Worldradio

Year 24, Issue 8 February 1995 • $1.25

FEATURED IN THIS ISSUE


Worldradio
Year 24, Issue 8
February 1995 • $1.25
Tornados strike Memphis area
Florida tower case update

Aloha, OR — 2-Meter burglars

Denton, TX — Simple guide to packet operations, Part 5 of 5

E. Patchogue, NY — Amateur Radio & sporadic-E, Part 1 of 2

Memphis, TN — Tornados strike Memphis area

Vero Beach, FL — Tower ruled "eyesore"

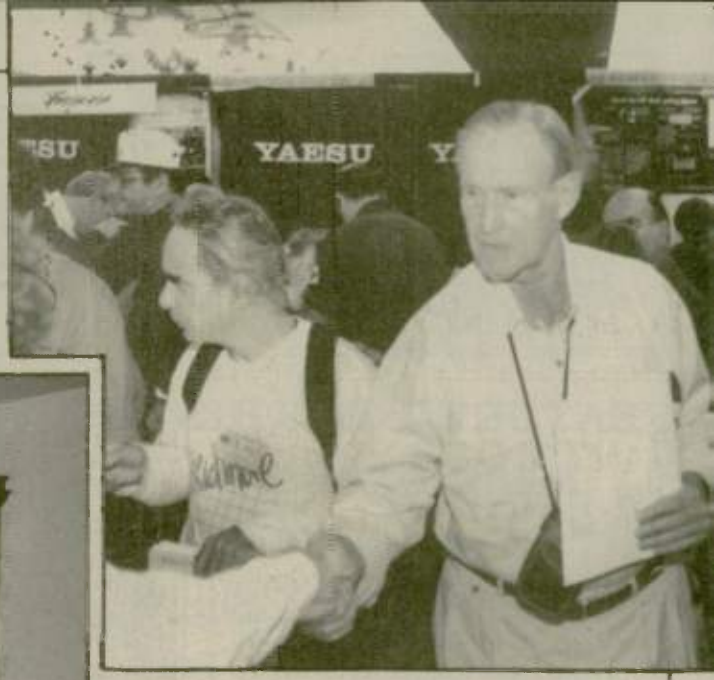
W. Anchorage, AK — What to do in Alaska in wintertime

COLUMNS

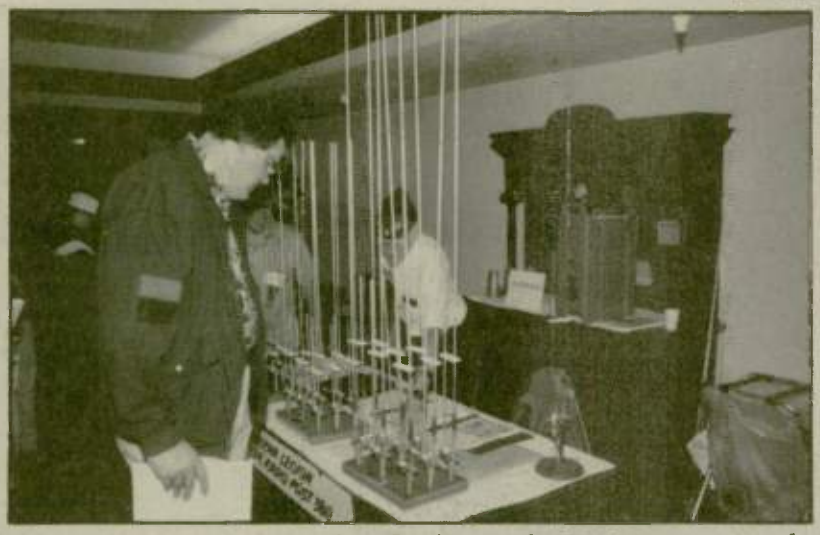
•10-10 International •Aerials •Amateur Hi •Amateur Radio Callsigns •Computers & Basic Stuff •Construction •Contests •Digital Bus •DX Prediction •DX World •FCC Highlights •FM & Repeaters •Hamfests •MARS •Mobile •New Products •Off the Air •Old-Time Radio •Propagation •Publisher's Microphone •QCWA •QRP •Search & Rescue •SPACECOM •Special Events •Station Appearance •VE Exams •Visit Your Local Radio Club •Visit Your Local Radio Store •With the Handi-Hams •Worldwide DX Contesting •YLs on the Air

ADDRESS & TELEPHONE FOR SUBSCRIPTIONS ONLY
520 Calvados Ave. • Sacramento, CA 95815 • 1-800-366-9192

Concord



"Jack Troster . . . Darn glad to meetcha!"



American Legion-made antennas — proceeds benefit charitable causes.

The Pacific Division ARRL Convention

Chris Imlay, N3AKD

Cynthia Wall, KA7ITT

Worldradio

Year 24, Issue 8 February 1995 • $1.25

Tornados strike Memphis area

MARILYN HARTLEY, KJ4GV

November 27, 1994, will go into the Tennessee record books as a very deadly and destructive Sunday. At least two tornados rumbled through the Memphis metropolitan area that day. The first roared through the nearby city of West Memphis, Arkansas. The twister produced a great deal of damage to property, but fortunately, few injuries.

The second tornado struck the city of Germantown at approximately 2:30 p.m. Germantown is a bedroom community that shares city limits with Memphis. Three deaths occurred, and at least 22 were injured. Thirty homes were destroyed and more than 100 sustained damage. Two schools and a church were also heavily damaged.

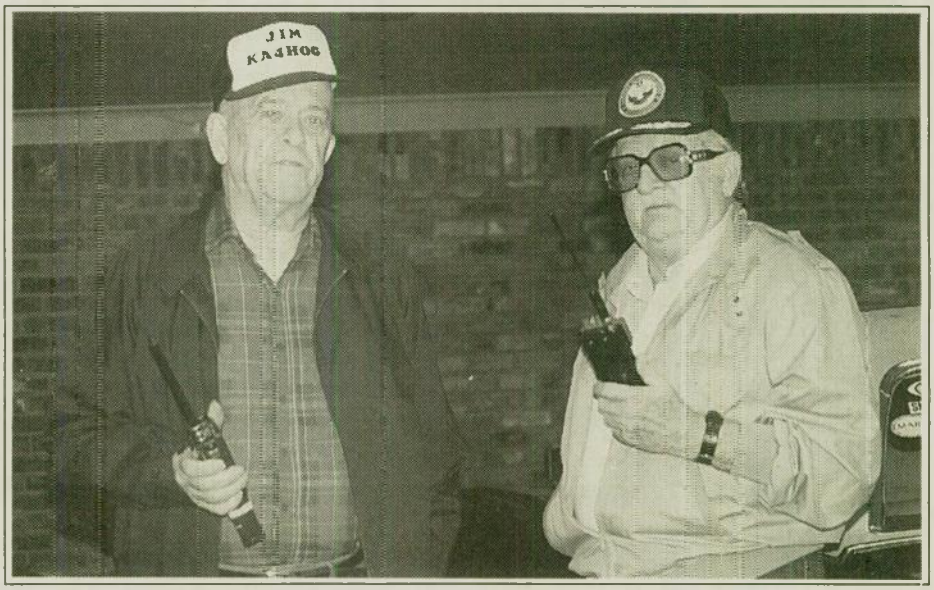
The National Weather Service had been tracking the storm since the day before. The Sky Warn Net was activated for the Weather Service early on the morning of the 27th, by Suresh Kagoo, N9GSA. The net covered six counties in West Tennessee, four counties in North Mississippi, and the counties of eastern Arkansas.

High frequency phone nets connected Arkansas, Mississppi, and the Tennessee Emergency Management Agency. The net was handled by Chic Wingate, AD4NN. Communications for the Memphis and Shelby County Emergency Management Agency was headed up by Jim Houston, KA4HOG. Operators Jim Moffat, WD4SMW, Virgil Shelby, W4FLD, Ken Schlidt, N4VSD, Bill Covington, Jimmy Johnson, KD4REX all served. So too, did Ham Hilliard, KE4OT, Pat Lane, W4OQG, Nina Stone, WB4CHH, Ned Savage, KA4BLL all participated.

Two area resident couples, Mr. and Mrs. Fred Miller, KS2X and KA2PGW, and Sam Johnson, WB4KWF, and wife Colleen, KE4GUZ, served at the Red Cross.

Operations ran through the following Thursday. From weather spotting, actual emergency communications, and subsequent damage assessment work, there is no way to name all the individual Amateur Radio operators who helped.

This was a cooperative, group effort. ARES, RACES, Sky Warn, and John Q. Ham all were involved. While there were no MARS operations activated, there were Army and Air Force MARS members who took part in this operation, all working together as a team to serve the community. WR



Jim Houston, KA4HOG, and Chic Wingate, AD4NN

Florida tower case update

A three-judge panel from Florida's 4th District Court of Appeals has signed an order that declares the ham radio tower belonging to David Bower, WA4NST, and his wife Sharon, N4XLF, to be "...a nuisance and annoyance" and must be removed. The signatures on the order come one year and 307 days after it was put in place in February, 1993.

Back on 15 January 1993, 19th Judicial Circuit Court Judge Charles E. Smith ruled that "...Amateur Radio transmissions are noxious and offensive" and that the Bowers' antenna system is "an eyesore constituting a nuisance and annoyance to the neighborhood" and therefore in violation of deed restrictions. Judge Smith ordered that the Bowers' remove the tower and antenna and enjoined them from making any Amateur Radio transmissions from their property.

With the appeal now lost, and the decision worded in a way that prevents them from taking the matter into the Florida Supreme Court, WA4SNT and N4XLF must now accede to the will of the State court or bypass it and move the matter into the Federal court system. The Bowers say that such an appeal will be very costly with some estimates being in the area of $20,0000 or more; an amount they say they cannot afford. So, the Bowers have appealed to the members of the ARRL Executive Board to have the ARRL take on the appeal for them. They are also asking hams nationwide to write to ARRL Executive Vice President David Sumner, K1ZZ, and ask him to use his influence in the ARRL political structure in their behalf. WR

Finally. . .the amplifier every amateur has always wanted

...the 3K-ULTRA

We are satisfied that this is the finest HF linear amplifier we have ever offered. The 3K Ultra represents a vision and a resolve taken years ago to provide amateurs with the finest amplifier that we could possibly build. It is every amateur's dream.

★ General coverage all frequencies 1.8 to 24 MHz (Export models to 30 MHz). Ask about our 8K Ultra.
★ Remote control
★ All modes. . .SSB, CW, AM, FM, Amtor
★ Full legal power
★ Unique, high reliability design
★ **Export, commercial and military (including MARS) communicators note that our higher power 8K ULTRA is also available for prompt delivery.**

It is rugged, reliable, remotely tuned and offers full power and efficiency on all bands between 1.8 and 24 MHz. Frequencies above 24 MHz are available on export models. The amplifier offers 6 memory channels for automatic tuning on your choice of frequencies. A small, light-weight, remote control cabinet sits at the operating position, while the amplifier itself can be across the room, in a closet, or in the next room. We manufacture many other HF, VHF, and UHF amplifiers, all still available as before. All domestic and foreign inquiries are invited. Write for full specifications on the 3K Ultra or for our complete amplifier information packet. Don't wait any longer to own the amplifier you have always wanted.

Henry Radio

2050 S. BUNDY DR. LOS ANGELES, CA 90025 (213) 820-1234
Toll free order number: (800) 877-7979 FAX (310) 826-7790

More on vanity calls

The FCC authorization act that would have converted an annual users fee for Amateur Radio vanity call signs to a one-time application fee failed to pass in the last session of the 1994 Congress. HR4522 passed the House, but failed in the Senate despite the concerted efforts of the ARRL.

The National Association of Broadcasters opposed other, non-amateur related provisions of the bill, and that opposition was cited in *Broadcasting and Cable* magazine as the cause of the bill's defeat.

The Budget Reconciliation Act of 1993 permits the Commission to charge for the *use* of vanity call signs at the rate of $7 per year, or $70 for a ten year license, which would be due again at each ten year renewal time. The ARRL had proposed a one-time *application* fee of $150, which would not be subject to a renewal fee, and that was the language which had been contained in HR4522. **WR**

GO List to new publishers

Jay and Jan O'Brien, W6GO and K6HHD, have retired from publishing their QSL route list. Beginning with the first edition in March of 1980, the well-known DX couple finished with their last issue (number 176) as of December, 1994.

Paul and Nancy Smith, N4FFO and KB4RGW, will be the new publishers of the list, which will keep the *GO List* title. The Smiths came to the O'Brien's Northern California QTH and spent three days going over the details of production and maintenance of this comprehensive list. They will honor all existing subscriptions as well as seek new subscribers. The Smiths may be reached at: P.O. Box 2306, Paducah, KY 42002-2306. **WR**

Joint Jordanian-Israeli "DXpedition" planned

Rumor has it that sometime later this month a joint Israeli-Jordanian operation will be set up on the international border, somewhere north of Eilat and Aqaba. The Israeli Ministry of Communications have already given their blessing, with the callsign 4X4-SALAM issued for the station on the Israeli side of the line. The counterpart station on the Jordanian side should be JY-SHALOM. The organizers of the event are still awaiting authorization from the Jordanian authorities. A special certificate will be issued to those successfully contacting both stations. Keep listening on the bands to see if this operation is pulled off! —*HaGal* Israel Ham News

Yaesu DX cruise '95

"DX-Caribe Cruise '95," sponsored again this year by Yaesu U.S.A., has been announced. Chip Margelli, K7JA, reports that radio activities will include two complete Yaesu HF stations for maritime mobile operation on board the *S.S. Ocean Breeze.* For more details, see back cover. **WR**

FCC reorganizing continues

The Federal Communications Commission on December 1 established a new Wireless Telecommunications Bureau, as part of its continuing reorganization begun last summer.

The new bureau will have seven divisions and will "handle all FCC domestic wireless telecommunications programs and policies, except satellite communications," the FCC said. The new bureau also will "serve as the commission's principal policy and administrative resource (regarding) spectrum auctions."

Ralph Haller, formerly chief of the Private Radio Bureau, was named one of the two deputy bureau chiefs, reporting directly to the chief of the Wireless Telecommunications Bureau, Regina M. Keeney, Both of Ms. Kenney's parents are licensed amateurs. The new Private Radio Division, along with the Licensing Division, will handle Amateur Radio matters at the FCC.

The FCC said that the Private Radio Division would "project demand for existing and possible new communications requirements and services."

—ARRL *Bulletin*

CONTENTS

FEATURES

Tornados strike Memphis area — 1
Florida tower case update — 1
Amateur Radio and sporadic-E — 6
What to do in Alaska in the winter time —11
A simple guide to packet operations — 12
The 2-Meter burglars strike again— 13

COLUMNS

10-10 International — 46
Advertisers' Index — 67
Aerials — 57
Amateur "Hi" — 58
Amateur Radio Call Signs — 8
Computers & Basic Stuff - 42
Construction — 52
Contests — 60
Digital Bus — 28
DX Prediction — 22
DX World — 18
FCC Highlights — 8
FM & Repeaters — 40
Hamfests — 59
MARS — 34
MART Classifieds — 65
Mobile — 26
New Products — 62
Off the Air — 17
Old-time Radio — 50
Propagation — 54
Publisher's Microphone — 4
QCWA — 38
QRP — 44
SAR Communications — 32
Silent Key — 16
Spacecom — 23
Special Events — 16
Station Appearance — 58
Subscription, ***Worldradio*** — 9
VE Exams — 64
Visit Your Local Radio Club — 35
With the Handi-Hams — 37
Worldwide DX Contesting — 48
YLs on the Air — 30

Worldradio

February 1995
Vol. 24, No. 8

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.

PUBLISHER'S MICROPHONE

It is now again time to display to the four corners of the world the names and calls of those who soar in the sky. "To excel" is their motto of life. The latest to become ***Worldradio*** SuperBoosters (Lifetime Subscribers) are:

***William Hilyerd, K4LRX, Henderson, KY**
***Fred Crowner, WD8ODO, Columbus, OH**
***Donald Dreyer, KFØUZ, Stanton, NE**
***Jim Spiva, KD6T, Vallejo, CA**
***Peter Brickey, KD6KDR, Los Gatos, CA**
***Dr. Terry Richards, WZ7G, Seattle, WA**

The above-mentioned WZ7G wrote: "I get them all, and yours is the most enjoyable, readable and entertaining.

"Particularly like 'Kurt', cynic and rabble rouser that he is.

"Now I don't have to write you any more checks."

Gerald Skinner, K4LVZ, Winter Park, FL was misidentified in a previous listing as KL4VZ. The person responsible for handing me a wrong call has been hung by the thumbs from the fig tree in our back yard and flogged. Salt was rubbed into the wounds and color Polaroids of the event were sent to K4LVZ. Thankfully the penalty for me not catching the error was not as severe.

We recently received nice letters from The Milwaukee (WI) Repeater Club and the Central Illinois/St. Louis Area Amateur Television Club thanking us for the "entertainment items" we furnish to hamfests and conventions gratis. Nice to see that the letter writer's parents taught them proper etiquette.

But, the puzzlement is, and I write about it on an annual basis, is why more clubs don't write to us asking for the items which, on an hourly basis, or after dinner, seem to liven up the proceedings.

•

We're working out the details now and in an issue or two from now you will see more NEWS of what is happening in Amateur Radio on our pages.

•

When various articles tell how to get more publicity for Amateur Radio they rightly mention contacting the city newspaper, weekly newspapers, radio and TV stations. Another possibility may be the Public Access channel on your cable system. You could present an entire program about Amateur Radio. Members of your club, who are handy with video equipment could present the sights and sounds of Field Day and other happenings.

•

Each month, to acquaint more amateurs with ***Worldradio***, we mail out free sample copies (hoping the recipients will subscribe). Most likely this is how you received your first issue. A recent mailing to A.J. "Tony" Rossano, KE4FFY, Macon, GA resulted in this letter: "Thanks for the free sample copy of your magazine. I found it very informative about the Amateur Radio community. I took it to our radio club meeting and the president made several announcements from the articles—especially about the new rule changes that are effective on December 20, 1994.

"I especially like the 'FCC Highlights' It gives an insight as to what is happening and how it affects us.

"Again many thanks."

(And, he took out a subscription.)

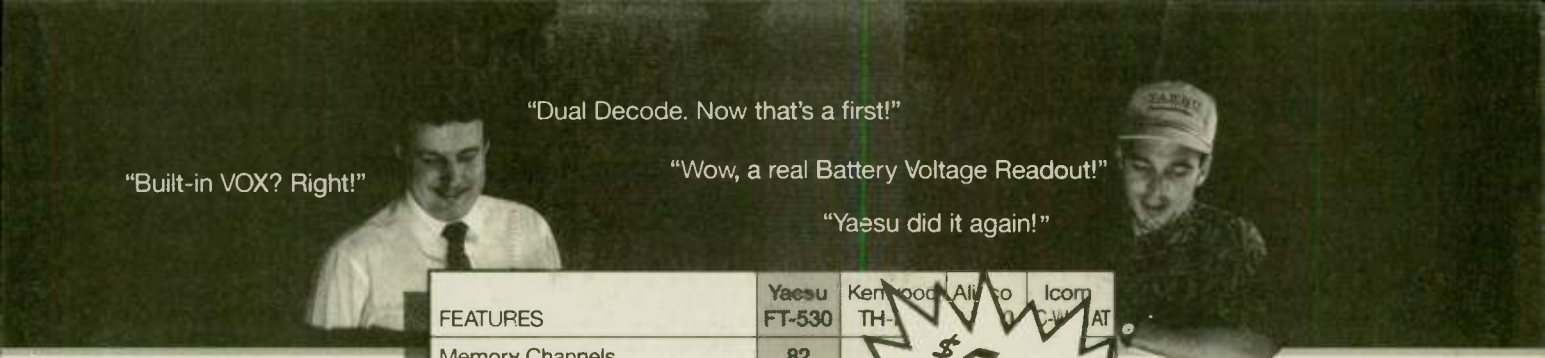
That got me thinking! Should you know an Amateur Radio operator who is not familiar with ***Worldradio*** (poor unfortunate soul) just drop us a note, or a postcard, with that person's name, call and address and they'll be sent a free sample copy of the next issue in the printing cycle.

In fact, contrary to what one letter-writer said, that we were an "exclusionary" hobby, I'm going to do what I can to bring more into this avocation. Send me the name and address of that friend that you have been badgering to get a license for many years now. I'll send them a copy of ***Worldradio*** (Your name will NOT be used in any manner whatsoever) and hopefully they will find lots of very interesting activities here and want to join the ranks of the licensed radio operators.

I'm getting even more inspired! If your club runs licensing classes, tell us how many in the class, and we'll send you a copy of ***Worldradio*** for each and every one in the class! Reading about all the interesting activities should give them even more incentive to complete the course and get their license.

Don't forget, we're always looking for interesting articles so send yours in. Please, though, not the 714th ver-

–Armond, N6WR



DX-CARIBE CRUISE '95
for details call or write Yaesu USA Today!
1995

FEATURES	Yaesu FT-530	Kenwood TH-	Alinco	Icom AT
Memory Channels	82			
Slide-out Lithium Battery	YES			
Dual CTCSS Decoder	YES			
Battery Voltage Readout	YES			
Automatic CTCSS Tone Search	YES	NO		
Transmit Battery Saver (Repeater & Simplex Operation)	YES	NO	NO	NO
Built-In Vox	YES	NO	NO	NO
One Touch Reverse Button	YES	NO	NO	NO
Dual In-Band Receive (V+V, U+U)	YES	YES	NO	YES
Programmable External Speaker Audio	YES	NO	NO	YES
Optional Digital Display Mic with "S" Meter	YES	NO	NO	NO
AM Aircraft Receive	YES	YES	YES	YES

$50.OFF
SEE YOUR DEALER FOR DETAILS
LIMITED TIME OFFER.

The Best vs. "the rest".

FT-530
Dual Band Handheld

Frequency Coverage:
2-Meter 130-174 MHz RX
144-148 MHz TX
70 cm 430-450 MHz RX/TX
4 TX Power levels:
w/FNB-25: 2.0, 1.5, 1.0, 0.5W
w/FNB-27: 5.0, 3.0, 1.5, 0.5W
DTMF Paging and Coded Squelch
AOT – Auto On-Timer with built-in clock and alarm functions
IBS – Intelligent Band Select (provides automatic TX band select on scan stop)
Backlit keypad and display with time delay
Built-in cross-band repeat function
APO – Automatic Power Off
5 Watts output w/ FNB-27 battery or 12 VDC
2 VFO's for each band

Accessories:
NC-42 1-Hour Desk Charger
FNB-25 600 mAh Battery (2 watt)
FNB-26 1000 mAh Battery (2 watt)
FNB-27 600 mAh Battery (5 watt)
FBA-12 6 AA Cell Holder
CSC-56 Vinyl Case w/ FNB-25
CSC-58 Vinyl Case w/ FNB-26/27
E-DC-5B 12 VDC Adaptor
YH-2 Headset for VOX
MH-12A2B Speaker Mic
MH-18A2B Lapel Speaker Mic
MH-19A2B Mini Earpiece Mic
MH-29A2B LCD Display Mic with Remote Functions
MMB-54 Mobile Mounting Hanger

No other dual band handheld beats the FT-530 on features for performance and ease of use. With the largest backlit keypad available, 82 memories, exclusive Dual CTCSS Decode and AM Aircraft Receive, the FT-530 is simply the best value there is.

Compare for yourself, then forget "the rest." See your dealer for the best dual band handheld you can buy. The FT-530.

YAESU
Performance without compromise.℠

Amateur Radio and sporadic-E research

Part 1 of 2

KEN NEUBECK, WB2AMU

The sporadic-E phenomenon has been of great interest to both scientists and radio operators for the better part of this century. The interest in sporadic-E has stayed very high with amateur radio operators because of the pronounced nature of the phenomenon when it appears on a broad range of ham radio frequencies such as 10, 6 and 2 Meters. While a greater understanding has been achieved on sporadic-E through scientific study, radio observations and rocket probes since its discovery of over fifty years ago, there are still some unanswered questions as to the exact causes of the phenomenon and it remains a subject of major interest. The intent of this article is to provide a brief summary of the scientific work and amateur radio observations that have been conducted in the study of the sporadic-E phenomenon as well as examining actual ionosonde sporadic-E data.

A sporadic-E cloud can be basically defined as a plasma or a collection of charged particles that when formed into stratified clouds, has the ability to reflect radio signals of over a broad frequency range. These clouds are located in the E-layer of the ionosphere roughly 70 miles or 100 km above the earth's surface. The composition of these clouds have been determined by numerous rocket studies to contain metallic ions such as sodium, silicon, magnesium and iron. Sporadic-E clouds generally cover areas of 200 km or less in diameter and are significantly smaller than the areas of coverage that are provided by F-layer propagation. The mass of charged ion particles will drift as the result of winds in the E-layer (typically in a westward direction) as well as from the rotation of the earth and will eventually dissipate as the charge of the individual ions is lost. It is possible to determine the general size of the sporadic-E clouds by plotting the midpoints between two-way radio stations that are making contact while the cloud is present.

Sporadic-E clouds are by nature, very unstable. They rarely last for more than one day and even though they may dissipate, the level of particle activity may be high enough for the cloud or clouds to reform again later on during the day or night. The E-layer of the ionosphere is apparently more accommodating for the formations of these types of ion clouds than the F-layer. The reasons for this may be attributed to factors such as temperature, density and atomic makeup of the E-layer, all of which are more conducive to the formation of sporadic-E ion clouds.

There are different forms of sporadic-E that are observed that relate to the different geomagnetic zones of the earth. There are equatorial sporadic-E (designated as Esq), auroral sporadic-E (Au) and mid-latitude or temperate zone sporadic-E (Es). The focus of this article will be on the latter as the other two have been pretty well defined.

"We can chalk up one more of those all-important phenomena which almost certainly would have gone unobserved had it not been for the hams."

United States radio amateurs were the first to observe the sporadic-E phenomenon in action and this occurred in 1935 on the 5 Meter band when contacts of 900 miles apart in distance were being made on this band. This newly discovered condition would be heard in May in each of the following years until by May, June and July in 1938, multiple contacts were being made via the sporadic-E mode almost on a daily basis although it was not called by that name at the time.

A. Pierce in his September, 1938, *QST* article, "Interpreting 1938's 56-Megacycle DX," wrote, "We have known for some years what is called "abnormal E ionization" occurs mostly in May, June, and July. Since, this is just the time when 56 Mc DX occurs, it looks as though there was a connection." He further states that it would take time to study the data but added that this was "another chance for the amateur to contribute to the knowledge of radio." Pierce was associated with the layer height measurement program that was being conducted at Harvard University at the same time of the 56 MHz discoveries.

R.A. Hull, editor for *QST* during that time, states in a September 1938 editorial, ". . . that while much of the picture is still shrouded in mystery, a really comprehensive explanation and a new understanding of certain irregularities of the ionosphere are on the way." He states, "We can chalk up one more of those all-important phenomena which almost certainly would have gone unobserved had it not been for the hams."

With the discovery of sporadic-E on the 56 MHz band of the Amateur Radio bands in the United States in 1935, several noted scientists examined the phenomenon and were able to express some of its characteristics in mathematical terms.

By the end of the 1930s, Sir Edward Appleton and Sir Granville Beynon worked from the observations of radio amateurs and solved the relationship of the maximum usable frequency (MUF) to the critical frequency for sporadic-E clouds.

The maximum usable frequency is the highest frequency for which the E cloud will reflect while the critical frequency is the frequency for which the vertical angle is zero and radio waves are reflected directly back. A rough calculation relating critical frequency to MUF is that the MUF is equal to 5.4 times the critical frequency. For example, if a critical frequency of 5.2 MHz is observed, the MUF would be 28 MHz or in the Amateur Radio 10 Meter band.

Radio amateurs would be moved from 56 MHz to 50 MHz in March of 1946 as part of FCC reallocations of radio frequencies. Yet, this did not hinder the study of the sporadic-E phenomenon by radio amateurs in this general frequency range. Many hams moved to this new frequency range and continued to submit reports.

A 1948 study was conducted by Oliver Ferell, the science editor for *CQ* magazine, who collected data from a number of radio amateurs in the United States during two openings in January and May of 1948.

The amount of data collected allowed one of the first detailed mappings of an E-cloud to be generated along with a determination of the direction that the cloud was traveling. This appears to be one of the earliest times when the two season pattern of sporadic-E was determined and accepted by radio operators. Prior to that time, it was viewed primarily as a summer season phenomenon.

The 50 MHz frequency range, or the 6 Meter band, provides an excellent canvas for the study of sporadic-E propagation. This is true for several reasons. While radio frequencies below 30 MHz exhibit F-layer propagation capabilities throughout the solar sunspot cycle (although at reduced amounts during the sunspot mini-

mum), the 50 MHz range shows little or no F-layer propagation during the years surrounding the sunspot minimum. This condition makes it very convenient for radio operators to clearly identify sporadic-E conditions without confusing it any with other phenomenon. The 6 Meter band, while not crowded, has a number of dedicated radio operators who monitor the band daily.

During the International Geophysical Years of 1957 through 1958, which took place during peak sunspot activity, radio ionosondes were set up throughout the world to record the effects of radio signals sent into the ionosphere. Several papers on sporadic-E were generated by two scientists, Ernest K. Smith and S. Matshushita, who were associated with the U.S. National Bureau of Standards in Boulder, Colorado. Their common interest on the subject would lead to the first dedicated book on the subject, *Ionospheric sporadic E,* in 1962 which they co-edited and submitted papers. A key paper that was included was the wind shear theory of E cloud formation by Whitehead which presents the theory that the formation of the sporadic-E clouds is caused by the effects of winds in the E-layer on the resident ion particles. This theory would require some adjustments due to rocket studies.

Rocket launches into the E-layer of the ionosphere commenced in 1960, from a wide range of locations with bases at Wallops Island in Virginia, White Sands in New Mexico, Eglin Air Force Base in Florida, Fort Churchill in Manitoba, Canada, and other countries such as the Soviet Union. The rocket studies were conducted in the 85 to 150 km range of the E-region above earth showed sporadic-E clouds consisted of metallic ions with the most prevalent ions detected being iron and magnesium with lesser amounts of silicon, sodium, aluminum and calcium occasionally found.

This information suggests that the main source of these particles are from meteors because of the common elements found.

During one 1960 launch in Russia, an estimate for the metal particle density was made where the peak concentration of magnesium ions found at 105 km was in the order of 13,600 ions per cubic centimeter and 540 iron ions per cubic centimeter at the same altitude. An Eglin AFB launch in November of 1965 found that the peak concentration was 10,000 ions/cc at 105 km.

Using this estimate of 10,000 ions/cc and applying it to a typical cloud size of 100 square km in diameter and 10 km in height, it can be calculated that total cloud concentration would contain on the order of 100 billion ions. This order of magnitude of particles could imply that additional sources besides resident E-layer meteor debris might be required to generate a typical sporadic-E cloud.

Radio ionosondes are a major tool in measuring sporadic-E. Ionosondes are stations that are set up throughout the world that work on the principle of sending a set of frequencies into the ionosphere and measuring what comes back. Ionosondes have been existence since WWII but the method of data collection became uniform for all stations beginning in 1957 during the International Geophysical Year (IGY).

Typically, an ionosonde station will send up a conical pattern with a frequency sweep that begins at 1.5 MHz up to 20 MHz. The frequency for which a signal that goes up and comes directly back is known as the critical frequency.

There are some limitations to ionosonde data, particularly in that it is not a continuous reading throughout each hour. How often have hams heard short sporadic-E openings that seemingly come out of the mud and last for less than 20 minutes? In addition, there are occasions where sporadic-E clouds are tilted and the ionosonde signals will not be reflected back. Yet the data can still be a very valuable tool in sporadic-E studies because of the consistency of the data being taken from the same place using the same equipment. **WR**

Next time, long-term data observations are compared, and revelations on the nature of sporadic-E more closely defined.

Cycle vs. hertz

JACK CARR, NV9S

Several years ago, when 'hertz' was used to replace 'cycle' in radio wave frequency designations, there was some displeasure among the old timers (we old timers don't like to see *any* changes).

I think the problem was that a specific word was used to replace a nonspecific word. 'Cycle' can be denotative and connotative. 'Cycle' denotes something that has rhythmic patttern—be it a washing machine or a frequency. Used specifically, 'cycle' connotes the word it is being used with e.g., kilocycle, moon cycle.

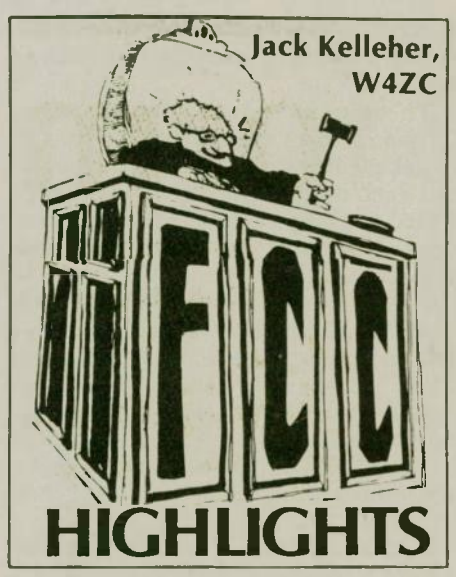
We would not think of saying, "The washing machine is in the rinse hertz" or "The moon is in its waning hertz." We would, however, feel comfortable using the word 'cycle' in the two sentences above because 'cycle' means periodic pattern. 'Cycle' can also be a verb. Something is cycling; something was cycled. Something can not be hertzing or re-hertzed.

In all fairness to the purists, I must point out that hertz refers to cycles per second. (1 Hz=1 cps). By saying, "One thousand kilohertz," we are saying, "One thousand kilocycles per second." I can't think of any situation in which one would say, "one thousand kilocycles per hour" when talking about electromagnetic waves. This might be why the old timers think that it was like putting bumper guards on bumpers to substitute 'hertz' for 'cycle.'

As I said, we old timers like to see things last. When I first read that our sun was good for only about 12 billion more years, I felt kind of sad.

—*Newswave,* DuPage ARC

If you are involved in any emergency situations, send the story and pictures to *Worldradio.* See your group in print and help your fellow amateurs with shared experiences. Your story may help others be better prepared.



FCC Intervenes in antenna zoning case

The Chief of the FCC's private radio bureau, Ralph Heller (N4RH), has told the Hempstead, New York Board of Zoning Appeals that the town is wrong in trying to regulate an amateur's antenna system based on interference caused by nearby consumer electronic equipment. The amateur involved is Mark Nadel, NK2T.

Nadel contacted his congressman, Peter T. King (R-NY), who contacted the FCC. Haller responded with a letter to King explaining the FCC's PRB-1 decision, then wrote to the Board of zoning appeals, as follows:

"It has come to our attention that the town of Hempstead's Board of Zoning Appeals (Board) has denied Mr. Hayden M. Nadel's application for a variance permitting him to maintain his amateur radio station's antenna at a height of fifty-five feet (versus the thirty feet permitted by the zoning ordinance). According to the text of the Board's decision. . .it based its determination largely on its finding that the "proposed and existing antenna height of fifty-five feet was resulting in interference to the home electronic equipment of Mr. Nadel's neighbors."

Haller cited PRB-1 and what local authorities may do under its provisions, but said "They may not base their regulation of amateur service antenna structures on the causation of interference to home electronic equipment — an area regulated exclusively by the Commission."

Haller said "there is no reasonable connection between requiring Mr. Nadel to reduce the height of his antenna and reducing the amount of interference to his neighbors' home electronic equipment. On the contrary, antenna height is inversely related to the strength . . .of the radio signal that serves as a catalyst for interference . . . it is a matter of technical fact" Haller said "that the higher the amateur antenna, the less likely it is that the radio frequency interference will appear in home electronic equipment."

Proposed transfer of bands from Government to Non-Government use

Last month we reported on adoption by the FCC, on October 20, of a Notice of Proposed Rulemaking on reallocation of 2390 - 2400, 2402 - 2417 and 4660 - 4685 MHz from federal government use to commercial use. (Several previous items in this column have covered progress on this action, beginning with a Plan released by the National Telecommunications and Information Administration early this year — See for example the *ARRL Letter*, February 24, 1994, this column in May1994, and the item on "Good Neighbors" in this column December 1994).

On November 8th the FCC released the NPRM. The release included extracts from the Commission's remarks concerning the Amateur Service. Those FCC comments are reproduced below.

"While we believe that [our] plan for allocation to Fixed and Mobile Services would ensure that the spectrum is used for services that are most highly valued by the public, we also recognize that such an approach may be difficult to implement given certain factors that are unique to these bands. For example, there are incumbent amateur users in the 2390 - 2400 MHz and 2402 - 2417 MHz bands"

The FCC said further that it believes several suggestions for use of the 2390 to 2400 MHz band are already adequately accommodated in other bands, and that parties supporting alternative proposals "should address the compatibility of the proposed service with the Amateur and other services."

In both the text of the NPRM and in footnotes the FCC acknowledged arguments from the Amateur Radio community, including the requirement of the Reconciliation Act to avoid excessive disruption of the amateur service

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 December 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	AAØUN	KGØRV		KBØPTK
1	AA1LM	KD1YE	N1TQD	KB1BLO
2	AA2UX	KF2ZD		KB2SOZ
3	AA3JD	KE3QE	N3TWX	KB3BFO
4	AD4AD	KS4IM		KE4STEA
5	AB5ZA	KK5FX		KC5LCE
6	AC6JA	KO6MH		KE6ONG
7	AB7GH	KJ7FZ		KC7GZS
8	AA8RE	KG8NH		KB8VTG
9	AA9NE	KF9ZB	N9ZHC	KB9JBM
N. Mariana Is.	KHØO		KHØDO	
Guam	WH2I	AH2CZ	KH2LP	
Midway Is.		AH4AA	KH4AG	WH4AAH
Hawaii		AH6NQ	WH6ZP	WH6CRM
Amer. Samoa	AH8L	AH8AG	KH8BJ	WH8ABB
Alaska		AL7PV	WL7ZA	WL7CHW
Virgin Is.	WP2P	KP2CD	NP2HS	WP2AHV
Puerto Rico		KP4XY		WP4MUL

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.

and to determine the extent to which, in general, commercial users could share the frequency with Amateur Radio licensees.

The FCC asked for comments on several options, including:

Maintaining a secondary allocation for the amateur service in all or part of this spectrum;

Making the amateur service the primary user in a portion of this spectrum while either maintaining a secondary allocation in the remaining portions of the bands or eliminating the other portions from the amateur service.

"We also solicit information" the FCC said "on the degree of disruption to the Amateur Service that would result if all or part of this spectrum was removed from the amateur service. We request comment on these options, including the ability of various radio services to share spectrum with the amateur service."

The FCC noted the ARRL's argument that, were amateurs to lose the spectrum in question, along with 2300-2310 MHz, which is also threatened, the remaining 35 MHz would be insufficient for amateur satellite operations, would prevent full duplex point-to-point operations carried out in that band, and would crowd Amateur Service operations in the 13-cm band into the least desirable spectrum near the center of the ISM band at 2450 MHz.

The FCC also noted comments about the difficulty of sharing between commercial licensees and the Amateur Radio Service, and that "the Commission has used the continued availability to Amateurs of the 13 cm band to justify reallocating Amateur spectrum in lower bands to commercial services (i.e., 220 - 222 MHz) and that it would therefore be unjust for the Commission to now allocate this spectrum for commercial uses."

Note: The Commission has a mandate to comply with the Omnibus Budget Reconciliation Act — which envisions an eventual transfer of 200 MHz from Government to commercial use. The foregoing comments indicate that they are doing their best to protect Amateur Radio interests from what is becoming a "tour de force."

NZART to ORACLE: No way on no code

This is the title of an item in the November 30 issue of *Westlink Report*. ORACLE was discussed in this column in the November issue in terms of the ORACLE objective to delete from ITU Radio Regulation #2735 the Morse code proficiency requirement for the Amateur Service.

True, this is not an FCC Highlight; but a change in the ITU Radio Regulations is not taken lightly by the FCC.

The article is "A Statement about the Morse code and Amateur Radio in New Zealand." Its preface is a note reading: "The following policy statement has been provided by the New Zealand Amateur Radio Transmitting Society (sic). NZART is the internationally recognized society representing radio amateurs in New Zealand. While not stating so in the text, the policy statement appears to be an answer to the lobbying efforts of the Organization Seeking Alternative Through Code Less Examinations — ORACLE. ORACLE has taken the position that mandatory Morse testing should be abolished worldwide and replaced with voluntary testing in those nations that might want to continue the requirement. NZART favors the continuance of mandatory code testing.

The NZART statement is as follows:

Suggestions that New Zealand may imminently propose changes to the ITU Radio Regulations affecting Amateur Radio are without foundation.

The New Zealand Association of Radio Transmitters Incorporated is the IARU member society for New Zealand. Founded in 1926, NZART is recognized by the New Zealand administration, the NZ Ministry of Commerce, as the body representing Amateur Radio in New Zealand.

The Morse code requirement for radio amateurs has been a topic for discussion within New Zealand for many years. Since 1963, New Zealand has had a very successful "codeless licence" for operation above 30 MHz. About one-third of New Zealand radio amateurs hold this "codeless" licence. To operate below 30 MHz, a Morse test must be passed.

A nation-wide membership survey about Morse code was conducted by NZART early in 1993. The diverse input received was used to develop the NZART policy on Morse code.

This Morse code policy wording was circulated to all NZART members by way of a remit for consideration at the Annual NZART Conference held in June 1994. This wording was voted on at local NZART Branch meetings. Branch delegates then jointly reviewed the Policy at the NZART Annual Conference. The conference unanimously supported the wording as contained in the Policy.

This policy supports the continuation of the requirement for competency in Morse code as a prerequisite for radio amateurs for operation below 30 MHz.

From the beginning of the survey to the final adoption took 18 months. Every step was open to input from the membership and for review. Every member received the survey and the results. Every member received a copy

of the Policy before it was adopted.

The NZART Policy on Morse code was presented in a paper in the IARU Region 3 Conference at Singapore in September where the matter was debated. The Conference endorsed a recommendation that the "status quo" as set out in the ITU Radio Regulation RR 2735 be continued. This completed a worldwide consideration by the three IARU Regional organizations of the Morse code requirement.

Following the IARU Region 3 Conference the IARU Administrative Council met. The IARU AC resolved "to neither propose nor support any change to the international radio regulations pertaining to Morse code."

NZART has reported these developments to the Ministry of Commerce (the New Zealand Administration). The Minister of Communications has assured NZART that "New Zealand will not actively make proposals for changes in the International Radio Regulations, as they affect the amateur service, until such time as there is evidence of significant opinion here in New Zealand, and/or overseas, to support modification of Article 32."

To fulfill a requirement of the adopted NZART Policy on Morse code, NZART Council is conducting a review of the Amateur Radio licence grades, the written examiniation syllabus and its structure, and the Morse code testing procedures.

A review of the Morse code testing procedure has received priority because it is recognized that a changed test environment will satisfy many of the NZART members' concerns. It must be remembered and respected that NZART, with its diverse membership interest, will have members who will continue to hold diverse views about Morse code.

Summary

The official New Zealand position on Morse code in the Amateur Service is for "no change."

The NZART Council is cognizant of members' concerns about the examinations and Morse code, implementing the outcome of a review of the Morse code test procedures, and supporting the Examination Working Group to review both the written examinations and the grades of New Zealand licence with the intention of commencing discussions with the New Zealand Administration on all these issues, and requesting the NZART Liaison Committee to monitor any overseas movements in those areas.

Note: Good news for those of us who opt for continuation of the Morse code requirement. —W4ZC WR

What to do in Alaska in the winter time

LARRY STRAIN, N7DF/KL7

As the snow begins to pile up against the windows and the daily temperature reports slide even further southward, a group of really stalwart amateurs in the Anchorage Amateur Radio Club begin to gear up for some of their biggest outdoor operating events of the year.

Yes, Field Day during the balmy month of June with its 24 hours of daylight is a popular activity but nothing compares with the annual fur rendezvous lasting for three weeks in February.

Two of the biggest events are the International Sled Dog Races and the Alaskan Grand Prix car race. Both of these would be far less successful if the AARC didn't provide their backup communications services.

The sled dog races begin in downtown Anchorage on snow hauled back onto the city streets by a cooperative public works department and wander for 25 miles through city parks, an abandoned airfield and the foothills of the Chugauch Mountains to end up back where they started. And they do it for three days in a row! Meanwhile, believe it or not, a full fledged carnival is running in minus 20 degree temperatures, with Ferris wheels and all, just a block from the starting line.

As many as 25 dog teams of up to 20 howling, rambunctious huskies each assemble on Fourth street where a large metallic racecourse map is displayed for tracking their progress with magnetic markers and the Amateur Radio base station is set up. The noise is unbelievable! The teams are released at five minute intervals and pass through 19 Amateur Radio equipped checkpoints during the next four hours as they race for the winnings.

Occasionally a team escapes the race course and goes charging through backyards and parking lots while dog handlers and onlookers try to bring the rampaging dogs to a halt and get them back on course. Sometimes a driver loses his grip and falls off his sled; then a wild chase ensues as the team really gets moving. Meanwhile the radio amateurs fight 35 degree below wind chill to keep their radios going and frostbite away. Communications operate on the AARC repeater.

A week later one of the most unusual Grand Prix races ever takes place. This time the snow is piled up into banks 10 feet high, surrounding a mile and a half long loop of streets in the railroad yards, a few blocks from downtown, to create an auto race course.

The Amateur Radio base station is usually set up in a borrowed motor home near the officials' stand and is linked into the official and safety radio networks.

At each turn and in several other locations around the race course, safety crews stand by to assist in case of accidents and to relay course information. Each crew is equipped with snow shovels to dig out any cars that run into the snow banks! An amateur station is assigned to each point and keeps the base station informed of course conditions and relays traffic among race officials.

For four hours on two consecutive days, Volkswagen Beetles and Rabbits predominate the field with a few other cars thrown in for variety as ten to twelve drivers slip, slide, and skid around the course giving each other custom body jobs.

The use of speaker mics is really preferred during these races as the noise of the cars going by makes it almost impossible to hear or be heard otherwise.

At other times during the winter, several groups of Alaskan amateurs are involved in additional events such as the Junior Iditarod sled dog race with 12 to 16-year old kids racing 75 miles through the woods (last year one went 40 miles up the wrong trail and had to be rescued by a ski-plane), the two day Idta-Ski cross country ski race, snowmobile races and even mid-winter parades. Then later comes the biggest winter race of them all, the Iditarod, a 1,000 mile-plus sled dog race.

Suffice to say; things aren't dull for the radio amateurs in Alaska in the wintertime and not all of the fun is indoors! WR

AN OPTIMIST is someone who tells you to cheer up when things are going his way...

A simple guide to better packet operations

Last of a 5-part series

GREG JONES, WD5IVD

The following touches on a number of issues that make day to day VHF/UHF operation of packet easier and possibly more enjoyable for yourself and everyone else on the channel.

TNC settings:

This list is the TAPR recommendation for TNC settings when using the current 1.1.8a TNC firmware on VHF. These are only recommendations. Every local area has different operating environments and thus some of these may change to help local operating conditions. If you would like information on how to get a copy of 1.1.8a, contact TAPR at the address at the end of the article. If you are not using 1.1.8a, set all settings that are implemented on your TNC. 1.1.8a implements a number of new features which dramatically improve channel operation.

ACKPRI	ON
ACKTIME	14
DEADTIME	33
DWAIT	33
FRAC	8
RESPTIME	0
SLOT	3
TXD	33

PACLE 64-255 (depending on channel quality)

MAXF 1-7 (depending on channel quality)

These settings have been found to work in most common, moderately congested packet channels. People who get the most discouraged when operating packet have problems with either the way their TNC is configured or are trying to make packet work over a poor path to begin with (Handi-Talki in an apartment with an inside antenna). If you are having problems, ask a packet operator who knows the parameters for your TNC and see if something is incorrectly set. Sources for problems are: TNC settings, better signal needed, radio and TNC deviation problems. Any of these or a lot more might be your problem.

Common courtesy:

Remember that packet radio is a shared resource. Typically whatever you do when operating packet affects someone else. Operating points to keep in mind are: Beacon Usage, digipeating, DX BBSing, and network utilization. None of these items are set in stone. Each situation requires that you use good judgment on how you operate. Packet can be a lot of fun or it can be a nightmare, all determined by channel operations.

Local traffic:

Packet can be thought of much like a voice repeater. If you have a local connect to make, don't stay on a congested packet channel to do it. Move to a less crowded, usually non-network or BBS frequency to conduct local exchanges.

Beacons:

Beacon usage can be used in good and bad ways. Typically, if you *have* to beacon, set your beacon for longer than 10 minutes. Remember that your beacon uses the UNPROTO setting to determine its path. Unless you have a *very* good reason to beacon through digipeaters, don't do it.

Digipeating:

Digipeaters were originally implemented to take up the slack for nonexistent networks at the time AX.25 was originally defined. Digipeating has been proven to be one of the worst methods of packet connections, but when it is the only one available it is better than nothing. When you can use a network over a digipeater, do so.

Network utilization and DX BBSing:

The thing to remember when using networks is that what you do at the far end now affects operators that you can no longer hear, who are many network hops away. A good rule of thumb about using networks is to ask someone who already uses the network about what you are doing, or experiment when you know channel access is low, so that you will not affect very many people.

DX BBSing is the most seen example of this problem, since BBSs are well established, stay on the same frequency, and operate 24 hours a day. Don't access a BBS a hundred miles away, when you have a local one to use. What is on your LOCAL BBS will be the same on a distant BBS, with the exception it might take a day longer to get to your system. Mailbox/BBS systems are designed to be used locally by users and pass messages and traffic during low channel usage times. Allowing Mailbox/BBS systems to do their jobs, by not circumventing them using a network, allows better utilization of the packet channels.

Proper operation of Data Carrier Detect (DCD) is imperative for efficient sharing of a packet channel. Many TNCs don't provide optimum DCD operation, and version 2.0 of the AX.25 Level 2 protocol compounds the problem. Over time, it has become apparent that most modems lack the proper DCD operation. Some work well, some are worse than others, some allow improper operator adjustment, and some have the "threshold" adjustment set incorrectly. With the release of TNC-2 code 1.1.6 and later, packets that are received without the DCD being active are not passed to the user. This encourages the operator to properly set any DCD threshold control that may be on their TNC. If the DCD decision could be made on the basis of "information coherence" rather than "is there some sort of signal or noise present?," LAN operation would improve. The TAPR DCD kit allows for true DCD operations with the squelch open on most major TNCs, thus helping overall channel efficiency. This premise has been demonstrated in a number of locations where modifications to TNCs have been made. The TAPR DCD kits were designed to make it a trivial matter to upgrade most TNCs to improved DCD operation with the addition of a simple board. These mods are extremely useful for both VHF and HF operation, since channel access is improved for all those operating.

The Elmer solution:

Amateur radio operators have had ELMERs around for all times, it seems. A packet Elmer is one of the best ways to get on packet with the least amount of problem and pain. Packet Elmers are people who have been on packet and know how to get around the local packet frequencies and networks. The easy part of packet radio is connecting the TNC to your radio. The hard part is actually using packet to accomplish something besides seeing screen after screen of stuff you don't understand. An Elmer can show you some very quick and productive ways to start enjoying packet right away.

References for this series:

Finke, C. R. (Ed.) (1992, February 15). *TPRS Quarterly Report*. Texas

Packet Radio Society, Inc.

Jones, G. (Ed.) (1993). *Packet Radio General Information*. Tucson Amateur Packet Radio Corp.

Jones, G., G. Knezek, M. Hata. (1992). *Packet Radio Prospects for Educational Data Communications. Proceedings of the Ninth International Conference on Technology in Education*, 1, 218-219. Paris, France.

Lucas, Larry, Greg Jones, David Moore. (1992) *An Educator's Alternative to Costly Telecommunications*. Texas Center for Educational Technology, University of North Texas.

Steve Watt, KD6GGD, steve@wattres.SJ.CA.US. (1993). Frequently Asked Questions from the listing in the rec.radio.amateur.packet news-group for the USENET network. Version 1.11.

This article is provided by TAPR, the Tucson Amateur Packet Radio Corp., an international organization that started the packet revolution in the early '80s. TAPR continues today to work as a membership organization that focuses on new technology, standards, and publications. TAPR is the place to get connected on a national and regional basis. For more information contact TAPR, 8987-309 E. Tanque Verde Rd #337, Tucson, AZ 85749-9399; 817/383-0000. **WR**

The 2-Meter burglars strike again

ROBERT PESCHKA, K7QXG

Have you ever had your radio ripped off? Did you get it back? No? Well maybe this brief article will explain why. Several years ago, I was directing the undercover operations of a special detective team in a major city here in the Pacific Northwest. One of our investigations led us to a gang of burglars that used the latest in electronic technology to stay one step ahead of the police. They made a practice of stealing Amateur Radio equipment and then using it for communications whenever they made their weekend "raids" on the community. I don't have the space available to tell the entire story, which was one of the most exciting of my 30-year career, so we will pick it up at the very end.

One of our undercover detectives had managed to penetrate the gang and learned that they had a spectacular burglary planned for a Sunday evening in the West Hills of the city. This was a residential area of the very wealthy and affluent citizens. They arrived at the targeted home on schedule...driving a large U-Haul truck which they drove right up to the front door. To get there they drove over the beautiful lawn and through a bed of gorgeous roses. As they began to remove everything from the house and placed it in the truck, the detective team, assisted by several uniformed officers, swept in from all sides and arrested the burglars.

Back at detective division headquarters the gang leader..."Burglar Jim"...was interviewed. He was a rather bright individual who had ripped off many amateurs in the metro area. He and his gang would then use the two Meter equipment for their communications.

Burglar Jim admitted that he had a few more of the radios at his apartment in the southeast part of the city. Our detective team quickly obtained search warrants and searched Burglar Jim's home. We recovered more than $125,000 worth of stolen property, including numerous 2 Meter handhelds (working and not working), some 440 equipment, HF equipment, and lots of computer items and other electronic goodies. Burglar Jim had even furnished his apartment with stolen property, including the couch, table and chairs, refrigerator, TV, and stereo.

The arrests and recovery of stolen property received great press coverage and for a few days we were walking on cloud nine. Then news began to trickle in that tempered our high spirits. It seems we could not trace the Amateur Radio equipment to its owners! Even computer searches of reported thefts were to no avail. Only one amateur was made happy by our efforts. So what happened to all the equipment? The city held the property for a legal period of time, while a sincere effort was made to find the owners, and it was then sold at city auction - a common practice in many cities. The radios were sold for pennies on the dollar...and I do mean pennies! I was not allowed to bid on the radios because I was a city employee, and I could only stand by and weep as the bidding went on.

Ordinarily a detective might not appreciate the loss, but I was an amateur (K7QXG), and it hurt to see someone's treasured investment being sold for peanuts. I then thought about my own equipment. It turned out that I was just as guilty as everyone else! Not a single item in my station was engraved with my driver's license number or other identifying information. I can assure you that I have since remedied that.

One last thought: It is of no value to engrave your Social Security number on your equipment because the police are not allowed access to Social Security information (privacy laws, you know!)

Burglar Jim received a lengthy sentence in the state penitentiary. He has since been paroled. Twice.

Editor's Note: The author has since retired and lives in quiet anonymity in Aloha, Oregon where he is frequently found on 10 Meters. **WR**

Double the pleasure

DIANE BAKER, KQ4VA

Donna Bentley, KG8HE, of Lake Worth Florida, traveled from testing session to testing session all over the State of Florida to try to pass her 20 wpm code for the Extra class license. She was close-agonizingly close—but no cigar. Her husband Jack, AA8NS, already an Extra, engineered these 'mini-vacation' weekends to encourage her to give her the chance to retest. But the weekend she struck gold, she did it in her own backyard and the amount of gold she struck was another story!

During the West Palm Beach hamfest at the end of October, she tested on Saturday and failed, but just barely. Determined, she tested again on Sunday. Finally success!! She passed and her struggle was finally over. But her day wasn't!

Later that day, Donna was anxiously awaiting the drawing of the hamfest prizes. They decided to draw the grand prize first — an ICOM-728 HF rig with a PS-55 power supply. Donna almost leaped over a vendor table when they announced that she had the winning ticket.

Congratulations to Donna, KG8HE/AE, and Jack Bentley, AA8NS for the hard work and persistence. How will it be to have two extras in one family, married to each other? Well, at least each one has a rig, for twice the contacts and twice the fun. **WR**

MFJ ACCESSORIES

Compact Speaker/Mics

Here's a **Compact** *Speaker/Mic that fits comfortably in your hand and has a* **full** *size speaker for crystal clear audio.*

No need to remove your handheld from your belt to talk or monitor calls. Clip it near your ears so you can easily hear every call with the volume turned down.

First-rate electret mic element and full size speaker gives superb audio on transmit *and* recieve. Earphone jack, PTT, lightweight retractable cord. Gray. 1¼x2x3 in.

MFJ-284 fits Icom and Yaesu.
MFJ-286 fits Kenwood.

MFJ-284 or MFJ-286
$24.95

Mini Speaker/Mics

These tiny MFJ Speaker/Mics are so small and so lightweight you'll forget they're there -- until you get a call.

Excellent audio from electret mic element and speaker. Has swiveling lapel /pocket clip, PTT button with transmit LED, earphone jack, lightweight retractable cord. Available with L or regular connector. *Tiny* 2x1¼x¼ in.

Order MFJ-285/MFJ-285L for ICOM, Yaesu, Alinco; **MFJ-287/MFJ- 287L** for Kenwood; **MFJ-283** for split plug Alinco; **MFJ-285W** for IC-W2A.

MFJ-283, MFJ-285, MFJ-285L, MFJ-285W, MFJ-287 or MFJ-287L
$24.95

L Connector also available - order L model.

MFJ Artificial RF Ground

MFJ-931
$79.95

Creates artifical RF ground that eliminates or reduces RF hot spots, RF feedback, TVI/RFI, weak signals caused by poor RF grounding.

Greatly improves your signal if you're using a random wire or longwire antenna with an ineffective ground.

Electrically places a far away RF ground directly at your rig by tuning out reactance of connecting wire.

20 Meter CW Transceiver

MFJ-9020
$179.95

Throw this *tiny* MFJ 20 Meter CW Transceiver in a corner of your briefcase and enjoy DXing and ragchewing wherever you go. You get a high performance superhet receiver, crystal filter, RIT, AGC, vernier tuning, sidetone, speaker, up to 5 watts output, semi/full break-in, much more. *Free* manual. See *free* MFJ catalog for 40, 30, 17, 15 Meter versions, keyer, audio filter, power pack, tuner, antennas.

Super *Active* Antenna

**``World Radio TV Handbook''** says MFJ-1024 is a ``first rate easy-to- operate active antenna...quiet...excellent dynamic range...good gain... low noise...broad frequency coverage... excellent choice."

Mount it outdoors away from electrical noise for maximum signal, minimum noise. Covers 50 KHz - 30 MHz.

Receives strong, clear signals from all over the world. 20 dB attenuator, gain control, ON LED. Switch two receivers and aux. or active antenna. 6x3x5 in. Remote has 54 inch whip, 50 ft. coax. 3x2x4 in. 12 VDC or 110 VAC with MFJ-1312, $12.95.

$129.95 MFJ-1024

Cross-Needle SWR Meter

MFJ-815B
$69.95

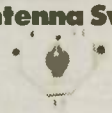
Peak/ average Cross-Needle SWR/ Wattmeter. Shows SWR, forward/ reflected power in 2000/500 & 200/50 watt ranges. 1.8-60 MHz.

Mechanical zero. SO-239 connectors. Lamp uses 12 VDC or 110 VAC with MFJ-1312, $12.95.

"Teflon® is a registered trademark of Dupont"

MFJ Coax Antenna Switches

$34.95 MFJ-1701



$21.95 MFJ-1702B

$59.95 MFJ-1704

Select any of several antennas from your operating desk with these MFJ Coax Switches. They feature mounting holes and automatic grounding of unused terminals. One year *unconditional* guarantee.

MFJ-1701, $34.95. 6 position antenna switch. SO-239 connectors. 50-75 ohm loads. 2 KW PEP, 1 KW CW. 10x3x1½ in. DC-60 MHz.

MFJ-1702B, $21.95. 2 positions plus new Center Ground. 2.5 KW PEP, 1 KW CW. Insertion loss below .2 dB. 50 dB isolation at 450 MHz. 50 ohm. 3x2x2 in. *MFJ-1702BN, $31.95, N connectors, DC-1.1 GHz.*

MFJ-1704, $59.95. 4 position cavity switch with lightning/surge protection. Center ground. 2.5 KW PEP, 1 KW CW. 50 dB isolation at 500 MHz. 50 ohm. 6¼x4¼x1¼ in. *MFJ-1704N, $69.95, N connectors.*

Dry Dummy Loads for HF/VHF/UHF

$29.95 MFJ-260B **$59.95** MFJ-264

MFJ has a full line of dummy loads to suit your needs. Use for tuning to reduce needless (and illegal) QRM and save your finals.

MFJ-260B, $29.95. VHF/ HF. Air cooled, non-inductive 50 ohm resistor. SO-239 connector. 300 Watts for 30 seconds, derating curve. SWR less than 1.3:1 to 30 MHz, 1.5:1 to 150 MHz. 2½x2½x7 in. *MFJ-260BN, $34.95, N connectors.*

MFJ-264, $59.95. Versatile UHF/VHF/HF 1.5 KW load. Low SWR to 650 MHz, usable to 750 MHz. 100 watts/10 minutes, 1500 watts/10 seconds. SWR is 1.1:1 to 30 MHz, below 1.3:1 to 650 MHz. 3x3x7 in. *MFJ-264N, $69.95, N connector. MFJ-5803, $4.95, 3 ft. coax/ PL-259.*

MFJ Low Pass Filter

MFJ-704
$39.95

Suppress TVI, RFI, telephone and other interference by reducing unwanted harmonics going to your antenna. 9 poles, MFJ's exclusive *Teflon® Dielectric Technology™* capacitors, hi-Q inductors, ground plane shielding, RF tight cabinet gives excellent TVI/ RFI protection. Full legal power 1.8-30 MHz. Mounting tabs.

Full Color FAX

MFJ-1214PC
$149.95

Use your computer and transceiver to receive, display and transmit *brilliant full color* news photos and incredible WeFAX weather maps with all 16 gray levels. Also receive/transmit RTTY, ASCII and CW.

Animate weather maps. Display 10 global pictures simultaneously. Zoom any part of picture or map. Manager lists over 900 FAX stations. Automatic picture capture and save.

MFJ Iambic Paddles

MFJ-564
$49.95

MFJ Deluxe Iambic Paddles feature a full range of adjustments in tension and contact spacing, self-adjusting nylon and steel needle bearings, contact points that almost never need cleaning, precision machined frame and non-skid feet on heavy chrome base. For all electronic CW keyers.

MFJ/Bencher Keyer

MFJ-422B
$134.95

The best of all CW worlds --a deluxe MFJ Keyer using a Curtis 8044ABM chip in a compact package that fits right on the Bencher iambic paddle!

Iambic keying, speed (8-50 wpm), weight, tone, volume controls. Automatic keyer or semi-automatic ("bug")/tune mode. RF proof. 4⅛x2⅝x5½ in.

MFJ-422BX, $79.95, keyer only for mounting on your Bencher paddle.

12/24 Hour LCD Clocks

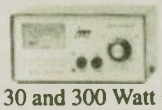
$19.95 MFJ-108B

$24.95 MFJ-112

MFJ-108B dual clock has separate UTC and local time displays. Huge 5/8 inch LCD digits are easy-to -see. Brushed aluminum frame.

MFJ-112 shows hour/minute/ second, day, month, date, year at any QTH on *world map*. 12 or 24 hour display. Daylight saving time feature.

VHF SWR/Wattmeter



MFJ-812B
$29.95

Covers 2 Meters and 220 MHz. 30 and 300 Watt scales. Relative field strength 1-250 MHz, SWR above 14 MHz. 4½x2¼x3 in.

Code Practice Oscillator

MFJ-557
$24.95

MFJ-557 Deluxe Code Practice Oscillator has a Morse key and oscillator unit mounted together on a heavy steel base so it stays put on your table. Portable. 9-volt battery or 110 VAC with MFJ-1305, $12.95.

Earphone jack for private practice, tone and volume controls for a wide range of sound. Speaker. Adjustable key. Can be hooked to transmitter. Sturdy. 8½x2¼x3¾ in.

MFJ Multiple DC Outlet

MFJ-1118
$64.95

Use your rig's 12 VDC power supply to power two HF/VHF rigs and six or more accessories with this MFJ *high current* multiple DC outlet.

2 pairs of 30 amp 5-way binding posts separately fused for rigs. 6 switched, fused pairs for accessories. DC voltmeter, "on" LED, RF bypassed, 6 ft. of 8 guage power cable. See *free* MFJ catalog for more DC outlets.

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

Nearest Dealer/Orders: 800-647-1800
Technical Help: 800-647-TECH (8324
• 1 year *unconditional* guarantee • 30 day money bac guarantee (less s/h) on orders from MFJ • Free catalo

MFJ ENTERPRISES, INC
Box 494, Miss. State, MS 39762
(601) 323-5869; 8-4:30 CST, Mon-Fr
FAX: (601)323-6551; Add $6 s/h

MFJ . . . making quality affordabl

MFJ HF/VHF SWR Analyzer™

. . . Read your antenna SWR from 1.8 to 170 MHz . . . built-in 10 digit LCD frequency counter . . . RF Resistance Meter™ . . . smooth vernier tuning . . .

MFJ-259 **$219.95**

MFJ-259 handheld *Univeral SWR Analyzer*™ lets you read your antenna SWR from 1.8 to 170 MHz quickly and easily without any other equipment!

MFJ's exclusive *RF Resistance Meter*™ lets you measure RF resistance up to 500 ohms at minimum SWR.

Has built-in 10 digit LCD frequency counter and smooth vernier tuning.

You get *four* instruments in one . . . 10-digit frequency counter . . . RF signal generator . . . *SWR Analyzer*™ . . . *RF Resistance Meter*™

Measure antenna resonant frequencies and 2:1 SWR bandwidths. Adjust mobile antennas, antenna tuners and matching networks in seconds.

Measure RF resistance, inductance, capacitance, resonant frequency of tuned circuits, transmission line velocity factor/ impedance/ loss. Test RF chokes, baluns.

MFJ-209, $109.95, same as MFJ-259 less frequency counter and *RF Resistance Meter*™.

See *free* MFJ catalog for complete line of *MFJ SWR Analyzers*™

MFJ-949E 300 W Tuner

MFJ-949E **$139.95**

World's most popular antenna tuner covers 1.8-30 MHz, has lighted *peak/ average* Cross-Needle SWR/ wattmeter, 4:1 balun for balanced lines and *full size* 300 watt dummy load.

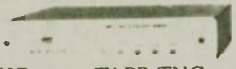
Versatile 8 position antenna switch lets you *pre-tune* MFJ-949E into dummy load to minimize QRM.

Custom inductor switch was carefully engineered to withstand extreme voltages and currents.

Cabinet has *tough* vinyl coating and molecular bonding -- not paint.

VHF/HF Packet TNCs

MFJ-1270B **$119.95**



MFJ-1270B *super* TAPR TNC clone has a world wide reputation as *the most reliable packet TNC in the world* -- many work 24 hours a day for years without a single failure!

Fully TAPR TNC-2 compatible, VHF *and* HF operation, *free* AC power supply, new *enchanced* mailbox expandable to 512K with auto/reverse mail forwarding, WeFAX mode lets you print weather maps, optional plug-in 2400/9600 baud modems, KISS interface, MFJ Host mode.

MFJ TNC/Mic Switch

MFJ-1272B **$34.95**

Switch between your TNC or microphone by pushing a button!

Just plug pre-wired cables into your rig's mic connector and TNC.

Plug-in jumpers let you use nearly any rig with 8 pin mic connector.

MFJ-1272B, $34.95 /MFJ/TAPR TNC2 clones; **MFJ-1272BX**/PK-232; **MFJ-1272BYV**/KAM VHF/KPC3; **MFJ-1272BYH**/KAM HF Port; **MFJ-1272BZ**/PK-88, $39.95 each. *For 8 pin RJ45 modular phone jack replace B with M in model number above.*

Regenerative RCVR Kit

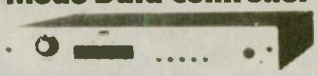
MFJ-8100K **$59.95** *kit*
MFJ 8100W **$79.95** *wired*

Build this *regenerative* shortwave receiver *kit* and listen to shortwave signals from all over the world with just a 10 foot wire antenna.

Has RF stage, vernier reduction drive, smooth regeneration, five bands.

MFJ-1278B Multi-Mode Data Controller

MFJ-1278B **$299.95**



Use this MFJ-1278B, your transceiver and computer to transmit and receive digital communications! You'll discover a whole new world of ham radio and communicate in ways you never knew existed on our ham bands.

The *world class* MFJ-1278B Multi-Mode and MultiCom™ software is packed with features *no other* multi-mode gives you.

You get *10 digital modes* . . . Packet, AMTOR, PACTOR (at no extra cost), RTTY, ASCII, Navtex, Color SSTV, 16 Gray Level FAX, CW and Memory Keyer plus an *enchanced* 32K Mailbox.

You'll have fun joining worldwide *packet* networks and exchanging *color SSTV* pictures with your buddies around the world. You'll marvel at *full color FAX* news photos as they come to life on your screen. You'll see weather changes on highy 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 receiving packet mail in an *enchanced 32K mailbox*. Want to copy some *CW*? Just watch your screen.

MFJ-1289, $59.95, MultiCom™ software and cables.

MFJ halfwave vertical Antenna

6 bands: 40, 20, 15, 10, 6, 2 Meters . . . No radials or ground needed!

MFJ-1796 **$199.95**

Operate 6 bands -- 40, 20, 15, 10, 6 and 2 Meters --with this MFJ-1796 *ground independent* halfwave vertical antenna! No radials or ground ever needed!

It's only 12 feet high and has a *tiny* 24 inch footprint! You can mount it anywhere from ground level to the top of a tower -- on apartments, condos, small lots, even on motorhomes. Perfect for vacations, field day, DX- pedition, camping.

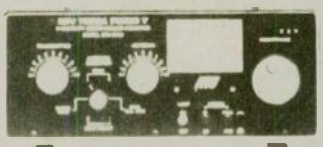
Frequency selection is fully automatic -- all you do is transmit. Its *low angle of radiation* really reaches out and brings in DX. Omni-directional. 1500 watts PEP.

Efficient *end loading*, no lossy traps. *Entire length* is always radiating. *Full size* halfwave on 2 and 6 Meters. High power *air-wound* choke balun eliminates feedline radiation. Adjusting one band has minimum effect on other bands. Add $20 s/h.

Easy to assemble -- you'll have it on the air in an afternoon.

MFJ's world famous 3 KW Versa Tuner V

MFJ-989C **$349.95**



Here's why the MFJ-989C is the finest 3 KW antenna tuner money can buy . . .

Two *massive* 250 pf transmitting variable capacitors can handle *amps* of RF current and *6000* RF volts. Logging scales.

Precision ball bearing roller inductor, three digit turns counter and spinner knob give you exact inductance control for minimum SWR.

Lighted *peak*/average Cross-Needle SWR/Wattmeter has 200/2000 watt ranges. Super heavy duty *current* balun has two giant 2½ inch powder iron toroid cores wound with *Teflon*® wire.

Six position *ceramic* antenna switch has extra large contacts. Flip stand, dummy load, one year *unconditional* guarantee, aluminum cabinet, tough *baked-on* paint, locking compound on nuts/bolts, handles 3 KW PEP, 10¼x4½x15 in. Meter lamp needs 12 volts. Add $13 s/h.

MFJ *No Matter What*™ Guarantee

MFJ's famous one year *No Matter What*™ *unconditional* guarantee means we will repair or replace (at our option) your MFJ product sold in this ad *no matter what* for a full year.

Super Hi-Q Loop Antenna

MFJ-1786 **$299.95**

Tiny 36 inch diameter high efficiency loop antenna covers 10-30 MHz *continuously* with low SWR. Handles 150 watts.

Ideal for home installations where space is limited-- apartments, condos, small lots. Take on trips.

All welded construction.

Remote control has *Automatic Band Selection*™, Cross-Needle SWR/ Wattmeter. No control cable needed. Use batteries or 110 VAC. Add$20 s/h.

No ground or tuner needed.

MFJ-1782, $269.95, like MFJ-1786 but remote control has only slow/fast tune buttons.

Dual Band Mobile Ant.

Mobile Antenna for 144/440 MHz

MFJ-1724B **$14.95**

MFJ *dual band* magnet mount mobile antenna for 144/440 MHz has 19 inch stainless steel radiator, low SWR. For mobile rigs with SO-239 UHF connector *and* handie-talkies with *included* BNC adapter.

5/8 Wave Mobile Ant.

MFJ-1728/B **$24.95**

Maximum Gain™ 5/8 Wave 2 Meter *magnet mount* mobile antenna has stainless steel radiator, 12 ft coax, low SWR. UHF mobile (MFJ-1728) or BNC handie-talkie (MFJ-1728B) connector.

5/8 Wave Ground Plane

$19.95 gets you a 2 Meter 5/8 wave ground plane *home station* antenna! You get the highest gain of any single element antenna, shunt fed matching, ceramic insulators. **MFJ-1752, $19.95**, for 220 MHz.

Free MFJ Catalog

Write or call. . . 800-647-1800

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 $6 s/h**

MFJ . . . making quality affordable

SPECIAL EVENTS

WAVE space shuttle flight simulation

Webber Aerospace Ventures in Education will operate NØBIB, 1500Z 2 Feb, to 3 Feb, 0500Z during space shuttle flight simulation from Webber Junior High School. ATV and phone operations on 10M Novice and lower portions of 15, 20, and 40 General subbands. For QSL certificate, send SASE to: WAVE, 4201 Seneca, Fort Collins, CO 80526.

Classic Radio Exchange

5-6 February, 1900 UTC to 0400 UTC. The Classic Radio Exchange, "CX" is a celebration of the older commercial and homebrew equipment that was the pride of our ham shacks a few decades ago. Object is to restore, operate, and enjoy older equipment with like-minded hams. A classic radio is at least ten years old, an advantage but NOT required to operate CX. You can use anything, although new gear is a distinct scoring liability and not as much fun!

Exchange your name, RST, QTH, receiver and transmitter type (homebrew send final amp tube or transistor) and other interesting conversation. The same station may be worked with different equipment combinations on each band and each mode. CW call "CQ CX," phone call "CQ Classic Call." Non-participants may be worked for credit.

Frequencies

CW up 60 kHz from low band edges; phone 3.880, 7.290, 14.280, 21.380, 28.320 and/or AM frequencies; Novice/Tech 20- kHz up low land edges. 7.060 and 3.560 CW tend to be the most popular CX frequencies.

Scoring

Multiply total QSOs (all bands and modes) by the following sum: (total number of different receivers and transmitters worked on each band and mode plus the total numbers of states/provinces/countries worked on each band and mode). Multiply that total by your Classic Multiplier: the total years old of all receives and transmitters used, three QSOs minimum per unit to qualify. If equipment is a transceiver, multiply age by two. If homebrew, count as 25 years old unless actual construction date or design is older.

Certificates are awarded every now and then for the highest score, exotic equipment, the best excuse, and other unusual achievements. Send logs, comments, anecdotes, pictures to: Jim Hanlon, W8KGI/5, P.O. Box 581, Sandia Park, NM 87047 or Marty Reynolds, AA4RM, P. O. Box 13354, Atlanta, GA 30324. Include SASE for next *CX Newsletter*.

G. Washington's birthday

The Mount Vernon Amateur Radio Club will operate Special Events Station N4BV from 1600Z - 2000Z 18 and 19 February to commemorate George Washington's birthday. The station will be located on Washington's Mount Vernon estate.

Frequencies

The lower General 80M - 15M phone and CW subbands, Novice 10M phone subband and 2M packet @ WA3TAI.MD.USA.NOAM. For a handsome commemorative certificate, send QSL and 9 x 12 SASE to: Steve Schneider, WB4EEA, 8602 Cushman Place, Alexandria, VA 22308.

Silent Key

Stanley Black, KF7BT

It is my sad duty to anounce to you the passing of Stanley Black, KF7BT, of Glendale, Arizona on December 3, 1994 at the age of 63. Stan was a very active NCS of the California-Hawaii net. He was a retired electrical engineer. He died of a massive heart attack and was found by his friends early Friday morning after not reporting into the net.

He was a great computer hobbyist and was active in the local weather watch net. He gave the California-Hawaii group the weather and propagation forecast every morning. He will be sorely missed by all on the net.—*submitted by Arnold Samuels, KH6COY*

OFF THE AIR

More for less

When I was a youngster, I was told by my parents that to attain anything of value you usually have to work for it. Maybe it's the instant gratification era in which we live that makes people believe that full amateur privileges should be awarded to them just because anything else would cause them to do a little work and they might actually fail on their first attempt.

The Amateur Radio Industry Association is proposing that the code speed requirement for a General Class license be reduced from the present 13 WPM to 10 WPM. A recent poll by *Newsline* on one of the national online services said respondents favor an even greater reduction to 5 WPM. It sort of reminds me of a major pizza chain and their commercial where they are polling different groups and asking if they would like more toppings or cheese on their pizza for the same price. Everybody wants more for less.

First of all, it should be understood that I was a proponent of the no-code Tech license which made it easier for people to enter the hobby. I do not however, think it necessarily follows that requirements for the remaining license classes should be reduced.

The best possible way to increase your expertise with the code is to use it on the air. I was first licensed in 1961 at age 14. At that time the Novice license expired in a year and was not renewable. I operated 80, 40 and 15 Meters after school and weekends building my speed by contacting other Novices and the many general class licensees that frequented the Novice portion of the bands. Within six months I took the General Class code test and luckily passed it on the first attempt. Back then you had to have one minute of solid copy to pass. And no, I'm not saying that because I did it everyone should. Today you pass by simply comprehending and in some cases answering a multiple choice (guess?) exam which should automatically make it easier to upgrade.

I also feel that many of the newcomers believe there are but two facets to the hobby, HF single sideband and VHF FM. Most seem unaware that it is possible to work all states, continents, and in fact earn a DXCC award on VHF? Hundreds of 6 Meter enthusiasts have. It doesn't take a kilowatt and a huge antenna either. TVI was once a major problem, especially in areas which have channel 2, but cable television has all but eliminated it from the areas it serves. We are approaching the low point in the sun spot cycle and intercontinental openings are becoming rare, but there is still plenty of auroral and E skip openings and lots of fun to be had. The same goes for 2 Meters, 222 and 432MHz to a lesser degree. Most of the operation is on SSB and CW on the low end of each band. This is available to Tech licensees right now! No need to upgrade. There is more to VHF/UHF operation than FM and repeaters. Gordon West has mentioned this in his column on several occasions. Used multimode radios are inexpensive, antennas are relatively small and can be home brewed or purchased commercially. Why not break some new ground and try VHF/UHF weak signal operation. I think you'll be surprised.

ALLEN JONES, K9DZE
Sacramento, California

Best bets

Here are my considerations for the best in Amateur Radio. Obviously the list is highly subjective and personal. Somehow I have been fortunate to meet many helpful people in my travels through Amateur Radio and I think they deserve a larger audience.

Best HF rig: TenTec Scout/Argo - I can use all the features in a practical sense. They are enjoyable and relatively reasonable. The technicians at TenTec have been patient and helpful with my queries and minor power supply problem (not their fault!) When I decide to spend mega-bucks on this hobby, TenTec will get my business.

Best vertical antenna: Butternut HF 6V. Decent performance (from a vertical) from a company with no hype, just good technical advice. Honesty. When my vertical fell victim to high winds, Butternut shipped replacement parts pronto. Who said American quality and service was dead? Not at Butternut.

Best kit-building support: Oak Hills Research. Patient technical support by telephone for that rare kit that "didn't work out" due to user error! All the kits I have built from OHR have been excellent in every respect.

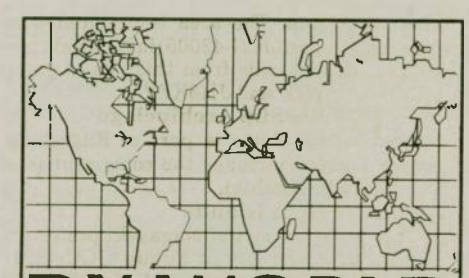
Best place for inclement weather: Dayton Hamvention. You can bet money on it!

Best antenna advice: Kurt N. Sterba.

Best Amateur Radio magazine: ***Worldradio***. Even and balanced in the coverage of Amateur Radio events and variety of operating interests. It's so good I even read the traffic handling column! Editorials are always on target. If you can only afford one periodical, this is the one.

Best operating mode: CW, of course, preferably QRP. End of discussion.

ROBERT M. SCHNICK, KA3YJG
Erie, Pennsylvania



DX WORLD

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

W-100-N

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

482. YB8DOK T.H. Junaedi
(All 15M SSB) 18 November 94

Malawi (7Q7)

A few calls have been reported from Malawi during this past reporting period. 7Q7SB has been reported on at least four bands. Look for this one on 20M between 14.182 and 14.192 MHz from 0015 UTC, on 17M near 18.125 MHz at 1600 UTC, on 12M on 24.940 MHz at 1300 UTC, and 10M between 28.465 and 28.485 MHz from 0900 to 1200 UTC. Other calls reported include:

7Q7JL	21.295 MHz	1800 UTC
7Q7LA	28.005 MHz	1400 UTC
7Q7RM	28.025 MHz	1700 UTC
7Q7ZZ	28.524 MHz	1100 UTC

Tonga (A35)

Not much to report on activity from the Kingdom of Tonga. That A35SS operation that came on at the end of October was Steve Salmon, AA6LF, operating from Minerva Reef. This brought back a bit of nostalgia for the aging DXer, as this one was once a DXCC country, and was deleted over 22 years ago. Steve was plagued with the reef going under water for a few hours at high tide.

A35CT was reported on October 22nd on 24.940 MHz at 2130 UTC and 28.510 MHz at 2330 UTC. No other activity has been reported from this one.

A35ZB has been on working mostly Europeans. Check this one near 7.072 MHz at 0500 UTC, 14.195 MHz at 0800 UTC, 18.125 to 18.145 MHz at 0900 UTC and 28.495 MHz at 0100 UTC.

QRZ DX reports that Paul Kidd, KK6H, should now be active, mostly on CW. Paul plans all bands 30 through 160M. His location will be Tongatapu Island (OC-049). He was supposed to have operated in the Worldwide DX Contest in November. However, we didn't hear him on.

South Korea (DS)

QRZ DX reports that South Korea has run out of calls with the HL prefix and will begin issuing calls with the DS prefix. A check with the ITU allocations shows DSA-DTZ as assigned to Republic of Korea. It wasn't that long ago that East Germany had used the DT prefix.

Reunion Island (FR)

We found at least four calls reported from Reunion Island for October and November. 10M might be a good band to check out as FR5DX was working DXers in Europe on 28.490 MHz around 1000 UTC on November 5th. FR5EL has also been found on this band between 28.500 and 28.546 MHz after 1100 UTC.

Check 15M for FR5BT near 21.030 MHz after 1400 UTC, FR5DX on 21.268 MHz around 1715 UTC, and FR5EL on 21.239 MHz at 1400 UTC. Other activity includes the following:

FR5DD	18.072 MHz	1415 UTC
FR5DN	7.007 MHz	1300 UTC
FR5DX	14.195 MHz	1400 UTC

Haiti (HH)

Three calls from Haiti were reported to the various DX newsletters. On 12M, HH2LQ has been found between 24.930 and 24.940 MHz after 1800 UTC.

10M appears to be popular with HH2LB the only band he has been reported on. Look for this one between 28.394 and 28.474 MHz from 1500 UTC.

For a 20M contact try HH2JR between 14.189 and 14.246 MHz after 2000 UTC and HH2LQ near 14.226 MHz around 1700 UTC. The latter station has been on 15M near 21.280 MHz at 1800 UTC.

Guinea-Bissau (J52)

According to the reports in DX News Sheet J52AK comes on 15M about once a month. He was reported in the 21.180 to 21.190 MHz range around 1200 UTC on October 17th and November 11th. QRZ DX reports that he is on 20M regularly. Try listening near 14.215 MHz after 2130 UTC.

Mongolia (JT)

We have a few calls from Mongolia to report this time. The reports included the following:

JT1BR	7.009 MHz	1500 UTC
JT1BS	7.002 MHz	2000 UTC
JT1BV	18.125 MHz	0800 UTC
JT1CO	14.015 MHz	0045 UTC
JT1CS	14.010 MHz	0015 UTC
JT7FAA	21.011 MHz	0800 UTC

Most of the above reports are from Europeans, included a couple of 75M reports of JT1BR on 3.799 MHz at 2000 UTC and JT7FAA on 3.799 MHz at 1600 UTC.

Jan Mayen (JX)

JX7DFA continues to be the present source for a contact with Jan Mayen. We have two reports of him working Europeans on October 18th; 3.520 MHz at 1700 UTC, and 14.345 MHz at 1800 UTC. The operator would be Per Einar Dahlen, LA7DFA. As for calls signing from Jan Mayen, as well as Svalbard, the calls are Norwegian calls replaced with the appropriate prefix.

Iceland (TF)

With winter now set in why not look for 160M activity? TF3DX and TF3GC have been reported on this band since the latter part of October. Listen between 1.830 to 1.833 MHz after your sunset. If the sun is high in the sky, don't bother.

TF3DX also operates 80M near 3.507 MHz. Try around 1130 UTC. And on 75M try TF3TF near 3.789 MHz after 2100 UTC.

Other band activity includes TF3DX near 7.003 MHz at 0800 UTC on October 19th and TF3GC on 14.030 MHz at 1815 UTC on October 29th.

Nicaragua (YN)

HT1T informs Bip Bachman, W6BIP, that Jose, YN1CC, became a Silent Key last March. Jose had been very active on CW for the last 15 years. His electronic shop maintained all the radios for the Managua Police Department. As HT1T will soon be leaving for his home in Sweden, there will be no active CW stations in Nicaragua. Note that this information was postmarked last July. It was received in November.

IOTA

We had a very nice selection of IOTA operations during the month of November, some of them brand new ones. From the pileups, we note expanding interest in this program. Heard on the bands were:

AS-023	Yoron Island	JA6HFY
EU-168	Flatey Islands	DL2SCQ/TF4
NA-037	Shemya Island	KL7FBI
NA-090	Cozumel Island	XF3/K7DBV
NA-153	Yucatan State XF3XE3RKK	
NA-200	Chinchorro Isl	XF3/XE3RKK
NA-201	Jardines de la Reina	CO9OTA
OC-061	Minerva Reef	A35SS
SA-072	Potros Island	PS8AM
SA-077	Santana Island	ZY1UP
SA-078	Fuerte Island	HK3JJH/1F

The SA-072 operation from Potros Island may be questionable as the IOTA Committee needs a map to see if it qualifies as an IOTA island.

Japanese Islands

The island nation of Japan is divided into many islands, resulting in several IOTA groups. Those of you beginning in the IOTA program might find several groups to your credit. Check those QSL cards from Japan.

Many of the rarer type IOTA island groups are activated by local IOTA chasers. One such helpful person is Yuki Deguchi, JI6KVR, who has been known to make telephone calls to some residents on the remote islands to come up and get on the frequencies. We have included some helpful information here in identifying those islands.

•AS-007 Honshu Island

This one includes the call areas JA1, JA2, JA3, JA4, JA7, JA9 and JA0. There are more amateurs on this island than any other island in the world. The island amateur radio population exceeds 800,000; this is more than the entire amateur population of the United States.

•AS-008 Izu Archipelago

This group of islands are off shore from Tokyo Bay and are included in Tokyo prefecture. Izu Archipelago is Oshima-gun (JCG-10004), and include such islands as To Shima, Nii Jima, Kozu Shima, Miyake Jima, and others. JH1RYN is reported to be resident on Nii Jima. JI1DUQ may also be there.

•AS-012 Amakusa Archipelago

Amakusa Shoto is Amakusa-gun (JCG-43003) and is part of Kumamoto prefecture. The cities of Hondo (JCC-4307) and Ushibuka (JCC-4309) are also located there. JN6WGF was reported to have been active there in March 1994 and the *Callbook* lists at least nine calls.

•AS-017 Okinawa Archipelago

Most of the calls in Okinawa prefecture are in this archipelago and would have the prefix or JR6 or JS6 in their calls. Okinawa was a DXCC country up through 14 May 1972. At that time the prefix was KR6 and KR8. The KR8 prefix was assigned to non-US personnel on the island. After that date Okinawa become a prefecture of Japan and the JR6 prefix was assigned to replace the US KR6 and KR8 prefixes. However, not all the JR6 calls are for calls from Okinawa. Other than two-letter suffixes, the suffixes should begin with an R, S, T, U, V, or a W. Three letter suffixes beginning with an X, Y, or Z are club stations and could be anywhere in the Japanese 6th call area. If you have a JR6 card from Okinawa prefecture (or a KR6 or KR8) most likely it is from that IOTA group.

•AS-023 Amami Archipelago

Amami Gunto is included in Kagoshima prefecture and includes several islands and the city of Naze (JCC-4608). Recent activity has included JO6HYO and JA6HFY on Yoron Island.

•AS-024

Yaeyama Islands Yaeyama Retto is Yaemama-gun (JCG-47005) in Okinawa prefecture and includes three major islands: Iriomote Jima; Ishigaki Shima, and Yonaguni Jima. The city of Ishigaki (JCC-4704) is located on Ishigaki Shima. We checked our 1991 *Callbook* and found at least 16 calls listed.

•AS-030 Kazan Islands

This group includes Iwo Jima and Volcano Island and is Ogasawara-gun (JCG-10007) in Tokyo prefecture. If you are active in the DXCC program this one counts as Minami Toroshjima. But, double check your cards as Marcus Island is in Oceania.

•AS-031 Ogasawara Archipelago

Also located in Ogasawara-gun as the Kazan group. Both groups will be identified with the JD1 prefix (other than US military calls). For DXCC purposes this one counts as Ogasawara and includes Bonin Island. Many years ago they both counted as Bonin and Volcano Islands (KA0 or KG6I) for DXCC purposes.

•AS-032 Osumi Archipelago

Osumi Shoto is in Kagoshime prefecture and includes Tanega and Taku islands. The city of Nishinoomote (JCC-4614) is located on Tanega Shima. The *Callbook* lists at least two calls in Nishinoomote: JH6VRW and JR6AXS. In November 1989 the special event call of 8J6JBS was active there.

•AS-036 Tsushima Archipelago

This group is almost in Korea and consists mainly of two islands, Kamino Shima and Shimino Shima. The area is designated as Shimoagata-gun (JCG-42005) in Nagasaki prefecture. Recent calls from this island group include JA6WIE and JH6KFY.

•AS-037 Koshiki Archipelago

Koshikijima Retto is part of Kagoshima prefecture and includes the communities of Sata and Simokoshiki.

•AS-040 Goto Islands

This group is part of Nagasaki prefecture and includes the city of Fukue (JCC-4206). JR6CSY is located there and his QSL card clearly indicates his IOTA reference number.

•AS-041 Oki Archipelago

Oki Archipelago is Oki-gun (JCG-32006). JF4KCK is a resident on this one QSLs.

•AS-043 Nampo Archipelago

Nampo Archipelago is Hachijo-gun (JCG-10006) with the main island being Hachijo. JI1GRU is active from there. Other calls reported from this one include JI1HUO, JL1LTW and JQ1SUO/1.

•AS-047 Daito Islands

The only activity from this one is mini-DXpeditions of the local JAs to satisfy the needs of the IOTA hunters. Such calls in the past have included JA3RKQ/6, JI6KVR/6 and JM6UJI/6.

•AS-049 Tokara Archipelago

Tokara Retto is at the southern end of the Ryukyu chain and another one that requires mini-DXpeditions.

•AS-052 Okino Torishima

Old-time DXers often refer to this one as Baldwin's Reef. This one is now a deleted DXCC country.

•AS-056 Danjo Archipelago

We don't have much information on this one. In March 1992 Yuki, JI6KVR, visited this one.

•AS-067 Uji Archipelago

The same applies for this one and requires mini DXpeditions.

•AS-076 Shikoku Island

If you have a JA5 card in your collection you have this one confirmed. There are approximately 60,000 amateurs on the island.

•AS-077 Kyushu Island

Most of the JA6 calls are located on Kyushu Island. If you have a QSL card from the

Japanese 6th call area, most likely the station is on this island. The amateur population exceeds 85,000, which includes Okinawa and the other islands in the call area.

•AS-078 Hokkaido Island

Hokkaido is the big island north of Honshu and represents the 8th call area of Japan. Some 49,000 amateurs reside on Hokkaido Island.

•AS-079 Miyako Islands

Miyako Retto is really part of Sakishima Shoto, which also includes Yaeyama Retto (AS-024). The IOTA committee divided this one a couple of years ago creating a new reference number for Miyako. Miyako-gun (JCG-47004) and includes at least four main islands: Irabu Jima; Miyako Jima; Minna Jima, and Tarama Jima. The city of Hirara (JCC-4703) is situated on Miyako Jima.

The *Callbook* lists at least five calls from this city and includes JR6YAF, JS6ASB, JS6BLS, JS6BLT, and JS6GNM.

•AS-117 Honshu Coastal Islands

This is a new IOTA group just established by the IOTA committee last year and includes all the coastal islands around the coast of Honshu. Stations on such islands, other than those in the 5th, 6th and 8th call areas may possibly count. Sado Island is one such island and is part of Niigata prefecture. The *Callbook* lists the calls of JAØHDH, JAØSX, JHØPEE and JRØIKG as residents on Sado Island. The city of Ryotsu (JCC-0819) is located there.

•AS-Senkaaru Archipelago

No reference number has been assigned to this island group as no operation as of this date has been documented.

Most wanted survey

The DX Magazine has released its 1994 Most Wanted Countries Survey, an annual survey among subscribers of the most needed countries. Each subscriber was asked to mark all the countries they need from a list of 100 countries taken from the DXCC list. I have listed the first 25 of this list.

Rank	DXCC Country	Prefix	%Need
1	Bhutan	A5	65.4
2	Andaman Islands	VU4	62.9
3	Libya	5A	61.2
4	Heard Island	VKØ	58.4
5	Yemen	7O	54.2
6	Tunisia	3V	49.4
7	Tromelin	FR/T	47.5
8	Burma	XZ	47.2
9	Laccadive Islands	VU7	47.1
10	Macquarie Island	VKØ	46.8
11	Kermadec Islands	ZL8	45.8
12	Mount Athos	SV/A	45.6
13	Glorioso Island	FR/G	43.5
14	Bouvet Island	3Y	42.4
15	Eritrea	E3	39.2
16	Campbell Islands	ZL9	38.2
17	Amsterdam Island	FT/Z	37.9
18	Laos	XW	36.4
19	South Georgia Is	VP8G	36.0
20	Juan de Nova Island	FR/J	35.8
21	Agalega Island	3B6	34.9
22	Marion Island	ZS8	34.9
23	Iran	EP	34.7
24	Crozet Island	FT/W	32.8
25	Conway Reef	3D2	32.4

DXCC Desk

The DXCC Desk has received documentation and has approved the following operations with the effective beginning dates:

3A/F1RWD	15 Jul 94	FJ/AA2SZ	20 Oct 94
3A/F1IXQ	15 Jul 94	FK/JA1CMS	05 Sep 89
3A/W5ZPA	29 Jul 94	FW/JA1CMS	21 Feb 91
3D2CA	01 Jan 94	HI3RW	09 May 94
3D2DJ	01 Aug 94	HSØZAZ	Jun 94
3D2DR	01 Jan 93	JT4/JA1CMS	01 Jul 92
3D2KA	01 Nov 92	KG4WP	31 Mar 94
3D2PC	10 May 94	LX/DL4FCH/P	28 Oct 94
3D2TT	19 Aug 94	OH/JH1AJT	31 Jul 94
3D2YH	10 May 94	PJ7/AHØG	09 May 94
3XY8A	18 May 94	R3/AA5NK	07 Apr 94
4U/F5LVR	11 May 94	S21AT	03 May 94
4U/F5LMG	11 May 94	S79DEQ	09 Apr 92
4X/VE2FTT	30 Oct 93	T9/PA3DZN	01 Oct 93
5B4/OK1CZ	09 Jun 94	TJ1TN	22 Oct 93
5V7DB	12 Sep 94	TY1IJ	24 Sep 93
7Q7CE	30 May 94	V26B	28 Oct 93
7Z5OO	11 Oct 94	V26Y	26 Sep 94
8Q7DR	01 Mar 94	V26Z	26 Sep 94
8Q7EA	18 Sep 94	V31VW	Ø6 Sep 94
8Q7EB	18 Sep 94	VK9MX	12 May 93
8Q7KA	02 Jan 93	VQ9TP	16 May 94
8Q7LX	01 Mar 94	XU3DWC	01 Aug 93
9G1BJ	24 Aug 94	YJØAAK	14 Jan 91
A6/F2JD	21 Jan 88	ZA/Z32KV	27 May 94
CN2VA	01 Aug 94	ZA/G3MHV	12 Sep 94
DU1KK	17 Oct 94	ZA/KA6ZYF	13 Sep 94
DU7/SMØCNS	28 Jun 94	ZF2LS	03 Oct 94
ET3BT	06 Oct 94	ZF2VS	11 Oct 93
ET3IJ	13 Sep 93	ZK1JKH	10 Aug 94

Recently there has been a large number of operations approved by the ARRL. Just because you worked DX and don't find the documentation listed does not mean that the operation is invalid. I wonder why, when some of those required documentation. I think it should only be necessary if the operation is in question and then the documentation shall be requested by the DXCC Desk.

At the end of October the number of unprocessed applications was 378 (a collection of some 48,640 QSL cards). During the month the DXCC Desk received 385 applications (39,546 QSLs) for endorsements and new awards.

Applications being sent out at the month's end were received less than a month earlier. Fifteen 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.

DXpeditioning Basics

DXpeditioning Basics, prepared by Wayne Mills, N7NG, has been published jointly by the American Radio Relay League and the International DX Association. Wayne, who has been licensed for over 40 years, is no newcomer to DXpeditions and has been on several of these adventures such as the 1985 FOØXX DXpedition to Clipperton Island.

The text contains nine major topics: Objectives, Organization, Who to Work, Pileup Management, QSO Mechanics, Frustration Management, Problems, Follow-up, and Ethics. Each topic is concluded with a summary.

DXpeditioning Basics is not written for your reading enjoyment, but rather as a guide for DXpedition operators. How many DXpeditions have you experienced turned into major frustration? True, these DXpedition operators all had good intentions. However, had they studied such a document as DXpeditioning Basics, perhaps much of the frustration would have been minimized.

This spiral-bound 8½ by 11 inch publication is a must for all those considering a DXpedition. I might suggest in future revisions of this work that pages be converted to newspaper-type columns. The pages are typed out in ordinary letter-style and reading from left to right on each page is tiring to the eyes. With word processor programs, this would be no problem.

DXpeditioning Basics is available from INDEXA, P.O. Box 607, Rock Hill, SC 29731 for $5.00 in US funds only. The price includes shipping via surface mail. Foreign orders requesting air mail delivery should add $5.00.

Nostalgia

Last month I discussed the updated LOGPlus! program. As the program has a feature of logging other calls I decided to enter the contacts I made when I was licensed as K2IKS back in 1954.

It was interesting to see what my thinking and interest was 40 years ago. In that I was introduced to Amateur Radio through the Army MARS program while stationed at Fort Dix, naturally much of my early interests was that of traffic handling. I had spent much time in the 75M traffic nets such as the Second Regional Phone Net, the Interstate Phone Net, and the Transcontinental Phone Net.

One of the problems of entering the log information is that I wished to convert the times to UTC. I had used local time "Q" time for Eastern Daylight Savings Time and "R" time for Eastern Standard Time. Of course, this "Q" and "R" business was a direct result of my military training.

Further down the log (that phrase was unheard of in those times) I came across a contact with my first European - a contact with I1TBU on 8 September 1955. I was on 15M AM running 65 watts with a Viking Ranger to a 75 Meter dipole. I was so happy that I immediately went straight to the post office and mailed a direct QSL card to

> 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
Mach, K6KAP, 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
Bill, K6YDQ, 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***

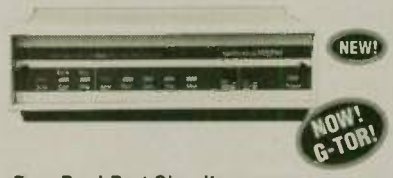
MA-550
55' Tubular Tower
Handles 10 sq. ft. at 50 mph
Pleases neighbors with
tubular streamlined look
REG. $1369 ***SALE $1069.95***

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

Shown with Optional Rotor Base

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!

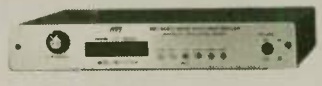
MFJ

MFJ-949 E

300 Watt Tuner

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!

conceptS
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***

Italy. I cannot remember if I sent IRCs or not. The reply QSL came a few months later when I was away at college.

I finally completed entering the log data from three logbooks, a total of 1385 contacts. Of these 1006 were AM, 260 on CW and 119 on SSB. The SSB contacts were made during the last two months of operating as K2IKS from Tenafly, New Jersey. For five years of operating - only 1385 contacts? That's right!

QSL Routes

3D2MW	-VK2BEX	J78CO	-DL7CO
3DAØZ	-ZS6EZ	J78FT	-DL7FT
3G1X	-CE1IDM	KØPP/C6A	-KØPP
3V8BB	-JF2EZA	KE7X/C6A	-KE7X
4U9U	-F2VX	KG4JO	-WI2T
5H3CC	-I1GMF	KH2/JK1ZHW	(See
5R8DP	-JA1OEM		Note1)
5V7GL	-EA5WX	L4D	-LU1EYV
5V7MD	-N7VEW	LRØN	-LU2NI
5W1MW	-VK2BEX	LTØM	-LU1MZE
5X1XT	-WF5T	LT1H	-LU8HSO
6D2X	-K5TSQ	LT7F	-LU7FJ
7Q7SB	-AB4IQ	LX/OH2PQ	-LX1TI
7Q7ZZ	-JA1UMN	LX4B	-LX1TI
7Z5OO	-W1AF	LX9SW	-AB7BB
8P9GD	-KU9C	N7RK/ZB2	-N7RK
8P9GE	-K2PF	NF6S/C6A	-NF6S
8R1K	-OH6DO	OA3/IK1EDC	-I1CAW
9G1JB	-G4XTA	OA5/IK1EDC	-I1ZL
9M6NA	-JE1JKL	OE2S	-OE2XEL
9N1WT	-OE7KWT	OH7X	-OH7AAC
9Q5BB	-EA4BB	OT4T	-ON4UN
A35MW	-VK2BEX	P29KH	-WD9DZV
A35RK	-KK6H	P29VGA	-W2HRX
A35ZB	-DJ4ZB	P4ØF	-KRØY
A61AF	-OH1NYP	P4ØW	-N2MM
BV/WB4IUX	WB4IUX	PPØF	-PP1CZ
BV4FH	-KA6SPQ	PQØMM	-PP5JR
C48A	-9A2AJ	S79CC	-JI1NJC
C6AGN	-KA1DIG	S79SS	-JN1NJC
C6AHB	-WA4WTG	S79TR	-JN1NJC
C6AHX	-WA4WTG	S79XE	-JN1NJC
CEØAJ	-JK2PKT	SO8IF/8	-SP8NR
CO9OTA	-CT1ZW	T32A	-JA5EXW
CR3U	-DL2HYH	T32BE	-WC5P
CR3X	-DL5EBE	T32BI	-KH6DFW
CT3FN	-HB9CRV	T32J	-JR5JAQ
D2XX	-PA3CXC	T32O	-JF4LNO
D68HS	-JA1ETQ	T32Q	-JR4QZH
D68TA	-JA1IDY	T32X	-JA4GXS
D68TK	-JA1ELY	TA2ZP	-JA2BDR
DL2SCQ/TF4	-DL6DK	TF4/SM6CAS	-G4WFZ
DL5XX/HC8	-DL5XX	TJ1JR	-N7VEW
EA8EA	-OH2MM	TK5EL	-DF4TD
ET3BN	-DL1JRC	TM5STR	-F6DNX
EY8MM	-DL8WN	TOØP	-F6BFH
FH/JL1UXH	-JL1UXH	UU5	-LZ3DB
FR5ZU/G	-VE2NW	V47NF	-WB8GEW
G4UOL	-GD4UOL	V47WZ	-WZ8D
HA15ØP	-HA5BWW	VEØUK	-VE1UK
HC8N	-AA5BT	VKØFPS	-VK3MA
HKØ/EA2KL	-EA2KL	VP2E/WR3Z	-WR3Z
II2T/3	-IK2IQR	VP2E/ND3A	-ND3A
IK/DL6PE/1PØX	-DL6PE	VP2EDK	-W1GAY
IK/DK8KW/1PØP	DK8KW	VP2EZA	-ND3A
IO9T	-IT9TQH	VP5VW	-W8TPS
J28BS	-F5PHW	VP9MZ	-WB2YQH
J37K	-W8KKF	VP9NC	-WB2YQH
J45T	-SV5BYV	VQ9TN	-K5TNP
J52AK	-IV3TIQ	VQ9ZX	-K7ZX
J54OFM	-I3LDP	VS6WO	-K9EC
J54UAB	-IK2JYJ	WJ2O/KP2	-WJ2O
J68ER	-W9UI	XF3/K7DBV	-K7DBV
J77J	-K1XM	XF3/XE3RKK	-KN6OU

DX Prediction — February 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.

WEST COAST

UTC	AFRI	ASIA	OCEA	EURO	SO AM
10	*(10)*	11	*14	*(8)*	*13
12	*(10)*	10	*13	*(8)*	*(13)*
14	*(15)*	10	13	*(12)*	24
16	*(20)*	10	*18	*(15)*	27
18	22	*(10)*	*(16)*	*(12)*	29
20	23	16	*(18)*	*(9)*	30
22	20	22	23	*(9)*	29
24	*(17)*	23	27	*(8)*	*26
2	*15	20	27	8	*20
4	*12	14	21	8	*17
6	*(11)*	12	18	9	*15
8	*(10)*	*11	16	*(9)*	*14

CENTRAL USA

UTC	AFRI	ASIA	OCEA	EURO	SO AM
8	*(13)*	8	*(14)*	*8	*14
10	*(12)*	8	13	*(8)*	*13
12	*(19)*	8	13	*(12)*	19
14	26	11	*19	17	*25
16	29	*(10)*	18	16	*27
18	*29	*(10)*	*(16)*	*(14)*	*29
20	24	*(16)*	*(19)*	*(10)*	*30
22	20	*(18)*	*24*	*(9)*	*29
24	*17	*(16)*	27	9	*23
2	*15	*(11)*	*(22)*	8	*20
4	*14	*(10)*	17	8	*17
6	*(13)*	*(9)*	*(15)*	8	*15

EAST COAST

UTC	AFRI	ASIA	OCEA	EURO	SO AM
7	*(12)*	*(8)*	*(13)*	*8	*14
9	*(12)*	8	*13	*(8)*	*13
11	24	8	12	12	18
13	28	9	*23	17	23
15	30	*(8)*	20	17	*26
17	*30	*(8)*	*(17)*	16	*28
19	*26	*(8)*	*(15)*	12	*29
21	*(22)*	*(15)*	*(22)*	*(10)*	*29
23	*16	*(15)*	*(25)*	9	*24
1	*15	*(11)*	*(18)*	9	*21
3	*14	*(10)*	*(16)*	8	*18
5	*13	*(9)*	*(14)*	8	*16

YKØA	-W6OAT	ZF8BS	-AA6KX
ZB2X	-OH2KI	ZK1SRF	-IK5SRF
ZF1A	-K9LA	ZK1UDS	-WB6UDS
ZF2AH	-WA6VNR	ZK1VAW	-N6VAW
ZF2AY	-K9LA	ZK2ZE	-LA9GY
ZF2QM	-W6OSP	ZL1BAI	-VK9NS
ZF2SJ/ZF8	-W5SJ	ZL6WA	-ZL1HQ
ZF2SY	-K2UFT	ZP5XYE	-JA7ZF
ZF2VG	-K4UVT	ZY1UP	-PY1RO

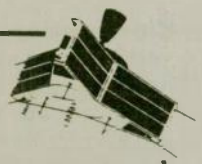
Notes: 1. Contacts made by US DXers may QSL via K7JA; all others should QSL via Yaesu Musen, Ltd, Attn: Y.Kurosaki, C.P.O. Box 1500, Tokyo 100-91, JAPAN. 2. Use address in 1995 *Callbook* or via the WØ QSL Bureau.

BZ5HAE	Lin, P.O. Box 804, Hangzhou, PEOPLE'S REPUBLIC OF CHINA
CN19AMV	P.O. Box 299, Rabat, MOROCCO
DU1KK	Dick Kwiatkowski, c/o American Embassy (IM), APO AP 96440
TU5BA/XT	Ed, American Embassy, Ouagadougou, Dept of State, Washington, DC 20521-2440
VP8CMR	Nigel, Halley Base, BAS, Port Stanley, FALKLAND ISLANDS
XE1BGM/1	Bernardo Garcia Mendoza, P.O. Box 160, Carman Island, Campeche,MEXICO
XF3/XE3XE	Roland J Lorono Pina, P.O. Box 23 AOM 8, Merida, Yuc, MEXICO
XV7SW	Rolf T. Salme, Embassy of Sweden, P.O. Box 9, Hanoi, VIETNAM
ZA1AJ	Vit Kungar, Ambassade de la Republic Tcheque, RRUGA Skenderbeeu 10, Tirana, ALBANIA

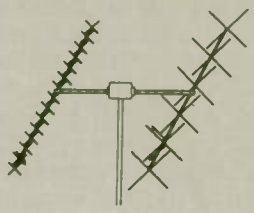
Many thanks to the following contributors: W6BIP, W7KCN, Western Washington DX Club (WA0RJY), Western New York DX Association (KB2NMV), Salt City DX Association (KB2G), The American Radio Relay League (K5FUV), The Ohio/Penn DX PacketCluster (KB8NW), *Amateur Radio Action* (VK9NS), *Long Skip* (VA3JS), *The Low Band Monitor* (K0CS), *Inside DX* (N2AU), *DX News Sheet* (G4DYO), QRZ DX (W5KNE), and *The DX Bulletin* (VP2ML).

I finally completed my QSL chores for our August operation as N6JM/KL7, and had a surplus of several cards. I suggested to the XYL that we should return to Fox Island so we could use up the cards. Somehow, she didn't see the logic.

73 de John N6JM. WR



SPACECOM



K7YHA
Rich Arland
Box 1691 • Wilkes-Barre, PA • 18703-1691

ARRL Field Day 1995

Field Day is drawing closer and closer. Are you prepared to demonstrate your abilities to your club or Field Day group? Each year, more and more SATOPS are volunteering their services to their local club or Field Day group. This does two things. First, it places SATCOM in the limelight. It focuses attention on a portion of the radio hobby that is deemed (by many) as "too technically intensive to be fun." Secondly, it serves to demonstrate that anyone who has some basic abilities and equipment can communicate via the amateur satellite system.

For the past two years I have stressed the K.I.S.S. (Keep It Simple, Stupid) approach to amateur SATCOM. While the high orbit satellites like AO-10 and AO-13 seem to get all the "glory," it is, in fact, the Low Earth Orbit birds (RS-10/12, the PacSats and UoSats) that are the work horses of amateur satellite communications. The majority of Field Day SATCOM stations utilize simple vertical and/or wire antennas, garden variety HF and VHF transceivers and relatively low power to access the many LEO satellites. Why? Simplicity, that's why. There is less to go wrong and therefore, your chances of successfully communicating through the satellites is greatly improved. Remember: Edsel Murphy lives for Field Day.

The Arrow Antenna

About three years ago, just before Dayton 1992, I saw an article in a ham magazine about a neat little four element two meter yagi antenna, designed around aluminum hunting arrows and a piece of square aluminum tubing. The antenna was cleverly named the Arrow Antenna and could be used as a walking stick while VHF mountain-topping. I saw one at Dayton that year, was sufficiently intrigued and procured one for test purposes.

About a year ago, I received an upgraded version of the two meter antenna and a new five element 440 MHz version from the manufacturer. Quality of the newer offerings is much better and the dangerous tapered antenna tips (no arrow heads, just turned down aluminum tubing) were made more safe by applying plastic caps to the element ends. The gamma match on the two meter antenna was redesigned to make it easier to attain a one to one match.

The Arrow Antenna has gained wide acceptance in Fox Hunting competitions as well as V/UHF interference hunting by local repeater groups. I have used the two meter Arrow Antenna for downlink reception tests on some of the LEO satellites as well as for the AO-13 beacon with varying degrees of success. I have not tried to use a set of them (two Meters and 70 cms) to access any of the high orbit satellites. I doubt seriously that they would work in this application. They just don't have enough gain for reliable communications on the high orbit birds.

However, having said this, there is nothing wrong with using a set of them to access some of the LEO satellites, like the PacSats. Using the "Armstrong Rotor," there is no reason that a set of these antennas would not perform quite well in the role of emergency antennas (or Field Day antennas) for a LEO digital SATCOM station.

In addition, these small yagi-styled beam antennas lend themselves to emergency communications applications like the annual Simulated Emergency Test and ARES activities. The gain and directivity offered by these antennas, combined with their portability and ease of storage, make them outstanding candidates for search and rescue/emergency communications work. Contact Allen Lowe, NØIMW at Arrow Antennas, 1461 Peacock Pl., Loveland, CO 80537 for further information and pricing.

Don Quixote and the WINDMILL

FINALLY, I managed to raise my reconditioned 50 foot tower and crown it with a HyGain TH7DX high performance HF triband beam. This only took fourteen months! I procured the tower from some of the V/UHF contest types that lurk in the local Amateur Radio club. The 50 foot tower initially cost me $40. However, due to the structural integrity of the sections, it took another $200 worth of welding, priming and painting to bring the tower sections up to the standards whereby they wouldn't collapse after being erected. Add to this the cost of the cubic yard of concrete ($115), custom manufactured base section ($100), reconditioned HAM-IV rotor ($250), thrust bearing ($84), guy anchors ($45), guy wires ($90) and we start approaching $1000!

The TH7DX cost $340 and came from a ham in Maine. It had been up for about eight years, taken down and stored. Cleaning and reconditioning the antenna took several months of steady, concentrated effort. Finally, with all new Cryolac™ end caps, trap caps and insulators ($40), stainless-steel replacement hardware and turnbuckles ($200) the antenna was hoisted into position 52 feet atop the tower. My son, Jamie, did the majority of the tower work (it must be nice to be 18 years old, fearless of heights, and immortal!).

The four full-size dipoles (80, 40, 30, and 20 Meters) were mounted on the side of the tower at the 48 foot level. Plans are to add an additional set of dipoles for 17 and 12 Meters in the spring. I now have a rather decent antenna farm that provides me with LEO SATCOM capability along with excellent HF coverage. My first "test"

of the TH7 occurred during the ARRL SSB Sweepstakes in November. I didn't enter the contest to submit a score, just to see how the antenna performed on 20, 15 and 10 Meters. I was impressed with the comments and signal reports I managed to solicit from contesters on Sunday. I was constantly asked if I was really running only 5 watts. Signal reports of 5-9 + 10 dB were not uncommon on 15 and 10 Meters. The results were definitely worth the effort and frustration associated with the project. Unless absolutely necessary, I will NEVER go back to wire antennas for the HF bands. Life is good (at a cost approaching $1500).

The AUTEK RF-1 RF Analyst

Previously I have sung the praises of Bill Onesky, N6WO, and the products he produces at Autek Research. When I wrote the QRP column, I reviewed the Autek QF-1A active audio filter and the WM-1 Computing SWR Bridge/RF wattmeter. Both of these products are outstanding value for the money and, needless to say, impressed me very much.

After reading the ad about Bill's newest addition to the Autek Research line, the RF-1 RF Analyst, I contacted him and bought a unit for review. Billed as "The only instrument you need to adjust any antenna," the RF-1 lived up to its press releases.

This tiny (4.5 X 2.5 X 1.5 inches) seven ounce wonder contains a microprocessor, low distortion sine-wave generator which functions as a transmitter (with outputs from 1.2 to 35 MHz), *large* LCD display (that is easily read in direct sunlight), A/D converters and crystal time base. The entire package is powered by a single nine volt battery.

Not only can you check the *exact* frequency of resonance for any HF antenna you have, you can plot SWR curves using the RF-1. The unit will also indicate whether your antenna is too short or too long for a given frequency. In a few moments, you can get a complete diagnostic of your HF antennas, using the Autek RF-1.

The usefulness of the RF-1 does not stop with simply measuring SWR. The microprocessor circuitry allows the user to directly read (via the LCD digital display) antenna and/or feedline impedance (Z), inductive and capacitive reactance Xl and Xc. This makes fabricating tuned feedlines and matching stubs a simple exercise.

Upon receiving my RF-1 RF Analyst (Autek is suffering a five to six week backlog due to the tremendous demand for the product), I immediately retired to the ham shack to check out my HF antenna system. Surprisingly, I found some interesting data regarding my full size 80 through 20 Meter dipoles. Braving the harsh weather, I pruned all four dipoles using the data furnished by the RF-1. Now my dipoles all resonate exactly on the QRP calling frequencies on 80, 40, 30 and 20 Meters. My 10 Meter vertical (used for RS-10 and 12 downlink) was close enough to resonance on 29.4 MHz to not require adjustment. Measurements taken on my TH7DX tribander showed the figures given by Telex/HyGain to be with in the limits needed for the beam to perform as advertised on the CW portion of the 20, 15 and 10 Meter bands.

Rest assured, when I add the dipoles for 17 and 12 Meters, I will rely upon the RF-1 to put them exactly on frequency. Likewise, when I take the Cushcraft R-7 out on camping trips and Field Day, the RF-1 will also make the trip to insure that the vertical is properly assembled and adjusted.

Antenna trimming and tuned feedlines/stubs are not the only things that the RF-1 does well. You can use this useful RF test tool to adjust your tuner, RF networks, and even the MFJ Artificial Ground matching system. Since my shack is on the third floor, tuning out the reactance on my ground system using QRP power levels on HF is somewhere between guesswork and a mystical experience. With the RF-1, adjusting the artificial ground (basically an antenna tuner for ground systems) is a snap. No more guess work and my hotline to the psychic network has been disconnected!

In case you haven't figured it out yet, I really like my RF-1 RF Analyst. It takes the place of several pieces of RF test gear and is "the only piece of RF test equipment I need to adjust my antennas, tuners and RF networks." For the price ($129.95 plus $6.00 shipping and handling) the RF-1 is an absolute steal. It outperforms anything in its price class. For more information on this and other Autek Research products, contact the company at P.O. Box 8772, Madreia Beach, FL 33738 or call them at (813) 886-9515.

The Finale

This is going to be my final column as the SPACECOM editor in ***Worldradio*** magazine. This column marks two years of writing the SPACECOM column and, to be candid, it's time to move on to other pursuits. After authoring two books on low power communications, a soon to be published third volume on QRP and countless hours poised over the word processor typing monthly columns and articles, it is time to push back from the keyboard and play with the radios.

One fact about constantly writing for the radio hobby press soon becomes very evident: writing takes over the majority of time which use to be spent operating. Added to this the responsibility of maintaining gainful employment, raising a family and owning a home: The time left for the hobby is almost nonexistent. To the writer it becomes painfully obvious that the reason for entering the radio hobby is no longer the driving force. The writer eventually encounters a juncture where he must decide if he is going to continue to pursue ham radio as a participant or merely an observer/reporter.

Over the last nine years I have written articles, edited monthly columns and authored books about my favorite aspects of our wonderful hobby. For me, ham radio has become Word Perfect, Ver 5.1, with little time left for "playing radio." This imbalance has been a major irritant in my lifestyle for the last four years. Now that I have accomplished my major writing goals, I have decided it is time to put down the pen and get back to being an Amateur Radio operator.

Throughout the last two years, I have tried to maintain one standard theme regarding satellite communications: you can have fun for very little cost if you follow a few simple rules. Judging from the mail I have received, my column's theme was right on target. All too often, experienced SATOPS tend to fall into a trap of thinking that everyone just stepping into the SATCOM arena has the desire and money to become active on the high orbit birds or the digital microsats. Quite frankly, the majority of us are getting into SATCOM after having tried mainstream (HF/VHF FM) ham radio for several years. Therefore, we already have a sizable investment in our stations in the form of money and equipment. When the neophyte SATOP suddenly finds out that, according to some "experts," he must buy some highly specialized and very expensive pieces of equipment and accessories just to play the game, the desire to play the game disappears. We've lost another fledgling SATOP to "sticker shock."

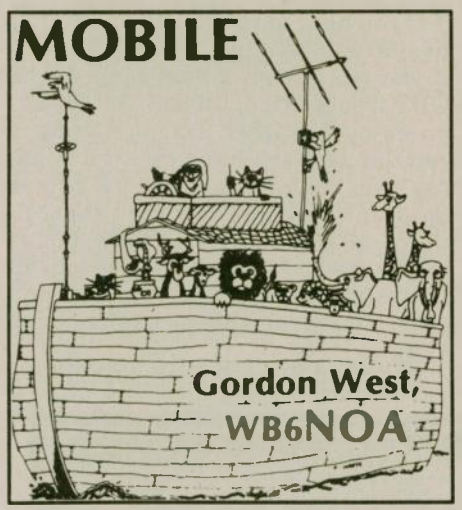
I have tried very hard to dispel this

last myth. If a survey of licensed amateurs was taken, I would be willing to bet that the majority of those involved with amateur satellite communications are active on the Low Earth Orbit birds, the "work horses" of amateur SATCOM. While the high orbit satellites are glitzy, and those hams who regularly work through them have stations that would make a NASA engineer jealous, this is not mainstream amateur satellite communications. For the new SATOP, remember two things: 1. The object of any facet of the radio hobby is to have FUN. This includes SATCOM. 2. By using some good old fashioned ingenuity, you can put a functional LEO satellite ground station on the air with very little expenditure of funds.

For the experienced SATOP, remember this: In order for our ranks to grow we have to nurture the newcomers in our hobby. Your advice and guidance will be taken as "gospel" so act accordingly. Exercise patience with our new converts to SATCOM for they are our future.

If you hear me on RS-10 or 12 don't hesitate to give me a call. Likewise, if you run across me on some of the QRP frequencies, I'll look forward to an enjoyable QSO. I hope all of the regular readers have enjoyed reading this column as much as I have enjoyed writing it. Between this column and my old QRP column, I have made many friends. Thank you all for your allegiance, comments and criticisms over the past eight-plus years.

73 es God Bless de Rich, K7YHA WR



New ways to watch the weather

There are three ways to capture weather facsimile on a lap-top or home computer for a bird's eye view of all the storms and clear weather around you. Weather facsimile reception is important for mobile marine, mobile home journeys, and for those stations that give out weather reports and weather warnings to other mobile stations.

H F FAX. The National Weather Service provides weather charts and satellite imagery to powerful transmitting stations who pump these megawatt signals out on high frequency bands adjacent to our regular high frequency ham bands.

10,863.1 kHz	Norfolk, VA
6,338.6 kHz	Boston, MA
12,748.1 kHz	Boston, MA
8,078.1 kHz	Norfolk, VA
4,344.1 kHz	San Francisco, CA
8,680.1 kHz	San Francisco, CA
12,728.1 kHz	San Francisco, CA
17,149.3 kHz	San Francisco, CA
11,118.1 kHz	Nebraska
6,903.1 kHz	Nebraska
6,850.1 kHz	Mobile, AL
9,155.6 kHz	Gulf Weather

You would tune in these frequencies with an amateur radio single sideband transceiver with general coverage receive capabilities. These frequencies can also be received with relatively inexpensive portable shortwave receivers: Grundig "Yacht Boy", West Marine; 800/538-0775 Radio Shack Model DX-390 Sangean Model 803, S.S.C.; 714/498-5784.

The program and hardware plugs for your lap-top or home computer run around $99, and are available from the following: S.S.C.; 714/498-5784 AEA; 206/774-5554.

Your computer requirements are minimal—IBM PC compatible with at least 640K memory, MS DOS 2.1 or above, one serial port, and almost any kind of monitor and printer.

Capturing the weather imagery is easy once you have your shortwave set hooked up to a long wire outside antenna, or a mobile H.F. whip like an Outbacker. Dial in the frequency where you hear the twice-a-second sweeping sound of weather FAX, hit capture on your computer screen, and the $99 software does the rest in converting these audio frequencies over to digital weather imagery that comes out on your CRT or LCD lap-top display. If it's really a good shot that you want to keep, save it to disk, or print it out. This weather imagery is usually within 4 hours of actual picture time, and you receive satellite imagery plus detailed weather charts and forecasts from the National Weather Service. All of the state boundaries are put in, so what you see is almost like watching the evening weather news.

Weather fax on your home computer

VHF POLAR ORBITERS. Your computer weather FAX system could also print out polar orbiting satellite transmissions in the 137 MHz band.

137.300 MHz	Soviet Meteor
137.400 MHz	Soviet Meteor
137.850 MHz	Soviet Meteor
137.500 MHz	U.S. NOAA
137.620 MHz	U.S. NOAA
137.095 MHz	Chinese
137.795 MHz	Chinese

These satellites fly over only every few hours, and you will need a programmable scanner that has been modified for wide-band FM reception to pull in these signals during a pass. The Software Systems Consulting weather FAX systems can also help you track the satellites on your computer, and they even have a new pro-

gram that artificially overlays state outlines on the chart so you can see exactly what the satellite is looking at. Polar-orbiting satellite weather reception is LIVE, and what you see is exactly what the satellite is looking at as it passes overhead. A simple crossed-loop dipole is all that's necessary to pull in these powerful signals. The cost of a modified scanner that plugs into your computer is approximately $200, and is also available from S.S.C.; 714/498-5784.

1691 GEOSTATIONARY SATELLITES. The third way to pull in weather reception at home, in a mobile home on a trip, or aboard a boat in a harbor is taking a direct aim at the geostationary satellites that continuously beam down to the United States weather facsimile imagery and weather charts of the world. That's right, the world. This is the only weather facsimile system that lets you see everywhere around the globe. The 137 MHz polar orbiting system only lets you see 400 or 500 miles around you. High frequency only lets you see the East Coast, Gulf Coast, or West Coast imagery. But direct imagery from the satellites give you the world, and it's easier than you think to come on 1691 MHz.

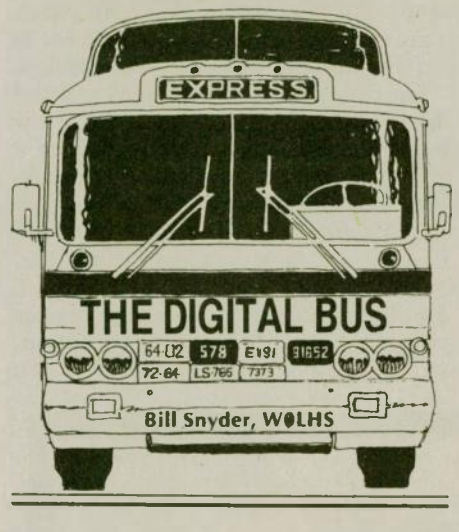
Best all-U.S. reception is now from geostationary GOES satellite #8, parked at 91 degrees west with an inclination around 140 degrees. This satellite is pumped information from ground stations that pool information from other satellites whizzing around the world or also parked in a stationary orbit. Every 5 minutes a new picture. First a shot of the United States with such exquisite detail that you can see the little puffy clouds hanging over your area from above that you can see from down below! Five minutes later, you are looking at South Africa. Next shot, Korea. Here comes, next, South America, and at least once an hour a full disk view of this side of the world.

Your antenna requirements are simple—slip together the boom element of a loop Yagi antenna, and screw on the supplied coax. This antenna aims toward the satellite, and you get crystal clear reception of the incoming signal. The loop Yagi runs around $200.

The down converter of choice is from Quorum. It takes the 1691 MHz signal, and down-converts it to 137.5 MHz that goes into a wide-band VHF scanner receiver. A simple $150 programmable scanner from Software Systems works nice. The down converter IS relatively expensive—around $550, but this is the best way to get signals from 1691 MHz all the way down to 137.5 MHz where you can then let the scanner decode them and take them to your $250 PC GOES weather FAX software system. You'll need some good coax to go between the output of the down converter and your little scanner receiver—but you don't need major sized coax because you are down at 137.5 MHz. The down converter mounts right next to the antenna feed.

Turn everything on, listen for white noise in the receiver, and then swoosh the antenna around and listen for the unmistakable sweeping sound or 30-second dead carrier of the geostationary satellite. Mount the antenna to keep pointed at the satellite, and then jump on your computer and get set to see the weather unfold in front of you.

The antenna is so powerful and the signals are so strong that even a few degrees this way or that way from a rolling boat won't cause reception problems. For more information about how you can tune into three different types of weather facsimile and tie all of these "free of charge" signals to a simple lap-top or home computer for exquisite satellite weather reception, call John Hoot, 714/498-5784. WR



My ham radio activity level has been slowly decreasing during the past few years. It's not due to old age or lowering solar flux, it's simply because I've become too busy with my volunteer efforts on behalf of various historical societies here in North Dakota. Oddly enough, I disliked history when I was in high school, but I found compiling and recording history to be an exciting effort in my old age. Therefore my ham activities are downsized because my history recording efforts are eating up my available time.

For example, Bob Leo, W7LR, and I have embarked on writing a book about our adventures with the Gatti-Hallicrafters African Expedition in 1948. Between the two of us, we have reams of notes, diaries, and press clippings to jog our memories. It's really fun to remember what we were doing back in those days when we were on the air from Kenya, Tanganyika and Uganda. I had forgotten a lot of the little sidebars that spiced up our junket.

The book effort started when Bob and I attended a reunion of the last three survivors (photographer Weldon King of Springfield, Missouri being the third) of the expedition last May. Mike O'Brien, NØNLQ, who published a story about our "First Grand Ham DXpedition" in the December, 1993 issue of *QST*, joined the three of us for a grand reunion. Mike's story capsules the basic expedition and its problems, and the reunion sparked Bob and me to dig into our memories and find remembrances of those crazy days in Africa. I'd forgotten about many of our day-to-day adventures. A good example is one that was published in the *Saturday Evening Post* in May of 194? It was entitled "Trial by Fire," and it dealt with a witch doctor ferreting out a thief in the midst of our African employees.

The witch doctor did it by ceremonially tapping (three times) the heel of the left hand of each suspect with a red hot iron. He had no trouble in finding the culprit. Although all the suspects were blistered, the culprit shook from fright enough to tip off the witch doctor of his guilt. The "trial" made a great picture story.

So, because of the excitement of revisiting Africa in my mind, the ham rig and the BBS are in the background — and I'm sorry to say, I have trouble finding time for the ham hobby.

Last year I wrote a piece for "North Dakota History, the Journal of the Prairies," dealing with the early days of television in North Dakota. The article, in the summer 1993 issue, documented my experiences putting a TV station on the air when the FCC lifted the freeze on licenses in 1952. If you are interested in it, you can contact the North Dakota Historical Society, 612 East Boulevard, Bismarck, 58505. I believe they still have back issues available.

With that background, you can probably see why I ain't on the air as much as I used to be. Lately, I've been unable to enter RTTY and CW contests because of time restraints. I keep saying I'll be back in the fray, but the tests go by without me.

Packet DX

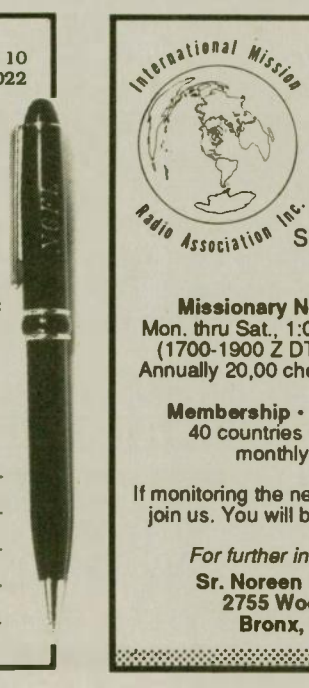
Readers might remember that I conducted a non-scientific test last year in which I asked for stations to send me ten packet messages, one a day, and I would keep statistics on the efficiency of our packet system. And if you follow this column regularly, you'll know that the test was a disaster, out of 33 who I assume sent the ten, only 3 got all ten to me. And none of 33 had their messages arrive in sequence. That's enough to say that the system doesn't work too well, isn't it?

Recently I received a message from ZS1AFZ @ ZS1DP.WCP.ZAF.AF in South Africa. It was from YL Maria, a gal looking for North Dakota to complete her CW WAS. Maria wanted bands I couldn't work, so I gave her the name and call of a local ham who could possibly help on all five bands. I sent my answer message and told our local club SYSOP how to route it.

What was unique about Maria's message is that it only took two days to get to North Dakota because it came part way by satellite. I've had overseas messages take weeks to get to me by HF/VHF. Maria's, however, came through a SATGATE station in South Africa to a SATGATE station in Winnipeg only 250 miles from me. One long hop like that really makes the miles evaporate and the time enroute shrink.

As I said, I've been out of the mainstream packet world lately, so I really wasn't sure how to address the message back to Maria in order to take advantage of the satellite link. I simply addressed my answer by using the SR command which is the automatic answering command. I normally use that command for all domestic traffic.

A few days later, I received an "educational" message from Gary, VE4GKG, in Manitoba, telling me how to address such a message. He also offered to send me the software to add a server to my BBS. The SatGate sta-



tions are using "REQSAT REquest Satellite Mail Server V2.7" which was written by Grant Willis, VK5ZWI. Because my BBS is now only a temporary backup for the local club BBS, I don't think I will add it.

On the same day, I received another educational message from Chris, VE4SET, the SYSOP of the SATGATE station in Winnipeg. Both messages had the same information: if you want your traffic to go by the satellite network, you have to address it to the server at a SATGATE station. There the software will re-address your message to go via the high road.

Here is how to do it:

First you type:

SP REQSAT @ VE4SET

That will address your message to the server at the BBS.

Next, put the title of the message when requested by the BBS. Here's a sample title:

SKED WANTED.

After that you type the address of the packet station that you hope to contact like this:

SP ZS1AFZ @ ZS1DP.WCP.ZAF.AF

Be sure to put the SP command in the message as shown. This is important to make the server do its job properly. Also, be sure to put a space between the SP and the address, and do not put anything else on the line. The very first line must only contain the address as indicated above. I believe that if the full extended address is not known the server may add it, but I'm not sure of this fact.

Then type the body of the message and end with Control Z or /EX. That should do it.

The following is a paragraph from a help message I received from the Canadian stations:

"The REQSAT Server is fairly careful about what it re-addresses. If it can't find the address line in the message it sends back the HELP text to the originator of the message as well as a copy of their message. If the users want help with the server, all they need to do is send a message to REQSAT @ SatGate.BBS with no body and the server will send back the help text. Users can also include the words HELP in the subject and the body of the message and provided they did not include an address line in the body of the message (the satellite address command) the help text will be returned to them."

The nicest thing about the SATGATE system is that it sends the originator an acknowledgment after the message has be transmitted by the satellite station. I forgot the SP in the second address and the system sent me the help message and pointed out my error. The SYSOP fixed the problem and the message went on its way to Maria, thanks to his efforts. I don't think enough thanks are given to the SYSOPs who operate the BBS and nodes that make up the ham packet system. Thank you, BBS ladies and gentlemen! You have my gratitude!

Maria is in the process of sending me 10 messages at the rate of one a day. So far I have six of them in the shack, and they have all arrived in sequence, which is more than I can say for domestic traffic in the USA. None of her messages took more than 3 days to make the trip and that includes six or seven relays.

Bob Leo, W7LR, and I visited a ham club when we were in Capetown, South Africa, and I will say that the members there were the greatest hosts I have ever had at a ham club meeting. They took us on an all-day tour of the Capetown area, and then they topped it off with a dinner at one of their homes. I really enjoyed my stay there. I am also enjoying my contacts with Maria. It's fun to work DX — even if it is on packet!

EAVESDROPPINGS

WINTER SEEMS TO GET LONGER EACH YEAR, I WONDER IF THAT IS CAUSED BY THE HOLE IN THE OZONE LAYER. . . .I'VE BEEN WATCHING THOSE PHONE-IN PSYCHICS ON THE BOOB TUBE, THEY ONLY PROVE PEOPLE WILL SPEND MONEY ON ANYTHING DUMB. . . .OUR TV CABLE SYSTEM HAS NOTHING BUT INFOMMERCIALS ON THE AIR AFTER MIDNIGHT—I DIDN'T KNOW THERE WERE SO MANY DIFFERENT EXERCISE MACHINES FOR SALE. . . .REMEMBER HOW IN WORLD WAR II THE AIR FORCE GUYS HAD PLACARDS IN THEIR PLANES THAT READ: "ENGAGE BRAIN BEFORE STARTING MOUTH?" SOMEONE SHOULD SEND ONE OF THOSE SIGNS TO A CERTAIN SOUTHERN SENATOR TO PUT ON HIS DESK. . . .REMEMBER WHEN WE USED TO PULL THE STREET CAR TROLLEY OFF THE OVERHEAD WIRE AND WATCH THE SPARKS FLY? THAT WAS MY INTRODUCTION TO ELECTRICITY AT WORK. . . .OUR STATE LEGISLATURE IS NOW IN SESSION AND OUR GOOD LIVING IS AGAIN IN TERRIBLE JEOPARDY.

Write me: Bill Snyder, WØLHS, 1514 South 12th St., Fargo, ND 58103. My packet address is WØLHS @ WØLHS.#SEND.ND.USA.NA. 73 and DIT DIT. **WR**

Life is like a ten speed bike; most of us have gears we never use.
—Jack I. Nicholas, W7LNE-SK

YLs on the Air

Kay Eyman, WAØWOF
Route 2, Box 366
Garnett, KS 66032

Coming Events

February 9-11
The 12th BYLARA Contest
February 11-13
YLRL YL-OM Contest (SSB)
February 18-19
Guides On the Air (CLARA)
February 25-27
YLRL YL-OM Contest (CW)
March 8 International Women's Day Contest

YL Contests

Christa Elksnat, DJ1TE, was the winner of YLRL's Howdy Days Contest, held in September. The YLRL Anniversary Party was held in October, and in this contest, DX YLs compete only against other DX YLs, and North American YLs compete only against other North American YLs. Christa was also the DX winner of the SSB contest, and Irma Weber, K6KCI, was the North American winner. In the CW contest, Rosel Dach, DL2FCA, was the DX winner, and Lia Zwack, WA2NFY, was the North American winner. Rosel was the DX YL with the highest combined SSB and CW scores and was awarded the Hager Award, and Lia was the North American YL with the highest combined SSB and CW scores and was awarded the Corcoran Award. Congratulations to all the winners.

There are several YL operating events scheduled in February. The first is BYLARA's annual contest, open to YLs, OMs, and SWLs. YLs can work both YLs and OMs; OMs work YLs only. Logs must be received by April 4, 1995, by Ella Tugwell, GØFIP, 67 Upper Kingston Lane, Shoreham by Sea, Sussex, BN43 6TG, England. The rules are the same as in past years or you can write me if you need them. (This is a good time to work toward the BYLARA certificates outlined in the last column.)

The rules for YLRL's annual YL-OM Contest are published in most Amateur Radio magazines and are also the same as in past years. This is the only YLRL contest in which the YLs work OMs and the SSB portion is always scheduled near Valentine's Day. We hope participation will be high for this one. Please get on the air and make some contacts even if you aren't a serious competitor.

CLARA will also sponsor Guides On the Air again this year, which will mark its 10th anniversary. It's a joint project of CLARA and the Girl Guides of Canada, and the Canadian Amateur Radio operators invite the Girl Guides to visit their stations and make contacts with other Guides around the world. From the beginning, stations in the United Kingdom, Australia, and New Zealand have participated in this event, which they call "Thinking Day." The organizer and chief coordinator is Cathy Hrischenko, VE3GJH, and you can contact her at 13451 Concession 1, R. R. 1, Zephyr, Ontario Canada LØE 1TØ, for full details.

The Finnish YL Club (OH-YLS) sponsors the International Women's Day Contest, held from 0000-2400 UTC, on March 8th of every year. All licensed YLs and OMs, as well as SWLs, are invited to participate. YLs call "CQ YL test" and OMs call "CQ YL." All bands from 3.5 through 28 MHz and both CW and SSB may be used, but stations may be worked and counted only once, regardless of band and mode. OMs work only YLs; YLs may work both OMs and YLs. The exchange is RS(T); name, and whether YL or OM. A QSO on SSB is one point and on CW is three points. There are no multipliers but every country and OH-district (OH1, OH2, etc.) gives an additional ten

points. Logs with unremoved duplicates will lose five points for each duplicate QSO. Certificates will be awarded.

Send logs before the end of March to Tuija Paalanen, OH5MX, Klamila, Lansikyla, SF-49860, Finland.

YL Meetings

YLRL's next convention will be sponsored by SAYLARC in Albany, New York, on July 11-14, 1996. SAYLARC members are working on plans to make this the biggest and best YLRL convention yet and have scheduled it one week before the Summer Olympics begin in Atlanta so that visiting DX YLs can attend both events.

Plans are also underway for the international worldwide YL meeting in Berlin, which will be held June 20-23, 1996. As noted in an earlier column, it was scheduled the week before the huge Amateur Radio meeting in Freidrichshafen, Germany, and a special bus to transport YLs from Berlin to Freidrichshafen will be available, if there are enough people interested. The organizer is Gertrud Szyza, DK8LQ, and it would be very helpful for her to know how many people will be attending and how many will be in Berlin a few days before or after the meeting so that some sightseeing tours can be organized.

Gertrud has prepared a short preregistration form, which has been printed in some of the YL club publications. If you need a copy, please write me or contact Gertrud at Am Brook 5, Fassensdorf, 23701 Susel, Germany.

I hope you'll give some serious thought to attending this meeting because it is truly a unique opportunity to meet YLs that you'd never have a chance to meet otherwise. The two previous YL meetings in Stockholm and Osaka far surpassed the stated goal of enhancing international friendship. It's hard to describe the deep bonding among YLs of many nationalities that occurred but just ask anyone who attended and you're bound to get an enthusiastic endorsement of these worldwide YL meetings.

A little closer to home will be the YLRL Forum at the Dayton Hamvention in April. I'll have more details for you in the next issue, and if there is anything you'd like to have on the agenda, please let me know right away.

YL Updates

Darleen Magen, 3A2/WD5FQX, operated from Monaco on October 28, during a stopover on a European cruise. Conditions to the U. S. were very poor, but a lucky few, including Don Wibel, K9ECE, had a good contact.

Beverly McLaughlin, GI4PMP, was the first YL to earn the Irish Radio Transmitters Society's certificate for WEIC (Worked All EI Counties), which is issued for working and confirming contacts with at least 20 of the 26 counties. This is a beautiful certificate, and St. Patrick's Day is a good time for you to find some of the rare counties on the air as it's been designated a special activity day for the Irish operators. The Irish Hour, Sundays, at 1700 UTC, on 21.317 MHz, provides another good chance.

Oyuma Bator, JT1CC, is 16 years old and is currently the only YL licensed in Mongolia. She can often be found on the 14.243 MHz European DX net. Her father is JT1BG.

Sara, VP8CGE, on South Georgia Island, can often be found on 20 Meters around 2200 UTC. She and her OM Patrick, VP8CID, will be there until August. QSLs for Sara and Patrick go to VP8AWU, Neil Rowlands, Box 520, Narrows View, Stanley, Falkland Islands, South Atlantic. (Neil's wife Sue is VP8BNG.) **WR**

Search And Rescue Communications

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

Several months ago there was quite a debate over emergency communications — specifically whether or not it was OK to modify Amateur Radio gear to operate on public safety frequencies. Several of you wrote to ask my opinion but I hesitated jumping into the fray without giving it some thought and doing some research.

Well. . . here goes. Before you leap from your chair and fire off flaming prose, this is just my opinion! What you choose to do remains your option. I'm NOT a communications attorney and certainly not going to drop you from my Christmas card list if you don't agree with me.

Over the years I've heard the statement: "You can do anything you need in an emergency, it's authorized in the FCC rules and regulations." Maybe it's there, maybe it's not — depending on who you ask. What's fun is to ask for chapter and verse. Most of the time (perhaps 99% of the time) the person is simply quoting something she/he heard from someone at a meeting sometime ago. Some say it's in the Communications Act of 1934, but have never actually read it. It's kind of an urban legend that has beginnings everywhere, but nowhere in particular.

Let's travel back in time to when the FCC actually administered your license exams and your walkie-talkie contained twelve crystals for six channels. My first was pretty nifty but I recall the delicate tuning required to get it on the Civil Air Patrol repeater and simplex which was just over a four megahertz split. As I recall, a good bump would either make the simplex quit or the repeater quit and require another tuning session. The radio could barely handle the Amateur Radio 2 Meter band edges, let alone stray into public safety above 150 MHz.

And then there was the cost of crystals and finding someone who could retune the radio and modify it to even work on public safety frequencies. The more I think back, the more I think it wasn't really an issue or something we even considered.

My memory is pretty fuzzy, but I think there was something similar to Part 97.403 that said (in essence) we could use any means of radio communication available to communicate in times when human life or property were in danger. Yesterday I read through a number of other "parts" that regulate aviation, marine, public safety, business, etc., and there is similar wording in those areas too. The concept of "emergency" is not new or confined to one radio service.

Moving forward to "today's" radio technology, it's common to see gear that covers audio to light, transmit and receive. If you remove the correct diode, short the proper jumper or enter the proper code, your radio can work stations you had no idea existed ("Gee, I wonder if the fire department sends out, QSL cards?").

So here's our dilemma: We have a nifty radio. We just received some modification instructions from our buddy and with the snip of a diode, we could be another set of eyes and ears for the local sheriff. Couldn't we? Isn't this one of the purposes of Amateur Radio — to serve the public in time of emergency? Don't we have a MORAL obligation to be prepared and clipping that diode would prepare us to better serve?

I made a few calls to FCC field offices and even the main office. Officially I was told to send a letter requesting an "official position." Unofficially there was a lot of opinions and lots of frustration. Some of the "unofficial" opinions ranged from "never" to "tolerance." One factor seems to be the nuisance factor and whether or not it's a regular occurrence.

I did not request an official statement because I'm not sure it makes any difference. Let's take a step back and consider some of the implications of being able to contact stations in marine, public safety or business service.

1. What is your purpose? How many times today would you need to call in a life or property threatening situation and radio is your only conduit? If you had the ability, would it cause you to "go on patrol" and impersonate a law officer? If you're a member of a volunteer group, does your group need access to the agency's communication system?

2. How would you integrate into these agency systems? Would you just call in with your Amateur Radio call sign and surprise them? Would you select a "unit" number that you've not heard anyone else using? Perhaps you could find a nifty acronym and use that, such as "NEAT Seven" (Neighborhood Emergency Assistance Team)?

3. How would you handle the potential liability? You've called in the bad accident, told everyone around that you've called it in, no one bothers to call by phone, and the agency writes it off as a hoax. Someone dies, gets your name and files a lawsuit because you prevented a call through accepted channels (like a phone). Or, perhaps you blocked a legitimate call (because you were not listening) and the fire department missed the call from a trapped firefighter in a burning building? ("Gee, I didn't realize there was an emergency in progress on this channel, sorry.")

4. What happens if you just happen to sit on your microphone and it just happens to block the ambulance channel for an hour or so? ("Sorry, my modified rig didn't include a time-out-timer.") How do you explain your five-year-old who decides to call daddy with your radio while you're away and blocks the sheriff dispatch for an hour or two?

5. You just happen to be on a marine channel and a boat calls for assistance. You field the call, but realize you haven't a clue what the skipper is talking about and by the time you figure out you can't help, the ship has sunk and all you've managed to do is cover the marine base operator's signal who needed a latitude and longitude in order to send help.

You might surmise I'm not in favor of opening up your radio and performing surgery so you can be of "help." Not wanting to speak for the public safety dispatcher, I called a friend who is a police dispatcher and asked his opinion. When I explained some scenarios of helpful operators calling in over the police frequency, he had serious reservations.

He was concerned primarily of interference for on-going operations because a "visitor" would not understand the codes or transmissions in progress and could cause confusion. He said few dispatchers would understand what your call letters were and would waste precious time trying to figure out who you were in order to validate your call.

Another concern was jurisdiction. Dispatchers, he said, are not familiar with having someone just pop on the air and report an accident that might require response from another agency or jurisdiction. He indicated that dispatchers would probably make every effort to handle the "call" but it would disrupt their normal routines. His suggestion? Report calls through regular means: the telephone. When the phone rings, they expect a citizen call, they expect panic, they expect jurisdiction questions and they also know where the call is coming from.

Playing the advocate for radio mods, I asked: "What about someone who travels the lonely highway (a lot) and might encounter an emergency." His response: Get a cellular phone. "No coverage," I said. His response: You might want to work with the agency and sign on as a reserve deputy, obtain authorization and training and be part of the system.

When many of you were debating the issue on the Internet and via packet, a lot of "what ifs" were proposed. Many of the scenarios were so bizarre they tested the limits of common sense. Several possibilities fell into the "might" category and one or two approached reality.

Let me boil this all down — and this is MY opinion, so take it for what it's worth!

You might be OK if you travel and you are too cheap to buy a repeater directory (but can afford a public safety frequency book). You might be OK if you are in another state, don't give your name and call sign, and hope you didn't cause any harm. You might be OK if a good friend is the police chief and doesn't get upset if you pretend to be a cop for an evening or two a week — just don't shoot or arrest anyone.

There are very few areas where you cannot hit an Amateur Radio repeater and get someone to make a call for you. Let's also consider that you're taking a radio that is not type-accepted (an FCC term for not approved) for public safety (or marine or business) and deciding in advance you're going to need it in an emergency. As far as I'm concerned it's laziness. If you have a legitimate need, plan in advance and follow approved procedures.

There are volunteer groups such as ARES and CAP that routinely interface with other agencies and can either obtain licenses and equipment or obtain authorization to use type-accepted equipment and not disrupt an existing system. It is possible for your group to obtain a marine utility license, an aeronautical search and rescue license or a public safety (Part 90) license and be 100 percent legal. It requires some forward thinking and a little research through the FCC regulations, but it can be done.

As you develop working arrangements with various agencies, you can obtain authorizations to operate, under certain circumstances, on an agency frequency. An agency might ask you to attend some training, or give you a special "tactical" call sign or place situational conditions upon your use, but you are then operating within their system and you won't cause disruptions.

As I see it, it's a matter of professionalism. Type-accepted equipment is not prohibitively priced. If your group needs this type of "link," a fundraiser will keep you legal with proper equipment. You should also consider if another agency might want all of you on their frequency. Maybe one or two units for coordination is all they can handle. What you want to avoid is the unexpected "link" and behavior that causes an agency to rethink why they needed your help.

One aspect of obtaining your own authorization is that it holds you to operating standards. One case in point is an aeronautical SAR license. Most authorizations are only for two frequencies, one for actual emergencies, the other for practice use. During one CAP mission, a frequency was selected "because it wasn't being used" but happened to be designated as an air-to-air frequency. The license didn't authorize that frequency use and who knows what interference was created. I do know if something bad happened, the liability would fall toward the user not following the rules!

Be careful! Think through what you need to accomplish and look for ways to be more useful. Before you do something that might affect how Amateur Radio is perceived, discover what's most effective. Don't assume 97.403 will cover everything you might do. Defending your actions could dent your toy budget for many years! **WR**

Lorraine S. Matthew, N4ZCF
MARS call AAA9PR

"On this day of honor and tradition, Americans across the globe rightfully remember and pay tribute to the men and women who proudly served or are presently serving our beloved country.

"Every American has benefited from the freedom they have achieved and we are most thankful. Army MARS also proudly joins our grateful nation in honoring them all.

"Many of our veterans also served and/or are continuing to serve in a most unique way as a member of the MARS programs to include providing the morale support that is highly desired and appreciated by countless thousands.

"It is one way that we continue to show our gratitude and I assure you that each and every one of your dedicated efforts are well appreciated. "On behalf of the United States Army, Major General Leffler, Commanding General of USAISC, all his command, myself and my family, our sincere thanks to our veterans and MARS members for a job well done.

"American veterans, and today's military, we salute you."

These words, written by Chief Army MARS Robert Sutton, were designed to help the Army MARS community honor and celebrate Veteran's Day in November. This is, of course, February — a month in which we again turn to patriotic thoughts and the honoring of two of our most memorable presidents in particular and all presidents who have served this great nation. Were it July, we would again turn to patriotic thoughts...and so on throughout the year.

Why a special month or day?

These words are applicable every day of the year and no group recognizes their continuing validity more than those men and women who serve in Army MARS day in and day out.

1994 closed its tenure in time with wild weather and the need for Army MARS to exercise its skill in carrying out the newest mission assigned to Army MARS. That newest mission, the sending of early eye-witness information about emergencies all over the country, is the Essential Elements of Information (EEI) program. These vital messages go to several recipients. The Army MARS Area Directors receive the message first and through them it is forwarded to the Director of Military Support (DOMS) and Chief Army MARS at Fort Huachuca. The DOMS office is the key recipient because it is this office that plans all of the support that can be given by military assets. They also share the information with other federal agencies. By having Army MARS assume the task of EEI reporting, DOMS has the ability to inquire for specific information. This has never been an option before this time. The people of America are well served and protected by these operations.

This program could just as easily be called Early Essential Information since that is one of its major benefits to the people of the impacted areas. When Tropical Storm Gordon crisscrossed Florida in November, the first EEI message sent by Florida Army MARS preceded the normal commercial news coverage by six (6) hours! This was six hours in which DOMS could plan its support to the area and have its assets ready if needed. In October, Texas Army MARS members had the option of reporting massive flooding or massive fire. They had the unusual situation in which both elements were present. Messages of appreciation and "Job well done!" comments were extended to both groups by DOMS and by all levels of Army MARS.

With all the practical experience that Army MARS operators have gained in emergency communications, one might wonder about the continuing programs of participation in emergency exercises within Army MARS and in cooperation with other agencies. There is an age-old adage that "Practice makes perfect." With ever-changing parameters of operation, often dictated by outside events or customer needs, these exercises prepare the Army MARS operators to meet any and all contingencies. Such was Army MARS participation in the quarterly FEMA training exercise in December. FEMA's aim was to "exercise" the National Emergency Coordination Net. This net provides backup command and control communications between FEMA and Emergency Support Functional Areas (ESF). This exercise also allows Army MARS to review its own assets and capabilities in serving other agencies. This third FEMA/Army MARS cooperative venture was declared a success by all the parties concerned.

Army MARS is ready and able to serve the Army, the country, the community, the people wherever they need us. Army MARS, as do all the MARS services, faces many challenges in 1995. These challenges will be met with skill and with a dedication to continual improvement of the services offered.

Army MARS...always...proud, professional, ready. WR

BOY, HARRY, I NEVER WOULD HAVE RECOGNIZED YOU FROM JUST THE SOUND OF YOUR VOICE!

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

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 K6IS Thurs., 8 p.m. 145.19(-). 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(-).

Saint Petersburg Amateur Radio Club. Meets 1st Fri./monthly, 7:30 p.m., Red Cross Bldg., 818 Fourth St. North, St. Petersburg, FL. Nightly nets 6:30 p.m., 147.06(+), 224.66(-). Rptrs. 147.06(+), 224.66(-), 444.475(+). Info: R. Russell, N4ZMQ, (813) 896-2518.

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 146.94(-). 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.

Hamfesters Radio Club, W9AA. P.O. Box 42792, Chicago, IL 60642. Meets 1st Fri./monthly, 8 p.m., Crestwood Civ. Ctr., 139th & Kostner, Crestwood, IL. Nets: Sun. (local) 0100 UTC, 28.410 MHz; Mon. 9 p.m. 146.43 S., Packet Mailbox 145.65. Info: (312) 974-3291.

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

Quannapowitt Radio Assoc., Inc. 6 Savin St., Burlington, MA 01803. Meets 4th Fri./monthly, 8:00 p.m., (May & Nov. meets 3rd Fri.), at Lynnfield-Wakefield Methodist Church, Wakefield. Info: Jim Chamerlain, N1AKG, (617) 944-5098.

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. to 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.

Hazel Park Amateur Radio Club. Meets 2nd Wed./monthly, 7:30 p.m., (Sept.-May), Hoover Elementary Sch., Hazel Park, MI. Net Sun., 9 p.m., 146.640.

Hiawatha Amateur Radio Club (H.A.R.A.) P.O. Box 1183, Marquette, MI 49855. Meets 1st Thurs./monthly, 7:30 p.m., Jacobetti Veterans Facility, Marquette. 146.760.

Utica Shelby Emergency Communications Assoc., (USECA). P.O. Box 1222, Sterling Hgts., MI 48311-1222. Meets 2nd Tue./monthly, (Sept.-June), Donald Bemis 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

Lebanon Amateur Radio Klub, Inc. P.O. Box 2034, Lebanon, MO 65536-2034. Meets 1st Mon./monthy, 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, NW7O, 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 Zimmerman 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 7.240. "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 28.480 at 8:30 p.m., 7260 at 9 p.m. and Sat. 6 p.m. on 7.240. Rptrs. 146.91(-), 146.715(-). P.O. Box 240, Rd. #1, Adena, OH 43901. (614) 546-3930.

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 997-6838.

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.

Mid-Atlantic ARC. Box 352, Villanova, PA 19085. Meets 3rd Thurs./monthly, 8:00 p.m., Radnor Mem. Library, Wayne. Call Bob Haase, W3SA, (610) 293-1919. 147.06(+) WB3JOE pt.bbs.

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.

Radio camp: Making a difference in people's lives

JOHN DOUGLAS, NØISL

Twice each year Courage Center provides the opportunity for people with physical disabilities or sensory impairments to gain their Amateur Radio licenses in a unique setting adapted to their special needs.

In January and August HANDI-HAM members from everywhere in the country attend Radio Camp, where they learn the skills required to be licensed Amateur Radio operators. The fifty campers at the August Courage North's HANDI-HAM camp were treated to an early fall this year as they made their way between the tall Minnesota pines to the classes. Campers arrive on Sunday, stay in comfortable cabins, and attend classes Monday through Friday. No personal care attendants accompany the campers, even those with severe disabilities, as trained counselors are on duty. There are plenty of opportunities for recreation as well as study. Saturday is test day, when, for many campers, their dreams of becoming ham radio operators come true! There is a special Saturday evening dinner and celebration, then on Sunday the campers travel home. A similar camp is held at Camp Joan Mier in Malibu, California during the second week in January.

But what if a person with a disability is already licensed? Can that person still attend camp? Yes! The camp provides instruction for every license class as well as seminars in operation, satellite, digital modes, computers, adapting radios to special needs, in addition to non-radio activities around the Lake George, Minnesota camp. This year was my first opportunity to help as an instructor at the camp. In earlier years I have been to the camp, to present the evening program, or to attend the Advisory Board meetings held there each year.

To the many people who donated computers and station equipment for the new station at the camp I pass on thanks. For the volunteers who donated the time and effort toward making this year's camp a success, well done!

How your club can get involved?

This is for those who might like to get involved. One of the missions of the Courage HANDI-HAM program is to help these newly licensed hams become a part of the world-wide ham community in as many ways as possible. What better project could a club of any size undertake than finding someone with special needs and providing a scholarship for them to attend a HANDI-HAM Radio Camp?

The modest tuition fee of $150 covers the camper's share of the week's food and lodging, all instruction, many recreational opportunities, and personal care. This is made possible by many generous supporters of The United Fund, Courage Center, and HANDI-HAMS. Surely there are many members in your own group of ham friends who have family members who would like to learn Amateur Radio at a HANDI-HAM camp.

Yet, as you probably have observed, such people often have difficulty making ends meet as it is.... The tuition and travel expense seem unreachable and THAT'S WHERE YOUR CLUB CAN HELP! Then after the camp, these newly licensed hams would like nothing more than to help with Field Day, be the logger at the next contest event, even be the president of your radio club. Help a person with a disability be part of your world, by being part of theirs!

Who is eligible?

Your club may be interested in sponsorship, but there may be questions from members about who would be eligible and how to approach them. The answers are really pretty straightforward: any person with a physical disability or sensory impairment can be considered for membership in the Courage HANDI-HAM System.

People of every age, men and women, boys and girls, with many different physical disabilities, blindness, or deafness attend. And you find folks in your area who would qualify in much the same way your club does recruiting already; the difference is that now you are armed with the knowledge that an organization dedicated to Amateur Radio education for people with physical disabilities is going to be there to help with camps and adapted study materials.

Many HANDI-HAM members get licenses by studying on their own, or with the help of "Elmers," who help them on a one-to-one basis. Others choose to attend Radio Camp. In any case, "adapted" study materials on cassette tape are available from the Courage HANDI-HAM System.

For more information on how your club can help people with physical disabilities or sensory impairments such as blindness or deafness, contact: The Courage HANDI-HAM System, 3915 Golden Valley Road, Golden Valley, MN 55125, (612) 520-0515, or HANDIHAMS@aol.com. You can also get to me at "johnn0isl@aol.com" 73

QUARTER CENTURY WIRELESS ASSOCIATION INC.

John G. Troster, W6ISQ

New Old

Many folks have written to HQ saying they had seen the QCWA ad in this magazine and want to know how to join. We want to acknowledge and thank those who have thus decided to upgrade and perhaps become one of us, the proud, the many, the Honor Society of Amateur Radio, the QCWA. Here are a few of the recent inquirers: Everett Curry, K6VGL, William Galliher (no call given), William Jackson, KE4JHI, Bill Larned, N9XCY, Joe Horsky, VE3HMD, Raymond Gascon, W67SYS. If you want to fall in with the rest of us, write the old swab jockey: Big Jim Walsh, W7LVN, QCWA GM, 159 E. 16th Ave., Eugene, OR 97401-4017.

QCWA QSO party, members only

I had a note from J. Frederick Strom, K9BSL, who is coordinating this year's QCWA QSO party. He asks that we alert QCWA members to this annual party and invite everybody to get in the act.

This activity is for QCWA members only, a CW QSO party (not a contest, I am assured, quack quack, heaven forbid), and it begins 11 February at 0001 UTC and ends on the 12th at 2400 UTC. The phone party begins 11 March, ends March 12 at same times as above for CW.

Rules about exchanges, scoring, sample logs and other information will be in your winter edition of the *QCWA Journal*. Read before starting.

Professor Gordo at work

Some of you may never have been in a contest, or perhaps would never willingly participate in one, etc, etc. But this isn't a contest! It's a QSO party which means you are not under contest pressures, and can feel free to yammer with the other QCWA old goats as the occasion arises. Just pass the time of day and somewhere during your chat, exchange the required information to make it official. Well, most of the time it's like that, but every now and again there's a wild Old Goat who will forget and think he's in a contest. Forsooth and forshame, but that's the fun. You can if you do, and you can't if you won't.

If all 10,000 current QCWA members got on the air and each made a measly 10 QSOs each—what fantastic QRM! Real fun! That's not too many QSOs to ask, is it? Ten? But, hey, what a blast! 100,000 QSOs, or is it 50,000 QSOs since it takes two to tango. And for 29¢ you can send in a copy of your log and see your call in the *QCWA Journal*. What have you got to lose? You can make at least 10 QSOs. Why not go for big time—11? I'm going for a whole lot more. Beat me if you can.

Gordon West, WB6NOA, one of us

As ***Worldradio*** readers know, Gordon West, WB6NOA, of Costa Mesa, California, writes an interesting, informative monthly column in this publication. He's now a monthly columnist for the *QCWA Journal*. Gordon is perhaps even better known as a teacher of the skills of becoming an Amateur Radio operator.

His teaching career began by his starting a course at Orange Coast Community College in Costa Mesa, California for those who wanted to obtain commercial radio telephone licenses. But it was soon apparent that there was an even greater demand for getting ham radio licenses. To accommodate them he developed and offered an 18 week, $30 course, also in the Community College. It became so popular that he added private classes outside the college which ran for nine weeks for a slightly higher fee.

The college eventually got into a budget crunch which caused a deterioration of facilities, so Gordon went full time into private classes. He wrote spiral bound books and made code audio cassettes which concentrated on the introductory level of Amateur Radio , Novice and Technician class licenses.

He also changed his teaching procedure. Instead of the original 18 week course, he reduced his classroom program to just a single weekend! Skeptics didn't believe it was possible to teach the entire Novice course in a weekend, but Gordon's plan did it. A month before his weekend class begins, he assigns his students a concentrated study program of reading from his books and code learning from his cassettes. The student is expected to pretty well master the ma-

terial before being accepted in the weekend class. Thus when the three day class meets, the students are well up to speed, ready to understand the principal points they'll need to know for the Novice/Tech license exams.

Radio Shack carries a full library of Gordon's books for all levels of amateur licenses, starting with his first texts, manuals, and cassettes at the Novice/Technician level. Over time they proved so popular that Gordon wrote material for the other license categories. He estimates that about one third of those receiving Novice licenses have used his study programs. Gordon became interested in radio when he was young by listening to short wave on a Hallicrafter receiver.

He was particularly fascinated with how radio can go from here to there through the air. Then he heard amateur CW on 40 Meters, so he learned the code to be able to copy what they were saying. Soon after, he got a Class D Citizens Band license and was able to talk around the country, and by now highly inspired, upgraded into the ranks of Amateur Radio.

He went to Chapman College in Orange, California, but his radio knowledge is pretty much self-taught. Must have covered the ground (or in this case, air) because he worked for Walt Henry of Henry Radio doing technical work.

Gordon's columns in ***Worldradio*** often deal with maritime mobile topics. This is because his love of boating rivals his interest in Amateur Radio. He speaks with authority based on first hand experience in maritime Amateur Radio matters.

The weekend classes now are directed to the interest in the no-code licensing program as an introduction to Amateur Radio. But he teaches the code to the no-code trainees whether they want it or not. He wants them to know that it's not as hard as they might have feared, plus it's fun, and from there easy to step up into higher amateur ranks.

Gordon pays tribute to the QCWA in that our organization backed the idea of no-code licenses from the beginning. He is pleased to point out that the Amateur Radio ranks are swelling today principally because the no-code licensees do upgrade to full amateur privileges.

Gordon's YF Susie, N6GLF, doesn't do teaching, but helps with preparing and distributing materials to students. Both she and Gordon encourage those who would like to teach courses at the Novice level to sit in on the weekend courses. He shows these hopeful Elmers how to organize the material for the class and even asks them to help teach for the experience.

How does he keep up with new developments? Well, he travels to seminars and symposiums and larger ham gatherings to exchange ideas with others. He seems to be always on the go—I first met him at his booth in Dayton. He's particularly interested, nowadays, in the field of digital and satellite communications, and of course, in mobile marine development and equipment of any kind! We can guess he'll be out with some more manuals.

Correction

In the December story about Lew McCoy we mentioned that he had invented the Ultimate Transmatch. A letter was received from Al LaPlaca, W2WW saying that he had the original idea from which Lew developed the Transmatch. Reference July, 1970, *QST*, the original Ultimate Transmatch article, in which Lew said "....a variable inductor is used, the idea for this innovation coming from Al LaPlaca, K2DDK (now W2WW) ....Using a roller inductor, along with the two variable capacitors, the Transmatch provides almost unlimited matching range plus the feature of 80 through 10 meter coverage without band switching." Glad to restore credit where it is due.

Easy Target

The Pacific Division Convention was a great success this year. Interesting talks and exhibits. One highlight for me was meeting Cynthia Wall, KA7ITT, author of EASY TARGET, another in her series of adventure/Amateur Radio books published by ARRL. You might remember that we wrote a feature about her in this column September, 1993. EASY TARGET is for teenagers, and their parents, and is about whales and hams and other things...but I won't give away the plot. For a teenager, girl or boy, who might be on the brink of Amateur Radio, this is a great read. Be sure to read it yourself first, of course.

73 + 25, Jack, W6ISQ WR

FM & REPEATERS REPEATERS REPEATERS REPEATERS REPEATERS

BILL PASTERNAK, WA6ITF

HF vs. VHF voice bulletins

"Does a so-called 'bulletin station' such as W1AW or K1MAN have a right to broadcast...an announcement at a specific time and frequency regardless of the activity on the band?" Editor Fred Maia of W5YI Report asked this in the October 1, 1994 issue. Why he asks the question, I do not know. He has to know that the United States Amateur Service rules very clearly state that any licensed radio amateur operating as a bulletin station does! More on the legal aspect in a moment. First lets talk about the "reality" of such services in today's modern world of Amateur Radio.

The question of "legality" has been affirmed several times by the FCC. Each time a challenge has been brought by some disgruntled ham whose QSO was interrupted by a bonafide bulletin, the FCC has held that stations who conform to FCC Part 97 Rules governing the operation of "bulletin stations" are "legal." That is well established in 97.117(4)(b)(6) on Authorized Transmissions which says: "An amateur station may transmit the following types of two-way communications:

(b) In addition to one-way transmissions specifically authorized elsewhere in this part, an amateur station may transmit the following types of one-way communications:

(6) Transmissions necessary to disseminate information bulletins." As the Producer of *Newsline* (formerly the Westlink Radio Network) for the past seventeen years, I am obviously deeply involved in the preparation and dissemination of such bulletins. I also have some very strong opinions that I want to share with you.

I think that the real question is not whether or not K1MAN or W1AW "have the right to broadcast." Rather than "legality" I think that the real question is one of "morality." Is it "morally" correct for either station, or anyone else to issue "voice bulletins" on our very crowded HF bands? Please note that the active words here are "voice bulletins." Bulletins that take up spectrum space on bands already overburdened with activity, and because of the crowding, few people really can hear.

I normally spend my break time in the work QTH hamshack. We have a TS-440 connected to a Cushcraft A-3S atop a three story building in Hollywood. There is a clear shot everywhere but due north where we are blocked by the Hollywood Hills. Those who operate from it say it's a better than average location.

It is also located about 3000 miles southwest of K1MAN and W1AW. One is in Maine; the other in Southern Connecticut. Of the two, K1MAN normally has better of the two signals into this location. But, even under the best of band conditions I would not want to rely on trying to regularly obtain my "ham radio news and information" from either entity. As any of you who have tried to copy either service on a regular basis know, the QRM is horrendous.

Malicious interference is not really an issue

The problem is not the malicious interference that Glenn Baxter, K1MAN claims to be suffering. I've not heard any of that since he distanced himself from the problems plaguing 14.313. The interference that I hear is unintentional, and usually coming from outside the United States.

If K1MAN or W1AW are "covered up" at my work location, it's usually a Spanish-speaking South American station that's the source. A few weeks ago, a 20 Meter W1AW bulletin was unreadable due to Japanese stations coming in 5x9! ZLs and VKs also blow in to the West Coast with hefty signals.

While each location will have different conditions, I am willing to wager that 99.9% of the stations causing interference to W1AW and K1MAN are outside of the United States; and therefore, outside of the jurisdiction of the United States' government. W5YI reports that K1MAN wants the United States Attorney to step in and solve his interference problem. If my observations are correct, such an investigation would be impossible.

Nor do I see complaints by either K1MAN or W1AW to the radio regulatory administrations of other nations to do anything to eliminate the problem. Simply said, neither W1AW nor K1MAN "own" any of the frequencies that they transmit on. They belong to the radio amateurs of the world, and it is this larger group that has the right to determine how the frequencies in question will be used.

Yesterday, today and tomorrow

But I digress. As I said earlier on, it seems that the only bulletins that have come under fire are "voice bulletins" which some hams say cause QRM to other ongoing communications. And this leads to the obvious question of "why is 'voice' even being used for bulletins on HF?"

To answer this, we must look at the telecommunications technology of yesterday vs. that of today. Two decades ago, high frequency voice bulletins were one of only three possible ways to reach the world's ham radio community. CW and RTTY were the other two. But scientific research and technological advancement has brought Amateur Radio a myriad of reliable, accurate and high speed data transmission services.

Today, a large number of hams have some sort of data handling capability, even if it's nothing more than an old Commodore C-64 computer and a Digicom packet modem. More are joining ham radio's version of the "information superhighway" every day. Some of us involved in ham radio news dissemination realized early on that the data-based information revolution was underway. As a result, both the ARRL's W1AW Bulletins and our *Newsline* scripts, rewritten as bulletins are everywhere!

You find our combined information on packet; on numerous PBBS; on commercial BBS systems like *GEnie, Compuserve, America Online, BIX,* etc. And within hours of release, all of this material is piped onto the Internet where it is available from several of on the newsgroups. Dissemination is fast and not affected by the anomalies of HF propagation. With this ability now in the hands of the world's ham radio community, I often wonder what value, if any, voice bulletins have on the high frequency bands except to add to the ever mounting level of QRM?

The real place for HF news bulletins is in transmission by non-voice modes. The growing number of data stations on HF are ideal for this purpose. With automatic error correction there is a 99.9% chance that any bulletin of consequence to non-US stations will reach them in a timely and accurate manner. In more remote areas, there are still numerous skilled CW operators

handling a myriad of messages every day. While not as error free as digital modes, CW assuredly fares better than SSB voice even under the most ideal of conditions. Don't take my word for it. Just ask anyone opposed to no-code licensing.

Repeaters: a better home for voice bulletins

The obvious next question then becomes: "if voice bulletins are a waste of time and effort on the HF bands, do they have any place at all?". The obvious answer to this is "yes" as demonstrated by the more than 6000 calls received every week by *Newsline*. And note that the active word here is "calls" because unlike either W1AW or K1MAN, our bulletins are distributed by telephone and specifically targeted to the far more structured environment of VHF/UHF repeaters and simplex nets.

Seventeen years ago, when Jim Hendershot, WA6VQP, and I began *Newsline* we realized that audio news bulletins transmitted in SSB on the HF bands were not very enjoyable to listen to. Have you ever taken the time to listen to W1AW or K1MAN? Yes, both are quite intelligible when band conditions are good, but in regard to audio quality, neither come close to *CBS network radio* or *CNN radio news*. VHF FM and FM repeaters are another story. To start with, most have transmission as determined by the Fletcher - Munson pre-emphasis and de-emphasis curve giving a "fuller" and more enjoyable sound, even when fed from a telephone hybrid on a non equalized telephone line.

Second, voice bulletins played on repeaters are normally presented as part of a structured information net. Unlike the high frequency transmissions of K1MAN and W1AW, they are there by the choice of the people who own and use a given repeater. Therefore, the listenership is established and it expects to hear a voice bulletin at a given time, on a given channel, as a part of the routine operational procedures on a repeater. In other words, the people listening are there because they want to be there; the environment is structured and therefore the voice bulletins on repeaters do not QRM anybody!

Third, voice bulletins issued over repeaters are convenient. They are no different than listening a newscast on your favorite AM radio station except for their content being related to matters of personal communications. You can listen at your leisure; you can listen while stuck in a rush-hour traffic jam; you can listen on your lunch break, etc. Basically, you can avail yourself of a VHF ham radio news bulletin anywhere you can hear a repeater. Even over a hand-held radio. This is not true of HF voice bulletin operations.

An international demographic issue

But there is a definite downside to targeting repeaters for bulletin dissemination. That being "target audience" and "demographics."

Services such as *Newsline*, Hap Holly, KC9RP's *RAIN-Dial-UP; Eastlink, Ohio Ham Radio Report*, etc. are designed primarily for domestic consumption. That is, to serve the needs of United States hams on a national or regional basis. Hams licensed under other governments cannot really avail themselves of these services except on a one-on-one, telephone basis. Simply, the radio regulations of many nations still forbid hams issuing informational bulletins on the air. Besides which, how many hams in Bombay or Paris or Beruit really care about a repeater coordination problem in Chicago? Or a ham on Long Island, New York being sued by his neighbors over the height of his tower? Or about hams aiding a March of Dimes Walk-A-Thon in Memphis? Or who won as ARRL West Gulf Division Director? Very few I would guess. These are domestic "North America" issues that mean nothing to those in other lands.

This obviously leads to the question of whether or not K1MAN or W1AW should be targeting anyone outside the United States? After all, the ARRL's charter is very clear in stating its various services are specific to its members. True, the ARRL has a small number of "members" living in foreign lands, but does that justify a continuation of an international voice bulletin broadcast service?

On the other hand, K1MAN bills himself as the "Network Manager" of an organization called The International Amateur Radio Network. He also claims its chartered purpose is to provide Amateur Radio emergency communications anywhere in the world. As such, it appears as if Baxter is the more justified of the two in disseminating material on a worldwide scope. But has he asked the communications administrations of each nation his signal enters if that nation wants its radio amateurs to listen to his broadcasts? I doubt it!

The bottom line

SSB voice bulletins issued on the HF bands serve few and cause problems for many. Even the best of SSB bulletin stations, when listened to on the most modern gear, are difficult to hear about half the time. They suffer from unintentional QRM and the whims of nature. The energies expended by W1AW and K1MAN in producing and airing them would almost assuredly be better be spent by typing them onto the Internet and letting them roam free.

Yes, a place exists for "voice bulletins," but only as a convenience to US hams and their repeaters. This is the audience served by *Newsline*. It has been our primary audience since 1976; it is a loyal audience that appreciates the effort put into the preparation of each newscast; and it is the audience that *Newsline* will continue to service as long as we remain a viable entity.

So we come full circle and again ask if HF voice "bulletin stations" should continue to operate? This question is one for the world's Amateur Radio community to answer, and it is the obligation of W1AW, K1MAN or any other HF bulletin operation to listen and to accede to community will. If the Amateur Radio community says "no" then they should go away!

Don't do it!

If you own a Radio Shack HTX-202 hand held, this is for you. No matter what any other ham might tell you. No matter what you read on packet radio. No matter what might be published in a radio club or other newsletter. Please —please do not try and perform any sort of extended frequency coverage modification to the Radio Shack HTX-202 two meter hand-held transceiver that Santa brought you for Christmas! The simple fact of the matter is that it is not possible to make an HTX-202 operate out of the ham bands. This is because the folks at Tandy Corporation designed it that way. Both in hardware and in software.

(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

Computers & BASIC STUFF

C.H. Stewart, KD5DL
P.O. Box 181
Duncan, OK 73435

BASIC Skin Effect

A few years ago I got interested in mobile antenna design. My thinking was along the lines that I could build one myself, save on the cost of commercially-available antennas, and learn some theory to boot. One of the things that came out of my research was a chance to have the results published in Kurt N. Sterba's column in the May 1991 issue.

One thing continued to haunt me, though, and that was how to predict or measure antenna Q. This so-called "quality factor" or "factor of merit," Q applies to a number of things in radio, including coils, capacitors, tank circuits, transmission lines and antennas. Basically, Q is the sharpness of resonance of a tuned circuit.

An antenna with high Q might be desirable for a single-frequency station, such as a commercial broadcast station, but in amateur designs the Q should be tailored to fit the appropriate band, or bands, of usable frequencies.

In my case, no matter what I did, I got unacceptably high Q in my calculations. The calculations had to be correct, I thought, because I got them from the ARRL *Handbook*. I simply used the standard formula: divide the loading coil's reactance by its wire resistance.

I have since found that the formula is correct, it just doesn't tell the whole story. I had erred by using the wire's DC resistance in the formula when I should have been using something called "equivalent series resistance." The *Handbook* could have explained it a little better.

Equivalent series resistance, in the case of a coil, is its AC resistance, the proximity affect caused by nearby turns, dielectric losses (that contribute to distributed capacitance within a coil) and eddy current losses to nearby conductors. All of these factors contribute to make mathematical forecasts of Q somewhat difficult. The usual procedure to determine Q is not so much designing it into a component, but to measure it afterwards. A few rules-of-thumb help in a design process in what is otherwise a trial-and-error affair.

Part of my problem was in not understanding the role frequency has on resistance, or, more specifically, on wire resistance. What I have since learned is that something called "skin effect" occurs at RF frequencies, and the thickness of this skin's depth determines how much of the conductor actually conducts.

Skin effect is a phenomenon wherein the magnetic flux created by a flowing current offers greater inductance in some parts of a conductor than in other parts. For a round wire the inductance in the center of the wire is greater than nearer the surface, so electrons flow less restricted along the "skin" than they do at the wire's core. At higher frequencies the center of the core is essentially a non-conductor. This effect is one reason we can get away with using hollow tubing for HF antennas and in some tank circuits.

Skin effect depth is related to AC frequency, resistivity and magnetic permeability of a conductor. In BASIC the formula would be D=5033*SQR(R/(P*F)), where D is skin depth in centimeters, R is the conductor's resistivity in ohms per centimeter cube, P is the magnetic permeability of the core material and F is the AC frequency in Hertz.

For copper, at .000001724 ohms per cm unit, the formula reduces to D=6.61/SQR(F) for depths in centimeters or D=2.602/SQR(F) for measurements in inches. For aluminum wire the numerator would be 8.4638 (cm) or 3.33 (inches) and for silver it would be 6.424 (cm) or 2.53 (inches).

Steel, because of its relatively high magnetic permeability, has very shallow skin depths. A steel wire might have a resistivity of .00008 ohms per centimeter and a permeability around 3000 or more, giving it a skin depth of perhaps four or five percent of what it would be in a copper conductor at the same frequency. That is one reason why steel wires used in communications service (especially antennas and transmission lines) are usually clad with a copper exterior. The copper provides lower RF resistance (and solderability) while the steel core gives the wire its tensile strength.

Let's see if we can find out how the theory works. Almost any copper wire table in any electronics handbook gives wire sizes and their DC resistances. AWG 20 wire, for instance, has a diameter of .0320 inches and a DC resistance of .01035 ohms per foot. Using the formula given a few paragraphs ago, and a frequency of, say, 1 MHz, we can see that the depth of skin will be about .0026 inches. That means that the center .0268 inches (.0320 minus twice .0026) is not contributing to the AC current flow. The equivalent active area of the wire then is the area of the original wire minus the area not being used. This works out to an equivalent diameter of about .0175 inches. That's about the same size as AWG 25 wire. The AC resistance of #20 wire at 1 MHz, therefore, is about equivalent to #25 wire's DC resistance, or about .033 ohms per foot.

This month's BASIC program puts it in a nutshell. It combines the skin effect formula with one for determining AC wire resistance (see line 50). Program inputs are wire size (AWG or B&S gauge) and operating frequency. The formulas

assume the wire is copper:

```
 0 REM: WIRE AC RESISTANCE,
    BY KD5DL, WORLDRADIO
    02/95
 10 CLS: PRINT " USE AWG '999'
TO
    QUIT ": PRINT
 20 INPUT "AWG NUMBER ", A: IF
    A=999 THEN 90 30 INPUT
    "FREQUENCY (MHZ) ",F
 40 G=.46/(1.1229322^(A+3)):
    D=2.602/(1000*SQR(F))
 50R=.003132*SQR(F)/(G*3.1415926)
 60 PRINT "  SKIN DEPTH= ";D;"
    INCHES"
 70 PRINT " AC RESISTANCE= ";R;"
    OHMS PER FOOT" 80 PRINT:
    GOTO 20
 90 END
```

Using our AWG #20 wire example in a trial run, you should get a skin depth of about .002602 inches and an AC resistance of about .03119 ohms per foot. These formulas, by the way, were derived from chapter 1 of Frederick Emmons Terman's book, *Radio Engineering*, published in the 1940s. A more recent explanation is in Irving M. Gottlieb's *Practical RF Power Design Techniques*, 1993.

The formulas, of course, apply only to single-strand conductors. Multiple-strand conductors offer a bit more surface area, so their effective AC resistances are somewhat lower at similar frequencies.

If the multiple strands are insulated from each other, and woven so that each strand has an equal exposure to the lines of magnetic flux, then AC resistances can be cut significantly. Early broadcast stations used this Litz (Litzendraht) wire to fashion tank coils with relatively high Qs. Unfortunately, Litz wire is useful only up to about 1 MHz. Above 1 MHz you can use wires with large diameters to keep AC resistances low.

Back to my original problem—I never did learn the Q of my antenna or its loading coil, although I am sure there are enough easy ways to measure it. What I do know now is why my figures were so far off back in the beginning. And I think I now have a much better understanding of AC resistance and maybe some of the reasons for ohmic losses in transmission lines and wire antennas. Like they say: You can learn from your mistakes. **WR**

Where is it?

The first place to look for information is the section of the manual where you least expect to find it.
—*Mike and Key,* Sacramento ARC

HAM TALK PUZZLE

MARTY HUFFMAN, N8SEY © 1994

Locate each word listed below in the puzzle. Words can be horizontal, vertical, diagonal, and backwards.

S	R	O	T	S	I	S	E	R	E	W	O	P	S
R	A	C	S	O	D	T	R	A	F	F	I	C	W
O	G	T	H	A	O	E	R	U	S	E	T	I	I
T	C	M	E	N	T	E	S	N	C	P	A	R	G
A	H	L	E	L	T	E	G	A	I	N	D	C	A
R	E	S	I	E	L	I	G	K	N	X	U	U	Y
E	W	F	M	O	S	I	S	E	O	L	A	I	C
P	R	O	P	A	G	A	T	E	M	A	B	T	N
O	T	S	R	W	U	N	R	E	R	I	G	E	E
O	S	P	A	K	A	T	O	M	A	X	E	N	U
I	E	T	E	K	C	A	P	S	H	A	C	K	Q
D	T	T	E	V	A	W	E	U	C	O	D	E	E
A	S	E	R	I	E	S	R	O	T	C	A	E	R
R	O	T	A	R	E	N	E	G	D	A	R	A	F

ANTENNA
BAUD
CIRCUIT
COAXIAL
CODE
CW
DX
EXAM
FARAD
FILTER
FM
FREQUENCY
FUSE
GAIN
GENERATOR
GIGA
HARMONICS
LEADS
METER
NET
~~OHM~~
OPERATORS
OSCAR
OUTPUT
PACKET
POLES
POWER
PROPAGATE
RADIO
RAGCHEW
REACTOR
REPORT
RESISTOR
RF
RIG
RST
SATELLITE
SERIES
SET
SETI
SHACK
SKIP
TEST
TONES
TRAFFIC
WATT
WAVE
WORK CW
YAGI

Richard Fisher, KI6SN

1940 Wetherly St.
Riverside, CA 92506

The Sierra, in review

QRP kit building — much like life, it seems — is a series of great expectations.

Just imagine the pressure managers of the Northern California QRP Club must have felt when producing a follow-up project to meet or exceed its 1994 triumph: the NorCal-40 monoband QRP CW transceiver. Legions of QRP homebrewers were waiting in anticipation. Generally regarded by its users and builders as one of the best kits ever produced, the NorCal-40 (reviewed here in February 1994) is undoubtedly a QRP classic. So, how do you follow an act like that?

I suspect it wasn't easy, but designer Wayne Burdick, N6KR, and his NorCal cohorts, Jim Cates, WA6GER and Doug Hendricks, KI6DS, have done it in style with the NorCal Sierra all-band superhet QRP transceiver. In most respects, comparing the Sierra and NorCal-40 is comparing "apples and oranges." But in electronic design, relative simplicity and kit craftsmanship, the Sierra kit joins the NorCal-40 as absolutely first class.

The Sierra can be built to cover all HF amateur frequencies — 160 through 10 Meters, including the WARC bands with easy-to-plug-in band modules. A quick-release top cover makes bandswitching a breeze. With a little practice, the whole process takes about 10 seconds. Obviously, a lot of hours were spent at the drawing board before the first curl of solder smoke rose from the earliest Sierra circuit board prototype. And it shows. I've built the Sierra, operated it extensively on 80 and 40 Meters and couldn't be more impressed.

Running one watt to a G5RV antenna 15 feet high, the Sierra performed spectacularly on 7 MHz during the ARRL's 1994 November Sweepstakes. With less-than-optimum band conditions, 146 QSOs were managed in 49 sections during 12 hours of operation at KI6SN here, in Southern California.

Anyone who has ever worked SS knows what receiver front-end-bashing QRM is produced on 40 CW. But between the Sierra's selectivity and sensitivity, coupled with RF gain, AF gain and RIT adjustments from the front panel, even East Coast signals were copied through the firefight with relative ease.

Later, during casual operation one November evening on 80 Meters running two watts to the G5RV, I managed to break — on the first call, mind you — a wild stateside pileup to work XE2JNE in La Paz, Mexico. A short time later — same night, same band — KH6CC sent me a 559 from Hawaii.

On-air reports on stability, tone and keying characteristics have been A+. Here are some of the reasons why:

The rig's rock-solid VFO is capacitor tuned, and covers a hefty 150 kHz of each band. Transmitter output ranges from 1.5 to 3 watts, depending on the band of operation. The main tuning capacitor comes with an 8-to-1 vernier drive for smooth sailing across the bands. Receiver sensitivity is better than 0.5 microvolts for 10dB S+N/N, and selectivity is -6dB at 400 Hz, -32dB or better at 1 kHz. The Sierra's IF is 4.915 MHz with a four pole Cohn filter and a single-crystal filter following the IF amplifier. Front panel controls include audio gain, RF gain, RIT control with ON/OFF toggle switch, and VFO tuning. Headphones plug into the front panel. There is plenty of audio, with about a half-of one watt into 8 ohm headphones or speaker. Laboratory specifications aside, this is simply a great CW transceiver that was as much a pleasure to build as it is to operate.

My kit arrived in early October, and I went to work on it right away in hopes of having it up and running for the November Sweepstakes. The bags of parts and aluminum chassis were accompanied by a superbly-written, spiral-bound manual. The documentation first touches on basic information for homebrewers, and then guides the builder through board assembly. There's an extensive and detailed alignment and testing procedure — with step-by-step instructions broken out either for builders with lab test equipment; builders using only a test receiver and transmitter; or builders using a DDM and RF probe. There are also sections on operation, troubleshooting, design overview and circuit details.

Like the NorCal-40, all of the Sierra's parts are on its circuit board — there's no chassis wiring. The top and bottom covers are easily removed for access to the circuitry.

In design, the receiver side of the house includes an input bandpass filter followed by an NE602 mixer, 4-pole crystal filter, an MC1350 IF amplifier, NE602 product detector and BFO, LM386N audio amplifier, and an LM358 AGC. RIT comes via an LM393.

The transmitter chain includes an NE602 mixer, J310 buffer, 2N2222A driver and 2N3553 final. The VFO includes a PN4416 coupled to a premixer with an NE602 and PN4416.

This rig is not difficult to build, but it is *not* for beginners. The PC board is double sided and plated through, so fixing soldering mistakes can present some real headaches. I have some experience building solid state gear, and it took me several nights at the bench to complete the Sierra.

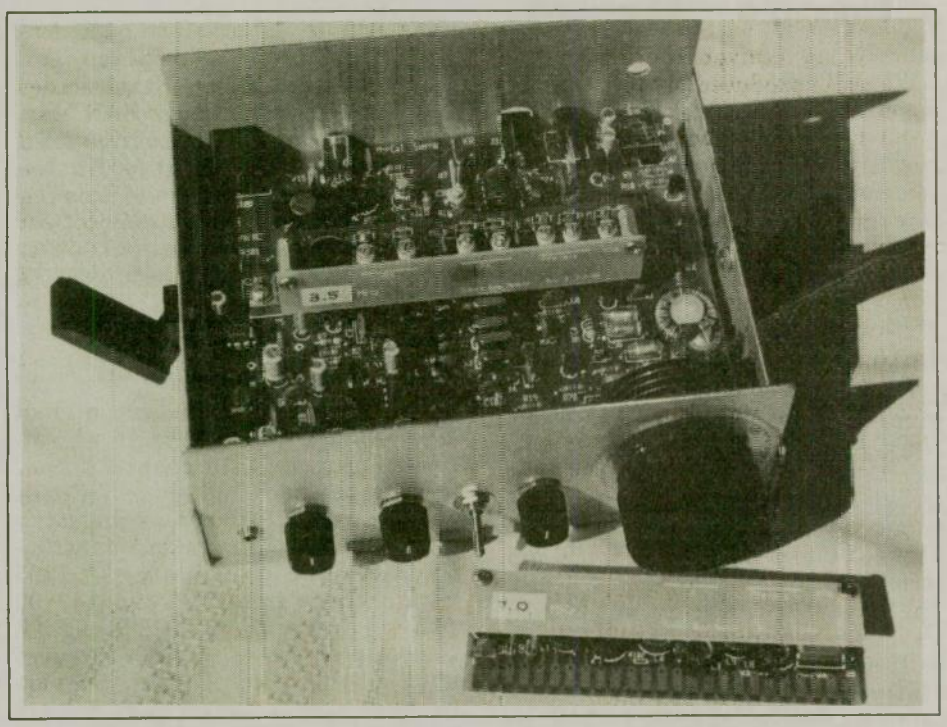
If you enjoy winding toroids, you're going to love this rig. There are seven on the main PC board, and eight per band module. If you build modules for every band, you'll be winding more than 70 toroids for bandswitching alone.

Not surprisingly, the Sierra's price tag is considerably higher than the NorCal-40's. The main board with parts and chassis was $160, and band modules were $25 each. Believe me, though, it was worth every penny.

Now for the bad news: As was the case with the NorCal-40 in 1994, the Sierra kits had a limited production run and quickly sold out.

The good news, though, is that it is quite possible you'll see the Sierra kit widely available in the future. Just as the NorCal-40 kit has been resurrected (as reported elsewhere in this month's column), so too may be the fortunes of the Sierra.

The triple play combination of Burdick to Hendricks to Cates — with the support of a handful of other pioneering Northern California QRP Club homebrewers — obviously worked



The NorCal Sierra, with 3.5 MHz band module installed and 7 MHz band module in the foreground.

hard on research and development, testing and packaging the Sierra. In so doing, they have pushed the club's stature — and QRP homebrewing — to unparalleled heights.

Given the opportunity to latch onto one, the Sierra is a kit not to be missed. Great expectations, indeed.

Now playing: the NorCal-40A

If you were kicking yourself last year for missing out on the production run of the NorCal-40 QRP transceiver produced by the Northern California QRP Club, here's your chance to make amends.

The club is now offering an updated, complete-kit version of the 40 meter CW superhet transceiver it's calling the NorCal-40A. The improvements were based largely on suggestions from people who had built and modified the original rig. Some of the updates found in the -40A include a cleaner PC board layout, more solidly seated front and rear panels, a potentiometer-adjusted AGC, room for a multi-turn VFO pot, improved keying, improved audio output and an improved manual — to name just a few.

The NorCal-40A is $89, plus $5 for shipping in the US, $6 to Canada, and $10 to other DX. California residents add $6.90 sales tax. Checks or money orders should be made out to Jim Cates, WA6GER, and mailed to him at 3241 Eastwood Rd., Sacramento, CA 95821.

If you're looking for a great 40 Meter superhet QRP transceiver, you won't go wrong with the NorCal-40A.

NE-QRP's '79er Sprint'

In the market for some QRP fun on Thursday evenings this month? Try the QRP Club of New England's "79er Sprint."

This weekly get-together during February is principally for operators using crystal-controlled QRP transmitters at 3.579 MHz, not coincidentally the frequency of the very cheap and widely available color burst crystals used in color television oscillators across the US and Canada.

Crystal-controlled "Sprint" stations can work all other stations. If you're VFO controlled, though, you may work only crystal-controlled stations. The exchange: RST, QTH, NE-QRP membership number, and your name. If you're crystal controlled, add the letter "X" to your NE-QRP membership number. Non-members send power output, plus "X" if you're crystal controlled. Also add the letter "X" to your call if you're rock bound: KI6SN/X.

The sprints run each Thursday evening (local time) in February. In UTC, it's 0200-0300, Fridays.

QSOs are cumulative, so you can work the same stations on consecutive Thursdays. Logs should be sent to Jim Kearman, KR1S, 83 Main St., Apt. 13C, Newington, CT 06111. By E-mail, it's jkearman@arrl.org. **WR**

Funniest thing...

Have you ever had a funny or strange experience with Amateur Radio, either on or off the air? If so, send it to us for consideration in our monthly "Amateur Hi" contest. You could win a free one-year subscription to ***Worldradio!***

10-10 INTERNATIONAL News

Chuck Imsande, W6YLJ
10-10 19636

10-10 New officers

The new officers of 10-10 officially took office on 1 January 1995. The officers and directors who will be responsible for the leadership, operation and conduct of 10-10 for the next four years are:

President - Tom Henderson, K4CIH #33233

Vice President - Chuck Imsande, W6YLJ #19636 and Secretary - Dave Prichard, KA5OVO #37297.

The officers will be supported by the following directors (with their committee assignments):

Linda Barnes, KJ4FM #43299 (Communications committee),

John Ellison, WØERZ #5145 (Planning committee)

Marv Hagan, WB2SJQ #6090 (Finance committee)

Bill Howe, VK4WBH #22187 (Membership committee)

Pete Matson, KC1CP #37190 (Communications committee)

Jack Miller, W9WYN #6894 (Planning committee)

Ed Redwine, K5ERJ #11843 (Operations committee)

Bob Ryan, K6YVG #18022 (Finance committee)

Joe Williams, WA9TSG #310 (Membership committee)

"I want to assure every member of Ten-Ten that I will answer any and all letters sent to me. There are a few things that I would request. If you don't like how we are doing something, let me know, include what you think to be a solution. Complaints without a possible solution do not usually correct problems. We need to know your thinking! If you are having a problem with one of the awards or any of the membership services, let ME know and I will do my best to assist with the remedy.

We will do our best to do what the majority of the membership believe is needed. We continue to solicit your suggestions and recommendations" said Tom, K4CIH, the new 10-10 president.

Address your correspondence to Tom Henderson, K4CIH #33233, 4901 15th Place East, Tuscaloosa, AL 35404-4522.

10-10 QSO parties

The next two 10-10 QSO Parties, or contests, have been announced by Harry Arsenault, K1PLR #28160. The Winter CW QSO Party will be held on the weekend of 4-5 February 1995. The party, or contest if you prefer, will begin at 0000Z on February 4th and terminate at 2400Z on February 5th. The Spring CW QSO Party will be held on the weekend of 22-23 April 1995. It will begin at 0000Z on April 22nd and conclude at 2400Z on April 23rd. For a complete set of rules and a 10-10 dupe sheet, send a #10 SASE to: Harry Arsenault, K1PLR #21680, 10-10 Contest Manager, 48 Crane Road North, Stamford, CT 06905. Mark your calendar now and reserve these two weekends for the 10-10 QSO Parties. Even with propagation being low due to the sunspot cycle, there are openings and there is always ground wave propagation. But don't give up on 10 - it will be back - it always has after each of the previous sunspot cycles. Check the band often, it is open more than you may think!

New 1000+ BAR manager

We have a new 1000+ BAR Manager. He is Allen Mattis, N5AFV #27571. Allen will replace Tom Henderson, K4CIH, who has been acting as an interim 1000+ BAR Manager, pending the selection of a replacement for Lonnie Butler, N9OSN #61493, who found it necessary to resign a few months ago. Send 1000+ BAR award applications to Allen at 5314 Wigton Drive, Houston, TX 77096-5115.

10-10 Convention

The plans for the 1995 10-10 Convention are progressing and a great time is being planned for all who attend. Forums, 10-10 chapter tables, ladies's program and shopping tour, and the usual 10-10 net are just a few of the scheduled programs. The activities begin on Thursday, June 15, 1995 with check-in from 1:00 p.m. to 9:00 p.m. On Friday, June 16th, the activities really begin and continue throughout Saturday, June 17th, with a gala banquet on Saturday night. Prizes and more prizes is the plan with a Kenwood TS-50S as the main preregistration prize. There will be two more radios as prizes along with a long list of both his and hers "goodies."

All activities will take place on June 15-18, 1995 at the Capstone Sheraton Inn and Convention Center, on the campus of the University of Alabama, in Tuscaloosa, Alabama.

The Convention Center is right next door to the Bear Bryant Museum, which will be open to 10-10 members. For a preregistration packet, send a #10 SASE to: 10-10 Convention, 4901 15th Place East, Tuscaloosa, AL 35404-4522.

Meet a 12-year-old Extra Class 10-10 member

Jonathan Fleischer, AC6GS #65861, is among the youngest with an Extra Class License, at age 12! He decided to become a ham in the summer of 1993 after watching his dad, Wayne, AB6UN #64116, who had recently received his license, talk with hams around the world. Jonathan passed his Technician class license in just eight weeks after beginning his study for his first test.

He is a seventh grader at St. John's Lutheran School in Oxnard, California and has started an Amateur Radio club at school and is helping other students get their licenses. He is scheduled to speak at the Youth Forum at the Dayton Hamfest in April of this year.

"I've talked to countries like Japan, Germany, Switzerland, Britain and Bulgaria," Jonathan said. In April 1994, he and his dad contacted the

commander on a space shuttle flight.

In addition to Jonathan, the Fleischer's have a daughter, Jennifer, KE6CKZ, who has a Tech Plus license and is 10-10 number 65855. Also another daughter, Lisa, 23 years old who is N3TRC and is working on her Technician Plus. A real ham family.

New 10-10 Roster *PLUS* on disk

The new 10-10 Roster PLUS on Disk and includes such features as call to 10-10 number and 10-10 number to call cross references, name, address, 10-10 membership status (life, full, family, club, etc.), membership expiration date, SK status, VP number, label printing and more. The new program will be called **XXIP** for 10-10 Inquiry PLUS. The program consists of three 3.5" high density disks and will run on IBM compatible computers. It will be issued in January and July and the cost is $10.00 per issue. It is planned to add additional features in the July issue such as: edit capability for names, address and calls, Logging provision and bar applications, listing of station county by ZIP code, a "notes" field to which the user can add such personal items as station's phone number; XYL's name, chapter information, stations birthday, etc., etc.

One advantage of the new **XXIP** program over other "callbook" type programs, is that the name, address and current call *is current*. Because 10-10 monitors and updates the address of all current 10-10 members through the mailing of the quarterly *10-10 International News*. Thus, we maintain a current address list. This new **XXIP** program can be obtained only from 10-10. Send your order to: 10-10 International Net, Inc. Roster on disk, 643 N. 98th Street #142, Omaha, NE 68114-2332.

Information about 10-10?

If you would like information about 10-10 and how you can become a member and receive your own unique 10-10 number, send $1.00 plus 2 first class stamps (to help cover the cost of printing and postage) plus an address label for the return of your package, to Mike Elliott, KF7ZQ #54625, at 9832 Gurdon Court, Boise, ID 83704. No SASE please as the package requires a 9 x 12 envelope. You will receive a copy of the 36 page *Information Manual* and a copy of the latest issue of the *10-10 International News*, the 32 page quarterly 10-10 magazine.

If you have lost your 10-10 number or have let your dues expire and would like to get back into 10-10, the same as above to Mike will get you the information package and your original number. WR

How many hardware engineers does it take to change a light bulb?

None: "We'll fix it in software."

How many software engineers does it take to change a light bulb?

None: "We'll document it in the manual."

How many tech writers does it take to change a light bulb?

None: "The user can work it out."

—The Microvolt

The '94 CQ WW Phone 'test

Despite declining sunspot numbers, the 1994 ZF2JI team which included Jack, ZF2DX/K1NQK, Dave, ZF2DL/N6DLU, Larry, ZF2LS/KJ6HO, Bob, ZF2NQ/W9NQ, Gary, ZF2GP/KJ4WH, Charlie, ZF2VT/N7QQ, Paul, ZF2LL/N6LL and John, K4IIF/ZF2JI, had an immediate goal, improving our 1993 score of 9 million-plus points, and a secondary goal of breaking the Cayman Islands record of some 11 million points multi/multi in the *CQ* Worldwide Phone Contest. These goals were viewed with some pessimism as propagation conditions had declined measurably since the previous year. However, with good equipment, dedicated operators and a lot of hard work, I am pleased to report that both goals were met. ZF2JI reports a new Cayman Islands multi/multi record with over 15 million points. The breakdown by bands was as follows:

Band	QSOs	Zones	Countries
160	407	9	28
80	1138	20	70
40	1852	20	70
20	3684	22	65
15	2497	34	134
10	1007	25	101

John, N8FU, is a top DX Contester from the Cincinnati area. He led all US entries in the 1993 ARI (Italian) contest 166,738 points.

Our secret weapon

Twenty Meters nosed out 15 Meters as the workhorse band this year although both 15 and 10 yielded over 100 countries, but our big surprise was 160 Meters. We hadn't expected much from the Top Band this year as propagation from the western Caribbean is notoriously poor; making it impossible to compete with W1 stations or stations in the eastern Caribbean on the path to Europe. However, we found that we had a secret weapon in Jack, K1KNQ who used his long years of YCCC experience to somehow dig out 9 zones and 28 countries from the 1.8MHz static crashes. This is by far a ZF2J1 record. Thanks Jack!

Incidentally, the ZF power limit on 160 is 100 watts and Jack observed it scrupulously.

But Murphy came along too

The American Airline's baggage handlers sent Dave Ritchie's Kenwood 950, and the transformer for his Alpha 78 to Port-of-Spain, Trinidad, instead of Grand Cayman. Fortunately, Dave had gone down a week early and the equipment retraced its steps and arrived just in time for the contest.

Results of the 1994 ARI International DX Contest

Congratulations, and a tip of the *Worldradio* hat to K3WW who topped US and North America entries in the single-op mixed category with 416 QSOs and 169 multipliers for a score of 449,852 points, and to K4PQL who was US and North America high on CW single-op with 219 QSOs and 132 multipliers for 204,468 points. Other US entries in order of score were:

KA1DWX	232,128
N2AA	137,057
K5ZD	126,024
K1BV	38,244
WB4UBD	29,970
K8JLF	28,905
WB5B	4,541

The 1995 ARI. 'test, the first full weekend in May, will be entitled the ARI "G. Marconi" International DX Contest to commemorate the 100th anniversary of the invention of radio by Guglielmo Marconi in 1895. There will be some special rules for this year's event only,

after which the regular rules will be restored. For a copy of the 1995 rules send SASE to K411F. Continental top scores in single-op were:

Country	CW	SSB	Mixed
Africa	DL8YR/ST2	S79CK/C	ZS6EZ
Asia	RWØAB	UN7R	EZ5AA
Europe	HA8VK	YO4NF	UT5UGR
No. Amer.	K4PQL	J79W	K3WW
So. Amer.	PY2OU	LU3HL	PY2NY
Oceania	VK2APK	no entry	V63YH

Results of the 1994 Dutch PACC Contest

In the Netherlands Section, the winning station in the single-op CW category was PAØVAJ with 951 QSOs and 223 multipliers for 212,073 points. He was closely followed by PAØLOU with 870 QSOs and 186 multipliers. High in the single-op category was PA3EPN with 567 QSOs and 185 multipliers for 104,895 points, while the top single op mixed category station was PAØCLN who scored 883 QSOs and 187 multipliers for 165,121 points.

Serbia dominated the Foreign Section with the two highest scoring stations. YT1BB tallied 616 QSOs and 58 multipliers for 35,728 points. YZ94DX was second. KA1DWX was the top US station and VE1VCT was high for Canada. Award winners for a few other select countries were:

Belgium - ON4XG
Bulgaria - LZ1ZF
Croatia - 9A20B
Czech Republic - OK2SBJ
England - GØAEV
France - F6CXJ
Germany - DJ5GG
Hungary - HA5MY
Italy - 1KØREH,
Japan - JA6GCE
Norway - LA7AK
Poland - SQ6J
Romania - YØ4NF
Russia - RA3XO
Scotland - GM3CFS
Slovakia - OM3EA
Spain EA3BHK.

DX Contest Calendar for February 1995

11-12 Feb.: Dutch "PACC" Contest, 1200 UTC 11 Feb. to 1200 UTC 12 Feb., both CW and SSB

18-19 Feb.: ARRL CW DX Contest, 0000 UTC 18 Feb. to 2400 UTC 19 Feb. (See December 1994 *QST*)

February 24-26: *CQ* Worldwide 160 Meter SSB Contest, 2200 UTC 24 Feb. to 1600 UTC 26 Feb. See November 1994 *CQ*, pg. 156. 25-26 Feb.: REF French SSB Contest, 0600 UTC 25 Feb. to 1800 UTC 26 Feb.

25-26 Feb.: UBA Belgian CW Contest, 1300 UTC 25 Feb. to 1300 26 Feb.

25-26 Feb.: RSGB 7 MHz CW Contest, 1500 UTC 25 Feb. to 0900 26 Feb.

Complete rules may be obtained by sending an SASE to K4IIF.

Contesting from the Pacific

The Contest department has an excellent letter from Wayne, W9GW, with information on the countries where he has operated over the past 5 years. Wayne indicates that he has personally operated from each of the hotels on this list, and that each of these countries will accept US bank cashiers checks and the cost of licenses is minimal. Local Customs in these countries do not require a deposit on Amateur Radio equipment brought into their respective countries.

KH8 American Samoa

US licensees can operate portable. However, Wayne suggests that you contact the local telecom office. The Rain Maker Hotel is satisfactory and the management has no objections to Amateur Radio operation.

T3 Christmas Island

Address license requests to Telecom Kiribati Ltd., P.O. Box 72, Bairiki, Tarawa, Kiribati, Central Pacific. There is only one hotel, the Captain Cook, but you should not have any problem operating from there.

V73 Marshall Islands

For licensing, contact Mr. Thomas H. Debron, Director of Communications, Ministry of Transportation and Communications, Republic of the Marshall Islands, Majuro, Marshall Islands. The Royal Garden Hotel is OK.

V63 Federated States of Micronesia

License requests to the Department of Transportation and Communications, P.O. Box PS-2, Palikir, Pohnpei, Federated States of Micronesia. The Harbor Hotel is a good place to operate.

YJØ Vanuatu

It isn't necessary for U.S. amateurs to obtain a license in advance as one will be granted on arrival by Telecom, the company which handles licensing for the Vanuatu government. Le Lagon Hotel is a bit expensive, but it is an ideal place to operate.

5W1 Western Samoa

Send license requests to:

Posts and Telecommunications Deparment
Government of Western Samoa
Apia, Western Samoa.

The Aggie Greys Hotel is one of the best and is reasonably priced. WR

OLD-TIME RADIO

The ragchewer's log

BOB SHRADER, W6BNB

One of life's little challenges is trying to remember the name of operators you are sure you have worked before, or what their QTH is, or when you worked them last. You will be pleased to know there is a relatively simple solution for such difficulties. When amateur licenses are first obtained we are all hot to talk to all those DX stations around the world. For many of us this mild form of madness of just making DX contacts may wear thin after awhile and we find that it is may be even more interesting to talk about many topics with other amateurs on the air—to "ragchew" with them.

What is described here might not be for DXing or contesting, but these things are only part of the fun of hamming. When you learn to enjoy ragchewing you will want to keep a log of interesting bits of information on operators you work over the years. If you use one of the common log books it may take a lot of leafing back through many log sheets to find a reworked station's call sign in order to find out what your notes tell you about the other operator. Often, if you have a few interesting notes about the other person's activities you can develop a really worthwhile and enjoyable second, or third, or whatever, QSO.

As you have undoubtedly found out, leafing back through a log book is for the birds! This is especially true if you haven't worked a station in several years. There is one way to beat the leafing back—use a simple card file—using a separate card for each different station you work. You can get up to about 20 QSO entries for a station on one file card if you use both sides. (There are many cases where I have two or three cards glued together at the top, for stations I have QSOed more than 20 times.)

It's fun keeping a card file and you can really astound another operator with whom you have had no contact in several months or years when you call him or her by name and ask if they are still in the same QTH, using the same rig which you name, as when you worked them back in 1980-something! A word about file cards. Many amateurs have tried a file card log in the past but most gave up because they went about it in the wrong way. There is a right and a wrong way to use card files in Amateur Radio. I did it the wrong way first and gave it up. Then, after many years using log books again I felt there just had to be a better way. So I went back to file cards again and found a simple method that really works.

The only difficulty with file card logging is knowing what stations were worked the day before, or last Monday, or on March 1st, or whenever. You have no way to do it with file cards alone. There is a simple fix for this, however. Use a little 4x6 inch spiral-ring notebook into which you jot down the call sign of each station you work under that day's date entry. This is all you need to enter in the notebook, just the date and the call sign of stations worked that day. Full information about these stations will be entered on their file card. Logging cards are filed by station call signs in a special file box you can glue or nail together from a few scraps of plywood cut to the proper size. If you are not familiar with keeping a card file of amateur stations, a more or less standard method is to file first by the station's district or area number and then alphabetically by the one, two or three letters that follow the number. If there are number-letter duplicates, then file alphabetically by the letters that precede the number. Let's take some examples. The calls in the lefthand list below would be filed by number and letters as shown in the righthand listing. It may help to space the call signs on your file cards, as shown at the right. It provides easier reading of call signs when searching through the cards in the box.

W6ECU	K	1 AVG
K4NO	XE	3 MN
KL7PQ	K	4 NO
W6BNB	W	4 NO
W9PDQ	W	6 BNB
K1AVGK		6 EC
K6EC	W	6 ECU
K7NP	WA	6 ECU

Use stiffer, taller separator cards, with labels on them that project up above the file cards to indicate the 1, 2, 3, 4, 5, 6, 7, 8, 9, and O district numbers of the call signs. The K1AVG card would be filed behind the "1" separator card, the XE3MN card would be filed after the "3" separator, and so on. Being in the large W6 district I follow my 6th district separator card with similar alphabetic separator cards, reading "A", "B", "C", etc. All 6th district cards are then filed alphabetically following the 6th district separator card. This allows rapid location of local call-letter cards. While in QSO, or right after, fill out the file card for the contact. Check your file first to see if you have worked the station before. Don't waste time making out a second card for previously worked stations. It's best to start a card for each station during a QSO if you find no card for it in your files. When you finish entering all of the information wanted on a file card, enter the station's call sign in the notebook, file the card, and you are ready for your next QSO. Cards can be made out as in Figure 1.

The difference between the start-time and the end-time indicates what kind of a ragchew it was. Five to ten

minutes tells you this QSO was pretty much a waste of time as a ragchew. Twenty to 60 minutes says that a lot of information, probably quite interesting, was exchanged and that this must be a pretty good person with whom to QSO. Really unrewarding QSOs can be red inked around the call sign so that you may not bother to answer that station's CQ again for a ragchew. If the operator has a poor fist, or won't slow down for you, or uses unseemly language, or is unfriendly, red lettering on the card is warranted.

What is the best card material? And this is critical. You can buy 3x5 inch file cards, of course. Because they are quite thick not many will fit into the small file box you will want to use at your operating position. What to do? Simple. Cut 8.5x11inch 16-lb typing, or computer, paper into 8.5÷2 = 4.25-inch wide strips, using a paper cutter. Then cut these again into 11÷4 = 2.75-inch high "cards". With these 4.25x2.75-inch thin cards you can fit in about 500 of them for each 2 inches of linear box length. A box you make with inside dimensions of 4.5-in by 10-in with 2.5-in depth will hold about 2500 cards and leave enough room between cards to allow adequate fingering space. If you have no paper cutter, possibly a friendly local printer will be willing to cut up a ream of paper to the correct dimensions for a nominal fee.

A most important point in cutting your file cards: The width dimension is not critical, but the height of all cards must be exactly the same or you will have trouble leafing through them when they are filed. Put a very precise mark on your paper cutter to make sure the height cut of all cards is always exactly the same.

Over the years you may want to double the size of the file box. It should be kept small enough to slide under the rig if you want a clear operating position. To do this the rig can be placed on a 5-in high, U-shaped wooden portable shelf. Your keys and microphone may be kept in this out-of-the-way area also.

At the first of each year, usually during QSOs, I finger through all of my W6 and W7 district (my adjacent states) cards and remove all that show no contacts in the last 10 years. I have found that after 10 years the number of cards in my file box increases only slightly year in and year out. However, my two American-station box areas are slowly becoming filled so I may have to begin to check on WØ and W5 cards to see if there are some of them that show no activity in the last 15 years and may be dumped. DX cards can be colored to make them stand out from U.S. cards and may be kept either in a separate section of the box or with the other cards. Being a ragchewer I tend to shun DX contacts, leaving DX QSOs to the many who really want them.

(Top left) **QTH.** Address, if wanted. (Top middle) **NAME.** (Top right) **CALL SIGN.** Work opr does?/retired? Background info on opr. CW speed to use, etc.
Other rig/power/antenna info.
Date/start-time/end-time/his RST/my RST/freq./any special info from the QSO, ant/surgery/new car/ etc.
Date/start-time/end-time/his RST/my RST/freq./follow-up on the notes taken on last QSO, etc.
Date/start-time/end-time/his RST/my RST/freq./follow-up, etc.
Figure 1

At first the card file box will have mostly open spaces of course. You can go back through the last couple of log pages and make out some file cards to see how things work. Cut a few 2x4-inch pieces of 1-inch scrap lumber and use them as spacer blocks to fill in the empty spaces in your box. As you begin to fill up the box with contact cards you can remove the spacer blocks. You can keep blank cards, both colored and white, in the box just ahead of the first district separator card, and separated from it by a thin spacer block to provide easy access to the blanks. It may be handy to cut a ¼-inch strip of electricians tape and fold it over the top of any card you feel warrants special identification in the file.

Glue some form of gliders, or slick surfaced, easy sliding material pieces under your card box so the desk-top will not be scratched as the box is pushed around the operating position. Nothing fancy is required. Four round thick pieces of cardboard, perhaps ¾-inch in diameter, having a slick side will work fine, as will four round pieces of felt. Position the gliders an inch in from each corner.

If you use this logging method your ragchew contacts will become much more interesting for you and the hams you contact. Your best QSOs will usually occur when you can ask questions about what the other person has done, is doing, or is expecting to do. The notes you make on the cards will aid you in asking pertinent questions. Experience will teach you what kind of questions to ask other amateurs. It really starts the other person talking if they are asked a question. A file-card log can really do a great job in making your ragchews more interesting.

WR

CONSTRUCTION

A vertical dipole/collinear for 80-10

ROBERT W. JORGENSEN, WA8TTX

This vertical antenna project gives gain (over a ground plane) on all bands 80-10. It was started as an experiment and the realization it could fail. Fortunately it has worked out quite well.

The idea of a vertical dipole (or collinear) meant that the feed line was going to be routed up through the inside of the bottom radiating element. There was a lot of uncertainty about feeding coax up through a radiating element (in this case a tower). A check list of methods to strip RF off the coax shield was prepared. None of which were ever needed. RF on the shield was never a problem (more on this later).

It seems simple enough. Take a commercial antenna (a Butternut HF6V, for example) and use it as the top half of a dipole (or collinear, depending on the band). On eighty meters, the bottom half of the vertical dipole would be a supporting tower. To isolate this bottom quarter-wave section from ground, it was mounted on the peak of the roof and guyed off with Dacron rope.

A one-foot-high roof peak mounting bracket, plus sixty feet of tower plus a three foot top section and two of pipe netted out a 63 foot vertical height. So, the bottom half of the antenna is naturally resonant to 80M and fairly broadband because of the large diameter afforded by the 12" wide tower sections. The top half of the 80M dipole would only be 26 feet tall, but would be made resonant by the resonator coils provided with the Butternut antenna. Putting the two halves together results in a vertical 80M dipole with excellent results.

The 80M configuration is set, so what about 40M? Again the top half (the Butternut HF6V) is made resonant by the resonator coils. However, the 63' tower is a half wavelength for forty meters and a high impedance. Something else is needed. So, a cone made of four wires each 33 feet long is added to the bottom half. This cone is tall and slender (12° from vertical) as opposed to the cone in a discone antenna (30). It also results in broadening the bandwidth.

Attaching the 33' wires right at the feed point didn't work out mechanically. So, they were attached 30" lower using hose clamps. To compensate, each wire was shortened 30". Remember these are radiating elements running near vertical *not* radial elements coming off perpendicular. So while radials must be attached at the feedpoint to prevent radiation below the feedpoint, it is OK to displace the attachment point for the cone (in this case 30").

For 30, 20, 17, 15 and 10M the 26 foot length of the Butternut is significant (ie., ¼, ½ and ¾ wavelengths). So, for these bands four more wires each 26 feet long were added to the cone and evenly spaced between the four 33' long wires. The far ends of the cone wires were not connected together. Like before, the attachment point was 30 inches down so the wires were shortened 30".

I'm going to jump ahead to 17M to establish the need of a good antenna tuner. On 17M the 26' length is a half wavelength when you consider the velocity factor. Here the antenna becomes a high impedance collinear (two half-waves, in phase). Most antennas try to maintain a 50-ohm impedance so you don't have to use an antenna tuner. I think that is the wrong choice. Use the tuner and pick up the extra gain. Comparing two half waves in phase against a ground plane is a big gain. Butternut didn't list 17M as one of the "covered" bands for its HF6V. Yet, when used as described, the performance is very good.

Now back to 30M. On thirty the 26' length is just over a quarter wave. So the Butternut on top and the four 26' wires below form a vertical dipole for 30M. The slightly extra length is not significant at all to the radiation pattern. The antenna tuner makes the impedance adjustments.

On 20 Meters, 26 feet is ⅜ wave and 33 feet is ½ wave. Since a half wave is high impedance it is the 26' long wires that will take most of the current. Combined with the 26' length of the Butternut, the cone and the antenna makes a ¾ wave center feed antenna.

Butternut supplies a length of 75Ω coax to provide a match on twenty. I wasn't sure if I should use this 75Ω matching section or just rely on the antenna tuner. I was also concerned about the antenna being asymmetrical and an unbalanced line feeding a balanced antenna. So, that 75Ω length of coax was coiled up into a choke balun (about 7 turns, 6 inches in diameter). A special U bolt made from threaded rod was formed and attached just below the feed point. The coiled balun was taped securely to the U bolt (about 10 inches long). This keeps the balun perpendicular to the feed point.

On 15M, Butternut supplies a decoupling stub to keep the antenna to a ¼ wave radiator and 50Ω. The choice here was to not use this decoupling stub. The 26' length is just over a ½ wave length and still less than ⅝ wave length. Again, use the tuner and operate as two half waves in phase. The slightly extra length is if anything, a plus in the radiation pattern.

Results on 15M are also very good. However, there is more going on than

two half waves in phase. Those 33' cone wires present a ¾ wave length for 15M in addition to the 26' half wave length. The cone seems to load up as a single unit. The tuner provides a perfect match.

On 10M, 26 feet is ¾ wave length. This then results in a center fed, 1½ wave length antenna. At this length the lobes in the radiation pattern start to split and depart at an angle. However, a 1½ wave antenna still has a central lobe that comes off perpendicular to the antenna. Then there is the cone angle of 12° that acts to refocus the bottom lobe back toward the center. The results are spectacular with the best performance being on 10M.

Even 12M can be loaded up using the tuner. On twelve, a 26' length is about ⅔ wavelength or a random length (but still fed in phase). The cone is very broadband and exact lengths are not important. This is similar to the discone antenna that can cover a very wide range of frequencies. In fact at these higher frequencies what results with this antenna configuration is a cone, and collinear arrangement.

Grounding the antenna is an important safety issue not to be overlooked. Butternut provides a coil that connects across the feed point to electrically connect the two halves of the antenna. I chose not to use this coil because of the high feed point impedance on 15 and 17M. Also, the base of my antenna (the tower) is on the roof, isolated from ground.

A coax switch was used with the common going to the antenna, not the rig. This is a must for the grounding system to work. Position one goes to a heavy duty ground wire (#4 copper). The ground wire is soldered to the tip and the shield of a PL-259. This coax connecter is then connected to position one of the antenna switch. When switched to position one both halves of the antenna are shorted together in the PL-259. The ground wire is connected to the metal well pipe and the fuse box neutral and ground rods. Position two on the antenna switch goes to the tuner and rig.

Being a bit impatient I started operating before it was finished. This was after the tower and Butternut were erected, but before any of the 33' or 26' cone radiators (not radials) were attached. This provided an opportunity to compare results before and after the cone (wires) were attached.

A ham friend, W9MQR, about 12 miles distant provided the readings. His "S" meter was adjusted to be very stingy. Comparisons were limited to the five bands he had.

Eighty Meters was truly "awesome," but declined to "just awesome" after the cone was added! Obviously some signal is being blocked by the cone.

Band	W/O Cone	With Cone
80	S 9	S 7
40	S 3	S 9
20	S 5	S 6+
15	S 5	S 6+
10	S 5	S 8

This suggests adding four more wires (66 feet long) for 80M.

Forty Meters now gave the strongest signal. Without the cone it was a ¼ wave-whip without a ground plane. Even so, the increase was more than expected. I believe part of the reason is that in the dipole configuration one gets a much lower angle of radiation over the ground plane configuration. The longer antenna (dipole vs. ¼ wave) plus a much lower angle of radiation work together to increase the effectiveness of the antenna.

The gain is more than just the added element. The angle of radiation is greatly improved as well.

Twenty and 15M both showed improvement in-line with what was expected. Before adding the cone wires, 15M was an end-feed half wave and presumably had a low angle of radiation to start with. Twenty was a ⅜ wave.

Ten Meters showed more improvement than would be expected. I believe this demonstrates the contribution of the 12° cone angle in increasing the central lobe. Another factor is the differential reactance tuning in the Butternut. Ten Meters does load up better than any other band.

Well, it has all worked out quite well for an experiment. There is more to do to restore 80M to the "truly awesome" category. Even so, it's quite a success, as-is. The biggest surprise was how easy (when using the antenna tuner) it was to route coax inside a radiating element and keep RF off the shield.

There are several factors that I believe helped. First, the cone configuration on 40-10 keeps the ends of the cone 6 to 7 feet away from the coax (good separation). Second, the long length of coax used (130 feet). Third, an antenna tuner is a must. Fourth, the tower is an open structure and capacitive coupling to the feedline is a minimum (as opposed to coax inside a pipe).

Performance has been very good. The very first contact was on 17M to CE7OXZ, located about 1,000 km south of Santiago, Chile.

It is similar to a discone in that it uses a cone for the bottom half of the antenna. The top half however, also radiates by using an all-band vertical in place of the disc array. I like this antenna because it is broadbanded, provides gain, is center fed with the coax running straight up to the feed point, eliminates the need for radials or a counterpoise, gives a low angle of radiation, provides a large capture area, and is omni-directional.

I also like the smaller cone angle and the different lengths (26' and 33') used in the cone. I believe it helps to optimize the antenna for the amateur frequencies. It is an experiment and I encourage others to try various cone configurations and report their findings. WR

As an incurable "number-cruncher," I keep my computer humming all the time, either programming myself, running someone else's program or writing about what I've learned. So it is today, writing a bit about my recent study of HF propagation programs.

As you know, propagation programs came into the Amateur Radio shack with the publication of the source code for MINIMUF in *QST*. That was back in December '82 and it didn't take long before all sorts of "bells and whistles" were added to the MUF predictions of MINIMUF. But other programs came along, some published by Radio Netherlands, others from England, Germany and Australia and, of course, the "Big Event" when NOAA's mainframe program, IONCAP, was brought down in size to where it would even fit on a PC.

I don't know how many programs are out there but I have about a dozen on disks, some sent to me by friends, others as demos from interested parties, even some that I bought myself. My most recent purchase was SKYCOM Version 1.0 from The Solar Terrestrial Dispatch up in Canada. That's in a class by itself so I won't touch on it here.

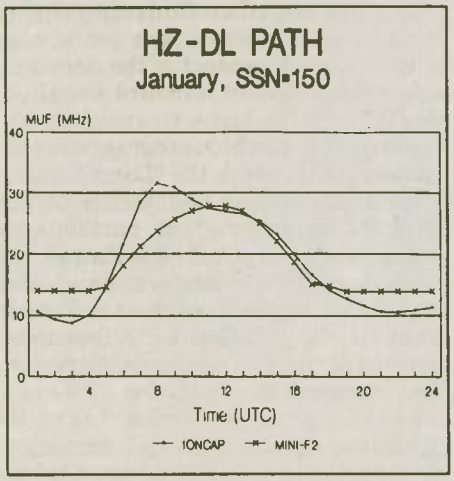
Anyway, with all those programs around the shack, the nagging question is which one mimics IONCAP the best when it comes to MUF predictions. I say that as the consensus is that IONCAP is the leader when it comes to propagation programs. True, it has its faults, being rather user-unfriendly and meant more for circuit planning than daily Amateur Radio operations. But it is out there, a big target, and the temptation is to find something that's quite comparable, but more agile, and then work with it instead.

To that end, I recently conducted a study of a good number of the programs in my files, seeing how they measured up against IONCAP's MUF predictions. In trying that, the easiest way would have been to pick paths which are representative of amateur radio operations and see how each of the programs compared, hour by hour, with IONCAP. One could even take a look at all the results by plotting them with a graphics program. But that would be rather subjective, not telling to the Nth degree or the very last decimal point just which of those programs came the closest to IONCAP. A better way was needed!

The first approach I used was to find the hourly MUF values for the programs on four paths, one N-S and another E-W in the Northern Hemisphere, another N-S into the Southern Hemisphere and the last one E-W within the Southern Hemisphere. The paths were chosen to have just two hops to them, to avoid the polar regions, and with the month of January and a smoothed sunspot number of 150, I was able to sample both summer and winter predictions during good solar activity.

Once the 24 hourly MUF values were in hand for each program, the next thing I did was use a spreadsheet to calculate the average value of the MUF on the path, for IONCAP and the program in question. That gives two numbers to compare and you can see if the program in question comes in above or below IONCAP for the whole day. But why just two numbers to compare the programs? Why not let the spreadsheet calculate the differences, hour by hour; then you have 24 numbers to look at and you can see when, and by how much, the program differed with IONCAP's predictions?

I did all that for eight of the programs, A through H, I have here and for each of the four paths. I found quite a range of differences in the daily average values, from as much as 9.4 MHz above IONCAP to 4.1 MHz below the average of its predictions. Then looking at the hourly differences with IONCAP, in 24 hours one hourly extreme was 20.3 MHz above IONCAP while another extreme was 11.7 MHz below its predictions. Clearly, there's no close convergence when it comes to MUF predictions from the programs! But, obviously, some were better than others; the question then boils down to how to sort them out, beyond what one gets from the simple method using daily averages and hourly differences.



Now if you think about it, hourly differences really tell you about the same thing as the difference in daily averages, whether the program in question comes in "low" or "high" relative to IONCAP. If you look at Figure 1, you'll see the times when the program, MINI-F2, came in above or below IONCAP in its predictions. The beauty of that graphic is that one can really look at every hourly value, by itself or in relation to the others, instead of including it in the rubble on a spreadsheet or burying it in the averaging process. But how about looking at how the hourly values compare with IONCAP without saying whether they're above or below it predictions, just how many MHz different from IONCAP without regard to algebraic sign, positive or negative?

Okay, now we're into "root-mean-square" country, just like talking about the 110V AC at the wall plug in your shack. So differences in the 24 hourly values are squared, added, divided by 24 and the square root taken. That's another way of looking at how a program compares with IONCAP and like the "average deviation" of the hourly values, the smaller the RMS or "standard deviation" for the hourly values, the better the agreement between the program and IONCAP.

For the eight programs and four paths, standard deviations ranged from as large as 7.9 MHz to as small as 1.5

MHz. Okay, that looks a bit better, not as much of a range in standard deviations as in the average deviations during a day. But "Listen Up!" If we have two measures that help us and we're looking for the lowest value of each, why not look for the lowest value of their product, the average deviation multiplied by the standard deviation? And if we're going to talk about the best program, we should be looking for the one with the lowest average product across all four paths. That should be the winner, right? WRONG!

Going through the records of my study, eight programs across four paths, the lowest average product of the daily average deviation and standard deviation was 2.9 and the highest average product was 29.4. So which program was the "Winner" and which the "Loser?" Well, I don't like to say bad things about anybody or any program, particularly when I imply the method is flawed. So I'll limit myself to telling you the winner of that simple test was shown in Figure 1: MINI-F2, a program by Raymond Fricker of the BBC External Services. And thereby hangs a tale!

In the early 80s, Fricker began to develop a unique approach to propagation predictions. The idea was to use a series of mathematical functions to represent the properties of the ionosphere. That way, instead of leafing through a book of ionospheric maps for FOF2, making some interpolations and tedious hand calculations, it would be possible to solve the problem by just substituting the relevant variables into the mathematical functions in a computer program.

Fricker's approach was to start with one simple core function to represent the main features of the ionosphere and then add other functions — by season, latitude or local time — to make up for the deficiencies of the core function in matching his database. Over the next few years, he came up with four MUF prediction programs of increasing complexity. The first was MINI-F2, just one function in the F-layer algorithm involving only 770 bytes; that's the one that did so well at first glance in the study. Next came MICROMUF 2+ with 14 functions, some 4.2K in length, and then MAXIMUF with 23 functions, about 6.7K in length. Finally, Fricker developed COMB, a combined modes propagation program, which was streamlined to 14 functions, about 5.1K in length and with an improved algorithm for the polar F-region.

In contrast to Fricker's method of using mathematical functions, the Deutsches Bundespost in Germany tackled the interpolation problem head-on. Their technique was to use the international database and interpolate between entries — in space, time and sunspot number — to obtain the F-region data needed to find the MUF for a path. That database contains observations made by vertical soundings. Another approach was used with MINIMUF where the parameters of a single function, some 1.9K in length, were optimized to represent ionospheric observations from oblique sounders.

One way or another, all the propagations programs are founded on a database, the CCIR Atlas of Ionospheric Characteristics being the most common one used. But how do we explain the wide range of differences mentioned above? And how do we find which approach, mathematical or by interpolation, gives the best fit with IONCAP? By prejudice, I'd lean toward more complicated methods, with more parameters or functions available to work with. So how do I explain the apparent success of the most rudimentary F-layer algorithm, MINI-F2?

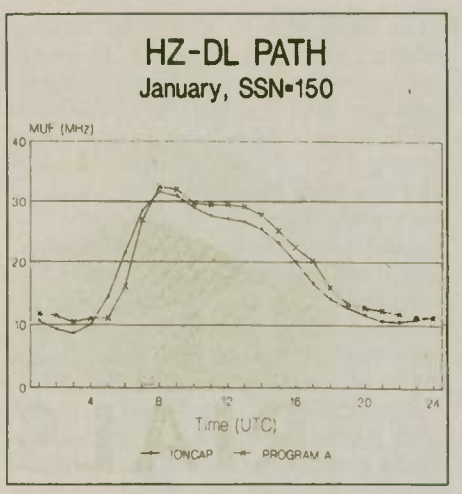
The simplest thing to do would be to call it a "fluke" and go on to the program with the next lowest average hourly

deviation and standard deviation; that would be Program A giving 3.7 instead of MINI-F2's value of 2.9 for the product. I should feel comfortable with that choice as the second-best program is actually quite sophisticated but I'd always have a nagging feeling about that kind of decision. I say that as it'd be more of a prejudicial ruling based on the notion that "the more complex, the better" than something based on sound methods.

But perhaps looking for the lowest average deviation and standard deviation was too simple; maybe a more complex set of criteria would be better. (Nothing like having faith in one's prejudices!) How about going a step further and looking at the correlation between predictions of each program and IONCAP? That'd bring linear regression analysis to bear on the problem, something powerful but within easy reach as that sort of curve-fitting is programmed into almost every modern, hand-held calculator of any significance. All you'd have to do in punch in pairs of hourly values for the MUF and the calculator would come up with a coefficient of linear correlation (r) and the parameters (slope m and intercept b) for the straight regression line.

Just to remind you of the features of the coefficient of linear correlation, values of r close to +1 imply a close correlation between the two variables, a value close to zero means essentially nothing in the way of correlation and values of r close to -1 says that the two variables are anti-correlated. For example, if you put $10 in the bank each day and I did the same, our bank balances would have a correlation coefficient of +1 but if I put in nothing, r would be zero. Finally, if I took out $10 each day while you were depositing $10, our bank balances would be anti-correlated with a coefficient r of -1. But if you look at the manual for your calculator, you'll find there's more to linear regression than just a correlation coefficient. Using the banking example, if I only put $5 in the bank each time you put in $10, the correlation coefficient for our accounts would still be +1. I'd get the same praise for being thrifty as you but maybe all that praise would not be warranted as my bank balance would fall short of yours, month after month, growing at only half the rate.

Having said all that, let's first look at the next-best case, shown in Figure 2, and compare correlation results between it and those for MINI-F2. For starters, you'll have to agree the fit of Program A to IONCAP is much closer than seen with MINI-F2 in Figure 1. So what do the numbers say about the two correlation analyses? Okay, the correlation coefficient for MUF values in Figure 2 is



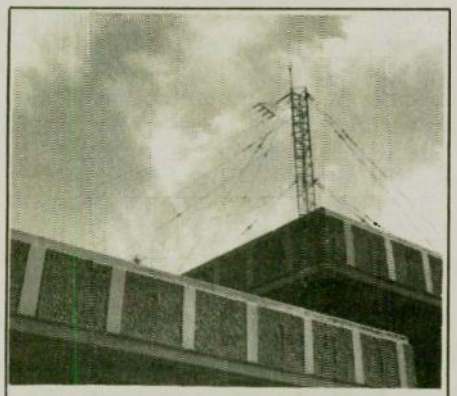
0.98 while that for Figure 1 is 0.94.

That's quite interesting but only part of the story; for the rest, we need to look at the slopes, m-values, for the two regression lines. For the case in Figure 2, m is 1.00 while for Figure 1, m is only 0.71. By way of interpretation, the different m-values tell us that in the first case, Figure 2, the MUF values for the two curves are quite close to each other in magnitude over the 24-hour period while in the second case, Figure 1, the MUF values for MINI-F2 fall significantly below those of IONCAP, on the average. In banking terms, MINI-F2 is only depositing about $7 for every $10 by IONCAP. Okay?

Finally, we should not just settle for one path but do the same sort of analysis over the four paths. The results are what one would expect, the more sophisticated program doing better, the average of its correlation coefficients being 0.96 while that for MINI-F2 only 0.87. And for the average of the slopes of the regression curves, it is 1.04 for the more sophisticated program while that for MINI-F2 only 0.68.

So there you have it, Program A is the winner, with justification, while MINI-F2, the shortest program of the group, gets an "Honorable Mention" because it gave credible results in spite of its simplicity. But actually, MINI-F2 would start to have problems with longer paths and at higher latitudes so don't write, asking for a copy. Okay?

As for Program A, I don't want to go on record as to which program it was as this was not a exhaustive test, by any means, and not to be construed as something like you find in *Consumer Reports*. But I think I've told you how to make your own study with nothing more complicated than running programs on your PC and making comparisons using your hand-held calculator. That'll keep you busy for a while! Send me a postcard when you're ready for another problem to work on. **WR**



AERIALS

KURT N. STERBA

As you start to read the following don't think that it is just a tooting of my own horn at all. Don't think that I am taken with my own greatness (my new assistant, Sancho Panza, keeps me cut down to size) the reason for this which will be explained in due course.

The British magazine *Ham Radio Today* reviewed the book "Aerials II." Here is a shortened version of what they said: "A great book dropped through the door last week. Entitled "Aerials II" it comes from the publishers of the American ***Worldradio*** magazine. I would recommend it to any serious aerial enthusiast. It disperses many of the myths ingrained in the minds of many UK amateurs and obviously US amateurs, too.

"Written by an oddly named couple Kurt N. Sterba and Lil Paddle, these obvious pseudonyms are apparently designed to stop either of the authors being harassed at rallies, as they are quite savage in their attacks on some statements made by well-known amateurs in the USA regarding aerials and associated equipment. The way their material is set out is often hilarious, always informative and I hate to say nearly always right. OK, always right (I think).

"Kurt decided that the claims of some manufacturers about their aerials left something to be desired. The oft-quoted "dB" receives much stick as do other claims. One other he destroys is the oft-quoted claim that feeder should be in multiples of half waves. Kurt insists the feeder should be long enough to reach the shack and no longer.

"He decided to try out a few ideas, which included loading up two shopping trolleys as a dipole. "Not great," he said, but he worked lots of stations, and as he says: "loading a golf club can get you on 10M." The down pipe from his gutter provided another aerial.

"You will guess that I love this book, it is full of surprises, good laughs but more importantly good information well written. It is available from ***Worldradio***, 2120 28th St., Sacramento, CA. USA at $11 plus $5 shipping to the UK." ($2 in USA).

The reason I reprinted the above by Dick Pascoe, GØBPS, whom I don't know, is to point out by contrast that NONE of the USA ham magazines have seen fit to review the book. I wonder why.

Next subject. A pal of mine sent me an advertisement from a Japanese hammag for a mobile antenna, also sold in the US, less than 7 ft. long. The ad says, in English, "Plug into DX!" Then there are some Japanese words and then it says "3.5-30 MHz." Eight charts show the SWR on each of the eight bands, and always perfectly the same on both sides (high and low) from resonance.

I really like that "Plug into DX!" WOWEE boys and girls!

The very first chart shows the SWR curve for "3.5 MHz." Since they start with that band, so will we. For 3.5 MHz the physical length of one wavelength is about 281 feet. The everyday garden-variety half-wave dipole will be about 134 feet. A quarter-wave vertical would be around 67 feet. A seven-foot mobile antenna would be close to one-tenth (1/10) the size of a real quarter-wave vertical. How DXy will that be? Well, you go on 20M with a vertical a smidge less than two feet tall (1.67 ft.) and let's see how well you "Plug into DX!" The same ratio is at work there.

The same company, under the "Plug into DX!" headline advertises other antennas, one being about 5½ feet tall, also to be used on the eight bands. And there is also another antenna about 4 feet tall, touted as one that will assist you to "Plug into DX!" You know of the .25 WL antenna? This is the .014 antenna. Or put another way, instead of a ¼-wave antenna this is the 1/71 antenna. Or, 1/18 of a ¼ vertical antenna for 3.5.

True, it would be better as you go higher in frequency. Just scale it up as a multiple from 3.5-7-14-21-28 and points in between. Yes, contacts will be made. (I'll let those who send me all those fancy formulas and computer printouts calculate the effiiciency of a 4-foot stick on 80 or 40, even if perfectly matched.) What I object to is that come-on of "Plug into DX!" sounding as if you will be the new strongman on the band. Like I say, you can call your Chihuahua "Bruno" but that doesn't mean that he gets to ride in the police car.

New subject. How do you know that your SWR meter is accurate? Well if you are running a 50-ohm transmitter into a 50Ω line and there is a perfect 50Ω load at the end, your SWR should read 1.0 to 1. Now lets say that you have the exact same situation but at the end of the line you put a perfect 25Ω resistive load. The meter should indicate 2.0 to one. (Do not use a wirewound resistor for this.) And don't dump 100W into some dinky little 2W resistor for this test. Poof! At parts houses that cater to the commercial radio market you can find five-watt, 50Ω loads built into a coax connector. The cable TV industry has 50Ω loads that will handle about two Watts. You can parallel four of them and see 12.5Ω. The SWR should read 4.0 to 1.

If you do this with resistors out of your junk box remember that the average resistor, the kind we put in grid leaks and later in cathode bias circuits had a tolerance of 20%. That's 10Ω at the 50Ω level. (Ones with closer tolerances cost ever more as the tolerances closed.) So don't blame your SWR bridge if the readings are not perfect because your resistances could be off somewhat.

Then the question arises, how accurate is the ohmmeter you are using to measure the resistive load you have created? You have put in parallel three, 50Ω resistors, you hope to measure 16.66666666Ω and thus see an SWR of 3.000000001 to 1? (Hah, hah, just kidding!) Just how accurate is your ohmmeter? Is the centerpiece of your test equipment that old Signal Corps ME-9B/U? What a monster. I've heard that when our B-25s in the South Pacific would run out of bombs they would just load up those 12 lb. multimeters. Sank two freighters that way, I heard.

If you have the higher power commercial dummy antennas you can strap some in parallel with T connectors and see how accurate your SWR bridge is at various SWRs. First measure the dummy loads and see how accurate they are to begin with.

(Kurt goes by his nom de ham so as to avoid people at hamfests who would come up and gasbag about "didn't receive an answer to my letter in which I showed you were wrong." Kurt would have to reply, "Consider yourself fortunate that I did not answer you and thus you could remain in your blissful state." He is far too kind a person to want to see crushed and dejected amateurs.) **WR**

Amateur Radio has something for everyone

Jules Katz, KK6TR

STATION APPEARANCE

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

I received my original ham license in 1950, with the call W2ZSF. I operated 40 Meter CW with a modified ARC-5 surplus transmitter and a Hallicrafter SX-25 receiver.

After retirement, I disposed of my ham equipment which consisted of a B&W 5100 transmitter, a National HRO-60 receiver and a Hammarland HQ-110 receiver.

I later purchased an HTX-100 mobile 10 Meter transceiver and couldn't believe the changes that had taken place in just a few years; being able to read frequency directly from a digital display!

I added a 2 Meter rig in my car for emergency communications while I drive around the mountains.

I became interested in the "new" ham radio so I started assembling a base station. It took two years and the photograph shows the result. The operating table consists of a wooden door and the shelves are made of number 2 pine. This is the equipment from left to right:

Bottom shelf: ARRL manuals, Nye manual key, Yaesu FRG-100B general coverage receiver, Realistic PRO-2026 scanner.

Shelf No. 2: Control unit for back-up battery power for the VHF transceiver and scanner, voltage monitors, Yaesu FP-800 power supply, ICOM IC-229A 2 Meter transceiver, ICOM PS-45 power supply, Yaesu FT-890/AT HF transceiver, voltage and current monitors for the Astron power supply.

Shelf No. 3: Digital clock, MFJ-917 VHF SWR/wattmeter, MFJ-815B HF SWR/wattmeter, ICOM SP-7 speaker for VHF, Yaesu SP-6 speaker for HF, ICOM SP-7 speaker for scanner.

Top shelf: ICOM IC-P2AT 2 Meter HT, Realistic PRO-39 scanner, 813 power amplifier tube, Heil speaker for general coverage receiver and MFJ coax switches for antennas.

To the right of the shelves are the Astron RS-7A power supply, MFJ-901 antenna tuner for the receiver, and a Realistic speaker.

The station works just great and is a delight to use. I am active on 40, 20, 17, 10 and 2 Meters.

I am a member of the Mountain Amateur Radio Club, Madera County ARC, Madera County Sheriff's posse for emergency communications, California Division of Forestry Auxiliary Telecommunications Group, MARS (AAR9UM), and ARRL.

Retirement has never been better, thanks to ham 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!

Major conflagration or simple communication problem?

Daniel Wilmshurst, KE4EMD, a young Englishman participating in the Pinellas County Field Day, was extremely enthusiastic about how he involved Linda Saunders, KI4RV, in refilling the gasoline-powered generator during the night.

"Linda was really helpful," he reported. "Even though she's blind, she held the torch while I poured the petrol."

In the split second before I realized that the Brits call a flashlight a "torch," I imagined that this Field Day was literally a blazing success. As they say, two nations separated by a common language!—*submitted by* Ann Shaver, AH2E

hamfests February

If you would like to see your club's hamfest listed under ***Worldradio's*** *hamfest column, please allow a lead time of at least two months. If you were to send an announcement for a hamfest in April, the copy would have to arrive at our office by February 1st.*

California

The LIVERMORE ARC is sponsoring an Amateur Radio/Electronic/Computer Swap Meet on February 5th 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, KCQAK; 510/447-3857 eves. or leave message days; 510/783-2803.

Georgia

The Dalton gang will host the DALTON ARC hamfest on February 25th at the North Georgia Fairgrounds from 9 a.m. to 3 p.m. Admission is $4, refreshments on site. For information call after 6 p.m. EST 706/673-2291,.N4OTC, or 706/278-0630, K4FLG.

Illinois

The WHEATON COMMUNITY RADIO AMATEURS will hold a winterfest on January 29, 1995 from 8 a.m. to 3 p.m., at the Odeum exposition center in Villa Park. Features include fleamarket and major radio manufacturers. VE exams will be on a first come, first served basis. Admission is $6 in advance, $8 at the door. For more information on vendor cost and set-up call WCRA 708/545-9950 or write for packet at P.O. Box QSL, Wheaton, IL 60189. Talk-in 145.39(-).

•

The STERLING-ROCK FALLS ARS will hold its 35th annual hamfest on March 19 at the Sterling High School Field House, 1608 4th Ave., from 7:30 a.m. Setup Sat 6-9 p.m. Features include radio, electronic items, and computers. Parking is free, including areas to accomodate self contained campers and self-contained mobile homes; food. Dummy load available to test equipment. Admission $5 in advance; $4 at the door. Tables $5 w/electricity; $6 without. In groups of tables, one will be $6, the rest $5. Talk-in 146.85(-) W9MEP repeater. For information, contact Lloyd Sherman, KB9APW, P.O. Box 521, Sterling, IL 61081-0521; 815/336-2434.

Indiana

The LAPORTE ARC HAMFEST will be held on February 25th from 8 a.m. to 2 p.m. at the Laporte Civic Auditorium in Laporte (50 miles east of Chicago). Admission $4 at the door. Vendor tables $5 each. Good food, coffee, donuts, cold drinks. Talk-in 146.61(-) 131.8 PL or 146.52(S). Information and reservations TX John @ 219/362-1121 or SASE to P.O. Box 30, Laporte, IN 46351.

The INDIANA HAMFEST & COMPUTER SHOW will be held on March 12 from 8 a.m. at the Indiana State Fairground's Pavilion Building in Indianapolis. Admission $7 at the door. Eight foot table (including space) is $15 (no space without table will be sold). Advance reservations strongly recommended. Set up March 11th, 3 p.m. to 9 p.m (security provided overnight); March 12th, 6 a.m. to 8 a.m. Parking $2 per vehicle. For table reservations or information send an SASE before February 21st to Deanne Martin, N9TEJ, 39 Lake Shore Dr., #14, Martinsville, IN 46151; 317/342-4307. Talk-in on 147.06(+).

Iowa

The 24th annual DAVENPORT ARC hamfest will be February 19th from 7:30 a.m. to 3:30 p.m. (set-up from noon to 9 p.m. on 18th) at the QCCA Expo center in Rock Island, IL. Ample parking and handicapped accessible. Admission is $4 in advance, $5 at the door. Tables $10 in advance of Feb. 1. Talk-in on the WØBXR 146.88(-) repeater. For more information on tickets or table reservations, send an SASE to: Kent Williams, K9UQI, 4245 10th St., East Moline, IL 61244. For information on VE exams, send an SASE to: Roger Franke, K9AYK, 2506 E. 29th Court, Davenport, IA 52803.

Massachusetts

The ALGONQUIN ARC flea market will be held on February 18th beginning at 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.

Michigan

The LIVONIA ARC presents its 25th "Silver Anniversary" Swap-n-Shop on February 26th from 8 a.m. to 3 p.m. at the Dearborn Civic Center. Amateur VE exam sessions. Reserved tables $15 plus advance admission $5; $5 at door. Talk-in LARC repeater 145.35(-) and 146.52(S). For information, send a 4x9 SASE, c/o Neil Coffin, WA8GWL, Livonia ARC, P.O. Box 2111, Livonia, MI 48151; 313/261-5486.

THE CHERRYLAND ARC will sponsor their annual swap-n-shop on February 18th from 8 a.m. to 12 noon at the Immaculate Conception Middle School in Traverse. VE exams at 1 p.m., walk-ins accepted. Talk-in 146.86(-). For information, contact Chuck Mellberg, W8SGR; 616/946-5312.

Minnesota

The 14th Annual MIDWINTER MADNESS will be held at National Sports Center, Blaine, MN. Exit #32 off 35W on February 11th from 7:30 a.m. to 2:30 p.m. Admission is $7 at the door. Super buys on computers, software, hardware, components, peripherals, Amateur Radio equipment. For information: RARC, P.O. Box 22613, Robbinsdale, MN 55422 or call 612/537-1722.

Mississippi

The JACKSON AMATEUR RADIO CLUB HAMFEST will be held on February 18 from 9 a.m. to 4 p.m. and the 19th from 9 a.m. to 2:30 p.m. at the Wahabi Shrine Temple, West Frontage Road in Jackson. Special HF station, forums, meetings, fleamarket with dealers and swap area. VE testing, door prizes, special "Introduction to Amateur Radio" presentation for the general public. VE exams conducted by the Jefferson VEC on the 19th from 8 a.m. to 11 a.m. Admission is $5 for age 12 and above. Free admission for Girl and Boys Scouts in uniform. Vendor cost is $20 per 8' table (no admission charge). Setup 3-8 p.m. (the 17th); 6 a.m. to 9 a.m. (the 18th). Swap tables are $15 plus $5 admission. Contact Travis Cliett, 117 Beechtree Lane, Florence, MS 39073 or call 601/359-3413; 601/939-9236. Talk-in 146.76(-).

New Jersey

The SHORE POINTS AMATEUR RADIO CLUB will sponsor its 13th annual hamfest, "Springfest '95," on March 4 from 9 a.m. at Holy Spirit High School, located on Rt 9 in Absecon. Features include heated indoor selling area, outdoor tailgating (weather permitting), free parking and refreshments. Admission is $5 (non-ham XYLs and children free); outdoor tailgating cost is $5 per painted parking space (no reservations). Tables (indoors) are $7 per 8' section (reservations will be accepted). Vendor set-up is 7 a.m. VE testing at 10 a.m. Talk-in on 146.985(-). For more information, contact SPARC, P.O. Box 142, Absecon, NJ,08201.

Ohio

The NORTHERN OHIO ARS will hold its Winterfest 1995 at Gargus Hall, 1969 N. Ridge Rd., Lorain, OH. Setup 7:00 a.m. Doors open 8 a.m. to 1:00 p.m. Admission $3. Flea market and commercial booths; 6' tables $8; 8' tables $10. For information contact Dee Dee Ohman, KA8VTS, 4122 Bush Ave., Cleveland, OH 44109; 216/398-8858.

•

The MANSFIELD MID WINTER HAMFEST/COMPUTER SHOW will be held on February 12th beginning at 7 a.m., at the Richland County Fairgrounds in Mansfield. Admission is $4 in advance and $5 at the door. Vendor tables are $9 in advance and $12 at the door (if available). Advanced ticket/table orders must be received and paid by February 1st. Talk-in 146.94(-). For additional information or advanced tickets/tables, send an SASE to Pat Ackerman, N8YOB, 63 N. Illinois Ave., Mansfield, OH 44905; 419/589-7133 after 4 p.m. E.S.T.

•

The ARRL GREAT LAKES DIVISION Convention will be held on February 25th and 26th from 8:30 a.m. to 5 p.m. at the Cincinnati Gardens Exhibition Center. Features include free parking, all indoors (drive-in unloading), ARRL officials, ham forums, ladies lounge, prizes and VE exams. Admission is $6 in advance, $8 at the door. Vendor rates range between $20 plus admission to $55 plus admission. Vendor set-up starts afternoon of 24th. For information, contact Stan Cohen, WD8QDQ, 2301 Royal Oak Ct., Cincinnati, OH 45237; 513/531-1011.

Oregon

The SALEM REPEATER ASSOCIATION AND OREGON COAST EMERGENCY REPEATER Inc. are proud to present the 1995 Salem Hamfair on February 18, from 9 a.m. to 4 p.m. Features include flea market, dealers and exhibits. Admission is $6 ($7 at door). Swap tables are $13 each ($15 with power). Swap table set-up 6 p.m. to 9 p.m. Friday night and 7 a.m. on the morning of the 18th. Self contained RV spaces available. For more information contact Evan Burroughs, N7IFJ, 503/585-5924 or talk-in on 146.86(-) repeater.

Pennsylvania

The CHESTNUT RIDGE ARC will hold their annual Winterfest February 5th from 8 a.m. to 4 p.m. at the Latrobe American Legion in Latrobe (40 miles east of Pittsburgh). Admission: $2, includes door prizes. Indoor tables available at $10 each. Hot food, warm fun and cool prizes. Contact Tim Bartlow, KA3BXA, 213 S. Washington Ave., Greensburg, PA 15601; 412/834-6517. Talk-in 145.150(-).

Send us your hamfest information early!

Tennessee

The SHRINERS OF THE KERBELA AMATEUR RADIO SERVICE will sponsor a hamfest on February 4th from 8 a.m. to 5 p.m. at the Kerbela Shrine Temple in Knoxville. Features include FCC exams by WCARS-VEC, registrations until 9:30 a.m. Mail completed 610 form w/check for $5.90 payable to WCARS-VEC, Ray Adams, N4BAQ, 5833 Clinton Hwy., Suite 203, Knoxville, TX 37912-2545; 615/688-7771. Tables are $8 plus admission of $2; tailgating $3 plus admission of $2. Setup 4-9 p.m. on Friday and 5-8 a.m. Saturday. Smoking in designated area only. Talk-in 146.94(-). For more information, contact Paul Baird, KY4A, 1500 Coulter Shoals Circle, Lenoir City, TN 37771; 615/986-9562.

Texas

ORANGE ARC annual hamfest on February 25th at the VFW hall, Hwy 87 North, Orange. Free admission — swap tables $5. Dealers $15. All indoors from 8 a.m. to 5 p.m. VE testing. Contact Paul Tullier, 409/769-1231 or write OARC, P.O. Box 232, Orange, TX 77630.

Vermont

The RADIO AMATEURS of Northern Vermont is sponsoring the Northern Vermont winter hamfest on February 25th from 8 a.m. to 3 p.m. at Milton High School, Route 7 in Milton, 5 miles north of I-89 exit 17. Features include flea market, auction, dealers, book sale, forums, exhibits and refreshments. VE exams will be given at 9 a.m. and 2 pm. Admission is $3, free for under 18 years of age. Tables are free while they last. Call for large setups. Talk-in on 145.15(-) repeater. Contact Mitch, WB2JSJ at 802/879-6589.

Wisconsin

M.A.C.E.: THE MILWAUKEE COMPUTER CLUB, SEWFARS 146.820 & 444.125 REPEATER SOCIETY, Inc., present a Swapfest & computer fair on February 26th from 8 a.m. to 2:00 p.m. at Kuglitsch's entertainment center, 16000 W. Cleveland Ave., New Berlin. Admission is $3 in advance, $4 at door. Reserved tables (4') are $4 or $5 at door; electrical outlet $5. VE exams will be given. Setup begins at 6 a.m. For information call 414/771-1250 or talk-in 146.82(-); fax 414/542-7474; E-mail craigc@execpc.com.

Combined QSO party

Mark your calendars for Saturday, 4 February, 0000 UTC through Sunday, 5 February, 0500 UTC. That's the date for the Great (combined) Northern New England QSO Party and County Hunt! For the first time, all three northern New England states—New Hampshire, Maine and Vermont—will operate their QSO parties on the same day, at the same time and with the same rules. All you have to do is point your beam toward New England and start piling up the contacts.

In 1995, each state will continue to run its own separate QSO party. So, if you want to enter the contests, it will be necessary for you to submit logs to each of the three states. However, for 1996, we hope to have all the details worked out so that you only have to submit one log. In the meantime, if you submit a log in 1995, you will automatically be eligible for recognition by the Great Northern New England QSO Party and County Hunt awards committee.

There are 40 counties in northern New England—New Hampshire has 10, Maine has 16 and Vermont has 14. We hope to have stations operating in each of those 40 counties during the QSO parties. For more information, contact:

Central Vermont ARC/Vermont QSO Party
P.O. Box 674
MOntpelier, VT 05601

G.E.A.R.S., Conrad Ekstrom - WB1GXM
P.O. Box 1076
Claremont, NH 03743-1076

Portland Amateur Wireless Association
P.O. Box 1605
Portland, ME 04104

YLRL YL-OM contest

SSB: 1400 UTC 11 February to 0200 UTC 13 February.

CW: 1400 UTC 25 February to 0200 UTC 27 February.

Operating breaks must be shown in your log.

Eligibility: All licensed men and women operators worldwide are invited to participate.

Procedure: OMs call "CQ-YL" - YLs call "CQ-OM"

Operation: All bands may be used. No crossband, net or repeater contacts. On

CW or SSB only one contact is permitted with each station on each band.

Exchange: Station calls; QSO numbers; RS(T)s; ARRL section/VE province/country. Entries in your log must also show: time, band, date, and transmitter power.

Scoring: (A) Phone and CW will be scored as separate contests. Submit separate logs for each contest.

(B) Score each band separately. One (1) point is earned for each station worked on each band. YLs count only OMs; OMs count only YLs. Add together the QSO points earned on each band.

(C) Multiply the number of QSO points by the total number of different ARRL/sections/VE provinces/countries worked.

(D) Each contestant using power output at all times of 100 watts or less on CW or 200 watts PEP or less on SSB multiply the score claimed in (C) by 1.5, the low power multiplier. Those not using low power are not entitled to power multiplier, and they are limited to 750 watts on CW and 1500 watts PEP on SSB.

Logs: All logs must show your ARRL section/VE province/country to qualify for awards. For each QSO, logs must show: call of the station worked; QSO number sent and received; RS(T) sent and received; ARRL section/VE province/country of station worked; band; time; and date. Logs must state the power used and the operating breaks taken. If you have 200 or more QSOs, submit a separate log for each band and submit a dupe sheet. Log photo copies are OK, but no carbon copies. Please type or print logs. Logs must be signed and must show score claimed. No logs will be returned. Submit separate logs for each contest.

All logs must be postmarked no later than 30 days after each contest ends.

Mail all logs to Carla Watson, WO6X, 473 Palo Verde Dr., Sunnyvale, CA 94086

Awards: First place phone YL: cup; OM: cup. First place CW YL: cup; OM: cup. The second and third YL and OM winners in each contest will receive certificates. The winner of the phone contest is eligible to win the CW cup. Certificates will be awarded to the high YL and OM phone and YL and OM CW winners of each US and VE call district and each country, provided there are at least ten valid contacts on the log.

Suggested Frequencies:

CW: 80 Meters 3.540 to 3.570; 40M 7.040 to 7.070, 20M 14.040 to 14.070 15M 21.120 to 21.150, 10M 28.180 to 28. 210.

SSB: 80M 3.940 to 3.970, 40M 7.240 to 7.290, 20M 14.250 to 14. 280 15M 21.380 to 21.410, 10M 28.280 to 28.410.

NOTE: Country band allocations differ. YLs should select appropriate frequencies for transmitting and receiving, especially on 40 and 80M.

Florida fox hunt

The West Palm Beach Florida ARC presents the first of what we hope to be an annual fox hunt contest on Saturday, 11 February from 1400-2000 UTC and Sunday, 12 February from 1700-1900 UTC. The object of the contest is to locate ten hidden transmitters within a given area. This is open to all interested parties licensed and unlicensed, WPBARC members free. Non-members (one dollar) donation to benefit the WPBARC. Registration by mail to Fox Hunt, c/o Dick Shofield, KE4CGQ; Sam Falco, KD4VBI; or Dennis Hamilton, AD4PS, P.O. Box 6834, West Palm Beach, FL 33405-6834. Last date for registration is midnight Friday, 10 February.

Categories

Class A, single hunter; Class B, team of two hunters; Class C, group of three or more. Scoring: The 1st hunter to locate a target will be awarded 1,000 points. The 2nd, 3rd, 4th and 5th hunter to locate the same target will be awarded 750; 500; 250; 100 points repectively. All other hunters who locate the same target will be awarded 50 points.

Confirmation chits

All hunters to locate targets will be given a color coded chit (slip of paper) corresponding to target number and contact number. Example: 1st hunter to locate a target will be given a blue, 2nd a red, 3rd a green, 4th yellow and 5th pink, 6th or later, white. Chits must accompany logs for credit.

1995 YL-ISSB QSO party

CW: 0001 UTC on 21 January through 2359 UTC on 22 February. Phone: 0001 UTC on February 18 thru 2359 UTC on 19 March, 1995.

Scope: The Party is open to all, however emphasis is on membership participation and member-to-member contacts.

Exchange: Signal report; state, province or country; name; (if member) send ISSB number and DX-W/K partner.

Categories: Single operator; DX-W/K partner; YL/OM teams.

Points: Three points for two-way member contacts within the same continent; Six points for two-way member contacts if different continents; one point for non member contacts.

Multipliers: Only member stations count as multipliers.

One for each of the following: Working both DX-W/K partners; each YL/OM team; each US state; Canadian province; DX country and each VK, ZL call district.

Two for running low power (250 watt PEP input) throughout the party.

Frequencies: The General portion of the phone and CW bands. Note: Avoid NET frequencies, e.g., 14.300, 14.332, 14.336, etc. Check 40/80M on the hour; more often after dark.

Awards: Certificates to top three scorers in each category. ZL AWARD: Most contacts with ZL Prefixes.

Logs containing contact info plus ISSB numbers must be received by April 30, 1995. Address all questions, comments and entries to: N4KNF, Rhonda, or N4ZGH, Roger Livingston, 2160 Ivy Street, Port Charlotte, FL 33952.

Use General Phone and CW bands. Open to all with emphasis on member-to-member contacts. Exchange report, state, province or country, name, ISSB number and DX W/K Partner. Logs must be received by April 30, 1995. Send questions, comments and entries to: Rhonda, N4KNF or Roger Livingston, N4ZGH, 2160 Ivy Street, Port Charlotte, FL 33952.

UHF distance record

A new over-land distance record has been reported on the 5.760 GHz amateur band. On November 12, Al Ward, WB5LUA in Allen, Texas, and Ron Stefanski, W9ZIH in Malta, Illinois, worked over a 738 mile path. The previous over-land record was 614 miles, set by N6CA and XE2/N6XQ.

Writing in the North Texas Microwave Society *Feed Point*, Ward reports working W9ZIH on the evening of November 11, on 432 MHz with S-9 signals. Those two then tried unsuccessfully to work on 5.760 GHz, having previously worked each other on the bands in between. They tried that night and the following morning.

In cooperation with Greg McIntire, AA5C, and W9ZIH, the first record breaking contact took place between WB5LUA and Roger Schneider, WB9OJR, of Green Valley, Illinois, who had joined the effort. The distance was 633 miles. AA5C and WB9OJR also connected, at 630 miles.

Continuing the effort, about three hours later at 1652 UTC, WB6LUA and W9ZIH made the 738-mile contact, and AA5C worked W9ZIH, at 733 miles. All contacts were on 2-way CW.

—ARRL *Bulletin*

Information in "New Products" is supplied by the manufacturers to acquaint *Worldradio* readers with new products on the market.

ARE

A new company, ARE (Amateur Radio Education, Inc.), specializing in Amateur Radio software, announces the release of *Ham University™*, a new *Windows™* program for learning Amateur Radio theory and Morse code for all levels of licensing. An interactive game called *Pentode™* makes learning the code and CW speedbuilding fun.

"Here at *Radio School*, we have switched over to this program exclusively for the generation of our on-the-air code practice, Morse code tapes, and commercial telegraphy cassette courses," states Gordon West, WB6NOA. "This new company, ARE, is owned and operated by active ham radio instructors Bob Gregg, AB6CH, and Roy Stephens, AC6CQ, both instructors in amateur and commercial radio and telegraph licensing."

The program called *Ham University™* has all the FCC updated Amateur Radio questions for Novice through Extra. The program uses the *Windows™* interactive format and *Hyper-Text* help files to assist students in better understanding the theory behind each question and answer.

The Morse code section of *Ham University™* teaches the code with the default as the Gordon West method (modified Farnsworth), but the student can also go to the ARRL method, or the student may create his/her own method in learning the letters, numbers, and required punctuation marks. Novice, General, and Extra Class lessons help increase speed and prepare the student to pass the test.

Great for kids and adults who enjoy computer games is *Pentode™*, the Morse code game, that offers an interactive challenge to advance students through the different states of learning the code and speedbuilding. *Pentode™* also has a Hall of Fame so that different students can compare their scores.

For more information about *Ham University™*, licensing classes, or *Gordon West Radio School* tapes and books, contact ARE by telephone, 714/968-0042; fax, 714/985-1016 or write *ARE*, 19032 Pauline Lane, Huntington Beach, California 91646.

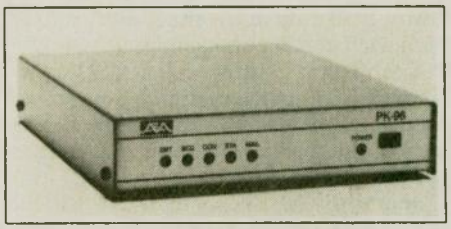
System requirements: 386 computer or higher, *Windows™*, 3.1, DOS 5.0 or higher, and a sound card is required for *Pentode™*, the Morse code game. Price, $69.95.

TheNet" and PK-96

AEA's PK-96 1200/9600 bps packet controller can now be a component in a "TheNet" network at 1200 or 9600 bps. "TheNet" compatibility of the PK-96 will allow node-builders to add a 9600 bps port to an existing mountain-top network quickly and easily.

The PK-96 has always been able to connect to "TheNet" network at 1200 bps. Being able to connect to a "TheNet" network allows a packet user on one frequency to connect with a network located on a hill, for example, and communicate with other packet users on different frequencies. The network allows users to communicate with people they otherwise couldn't because of geographic obstacles. The network also allows cross-frequency communication so all users can communicate with each other in one forum, regardless of frequency.

Now, AEA has the biggest network



news in quite awhile. Dave Roberts, G8KBB, has written a version of "TheNet" X1J especially for the PK-96. The PK-96 can now be part of the network. A special version of "TheNet" is now available for the PK-96 at 1200 bps and 9600 bps. This means that network builders can add a 9600 bps port to an existing mountain-top network, quickly. All the benefits associated with using a network have been available at 1200 bps for quite a while, but now they are available at 9600 bps. Once a PK-96 is installed in a network, 9600 bps users can find users to communicate with in one forum.

The quality of the PK-96 makes it an excellent choice to put into an existing network. The PK-96 utilizes proven HDLC hardware, it is small enough to fit most anywhere, it operates at 1200 and 9600 bps, it comes with 32K RAM and is upgradable to 128K, and the adjustment controls are on the back panel for easy access. The PK-96's ability to "plug and play" right out of the box gets users up and running immediately. AEA's operating manual and trained service crew offer the best instruction available. The PK-96, as well as the rest of AEA's products, are covered under a one year limited warranty. There are two ways network operators can acquire "TheNet" software for the PK-96. With the first option, AEA will send an initialization disk and an EPROM; you fill in the parameters and burn your own EPROM. Second, AEA will send you an initialization disk to fill out (listing the parameters you wish to have set on your PK-96), you then send the disk back to AEA. AEA will take this information and burn a chip for you and send you the EPROM in the mail. The first option is $10.00. The second option is $30.00 plus $5.50 shipping and handling This version of "TheNet" was designed specifically for the PK-96. For

more information about the PK-96 "TheNet" EPROM, call AEA at (206) 774-5554.

For more information, please contact: Advanced Electronic Applications, Inc., P.O. Box C2160, Lynnwood, WA 98036, 206/774-5554; Fax: 206/ 775-2340.

KKCOM

AEA is proud to introduce KKCOM, an editing and control accessory for the popular KK-1 Keyboard Keyer. The KKCOM package consists of application software and a serial interface cable which connects the KK-1 to a PC computer.

KKCOM gives users the ability to compose and edit buffer contents right on the computer screen. Keyer parameters such as: speed, sidetone pitch, serial number, and paddle sense can also be displayed and changed from the KKCOM software. KKCOM even allows the entire contents of the KK-I Keyer, including messages and settings, to be quickly saved to a file and reloaded later.

KKCOM makes customizing the KK-1's battery-backed message buffers easy. Have different buffer banks for Field Day, contesting, or for everyday use. Create and save one buffer or any number of buffers up to twelve. KKCOM makes creating, saving, and loading buffer messages easy. Once buffers are loaded into the KK-1, they will stay in the battery-backed buffer memory until you decide to change them.

Suggested retail price for the KKCOM interface cable and software is $49.00. Suggested retail price for the KK-1 Keyboard Keyer is $199.00.

For more information, please contact: Advanced Electronic Applications, Inc.P.O. Box C2160, Lynnwood, WA 98036, Phone: 206/774-5554 Fax 206/ 775-2340.

Constructor's Catalog

SESCOM, Inc. has released their 1995 *Constructor's Catalog*. This updated and expanded version features new and innovative electronics packaging solutions along with hard-to-find items, and also serves to introduce its two newest product lines.

The *RACKEM 'N' STACKEM™* series is a comprehensive line of half-rack sized boxes, racks and mounting accessories.

The BOX-IT™ system is designed to make building easy and fast. BOX-IT boxes are available in many sizes, and BOX-IT panels are cut to assorted sizes and simply slide into the box's rail system. They have common hole sizes and patterns prepunched to eliminate work for the constructor. A variety of components and tools are available for purchase in small quantities. Contact: SESCOM, Inc., 2100 Ward Drive, Henderson, NC 89015-4249, 702/565-3400, fax 702/565-4828.

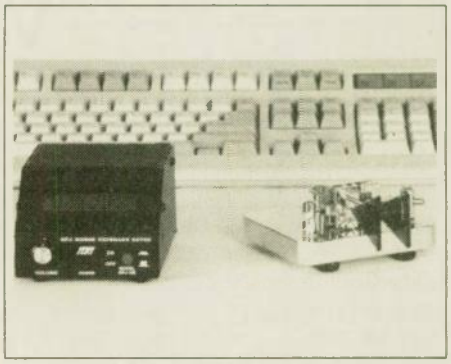
MFJ-452

MFJ Enterprises, Inc. announces the MFJ-452 Super CW Keyboard with "Perpetual Memory," for $129.95.

The MFJ-452 CW Keyboard keyer has a two-line LCD display, and the keyboard is RFI suppressed. It features eight, 250 character, nonvolatile message memories, a 150 character type-ahead buffer, an iambic keyer, and a powerful Morse code trainer. The "perpetual memory" feature retains messages and settings for up to twenty years without power or batteries.

The LCD display simultaneously shows what is being typed on one line, and what is being sent on the second. Stored messages and keyboard settings may be reviewed, and typing errors may be corrected by simply backspacing. The LCD is displayed on a sloped front panel mounted on the front of the MFJ-452, which is an advantage for ease in viewing.

The RFI suppression prevents lockup, and prevents digital hash in your receiver. Function keys allow a single



key stroke to store or recall messages, the setting of speed, weight and tone, set up of serial numbering, and the turn on of transmitter tune, etc. Other features include a hand key mode, and iambic keyer. By plugging in your iambic paddle, it can be used as a full featured keyer.

By pausing the buffer, comments can be inserted, and then the buffered text can be resumed, if the operator wishes.

The Morse code trainer affords practice (or teaching) using the Farnsworth method or the slow code method. Letters, numbers, punctuation and prosigns in any combination may be sent in either the standard group of 5, or may be user selected from 1 to 8 character groups.

The MFJ-452 includes a built-in speaker with sidetone, volume control, and a jack for an external speaker or earphones. The keyer is also available without the keyboard as the MFJ-452X, at $99.95. Power is either via 12V DC, or may be supplied with 110V AC by MFJ's #1312B, $12.95. These products come with a one year, unconditional guarantee from MFJ.

For more information or to order, contact any MFJ dealer or MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762, or call 1-601-323-5869. Toll-free order line, 1-800-647-1800. WR

VE exam schedules

As a service to our readers, ***Worldradio*** presents a feature listing those VE exams, times and locations which are sent to us.

Please remember that our deadline for publication is three months in advance. For example, if your VE group is scheduling an exam for September, please have the information to us by mid June.

Worldradio, 2120 28th St., Sacramento, CA 95818. Please mark the envelope "VE Exams."

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

p/r = pre-register
w/i = walk-in

Date	City	Contact	Notes
Arizona			
3/11/95	Tucson	Joe, K7OPX 602/886-7217	w/i only
3/18/95	Tucson	Micki, AA7RR 602/883-8305	p/r req
Arkansas			
3/18/95	Mountain Hm	Gerald, WM5W 501/430-5123	p/r req
California			
3/19/95	Berkeley	Gary, N6YBD 510/530-0544	w/i OK
3/23/95	Colton	Harold, AB6RN 909/685-6073	w/i OK
3/25/95	Culver City	Scott, K6PYP 310/459-0337 or Dave, N3BKV 818/559-2572	
3/25/95	Fairfield	Dick, AB6EY 916/791-0268	w/i pref
3/16/95	Fountain Vlly	Tom, N6XKY 714/778-1542	p/r only
3/7/95	Fremont	Greg, KJ6EP 510/791-6818	w/i only
3/4/95	Hesperia	619/244-1396	w/i only
3/1/95	Lake Isabella	Tom, KN6TS 619/379-2947	w/i OK
3/30/95	Long Beach	Blair, W6LRF 714/847-6370; Dale, N6LUH 310/596-1023	p/r pref
3/18/95	Long Beach	Don, NN6Q 310/420-9480	p/r pref
3/3/95	Novato	Recording, 415/883-9789	p/r
3/11/95	Oakhurst	Ken, K6LFR 209/683-8245	w/i OK
3/25/95	Pomona	Don, WA6HNC 909/949-0059	p/r only
3/25/95	Petaluma	Dale 707/762-9414	p/r
3/18/95	Redwood City	Joe, KB6OWG 145.23(-) PL=100	w/i OK
3/1/95	Sacramento	Jim, AB6OP 916/393-8839 or Earl, AB6CN 916/331-1115	p/r pref.; w/i OK
3/18/95	Sacramento	Lyle, AA6DJ 916/483-3293 or Phil, N6ZVA 916/338-3223	w/i OK
3/11/95	San Pedro	N6DYZ 310/325-2965	p/r pref.; w/i OK
3/18/95	Stockton	Mark, W6DKI 209/465-7496	w/i
3/11/95	Sunnyvale	408/255-9000 24-hrs.	w/i only
3/18/95	Vacaville	Barbara, KM6AC 707/429-4878	w/i only
3/11/95	Willits	Don, WA6ACX 707/459-3980	w/i OK
Colorado			
3/11/95	Denver	24-hr hotline 303/360-7294	w/i OK
Connecticut			
3/22/95	Shelton	Lee, WA1TSW 203/735-9476	w/i OK
Florida			
3/18/95	Melbourne	Bill, WB9IVR 407/724-6183	w/i OK
3/16/95	Vero Beach	Roger, KC4NHB 407/567-3979	w/i OK
Idaho			
3/11/95	Boise	Lem, W7JMH 208/343-9153	w/i OK
Illinois			
3/18/95	Loves Park	Dennis, W9SS 815/877-6768	p/r; w/i
3/11/95	Oak Forest	David, NF9N 708/448-0580	w/i OK
Indiana			
3/15/95	Indianapolis	Pete, 317/259-7610	p/r only
Iowa			
3/25/95	Council Bluffs	Lorraine, AAØBS 712/322-1454	w/i OK
Kansas			
3/2/95	Newton	Charles, KAØRCK 316/283-6042	p/r pref; w/i OK
Maine			
3/29/95	Brunswick	WZ1J, 147.135VHF, 444.900VHF	w/i OK
Maryland			
3/28/95	Glen Burnie	Jerry, NU3D 410/761-1423	p/r pref; w/i OK
Missouri			
3/4/95	Kimberling	James, NQØG 417/739-2888	w/i OK
Montana			
3/7/95	Great Falls	George, AA7GS 406/453-2360	
Nevada			
3/18/95	Minden	George, WW7E 702/265-4278	w/i OK
New Jersey			
3/16/95	Bellmawr	Bill, WA2VQG 609/933-1500	w/i
3/11/95	Cranford	24-hr. hotline: 201/377-4790	w/i OK
3/8/95	Ft Monmouth	Gerry, WB2GYS 908/532-5354	w/i OK
3/18/95	Pennington	Don, AA2F 609/737-1723	p/r pref.
3/6/95	Sayreville	Larry, N2ELW 908/754-5800days 908/613-8967 eve.	w/i OK
New York			
3/14/95	Hicksville	Bob, W2ILP 516/499-2214	w/i
3/18/95	Long Island	Les, AA2FJ 516/364-0030	
3/5/95	Yonkers	Emily, AC2V 914/237-5589	w/i OK
Ohio			
3/2/95	Cincinnati	Herb, WA8PBW 513/891-7556	w/i OK
3/11/95	Van Wert	Robert, KA8IAF 419/795-5763	p/r
3/16/95	Youngstown	James, N8IRL 216/534-1394	p/r only
Oregon			
3/15/95	Florence	Hal, N7NNA 503/997-2323 or Bob, KG7VA 503/997-1222	p/r pref; w/i OK
3/15/95	Medford	Dale, N7IXS 503/772-6865	w/i OK
3/8/95	Roseburg	Dick, AA7GC 503/672-5997	w/i OK
Pennsylvania			
3/4/95	Erie	Norma, W3CG 814/665-9124	w/i OK
3/3/95	Nazareth	Robin, WA3T 610/820-9110	w/i
3/18/95	Stockdale	Lou, KA3FLU 412/938-8125	p/r only
Rhode Island			
3/9/95	Providence	Al, NN1U 401/454-6848	w/i OK
3/20/95	E. Providence	Bob, AA1CT 401/438-0935	
3/25/95	Slatersville	Bob, W1YRC 401/333/2129	p/r pref; w/i OK
South Dakota			
3/11/95	Rapid City	Frank, NUØF 605/348-6564	w/i OK
Texas			
3/18/95	Austin	Jim, AB5EK, 512/327-6184	w/i OK
3/14/95	Houston	Harold, ND5F 713/464-9044	p/r pref.; w/i OK
3/18/95	Lubbock	Gerry, WB5R 806/765-5526 or Doug, W5JUV 806/745-1504	
Virginia			
3/25/95	Gloucester	Fran, KS4FO 804/898-8031	p/r pref; w/i OK
3/4/95	South. Penin.	Ed, W4RTZ 804/898-8031	p/r pref; w/i OK

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.

THE MART *Worldradio*
2120 28th St., Sacramento, CA 95818

***WORLDRADIO* ON CASSETTES** for the blind. For information, contact TOM CARTEN, K1PZU, 1602-Y King's College, Wilkes-Barre, PA, 18711. F196

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. F295

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. 694-795

RADIO REPAIR: Amateur & commercial, reasonable, JIM RUPP, 9330 State St. Ste. B-313, Marysville, WA 98270; 206/387-6312. 8am to 8pm. 594-895

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 METERS. Build seven models representing the development of simple electrical meters. $9.95 each, ppd USA. Send to ALLABOUT BOOKS, Dept. W, Box 22366, San Diego, CA 92192. 10,1294,2,4,6,8, 1095

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

QSLs — ELEGANT, AFFORDABLE. Samples $1 (refunded with order). AACO, Dept. W51, 1639 Fordham, Mountain View, CA 94040. 295

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

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. 694-395

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

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

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. 295-296

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

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; 360/896-8856, 800/346-6667, fax 306/896-5476. 295-296

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

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

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

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

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 813/758-9758.1-295

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

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

WANTED ELECTRON TUBES, ICs, semiconductors. ASTRAL, P.O. Box 707WM, Linden NJ 07036. Call 800/666-8467. 1294-1295

NOW ON 80 METERS! New, knob tuned w/ digital display, synthesized QRP transceiver. Complete kit only $199.95. S&H $6.50 (Continental US). Guaranteed to work. For info, send SASE; call/write to order: S&S ENGINEERING, 14102 Brown Road, Smithsburg, MD 21783; 301/416-0661. 295

The MART (cont.)

FOREIGN AIRMAIL POSTAGE for successful QSLing! Many countries, monthly bargains. Plus European airmail envelopes! Samples, prices: BILL PLUM, 12 Glenn Rd., Flemington, NJ 08822; Fax 908/782-2612. 2-895

WINTER SALE: FINALLY HEAR WEAK SIGNALS: DSP audio filters by JPS, NIR-10: $309.95, NRF-7: $199.95, NTR-1: $149.95, SSTV-1: $134. Free shipping 48 states. Full satisfaction or full refund. Do not accept JPS clones. 24-hour orders, authorized JPS dealer: DAVIS RF CO., orders only: 800/328-4773, tech: 508/369-1738. 2-795

QSL CARDS - Standard and custom. Your ideas or ours. Excellent quality. Foil stamping available. Many designs and type styles. Catalog and samples $1.00 refundable. WILKINS, Dept. D, Box 787, Atascadero, CA 93423. 2-495

OLD TIME RADIO SHOWS: Hundreds of titles to choose from on cassette or reel to reel. Send to: NOSTALGIA, Box 82, Redmond, WA 98073-0082. 295

CODE PRACTICE 5 through 40 WPM. Daily at 1400Z and 2300Z on 7058. Interesting sea stories by former wireless operators. R.V. EVANS, K7HLR 2-495

SPECIAL: 100 QSL cards 3½x5½ prepaid $7 good camera ready copy or your old card. We pay postage.Color paper: white, blue, green, yellow, ivory and red. Black ink flat, one side. ARTIST, P.O. Box 23325, Nashville, TN 37202. For sample send stamp only. 295

FIBERGLASS: Solid rod, round tube, square tube, quad spreaders, (UHF to 40 Meters!) masts, crossbooms. Any quantity, retail and wholesale. SASE for list. MAX-GAIN SYSTEMS, 221 Greencrest, Marietta, GA 30068-3825. 295

QSLs — ELEGANT, AFFORDABLE. Samples $1 (refunded with order). AACO, Dept. W52, 1639 Fordham, Mountain View, CA 94040. 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. 295

SUPERFAST MORSE CODE SUPEREASY. Subliminal cassette. $12. Learn Morse Code in one hour. Amazing supereasy technique. $12. Both $20. Money-back guarantee. Free catalog: SASE. BAHR-W8, 150 Greenfield, Bloomingdale, IL 60108. 295

HTX100 & UNIDEN OWNERS: 80 watts from your mobile! Parts less than $40.00. Super easy instructions. $2 SASE: PLANS, 6173 Gundry, Long Beach, CA 90805 295

FOX-TANGO CW crystal filter special for TS-940/930/830. 400 Hz Bandwidth, 455.7 center frequency. Stock IRCI filter is $135.00; stock Kenwood filter is $159.95. Our price is $49.00 + $5.00 S/H. Only 50 pieces available. This filter is an exact drop-in on the 830. On the 930 and 940, we supply a plug-in PC board. International radio and computers, FOX-TANGO, Inc., 3804 S. U.S. #1, Ft. Pierce, FL 34982, 407/489-0956. Ask for our catalog. 295

ANY OLD TRAINS IN YOUR ATTIC? I have new/used ham equipment or test equipment to trade for Lionel, American Flyer, Marklin, or LGB Trains. Get the ham rig you want with minimal cash outlay. Call JIM TUCKER, WM5G at 800-527-4642 today. 2-395

TEN-TEC CENTURY/21 MODEL 574. $300.00 shipped. MICHAEL TARANT, N3FKH, 11 Tennent St., Warminster, PA 18974-4932, 215/441-4030. 295

AMATEUR RADIO REPAIR— Prompt service. ROBERT HALL ELECTRONICS, 1660 McKee Rd., Ste. A, San Jose, CA 95116; 408/729-8200. 295-296

RADIO RUBBER STAMPS. 10-10, CW stamp, etc. Free brochure. REID ASSOCIATES, 6680 Mellow Wood, W. Bloomfield, MI 48322. 2-495.

DX'ERS/CONTESTORS: Eliminate atmospheric white noise, static, heterodynes or enhance AMTOR/RTTY. JPS Communications NRF-7 DSP audio filter. New low price: $199.95 delivered continental USA. For impulse noise elimination, ignition, power line plus all NRF-7 noise cures, order NIR-10: $309.95 (see our ad "Finally hear..."). Immediate shipment. DAVIS RF CO., 800/328-4773. 2-795

REPEATER JAMMERS? The "Handi-Finder" DFer (kit) attaches to HT. $27.95. Group discounts! NOARD, 29460-N Lorain, Cleveland, OH 44070; 216/777-9460. 1094-395

PACKET RADIO. Join TAPR, connect with the largest packet/digital group in the US. Creators for the TNC-2 standard. Benefits: newsletter, software, discount on kits/publications. $15/year US, $18 Can/Mx, $25 elsewhere. Visa/MC. When joining, mention *Worldradio*, receive TAPR's Packet Radio info booklet ($7 value) Free! 817/383-0000, Mail: 8987-309 E. Tanque Verde Rd. #337, Tucson, AZ 85749-9399. F295

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. 295

COPPER WELD ™, lowest pricing: Solid, all sizes, lengths from 100 ft. on up. Example: 1,000' #14: 6.9 cents/ft. Strong. Call DAVIS RF CO., 800/328-4773. 2-795

PICTURE QSL CARDS of your shack, etc., from your photo or black and white artwork. 500–$28.00, 1000–$44.50. Also non-picture cards. Customized cards, send specifications for estimate. Send two stamps for illustrated literature. Generous sample kit–$2.00, half pound of samples–$3.00. RAUM'S, 8617 Orchard Rd., Coopersburg, PA 18036. Phone or fax 215/679-7238 1194-295

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

MILITARY KEYS, telegraph stuff, et cetera. 15-page illustrated list, $2.00 (refundable) plus 2 stamps. JACOBS, 60 Seaview Terrace, Northport, NY 11768. 1-295

ANTENNA BOOM-MAST EXTRUSIONS, type 60601-T6. Specify your tube or pipe diameter. In 12-inch undrilled lengths. $12 prepaid in CONUS or $22 for two. KOPPS CORP., 1236-40th Ave., Sacramento, CA 95822. Good check or MO. 1094-395

WANTED REPLY COUPONS of all types, IRCs & others. Buy, sell, trade. JIM NOLL, P.O. Box 3410, Escondido, CA 92033. 295-296

YAESU FT-990 SIDEBAND/CW FILTERS NOW AVAILABLE! Also 8-pole & 10 pole crystal filters for Kenwood, Icom, & Yaesu. Fox-Tango filters available. Kits and upgrades. Authorized Kenwood warranty service center. Send for our free catalog. INTERNATIONAL RADIO & COMPUTER, INC., 3804 S. US #1, Ft. Pierce, FL 34982. 407/489-0956. Look for us at Dayton in booth #443. 2-495

DACRON ROPE: Why risk failures with aerial supports? Strong, high UV resistant, non-stretch military-type black double (unlike our competitors' single) braided Dacron. 3/32" 260 lb. test ($.06/ft), 3/16" 770 lb. ($.11/ft), 5/16" 1,770 lb. (.16/ft). Discounts at 1,000 ft. DAVIS RF CO., 24-hour orders: 800/328-4773. 2-795

THE SPEC-COM JOURNAL is devoted to full coverage of all the specialized modes. Published 6 times per year, The SCj, published by KA6JAW, is 28-40 pages of contributing authors, reader submission, building projects, news product reviews and information covering RTTY, Digital, Slow & Fast Scan TV, Satellite, TVRO, QRP Repeater, SWL Scanning and other specialized modes. The SCj is the official publication of the United States ATV Society. Samples only $3.80, annual subscriptions : USA $20; Canada/Mexico $25; foreign surface $30. MC/VISA orders (5% service charge addded) are welcome. THE SPEC-COM JOURNAL, P.O. Box 1002, Dubuque, IA 52004-1002; phone 319/557-8791; fax 319/583-6462. A Donovan Group Company, The Spec-Com Journal is for you! F895

CHASSIS & CABINET KITS. SASE. K3IWK, 5120 Harmony Grove Rd., Dover, PA 17315. 1094-1095

WHOLESALE PRICING TO MEMBERS OF HAM CLUBS: Wire, coax, DSP, *Flex-weave*™ #14 wire rope, *Bury-flex*™ low loss 50 ohm HD cable (44 cents/ft!!), copper weld, insulators, baluns, ladder line, Vibroplex, Bencher, etc., send 3 stamps for catalog. DAVIS RF CO., P.O. Box 230-W, Carlisle, MA 01741. 2-795

THE HOW-TO QUAD MANUAL with the new "Quad Clip." Thirty years experience building, learning and operating with the KING of Antennas. 82 p., 8 x 11, w/1994 updates, 50% full page detailed photos and drawings. Send $7.50 + $2.50 AIR/S&H, to AMPRUSS, c/o KH6CTQ, P.O. Box 551, Aiea, HI 96701-0551. 1094-1095

BROWNIE'S QSLs since1939. Catalog and samples $1.00. 3035 Lehigh St. (rear), Allentown, PA 18103. 1094-395

ROSS'$$$$ used February Specials: Kenwood TV-506 $240.00, VFO-120 $130.00, TS-530S/YK-88C $550.00, BC-11 $69.90, ICOM 2SAT/UT-50 $295.00, 4SAT/UT-50 $300.00, IC-701PS $99.90, R-1 $490.00, Yaesu FT-690RII $600, FV-101 $130.00, FT-726R 2M, 70CM, SU $900.00, FT-221R $350.00, FT-209RH $150.00, YO-901P $420.00, Collins 32S-3, 75S-3B, 516F-2, 312B-4 all round $1250.00, CC-2 $90.00, AC-3805, HB $60.00, Drake PS-75 $65.00, PS-7 $140.00, Ten-tec 225 $75.00, 252-MO $80.00, 961 $130.00, 251-M $70.00. 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. 2-795

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. 794-795

FOR CODE 5 NEWS and Petition information, SASE to KB7PNQ, 503 Dubois Street, Cheney, WA 99004. 2-395

TEN PL-259ST CONNECTORS. Send check, $13 ppd., Rob Kontes, 465 Croft, Idaho Falls, ID 83401. 2-795

HAM RADIO REPAIR! Most HF radios repaired $116.00 plus parts. Hand held radios $72.00 plus parts. WARRC, JIM RUPP, Box 697, Grayland, WA 98547, 360/267-4011, AB7DR. 295-296

AZDEN-KDK-ADI REPAIR Also other VHF/UHF amateur transceivers. Trade-ins welcome... Sales: AZDEN, Alinco, Vectronics, Valor, Pyramid, AEA, RF Concepts, etc. QRV ELECTRONICS, 503 Main St., P.O. Box 330, Crawford, GA 30630; Ph/Fax 706/743-3344. 1294-1295

AMATEUR RADIO REPAIR: FCC licensed, 18 years experience, lab quality NBS traceable test equipment, reasonable rates. G.B. COMMUNICATIONS, INC., 963 Birch Bay Lynden Rd., Lynden, WA 98264. 206/354-5884. 2-595

Nominations sought

KAY CRAIGIE, WT3P

Nominations are now being sought for the 1995 awards to be presented at the ARRL Atlantic Division convention. The convention is held in association with the Rochester, New York Hamfest, 19-21 May, 1995. The awards are handsome plaques to be presented at the hamfest banquet.

"Amateur of the Year" nominees should be outstanding all-round Amateurs from the Atlantic Division with a strong record of service to the Amateur community. An award for lifetime service to Amateur Radio, the "Grand 'Ole Ham," is open to Atlantic Division OMs and YLs who have been licensed at least 30 years, or are at least 50 years of age. The Atlantic Division "Technical Achievement" award my be presented to an individual or to a group.

Complete information on the awards and nomination procedures is available from the Rochester Hamfest, 300 White Spruce Blvd., Rochester, New York 14623. Telephone, during regular business hours at 800/724-8515, or 716/424-7184. The deadline for nomi-

Calibrate scales

ART SADLER, W6SFW

For you QSLers, recent scientific studies have definitely concluded that two quarters plus one penny weigh a half ounce. And, further research has revealed that four quarters plus two pennies will weigh one ounce. This is close enough for Government work as the above studies were verified by my local Post Office on their electronic scales. —SARO *News*

——Happy Valentine's Day!——

ADVERTISERS' INDEX

A & A Engineering — 16, 63
Ace Communications — 16
Amsoft Ham Radio Software — 30
Antennas West — 11, 38, 42, 61, 62
Antique Radio Classified — 50
Arrow Antenna — 13, 41, 63
Atlas Radio Company — 55
Aztec RF — 62
Battery-Tech - 31
Bilal Co. — 12
Bohnhoff, M. — 37, 40
Bonneville Music — 29
Brian Beezley, K6STI — 49
Buckmaster Publishing — 22, 34, 46
Butternut Electronics — 30
Cable X-Perts — 52
Caps Unlimited — 34
Coax Connection — 38
Communications Specialists — 19
Courage Center — 10
Cubex Co. — 45
DX Edge — 18
Embroidery Warehouse — 50
Engineering Systems, Inc — 54
GGTE — 45
GLA Systems — 17
H. Stewart Designs — 4, 52
Ham Radio Insurance — 24, 63
Ham Radio Outlet — 21
Henry Radio — 2
IMRA — 28
Jade Products — 53
Jun's Electronics — 25
KAWA Records — 10
Kilo-Tec — 28
Lakeview Co. — 10, 51
Media Mentors — 44
MFJ Enterprises, Inc. — 14, 15
Microcraft Corp. — 37
Mike Klein/Callbooks by — 67
Mouser Electronics — 47
Omega Electronics — 59
Palomar Engineers — 3, 39, 49, 56
PC Electronics — 43
QCWA — 37
QSLs by W4MPY — 22
Radio Engineers — 32
Radio Place, The — 33
Radioware — 42
RF Applications — 23
Rusprint — 58
SGC, Inc. — 27
Solder-it — 49
Sound N Mind — 34
SWS Ham Aids— 26
T.J. Antenna — 47
Tucker Electronics - 68
Universal Radio Inc. — 62
Van Gorden Engineering — 7
VIS Study Guides — 26, 39
Visit Your Local Radio Club — 35, 36
Visit Your Local Radio Store — 48
W5YI-VEC — 16
W9INN Atennas — 18, 46
Wheeler Applied Research — 8
Wireman, Inc., The — 47
WJ2O Software — 20
Worldradio Books — 69
Yaesu — 5

Tucker Brand Products... Don't Settle For Less!

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.

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)

Tucker SatisfactionPlus 30-Days - No Questions Asked Guarantee

Your Choice... $79 each

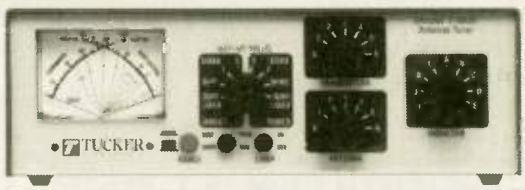
Tucker TM-3000UV
100-500 MHz Cross-Needle SWR/PWR Meter

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.

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

TUCKER ELECTRONICS

Call, Write or Fax for a FREE copy of our Huge Catalog!

We Take Trades!

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
ASTRON CORPORATION
COMET
CREATE
cushcraft
DAIWA
DIAMOND ANTENNA
DRSI
EDCO
HEIL SOUND
EMOTO
HUSTLER
hy-gain
ICE
ICOM
Jim
JPS
Kantronics
KENWOOD
mfj
pro-am
RAMSEY
ROHN TOWERS

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_____

Yaesu DX-Caribe cruise '95

Yaesu U.S.A. is pleased to announce its sponsorship of "DX-Caribe Cruise '95," the second in a series of Amateur Radio theme cruises, to be held June 18-25, 1995.

Sailing from Aruba on board Dolphin Cruise Line's *S.S. Ocean Breeze*, passengers on DX-Caribe Cruise '95 will make stopovers in Dominica, Barbados, Martinique, and Curaçao, before returning to Aruba. While on board in international waters, two fully-equipped Yaesu HF stations will allow maritime mobile operation. At each shore stopover, optional shore excursions will provide the opportunity for passengers to operate "DXpedition" style from beach locations; current plans are for operation from three HF stations plus 6 Meters, OSCAR, and 2 Meter EME (Moonbounce).

Entertainment on board the ship, besides Dolphin's exciting slate of evening shows, includes special presentations from Roger Balister, G3KMA (Director of the RSGB IOTA Program), Charles K. "Rusty" Epps, W6OAT (Director of the Northern California DX Foundation), Gordon West, WB6NOA (renowned instructor and writer), and Yaesu's cruise staff. While at sea, a wide variety of workshops and other activities will cover many areas of Amateur Radio activity.

Information regarding DX-Caribe Cruise '95, including booking of ship and airline passage, is being handled *exclusively* by Landry & King, Inc., 1390 South Dixie Highway (Suite 1207), Coral Gables, FL 33146, (800) 448-9002. Inquiries from outside the United States are heartily welcome, and may be directed via fax to Landry & Kling at (305) 661-0977. 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