and 130 commands, respectively. Battery backed 32K RAM expandable to 512K. PBBS includes two-way forwarding, message header editing, remote sysop access and KA-NODE.

Call For Special Low Price!

rfconcepts

VHF/UHF

Solid State Amplifiers

Contemporary design, quality and a 1 year warranty on parts and labor. 1 year on the RF Final transistors. Most amplifiers have GaAsFET receive pre-amps and high SWR shutdown protection

GEOCHRON

Global Time Indicator

• Detailed illuminated map shows time, time zone, sun position and day of the week at a glance for any place in the world. Continuously moving - areas of day and night change as you watch. • Mounts easily on wall. • Size: 34 1/2" x 22 1/2".

Reg $1295. ***SALE $999.95***

DX Prediction — January 1995

Maximum usable frequency from West Coast, Central US and East Coast *(courtesy of Engineering Systems Incorporated, Box 939, Vienna, VA 22183).*

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

CENTRAL USA

UTC	AFRI	ASIA	OCEA	EURO	SO AM
8	*(12)*	8	12	*8	*12
10	*(12)*	8	*12	*(8)*	*12
12	*(11)*	8	12	*(8)*	17
14	23	10	*22	*(15)*	*25
16	26	*(10)*	18	*(13)*	*27
18	27	*(10)*	*(15)*	*(18)*	*29
20	22	*(9)*	*(18)*	*(9)*	*29
22	19	*(16)*	*23*	*(8)*	*26
24	*15	*(14)*	23	8	*19
2	*14	*(10)*	16	8	*15
4	*13	*(9)*	*(14)*	8	*14
6	*(13)*	*(8)*	*(13)*	8	*13

WEST COAST

UTC	AFRI	ASIA	OCEA	EURO	SO AM
10	*(10)*	10	*13	*(8)*	*12
12	*(9)*	10	12	*(8)*	*(12)*
14	*(9)*	10	12	*(8)*	23
16	*(18)*	10	*18	*(12)*	27
18	20	*(10)*	*(15)*	*(9)*	28
20	21	*(11)*	*(18)*	*(9)*	29
22	*(18)*	20	22	*(8)*	28
24	*(16)*	21	25	*(8)*	*13
2	13	18	24	8	*16
4	11	13	16	8	*14
6	*(10)*	*(11)*	*(14)*	8	*13
8	*(10)*	*11	*(13)*	8	*13

EAST COAST

UTC	AFRI	ASIA	OCEA	EURO	SO AM
7	*(12)*	8	*(12)*	8	*13
9	*(12)*	8	*12	*8	*12
11	21	8	12	13	18
13	26	9	*22	16	*25
15	27	*(8)*	*(20)*	15	*27
17	28	*(8)*	*(17)*	14	*29
19	*28	*(8)*	*(16)*	*(10)*	*29
21	24	*(13)*	*(21)*	9	*27
23	*15	*(13)*	*(23)*	8	*20
1	*14	*(10)*	*(16)*	8	*16
3	*13	*(9)*	*(14)*	8	*14
5	*12	*(8)*	*(13)*	8	*13

EO5ØCZZ UT1CZZ HSØZAG K9ECE
EO6ØJS LY1DS HS7CDI 7L1MFS
ET3BN DL1JRC HV3SJ IØDUD
EU1DX UC2ADX IBØC IKØAZG
EU7SA RC2SA IO2A IK2RZP
EW1MM SM6OEW IQ9K IT9JOF
EW8WA SP8JM IZ8ARI I6LKB
EX9HQ DF8WS J31K W8KKF
EY8MM DL8WN J37K W8KKF
FG5FR F6FNU J37T K6GXO
FG5FZ F6FNU J39L WA8LOW
FG5GZ F6CLK J3A WA8LOW
FH/JA1IDY JA1IDY J6DX N9AG
FR/JA1OEM JA1OEM JWØH LA5NM
FH/JL1UXH JL1UXH JX3DI LA3DI
FS5PL FG5BG K3DI/VP9 K3DI
FY5FJ IK2HTW KC6OK N5OK
FY5FY F6EVZ KC6SS WV5S
FY5GJ F2YT KG4JO WI2T
GD4VGN DL4FF KG4ML WB6VGI
GMØGQV/9G1 G4XTA KH2DD/KHØ JA1SGU
GMØKCY/P GM3ITN KH8AF WB4AKH
HC8A WV7Y KH8AL/FS KH8AL
HC8N AA5BT L73AA LU4AA
HH1D NE8Z LX1DM ØØMMI
HH1T NE8Z LZ1OTA LZ1KDP
HH2LQ KM6ON OK8EMR PA3EMR
HL9DC N7RO OK8GMT PA3GMT
HP1XBH W4YC OS5GK ON5GK
HQ1T HR1FC OS6TT ON6TT

OT4T ON4UN UX2MM DL3BQA
OT4V ON4AW V26B WT3Q
OX3XR OZ3PZ V26X N1HIW
P2ØWW WD9DZV V26Y W2KKZ
P4ØW N2MM V26Z WF2S
PA3EVJ VE3MR V29NR YU1NR
PA6OMG PAØKHS V31CK XE1CI
PI4COM PA3CAL V31ER W7WY
PJ7/OH2LVG KE4LZ V31JY KV5E
PJ7/WB1HBB WB1HBB V31MP W5ZPA
PJ8X KE7LZ V31VW W7WY
PJ8Z KA9FOX V31YK W5JYK
RØ/LY2BMV LY2BIP V47NS W9NSZ
R1FJV RW3GW V47WK AB4JI
RK4WWQ AA4NU V59T WA2FIJ
S42U ZS2U V7X KH6HH
S61XQ G4PKP VA1S VE1AL
SV8/HA4XG/P HA4XG VA2TA VE2BQB
SY1MF SV1MF VE2NRK WJ2O
T2ØXC JE1DXC VE2TJA WB2K
T3ØBH ZL1AMO VE3MJQ/9X5 VE2PR
T3ØGI JA3IG VE9AA VE1MQ
T5AR SMØDJZ VI1HSK WB2FFY
T91DNO DL1DAZ VK1DX VK1PJ
TA/DF8AN/P DF8AN VK1FF WB2FFY
TG9IKN KC8AGX VK3FBM/3 NN7A
TJ1JR N7VEW VK3FBM/5 NN7A
(See Note 2) VP2E/WB1HBB WB1HBB
TK3K F6KLS VP2MEG WB2LCH
TM1C F5NLY VP5R N2VW
TM2P F6CYV VP8BKT GØKUC
TM4T F5NBU VP8GAV GMØLVI
TM5IPA F5LGQ VQ9TN K5TNP
TM5STR F6DNX VQ9TP N5TP
TM8P F5KFE VS6GZ OE1GZA
TO5MM N3ADL VX3N VE3XN
TO9TI F6AJA XE2DV W7ZR
TU4EI W3HCW XF3/K7DBV
TU4EV WD4IFN K7DBV
UAØQJG/Ø UA1AGC XF4M AA6BB
UE3LAA UA3LAF XT2BW WB2YQH
UE6LRD UA6LU XU7VK HAØHW
UE9WAC W3HCW XX9TSX G3SXW
UU5J LZ3DB XX9TXF G3TXF

YJØAAY W6YA ZF1CQ W8BLA
YS1DRF W2PD ZF1DX W8BLA
Z32JA YU5XTC ZF2JI KG6AR
ZA1AJ OK2PSZ ZF2MC N7MCA
ZA1E I2MQP ZF2VW W7WY
ZA2GD W2DFG ZF8BS AA6KX
ZD7BJ W4FRU ZK2XN LA9GY
ZD7HG ZS4FG ZP5XYE JA7ZF
ZD8KJ GØFXQ

SMØCNS/DU7
—Thomas Bevenheim Ronda
Cebu Island 6034
PHILIPPINES

TA7I —Ozkan Ozal
P.O. Box 164
TR-61000 Trabzon, TURKEY

TY5HA —P.O. Box 1274
Cotonou, BENIN

V31XD —Alena Bruchanova,OK2XDE
P.O. Box 50
591 01 Zdar n S
CZECH REPUBLIC

V51CM —C. McIntyre
P.O. Box 1500
Taumeb, NAMIBIA

V73C —OKDXA
P.O. Box 88
Illston, OK 74881

XW8KPL —P.O. Box 59
Kyotonishi, 616, JAPAN

YI1HXH —Rafat
P.O. Box 28192
12631 Baghdad, IRAQ

ZB2EO —John J. Bautista
47 Valiant House
Varyl Begg Estate, GIBRALTAR

NOTES: 1. All contacts with 5V7DB via SSB and CW go to DJ8SI; RTTY contacts go to DJ6JC. 2. This manager requests that cards be sent direct only.

Many thanks to the following contributors: G3NUG, VK1FF, W7WY, K8SJ, Western Washington DX Club (WAØRJY), Western New York DX Association (K2NMV), Salt City DX Association (KB2G), The Ohio/Penn DX PacketCluster (KB8NW), International DX Association (W4WMQ), The American Radio Relay League (K5FUV), Amateur Radio Action (VK9NS), Long Skip (VA3JS), *The Low Band Monitor* (KØCS), *Inside DX* (N2AU), *DX News Sheet* (G4DYO), QRZ DX (W5KNE), and *The DX Bulletin* (VP2ML).

I made an attempt in the October *CQ* Worldwide and wound up more frustrated than making contacts. Maybe this is a signal to get caught up in the QSL chores. Check back through your logs for missed QSLs both sent and received. Think positive! The bands should improve before long.

73 de John N6JM. WR

Overheard. . .

"I hate CW!"

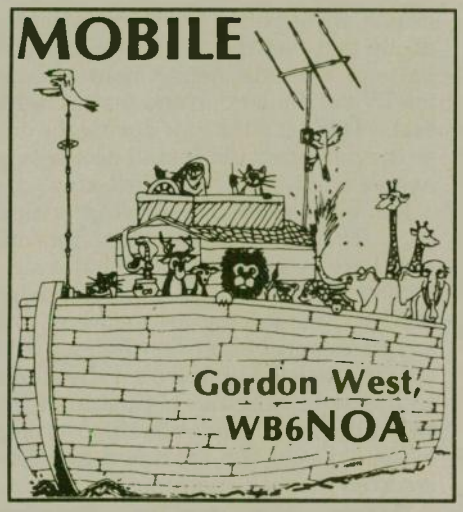
"What's wrong with it? It's lots of fun!"

"Well, mostly my hand gets tired. What I really hate is the end of the contact!"

"Why is that? If your hand is tired, I'd think you were ready to quit."

"Yeah, but it's because the guy on the other end always asks me to send those seventy threes!!!"

Avoid discouraging new hams. Remember, 73 is already plural!—Plano ARK *Parking Ticket*



Boat net lingo

Maritime mobile nets are the radio lifeline that keep amateur radio boaters in touch with each other and with shore stations. While there are literally hundreds of local nets that may take place on 75 Meters, longer-range maritime mobile nets on 40 Meters, 20 Meters, and 15 Meters are best recognized by their names:

Seafarer's Net
Sandia
Net Pacific Maritime Net
International Maritime Mobile Net
Intercontinental Net
East Coast Waterway Net
Chubasco Net
Baja California Maritime Net
Manana Net (Kaffee Klatch Net)

These maritime nets plus all of the local nets on 75 Meters are well-structured in the way they operate. When they first come up in the morning or afternoon, there is a request for emergency calls only. Then priority. Then health and welfare traffic regarding a person's well-being. Then routine traffic from members, and then newcomers.

If you have never checked into a maritime mobile net, LISTEN FIRST! Marine nets have a structured way of conduct, and you don't want to come in at the wrong time. If it's your first check-in, wait until they call for visitors. Come in with your complete call letters, phonetically. Be a regular part of the maritime net, and become a "regular." You can give locally observed marine weather reports, handle messages for other ships without hams in your anchorage, and relays for vessels that you hear that the net control may not hear. As a "net regular" on the marine nets, you will establish a friendship among other operators on shore who will be glad to handle phone-patch traffic for you if the need arises.

But no shore station enjoys hearing only from a boater when that mariner is simply looking for anyone on shore to get a phone call placed. There is no problem with phone-patch traffic, but make sure you support that net with more than just the need for a free phone call ashore.

Here are some terms that may be universal to many public service nets, but unique to maritime mobile nets.

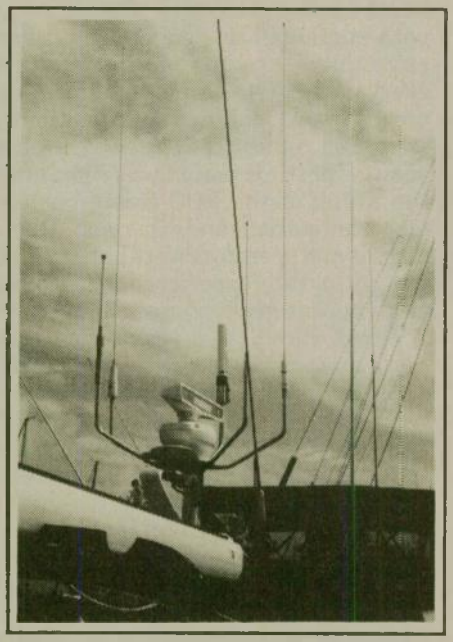
BREAK BREAK BREAK. Emergency call, same as SOS.

CHECK-IN WITH. You are checking in with traffic for another station.

CHECK-IN WITHOUT. You are checking in but have no traffic.

CHECK-OUT. Leaving the net.

CONTACT! You want to talk with the station who just sent their call sign.



Plenty of maritime antennas

INFO! I can tell you about what you were asking for. LONG-HAUL. You wish to place a phone-patch call from ship to shore, and the charges are okay to be reversed to the called party.

ONE WAY. You just need a message delivered to someone on shore without an actual phone-patch necessary.

RE-ENTRY. You are coming back on frequency after being absent for a few minutes.

RELAY. You hear the other station and wish to relay their message to net control.

200 and DOWN. You will switch off (QSY) off the net frequency and meet the other party on the band you are on, 200 kHz, or tuning lower than 200 kHz if that frequency is in use; i.e., 7200 kHz, 14200 kHz, 21200 kHz, etc., and down.

I'LL CALL YOU. You will switch off the net frequency and place the first call to the other station. The other station should listen for your call.

UP 5. You may be troubled by interference and you ask the other station to go up 5 kHz; i.e., 14,200 will shift to 14.205 kHz.

COME BACK IF YOU GET LOST. This means to return to the net frequency in case you can't find the other station you wish to communicate with on the other frequency.

Be careful with business calls. Calling your own business is in violation of the rules. However, the new rules do permit you to place a phone call to a marine store to order a part. That's right, it's now perfectly legal. I wouldn't give my credit card number over the air. And I wouldn't be using my ham radio on a daily basis to order parts. But the new rules now make it perfectly okay to call the marine store to order a new depth sounder transducer, or the hardware store to order a new cleat, or to call ahead to the yacht club to make sure You've got a table for four when you finally hit the guest dock.

The tiny TS-50

An excellent book called "Cruiser's Radio Guide" contains 150 pages of information for $19.95, and is available from the authors, Roger and Marilyn Krautkremer, W6SOT and KBØJW, by calling 619/984-4304. Not only is it an excellent guide to using ham radio aboard boats, but it also has three pages exclusively listing all of those big and small maritime mobile nets throughout the world for the cruising sailors on ham radio. Call for a copy today—it's a wealth of information for the maritime mobile operator. **WR**

When I look back at the "electronic" events in my life, I still have a special warm spot for the excitement of putting WDAY-TV, the first television station in the eastern part of North Dakota, on the air. We began at 6:30 p.m. on June 1, 1953 and we telecast until about midnight from a two car garage for a studio, with a single car garage as a prop storage area. And to top off all that excitement, I quit smoking forever on the very same day.

WDAY, Incorporated, owned the first radio station in North Dakota and it had been on the air since 1922. It was a great place to work and the staff included 25 singers and musicians in addition to the news and announcing staff. We broadcast live music shows daily, and believe it or not, only one, repeat one, disk jockey record show per week. It happened on Saturday afternoon when there were no sports games to broadcast.

Twice a week the studio band and some of the singing talent would go out to the small towns in the area and broadcast from a high school gym or town hall. The two shows, Hayloft Jamboree and Talent Parade, would pack the auditoriums to the rafters. Frank Scott, whom you might remember as a pianist and arranger for the Lawrence Welk Show, was the director of music for the station at the time. The Hayloft show was country western; the Talent Parade was an amateur show.

Ken Kennedy, the station's program director, doubled as a rube Norwegian comedian on the Hayloft show. A former dance orchestra leader and drummer, Ken played an antique washboard by strumming it with a thimble on each finger of his right hand. Super star Peggy Lee got her professional start by singing with the studio band and traveling with the Hayloft Jamboree. And Ken Kennedy was the guy who changed her name from Norma Egstrom to Peggy Lee. Many of the side men in the studio band were veterans of the big name bands. They were guys who liked working full time in a fixed location and away from the nomadic traveling band life.

The fun at WDAY for me — I was hired as the photo and film director, with studio lighting supervision as an extra duty — came from the fact that everyone but two people came from radio and were making the transition to television, a thing they knew very little about. This time period was right after the lifting of the FCC freeze on new television stations and experienced technicians and operators were hard to find. If a guy had any experience or schooling at all he was given a job right away.

WDAY hired me a year before they had a construction permit. I was experienced in making industrial motion pictures and they wanted to keep me around to head a department. I wanted to get into television and I held a 1st radiotelephone license, so they put me to work on radio for the summer. After that I worked with the chief engineer and the architects on the design of the studio building, a structure that was barely started when we chose to go on the air. Hence the temporary two car garage/studio was hooked onto our interim transmitter building, a structure that once housed an FM radio transmitter. This happened because management was eager to get on the air as soon as possible after the construction permit was granted in January of 1953.

Prior to going on the air with programs, we operated the transmitter for about two months sending out a test pattern. The sales department sold ads for TV set dealers on the test pattern, and we kept it on the air during the day so the dealers could install new sets in homes around the broadcast area.

We were slow in receiving critical parts for the station operation from our suppliers — keep in mind that everywhere in the country new television stations were doing as we were, and suppliers were being overwhelmed with orders. Little by little we got the studio equipment, hung the big lights in the two car garage, made sound absorbing baffles to help the acoustics, and constructed scenery and props.

When opening day arrived, we transmitted the first show. It was one that I had put on film and consisted of congratulatory speeches by senators, mayors, etc. The last speech on the reel was delivered by the station sales manager. He said this little gem, "After all friends, WDAY has been on radio since 1922 as service to the area, and television is simply adding picture to sound." I laughed when I shot the film of him saying it, and I laughed again when I edited the film for the opening show. The sales manager really simplified the job of telecasting with that statement.

After the dignitaries' reel came a big live camera show with the studio musicians and singers doing their stuff. Kennedy was the master of ceremonies for the "inaugural show." The band played a mix of popular and western music; the singers took turns in doing one number each. Ken paraded all the WDAY staff talent in front of the two image orthicon cameras in the two car

garage studio. It was quite a show, and the hot lights turned on the sweat glands of the participants.

During one musical number featuring a country singer duo, Ken was supposed to cross over to the other side of the dinky studio set. Instead of walking around behind the cameras, he chose to crawl across the set on his hands and knees. Yes, you guessed it, Ken was caught in the act by the director when he switched to a wide angle shot and there were Hank and Thelma, the singers, with Kennedy crawling across in the background. My girl friend, who was sitting home at the time, said afterwards, "Ken's crawling scene was the hit of the show!"

At that time nobody had thought of using cue cards for help in the business of remembering lines. So, right in the middle of commercial that Ken was delivering on camera, he forgot his lines, so he reached in his coat pocket and pulled out the script and read the rest of the blurb on camera.

One of the first commercials of the evening was for a music instrument retail store. The floor man piled all kinds of brass instruments up on a table that could be rolled out into the camera field quickly. When the image orthicon cameras were aimed at the pile of horns, all hell broke loose. The specular reflections of multiple lights bounced into the camera lenses and no technician was prepared for the result. An image orthicon tube had one bad feature, it bloomed black all around a specular highlight. With 20 lights putting hundreds of specular flares on the horns, the whole screen when black with a white spot for each reflection.

The control room when into orbit — people were yelling great sentences like, "For God's sake, do something! Try turning all those knobs....." The director told the camera men to pan around on the horns, so the thing got worse. The only saving grace was to switch to a slide of the store logo and fill out the minute on it.

After the big live show, we went to network shows which were all on film or kinescope recording (film recording of the tube's face). Among the shows were "I Love Lucy" and "Jack Benny." There were no satellites, no microwave network, and no cable in those days. We had shows from all four networks to start with: NBC, CBS, ABC and Dumont. We finished the evening with a local newscast followed by an old movie in a time slot we called "Arm Chair Theater." Because of the low quality of pictures available at that time, the late night movie became known by the crew as "Armpit Theater."

Anyway, the first night was a great evening of laughs. To top it off our newly-hired director of the big live show, along with one of the video technicians, went out for a drink after Armchair Theater began. It was really a bar hopping expedition to see if the TV sets were playing in the bistros. In the course of traveling around, they were picked up for speeding. The cop asked the director-driver for his license and asked "Where do you live?" "In Fargo," was the reply. When the officer looked at the director's license, he asked, "How come you have a Oregon driver's license, your car has California plates, and you live in Fargo?"

I don't know how the two got away with it, but the cop let them go after they told him about television. And that's how TV came to Fargo, North Dakota. I'll never forget that day — and I quit smoking, too!

EAVESDROPPINGS

I'LL BE GLAD WHEN THE FOOTBALL SEASON IS OVER SO MY WIFE WILL LET ME WATCH TV AGAIN. . .THE WEATHER HAS BEEN FAIR, ALTHOUGH THE LAST BIG SNOWSTORM BURIED MY SATELLITE DISH. . . I HAVE MORE CD-ROM DISKS THAT NEVER GET USED THAN I HAVE ONES THAT DO. . .I'M GOING TO WAIT TILL THE SIX EIGHTY SIX COMPUTER COMES OUT BEFORE I BUY ONE THAT IS ALREADY OUT OF DATE. . .I USED TO GO SOUTH FOR THE WINTER UNTIL I MOVED TO FLORIDA, NOW I GOT NORTH FOR THE SUMMER. . .THERE IS NOTHING ON THE BAND THESE DAYS TO MAKE ME WANT TO SIT HERE ALL DAY AND LISTEN TO BACKGROUND NOISE. . .OUR CLUB STARTED A CW CODE CLASS FOR HAMS WITH LICENSES, BUT NOBODY SIGNED UP. . .WE'RE GOING FISHING THROUGH THE ICE AS SOON AS IT GETS THICK ENOUGH TO HOLD MY 350 POUND FRAME. . .I USE THAT BOOKKEEPING COMPUTER PROGRAM SO RARELY THAT I HAVE TO READ THE BOOK BEFORE I DARE PUT THE CD-ROM IN TO GET STARTED.

Thanks to KA4FHS and WBØVND. If you wish to communicate with me, my address is 1514 South 12th St., Fargo, ND 58103. My packet address is WØLHS @ WØLHS.#SEND.ND.USA.NA. 73 de Bill Snyder, WØLHS. DIT DIT. **WR**

Radio school, class of '59

While in the Army, I was sent to radio school at Fort Dix, New Jersey for 12 weeks in January of 1959.The school was called Intermediate Speed CW Radio Operator, Specialist Training Regiment.

Anyone from the class of '59, please contact Bob Herrmann, N2NTO, 222 Hamilton Valley Rd., Lockwood, NY 14859-9729. **WR**

Search And Rescue Communications

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

My son Zach recently received his Amateur Radio license in the mail (KC7GKE). Naturally his parents (and grandparents) were pleased with his accomplishment. Armed with his portable radio and a new ticket, he began working the local repeaters and making friends.

Zach has also started checking into the local ARES net and is interested in emergency service. As a Civil Air Patrol cadet he has worked the CAP radio on several search missions and accompanied me to help locate emergency locator beacons.

A CAP leader and I recently had a friendly debate over the value of having cadets involved in ground search and rescue missions. He was all for it and I was not quite convinced. That was prior to my son becoming "radio active." Now I have an opinion, but before I share it with you let me propose a scenario.

You may remember a recent commercial airline crash in Illinois that killed 68 people. News reports and photos from the scene showed carnage beyond imagination. One article discussed the stress voiced by emergency workers as they participated in the recovery of human remains.

One of the first aircraft search missions I participated in resulted in a "find" where the aircraft was found scattered over hundreds of yards and in small pieces. I still shudder when I recall kicking something on the ground and discovering it to be part of a human hip — that being the largest body part recovered.

Back to the kids.

Would I want my son or daughter (age 14 and 13) stumbling across such an event while participating on a search mission? Considering that they do participate and come across a particularly difficult crash, what is in place to help them deal with their feelings? Would the adult leader be prepared to have some highly emotional kids to deal with?

One of my best friends died in a plane crash. I participated in the search and the memories are still vivid of his parents upon being told of their son's death. My "dealing" with it involved talking to his parents, attending the funeral and shedding a tear of sadness once in a while. It still bothers me. I still remember the first automotive fatality I witnessed. I still remember a 9-year-old shooting victim.

And all of these memories happened as an "adult."

There was no "critical incident stress debriefing" at the time. As now, there were parents, religious leaders and quiet moments alone trying to sort it all out.

Would I encourage my son to participate on a ground rescue team? I don't think so. ARES and CAP are not quite prepared to help him deal with what he might witness. Yes, there are "critical stress debriefers" available — but much of that depends on the maturity and experience of both the debriefer and the rescuer. My son is not quite ready for such an experience.

This brings up the question of what do you do with "kids" during emergency operations? When Zach took his test, more than half were also youth. Some afternoons repeaters are filled with "kids." And I think this is wonderful that they're getting into a great hobby.

As with Zach, some will decide they want to get into emergency services. What are you ARES (or CAP) leaders going to do with them? Are you equipped to have a 12-year-old witness carnage while on a field communication team following an earthquake or at the site of a disaster. For me, the most gruesome sight is a fire victim and many radio groups respond in support of fire departments or relief agencies.

I don't have the answers. Maybe when Zach is 18 or 21 I'll have a different perspective and can share some thoughts. I know it depends on the young peoples' level of maturity and their outlook in general. Some years ago several CAP cadets and I helped a sheriff recover bodies in an air crash. It wasn't pleasant and we were pretty silent during the trip back to town.

It was one of those life experiences that help prepare you for what is to come and I know the youth involved were older (in college) and perhaps better able to deal with what they witnessed. (And there are some adults who would have a difficult time, so age is not the only yardstick).

It's something for you to consider as the youth begin attending your training sessions. I've worked with CAP nearly 25 years now, much of it with cadets and

with emergency services. Here are some thoughts:

- It takes time and honesty. Kids know when you sincerely care about them and when you're feeding them a dishonest line.
- Kids have a short attention span. If they're going to help you on the mission, plan on two hours (at the most). Youth can be a great help and will give you their best but they usually cannot last as long as you can.
- Limit numbers. My rule is to never have more than three at the communications center (or EOC) at a time. Two can handle the tasks while the third takes a break. That single kid on a break gets into far less trouble than two, three, four or more kids with time on their hands.
- Talk to their parents. Good communication with a parent avoids lots of problems. Parents usually can give you a handle on a son or daughter's level of maturity. When I've talked to parents and explained what their CAP "cadet" might encounter I've gained support for what I do. Parents can also help their son/daughter prepare such as bringing food, books, homework, etc.
- Remember that kids need to learn, just as you did. They're not able to process great amounts of in-depth information and will need lots of coaching as they become competent. Offer your thanks, give them a big smile. It's your sincere appreciation and attention that keeps them fueled during their shift.
- Remember they have feelings and their feelings are still pretty confusing to them. I would be pretty careful taking any youth into the field where a "new" experience might result in some critical stress.

Lastly, plan in advance. If you have youth attending your meetings and want to involve them, develop a plan for what they could do. Make what they do an important part of your response and make their jobs worthwhile. It's no fun to be the "garbage can emptier" or the "door monitor." Kids can "shadow" experienced communicators or help get things set up. Youth are wonderful additions to any event as long as you are prepared for their involvement!

Discovering paradigms

I watched a fun video at school called the "Business of Paradigms" by Joel Arthur Barker. He also has a book ("Paradigms") you can find at your local book store. If you can locate a copy of the video at the library or through your company's human resource (or training) department, it would be worth watching. It would also be great for your next group meeting.

The book (which will set you back $12) is well worth the price and time to read it. The essence of the video and book is how we filter information based on our own beliefs and expectations. They're also about pioneering our future.

Once you've read the book you will observe your SAR team meeting in a new light. Conflicts between people will often seem silly as you consider their "paradigm paralysis."

Heck, just go out and find the book. Believe me, if you enjoy learning and discovering insights about ourselves, you'll enjoy it.

Publishing publications

Years ago printing instruction manuals involved a mimeograph machine or some kind of a messy process that left you with a poorly-done stack of papers that were hard to read after 50 copies.

Now you can output high quality documents with many pleasing type styles and have copy 5,000 look as good as the first. My point is there is no reason you cannot produce materials for your group that are of good value and provide up-to-the-minute information.

In addition to policy manuals and training materials, I would suggest you consider some sort of a pocket reference manual for your responders. This manual would list area frequencies and their pre-designated assignments. You would tell where the resource net will meet, where the hospital net would be found, where the on-scene coordinator would operate, etc.

This manual would have a list of items needed in a response kit and some "what-to-do-if-this-happens" guidelines. You might also include a thumbnail sketch of what to do when you arrive on scene and other important things to do during an emergency.

Before you go off and reproduce your 200-page resource manual — remember that this is a quick reference guide. The type should not require a magnifying glass. You might only need 15-20 pages with lots of space for notes. It also must fit in a shirt pocket!

This is something easily produced with a personal computer and laser printer — but I've not seen one. Anyone out there have one? Anyone willing to take the challenge and produce one? I'm counting on one of you talented readers to undertake this project and produce a sample other groups could use. Contact me with your rough drafts!

Have a great year! See you next month. **WR**

The Youth Forum

Sammy Garrett, AAØCR
#8 Willow Ct., Florissant, MO 63031

So it really is the greatest hobby in the world.

"The greatest hobby in the world"—That's how many people describe Amateur Radio. Like thousands of other hams, I've always agreed with this philosophy, but I never put much thought into why I felt this way, until recently. A few weeks ago I came to the realization that Amateur Radio really is the greatest hobby in the world because of all the different opportunities it offers.

By "opportunities" I'm not necessarily referring to all the different modes of operation or operating events. What I am referring to is how Amateur Radio can make every day life a lot easier.

Recently, it occurred to me that for nearly every success I've had in the past few years, at least part of the credit goes to what I've learned from Amateur Radio. I don't mean to say that learning the band plan or reading a chapter about yagis and quads has greatly enhanced my life. I am referring to the people who make up Amateur Radio. These people are what make this service so fantastic and it is these people who have taught me a lot about life in general the past five years. Without Amateur Radio, I would never have had the pleasure of meeting them.

The experiences and confidence I've gained through Amateur Radio have benefited me countless times throughout the past few years. However, one of my recent projects allowed me to utilize all of the communications skills which this service has helped me develop.

One of my ambitions is to pursue a career in international journalism. Incidentally, this ambition is a direct consequence of my involvement in Amateur Radio. I spend a great deal of my free time reading newspapers and studying radio and television news programs. However, I realized that I needed to learn more about what the field of journalism was really like and how the industry worked. I wanted to contact several journalists, asking them for their advice and opinions on the industry, but I wasn't quite sure where to begin. So, after sorting through several possible approaches, I turned to my friend, Bill Pasternak, WA6ITF, *Worldradio's* FM & Repeaters columnist and producer of *The Amateur Radio Newsline,* for advice. Bill works in the television industry in Los Angeles, so I thought he might be able to provide me with some insight.

Bill did have several ideas which helped me refine my thinking. He also suggested that I contact one of his colleagues, Alan Kaul, W6RCL, who is also employed in the television industry. I knew of Alan, but had never met him, so I was a bit ill at ease about contacting him. However, I mustered up some courage and called him a few days later. Alan was extremely helpful. He took the time to answer my questions and made several suggestions as to how I should go about seeking advice from other journalists.

In the end, I wrote to several journalists throughout the country, utilizing the advice I had received. A few days later I began receiving responses to my questions. I have no doubt that this project would not have been nearly as successful (and may not have even gotten off the ground) without my background in Amateur Radio and it's greatest resource—the people who keep the service alive.

I can't say what impact this project will have on my future career plans. But so far, the results have been wonderful. Aside from all the encouraging replies I have received, this project has helped me in other ways, as well. For example, I also directed my questions to several professors at colleges which I was interested in attending. As luck would have it, a professor at my "first choice" university contacted me with answers to my questions. Recently, I even had the opportunity to meet with him, which allowed me to get a more personalized view of the school. Obviously, this will come in very handy next fall as I make my final decisions about where to apply.

So what's the point of this little autobiography, you ask? I'm not trying to convey a message of how talented or lucky I think I am. Nor do I hope to impress you with all of my friends or what they do for a living. You probably don't care what my career ambitions are. However, I do hope that you see just how much I owe to Amateur Radio in one form or another. Directly and indirectly Amateur Radio has helped me accomplish a lot during my five years as an amateur. It has been the topic of countless essays and science projects. The ultimate geography and social studies lesson can be obtained with the turn of a dial. Amateur Radio has helped me discover my interest in travel and languages, which led to the best two weeks of my life last spring in France.

Most importantly, however, Amateur Radio has allowed me to make new friends and meet new people from every corner of the globe. These friends have exposed me to new ideas and cultures and ways of thinking to which I may never have otherwise been introduced. They've also helped me through countless physics problems, and they've started me on the road to writing well. A few of them even taught me to drive. I have no doubt that many of these individuals will remain among my best friends for life.

So to all the Bills, and Alans in California, the Steves in New Jersey and the Daves in Illinois, not to mention every other contact I've ever had; thanks—you've taught me more than you know.

Chances are Amateur Radio has probably done a lot for you, too. So the next time you call CQ, just remember that you might be in for more than you might expect.

Finally, some mail!

Recently I was happy to receive a letter from Sarah Condon, KB7RWG of Kirkland, Washington. She writes: "I am a 17-year-old senior ... living just outside of Seattle. I have been a ham for two years and hold a 'Technician Plus' license. Just this weekend, I read your Youth Forum in ***Worldradio*** magazine for the first time....I'd never read a column in a ham radio magazine directed towards kids before. I passed it on to a group of 15 elementary school aged hams in my area. They also read and enjoyed the column....I just wanted to let you know...that you now have a small group of fans in the Northwest."

Thanks for the letter, Sarah! I'm flattered to know that you and the other hams in your area enjoyed the "Youth Forum." Stories like yours are what keep me writing. Thanks again and please keep me informed of your Amateur Radio activities—I'm always looking for story ideas!

73 Sam, AAØCR. WR

Visit Your Local RADIO CLUB

ALABAMA

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

ALASKA

North Pole Hamsters ARC. Meets 1st Mon./monthly, 7 p.m., VFW Bldg., Old Rich Hwy. & VFW St., P.O. Box 56424, North Pole, AK 99705.

South Central Radio Club. 8023 E. 11th Ct., Anchorage, AK. Meets 2nd Fri./monthly, 7 p.m., UAA Business Ed. Bldg., Rm. 220. KL7CC, (907) 338-0662 for info. Club rptr: KL7CC/R 146.97(-) PL 103.5 Hz.

ARIZONA

Arizona Repeater Association. P.O. Box 35758, Phoenix, AZ 85069-5758. Operates 15 VHF & UHF rptrs. in AZ. Meets 4th Thurs./monthly, 7:30 p.m., 1515 E. Osborne, Phoenix. Info: (602) 631-4879.

Central Arizona DX Assoc., (CADXA). Meets 1st Thurs./monthly, 7 p.m., Salt River Project Pera Club, 1/2 mi. West of 68th & Continental Dr., Scottsdale, AZ. Rptr. K5VT 147.32(+). Packet Cluster nodes (S): 145.09, 144.93, 145.03. Info: (800) 283-4319 or (602) 876-2718.

Cochise Amateur Radio Assn., (CARA). Meets 1st Mon./monthly, 7:30 p.m. at club facility on Moson Rd., Sierra Vista, AZ. WA7KYT/R 146.76(-) rptr.

Scottsdale Amateur Club. Meets 1st Wed./monthly, 7:00 p.m., Scottsdale Sr. Cntr., 7375 E. 2nd St., Scottsdale, AZ. Net Tues., 7 p.m., 147.18(+) rptr. Info: Barbara Myers, KB7UKD, (602) 837-6492.

Tucson Repeater Assoc., P.O. Box 40371, Tucson, AZ 85717-0371. Meets 2nd Sat./monthly, 7:15 p.m., Pima Co. Sheriff Bldg., 1750 E. Benson Hwy. Net Thurs. 7:30 p.m. 146.82(-), 146.88(-), 147.08(-), 448.550(-) & 145.15 Packet.

CALIFORNIA

Amador County Amateur Radio Club. P.O. Box 1094, Pine Grove, CA 95665. Meets 1st Thurs./monthly, 7:30 p.m., Jackson Sr. Cntr., 229 New York Ranch Rd., Jackson, CA. Info: call 146.835(-).

Amateur Radio Club of El Cajon, WA6BGS. P.O. Box 50, El Cajon, CA 92022. Meets 2nd Thurs./monthly, 7 p.m., La Mesa Church of Christ, 5150 Jackson Dr., La Mesa, CA. 224.08(-). PL 107.2. Nets 147.570 Wed./Sat., 7 p.m. Info: (619) 697-2700.

Calveras Amateur Radio Society, (CARS), WA6YGA. P.O. Box 391, Angels Camp, CA 95222. Meets 3rd Thurs./monthly, 7:30 p.m., Fire Dept., 1404 Hwy 4, Angels Camp, CA. Net each Mon., 7:30 p.m., WB6MFV/R, 145.170(-), PL 100 Hz. Contact N6EL, Lloyd, (209) 754-3714.

Contra Costa Communications Club, Inc., WD6EZC/R. P.O. Box 20661, El Sobrante, CA 94803-0661. Meets 2nd Sun./monthly (except May & Dec.), 7 a.m., Baker's Square Restaurant in Richmond, CA. Info: Ed Caine, KA6OFR, (707) 996-0962.

East Bay Amateur Radio Club, Inc. Meets 2nd Fri./monthly, 8 p.m.-10 p.m., West Co Times Bldg., 4301 Lakeside Dr., Richmond, CA 94806. Info: Rachel Lewellen KB6LHR, (510) 233-5034.

Fresno Amateur Radio Club. Meets 2nd Fri./monthly, 7:30 p.m., Ernie Pyle School, 4140 N. Augusta, Fresno, CA. 146.94(-) 223.94(-).

Fullerton Radio Club, Inc., W6ULI. P.O. Box 545, Fullerton, CA 92632. Meets: 3rd Wed./monthly, 7:30 p.m., Sr. Citizens Ctr., 340 W. Commonwealth, Fullerton. Net ea. Tue., 8 p.m. 147.975(-). Info: Bob Hastings, K6PHE (714) 990-9203.

Gabilan Amateur Radio Club, (GARC). P.O. Box 2178, Gilroy, CA 95021-2178. Meets odd months, 2nd Thurs., 7:30 p.m., First Interstate Bank, First St., Gilroy and even months for brkfst., 3rd Sat., 8:30 a.m. (408) 623-2462.

Golden Empire Amateur Radio Society, (VEC). P.O. Box 508, Chico, CA 95927. Club call W6RHC, rptr. 146.85(-). Meets: 3rd Fri./monthly, 8 p.m. at 1528 Esplanade, Rm. 110B, Chico.

Golden Triangle ARC, (GTARC). Meets 4th Mon./monthly, 7:30 p.m., Sharp Health Care Activities Rm., 25500 Med. Ctr. Dr., Murrieta, CA 92562.

Lake County Amateur Radio Society, (LCARS). Meets last Thurs./monthly at either Red Cross HQ, Clearlake, or the Nice Community Clubhouse, Nice, CA, 7 p.m. Net Mon., 7 p.m. 146.775(-) for info.

Livermore Amateur Radio Klub, (LARK). Meets 3rd Sat./monthly, 9:30 a.m., City Council Chamber, 3575 Pacific Ave., Livermore, CA. Net Mon. 1900 on 147.12(+). For info: LARK Secretary, P.O. Box 3190, Livermore, CA 94551-3190. (510) 447-3815.

Manteca Amateur Radio Club (MARC). P.O. Box 545, Manteca, CA 95336. Meets 1st Thurs./monthly, #1 Firehouse, 7 p.m. Talk-in on club rptr. 146.985(-) PL 100Hz. Info: (209) 823-3611.

Marin Amateur Radio Club (MARC). W6SG. Box 151231, San Rafael, CA 94915-1231. Meets 1st Fri./8 p.m.; MARC Clubhouse Bldg. 549, HAFB, Novato, CA. (415) 883-9789 (Summer exceptions; contact Pete N6IYU, 924-1578). Sun. AM Club at Red Cross, San Rafael.

Motorcycling Amateur Radio Club. Meets 2nd Sat./monthly, 8 a.m., Denny's Restaurant, 1695 E. Lincoln Ave., Orange at Lincoln & the 55 Fwy. Info: Ray Davis, KD6FHN, (714) 551-2010 or (714) 551-1036.

Mount Diablo Amateur Radio Club. P.O. Box 23222, Pleasant Hill, CA 94523. Meets 3rd Fri./monthly, 8 p.m., Our Savior's Lutheran Church, 1035 Carol Ln., Lafayette, CA. Net Thurs. 7:30 p.m. on 147.06(+) 100Hz PL. Info: George, KI6YK, (510) 837-9316.

North Hills Radio Club. Meets 3rd Tue./monthly, 7:30 p.m., Elks Lodge, on Cypress at Hackberry in Carmichael, CA. (PL 162.2) Net K61S Thurs., 8 p.m. 145.190. 220 Net, Tue. 8 p.m. 224.40(-).

North Shores ARC. Meets 1st Tues./monthly, 7:30 p.m., So. Clairemont Rec. Cntr., 3605 Clairemont Dr., San Diego, CA. Info: (619) 224-1294.

Palos Verdes ARC. Meets 3rd Wed./monthly, 7:30 p.m., Community Rm., "Shops at Palos Verdes," 550 Deep Valley Dr., Rolling Hills Estates, CA. Info. Ms. Marti Brutcher, N6XDS, (310) 376-1861 or (310) 377-6342. Rptr. 145.38(-) PL 100.

River City A.R.C.S. Meets 1st Tues./monthly, 7 p.m., SMUD Bldg., Don Julio at Elkhorn, Sacramento, CA. License classes offered. For info contact Lyle, AA6DJ, (916) 483-3293.

Sacramento Amateur Radio Club. Meets 2nd Wed./monthly, 7 p.m. Sac. Blood Ctr., 32nd St. & Stockton Blvd., Sacramento, CA. Info net every noon on rptr. W6AK/R 146.91(-). Steve Cates, KC6TEV, (916) 391-7341 or Gary E. Bryant KB6KZZ, (916) 646-1171.

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

Santa Clara County Amateur Radio Assoc., (SCCARA) W6UW & W6UU. P.O. Box 6, San Jose, CA 95103-0006. (408) 249-6909. Meets 2nd Mon./monthly, 7:30 p.m., United Way, 1922 The Alameda, San Jose. Net all other Mon., 7:30 p.m. W6UU/R 146.385(+), 442.425(+) PL 107.2

Santa Clara Valley Rptr. Society, (SCVRS). P.O. Box 2085, Sunnyvale, CA 94087. (408) 247-2877. 146.76(-), 224.26(-), 444.60(+). 2 meter/220 net Mon. 9 p.m. Mtgs./3rd Fri.

Shasta Cascade Amateur Radio Society, (SCARS). 2955 Shasta St., Redding, CA 96001. Meets: 3rd Wed./monthly, 7 p.m. at the C.D.F. Conf. Rm. Grape St., near Parkview Ave., Redding, CA. Net 146.64, Wed., 8 p.m.

Sierra Foothills ARC. P.O. 3262, Auburn, CA 95604. Meets 2nd Fri./monthly, 7:30 p.m., Firehouse, 226 Sacramento St. Auburn. 10m, Wed. 7:30 p.m., 28.415, 2/220m, Thurs. 7:30 p.m., 145.430(-) (PL 94.8) & 223.86(-).

So. Sierra ARS. Meets 2nd Thurs./monthly, 7 p.m., Veteran's Mem. Hall, 125 East F St., Tehachapi, CA. Contact: C. Parsons, KD6KMN, (805) 822-5995. 147.06/224.42.

South Bay ARC. P.O. Box 536, Torrance, CA 90508. Meets 3rd Thurs./monthly, 7:30 p.m., Torrance Memorial Hosp., 3330 Lomita Blvd., Torrance, CA. Talk-in on WB6MYD rpt. 244.38(-). Info: (310) 328-0817.

Southern California Six Meter Club. P.O. Box 10441, Fullerton, CA 92635. USB Net Tue., 8 p.m., 50.150. FM Rpt. Net Thurs., 8 p.m., 52.86/52.36 tx. FM Smplx, call freq. 50.300.

Stanislaus Amateur Radio Assoc., Inc. (SARA). Meets 3rd Tues./monthly, 7:30 p.m., Stanislaus County Admin. Bldg. (lower level conf. rm.), 11th & H St., Modesto, CA.

Tri-County Amateur Radio Assoc. P.O. Box 142, Pomona, CA 91769. Meets: 2nd Mon./monthly, 7:30 p.m., Covenant United Methodist Church, corner of Towne Ave. & San Bernardino Rd. in Pomona, CA.

Trinity Country ARC. P.O. Box 2283, Weaverville, CA 96093. Meets 2nd Wed./monthly, CD Hall in Weaverville, 7:30 p.m., Rptrs: WA6BXN 146.73(-) PL 85.4, W6HOR 146.925(-) PL 85.4.

United Radio Amateur Club, K6AA. L.A. Maritime Museum, Berth 84, Foot of 6th St. San Pedro, CA 90731. Meets 3rd Fri./monthly (except Dec.), 7:00 p.m. Monitors 145.52 Simplex 10 a.m.—5 p.m.

Vaca Valley Radio Club. Meets 2nd Wed./monthly, 7 p.m., Vaca Fire Dist. Stn. on Vine St. in Vacaville, CA. Rptr.: WD6BUS 145.47(-) PL 127.3. Dan Bissell (707) 446-7411.

Victor Valley Amateur Radio Club. P.O. Box 869, Victorville, CA 92392. Meets 2nd Tues./monthly, 7:30 p.m., Victor Valley Museum, 11873 Apple Valley Rd., Apple Valley, CA. Talk-in 146.94(-), info net Sun. 7 p.m. 146.94(-).

West Coast Amateur Radio Club, (WCARC). P.O. Box 2617, Costa Mesa, CA 92628. Meets 3rd Thurs./monthly, 7 p.m., Fountain Valley Sch. Dist. office, 17210 Oak St., Fountain Valley. 145.440(-) PL 136.5. For info: Joe, KA6LPZ, (714) 963-4426.

Westside Amateur Radio Club. P.O. Box 11092, Marina del Rey, CA 90295. Meets 3rd Thurs./monthly, 7:30 p.m., Red Cross Bldg., 1450 11th St., Santa Monica, CA. Net every Tues., 8 p.m., 146.67(-). Voice mail: (310) 917-1100.

Willits Amateur Radio Society, (WARS). P.O. Box 73, Willits, CA 95490. Meets 4th Mon./monthly, 7 p.m., Brooktrails Fire Dept. (northwest of Willits). Talk-in: 145.13(-), PL 103.5.

Yolo Amateur Radio Society. Meets 1st Tues./monthly, 7:30 p.m., Training Rm. of the Davis PD, 226 F St., Davis, CA. Contact Dave Nishikawa, KC6YFG, (916) 756-6375/Talk-in 144.430.

Yuba-Sutter Amateur Radio Club, (YSARC). P.O. Box 1169, Yuba City, CA 95991. Meets 2nd Tue./monthly, 7:30 p.m., Yuba City Police Bldg., 1545 Poole Blvd., Yuba City.

CONNECTICUT

Tri-City Amateur Radio Club. P.O. Box 686, Groton, CT 06340-0686. Meets 2nd Tue./monthly, 7 p.m., St. Lukes Lutheran Church of Gales Ferry on Rt. 12. Info: Bob, KA1BB, (203) 739-8016.

FLORIDA

Gulf Coast ARC, Inc. P.O. Box 595, New Port Richey, FL 34656. Meets 4th Mon./monthly, 7:30 p.m., 3852 Prime Place, New Port Richey. WA4GDN rptr. 146.67(-) & 145.33(-), serving Pasco Cnty.

Indian River ARC, Inc., (IRARC). 597 Capri Rd., Cocoa Beach, FL 32931-3011. Meets 1st Thurs./monthly, 7:30 p.m., Community Church of the Nazarene, 400 Crockett Blvd., Merritt Island, FL.

Port St. Lucie ARA. Meets 1st Fri./monthly, 7:30 p.m., St. Andrews Church, Prima Vista Blvd., Port St. Lucie, FL. Contact: Wes Sammis, W2YRW, (407) 878-4739. Call in 146.955(-).

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

Suncoast Amateur Radio Club. P.O. Box 1992, New Port Richey, FL 34656-1992. Meets 2nd Mon./monthly, 7:30 p.m., First Lutheran Church, corner of Polk & Delaware, New Port Richey, FL. Sponsor of WC2G/rptr. on 145.35(-), serving west Pasco County.

Vero Beach ARC, W4OT. P.O. Box 2082, Vero Beach, FL 32961. Meets 2nd Thurs./monthly, 8 p.m., Emerg. Mgmt., Indian River County Adm. Bldg., 1840 25th St. Net Mon., 7:30 p.m. 146.64.

GEORGIA

Dalton Amateur Radio Club, Inc., (DARC). Meets 4th Mon./monthly, 7:30 p.m., Magistrate Court Bldg., corner of Waugh St. & Thornton Ave., Dalton, GA. Info: Bill Jourdain, N4XOG, (404) 226-3793.

HAWAII

Big Island Amateur Radio Club. P.O. Box 1938, Hilo, HI 96721-1938. Meets: 2nd Tue./monthly, 7 p.m., HELCO Auditorium, 1200 Kilauea Ave., Hilo. Talk-in on 146.68(-), 146.76(-), 146.88(-), 147.02(+) & 147.04(+).

Emergency Amateur Radio Club, (EARC). P.O. Box 30315, Honolulu, HI 96820-0315. Meets 4th Thurs./monthly, 7 p.m., Lincoln Elem. Sch., 615 Auwaiolimu, Honolulu. Nets: nightly 7:30 p.m., 146.88 & 146.80. Rptrs: 146.76(-), 146.80(-), 146.88(-), 146.96(-) 146.94(-). Info: (808) 595-6245.

IDAHO

Idaho Society Radio Amateurs. Boise Chapter 146.94. Meets 3rd Tues./monthly, Borah H.S., 7 p.m. Rptr. at 8000. Membership welcome. 146.94(-).

ILLINOIS

Chicago FM Club Inc., (CFMC). 146.76 (PL 107.2)/224.10/224.18/443.75 (PL 114.8). P.O. Box 1532, Evanston, IL 60204. Ham help line: (312) 262-6773. Info net Tues., 9 p.m. on 146.76(-). Meets 3rd Wed./monthly, 8 p.m.

Chicago Suburban Radio Assn., (CSRA). P.O. Box 88, Lyons, IL 60534. Meets 3rd Tues./monthly, 7 p.m., Mid City Nat'l Bank, 7222 W. Cermak Rd., N. Riverside, IL.

Dupage Amateur Radio Club. (DARC). P.O. Box 71, Clarendon Hills, IL 60514. Meets 4th Mon./monthly, 7:30 p.m., Holy Trinity Church, SE corner of Cass & Richmond, Westmont, IL. Net Sun., 9 p.m. on 145.25. W9DUP repeaters 145.25(-) (107.2PL), 442.55(+) (114.8PL), 224.68(-).

Fox River Radio League. P.O. Box 673, Batavia, IL 60510-0673. Meets 2nd Tue./monthly, 7:30 p.m., Old Bank Bldg., 900 No. Lake St., lower level, Northgate Shopping Ctr. & Rt. 31, Aurora, IL.

Peoria Area Amateur Radio Club, (PAARC). Meets 2nd Fri./monthly, 7 p.m., 1401 N. Knoxville Ave. Info: (309) 685-6698. Rptrs: 146.25(-) & 147.675(+).

Schaumburg ARC, (SARC). Meets: 3rd Thurs./monthly, 7:30 p.m., Schaum-burg Park Dist. Community Rec. Ctr. at Bode & Springinsguth Rds. Schaumburg, IL. Net 145.23(-), 9 p.m. Thurs. Info: (708) 213-0910.

Six Meter Club of Chicago, Inc., K9ONA. Meets 2nd Fri./monthly, 7:30 p.m., St. John's Lutheran Church, 47th St. & Brainard Ave., La Grange Pk., IL. Info net every Tue., 9 p.m. K9ONA/R 146.970(-), 443.300(+), 107.2 Hz PL.

The Starved Rock Radio Club, W9MKS. P.O. Box 198, Tabor St., Leonore, IL 61332. Meets 1st Mon./monthly, 7:30 p.m. Rptr. net 7 p.m. Wed./wkly., 147.12(+).

Wheaton Community Radio Amateurs, (WCRA). P.O. Box QSL, Wheaton, IL 60189. Meets 7:30 p.m., 1st Fri./monthly, College of DuPage, Glen Ellyn, IL. Nets Sun. & Tue. 8 p.m., 145.39(+) MHz. 440 MHz net on Tues., 8:30 p.m. on 444.475(+) MHz. RTTY Net Sun. 9:30 p.m. 145.31(-).

York Radio Club. Meets 3rd Fri./monthly, 8 p.m., Elmhurst College (Science Bldg.) Elmhurst, IL. Net Mon., 8 p.m. W9PCS/147.42 simplex. Rptr. 442.875(+).

IOWA

Sooland Amateur Radio Assoc., (SARA). Meets 3rd Tues./monthly, 7:30 p.m., American Red Cross Bldg., 1512 Pierce St., Sioux City, IA. Contact: Glenn Holder, KØTFT. (712) 239-1749. Call-in 146.97(-)

MAINE

Androscoggin Amateur Radio Club. Meets 1st Wed./monthly, 7:00 p.m., Auburn Police Station, 1 Minot Ave., Auburn, ME.

MASSACHUSETTS

Wellesley Amateur Radio Soc., & Babson Wireless Club. Meets 1st & 3rd Thurs./monthly, 7:30 p.m., Gerber Hall, Babson College Forest St., Wellesley, MA (Sept.- June) Talk-in 147.03(+). Info: J. Driscoll, NV1T, (617)444-2686.

MICHIGAN

Chelsea Amateur Radio Club, Inc. Meets 4th Tue./monthly, 7 p.m., Society Bank, 1478 Chelsea-Manchester Rd., Chelsea, MI 48118.

Utica Shelby Emergency Communications Assoc., (USECA). P.O. Box 1222, Sterling Hgts., MI 48311-1222. Meets 2nd Tue./monthly, (Sept.-June), Donald Bernis Jr. High Sch., 12500 Nineteen Mile Rd., Sterling Hgts, MI (between Schoennher & Clinton River Rds.) Talk-in on 147.18(+) 100Hz PL. 24-hr. hot line: (313) 268-6730.

MISSISSIPPI

Jackson Amateur Radio Club, Inc. Meets 3rd Thurs./monthly, 7 p.m., Am. Red Cross Bldg., Riverside Dr., Jackson, MS 39202.

MISSOURI

Central Missouri Radio Assoc. P.O. Box 283, Columbia, MO 65202. Meets 2nd Tues./monthly, 7 p.m., Boone Electric Coop, 1413 Rangeline Rd., Columbia, MO. Talk-in 146.76(-).

Lebanon Amateur Radio Klub, Inc. P.O. Box 2034, Lebanon, MO 65536-2034. Meets 1st Mon./monthly, 7 p.m., Bell Restaurant, City Rt. 66 East Lebanon. Call in 146.700(-).

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

NEVADA

Frontier Amateur Radio Society, (FARS). Meets: 3rd Mon./monthly, 7 p.m., Denny's Restaurant across from Nevada Palace, 5318 Boulder Hwy, Las Vegas, NV. Net Mon. 7:30 p.m., 145.39(-) Rptr. on Black Mountain. Club info: Jim Frye, NW70, 456-5396.

Wide Area Data Group, Inc. P.O. Box 3132, Sparks, NV 89432. Meets 1st Sat./monthly, 9 a.m., Penny's Kountry Kitchen, 337 E. Plumb Ln., Reno. Info: (702) 356-8200. Call in on 147.30(+) MHz.

Sierra Intermountain Emergency Radio Assoc., (SIERA). Meets 2nd Tues./monthly, 7:30 p.m., Douglas County Lib., Minden. Contact: George Uebele, WW7E, (702) 265-4278, 147.330.

NEW HAMPSHIRE

Great Bay Radio Assn., WB1CAG. P.O. Box 911, Dover, NH 03820. (603) 755-2600/335-6643. Meets 2nd Sun./monthly, 7 p.m., Rochester Fire Dept. Training Rm. Talk-in: 147.57.

NEW JERSEY

10-70 Repeater Assn., Inc. 235 Van Emburgh Ave., Ridgewood, NJ 07450. Meets 1st Wed./monthly (except July & Aug.), 8 p.m., VFW, Valley Rd., Clifton, NJ. Rptrs.: 146.70(-), 224.84(-), 444.15(+).

Bergen Amateur Radio Assoc., (BARA). P.O. Box 304, Hackensack, NJ 07601. Meets 1st Sun./monthly, New Milford Elks Lodge, Patrolman Ray Woods Dr., New Milford, NJ 07646. Nets: 28.350 Mon. 9 p.m., 144.40 9 p.m. Wed.

South Jersey Radio Assoc., (SJRA). Pennsauken Sr. Hi Sch. at Hylton Rd. & Remmington Ave., Pennsauken, NJ 08109. Meets Jan.-Oct., 4th Wed./monthly, 7:30 p.m. (Nov.-Dec. 3rd Wed.). Talk-in: 145.29(-) rptr. Club call K2AA.

NEW MEXICO

Albuquerque Amateur Radio Club. P.O. Box 11853, Albuquerque, NM 87192. Meets 1st Sat./monthly, 7:30 a.m., Golden Corral Restaurant, 8505 Montgomery NE.

NEW YORK

Amateur Radio Assoc. of the Tonawandas, (ARATS). P.O. Box 430, No. Tonawanda, NY 14120. Meets 3rd Tues./monthly (except July & Aug.), 7:30 p.m., Sweeney Hose Co., 499 Zim-merman St., No. Tonawanda, NY. Talk-in: 146.955(-) rptr. W2PVL.

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

Hall of Science Amateur Radio Club. P.O. Box 131, Jamaica, NY 11415. HOSARC, 2nd Tue./monthly, Hall of Science Bldg., 47-01 111 St., Flushing Meadow Park, 7:30 p.m. Info: Charlie, WA2JUJ, (518) 420-0046.

Orleans County Amateur Radio Club, (WA2DQL). Meets at Emergency Management Office, West County House Rd., Albion, NY 14411, 2nd Mon./monthly, 7:30 p.m. 145.27(-) — WA2DQL.

PROS, Pioneer Radio Operators Society. Meets 1st Wed./monthly (except July/Aug.), 7 p.m., Sardinia Town Hall, Savage Rd., Sardinia, NY. Net 9 a.m. Thurs. 3853 kHz.

The Radio Club of J.H.S. 22, N.Y.C., Inc. WB2JKJ. P.O. Box 1052, New York, NY 10002. 24-hr. hotline: (516) 674-4072. Fax: (516) 674-9600. Non-profit org. using Ham Radio to enhance the education of youngsters, nationwide. Join us — "Classroom Net", 7.238 MHz, 7 a.m. E.S.T. PSE QSL!

Suffolk County Radio Club, (SCRC). Meets 3rd Tues./monthly, 8 p.m., Bohemia Rec. Ctr., Ruzicka Way, Bohemia, NY. Talk-in: 145.21(-) rpt. Morten Eriksen, KA2UIU, (516) 929-6911.

Westchester Amateur Radio Assoc., (WARA). Meets 1st Thurs./monthly, 7:30 p.m., Scarsdale Town Hall, Scarsdale, NY 10583. All invited. Info: Dan Grabel, N2FLR, Pres. (914) 723-8625.

Westchester Emergency Comm. Assoc., (WECA). Meets 2nd Mon./monthly, 7:30 p.m., Westchester County Ctr., White Plains, NY. Contact WB2VUK (914) 631-7424 or WECA INFO LINE (914) 962-9666 for details. Talk-in WB2ZII/R 147.06(+) PL 114.8/2A.

Yonkers Amateur Radio Club, (YARC). Meets 2nd Sun./monthly, 10 a.m., 1st Pct., Yonkers Police Station, E. Grassy Sprain Rd., Yonkers, NY. Info: P.O. Box 378, Centuck Sta., Yonkers, NY 10710. (914) 963-8995. 146.865(-), 440.15(+).

NORTH CAROLINA

North Carolina Alligator Group, (NAGs). Meets Mondays, 28.35 on the air, 8:30 p.m. local time, Sat. 10 a.m. on 7240. "The Alligators" — all mouth, no ears.

Stanly County Amateur Radio Club. P.O. Box 188, Stanfield, N.C. 28163. Meets 4th Thurs./monthly, 7 p.m. at Stanly Community College, Albemarle, N.C.

OHIO

Ashtabula County ARC. Ken Stenback, AI8S (964-7316). County Justice Ctr, Jefferson, OH. Meets 3rd Tue./monthly, 7:30 p.m. County rptr., 146.715(-).

Clyde Amateur Radio Society (CARS). Meets 2nd Tue./monthly, 7:30 p.m., Municipal Bldg., Clyde, OH 43410. NF8E rptr. 145.35(-) and 442.625(+) MHz. Net Sun. 9 p.m. Info: E. Remaley, KA8CAS.

Firelands Area Rptr. Assn., (FARA). Meets 4th Tue./monthly, 7 p.m., Ohio Veterans Home, Sandusky, OH. WB8LLY rptr. 146.805(-). Net Sundays, 8 p.m. Info: FARA, P.O. Box 442, Huron, OH 44839.

Greater Cincinnati Amateur Radio Assn., (GCARA). Meets 4th Wed./monthly, 7:45 p.m., Cincinnati Museum of Nat. History, 1720 Gilbert Ave. Amateur Radio Station W8DZ. Info: WA8STX or (513) 563-7373.

Lancaster & Fairfield County ARC. Meets 1st Thurs./monthly, 7:30 p.m., American Red Cross, 121 W. Mulberry St., Lancaster, OH 43130. Info net Mondays, 8 p.m., K8QIK/R 147.63(-) rptr.

Sandusky Valley Amateur Radio Club. Meets 1st Sat./monthly, 9 a.m., Sheriffs Bldg. in the D.S.A. office, 2323 Country Side Dr., Fremont, OH.

Toledo Mobile Radio Association. P.O. Box 273, Toledo, OH 43697. Meets 2nd Wed./monthly, 7:30 p.m., Luke's Barn, Lucas County Rec. Ctr., 2901 Key St., Maumee, OH. Contact: Brian, WD8MXR, 385-5624.

Triple States Radio Amateur Club. Meets Wed./weekly on 28.48 at 8:30 p.m., 7260 at 9 p.m. and Sat. 6 p.m. on 7240. Rptrs. 146.91(-), 146.715(-). P.O. Box 240, Rd. #1, Adena, OH 43901. (614) 546-3930.

Van Wert Amateur Radio Club, Inc. 1220 E. Ridge Rd., Van Wert, OH 45891. Call-in: 146.85(-). Meets 1st & 3rd Sat./monthly, 8 p.m.

OREGON

Central Oregon Radio Amateurs, (CORA). P.O. Box 723, Bend, OR 97709. Meets last Thurs./monthly, 7 p.m., Bend Sr. Ctr., 1036 NE 5th, Bend, OR. Net Sun. 7:30 p.m. 147.06(+) MHz. Info: (503) 385-1156.

Keno Amateur Radio Club. P.O. Box 653, Keno, OR 97627. Meets 3rd Thurs./monthly, 7 p.m., Keno Fire Stn. Rptr. 147.32(+) W7UFM. Info: Tom Hamilton, WD6EAW, (503) 883-2736.

Oregon Coast Emergency Rptr., Inc. P.O. Box 254, Florence, OR 97439. Meets 3rd Sat./monthly, 9 a.m. for brkfst. Net, Wed. 7 p.m., 146.80(-). Info: 997-2323 or 997-3081.

Umpqua Valley Amateur Radio Club, Inc. P.O. Box 925, Roseburg, OR 97470. Meets 3rd Thurs./monthly, 7:30 p.m., Douglas County Courthouse, Rm. 311, Douglas St., Roseburg, OR. Info: W5PII/R 146.90(-) or (503) 673-1310.

PENNSYLVANIA

Butler County Amateur Radio Assn. P.O. Box 1787, Butler, PA 16001-1787. Meets 1st Tues./monthly, 7:30 p.m., Boy Scout Cntr., 830 Morton Rd., Butler, PA. Call-in W3UDX/R 147.36(+). Net 10:10 p.m. nightly.

Mercer County Amateur Radio Club, W3LIF. P.O. Box 996, Sharon, PA 16146. Meets 4th Tue./monthly, 7:30 p.m., Shenango Valley Med. Ctr, Farrell, PA. Net, Thurs. 9 p.m. on 145.35(-) W3LIF, Digi. 145.01.

TEXAS

Brazos Valley Amateur Radio Club, (B-VARC). P.O. Box 1630, Missouri City, TX 77459. Meets 2nd Thurs./monthly, 7:30 p.m., Sugar Land Community Ctr., 226 Matlage Way., 3 blks SW of Imperial Sugar Co. at HWY US-90A & Brooks St. (HWY 58) in Sugar Land, TX. Talk-in: 145.47(-), 442.5(+) rptrs.

VIRGINIA

Southern Peninsula Amateur Radio Klub, (SPARK). Meets 1st & 3rd Tue., Salvation Army Community Bldg., Hampton, VA. Repeaters 146.73(-), 449.55(-). VE Exam Info: (804) 898-8031, W4RTZ

Virginia Beach ARC. Meets 1st Thurs./monthly (except July), 7:30 p.m., St. Andrews United Methodist Church, Tucson & Princess Anne Rds., Virginia Beach, VA 23462.

WASHINGTON

The Mike & Key Amateur Radio Club. Meets 3rd Sat./monthly, 10 a.m., Salvation Army Renton HQ., 720 Tobin St., Renton, WA. Talk-in on 146.82(-) rptr. Doors open at 9:30 a.m.

WEST VIRGINIA

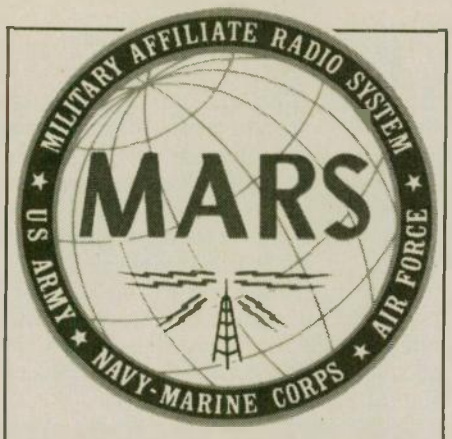
Jackson County Amateur Radio Club. Clark Stewart, W8TN, Pres., 104 Henrietta St. Ravenswood, WV 26164. Meets 1st Thurs./monthly, 7:30 p.m., United Nat'l Bank of Ripley. Net Mon. 9 p.m. on 146.67(-) WD8JNU/R.

Tri-State Amateur Radio Assn. Meets 3rd Tues./monthly, 7 p.m., Green Valley Fire Dept., 16th & Norwood Rd., Huntington, WV. Monthly breakfast 1st Sat., 9:15 a.m., Bonanza.

WYOMING

Sheridan Radio Amateur League, 146.82. 926 La Clede, Sheridan, WY 82801. Meets 4th Thurs./monthly, 7 p.m., location varies; Saturdays, 8 a.m. at J.B.'s. Info: (307) 674-6666, WA7B.

For information on how to get your club listed in "Visit Your Local Radio Club," plus receive many other benefits, write to Club Liason, *Worldradio*, 2120 28th St., Sacramento, CA 95818



Lorraine S. Matthew, N4ZCF
MARS call AAA9PR

This column marks the first anniversary of my writing the monthly MARS column. It has been a most satisfying year for this columnist.

The first column highlighted the Army MARS sponsorship of *Operation: Holidays* for 1993. Army MARS has just concluded the same program for 1994 which was made doubly important because of the separation of so many families with widespread deployment of our soldiers. I thank all of you inside MARS and in the Amateur community who made possible this successful season of radio communications for the public. I look forward to Army MARS sponsorship of the same program in 1995.

Through the year, I have learned about phone patches; then from Somalia, and now from Haiti as well as the normal Germany and Korea locations.

The challenge of change for Army MARS was addressed in several columns with coverage of changes in policies and practices as well as changes in mission. Chief Army MARS, Robert Sutton has been quoted in these pages as saying, "...without change there cannot be progress...without progress, there is no growth...and without growth, there is no future."

At no time in the existence of the MARS programs is the challenge of change more evident than at this time. All of the services are undergoing mission reviews and revisions. The process of studying review and revision options has also been applied to the MARS programs of each service. For several months, this has been an ongoing process which has required many hours of work on the part of the dedicated leadership of each MARS branch. No final decision has been reached at this writing and it is expected that none will be reached much before 1994 ends. This factor makes the approach of 1995 that much more exciting.

In my first column for ***Worldradio***, I wrote, "While the origin of this column is Army MARS, it has always been my policy to include news and ideas from all of the MARS services." This can only be done if those services send me information. I am happy to report that AFMARS has submitted materials that are very applicable to the mission review process that is common to all of us. I thank Eston Gallant, AFF2P/AFA2PT for his efforts in having AFMARS represented in the public relations columns. I also thank Chief Air Force MARS, Ray Collins for his approval and support.

Region 2 Air Force MARS held its conference in Atlanta, GA in August 1994. More than 60 Region 2 delegates attended. Topics addressed included packet (Ben, AFA2OS), MARS Technical Service (MTS) nets (Bix, AFF2M), General Services Administration (GSA) procedures dealing with surplus equipment (Dennis, AFA2FZ), MARS emergency mission support (Gerry, AFF2E), and frequency monitoring (Everett, AFF2VA).

"Contrary to reports ...

Air Force MARS Chief Ray Collins was also in attendance and addressed the issues that have been on the minds of all MARS members of all the services. The Air Force, like all of the services, is engaged in a sweeping review of roles and missions. This review includes the MARS programs. According to Chief Collins, "rightsizing" is the favored term for this ongoing process.

As part of this "rightsizing" process going on within the Air Force, several military MARS stations have had their operating hours reduced or have been closed altogether. Chief Collins asked his volunteer MARS members not to read anything into this reduction. To quote his AFMARS broadcast, "Contrary to reports being circulated, MARS is still alive and well. ... It was no longer cost effective to maintain these stations at full 24 hour capacity. A potential realignment of 30-35 military personnel will be the result of this reduction with NO APPRECIABLE DECREASE IN SERVICE TO OUR CUSTOMERS."

The military services are using criteria similar to those found in business when companies face practical economics. Some companies may merge, others may remain independent and downsize or "rightsize" to use Chief Collins' word. Thus the criteria being used for the MAR (Mission Area Review) considerations are well established. Whatever action is taken, there is no indication of any reduction in the missions being served by the MARS volunteer members. Indeed, some of these missions have shown a marked increase. No decision on the realignment of the MARS organizations has been announced and won't be until the series of MAR meetings and conferences are concluded. The intense self-examination by all the service MARS organizations has yielded a great many beneficial results. These results are certain to be felt no matter what the final decision about the ultimate structure of the three MARS services is. MARS is alive and well and is destined to stay that way.

All MARS services...here to serve... proud...professional...ready. **WR**

FM & REPEATERS REPEATERS REPEATERS

BILL PASTERNAK, WA6ITF

It's time to dream

Ever wonder if you will ever be able to operate regularly through an extra-terrestrial repeater? Yes, AMSAT is currently working on the development and launch of its sophisticated Phase III-D bird, but for all it will offer hams, its still not going to let you whip out an HT and directly call your buddy on the other side of the nation.

Some dreamers in our wondrous ham radio community have offered the thought of putting a full blown, open carrier access repeater on the surface of the moon. Other hams with less imagination have shown why it would be a foolish venture.

Yet the dreamers continue, and we all know that it is from dreams that scientific advancement becomes reality. And it is with this in mind that we offer to you the dreams of another ham radio visionary. He is Dennis Wingo, KD4ETA, and he wants to put a repeater in orbit around the moon:

The first repeater near the moon

BY DENNIS WINGO, KD4ETA, PROJECT MANAGER - SEDSAT

We here at the University of Alabama in Huntsville are participants in a proposal process that will allow us to add one or two Amateur Radio transponders to a SEDSAT (Students for the exploration and development of space satellite) type bus that will be deployed into lunar orbit. The Amateur Radio payload is secondary to the primary payload on the SEDSAT bus and the Amateur Radio transponder(s) would be turned on *after* the primary science mission has been accomplished.

This opportunity is not with any of the present or past "commercial" ventures that seek to go to the moon. This will be a science mission that has support from three NASA field centers, a major aerospace corporation and two universities. Sorry that I am being vague here but we will present a full paper at the AMSAT conference in Orlando on the subject.

Questions

1. What transponders would the Amateur Radio satellite community wish to be included on this satellite? Note that the maximum input power to the transmitter(s) will be 20 watts DC. Note also that the antennas will have to be omnis due to constraints on the satellite's pointing ability. That is the lack of pointing to an object as small as the earth; the satellite is inertially stabilized in a sun synchronous lunar orbit.

2. What frequency(s) of transponders would you like included? We have had some discussions with interested parties and there are concerns regarding mutual interference with the EME transmitters on the L and S band. Is this a valid concern? Can Tom Clark's famous filters help us here (inside joke from gps-dev).

3. What modes would you like the transponders to use? We have looked at the link margins and an OSCAR 13 station could easily do CW or RTTY with their typical station. Would it be worth it to go 9600 bps for a BBS that would be available 12 hours a day? What upgrades would an OSCAR 13 station have to make to go 9600 bps to omni in lunar orbit? (also consider that this will not happen until phase III-D is in orbit for a while). How about a linear transponder? Would it be possible to do DXCC in a day or two on the satellite bands with such a beast using voice and an upgraded OSCAR 13/III-D station?

4. What would the AMSAT community think of this as a successor to Phase III-D as an official AMSAT project? This project is real, folks, there is at least a 50-50 chance that this mission will happen at the present time. There is a large amount of support for this mission. We would obviously like to use existing Phase III-D transponder designs, or would we? What would be the interest in an OSCAR that is available over large portions of the earth's surface for many hours a day? Imagine being in the U.S. and getting up and working Africa to Eastern Europe in the morning and Australia late in the day. Its effective coverage would be great for DX. It might even interest the HF DXers enough to get them involved in satellite work. Is this a goal that AMSAT wants to pursue?

5. Cost. AMSAT and/or its donors would be asked to pick up some of the costs for the transponder(s). This expense would not be incurred until after phase III-D is in orbit. It would be no greater than the costs associated with preparing the transponders and helping us integrate them in the SEDSAT bus. The University of Alabama, Huntsville SEDSAT project, along with the sponsoring organizations would pick up the tab for everything else.

6. Benefit to Amateur Radio. What are the benefits of this being in orbit around the moon for Amateur Radio? Emergency communications is an obvious one based upon the UoSat experience in the Hawaiian hurricane few years ago. The long dwell time over a particular area could help facilitate communications. With a possible cross-link to Phase III-D it is certainly possible to have continuous coverage of an area of the globe, depending of course on phasing between the two birds. Education? Well a successor to my organization for SEDSAT-I will be building the satellite with much support from our Research Administration here at the University of Alabama, Huntsville. All of the activities that currently are envisioned for communications research with SEDSAT could be carried on for the new bird. Publicity for Amateur Radio? Sure.

7. Cross links to Phase III-D. Desirable? Undesirable? What new modes of communications could this bird bring about?

Thank you in advance for your time. (Note: Please send responses directly to Dennis Wingo KD4ETA at his *Callbook*™ address or via Internet to KD4ETA@amsat.org).

Radio prices going up

Regardless if you operate HF or VHF, you will want to take note of the following. If you have been planning on buying a new piece of ham gear that is made in Japan, now may be the best time. Not because dealers are having any kind of ham radio super sale. Rather, you want to buy now to avoid what could be the biggest price hike in all Pacific Rim manufactured merchandise ever to hit the United States.

Most hams — in fact most Americans are not aware that the cost of items manufactured outside of the United States is not directly measured in US dollars. Rather, it is how much of another foreign currency a US dollar will buy. And when we talk about most of today's electronics — especially consumer electronics which includes most ham gear — we are talking about the Japanese unit of currency, the yen.

Let's suppose that a piece of ham gear costs ten thousand yen in Japan. A year ago, a United States dollar would buy about 125 Japanese yen. Divide 10,000 yen by 125 yen to the dollar and you find that eighty United States dollars would equal the 10,000 yen needed to buy that piece of equipment.

In late June and early July, the United States dollar fell to a new all-time exchange low. Currently a dollar will buy only about 97 yen. So if we divide 10,000 yen by 97 yen to the dollar, the eighty dollar piece of ham gear now costs US$103 — an increase of about seventeen percent. And these are what we call base price increases that do not take into account the upward cost of excise taxes and import duties levied on almost all imports. Nor does it cover the high state and city sales taxes that you will have to pay. If you add in all the real world costs, the actual increase is probably closer to 19%.

And making matters worse is that the Japanese economy is in its worst recession in modern times. And, because their economy is in a tailspin, the value of their currency is unstable. We won't go into the science of international money trading. But we will say that the Japanese yen and United States dollar are changing value on almost a daily basis, with the dollar constantly sinking in relation to the yen.

And what happens if we wind up with a dollar only being able to buy — say fifty yen? Well, using our 10,000 yen piece of ham gear that used to cost us US$80, the price would skyrocket to around US$200, but you would not be able to buy it. Long before the rate of currency exchange reached that low a value, the entire economic infrastructure of Japan would have collapsed. There would be millions of people out of work. No manufacturing and no export of ham rigs or anything else to the United States. And because the economies of other Pacific Rim nations are tied directly to Japan, Korea, the Philippines, Indonesia and other manufacturing nations would suffer as well.

So the big question is when will the downward spiral of the dollar in relation to the yen end? That is not an easy question to answer since the best minds in the world of global economics are divided on it. Some thought the spiral had ended last fall when the exchange rate hit 100, only to be shocked back to reality when 97 was the new record low. The more conservative analysts point to the mid 70s before an upturn occurs. Liberals point to the new Socialist coalition government now ruling Japan that says it will let the yen float against the dollar no matter how low the rate gets. So the answer is that nobody really has an answer, but the reality is that each time the dollar buys fewer yen, the price you have to pay for that new transceiver or hand-held goes up.

Another great packet posting

As stated in an earlier column, from time to time we run across some true words of FM and repeater wisdom floating across the packet radio airwaves. One of the best deals with open vs. closed repeaters and is the work of Don Smith, W6NKF:

From: W6NKF
To: DEBATE @ ALLUS
Re: DEBATE & 97.205E

The last word on open/closed repeaters and FCC rule 97.205E

I have watched the debate going the rounds on the various BBS systems around the country, as it regards operators being asked to refrain from using some repeater systems. Some of the arguments refer to a "return to closed repeaters." I disagree with this argument. Admittedly, there are a few diehards on the 440 bands who started a repeater for their own private use, however they are few and far between. Any radio club that operates a repeater, or group of repeaters are essentially operating open repeaters. The use of a PL to access the repeaters does not make them a "closed" repeater system. Many site owners now require the use of PL to cure intermod and interference problems.

The use of FCC Rule 97.205E to restrict the use of a repeater has been used for a good purpose, and of course, should be used with discretion. Any operator who cannot utter a complete sentence without the use of a four letter word, jams the club net, and makes a routine fool of himself, deserves to be banished. Don't get me wrong, I am not a do-gooder! I sailed in the Merchant Marine for years, and I can swear in several languages! I do not, however, believe in using foul language on the radio! I assume that any one who does so only shows a lack of intelligence and education, and is trying to cover up their stupidity with shock verbiage!

When you come over the radio into my home, or any other ham's radio, you are a guest in the house. There may be children present, and they may be thinking of becoming a ham. Would you let your children join a group of foul mouthed louts? I think not!

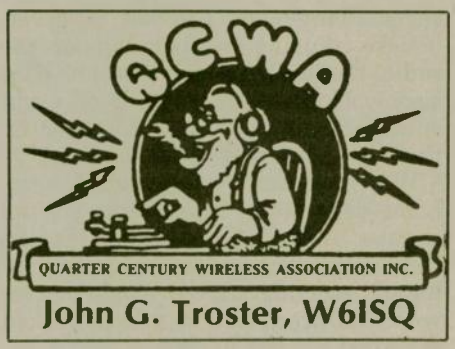
Let's show some common sense here. Ham radio is for all of those who wish to join the fraternity and play by some very simple rules. Be nice, say something intelligent, and above all, be a gentleman!!!

de W6NKF @ KE6AML.NOCAL

Till next month America....de WA6ITF

(FM and Repeater column author Bill Pasternak WA6ITF receives mail at 28197 Robin Avenue, Saugus Ca. 91350. His 24 hour/day voice and fax line is (805) 296-7180. He can also be reached by electronic mail on the following services to the mailboxes: (GEnie) B. Pasternak;(Internet) b.pasternak@genie.geis.com; (America Online) BILLWA6ITF; (MCI Electronic Mail) 324-1437.) **WR**

WE CAN'T USE A RADIO TRANSMITTER BUG -- THE F.C.C. TOOK OUR FREQUENCY AND SOLD IT TO SOME SHIPPING OUTFIT!



John G. Troster, W6ISQ

73 + 25

Someone wrote a few months ago asking what the "25" meant at the end of this column. I set that letter aside to answer in this column, but dawgonit, I lost it. So, I don't know who asked. But here's the answer anyway. What does the 25 mean? Hmmmm, lesseee. This is the Quarter Century Wireless Association, and we are all Old Goats together, some lesser, some greater, as will be discussed below. And if we are all proud comrades united with the common binding factor of 25 years experience to be One Of Us, The Proud, The Elite. My guess is that I meant the 25 as an expression of our common brother/sisterhood, OK?

Old goats

I've got good news for us QCWA Old Goats! First of all, if you are QCWA you're automatically considered an Old Goat. That's great, right? Ask anyone. It means experience, the wisdom of the ages piled on your shoulders. It also means you know everything, important facts and figures whatever the subject is. You've arrived.

More good news. There are different classes of Old Goats. The Real Old Goats. They've been around for a few sunspot cycles. The Middle Old Goats who have put in their time, but still have a way to fight on. Lowest on the ladder, the Young Old Goats. They've just entered the Golden Age as signified by eligibility to enter the ranks of QCWA.

So we have now, ROGs, MOGs, and YOGs,(no, no Mairzy Goats!!) You could think this is classification according to age. Au contraire. It refers to state of mind. Keep it in mind. The nice thing about this classification thing, is that members can select their own category. If you are an MOG, you can switch either way. I have met some serious YOGs who could have passed as ROGs. And I've met a lot of ROGs who think and act like pre-YOGs. As a matter of fact, I have never met a QCWA ROG who didn't consider himself a YOG.

Dr. Bob Brown, NM7M, QCWA

Readers of ***Worldradio*** are familiar with Bob Brown's Propagation column. Bob is a fellow QCWAer. There are times when I finish reading his articles that I find myself thinking, "What was that?" and I have to re-read more slowly. But Bob has a natural talent for presenting this stuff. I couldn't help being amazed by how he comes up every month with a different master view of the ionosphere, radio waves and rays piercing hither and reflecting yon all over inside and outside our ionospheric shell. I wondered how he got to digging so deeply into the subject, so I called him up. I asked what had sparked his interest in the workings of radio and radio waves, and here is what I found out.

Bob's a San Francisco Bay Area native, from Alameda. During the 30s, the family had a Zenith radio which, as you may remember, tuned the broadcast band as well as the 160 Meter amateur band. Bob listened to the amateurs on 160 and the Lone Ranger on the broadcast band. It was a contest to see which got most attention. He found a station on 160 which sent code practice and Bob decided to learn it, along with some theory. He got his ticket in 1937 and went on CW, still his favorite mode today.

At Fresno High School, he discovered chemistry and decided that was what he wanted to study. He matriculated (that's an Ivy League word) at the University of California, Berkeley, and started with a major in chemistry. However, he noted that chem labs were full of bad smells and persistent odors, but the physics department was clean, with polished floors and no odors. So, he switched to physics, graduating in '44, and immediately went into the Navy. His Phi Beta Kappa key got him sent off to Japanese-language school. Commissioned in December '44, he was then shipped to Pusan, Korea, and later to Osaka, Japan as a translator and interpreter.

After the war, he reentered Cal Berkeley and began the study of cosmic rays—high energy physics. In '50 he received his Ph.D., and went off to Princeton for a year as an instructor, then to University of New Mexico for three years, and then another year with the National Science Foundation. Finally, in '57, back to Berkeley to teach and research cosmic rays.

Bob says his most vivid scientific experience occurred on February 23, 1956 as he was observing one of his ionospheric monitoring instruments. Suddenly the instrument began to show a huge increase in reading, which ultimately inched up to 15 times the normal reading. He had been lucky enough to have just observed the greatest solar flare in history as it burst forth in all its glory!

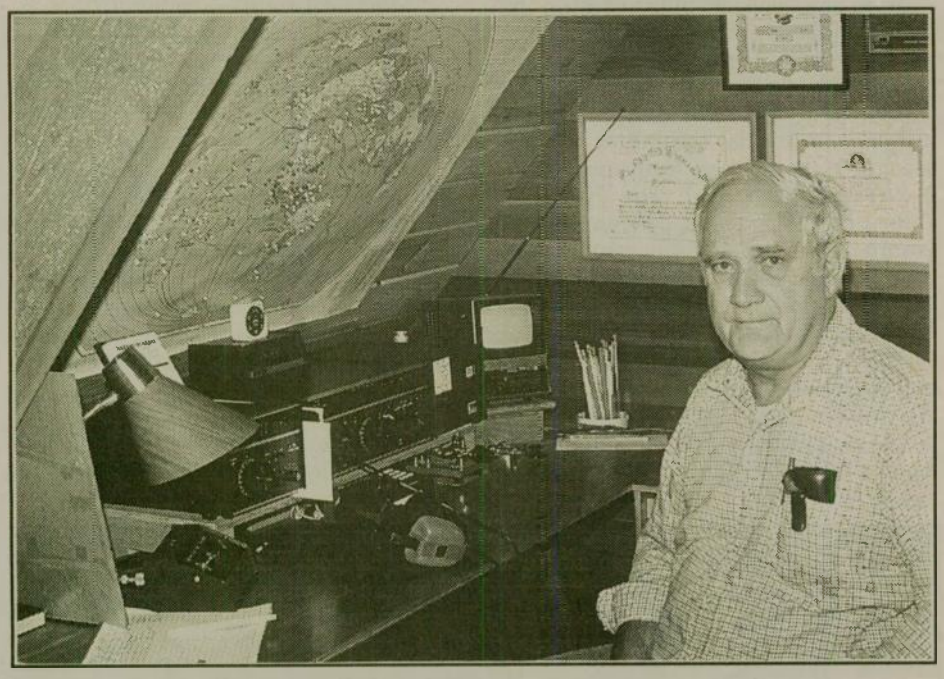
Although Bob was doing cosmic research, his interest in the ionosphere, or "poor man's space physics" as he calls it, grew. He didn't use rockets and satellites, just balloons and observations. As a natural consequence, he began playing with regional propagation predictions and has continued to pursue it. As dean of the College of Arts and Science, he met often with the University's ombudsman for students, a young woman named Mary Lou who was also a Professor of Physical Education. They seemed to have no problems straightening out student problems and observed they might be able to get along together themselves. They married and their observations proved right.

He'd let his license lapse during WWII, but when he was about ready to retire to Anacostia, Washington in '81, he thought it would be fun to again take up the hobby of his youth. Mary Lou was interested too, so they studied up and took the Novice test together. Both passed. They then upgraded to General and soon decided to go for Extra. Again they took the exam together, both passing and going from General to Extra in one evening! Bob is now licensed NM7M, and Mary Lou, NM7N.

Bob describes himself as a technically oriented DXer. As you know from his columns, he is interested in finding out what happens to those radio signals after they leave the transmitter. He does much of his work on a computer which he has programmed to his special interests and needs. As a result he can do wondrous things. For instance, he

recreates radio history so that he can tell you about conditions during a DX contest in cycle 17, or even tell you all about conditions when Marconi was actively trying to span the Atlantic on frequencies below 200 Meters. Kinda like a radio planetarium.

He also plays radio fantasy games like this: when Reg Tibbets, AC4YN, the legend of Lhasa, was actively on the air, could Bob have contacted him with his 50 watt transmitter and very low, long wire? Plugging this information into his computer plus a few other things he knows about, he comes out with an answer. Sorry I cannot reveal his conclusion. You will have to read Bob's column on page 52 to find out if he could have worked AC4YN in the good old days. A few years ago Bob did a year's study of long path propagation which involved daily skeds with Europe. He concluded that during times of good solar activity, and barring ionospheric storms, there is almost always a long path opening, even without gray line propagation. He turned his findings into a book, incidentally, still available from him at $10 per copy.



QCWAer and propagation guru, Dr. Bob Brown, NM7M

At another time he and colleague GM4IHJ, noticed that at times they could hear satellites 10-12 minutes before they should be heard during polar passes. They wrote a scientific paper proposing that this newly discovered phenomenon was due to clouds in the ionized F-layer drifting across the dark polar cap. This represented a newly-recognized form of propagation.

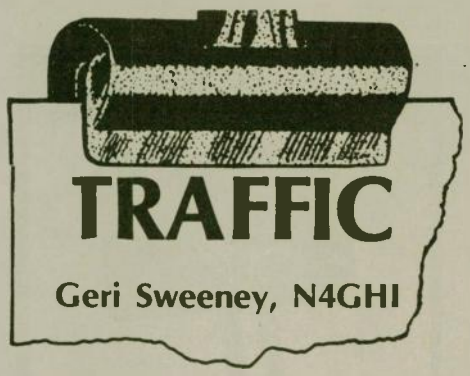
Bob has computer programs for about everything, including games. He developed one called Snap Shot, and went public with his Solar Max game which you've probably seen advertised in the amateur press.

YF Mary Lou is an active DXpeditioner. She has ventured with other YLs to Niue, Wallis Island, Fiji, St Pierre and Miquelon, British Virgin Islands, and Grenada. No doubt many of you have talked to her at those locations. She is gearing up for the next all-YL trip in January. Usually she doesn't "consult" with Bob about where the gals will go so he jokes that he has to work them to find out where they are. Listen up in January and you'll find out too.

Bob and Mary Lou have six transceivers! The most important is the Yaesu 757, which Mary Lou takes on her DXpeditions. They also have a Cushcraft A3, plus many dipoles and verticals.

Bob continues at a pace equivalent to the speedy radio rays bouncing off the F-layers that he tracks. It is hard to guess what he will turn up next, but you can be sure it will be interesting and fun. And if you're like me, you haven't quite figured out what he has written the first time you read it, read it again. What do you expect from the Professor? Something easy? Here is your final exam from the good Doctor: there are D-, E- and F-layers labelled in the ionosphere. What happened to the A, B and C layers?

Good night all you YOGS. Study strongly. 73 + 25. Jack, W6ISQ WR



TRAFFIC

Geri Sweeney, N4GHI

Upcoming traffic events

December
- WA4TGF, Virginia Beach, VA
- Shopping mall message center
- First Night, Annapolis, MD
- First Night, Boston, MA

January
- South Florida Fair

Evolution not revolution

The NTS has, and always has had, a recognized purpose - to move a message from an originator to a recipient in a timely and accurate manner. While it has evolved over time to keep current with its environment and changes in technology, it has remained faithful to its purpose; moreover it still works.

One often hears laments that the system is mortally wounded because:

1) Nobody uses CW anymore.

2) Packet hasn't been adopted as the mode of choice.

3) Packet has been adopted as the mode of choice.

4) There aren't any new people getting into traffic handling.

5) Modern commercial modes are too effective.

6) and on and on....

But, each and every day, across the USA and Canada, NTS nets meet, traffic handlers interact and enjoy their chosen hobby, and messages flow. Some operators use CW, many use voice, and an increasing number utilize automated modes such as packet and AMTOR. But not one of these modes originates or delivers a message. Traffic handling is a people sport whose goal is to transmit a message from one person to another; something which hopefully increases the pleasure of both the sender and the recipient. The traffic handlers in between are happier for having had the experience of moving the message and for having had the experience of interacting with their traffic handling peers. Not a bad deal—something that makes everybody happy.

Still, as with everything that we do, we'd like to do it better. Dr. Demming called it TQM (Total Quality Management), and pushed it as a new and revolutionary management philosophy. A basic tenet is that "willing workers" want to do a good job, but that often the policy makers impose inappropriate management dogma which prevent them from doing their best. Worker involvement in establishing procedures is a key to finding the better way. A second tenet is that "continuous improvement" is a goal. The NTS has embraced that philosophy from the beginning, albeit reluctantly at times, and that is why it is alive and viable today.

The NTS is a bit like the armed forces. Stations practice at a fairly low level of activity, but must be able to surge to meet the instant need when it develops. We practice that surge capability over holidays. Typical is the Virginia Beach Amateur Radio Club which runs a Christmas message drive at a local mall each year. Last year they inserted approximately 1400 messages into the NTS over an eight day period (about 175 messages per day). That contrasts to a normal Virginia day of about 20 messages. When the system is stressed, weak points tend to stick out - error rates climb, delays and lost messages increase. Here is where corrective action may need to be applied, but carefully. Ad hoc solutions don't necessarily help make the base system healthier. Nay-sayers of all sorts take the opportunity to intone:

1) Packet is a black hole

2) CW is error-prone and slow

3) Only automated methods can handle this much traffic.

So, what's a station to do? Dr. Demming's solution: Do the best that you can, and keep trying to do it better. He noted the futility of the search for what he called "Instant Pudding," the quick and easy solution. For the NTS too, it just isn't there, but our willing workers will seek continuous improvement, work their way through the holiday traffic, and be the better for it.

Traffic training

With the above in mind, I recently received a letter from N1JXP request-

ing specific dos and don'ts for traffic procedures. This amazed my husband, as he's always telling me that I preach too much. But, with such an opening, and realizing some of you are new to the game, let's take a look at receiving a message.

One's level of confidence seems to dictate how you send and receive traffic. A receiving station often has need of fills. New traffic handlers often attempt to read back the entire message to be sure it is correct. With experience, one's confidence level advances to a higher level. Here, stations ask for fills using lots of words to be sure the other person can find the right place. (Please, I need, in the address/text/signature, the word after, "love and miss"). Stations who have had the good fortune of being able to listen to top ops, realize they can condense a fill request to: WA miss (whether on SSB or CW). One of the hardest things a traffic handler must learn is when to stop talking.

It's just more fun working stations who are at the top confidence level. They expect you know how to find a fill and give you the chance to show them. The primary fill request words are: WA (Word After), WB (Word Before), and BN (Between). You might wonder when you would use WB instead of WA. Aren't they requesting the same word? Yes. It gives the receive station a choice of two words (one on either side of the word you want). One of those two words may be much easier for the transmit station to find. There may be 3 "x's" but only one "miss." You should form your fill request using the more distinctive word. Thought is required.

If you have been noting where you need fills as you go along, you can ask for them in order - top to bottom. Order is always easier than chaos. As you copy, try underlining, leaving a space, or whatever mark you decide upon to indicate a fill will be needed. When it's fill time, you don't have to reread the message. You just follow your trail of marks.

It seems a lot of folks are currently responding with, "QSL number whatever." QSL means QSL everything, including the message number. On CW, top ops indicate they QSL with a 'K' or just a 'dit.' While a 'K' or 'dit' may not be in the procedure manual, it not only serves the purpose of signaling QSL, but it saves some amount of time. You may question how a few seconds can make any difference. If you add up all the few seconds you could save as the message is relayed (fills, QSLing, etc.), times the number of messages you might handle, it can add up. One gains satisfaction from a job well done.

Stations seem compelled to explain why a fill was needed. There are so many little things that can go wrong while copying a message (from static crashes and fading, to the phone ringing and the dog barking), that one wonders how anyone can ever get an entire message without a fill. Explanations are never needed.

So, there you have some of the dos and don't of asking for a fill, think and condense.

Traffic trivia

1) What are the three areas into which the NTS is divided?

2) To which area is international traffic sent?

3) If you ask someone to QRS, what should they do?

4) Which five sections handled the most traffic last year?

5) How many sections does the NTS have?

International traffic

The International Assistance and Traffic Net relays traffic from nets. The IATN uses a privately owned satellite system (Satgate), for some of its traffic. Messages not delivered are serviced back. How does international traffic move on packet? Does anyone know how you address a message on a PBBS to a foreign country? And, how do PBBSs forward foreign messages?

Bolivia

We now have an excellent outlet for traffic to Bolivia on the IATN. We just need some Bolivian traffic. We do have a third party traffic agreement with most of the South America countries.

SAN

The Sweden/American Net needs amateur to amateur traffic. Possibilities:

1) Thanks for the QSO.

2) Glad to have worked you in the contest.

3) Amateurs with amateur friends and/or acquaintances in Sweden.

Send your international traffic to the EAN where it will be picked up by the liaison to the IATN. WR

YEAH, YOU'RE RIGHT— A MAGMOUNT DOES WORK PRETTY GOOD ON A METAL TRAY

County Hunter

Ace Jansen, N3AHA
1234 Thommill Way, San Jose, CA 95121

Miracles

Yes, miracles come in all shapes and sizes. Miracles are all around us if we stop and think and rediscover all our little wonders. Our little miracle in the Jansen family appeared September 13th as you may have read in ***Worldradio***, November '94, page 3. The short article was entitled *County Hunter Addition* — we canceled the County Hunter *edition* for that month, but we celebrated the County Hunter *addition*.

But our joy is our baby girl, Carlie Ann. Carlie truly is a great baby and she keeps my wife and me very busy. Our answering machine message says, "thanks for calling but we're busy taking care of little Carlie. We'll give you a call back when we have some free time, probably when she's five and starts school!" Now I don't want you to think I've totally lost interest in ham radio or county hunting, so let's just say I've had a major priority shift. Still, I operate the same amount I have over the past two years; to-and-from work.

Merry Christmas!

Well depending when you get this issue and sit down to read it, Christmas may be around the corner or has come and gone. Regardless, I can still wish you a Merry Christmas and a Happy New Year. To do that, I've prepared a 'Twas the Night Before Christmas-story for you and a list of New Year's resolutions. Of course, since this is a county hunter column, it relates!

'Twas the Night Before...

'Twas the night before Christmas with tons of line noise,
Not a mobile was active, not one of the boys.
My headphones were hung by the radio with care,
In hopes that my last county soon would be there.

The bands were so quiet, quite frankly pretty dead,
I decided to bag it and just go to bed;
But before I shut down, one more look at the packet,
To see if I was missing some elusive ham racket.

When on my packet screen there arose a great spot,
I blinked my eyes twice and drank one last shot.
Flipped on the radio as fast as I could,
Closed my eyes, prayed and knocked on wood.

The static on twenty was as loud as before,
and I wondered if my ears could take any more,
When what to my wondering ears should "appear"
But my last county coming in loud and clear.

With a mobile op so lively and quick
I knew that our signals surely would click.
More rapid than contesters his QSOs they came,
And he whispered and shouted and called them by name:

"Now Arnie! Now Dennis! Now Mary and Joe!
On Eddie! On Tessy! On Katie and Flo!
You're 5-9 plus forty! Just broke my poor speaker!
Now standby awhile so I can work someone weaker!

It's been a long time since this county's been run,
After ten minutes and the mobile op isn't done,
Without slowing down county hunters did call,
The mobile op responded with a 5-9 for all.

And then almost suddenly he vanished with a poof.
I sat there depressed, concerned and aloof.
As I lowered my head and was filled with despair,
His signal reappeared as if out of thin air.

He was louder and stronger than even before,
And his humor made listeners laugh and roar.
Giving out contacts to all that did speak,
Though net control watched his clock and did shriek.

His voice, how it soared! His signal, how hearty!
His twenty minute run has labeled him tardy!
He drives through counties to help all his friends,
MRCs by the thousands he signs and he sends.

The switch of the mic he held tight in his hand,
And his mobile equipment was best in the land.
But his rate was slowing and started to die,
I knew it was time for me to contact this guy.

The pressure was building and I couldn't stand to wait,
I couldn't keep waiting and risk being too late.
I flicked on the amp and all the lights flickered,
He said "last call" then giggled and snickered.

He heard no more, said he was "moving to code,"
I didn't know county hunters used that old mode,
I grabbed my Morse key and wiped off the dust,
Quickly plugged it in and pounded off the rust.

I sent my call once and we made it complete,
He sent "73" and I relaxed in my seat.
Now, I must thank him or feel like a jerk:
"Merry Christmas Santa, I'll do the paperwork!"

•

Now is an opportunity to thank all the mobiles who mobiled in '94 and plan to mobile in '95! Without you the county hunt would be much more difficult. You are a Santa to someone every time you run a county, whether it's a "green-stamper" or a "rare" county. Please continue to run counties at every opportunity.

Happy New Year!

I wish you the best in '95 and to make sure you get along okay, here are some...

•*Resolutions*

And now, something you've been waiting for over the last twelve months. An opportunity to clear out the resolutions you didn't do from last year's list and try once again. So to aid in your endless endeavor to pursue bettering yourself, I have for you a list! But not just any list, this is a top ten list. Here now are the...

•*Top ten "Mobile operator tricks"*

This next year, you will either set up your mobile station or improve upon it, and this list will help you facilitate not only your mobile station improvement but also mobile operator skills. The Top Ten Mobile Operator Tricks. Heeeeeeere we go...

#10—Hang underwear from multiband resonators; better signal from airing dirty laundry.
#9—Use cruise control, one less thing to think about while operating
#8—Use shoulders; nothing worse than disengaging cruise control.
#7—Only send combinations of E, I, S, H, T, M, and O on code.
#6—Use wireless mic; leave hands free for typing on laptop computer.
#5—Use satellite link to Mexican-based remote station.
#4—Verbal shortcuts;"got the 9!"; "Yep 9!"; "9!"; "Yes!"
#3—Don't bother remembering names; call everyone "Bubba."
#2—Strap paddle on knee; much better for code than a banjo; and the **Number 1** Mobile operator trick. Shift gears with left hand.

There you have it, your list to post in every car. But don't worry, they'll sit there like every list before. You'll find it around December, '95 and think "Man, was I dumb not to act on all these awesome suggestions." Authors get no respect!

See you next time

That's enough for now. Until March, see you on 14.336 or 14.056 MHz. Happy trails, happy hunting, and most importantly, happy diapering! **WR**

OLD-TIME RADIO

Hardscrabble hamming

JOHN K. MUNROE, W7KCN

There's a radio museum here in town. In the museum is the exact likeness of the first radio we had when I was a lad. It's an old RCA radio/phonograph with the phono part above (the crank handle at the side), and the radio and speaker below. I spent so many childhood hours at that old radio with my ear held close to the speaker. I thought it was glorious that we could get so many exciting programs.

Later my parents bought a 1936 Chevrolet, the first car we had with a radio in it. Now and then I would talk Mom into a little longer drive down highway 410 so we could listen to the radio. The dial had a lovely apricot glow and we could get KUJ, Walla Walla, and KHQ, Spokane - maybe more if propagation was good. It was thrilling. It must have helped ignite my lifelong interest in radio in general.

In the later '30s, Dad bought a new Zenith with pushbuttons so he could hear the baseball games, but what attracted my attention was the shortwave band! Another first. Distant cities where stations might be found were indicated on the dial: Berlin, Calcutta, Shanghai, Tokyo, Buenos Aires, et al. I don't remember any of those, but I do remember hams. I was like Mr. Toad from *Wind In The Willows*. I had to have more of that.

Somebody put me onto Iley Winn, W7BDB, who repaired radios in the basement of Hamilton Hardware in Dayton, Washington. In the back of the store a coal cellar-type door led down to the basement. There was a dirt floor, one 60-watt bulb so Iley could see his work, a cluttered workbench with some test equipment, and a number of radios sitting around. But the whole basement was draped with cobwebs and smelled musty. That was my after-school hangout for many days. Iley eventually invited me to his shack, an upstairs unused bedroom.

Everything was, of course, homebrew. The transmitter had fine business mercury vapor rectifiers behind a wire screen. The finals were a pair of, '10s. The receiver was home brew and Iley was one of the first to build an ECO, the forerunner of the VFO. He was constantly getting shocks from various things. He often warned me to stay back. Ragchews on 160 and 80 were his daily routine.

Frank Cote, W7CDS, repaired cars and radios in his shop. Only once, when I came home from the Navy, did he invite me to his shack, another masterpiece of homebrew. I think kids bothered him.

Dennis Price, W7BQW, moved from an old three-story house in Dayton out to a farm. When he moved out, he left what I thought was an astonishing amount of wonderful stuff behind. Tickler coils, audio transformers, RF chokes, crystal holders, Fahnestock clips, etc. Once when I visited him at the farm, he pointed to his new shack - it was at one end of the woodshed! In front of his operating table was a window with the glass broken out. Snow had drifted in on his rig! A Zepp antenna hung between the woodshed and his barn.

Wes Calkins, W71LJ, had a neat, cozy little station in his basement. His XYL also enjoyed his hobby and often came down for ragchews. His receiver was a Hallicrafter Sky Buddy. The transmitter was a pair of 6L6s. He often let me talk with other hams around the state. By then I was nearing my teens and ready for a serious effort toward licensing.

Wayne Spoonemore, W71TP, worked for my Dad and often coached me on radio basics. I loved his shack. It was in one end of an unfinished attic. To reach it, we had to climb an outside ladder, walk carefully through the unlit part of the attic on a 6-inch wide plank and into the rough-framed shack. Again, everything was homebrew. Wayne ran high power from an 813 amplifier. The place was a confusion of wires everywhere. "How come they call this wireless?" he used to ask me.

Bert Dingle, W7WDQ, was my best pal. He and I made wonderful plans for ham shacks in his basement. We practiced code together, confused each other with unanswerable questions (What does a coil really do?), and created some masterful projects. One was a wooden tower upon which we planned to support a rotary beam antenna for which we also had tentative plans. We began the work one night by porch light. We dug holes in his back yard, planted 2 x 4s, nailed them together, then stopped at 15 feet to ponder how we could support further a 2-legged tower.

I didn't pass my first exam in 1941 (administered by W7BDB) for want of preparation, but did pass the next one. Alas, it was too late for a callsign. The war ended all amateur activity, but I did get an operator license.

The U.S. Army Air Force had a B-17 base in Walla Walla, 30 miles south of Dayton. One day a plane crashed in the mountains east of Dayton. We lads felt we knew those mountains like our back yards, so three of us arranged a search party. We, ourselves got lost in a mountain-top blizzard and had to follow the terrain downhill until we found habitation. Our first night in the snow was very uncomfortable. We tried to build a fire. I collected small dry twigs from trees. I had three paper matches in my pocket. I was the only one who brought a wallet, so I emptied the contents for the fire. I sacrificed my girlfriend's picture, three dollars, a bunch of ID cards, some stamps, but NOT MY HAM LICENSE. I would rather freeze, I thought. No matter. Three matches weren't enough for that damp fire. We found our way out late the next day.

I appreciate my modern station, but those youthful construction efforts were fine training, I'm sure, even though nothing much ever worked. I used bottle handles for insulators. I made feedline spacers out of cedar sticks soaked in paraffin. Coils were wound on toilet paper cores and plugged into tube sockets. Construction materials were shiplap, Masonite, and Bakelite. Transformers were mostly hand-wound. Crystals were frequency amenable by using Bon Ami on a pane of glass. (To change a few kilocycles, rub on graphite from a pencil.) One could tune the final with a light bulb and coil. Old fluorescent bulbs hung from Yagi elements glowed wonderfully when keyed thus lighting up the whole back yard. Feed line options were twisted pair lamp cord, or Zepp-type feeders.

Many of us made our own keys. They were never very good-looking but were pretty easy to make. Iley (BDB) once made a bug. He never seemed to use it, though. Carbon mikes were common, but unreliable. If the air was damp, one had to wham the mike on something to shake up the carbon granules.

Transmissions, in addition to being many kilocycles from the receiving frequency, were slow. First, turn off the receiver, throw the antenna switch, which was always a double pole double throw knife switch (seldom fastened down), then turn on the transmitter. It took a while. Wave meters gave us an idea what band we were on and roughly what part of the band. Fixed capacitors were possible to build using waxed paper and tin foil, but difficult to set to a particular value. Brush earphones were uncomfortable to wear very long. They had wires going over the top. The ends were terminated in two silver metal probes which plugged in to the Fahnestock clips...as did your antenna and your key.

Without anyone nearby to help me, some ridiculous mistakes were made. My first receiver, a 2-tube regenerative, was laid out first with pencil on a REAL breadboard. Without somebody to tell me how to do it, it seemed the safe thing to do was secure parts onto the breadboard exactly where they appeared on my penciled schematic. Roofing nails fit into the holes in the B battery. Doorbell wire looped around the nails led to the B+ on the receiver.

Now, when I push a button and my tower goes up/down, my transceiver can tune out nearly all kinds of interference, and my amplifier gets me anything I need to work, and my packet tells me where the DX is, it seems an impossible distance back to those beginning days. **WR**

QRP organization survey

If there was any question about the health and welfare of QRP across the United States and around the world, take a look at the findings of the second annual ***Worldradio*** QRP Organization Survey.This year's roundup of clubs, groups and societies — updated annually and published each January in the QRP column — is bigger than ever, and contains some noteable changes when held up against the '93-'94 survey. Five organizations have been added to this year's list: The GW QRP Club, Colorado QRP Club, QRP Club of British Columbia, QRP Society of Central Pennsylvania, and Wyoming Valley QRP Commandos.

Fifteen organizations completed the '94-'95 survey questionnaire, a net increase of one organization over last year's total of 14 — testimony that low power operation is still of keen interest regionally, nationally and internationally.

Note: Net times listed here are in UTC. Therefore, for radio amateurs in the Western Hemisphere a net at 0200Z Thursdays, for example, is actually taking place on Wednesday evenings, local time.

Michigan QRP Club

Founded: 1978

Membership: More than 1,300; open to all radio amateurs, membership numbers assigned.

Cost to join: $7 US/VE, $12 DX

Annual dues for current members:$5 US/VE, $10 DX

Periodicals: *The Five-Watter*, published quarterly.

Nets: MI-QRP Net at 0200Z Wednesdays on 3.535 MHz.

Club-sponsored activities: Michigan QRP Club CW Contest, 7-8 January, 1995; MI-QRP Labor Day Sprint, 4 September, 1995. For information, Michigan QRP club, 654 Georgia, Marysville MI, 48040-1243.

MFJ 90's Radio Club

Founded: 1993

Membership: 75; open to all radio amateurs with an interest in operation and modification of the MFJ series of QRP transceivers and accessories, membership numbers assigned.

Cost to join: Free

Annual dues for current members: None

Periodicals: *MFJ Nineties*, published quarterly.

Nets: Members meet Sunday afternoons on recognized QRP frequencies.

Club-sponsored activities: None

For information: Joe Falcone, AA8HV, 3000 Town Center, Suite 2370, Southfield, MI 48075 St. Louis.

St. Louis QRP Society

Founded: 1987

Membership: 42; open to all radio amateurs in the St. Louis metropolitan area, or to radio amateurs who have established membership prior to leaving the area. No membership numbers assigned.

Cost to join:Free

Prospective members are requested to attend one of the monthly meetings.

Annual dues for current members: $12.

Periodicals: *The Peanut Whistle*, published monthly, with an expanded anniversary bonus issue each November.

Nets: Club members meet on 145.33 MHz FM the first Thursday of each month at 0200Z.

Club-sponsored activities: Field Day and occasional portable outings are scheduled each year. There is an annual tailgate swap-sale and open house in place of a regular meeting. Also, the club sponsors an annual Builders Contest, and in November the club meeting is in the form of a club anniversary dinner. Each year a trophy is awarded to the club's outstanding member of the year by the previous year's winner.

For information: Keith Arns, KCØPP, 2832 Pembroke Ln., Saint Charles, MO 63301-0344.

NorthWest QRP Club

Founded: 1992

Membership: 315; open to all radio amateurs, membership numbers assigned.

Cost to join: $10

Annual dues for current members: $10

Periodicals: *The NWQ Newsletter*, published bimonthly.

Nets: NWQRP Net meets Tuesdays at 0300Z on 10.123 MHz; and Saturday at 1530Z on 3.561 MHz.

Club-sponsored activities: NWQRP Winter Sprint, 14 January 1995; and NWQRP Spring Sprint, 20 May 1995.

For information: Bill Todd, N7MFB, NW QRP Club, 4153 49th Ave. SW, Seattle, WA 98116.

Cleveland QRP Amateur Radio Club

Founded: 1993

Membership: 6; restricted to radio amateurs in the Cleveland metropolitan area, no membership numbers assigned.

Cost to join: Free

Annual dues for current members: None

Periodicals: None

Nets: None

Club-sponsored activities: Gatherings to promote QRP in the Cleveland area and to assist newcomers into QRP activity.

For information: Bruce A. Wright, N8MWL, P.O. Box 14052, 410 Superior Ave., Cleveland, OH 44114-9998.

QRP Club of New England

Founded: 1991

Membership: 250; open to all radio amateurs, membership numbers assigned.

Cost to join: $10

Annual dues for current members:$7

Periodicals: *72* published quarterly

Nets: QRP-NE SSB Net Tuesday at 0230Z on 3.855 MHz.

Club-sponsored activities: QRP field Contest in September; Colorburst Sprint (CW) during May and September on 3.579 MHZ; Field Day in June; and a club outing to W1AW in Newington, CT annually in January or February.

For information: Jack Frake, NG1G, P.O. Box 93, Barnard, VT 05031.

Maryland Milliwatt Club

Founded:1992

Membership: 25; currently by invitation only, membership numbers assigned

Cost to join: None

Annual dues for current members: None

Periodicals: None

Nets: None

Club-sponsored activities: Promotion of QRP in the 3rd call district. The club sponsors QRP discussions regularly at the Maryland Radio Center in Laurel, MD; sponsors QRP "Show and Tell" sessions; and is establishing a QRP reference library.

For information: Maryland Milliwatt Club, 3052 Fairland Rd., Silver Spring, MD 20904.

G-QRP Club of Great Britain

Founded: 1974

Membership: 8,300; open to all radio amateurs, membership numbers assigned Cost to join: $12

Annual dues for current members: $12.

Periodicals: *SPRAT*, published quarterly.

Nets: None

Club-sponsored activities: QRP tests and activities organized by A.D. Taylor, G8PG. Extensive awards program including: Worked G-QRP Club Award, QRP Countries, Two-Way QRP Master, and CW Novice Award. Trophy program including the G2NJ, Partridge, G4DQP, Chelmsley and Suffolk trophies. Annual club-sponsored contest is "Winter Sports" from 26 December to 1 January, inclusive.

For information: G-QRP Club, Rev. George Dobbs, G3RJV, St. Aidans Vicarage, 498 Manchester Rd., Rochdale, Lancs, OL11 3HE, England.

QRP Amateur Radio Club International

Founded: 1961

Membership: More than 8,600; open to all radio amateurs, membership numbers assigned.

Cost to join: $12

Annual dues for current members: $12 Periodicals: *QRP Quarterly*, published quarterly.

Nets: TCN on 14.060 MHz at 2300Z Sundays; SEN on 7.030 MHz at 0100Z Wednesdays (QSY to 3.535 MHz at 0130Z if 40 Meter conditions are poor); GSN on 3.560 MHz at 0200Z Thursdays; GLN on 3.560 MHz at 0200Z Thursdays; NEN on 7.040 MHz at 1300Z Saturdays; WSN-80 on 3.558 MHz at 0400Z Thursdays; WSN-40 on 7.040 MHz at 1700Z Saturdays.

Club-sponsored activities: QRP ARCI Operating Awards Program includes QRP-25, WAC QRP, WAS-QRP, DXCC-QRP, 1,000 Mile-Per-Watt and QRP-Net (QNI-25) awards. Contests include the Spring QSO Party in April, Hoot Owl Sprint-CW in May, Summer Homebrew Sprint CW in July, Summer Daze Sprint-SSB in August, Fall QSO Party-CW in October, and Holiday Spirits Sprint-CW in December.

For information: Michael Bryce, WB8VGE, 2225 Mayflower NW, Massillon, OH 44647.

NorCal (Northern California) QRP Club

Founded:1993

Membership: 75; open to all radio amateurs, membership numbers assigned.

Cost to join: None

Annual dues for current members: To receive the club publication there is an annual fee of $5 for U.S. stations, $10 for Canadian stations, and $15 for DX

Periodicals: *QRPp,* published quarterly.

Nets: None

Club-sponsored activities: The club has developed and distributed hundreds of transceiver kits for the QRP homebrewer.

For information: Jim Cates, WA6GER, 3241 Eastwood Rd., Sacramento, CA 95821.

Colorado QRP Club

Founded: 1994

Membership: 78; open to all radio amateurs, membership numbers assigned.

Cost to join: $10

Annual dues for current members: $10

Periodicals: *The Low Down*, published bi-monthly.

Nets: CQC Net meets Tuesdays at 0300Z on the 147.225 FM repeater, covering Cheyenne, WY to Pueblo, CO.

Club-sponsored activities: Colorado QRP Club Winter QSO Party, 19 February 1995; and Summer QSO Party, 19 August 1995.

For information: CQC, c/o Mark Meyer, WUØL, 14153 W. First Dr., Golden, CO, 80401.

QRP Society of Central Pennsylvania

Founded:1993

Membership: 10; open to all radio amateurs, membership numbers to be assigned.

Cost to join: Free

Annual dues for current members: $4

Periodicals: *QRP Gazette*, published monthly.

Nets: None

Club-sponsored activities: The club has a special interest in QRP homebrewing.

For information: Robert B. Wicks, W3HAH, 20 Brenely Ln., Mt. Holly Springs, PA 17065-1401.

GW QRP Club

Founded: 1994

Membership: 26; at present by invitation only, membership numbers assigned.

Cost to join: Free

Annual dues for current members: None

Periodicals: None

Nets: Members meet on 1.949 MHz on lower sideband weekday evenings.

Club-sponsored activities: Sponsors Worked All Wales, Worked All Wales Milliwatt, Worked British Countries and Worked European Countries QRP awards. For information: Leighton Smart, GWØLBI, 33 Nant Gwyn, Trelewis, CF46 6DB, Mid-Glamorgan, Wales, Europe.

QRP Club of British Columbia

Founded: 1990

Membership: 30; open to all radio amateurs, no membership numbers assigned.

Cost to join: $5

Annual dues for current members: $5

Periodicals: None, however a report of club meetings is posted on an Internet mailing list (listserv@netcom.com) and on Packet BBS (QRP@USA). Printouts are mailed to all members along with minutes of the business meeting and other material of interest to members.

Nets: Club members meet nightly on 3.729 MHz at 0400Z immediately following the British Columbia Public Service Net.

Club-sponsored activities: The club is primarily interested in promoting homebrewing of QRP SSB equipment. Quarterly luncheon meetings are alternated between the U.S. mainland and Vancouver Island, BC.

For information: Derry Spittle, VE7QK, 1241 Mount Crown Rd., North Vancouver, BC, V7R 1R9, Canada.

Wyoming Valley QRP Commandos

Founded: 1993Membership: 16; restricted to radio amateurs in the Greater Scranton/Wilkes-Barre, PA area, no membership numbers assigned.

Cost to join: None

Annual dues for current members: None

Periodicals: None

Nets: Club members meet nightly on 147.525 MHz FM simplex.

Club-sponsored activities: None

For information: Rich Arland, K7YHA, 25 Amherst Ave., Wilkes-Barre, PA 18702. **WR**

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

Red-faced ham

A local Amateur Radio operator notified a nearby AM broadcast station of harmonic radiation he was receiving at his home. The station Chief Engineer measured his harmonics at the station and found none to exceed FCC limits. The frustrated ham called the FCC, which sent an inspector to his home.

Sure enough, excessive harmonic radiation from the AM station was measured. The inspector then went to the station, where the surprised CE asked to see the harmonic measurement demonstrated in his presence. Guess what...no excessive harmonics! Again, there were plenty of measurable harmonics on the second visit to the ham's residence.

In the end, the problem was found to be caused by a neighbor's loose rain gutter. The spout was acting like an antenna, making intermittent contact --(diode effect) and radiating the signal.—*The Readout* Modesto, CA

Worldwide DX CONTESTING

John Attaway K4IIF/ZF2JI

P.O. Box 205 • Winter Haven, FL 33882

HAPPY NEW YEAR!

Welcome to the 1995 DX Contest season which promises to be interesting. Not outstanding, because sunspot numbers are declining and propagation will at times be poor, but definitely interesting.

One reason I believe it will be interesting is the astounding increase in participation in contestpeditions by avid contesters all around the world. Contestpeditions were relatively rare 30 years ago when G3SBP, K4CAH and this writer operated VP2VD from a remote mountain top on Tortola using dipoles and a 20 year old portable generator.

In those days such an operation was sufficiently noteworthy to generate a 5 page article in one of the slick monthly magazines. Not anymore. In the 1990s it is noteworthy when there isn't a contest operation from a semirare country in the *ARRL, CQ Worldwide, CQ WPX* or other popular contests. This is particularly true of the Caribbean island countries where prominent contesters have even installed permanent antenna farms to facilitate competition in the major worldwide championships.

I like to feel that this column and its predecessors have contributed to this growing aspect of our hobby by researching and publishing information on licensing from other countries, places to operate in a contest and other such helpful information. We've played just a small part, but it has helped. Despite the declining sunspots I expect this trend to continue because interest remains high and it is just plain fun being on the other end. If 10 and 15 Meters deteriorate, you just put up better antennas for 80 and 160. The action will be there. Contest enthusiasm will continue. See you in the pileups, hopefully from the other end.

DX contest for January 1995

The European national contests kick off their season in January with the French CW test, the Belgian test and the Hungarian DX test which is a CW only event with no SSB weekend. In addition, we have the Japan International Low 9 and CW DX Contest which is very popular on the west coast, and, of course, the *CQ* 160 Meter CW event which is popular with "top-banders" everywhere.

Dates and times are:

13-15 January: JA Int. Low Band CWDX Contest, 2200 UTC 13 January 2200 UTC, 15 January.

21-22 January: Hungarian DX Contest, 2200 UTC, 21 January 2200 UTC 22 January.

27-29 January: REF (French) CW Weekend, 0600 UTC, 28 January 1800 UTC, 29 January.

UBA (Belgian) SSB Weekend, 1300 UTC 28 January 1300 UTC, 29 January. *CQ* 160 Meter DX Contest, CW Weekend, 2200 UTC, 27 January - 1600 UTC 29 January.

Mini rules for January DX contests

Japan International Low Band CW DX Contest

Bands: 1.9, 3.5 and 7.0 MHz

Exchange: JA stations send RST + prefecture number (zero - 50) Others send RST + *CQ* zone number

Points: 1.9 MHz - 4 points, 3.5 MHz - 2 points, 7.0 MHz - 1 point

Multipliers: For JA stations - DXCC countries + *CQ* zones

Others - JA prefectures + Ogasawara, Minami-Torishima and Okino Torishima JA stations operate the full 48 hours, others operate only 30 hours Hungarian DX Contest Bands: 28, 21, 14, 7 and 3.5 MHz

Exchange: HA stations send RST, serial number + 2-letter county code. Others send RST + serial number

Points: 6 points for HA contacts and 3 points for non-HA contacts on other continents.

Multipliers: HA counties

REF (French) CW

Contest bands: 28, 21, 14, 7 and 3.5 MHz .

Exchange: F stations send RST + department number. Others send RST + serial number.

Points: 5 points per contact with French speaking countries. 3 points for non-French speaking countries on other continents, 1 point for same continent.

Multipliers: 1 point per department per band.

UBA (Belgian) Phone Contest

Bands: 28, 21, 14, 7 and 3.5 MHz

Exchange: ON stations send RS, serial number + province abbreviation. Others send RS + serial number.

Points: ON contacts 10 points, other European 3 points, non-European 1 point.

Multipliers: All Belgian provinces, all Belgian prefixes, DA 1-2 and European community countries.

CQ 160 Meter CW Contest

See the November issue of *CQ* page 156. A complete copy of the official rules for the Japan International Low Band CW DX Contest, the REF CW Contes, and the UBA Phone Contest may be obtained by sending an SASE to K4IIF.

More on Africa

In an earlier article we presented information on Liberia and Sierra Leone from Jay, K4ZLE/EL2LE. At that time Jay could not help with the Ivory Coast (TU), but in a recent letter he included the licensing procedure for TU as well as more on Liberia (EL) and Sierra Leone (9L).

TU

Neither the United States nor Canada holds a reciprocal operating agreement with the Republic of Ivory Coast. Ivory Coast's government, however, generally issues courtesy operating permits to foreign amateurs upon receipt of formal applications.

If you are a short-term visitor, send a letter of application (preferably in French, which greatly expedites the process) and a photocopy of your FCC/DOC license to the following:

Ministere des Postes et Telecommunications Service Radioelectrique
13 Etage BP 2000 Abidjan 01,
COTE D'IVOIRE

You will be issued a TU4 call good for 2 months.

You can not select a vanity call. Allow at least a month, preferably two, for processing and a week on each side for mail transit. Unless you speak fluent French, a copy of your license will help you get through customs, should they become inquisitive about your equipment.

If you are a resident, you need to submit, in addition to the above, the specific application form (Demande d'Autorisation) in quadruplicate, the specific information sheet (Fiche de Renseignements) in quadruplicate and a certificate of nationality. Forms are available from the above address. You will eventually be assigned a permanent TU2 call, but as of fall 1994, it has been taking over a year for issuance of a permanent call. In the interim, you will be issued a temporary, TU4, call which will have to be renewed periodically. Power: 220 VAC, 50 Hz. Very reliable in metropolitan areas.

9L

As of fall 1994, the political situation in Sierra Leone is tenuous, at best. The current government does honor the reciprocal operating agreement with the United States. According to Cassandra Davies, 9L1YL, who is the licensing coordinator for Sierra Leone, you should apply well in advance of arriving, but actual permission to operate will not be concluded until you arrive in-country.

A formal letter of application should be made following the instructions outlined in the General Information letter. In the letter, request a license under reciprocity. A letter attesting to your character signed by your local Chief of Police or your clergy will probably help expedite things. Make primary application to the following address:

Managing Director
Sierra Leone National Telecom Co.
P. O. Box 15
Freetown, SIERRA LEONE

Send a copy of the entire packet to:

Permanent Secretary
Dept. of Transport and Communication
Ministerial Building
George Street
Freetown, SIERRA LEONE

As a temporary visitor you will not be assigned a 9L call sign. You will be permitted to operate as 9L#/ your call. The '#' will be a number corresponding to the call area you are operating from.

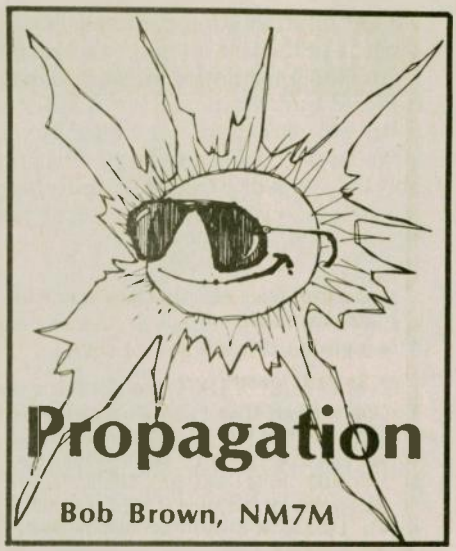
Permanent (9L) calls are being issued only to nationals and people who will be residing for over a year. You would no doubt operate as a temporary licensee until the issuance of your permanent call: therefore, application for a permanent call, if appropriate, would be made once you establish residency. Power: 220 VAC, 50 Hz. Available in Freetown, Spotty at best. Some hotels have their own generators.

EL

Liberia will issue permission to operate upon formal application along with a copy of your United States FCC license. Application should be made providing the information suggested in the General Information letter. A letter attesting to your character signed by your local chief of police or clergy will probably help expedite things. It really helps if you have someone local to act as your agent. Send your request to:

Director
Radio Regulatory & Licensing
Bureau Ministry of Posts & Telecommun.
Monrovia, LIBERIA

As of the fall of 1994, the director was Mr. G. Alfred Tow, Jr. The cost of the license is US$75, annually, good from January to December. $35 is for mandatory membership in the Liberian Radio Club. The remainder is the actual license fee. The entire sum is paid to the licensing authority. It is suggested that application be made at least 90 days ahead of time so they can advise you of how to pay the fee. For temporary authorization, they will probably advise you to sign your call /EL2 instead of EL2/ your call. EL2xx calls are generally reserved for residents. If you are assigned a permanent call, it is possible to receive a vanity call. Power: 220 VAC, 50 Hz. Almost non-existent. Some hotels have their own generators, but do not expect 24 hour service. WR



Propagation

Bob Brown, NM7M

There's many a phrase that rattles around in my head but the one for today is "The Age of Innocence." It could be the title of a book for all I know but I think of it more as applying to young people, before they've enrolled in the "school of hard knocks." Myself, I'm a graduate of that fine institution and have a good number of scars to show for it. But in my "age of innocence," I had a lot of unrealistic ambitions. Let me tell you about one in Amateur Radio.

Back in the late '30s before WWII and the early days of DXCC, there was DX and *rare* DX. I didn't work much of the former and only dreamt of the latter. My problem was that I didn't have much of a station. Well, I should qualify that; I did have a FB receiver, a National NC-101X, but my transmitter used a 6L6 crystal oscillator and an HK-24 final, putting out about 50 watts on 14 MHz into a low zipcord dipole. I think you can understand that by any standard, pre-war or now, that was not exactly a competitive set-up for DXing.

But it didn't keep me from fantasizing about having a contact with the legendary Reg Fox, AC4YN, in Tibet, a rare one that I read about in *QST*. Now in my dotage, I'm looking back more than 50 years, wondering whether my fervent wish for a DX contact with AC4YN could have been fulfilled or whether a contemporary analysis of the circumstances would prove it utterly hopeless. Since you're interested in propagation, I thought you'd like to see how it comes out. So listen to my story.

First, I knew where Tibet was on the map, thanks to collecting stamps as a youngster. But I must confess, I had no idea of how far away it was, in kilometers or even miles. Actually, kilometers is a unit from the MKS (meter-kilogram-second) systems of units. At the time I didn't know about meters, except for the one on the front panel of my rig, but I did know about other MKS units: volts, amperes, watts, ohms, farads and henries, all the big names in electricity. The other part of my radio vocabulary was kilocycles, from the *ARRL Handbook*.

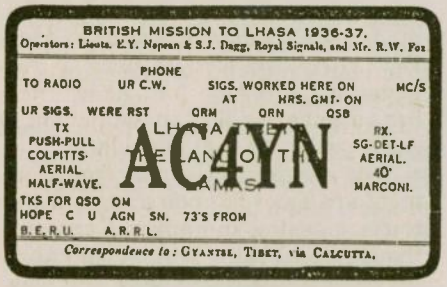
My QTH was in Sacramento, California and the only distance that I understood from first-hand experience was 75 miles (120 km), after a trip to San Francisco. So you can understand the great distance (7,150 miles or 11,500 kilometers) to Tibet was only an abstract notion to my young mind. But at the end of that rainbow was the QTH of AC4YN.

While contacting AC4YN on the other side of the world was my fantasy, I must confess I had no idea of how weak my RF would become in trying to go that far over the horizon. Of course, I did understand that auto headlights gave less and less illumination the farther away they were but it wasn't until a couple years later that my high school physics teacher explained the famous 'Inverse-Square Law' to me.

That's the one that applies to flashlights, headlights and RF, at least to a first approximation. By appearances, it seems to be nothing but geometry but actually it involves the idea of energy conservation from physics. Thus, it assumes no absorption of the power radiated as RF waves spread out from a small (point) source and at any distance, the RF power radiated will all be flowing through the surface of a sphere surrounding the source.

In the ideal case, the signal intensity from my 50 watt rig would be about 4/1,000,000 (4E-6) watts per square meter at 1 km distance. That number is obtained by thinking of 50 watts of RF being spread uniformly over a sphere of 1 km radius, as mentioned above. With the inverse-square law, it's not hard to figure out next that at 11,500 km distance my RF would be diluted by another factor of 132,000,000, making the signal intensity very small, 3E-14 watts per square meter.

If we take 1 watt per square meter as a reference value of intensity, the RF from my rig would've been a small fraction, 3E-14, of that value. As a youngster in '39, I don't think I could have grasped that small a number. True, I did know about abbreviations like mFd and mmFd but as far as



I was concerned, those were only used on ID tags for the parts bins in the local radio supply store.

At the time I was taking the second-year algebra course in high school but it wasn't until a year later, when I took the course in plane trigonometry, that I learned about logarithms (to the base 10). So even if I found the discussion of decibels (for power ratios on a logarithmic scale) in the Appendix of the *ARRL Handbook*, I wouldn't have understood it at the time. But now that I'm older and wiser, I know that power ratio, 3E-14, amounts to -135 dB for the ideal strength of my 50 watt signal over Tibet when compared to 1 watt per square meter.

Okay, being impatient, you ask "What about the 'real' strength of your signals at AC4YNs receiver?" In reply to that, I have to say "Don't rush me! DXing was tough in those days and what I've told you so far is about all that could have been figured out with the tools available in amateur circles at the time." As a matter of fact, in those days the *ARRL Handbook* had only three (3) pages in the Antenna chapter devoted to "Propagation of Radio Waves" and there were only vague references to "skip distance," nothing quantitative at all about hop lengths!

After WWII, of course, more information appeared in the *Handbook*: The mention of F-layer skip distances up to 4,000 km, antenna patterns, even the effects of ground on antenna gain. With those ideas at my disposal, I can now do more to evaluate whether my fantasy had a chance of being fulfilled or not, first, by finding the number of hops from Sacramento to Tibet, then dealing with antenna gains and losses at ground reflections along the way.

But take note; even with the discussion of those points, I won't be down to the basic ionospheric question of whether the band would have been open for my signals. That'll come a bit later in this article. And then there's the $64 question: "Even if it had been open, would my signals have been heard above the noise, local or otherwise?" So there's more to do, no doubt about it. Let's turn our hands to it.

As for hops, my antenna was not very high, making low-angle hops out to 4,000 km quite out of the question, so I'd have to estimate that my RF might have made 11,500 km in no less than 4 hops. But where would that path go, over water or land? As a youngster, I didn't have a globe nor did I know about great-circle paths; all that came later.

Today, I can say the path from Sacramento to Tibet goes on a high latitude route, crossing the auroral zone near the Bering Straits, and one of the surface reflections would be on salt water, the other two on ground out in Siberia. If you look into it, those reflections would have reduced my signal by about 7 dB, 1 dB from salt water and 3 dB from each ground reflection. So now my RF would be 142 dB below the reference level and I still have not even dealt with my antenna or looked into propagation questions, say losses in the D-region.

As for antennas, I have to adjust the above calculations from their simple beginning, a point source, to a low dipole. Now that point source travels incognito as an "isotropic radiator" and any antenna gain is given relative to it, so many dBi. If a dipole is in free space, its gain in its most favorable direction is 2.1 dB over an isotropic radiator or 2.1 dBi. If you put the dipole at a half wavelength above a perfect ground plane, its most favorable direction is at 30 degrees elevation and its gain becomes 8.1 dBi. Okay? Sure, everybody knows that.

But my antenna was not that high and radiation heading for Tibet wouldn't have been going off at 30 degrees elevation, more like less than 10 degrees. Now if you replace the perfect ground with real dirt and lower the radiation angle appropriately, the gain of my antenna was about 12 dB lower than the ideal case, - 4 dBi at very best. That's right, that low dipole was not even as good as an isotropic radiator at that kind of radiation angle, making my signal 146 dB below 1 watt per square meter.

But that would be the case if my antenna's radiation pattern were oriented at 330 degrees east of north. My memory tells me that the dipole itself was parallel to Folsom Blvd, a major Sacramento street in those days, and would put its radiation pattern toward about 30 degrees east of north, costing another 7 dB in signal strength.

So there you are, at most my signals would have been at 153 dB below the reference unit of intensity and I still haven't factored in the effects of the D-region. Now that's an ionospheric factor and thus depends on the date and sunspot number. In that regard, historical data shows that the smoothed sunspot number (SSN) was declining in '39, ranging from 100 at the beginning of the year to 76 at year's end.

Back in the late '30s, propagation predictions didn't exist. You knew the band was open to some place when you heard signals coming from there. It was as simple as that. Today, with propagation prediction programs, we can look back and find when the band would have been open then, even evaluate signal loss due to D-region absorption. With that in mind, I looked at the situation at the two equinoxes in '39 and the two solstices as well.

As you might have suspected, summer in the Northern Hemisphere would have been the poorest time to get signals to Tibet. The band was open around dawn but at least two of the four hops would be in broad daylight, with corresponding D-region losses. The best time turned out to be around sunset (0000 UTC) in winter, with only one hop in daylight and about 4 dB loss of signal in the D-region. That'd put my signal at -157dB watts per square meter when it came over the horizon in Tibet.

So far, everything that I've done in pursuing this matter has been based on my station and the path to Tibet. Now it's time to think about the other end of the path, say the antenna there, the receiver's bandwidth and noise, whether from atmospheric sources or man-made. When that's done, we'll see whether my fantasy was just that, a youth's wild and crazy dream, or if my signal could have stood up in the face of modest QSB, maybe even have enough of a signal/noise ratio to make a reliable CW contact possible.

To begin that chore, it's necessary to find how much of my RF power would have reached a receiver in Tibet. More particularly, that means making an estimate of the "aperture" or cross-section of AC4YN's antenna (in square meters) that "collected" RF and then multiplying it by the flux of my RF in watts per square meter. Now if that's a new concept to you, check it out in the *ARRL Antenna Book*. In simple terms it is this measure of the target size or - "collecting area" of an antenna that intercepts incoming RF power and delivers it to the input of a receiver. For the familiar dipole, it's 0.13 times the

square of the wavelength.

For 14 MHz signals, the aperture of a dipole is about 59 square meters and when combined (logarithmically) with the radiation flux, it would bring the RF power reaching a receiver up by 18 dB. But a look at a copy of AC4YNs QSL in figure 1 shows that receiving antenna in Tibet was a 40 foot Marconi, essentially a 5/8 wave vertical. So the aperture of a Marconi antenna has to be substituted for the dipole; that amounts to about 54 square meters and brings the power reaching the receiver up by 17 dB instead of 18 dB.

Also, Tibet, being in the Himalayas, must be a rocky place and the ground wouldn't add very much to the antenna's gain. So instead of adding 6 dB gain for being above a perfect ground, I'm going to be generous again and add another 4 dB to the gain of his antenna. That brings my signal up to -136 dBW. Okay, now the $64 question, "Would AC4YN have been able to hear that signal above the noise?"

When we switch gears to noise, you should know that three types come to mind: radio noise from our galaxy, atmospheric noise and manmade noise, in order of increasing importance in the HF spectrum. Of the three, galactic noise is easy to dispose of. It's only significant above 30 MHz and that's beyond our area of interest.

So let's turn to atmospheric noise. As you can well imagine, that will be variable, depending on location and seasons. Little in the way of quantitative information was known before WWII when AC4YN was on the air but rapid progress was made during the war and global surveys soon became available. With those and the improvements which followed, we can look back in time and make some estimates of what the noise situation was like in Tibet during the late '30s.

But in starting to evaluate the importance of noise, the first thing to deal with is the bandwidth over which the receiver accepted signals and, incidentally, noise. In those days, SSB was unknown and AM receivers had a bandwidth of something like 6,000 Hz. Of course, less bandwidth is required for CW but AC4YN's QSL shows his receiver was a "TRF," not anything like a superhet with the sort of crystal filtering we now enjoy. So let me take 3,000 Hz as an rough estimate for the receiver bandwidth and use that to multiply up the incident noise, usually specified at 1 Hz bandwidth.

Having settled the matter of bandwidth, consider atmospheric noise produced by lightning strikes; that will be quite dependent time of day, season of the year and location. In the case of Tibet, however, it should be noted that it's a fairly strong, year-round site for thunderstorms. As a result, if one goes to maps of a recent noise survey, the year-round noise level on 14 MHz at the input of AC4YNs receiver with 3,000 Hz bandwidth was about -135 dBW, propagated by the ionosphere largely from thunderstorms.

As for man-made noise, that is site-specific but representative data can be obtained from the *IONCAP User's Manual*. At 3 MHz, average values for 1 Hz bandwidth are -125 dBw for an industrial environment, -135 dBW for residential, -147 dBW for rural and -163 dBW for remote, unpopulous locations. Noise at 14 MHz is less by about 7 dB but the 3,000 Hz bandwidth increases it by 35 dBW, bringing those numerical values to -97 dBW, -107 dBW, -119 dBW and -135 dBW, respectively.

Now I find it hard to think that Tibet was anything more than a remote, unpopulous place back in the late '30s. I say that from my childhood recollections of articles about that region in the *National Geographic* magazine, camel caravans and pictures of Tibetan horsemen around the capitol of Lhasa. So you'd think that it's against those noise levels, -135 dBW for atmospheric or -135 dBW for man-made noise, that my -136 dBW signals should be compared. Obviously, that's not very promising as we're not looking at the large, positive signal/noise ratio needed for a good contact. Quite the contrary; but to make things even worse, I have to admit now in arriving at that figure, I painted a rather "rosy scenario" for my signals.

For one thing, I used the ground range to Tibet in the inverse-square law instead of the longer path length through the ionosphere. That's a small effect. More importantly, I failed to include any polarization coupling loss (3-6 dB) between two antennas of different polarization and for possible changes in wave polarization of RF with hops in going through the geomagnetic field. And I didn't include effects of the defocusing and spreading of RF on ground reflection or signal variability, say losses of 1 to 2 S-units (6-12 dB), to cover the effects of fading.

As a result, I have to conclude signals from my 50 watt rig and puny antenna never had a chance to be heard above the noise by AC4YN and a contact was just impossible, even if I had heard him.

So that's the bottom line, there was no physical possibility of my fantasy ever coming true. But even if I could have figured that out, being just a teen-ager with no substantial resources at my command, I really couldn't have run my power to the legal limit (1 kW DC input) at the time nor did I have the real estate to add a rotary beam antenna with a large, positive gain relative to an isotropic radiator. Oh well, life has its little disappointments, even for the young and eager.

So that's my story; I hope you found it interesting. And maybe you too had a childhood fantasy that was not realized in your "age of innocence." But don't be discouraged; DXing is better now: with large antenna gains at both ends of a path, more power, narrow filtering, even digital signal processing! You never had it so good! Now if the sun would just cooperate. But you'll hang in there until Cycle 23 starts up, I just know it! WR

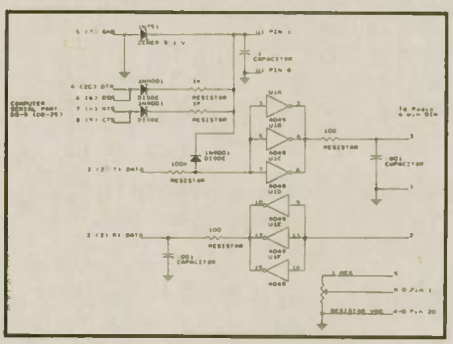
CONSTRUCTION

Frequency spectrum analyzer

JOHN BELL, N6ZJB

I have always wanted a spectrum analyzer but could not afford one. This article will show you how to use your HF CAT (Computer Aided Transceiver) and a computer to make a spectrum analyzer display on your computer screen.

I was looking for another application for my 12 bit analog to digital converter board when I remembered that my Yaesu FT-747GX HF Transceiver has a serial connection for a computer to control it. I looked through the Yaesu manual and saw that this connector also had an AGC (automatic gain control) output. This AGC signal outputs about 0 to 3 volts depending on the received signal strength, just what I need for the A-D converter. This connector is the Yaesu CAT system.



Interface circuit diagram

How it works

The computer program simply has to set the mode of the radio using the COM port then make it step through the frequencies that you want displayed while the A-D converter measures the AGC (signal strength) voltage and plots it on the screen. This is essentially now all spectrum analyzers work. The vertical axis is the signal strength and the horizontal axis is frequency. Every peak on the display is a transmitter with its power relative the height of the peak. Every valley is a clear space. If you load the DOS graphics program before you run the spectrum program you can print the display by pressing the Print Screen key (see your DOS manual).

Making the connection

First I had to build a level converter for the serial connection between the radio and the computer COM port. The radio is TTL levels and the computer is RS-232 levels. I also had to add a 1 meg trimpot to connect the 0-3 volt AGC signal to the 0-2 volt A-D board. The level converter uses a CD 4049 CMOS HEX inverter that is powered by the computer's RS-232 serial COM port. This circuit doesn't make "real RS-232" but it works for short distances (less than 15 feet). The circuit can send and receive data to and from the radio even though the part that sends data from the radio to the computer isn't used in this application. You may need it later.

Construction

Construction of this interface is not critical on parts placement or construction techniques. You can use a plugboard, wirewrap or solder it together. Just remember that static electricity will blow out the CD4049 IC. It is also a good idea to connect your computer case to the ground strap that grounds all of your radio equipment. After you finish the construction, connect the three connectors to your computer and radio; make sure the power is off when making these connections!

Level converter parts list

Part	Quantity
CD4049 CMOS Hex inverter integrated Circuit	1
1N4001 diodes	3
100 ohm ¼ watt resistors	2
1K ¼ watt resistors	1
100K ¼ watt resistor	1
.001mf 50 volt disc capacitor	2
.1 50 volt disc capacitor	1
1N751 5.1 volt zener diode	1
16 pin socket for the IC	1
DB-9 female connector (DB-25 on some computers)	1
6 pin DIN plug (connects to radio)	1
1 meg trimpot, one turn	1

Write the program

The next step was to write the program. I wrote the program in GW BASIC. It is simple and quick to program and you can modify it if needed. It will also run in IBM's *Basica* and Microsoft's *QBasic*. My computer system is a 12 MHz 286; however anything from a 4.77 MHz 8088 XT to a 66 MHz 486 will work (I'm not sure if the new Pentium is compatible). Your computer must have a graphics display screen (not a mono text only display) CGA, EGA, VGA all work fine.

Here is the program:

```
10 REM Program by John Bell - Feb 20, 1994.
20 REM This program displays frequency spectrum using the John Bell 93-326
30 REM A-D converter and a Yaesu FT-747GX transceiver or other Yaesu transceiver
40 REM that has the same CAT system.
50 REM Also a serial level converter and voltage divider circuit is needed.
60 REM Two delay variables need to be set depending on the speed of your
70 REM computer. T2=250 and T3=1000 works good in my 12 MHz 286 computer.
80 REM I would guess that T2=2000 and T3=8000 would work in a 33 MHz 486.
90 REM See lines 140 and 150. Also see lines 1190-1240.
100 REM You may have to change line 190 to set the COM port.
110 REM To print the display load the DOS GRAPHICS program first and
120 REM press Print Screen to print.
130 KEY OFF
140 T2=250:REM char delay (50ms to 200ms)
150 T3=1000:REM Delay for AGC response.
160 PORT=544
170 SCREEN 0
180 CLS
190 OPEN "com1:4800,n,8,2" AS #1
200 INPUT "Start Frequency 0.1 MHz to 29.7 MHz";SF
210 IF SF<.1 OR SF>29.7 THEN 130
220 FF=(INT(SF*10))*100000!
230 INPUT "Number of passes 1-5";PASS
240 IF PASS<1 OR PASS >5 THEN 230
250 PRINT:PRINT "Bandwidth 1=Wide"
260 PRINT "  2=Medium"
270 PRINT "  3=Narrow"
280 INPUT "1,2,3";BW
290 IF BW<1 OR BW>3 THEN 250
```

```
300 IF BW=1 THEN BW=4
310 IF BW=2 THEN BW=5
320 SCREEN 2
330 LINE (39, 0)-(39, 99)
340 LINE (39, 0)-(639, 0)
350 LINE (39, 99)-(639, 99)
360 LINE (639, 0)-(639, 99)
370 LOCATE 1,1:PRINT "  60"
380 LOCATE 3,1:PRINT "  20"
390 LOCATE 5,1:PRINT "S  9"
400 LOCATE 6,1:PRINT "I"
410 LOCATE 7,1:PRINT "G  7"
420 LOCATE 8,1:PRINT "N"
430 LOCATE 9,1:PRINT "A  5"
440 LOCATE 10,1:PRINT "L"
450 LOCATE 11,1:PRINT "  3"
460 LOCATE 13,1:PRINT "  0"
470 LOCATE 14,5:PRINT USING
"##.#
";FF/1000000!,(FF+100000!)/
1000000!,(FF+200000!)/1000000!,(FF
+300000!)/1000000!
480 LOCATE 16,1:PRINT "Frequency
Spectrum Display -
";FF/1000000!;"MHz to
";(FF+300000!)/1000000!;"MHz";"
";DATE$;"  ";TIME$
490 LOCATE 17,1
500 IF BW=4 THEN PRINT "Band
width is Wide - 6 KHz"
510 IF BW=5 THEN PRINT "Band
width is Medium - 3 KHz"
520 IF BW=3 THEN PRINT "Band
width is Narrow - 500 Hz"
530 REM set up
540 FOR I=1 TO 15
550 READ SA
560 PRINT #1,CHR$(SA);
570 FOR T=1 TO T2:NEXT T
580 NEXT I
590 REM Set bandwidth
600 PRINT #1,CHR$(0);
610 FOR T=1 TO T2:NEXT T
620 PRINT #1,CHR$(0);
630 FOR T=1 TO T2:NEXT T
640 PRINT #1,CHR$(0);
650 FOR T=1 TO T2:NEXT T
660 PRINT #1,CHR$(BW);
670 FOR T=1 TO T2:NEXT T
680 PRINT #1,CHR$(12);
690 FOR T=1 TO T2:NEXT T
700 REM freq sweep (600 points)
710 X=39
720 FOR F=FF TO FF+300000! STEP
500
730 X=X+1
740 FA=F
750 F1=INT(FA/10000000#)
760 FA=FA-(F1*10000000#)
770 F2=INT(FA/100000!)
780 FA=FA-(F2*100000!)
790 F3=INT(FA/1000)
800 FA=FA-(F3*1000)
810 F4=INT(FA/10)
820 F1=((INT(F1/10))*16)+(F1-
((INT(F1/10)))*10)
830 F2=((INT(F2/10))*16)+(F2-
((INT(F2/10)))*10)
840 F3=((INT(F3/10))*16)+(F3-
((INT(F3/10)))*10)
850 F4=((INT(F4/10))*16)+(F4-
((INT(F4/10)))*10)
860 PRINT #1,CHR$(F4);CHR$(F3);
CHR$(F2);CHR$(F1);CHR$(10);
870 FOR T=1 TO T3:NEXT T
880 IF F/100000!<>INT(F/100000!)
THEN 900
890 LINE (X,1)-(X,99),1
900 IF F/50000!<>INT(F/50000!)
THEN 920
910 LINE (X,79)-(X,99),1
920 IF F/10000<>INT(F/10000)
THEN 970
930 LINE (X,89)-(X,99),1
940 FOR PP=10 TO 90 STEP 10
950 PSET (X,PP),1
960 NEXT PP
970 C=0
980 OUT PORT, C + 8
990 OUT PORT, C
1000 OUT PORT, C + 8
1010 IF (128 AND INP(PORT + 1)) <>
0 THEN 1010
1020 D = INP(PORT) + 256 *
INP(PORT + 1)
1030 P = 98 - (D / 41.37)
1040 IF P < 0 THEN P = 0
1050 IF X = 40 THEN 1080
1060 PSET (X, P), 1
1070 LINE (X, P)-(E, Q), 1
1080 E = X: Q = P
1090 I$ = INKEY$
1100 IF LEN(I$) <> 0 THEN 1110
1110 NEXT F
1120 PASS=PASS-1
1130 IF PASS>0 THEN 700
1140 LOCATE 22,1
1150 CLOSE:END
1160 DATA 0,0,0,1,4:REM DLOCK
ON
1170 DATA 0,0,0,0,1:REM SPLIT
OFF
1180 DATA 0,0,0,0,5:REM VFO A
1190 REM These lines can be used to
test the speed of your computer.
1200 PRINT TIME$
1210 FOR T=1 TO 50000!:NEXT T
1220 PRINT TIME$
1230 REM T2=(.05/time)*50000
1240 REM T3=5*T2
```

Operation

The first step is to turn the MIC (gain) and DRIVE (carrier) controls all the way down (counterclockwise) to minimize the smoke if something goes wrong. Then switch the computer on and then the radio. The power for the converter circuit will come on when the program is running. When you run this program, it will ask you for the starting frequency. The radio has a range of .1 MHz to 30 MHz and the program covers. 3 MHz in one scan so the maximum starting frequency is 29.7 MHz. This covers 29.7 to 30 MHz. To see the 40 meter band, enter "7" and the program will start at 7 MHz and go to 7.3 MHz. The program asks for the number of passes; use 1 to start, several passes will catch intermittent signals. Next, it will ask you for the bandwidth (narrow, medium or wide) try medium first. Now the radio will start scanning and the display will scan from right to left graphing the signal strength. It takes about 150 seconds to complete one scan because of the slow AGC response time. The relatively large capacitor on AGC line doesn't discharge very quickly. I don't recommend changing this capacitor. The AM broadcast band (.5MHz to 1.6MHz) is interesting at night.

A spectrum display has many uses. You can find a clear space to transmit, find someone to talk to when the band is quiet, and check the relative band activity from day to day (day tonight). What do the bands look like during a contest?

Compatibility

I called the Yaesu technical department to see if other Yaesu radios are compatible. They said that all C.A.T. connections are the same but some Yaesu radios use different commands. You may have to modify the basic program to work with other Yaesu radios; see your Owners Manual. Here are the commands that I used:

Instruction parameters instr.

Name	LSD	MSD	Opcode	Remarks
SPLIT	xx xx xx yy		01h	yy: 0=off, 1=on
DLOCK	xx xx xx yy		04h	yy: 0=off, 1=on
A-BVFO	xx xx xx yy		05h	yy: 0=VFO A, 1=VFO B
MODE-SET	xx xx xx zz		0Ch	zz:0=LSB, 1=USB, 2=CWW, 3=CWN 4=AMW, 5=AMN, 6=FMW, 7=FMN
FREQ-SET	78 56 34 2		0Ah	Seven packed decimal digits
VFO-TO-M	xx xx xx mm		03h	Write VFO to Mem # m

Note xx=don't care. The VFO-TO-M isn't used in the spectrum program but is used in the following program.

Serial data format

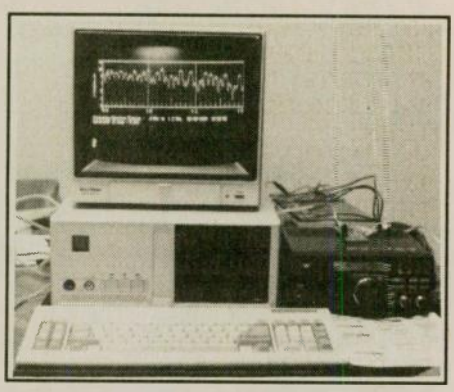
Data is sent to the radio at 4800 baud (bits per second) N,8,2 (no parity, 8 data bits and 2 stop bits). The commands are

sent as a five byte block with a minimum spacing of 50 ms and a maximum of 200ms between bytes. The first four bytes are the parameters for the instruction or pad bytes to make the five byte block and the fifth byte is the instruction.

Extra stuff

Here is a program that I use to pro gram all 20 channels on my Yaesu FT-747GX in 10 seconds:

```
10 KEY OFF
20 T2=250:REM char delay (50ms to 200ms)
30 CLS
40 OPEN "com1:4800,n,8,2" AS #1
50 REM set up
60 READ SA
70 I=I+1
80 LOCATE 12,35:PRINT "BYTE ";I;" ";SA;" "
90 PRINT #1,CHR$(SA);
100 FOR T=1 TO T2:NEXT T
110 GOTO 60
120 CLOSE:END
130 DATA 0,0,0,1,4:REM DLOCK ON
140 DATA 0,0,0,0,1:REM SPLIT OFF
150 DATA 0,0,0,0,5:REM VFO A
160 REM CW SETUP
170 DATA 0,0,0,3,12:REM CWN
180 DATA &H0,&H0,&H37,&H0,&HA: FREQ 3.7 MHZ
190 DATA 0,0,0,0,3:REM VFO TO MEM 0
200 DATA &H0,&H25,&H71,&H0,&HA:FREQ 7.125 MHZ
210 DATA 0,0,0,1,3:REM VFO TO MEM 1
220 DATA &H0,&H50,&H11,&H2,&HA:FREQ 21.150 MHZ
230 DATA 0,0,0,2,3:REM VFO TO MEM 2
240 DATA &H0,&H0,&H82,&H2,&HA:FREQ 28.200 MHZ
250 DATA 0,0,0,3,3:REM VFO TO MEM 3
260 REM LSB SETUP
270 DATA 0,0,0,0,12:REM LSB
280 DATA &H0,&H0,&H19,&H0,&HA:FREQ 1.9 MHZ
290 DATA 0,0,0,4,3:REM VFO TO MEM 4
300 DATA &H0,&H05,&H39,&H0,&HA:FREQ 3.905 MHZ
310 DATA 0,0,0,5,3:REM VFO TO MEM 5
320 DATA &H0,&H08,&H39,&H0,&HA:FREQ 3.908 MHZ
330 DATA 0,0,0,6,3:REM VFO TO MEM 6
```



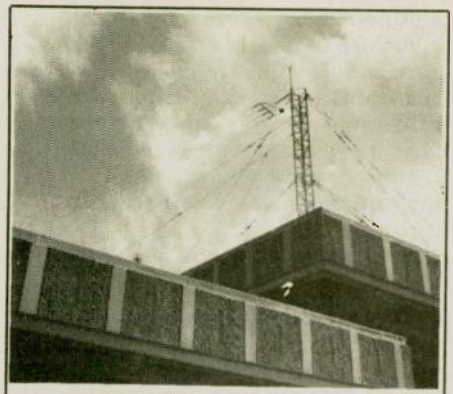
My computer, Yaesu FT-747GX and interface circuit before it was put in a box.

```
340 DATA &H0,&H63,&H71,&H0,&HA:FREQ 7.163 MHZ
350 DATA 0,0,0,7,3:REM VFO TO MEM 7
360 DATA &H0,&H40,&H72,&H0,&HA:FREQ 7.240 MHZ
370 DATA 0,0,0,8,3:REM VFO TO MEM 8
380 DATA &H50,&H68,&H72,&H0,&HA:FREQ 7.2685 MHZ
390 DATA 0,0,0,9,3:REM VFO TO MEM 9
400 REM USB SETUP
410 DATA 0,0,0,1,12:REM USB
420 DATA &H0,&H0,&H42,&H1,&HA:FREQ 14.2 MHZ
430 DATA 0,0,0,10,3:REM VFO TO MEM 10
440 DATA &H0,&H50,&H42,&H1,&HA:FREQ 14.25 MHZ
450 DATA 0,0,0,11,3:REM VFO TO MEM 11
460 DATA &H0,&H0,&H43,&H1,&HA:FREQ 14.3 MHZ
470 DATA 0,0,0,12,3:REM VFO TO MEM 12
480 DATA &H0,&H25,&H13,&H2,&HA:FREQ 21.325 MHZ
490 DATA 0,0,0,13,3:REM VFO TO MEM 13
500 DATA &H0,&H0,&H14,&H2,&HA:FREQ 21.4 MHZ
510 DATA 0,0,0,14,3:REM VFO TO MEM 14
520 DATA &H0,&H0,&H84,&H2,&HA:FREQ 28.4 MHZ
530 DATA 0,0,0,15,3:REM VFO TO MEM 15
540 REM FM SETUP
550 DATA 0,0,0,6,12:REM FMW
560 DATA &H0,&H0,&H96,&H2,&HA:FREQ 29.6 MHZ
570 DATA 0,0,0,16,3:REM VFO TO MEM 16
580 REM AM SETUP
590 DATA 0,0,0,4,12:REM AMW
600 DATA &H0,&H0,&H0,&H1,&HA:FREQ 10 MHZ
610 DATA 0,0,0,17,3:REM VFO TO MEM 17
620 DATA &H0,&H20,&H9,&H0,&HA:FREQ .92 MHZ
630 DATA 0,0,0,18 3:REM VFO TO MEM 18
640 DATA &H0,&H85,&H70,&H2,&HA:FREQ 27.085 MHZ
650 DATA 0,0,0,19,3:REM VFO TO MEM 19
```

You can order the Analog to Digital Converter board, part number 93-326A from John Bell, 1381 Saratoga St., Minden, NV 89423 702/ 267-2704 the price is $149.95 + $4 shipping for UPS ground or $6 shipping for UPS two day air. You'll receive a 360K disk with these programs and many others and a manual.

(About the Author - John Bell received his First Class Commercial Radio Telephone license in 1969 and his Amateur license in 1990. He has worked as an engineer at Ampex and Stanford's Childrens Hospital. In 1980 he started his own company making computer Data Acquisition interfaces.)

WR



AERIALS

A recent issue of *Newington News* contained a statement which I, (being one of the world's greatest DXers) am able to correct.

It was stated that from anywhere in North America, Japan is as far away as you can get. Alas, such is not true, as the old string and a world globe trick would have shown.

"As far away as you can get," is known as the "antipodes" to geographers and students of the interesting subject. Here is how you find the antipodes from Newington, CT. First you find that Newington is 72.4 degrees West. Then you subtract that from 180 degrees with the result being 107.6 degrees. So you go East (from Greenwich, as in GMT) 107.6 degrees. The 72.4 West and the 107.6 East add up to 180 which is halfway around the world, only if we do the next step.

Newington, CT is 41.5 (rounded off) degrees NORTH (of the Equator) thus we must, on the other side of the world) go 41.5 degrees SOUTH (of the Equator). This would put us about 700 miles southwest of Perth Australia. This spot would be roughly 12,000 plus miles away from Newington, CT.

Out in the Pacific there is an island named by early English navigators "Antipodes" for obvious reasons.

So with the above, I pound another nail in the coffin of the *Newington News* never doing a book review on the deeply profound and technically brilliant antenna book which your humble servant wrote with the title of *Aerials II*.

So, just what is this SWR business that has hams falling out of trees trying to prune an antenna to the ultimate of perfection? What is it that has usually normal people saying such things as, "I don't get out as well in this part of the band, my SWR is too high." If that is the same level of their knowledge, in whatever their chosen career field is, they're lucky they have a job. Let's just look at what actual power levels all this SWR biz really entails.

Assuming 100 watts out of the transmitter: one-tenth of a watt reflected would read, on your perfect SWR meter, 1:05 to 1; eight-tenths of a watt would read, laboratory standard reference, 1.20; at a smidge over five watts (5.3 to be exact) the needle would reach 1.6, hopefully. That horrible (don't admit it in polite company) SWR of 2:0 means that 11.1 watts runs back down the feedline from the antenna. Such an SWR results in, according to the beliefs of many, transmitters melting and volcanos rising from the sea and erupting. Or, at the very least, "I don't get out as well in this part of the band because my SWR is too high."

Even if all those 11 watts were lost forever, which is, of course, far from being the case (a surprise to many) the station at the other end would never hear the difference. Remember, one would have to go from 100 watts down to 50 watts (radiated power) for there to be a three dB difference. Fifty watts (from the original 100) down the drain and the loss is but half an "S" unit. (As calibrated in "Sterbies".) Yes, cutting the power in half from wherever you are (1000 to 500), (500 to 250), (100 to 50), (50 to 25), (3 to 1.5) etc., results in but a three dB drop. So, you can see that a one-tenth drop in power is meaningless.

Now, let's go to that absolutely horrible place, SWR of 3 to 1. Oh, the meter face is in RED at that point. That's the same RED warning in racing cars which means that pistons and valves are about to be flung into the viewing stands. Three-to-one SWR means that 25% of your power has been sent on the return trip back down the feedline. Should that (just pretending now) power be totally lost, the signal at the other end would be roughly one dB down.

If you were listening to a single tone and you were asked to indicate when you perceived that the tone had become louder, and you did that at the very slightest increase that you could detect, that would be a one dB increase. Most people need a two dB increase to sense the tiniest difference. And, that is during a hearing test when one is really concentrating. A 2dB difference in your signal on the nightly 75M Snort and Wheeze Net would never be noticed.

What I'm trying to tell show you is that a sweaty afternoon (or in the winter, frostbitten fingers) spent getting that antenna to reflect only one-half a watt instead of three-quarters of a watt will not turn that soggy droopy doublet from an also-ran into the Hunter-Killer antenna you desire. There's more. Just as pilots have their "How to Land" book, we have the well known (to some) "Loss in dB " chart.

Let's assume that you are going to run 100 feet of RG-213 coax cable from your antenna to your transmitter. First looking at the Cable Attenuation chart you see that on the 20 Meter band there will be a loss of roughly one half of a dB (0.6 to be exact). Now, taking that point six figure over to the Loss in dB chart we see that with an SWR of 4 to 1, the TOTAL line loss comes to a mere 1.2 dB. You should be, of course, in this situation, using a tuner and thus are matching to the line at the transmitter end.)

Well, you may be asking, WHAT did happen to all that power that came back down the line? Good question. What happened is that the proper setting of the components in the tuner looked at the power coming down and kicked it in the gauss and made it go back up the line where it went out the antenna. (Minus, of course, what watts were lost in cable attenuation.)

How can you check the accuracy of your SWR measuring gear? That is the subject for next month.

One of the better sorts around is Dan Senie, N1JEB, a good chap indeed. And, forwarded to me was an article in a South African magazine in which Ivo Chiadek, ZS6AXT, wrote: "For many years, the antennas published by the American National Bureau of Standards (NBS) were the best constructions available. Many companies manufacturing antennas (designs) came with claims of very high gain for their products, and since it is impossible for a Radio Amateur to check these figures, they got away with their claims."

(KNS goes by his nom-de-ham so as he goes down the aisles at Dayton he will avoid, from the display booths of antenna manufacturers, arrows being fired into his back.) **WR**

hamfests January

California

THE NAVAL POSTGRADUATE SCHOOL ARC is holding their 6th annual Winterfest on January 21st from 7 a.m to 2 p.m. at Monterey Peninsula College Armory. Features include demonstrations, and both inside and outside flea markets. Auction at 12 noon. Sellers —bring your own tables, none provided. $10 indoor space, 8' x 6' (limited. quantity) $5 tailgate space, (2 parking spaces). Send requests for pre-registration to Cal Miller, WW7G, 969 B Pacific Street, Monterey, CA 93940; 800/497-5130. Talk-in 146.97(-), K6LY repeater.

•

THE LIVERMORE ARC is sponsoring an Amateur Radio/Electronics/Computer Swap Meet on January 1st from 7 a.m to 12 noon at Las Positas College. Features include free parking and covered spaces at no additional charge. Admission is free. Sellers pay $10 space fee. Talk-in 147.045(+) from the west and 145.350(-), PL 100 Hz, from the east. Contact Noel Anklam, KC6QZK; 510/447-3857 eves. or leave message days; 510/783-2803.

Colorado

The NORTHERN COLORADO ARC will host its Winterfest Superfest Swapmeet on January 21st at the Larimer County Fairgrounds in Loveland from 9 a.m to 3 p.m. Find the ham toys Santa forgot to deliver! Features include commercial exhibits, V.E. session (Trent Hays, WBØHZL, 303/ 484-8315), and refreshments. Admission is $3 and tables are $8. Contact Jeanene Gage, NØYHY; 303/ 351-7327. Talk-in on 145.115(-). For information, contact Randy Long, WB6AVV; 303/ 226-1529 or Musser Moore, AAØPB; 303/ 221-3698.

Florida

The SARASOTA hamfest and computer show will be held on January 14th from 9 a.m. to 5 p.m. and January 15th from 9 a.m. to 3 p.m. at the Robarts Sports Arena, Sarasota Fairgrounds, East gate ($5 per space plus admission). Forums, drawings, FCC exams and refreshment counter. Plenty of free parking. Admission is $5 donation in advance; $7 at the door. Regular tables, $15 plus admission; booths and end tables $20. Contact Ed Neely, KC4RYC. Talk-in 146.91(-), 449.925 and 146.73(-).

Louisiana

The SOUTHEAST LOUISIANA ARC proudly presents its 14th annual Hammond hamfest to be held on January 21st in the SLU University Center, in Hammond. Free parking/admission and a limited number of free swap tables. Set-up 6:30 a.m., open 7:30 a.m.; talk-in on 147.00(-). For more information or table reservations, write SELARC Hamfest, P.O. Box 1324, Hammond, LA 70404.

Maryland

The MARYLAND MOBILEERS ARC will sponsor a post-holiday swapfest and flea market on January 29th at the Odenton volunteer fire department, 1425 Annapolis Rd., Odenton Fire Hall, 8 a.m. to 2 p.m. Indoor flea market, no tailgating. Free parking, refreshments available. Donation of $3; tables in advance $7; Tom Wilkison, KA3OMU, 592 Eason Dr., Sev-

ern, MD 21144. For VE sessions, pre-register with Jerry Gavin NU3D, 7801 Overhill Rd., Glen Burnie, MD 21060; 410/761-1423 anytime. Talk-in 146.805(-).

Massachusetts

The ALGONQUIN ARC flea market will be held on January 18th from 10 a.m. at the Marlborough Middle School. Admission is $2. Dealer space is $12 for tables and spaces as available. For further information contact Ann Weldon, KA1PON, P.O. Box 258, Marlborough, MA 01752; 508/481-4988.

Missouri

The 5th Annual NORTHWEST MISSOURI winter hamfest sponsored by MVARC, Green-Hills ARC and Ray-Clay ARC will be held on January 21st from 9 a.m. to 4 p.m, at the Ramada Inn in St. Joseph. Special rates are available for hamfest participants. FCC exams, major exhibitors and flea market all indoors, plus free parking. Preregistration: $2 each or 3 for $5; at the door $3 each or 2 for $5. Preregistration requests received after the 10th will be held at the door. Swap tables $9 each first two tables. Commercial exhibitors welcome. For more information write to Northwest Missouri Winter Hamfest, c/o Gaylen Pearson, WBØW, 1210 Midyett Rd., St. Joseph, MO 64506; 816 232-8786.

New York

METRO 70CM NETWORK presents another giant electronic flea market to be held on January 15th at Lincoln High School in Yonkers. Free parking, no tailgating; indoor flea market only! 9 a.m. to 3 p.m, rain or shine. Unlimited free coffee; VE exams, food. Donation is $5, kids under 12 free. Sellers $18 1st table, $13 each additional. All tables 2½' x 5', or bring your own tables at $13 for a 6'-0" space. $25 each table at the door, $20 for a 6' space (if available) Table set-up 7 a.m. No paid reservations will be held past 9 a.m. For registration call Otto Supliski, WB2SLQ, 914/969-1053.

Ohio

The TUSCO ARC hamfest will be held on January 29th from 8 a.m. at the Ohio National Guard Armory in Dover. Doors open for set-up at 6 a.m. Donation is $2 at the door; food is available on site. Talk-in 146.73(-), W8ZX repeater. For more information, contact Howard Blind, KD8KF, 6288 Echo Lake Rd., N.E., New Philadelphia, OH 44663; 216/364-5258.

•

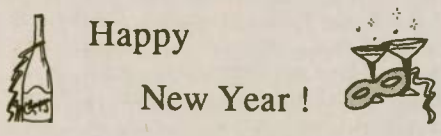
The SUNDAY CREEK ARF hamfest will be held on January 23rd from 8 a.m. to 4 p.m. at Hocking College in Nelsonville. Admission: $5, kids under 12 and spouses free. Tables and food; VE testing, etc. Talk-in 146.46(S) Nelsonville area.

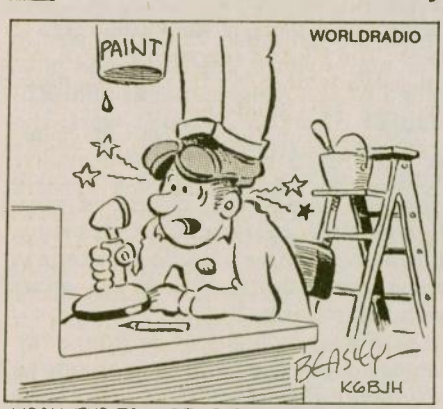
Pennsylvania

The COLUMBIA AREA ARC will hold its Dutch Country computer and communications show on January 14th from 9 a.m. to 2 p.m. at the Lancaster Host Golf Resort and Conference Center on U.S. Route 30. Show held regardless of weather. Features include manufacturers, retailers, supplies, software, books, Amateur Radio equipment, all indoors with ample free parking. Admission is $5 at the door, children under 12 free accompanied by an adult. VE testing (must pre-register by 31 Dec '94). Dealer inquiries should be made to P.O. Box 682, East Petersburg, PA 17520-0682; 717/560-2072; Fax 717/872-0857. Talk-in 146.715(-).

Tennessee

THE TENNESSEE VALLEY AR NETWORK will hold its 5th annual hamfest on January 28th from 8 a.m. to 4 p.m. at the Gallatin civic center. Set-up from 4 p.m. to 9 p.m. on Friday night. Admission will be $5 for age 16 and older. Tables are $10 which includes one admission. VE testing by pre-registration only. Send a completed 610, copy of license or certificate of successful completion to Ronnie Gilley, 512 Hillside Dr., Gallatin, TN 37066. SASE for registration confirmation. Food available on site. Free parking near door. Talk-in 145.13(-) and 442.600(+) Fri 3 p.m to 9 p.m. and Sat 5 a.m. to 2 p.m. For information and table reservations, contact Bill Ferrell, N4SSB, 1120 Douglas Bend Rd., Gallatin, TN 37066, 615/452-3962 after 5 p.m.





YEAH, THE PAINTER IS PAINTING THE SHACK RIGHT NOW, BUT I JUST COULDN'T MISS A BAND OPENING THIS GOOD!

Information in "New Products" is supplied by the manufacturers to acquaint *Worldradio* readers with new products on the market.

S&S Engineering

S & S Engineering has developed a programmable frequency counter. You can set the DIP switches for the offset, connect it to your VFO (we'll tell you how if you provide us a schematic), feed it with 7 to15V DC and know your tuned frequency with accuracy. The PC1 counts to 40 MHz - up OR down. It handles any IF offset and "backward" tuning VFOs. Its small size (4" x 2.5" x 5.5") makes it the perfect complement to your VFO rig. It has a power thrifty (150 mA) red LED display is easy to read. The PCB is solder-masked for ease of assembly.

Programmable counter kit without case, (model no. PC1), is $69.95, and kit with case, (model no. PCC1), is $99.95. Counter assembled with case, (model no. PCA1), is $139.95. An AC option for all models is available for $6.95.

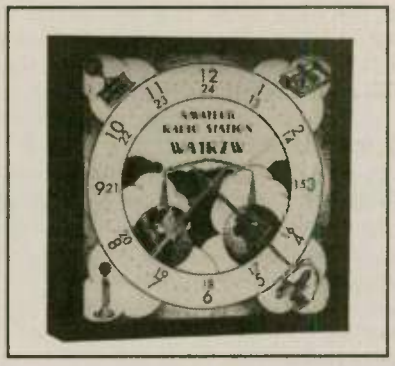
Contact S&S Engineering, 14102 Brown Rd., Smithsburg, MD 21783; 301/416-0661; Fax, 301/416-0963.

ARE "Classic" clock

Amateur Radio Excellence Products has introduced the ARE "Classic" clock for the ultimate ham shack. Ham operators everywhere will appreciate the Classic's beautiful original artwork dial, capturing the essence of the Golden Age of radio. The Classic represents the finest value available today in a custom-made clock for radio amateurs.

The Amateur Radio Excellence "Classic" features 12- and 24-hour dial, quartz accuracy, and fully laminated artwork face with the call letters of your choice custom-printed with the artwork. These beauties are 100% crafted in the USA. The clock frame measures approximately 9" square by 2" deep and is suitable for desktop display or wall mounting.

The ARE Classic Clock is powered by one AA battery, which is included. Every clock is shipped in its own gift box, packed in fine tissue. The dial face is designed in



dark brown on light beige, for an heirloom finish. Frames are available in simulated light oak, walnut, or black finishes. Please specify frame and call letters when ordering.

An excellent gift, the clock is a great value at just $39.99 plus $4.50 shipping within the United States. (Foreign orders add shipping F.P.O. Manchester, NH, USA.)

Contact Amateur Radio Excellence, P.O. Box 1551, Dept. WR , Manchester, NH 03105.

The Insect CW audio filter

The Insect audio filter from England is housed in a sturdy black metal box 8" wide x 6.25" deep, and 3.5" tall. The front panel is white with black lettering. It sports toggle switches for setting power on/off, filter in/out, input impedance 8/600 ohms, output impedance 8/600 ohms, and one switch for directing output to a computer, etc.

Audio connections are 1/4" headphone jacks on the front. A 7-pin DIN socket is on the back for connection to a computer. An audio cable with both 1/4" and 1/8" plugs, and other connectors are provided. This Insect feeds on just 60mA of 12V DC, which makes it QRP friendly.

Four large control knobs are: Input Attenuation, used mainly to match volume of filtered and unfiltered signals as the filter is switched in and out. Frequency centered at 800Hz, and adjustable ±50Hz. Used to center the filter over the signal wanted. Bandwidth centered at 60Hz, and adjustable from 10 to 110Hz output attenuation used along with Frequency and Bandwidth knobs to tune the filter for best copy of the signal wanted.

To use the Insect Filter, zero beat the signal wanted near 800Hz; set filter tnput attenuation at -5, output attenuation at -2, bandwidth at 60Hz, and frequency at 800Hz; switch in the filter, and center it over the signal; alternately narrow the bandwidth, center the filter and adjust output attenuation for best copy.

The filter circuit provides a 'sweet spot,' and correctly tuned signals jump out of the QRN/M with a tone all their own. Even at the narrow 10 Hz bandwidth, background signals are faint. The signal from the QRN/M stands out unmistakably.

With decent received signal strength, the filter will let you give 599 reports when you are heard just 349/QRN/QRM. With weak signals the Insect will let you pull 10 Meter 219 signals to comfortable 449 copy.

The board is double-sided glass. Metal stand-offs and supports are used in abundance, and off-board wiring is bundled and laced.

Money order for US$189 to: The Insect Filter, c/o Stuart Dodson, G3PPD, The Haven, Lound Road, Blundeston, NR32 5AT, England. Phone 0502 732322.

Includes shipping from England. Delivery in about 3 weeks.

US contact (and Insect user): Mike Greenfield, N9JIY, 2437 Magna Vista Jackson, WI 53037; (414) 677-4392.

Kantronics' KPC-9612

The KPC-9612 is a true dual-speed, dual-port TNC capable of 9600 and 1200 baud QSOs at the same time, even if cabled to only one radio. For its small size and low power requirements, the KPC-9612 is an amazingly full-featured packet TNC ideal for both new and experienced users.

With one radio connected to the 9600 baud port and another radio connected to the 1200 baud port, KPC-9612 users can simultaneously transmit and receive at both baud rates. With both ports connected to one radio, the KPC-9612 automatically detects the speed of the incoming signal and can transmit at 9600 or 1200 baud. No hardware changes are required to switch speeds, regardless of the configuration.

In addition, the KPC-9612 provides KA-Node cross-connecting and gateway digipeating, offering high-speed access to 1200 baud users. A connect at 1200 baud can be forwarded through to the other port and converted to 9600 baud.

The KPC-9612 is available with either 32K or 128K RAM and will accept an optional 512K. The 32K RAM provides for 20K of mailbox space, and the 128K RAM provides for nearly 100K of mailbox space. The full-featured PBBS includes forwarding and reverse forwarding to a BBS, remote sysop access, and mail waiting LED.

For status information, eight LEDs display 9600 and 1200 Xmit and Rcv, Con, Sta, Mail, and Power. The user interface supports Kantronics' new user and terminal modes, Kantronics Host Mode, BBS mode, and KISS.

The KPC-9612 is capable of operating on a single 9-volt battery. It comes complete with DB-9 and DB-15 connectors, cable, 2.1mm power connector, and an owner's manual. Users supply only a serial cable for computer or terminal, connectors for the radio(s), and DC power (6-25 volts).

Some features include: Real-time clock backed by socketed lithium battery, remote control with two digital output lines for each port, battery-backed RAM which saves all parameters. The unit weighs less than 16 oz and measures 0.8 x 6.2 x 6.1 inches.

Some available options are: Host Master terminal programs (PC, Macintosh, C-64), radio cable assembly without microphone plug (1200 baud port only).

NOTE: A 9600-ready radio is required for 9600 baud operations.

Contact Kantronics - RF Data Communications Specialists, 1202E. 23rdStreet, Lawrence, KS 66046; 913/842-7745, Fax 913/842-2021.

SGC-500

The SG-500 SmartPowerCube linear amplifier is microprocessor-controlled and constantly monitors power needs, antenna conditions and in milliseconds selects the right broadband filter. This amplifier is ideal for high power applications and is designed for fixed, mobile and marine applications.

The unit significantly boosts power to

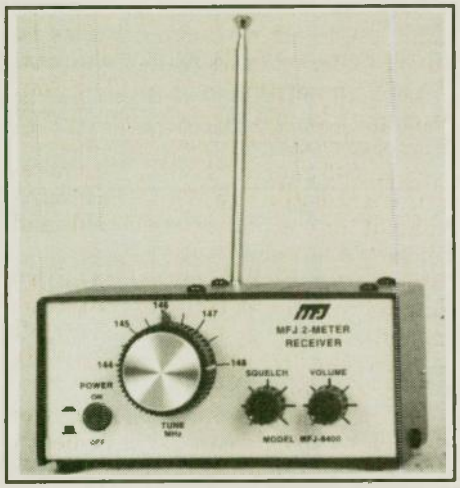
500 watt. The unit has a bank of status LEDs on the front panel which function as built-in-test-equipment (BITE) and allows the operator to quickly determine any fault which may occur.

It constantly monitors your HF-SSBs activities, power needs and antenna condition, and in less than 15 milliseconds, selects the right broadband filter. It is also protected from preprogrammed shutdown procedures and shuts down automatically in the event of a microprocessor fault, and is designed for service in fixed, mobile and marine applications and is fully compatible with most HF equipment produced.

For a limited time, the price of the Cube will be $845. For additional product information, contact SGE toll free at 800/259-7331.

MFJ 8400-K

The MFJ-8400K will make an excellent second receiver so that you can keep up with what is going on or monitor packet. A low noise, high gain RF preamp gives you 0.1 microvolt sensitivity. An air variable tuning capacitor with a velvet smooth 6:1 reduction drive makes tuning easy and comfortable with no noticeable drift. A dual conversion superhet receiver with sharp ceramic fil-



ters and crystal controlled second oscillator gives you excellent selectivity and stability.

The MFJ-8400K comes with the exclusive TailFree squelch which eliminates annoying squelch tails. A shaped audio response reduces background noise on-weak signals. A 19-inch, ¼-wave whip antenna is included. A 50-ohm antenna input lets you plug in an external groundplane or Yagi so you can reach out and pull in outlying repeaters.

The MFJ-8400K has tune, squelch and volume controls, built-in speaker, high quality components with glass expoxy PC board and attractive all metal cabinet.

The MFJ-8400K has a step-by-step instruction booklet which includes directions for aligning your receiver without instruments. The kit costs $69.95. It uses a 9 volt battery, 9-12 VDC or 110 VAC with optional MFJ-1312B, $12.95.

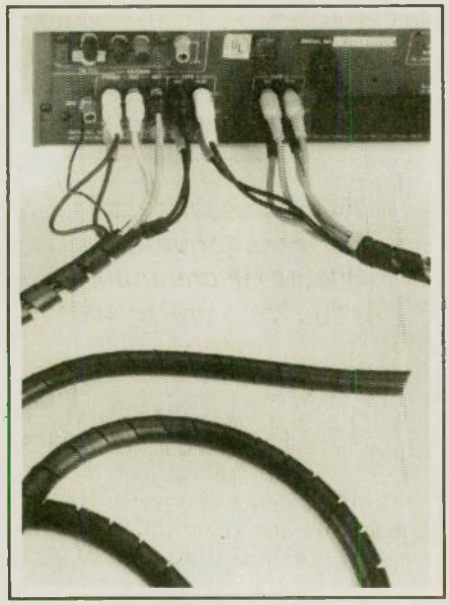
MFJ-8400W is the same as 8400K but is wired and tested, and costs $89.95. The instruction manual is available free of charge. For more information or to order, contact any MFJ dealer or MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762 or call 601/323-5869, Fax: 601/323-6551, or order toll-free at 800/647-1800.

Spirally cut wrap

A line of spirally cut cable wrap for neatly organizing the many types of wires behind equipment is available from M.M. Newman Corporation of Marblehead, MA.

Heli-Tube® spirally cut cable wrap applies like tape to keep wires organized and prevent improper routing. This flexible wrap allows wire breakouts in any direction for accomodating numerous electronic components.

Available in a variety of colors and



sizes from 1/8" to 1" O.D. for handing bundles up to 7" dia., the Heli-Tube® is extruded from polyethylene and comes in a UV-resistant grade for outdoor use. Teflon® and other materials are offered.

The Heli-Tube® sells for $3.95 in ½" O.D. size and comes in a 10 ft. polypag with a header card. Private labeling and bulk packaging are available.

Contact Charles F. Loutrel, M.M. Newman Corp., 24 Tioga Way, P.O. Box 615, Marblehead, MA 01945 or call 617/631-7000.

Mini Audio Level Controller

The ALC245M Miniature Audio Level Controller produces a nearly constant output level of 100mv RMS (optional) whether the input signal is a whisper or a scream. The large signals are attenuated and the low levels are amplified while reducing the ambient and low noise levels. The module is powered from the host equipment's power source, 7 to 30 VDC @ less than 10 mA of power. The ALC is ideal for new design or add on applications such as amplifier transceiver and scanner installation and experimental hearing aids. Dimensions are ¾" x ¾" x ¼." The ALC 245M is priced at $29.95 in

single quantity. Contact C & S Electronics, P.O. Box 2142, Norwalk, CT 06852-3208; 203/866-3208. WR

When you call. . .

Be sure to tell the nice people at the companies mentioned here that you saw their product mentioned in *Worldradio.*

VE exam schedules

As a service to our readers, ***Worldradio*** presents a feature listing those VE exams, times and locations which are sent to us.

Please remember that our deadline for publication is three months in advance. For example, if your VE group is scheduling an exam for September, please have the information to us by mid June.

p/r = pre-register

Worldradio, 2120 28th St., Sacramento, CA 95818. Please mark the envelope "VE Exams."

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

w/i = walk-in

Date	City	Contact	Notes
Arizona			
2/11/95	Tucson	Joe, K7OPX 602/886-7217	w/i only
California			
2/23/95	Colton	Harold, AB6RN 909/685-6073	w/i OK
2/5/95	Concord	Gene, WW6H 510/254-5090	
2/25/95	Fairfield	Dick, AB6EY 916/791-0268	w/i pref.
2/16/95	Fountain Vlly	Tom, N6XKY 714/778-1542	p/r only
2/7/95	Fremont	Greg, KJ6EP 510/791-6818	w/i only
2/25/95	Garden Grove	John, N6CTV 714/534-8633	p/r pref
2/18/95	Long Beach	Ken, KN6EC 310/431-8998	p/r pref
2/23/95	Long Beach	Blair, W6LRF 714/847-6370; Dale, N6LUH 310/596-1023	p/r pref
2/18/95	Porterville	Phil, WA6WRS 209/535-4288	w/i only
2/18/95	Redwood City	Joe, KB6OWG 145.23(-) PL=100	w/i OK
2/1/95	Sacramento	Jim, AB6OP 393-8839 or Earl, AB6CN 331-1115	p/r pref.; w/i OK
2/12/95	San Pedro	N6DYZ 310/325-2965	p/r pref.; w/i ltd.
2/18/95	Stockton	Mark, W6DKI 209/465-7496	w/i
2/11/95	Sunnyvale	408/255-9000 24-hrs.	w/i only
Colorado			
2/11/95	Colorado Spgs	Rick Brown 719/531-9423	w/i only
2/11/95	Denver	24-hr hotline 303/360-7294	w/i OK
2/19/95	Sterling	Blaine, WAØJTB 303/522-5787	w/i OK
Connecticut			
2/5/95	Newington	Fred, K9EBK 812/466-2122	w/i OK
2/22/95	Shelton	Lee, WA1TSW 203/735-9476	w/i OK
Florida			
2/18/95	Melbourne	WB9IVR 407/724-6183	w/i OK
2/16/95	Vero Beach	Rober, KC4NHB 407/567-3979	w/i OK
Idaho			
2/11/95	Boise	Lem, W7JMH 208/343-9153	w/i OK
Illinois			
2/18/95	Loves Park	Dennis, W9SS 815/877-6768	p/r; w/i
2/3/95	Westmont	Don, N9IZU 708/964-6712	w/i OK
Indiana			
2/15/95	Indianapolis	Pete, 317/259-7610	p/r only
Iowa			
2/25/95	Council Bluffs	Lorraine, AAØBS 712/322-1454	w/i OK
Missouri			
2/4/95	Kimberling	NQØG 417/739-2888	w/i OK
Montana			
2/7/95	Great Falls	Jerry, WB7WBW 406/452-6857	
New Jersey			
2/16/95	Bellmawr	Bill, WA2VQG 609/933-1500	w/i
2/11/95	Cranford	24-hr. hotline: 201/377-4790	w/i OK
2/8/95	Ft Monmouth	MARS 908/532-5354	w/i
2/6/95	Sayreville	Larry, N2ELW 908/754-5800 day 908/613-8967 eve.	w/i OK
New York			
2/14/95	Hicksville	Bob, W2ILP 516/499-2214	w/i
2/18/95	Long Island	Les, AA2FJ 516/364-0030	w/i OK
2/5/95	Yonkers	AC2V, 914/237-5589	w/i OK
Ohio			
2/2/95	Cincinnati	Herb, WA8PBW 513/ 891-7556	w/i OK
2/11/95	Van Wert	Robert, KA8IAF 419/795-5763	p/r
Oregon			
2/8/95	Roseburg	KB7CMB 503/672-5997	w/i OK
Pennsylvania			
2/4/95	Corry	Norma, W3CG 814/665-9124	w/i OK
2/18/95	Hermitage	Dennis, WM3H 412/347-5960	w/i OK
2/3/95	Nazareth	John, WX3C 610/767-4778	w/i
2/18/95	Stockdale	Lou, KA3FLU 412/938-8125	p/r only
Rhode Island			
2/9/95	Providence	Al, NN1U 401/454-6848	w/i OK
2/25/95	Slatersville	Bob, W1YRC 401/333/2129	p/r pref; w/i OK
Texas			
2/18/95	Austin	Jim, AB5EK, 512/327-6184	w/i OK
2/14/95	Houston	Harold, ND5F 713/464-9044	p/r pref.; w/i OK
2/18/95	Lubbock	Gerry, WB5R 806/765-5526 or Doug, W5JUV 745-	

THE MART

Classified
• Buy • Trade
• Sell • Inform

MART deadline 15th of the month two months prior to issue date. Please include an address on all ads so prospective clients can contact you by mail, if they prefer.

Commercial rate: 35¢/word, prepaid.
Private rate: 20¢/word, prepaid.

***WORLDRADIO* ON CASSETTES** for the blind. For information, contact TOM CARTEN, K1PZU, 1602-Y King's College, Wilkes-Barre, PA, 18711. F195

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 SASE to W6LS, 45527 3rd St. East, Lancaster, CA 93535-1802 to get data sheet. F195

CODE PROFICIENCY DRILLS are transmitted from WB3IVO Brass Pounders ARC each Saturday, Sunday, Monday and Thursday on 7040 kHz, starting 2000Z, each Tuesday and Friday on 14060 kHz, starting at 2000Z. Speeds range from 20 to 60 wpm. F195

MORSE CODE MUSIC! Do aerobics, sing, jog while learning code! Sensational new discovery and now the secret is yours! Order "The Rhythm of The Code" cassette today! $9.95 (add $2 shipping). KAWA RECORDS P.O. Box 319-WR, Weymouth, MA 02188. As heard at the Dayton Hamvention! 1194-395

ARUBA COTTAGE — 2 bedrooms with beams and rig for rent. For info write to: AI6V, 11407 Tower Hill Rd., Nevada City, CA 95959.6-795

RADIO REPAIR: Amateur & commercial, reasonable, JIM RUPP, 9330 State St. Ste. B-313, Marysville, WA 98270; 206/387-6312. 8am to 8pm. 594-895

PART-TIME HELP WANTED; FIELD TECH/INSPECTOR Sacramento region (approx 75 mi radius); high-tech environment. Paid training program. Must have clean, reliable vehicle. No sales required. Ideal for recent technical retirees and all others. Call 800/962-0681 (leave message). F195

POST CARD QSL KIT — Converts post cards, photos to QSLs! Stamp brings circular. K-K LABELS, P.O. Box 412, Troy, NY 12181-0412. 1194-395

PEP CONVERTER! Transforms averaging wattmeters to read PEP with flip of switch. Peak hold adjustment to 10 seconds. $19.99 ppd. kit. HI-RES, 18464 Ash Creek, Macomb, MI 48044; 810/228-1600. 1-495

ALL ABOUT CRYSTAL SETS. Theory and construction of crystal set radios. $9.95 ea., ppd USA. Send to ALLABOUT BOOKS, Dept. W Box 22366, San Diego, CA 92192. 1194,1,3,5,9-95

DISCOUNT PRICES AT RT ELECTRONICS. 10/11 meter radios, antennas, scanners, power supplies and more. Free flyer. P.O. Box 2123, Warren, OH 44484; 216/369-1789. 1294-595

EDITING A CLUB PAPER? Need one for your club? Interested in Amateur Radio public relations? Need some help? Amateur Radio News Service would like to hear from you. For info write PAM MYERS, N8IAK, 510 W. Harrison, Alliance, OH 44601. F295

GET YOUR "FCC COMMERCIAL GENERAL RADIOTELEPHONE LICENSE." Electronics home study. Fast, inexpensive! "Free" details. COMMAND PRODUCTIONS, D-173, Box 2824, San Francisco, CA 94126-2824. 894-195

METAL BADGES engraved with your name and call sign, civil defense and state seals available. Send $2 for catalog. IPEC, Dept. WR494, P.O. Box 7638, Moreno, CA 92552. 395

PERSONALIZED HOURLY HF SKYWAVE PREDICTIONS from your city or town: SKYCOM 1.5 floppy disk for Apple Macintosh or IBM PC and compatible personal computers. Includes complete mathematical description of theory ($30). DX window 2.0 floppy disk circular projection world radio map centered on your QTH shows sunrise-sunset gray line for any time of interest. Includes feature which displays any of 400 prefixes on world map instantly. For all Apple Macintosh machines ($50). SASE for more info: ATTN: DX; ENGINEERING SYSTEMS INC., P.O. Box 939, Vienna, VA 22183. F195

AMATEUR RADIO REPAIR — Prompt service. ROBERT HALL ELECTRONICS, 1660 McKee Rd., Ste. A, San Jose, CA 95116; 408/729-8200. 194-195

ANGUILLA — VP2E! Ham apartment for 1 or 2 persons. Multiband yagi, 40M yagi, R7 Vertical, tuner, power supply. Call DAVE, VP2EHF or Dorothea, VP2EE, 809/497-2150. 794-795

RTTY DIGITAL JOURNAL. The premier source of digital radio news and knowledge! Published ten times per year by the American Digital Radio Society. Whether a beginner or veteran, you need the RDJ for its coverage of all modes/bands from technical data to contesting. $20 per year (foreign higher). ADRS, Box 2465, New York, NY 10185. F195

QSL SAMPLES —50¢ SAMCARDS, 48 Monte Carlo Dr., Pittsburgh, PA 15239. 1194-595

FREE: Ham Radio Gospel Tracts: DX Contact and Christian Helps. SASE: N1GDP RAR-OFC, P.O. Box 8, Harmony, ME 04942. 1094-195

ELECTRON TUBES! Transmitting, receiving, military obsolete... all types. Large inventory. Fast delivery. DAILY ELECTRONICS, 10914 N.E. 39th St., Ste. B-6, Vancouver, WA 98682; 206/896-8856, 800/346-6667, fax 206/896-5476. 194-195

AUTO-CALL MAGAZINE, official journal of the Foundation For Amateur Radio, a federation of over 50 clubs in the greater Washington D. C. area. Great coverage of FCC, ARRL, VEC, Public Service and club activities in the area. A must for those even passing through the area. For a sample copy write FOUNDATION FOR AMATEUR RADIO, P.O. Box 7612, Falls Church, VA 22046-7612. F195

MORSE CODE COMPUTER INTERFACES for IBM $49.95. Over 650 IBM shareware disks with quantity discounts and no shipping. Free catalog. DYNAMIC ELECTRONICS, Box 896, Hartselle, AL 35640, 205/773-2758, Fax 205/773-7295. 1294-295

FREE HAM GOSPEL TRACTS. SASE, N3FTT, 5133 Gramercy, Clifton Heights, PA 19018. 894-1095

HAMS — DO YOU NEED COMPUTER PRINTER ribbons? Lowest prices. Color or black. State your needs. Free information. Special deal for clubs. HARCLY, P.O.Box 830, Coquille, OR 97423. 195-495

TRAVEL WITH WB6WCV & WY6Y to Baja and Copper Canyon, Mazatlan, Puerto Vallarta, Guadalajara and Guatemala. Help with Mexican License. 800/432-9111. 7, 9, 1194,195

WANTED FOR MUSEUM: Apple-1 and other pre-1980 micro-computers, also early microcomputer journals, newsletters and advertising literature. KK4WW, P.O. Box 341, Floyd, VA 24091, 703/231-6478 or 703/763-2321. 1294-1295

WE REPAIR BROKEN RADIOS! Quality sales and service. Icom, Kenwood, Yaesu, Ten-Tec, Azden, KDK & Atlas repaired at reasonable cost. Our famous optimized alignments are available from our sophisticated lab, with 15 years ham-only repair experience. Authorized Kenwood warranty service center. 8-pole and 10-pole Crystal filters for Kenwood, Icom & Yaesu. Fox-Tango Filters available. Kits & Upgrades. Icom & Kenwood separate newsletter/supplements. Ship equipment with letter detailing problems and preferred method of payment to: INTERNATIONAL RADIO & COMPUTER, INC., 3804 S. U.S. #1, Ft. Pierce, FL 34982. 407/489-0956. Send for your free catalog today! 1294-195

#2 SOLDER BRAID: 500 ft. $50.00. Check or money order, KEN KALETTA, N9NST, 1012 Pape Ave., Ft. Wayne, IN 46808. 1294-195

SCANNER SOURCEBOOK: Where to find anything and everything for your scanner! Amateur Radio, Antennas, Battery packs, BBSs, Computer Software, Frequency Directories, INTERNET Information, Library Books, Newsletters, Radio Clubs, and much, much more! Over 400 listings, 42 pages, only $12 postpaid, or send an SASE for more information to: GRIFFIN RESEARCH, 16333 Harbor Blvd., #110-W, Fountain Valley, CA 92708-1311. 1294-195

WANTED: BUY & SELL all types of electron tubes. Harold Bramstedt, C & N ELECTRONICS, 6104 Egg Lake Rd., Hugo, MN 55038; 800/421-9397 or 612/429-9397. Fax 612/429-0292. 1094-1095

The MART (cont.)

ROSS'$$$$ used January Specials: Kenwood TS-940SAT, $1,400.90; TS-530S/W YK-88C, $599.90; TV-506, $250.00; VFO-820, $150; ICOM IC-701, $380; R-71A, $698.90; IC-R1, $490; IC-701PS, $109.90; Yaesu FRG-8800/W FRV-8800, $580.90; FT-747GX, $599.90; FT-690RII, $600; Advanced radio devices 230A $3,499.90; Heath kit WH-5400, $369; SB-630, $115; SBA-1400, $150; IG-5257, $120; SB-630, $129.90; Hallicrafters HT-37, $399.90; HT-41, $595.90; Looking for something not listed? Call or send 2 stamps. We have over 120 used items in stock. Mention ad. Prices cash, F.O.B. Preston. Hours Tuesday - Friday, 9 a.m. to 6 p.m., 9 a.m. to 2 p.m. Mondays. Closed Saturday & Sunday. ROSS DISTRIBUTING COMPANY, 78 South State, Preston, ID 83263. 208/852-0830. 195

QRP/SOLAR. Power your QRP radio by solar recharged battery. Rugged and portable. Complete with 7Ah battery pack/charge controller and 10W solar panel. $199 (CT residents $212). QRP/SOLAR, 28-WR Carriage Drive, Enfield, CT 06082. 195

TRANSCEIVERS. Kenwood TS-430S, $600; TS-520S, $375. K1BW 508/537-7195. 195

COLLINS Operating/Maintenance Manuals RT KWM2A & amps 30L1, 30S1, set $21. R-390A, 51S1, $19 ea. (post paid). All schematics included. DMT, P.O. Box 9064, Newark, NJ 07104.

New Mart Deadline is the 15th of the Month

CQ, HR, QST, AND 73 magazines for sale. Send SASE to W6DDB, 45527 3rd St. East, Lancaster, CA 93535-1802 to get data sheet. 1194-1095

NEW! THE HANDY HAMBOOK by K2EWA. 200 pages, 5½ x 8½". Technical data and practical info including formulas, tables, nomographs, charts, operating aids and much more. Only $12 plus $2.50 s/h. NJ residents add 6% tax. ROMANCO P.O. Box 34, Milltown, NJ 08850-0034. 1294-295

CODE READING MACHINE—Kantronics (digital display) $180, LEWALSKI, 3512 Moraga Blvd., #4103, Lafayette, CA 95459 195

CUSTOM MADE SELF INKING STAMPS. Ham radio call and address. Address stamps. Club logos. Check writing stamps. Stamps of all kinds. Write for info, LOUIS CRAYCRAFT, K8NUJ, Dept. WR, 1502 53rd Ave. W., Bradenton, FL 34207; fax or phone 813/758-8758. 1-295

COMMODORE 64 HAM PROGRAMS — 8 disk sides, over 200 ham programs, $16.95. 29¢ stamp gets software catalog. HOME-SPUN SOFTWARE, Box 1064-W, Estero, FL 33928. 195

QSLs — ELEGANT, AFFORDABLE. Samples $1 (refunded with order). AACO, Dept. W51, 1639 Fordham, Mountain View, CA 94040 195

CALLSIGN & HANDLE on 11 oz. coffee mug, $10.95 ppd. BEST IMPRESSIONS, Box 2383, Ramona, CA 92065 1-295

DX DESKTOP for Windows™, DX station management, $99.00. Logging with DXCC, WAS, and WAZ. SAM and Buckmaster interface. DX Cluster interface with automatic radio QSY. Optional coordinated rotator control. Put Windows™ to work in your station with DX Desktop from DEBCO ELECTRONICS, INC., 3931 Edwards Road, Cincinnati, OH 45209, 1/800/423-4499. 1-695

BUILD A 35' FREE STANDING tilt-over antenna tower. Plan book $8.95. Build a universal coil winding machine. Plan book $8.95. Include $1.00 S&H with each order. Other books available. DAVE GINGERY PUBLISHING, P.O. Box 75, Fordland, MO 65652-0075. 1-695

VIBROPLEX AND MELEHAN KEYS WANTED: Looking for Vibroplex bugs with New York or Georgia nameplate. Still seeking Melehan Valiant keys. RANDY COLE, KN6W, 1216 S. Alvira, Los Angeles, CA 90035; 213/939-9847. 1194-295

WANTED: HAM EQUIPMENT AND RELATED ITEMS. Donate your excess gear—new, old, in any condition—to the Radio Club of Junior High School 22, the Nation's only full-time, non-profit organization working to get ham radio into schools around the country as a teaching tool, using our EDUCOM (Education Thru Communication) program. Send your radio to school. Your donated material will be picked up ANYWHERE or shipping arranged and this means a tax deduction to the full extent of the law for you as we are an IRS 501(c)(3) charity in our 15th year of service. It is always easier to donate and usually more financially rewarding, plus your gift will mean a whole new world of educational opportunity for children nationwide. Radios you can write off; kids you can't. Start 1995 by helping a child and yourself. Write, phone or Fax the WB2JKJ "22 Crew" today: The RC of JHS 22, P.O. Box 1052, New York, NY 10002. Call 24 hours 516/674-4072 or Fax 516-674-9600. Meet us on the WB2JKJ classroom net, 7.238 MHz 1200-1330 UTC daily and 21.395 MHz from 1400-2000 UTC. 195

HAM RADIO REPAIR. Quality workmanship. All makes and models. Fast turnaround. AFFORDABLE ELECTRONIC REPAIR, 7110 E. Thomas Rd., Scottsdale, AZ 85251; 602/945-3908. 993-295

PROGRAMMABLE COUNTER: Works with any VFO rig! Get a digital display for your rig, 100 Hz resolution. You can read the tuned frequency directly, no need to calculate offsets. Counts to 40 MHz, up or down. Counter Kit $69.95. Kit w/case $99.95. Assembled w/case $139.95. Guaranteed to work. For info send SASE; Call/write to order: S&S ENGINEERING, 14102 Brown Rd., Smithsburg, MD 21783; 301/416-0661. 195

WANTED ELECTRON TUBES, ICs, semiconductors. ASTRAL, P.O. Box 707WM, Linden NJ 07036. Call 800/666-8467. 1294-1295

KIT BUILDERS—NEW, SYNTHESIZED QRP transceiver, the ARK4. Full transceiver kit w/case only $199.95. One board, no wiring, top quality components & PCB. Guaranteed to work. For info send SASE; Call/write to: S&S ENGINEERING, 14102 Brown Road, Smithsburg, MD 21783; 301/416-0661. 195

MARCO: Medical Amateur Radio Council, operates daily and Sunday nets. Medically-oriented amateurs (physicians, dentists, veterinarians, nurses, therapists, etc.) invited to join. For information write: MARCO, Box 73, Acme, PA 15610. 7-795

CAPACITORS, variable, 15-225 pF 5kV peak, 2.6 inches square, 11 inches long, 1/4 dia. shaft. New, individually boxed. $37 prepaid, two for $70 prepaid CONUS. KOPPS CORP., 1236-40th Ave., Sacramento, CA 95822. Good check or MO. 1094-395

Flying high

KE6LLZ takes ham radio to new heights

Jimmy Guerrero, KE6LLZ, has a lofty perspective on Amateur Radio. Jimmy is a crew member on the Goodyear blimp *"Eagle"* based in Carson, California and does his hamming from 1200 feet in the air. He uses a Kenwood TH-78A with a rubber ducky clamped to a handrail outside the blimp. Jimmy belongs to the Buena Park Amateur Radio Club and the other members are green with envy. You can almost read the minds of the DXers thinking, "If I could only get my beam up that high."

Jimmy has been working on the blimp for four years and has the title of electronics technician. He is responsible for the down-links from the blimp-mounted camera to the network vans on the ground. He also programs the moving light signs on the side of the blimp.

On October 19th, 1994, the Buena Park Amateur Radio Club was holding its regular monthly meeting. Jimmy couldn't attend because he was working. He gave a call on 2 Meters and was heard in the meeting room. Calls back to KE6LLZ went unanswered, so Randy Boyd, N6BMD, ran to his car and set up his Kenwood TM-732 duo- bander as a repeater. Back in the meeting room, Dick Carter, WB7LGL, turned on his Kenwood TH-415A 440 rig and the contact was made. The path was from the meeting room to the "instant repeater" on 440MHz and from the make-shift repeater to the blimp on 2 Meters. Fourteen club members talked to Jimmy via the crossband hookup. Don't forget to credit Bob Painter, WA6PLM, with hearing Jimmy's first call on his ICOM-2AT (yes, old radios still work).

Everyone wants a QSL card because none have worked a blimp before. At the moment it's a moot question because Jimmy doesn't have QSL cards yet. But he won the raffle even though he wasn't at the meeting. He should be able to afford some great looking cards. —*Buena Park ARC* WR

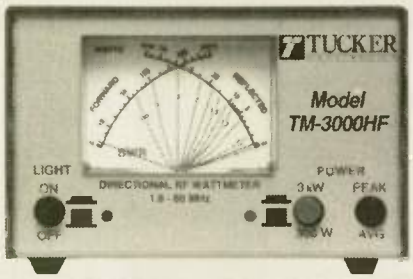
More on mag-mounts

Many of us use a mag-mount antenna on two meters. It is a fine antenna if you remember that moisture often collects between the antenna and the body of your car — even when it is not raining. It is a good habit to wipe off the bottom of your antenna as well as the car body spot at which you place it. You would be surprised how much moisture collects overnight — from dew. So, especially when it rains — but even when it does not, get into the habit of wiping your antenna mag mount and car body regularly. Your signal will improve. —*The Milliwatt* BRATS, Baltimore, MD

ADVERTISERS' INDEX

START THE NEW YEAR IN TUNE WITH TUCKER ELECTRONICS!

INTRODUCING THE NEW TUCKER SWR/POWER METERS! 2 METERS YOU WILL BE PROUD TO HAVE IN YOUR SHACK!



Tucker TM-3000HF
1.8-60 MHz Cross-Needle SWR/PWR Meter

The new Tucker TM-3000HF displays forward power, reflected power and SWR SIMULTANEOUSLY on its dual movement meter system! The readings' accuracy is assured because we use a TRUE SHIELDED DIRECTIONAL COUPLER. The meter is backlit (AC ADAPTER INCLUDED AT NO CHARGE!) and displays either peak or average power in 300 and 3000 W scales. Construction is first-rate. We use an aluminum case with chemically treated scratch and chip resistance. Our front-panel is reverse-printed lexan that is virtually scratch-proof as well. High quality connectors and screws are used throughout. Of course, your complete satisfaction is assured by our exclusive SATISFACTION PLUS GUARANTEE.

Specifications:
- Power Handling: 300/3000 W, scale selectable
- Frequency Range: 1.8-60 MHz
- Connectors: High Quality SO-239 (input/output)
- Power Requirement: 9-12 VDC (AC adapter included)
- Size: 5.3"(135mm)W x 5.75"(146mm)D x 3.5"(89mm)H
- Weight: 1.2 lbs (.55kg)

YOUR CHOICE... $79 EACH

Tucker TM-3000UV
100-500 MHz Cross-Needle SWR/PWR Meter

The new Tucker TM-3000UV displays forward power, reflected power, and SWR SIMULTANEOUSLY on it's dual movement meter system. Like the TM-3000HF,it uses a TRUE SHIELDED DIRECTIONAL COUPLER for greater accuracy. 30 and 300 W scales are selectable from the front-panel. All other features of the HF version are included as well, such as backlighting, AVERAGE and PEAK power readings and scratch-resistant construction. The frequency range is selected in three steps (144 MHz, 220 MHz and 440 MHz) for optimizing accuracy within the amateur bands. We use Teflon BNC connectors with gold pins because SO-239 connectors are to lossy above 2m. Everything is backed by our SATISFACTION PLUS GUARANTEE.

Specifications:
- Power Handling: 30/300 W, scale selectable
- Frequency Range: 100-500 MHz (can be used from 50-650 MHz with reduced accuracy)
- Connectors: Teflon BNC with gold pins
- Power Requirement: 9-12 VDC (AC Adapter included)
- Size: 5.3"(135mm)W x 5.75"(146mm)D x 3.5(89mm)H
- Weight: 1.2 lbs

THE HOTTEST SELLING ANTENNA TUNER ON THE MARKET!

Tucker T-1000
THE BEST 300 W TUNER

The Tucker T-1000 has been designed to give you more than any other tuner currently available for 300 W and its construction will let you appreciate its many features for years to come. Covers the entire frequency range up to 300 W PEP. Utilizes continuous rotation capacitors to provide superior transmitter/antenna tuning. Inductance is setup using a 12-position switched inductor. Antenna Selector: six positions: COAX 1 tuned and DIRECT, COAX 2 tuned and DIRECT, bypass and balanced antenna. Power Switch: high and low (300 W/30 W). Comes complete with a 1 year warranty and our risk-free Tucker SatisfactionPlus guarantee

Specifications:
- RF Power: 300 W PEP
- Frequency Range: 1.8 to 30 MHz
- Transmitter/Antenna Tuning: Continuous rotation capacitors
- Inductance: 12-position switched inductor
- Antenna Selector: Six positions: COAX 1 tuned and DIRECT, COAX 2 tuned and DIRECT, bypass and balanced antenna
- Power Switch: High and low (300 W/30 W)
- Dimensions: 10.2" (259 mm) W x 9.4" (239 mm) D x 3.5 (89 mm) H
- Weight: 3.4 lbs (1.5 kg)

INTRODUCTORY PRICE: $139 with FREE FedEx Federal Express Economy Shipping

Made in the U.S.A.! Get the best, order your T-1000 today!

Tucker SatisfactionPlus 30-Days No Questions Asked Guarantee

WE TAKE TRADES!

TUCKER ELECTRONICS

CALL, WRITE OR FAX FOR A FREE COPY OF OUR HUGE HOLIDAY CATALOG!

TO ORDER; CALL, WRITE OR FAX:

CALL TOLL FREE: 800-527-4642

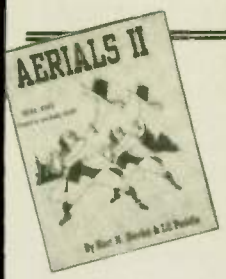
RADIO & COMPUTER HOTLINE: 800-559-7388 • LOCAL: 214-348-8800 • FAX: 214-348-0367

1717 RESERVE ST., GARLAND, TX 75042 • P.O. BOX 551419, DALLAS, TX 75355-1419

WE CARRY THESE FULL LINES:

AEA · ALINCO · AMIDON Associates · ANLI Antenna · AOR · ASTRON CORPORATION · Bearcat · COMET · CREATE · cushcraft · DAIWA · DIAMOND ANTENNA · DRSI · EDCO · HEIL SOUND · EMOTO · GRUNDIG made for you · HUSTLER · hy-gain · ICE · ICOM · Jim PROFESSIONAL SERIES · JPS · Kantronics · KENWOOD · MFJ · OPTOELECTRONICS · pro-am · RAMSEY · ROHN TOWERS · SANGEAN · SIGMA · SONY

WORLDRADIO BOOKS






AERIALS II, *by Kurt N. Sterba & Lil Paddle*

A compilation of antenna columns which appeared in ***Worldradio*** from 1985-93. 88 pp. $11.00 + $2.00 s/h ($4.00 for non-US ZIP air delivery.) CA residents add tax.

40+5 YEARS of HF MOBILEERING, *by Don Johnson, W6AAQ*

This long-awaited and eagerly anticipated revision of Don's "40 Years of HF Mobileering" is now ready for shipping. A compendium of invaluable information on mobile antennas. 104 pp. $14.95 + $2.00 s/h ($4.00 for non-US ZIP air delivery.) CA residents add tax.

WHEN THE BIG ONE HITS... *A Survival Guide for Amateur Radio Operators, by Jerry Boyd, KG6LF & Jay Boyd, KN6BP*

Tells Amateur Radio operators what to do to prepare for survival, safety of families and loved ones, and perform disaster communications duties efficiently in the face of disaster. 56 pp. $7.50 + $2.00 s/h. ($4.00 for non-US ZIP air delivery.) CA residents add tax.

MORE ABOUT CUBICAL QUADS, *by George McCarthy, W6SUN*

Details W6SUN's 25-year love affair (or probably more accurately — wrestling match) with the Quad antenna and has many building and installation tips garnered from his extensive experience. 64 pp. $10.00 + $2.00 shipping and handling. ($4.00 for non-US ZIP air delivery.) CA residents add tax.

SIX METERS, *A Guide to the Magic Band, by Ken Neubeck, WB2AMU*

A labor of love by the author, the book provides comprehensive information on Six Meter equipment and modes. A little history of the Golden Age of Six Meters is provided along with some explanations for the causes of various forms of propagation. 80 pp. $12.00 + $2.00 shipping and handling. ($4.00 for non-US ZIP air delivery.) CA residents add tax.

THE BEST OF BEASLEY, *by Robert Beasley, K6BJH*

"Oh, to see ourselves as others see us...." A wacky view of Amateur Radio through the eyes of a very clever cartoonist. Great gift for a fellow amateur. 112 pp. $8.00 + $2.00 shipping and handling. ($4.00 for non-US ZIP air delivery.) CA residents add tax.

••••••••••••••••••*Send your order to*••••••••••••••••••

WORLDRADIO BOOKS • P.O. Box 189490 • Sacramento, CA 95818

___AERIALS II @$11.00 _____
___CA tax @ $.85 (if applicable)_____
____40+5 YEARS OF HF MOBILEERING @ $14.95_____
____CA tax @ $1.16 (if applicable)___
___WHEN THE BIG ONE HITS... @ $7.50_____
___CA tax @ $.58 (if applicable)_____
____MORE ABOUT CUBICAL QUADS... @ $10.00 _____
____CA tax @ $.78 (if applicable)_____
____SIX METERS... @ $12.00 _____
____CA tax @ $.93 (if applicable)_____
____BEST OF BEASLEY.. @ $8.00 ___
____CA tax @ $.62 (if applicable)_____

___S&H charges: $2.00 for the first book to an address, and $1.00/book for additional books_____

Name_____

Call_____

Address_____

City_____

State_____ ZIP_____

TOTAL ENCLOSED _____

Ck. M.O. AmEx. MC VISA

Card # _____ Exp.Date_____

_____

Signature_____

Take me to your ladder....

KURT N. STERBA, K—??

There are those who live in an Orwellian nightmare. The unfortunate ham's neighbors gather at monthly white wine and brie parties to plot. After dividing an area into patrol sectors, with all the intensity of avid bird watchers, eyes are unblinkingly aimed skyward in search of those dreaded antennas.

Yes, an esteemed professor from a local junior college told one meeting that the radiation from those antennas punches holes in the ionosphere.

A scientist testified that a laboratory mouse was sacrificed by being on a six-foot tether and forced to stay outdoors to test the amount of bad rays coming through the holes in the ionosphere. The poor mouse, while being well fed, succumbed after only three months. The scientist took umbrage when asked if the fact that this experiment was conducted at the University of Montana over the winter might have had anything to do with the mouse's demise.

Anyway, with the zealous neighborhood patrol, (already warned to look closely at flagpoles to see if any coax cable runs from the bottom) on watch, the radio operator has a rough go. But the ham really wants to enter the ARRL's Sweepstakes contest.

Kurt to the rescue! Prop up an aluminium ladder on the garage or the house. Make up a cover story about whatever household project fits. (Encouraging your daughter to elope?) In this particular instance the ladder was 13 feet long when extended. The coax cable went into a Budwig connector and a few quarter-wave radials for 20M were laid out and connected to one side of the connector. On the other side (+) of the connector, wire was attached and then run to the bottom rung of the ladder.

Ho, ho, some reading this are laughing already. Impossible! A travesty! No, dear and gentle reader, this article is not a satire on science. The technically oriented are wondering just what the resonant frequency, with all the cross steps, could be and to what level the impedance would be complex. With trepidation, an Autek RF Analyst was attached to the Budwig connector. Would the little digital readout have tears flowing, feeling that all this was a mockery? Would Mr. Autek, upon hearing about this, fume? Would it even be possible to match whatever convoluted "Z" resulted?

Results? At 14.210 MHz the SWR was 1.1 to 1. Honest to Hannah! No Kurt spoofin' or anything like that. Just to double check and make sure, a Bird model 43 wattmeter was put in place of the Autek unit and measurements were made.

To replicate these results, the place where the wire (from the coax connector) has to hit the right spot on the ladder and the radials have to be just right. It was found that running a wire to a water pipe for a ground threw everything off. The angle of the ladder is critical, especially if the garage wall has the metal mesh. To adjust properly in different environments may result in factors moving in opposite directions.

Anyway, if you see 2 to 1 (or less) SWR don't worry a bit and use a tuner at the transmitter end. So, how did it work? There was one hour that I worked 18 sections. The ARRL gives a pin if you make 100 contacts in SS. I qualified with the ladder. Contacts were to the North, the South, East and West (wasn't that a Cole Porter tune?) The QSOs ranged from Maine to Hawaii, Alaska to South Florida, Saskatchewan to South Texas. A total of 49 sections were worked on 20M via ladder.

I much prefer to go up and down the band answering the CQs. To just sit and call CQ, is boring for me. I did it once with the ladder and worked three contacts in three minutes. Yuk. In my "seek and ye shall find" operating I had some runs of (clock minutes) :14, :16, :18, :19,—:23, :25 :26,—:34, :35, :36,—:41,:43, :44,—:13, :15, :16, :17, :18, :19: 20,—:12, :14, :15, :16, :17. I thought the draft from turning the dupe sheet over was going to give me a cold. One station even said to me "big signal." I found the strangest thing was that I could work very, very weak stations. And, yes, there were some loud stations that I stood in a long line for.

But, I had fun and that's what counts. I earned an ARRL pin which I know I could get, unlike the certificate that New York magazine never mailed me for a recent serious effort.

(KNS goes by his special moniker so he doesn't get letters from wives saying how depressed their husbands were after reading his column. He doesn't want to hear about tears and chewing on shirt cuffs because some can't do as well with real antennas as Kurt does with a ladder.) **WR**

Worldradio

(USPS 947000)
PO Box 189490
Sacramento, CA 95818

POSTMASTER: Send changes of address to above (Please include mailing label.)

Second-class postage paid Sacramento, California and additional mailing offices