October, 1987 Volume 6, Number 10

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MONITORING TIMES

A Publication Of
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SKYWARN!

When the Seconds Count

by Jock Elliott

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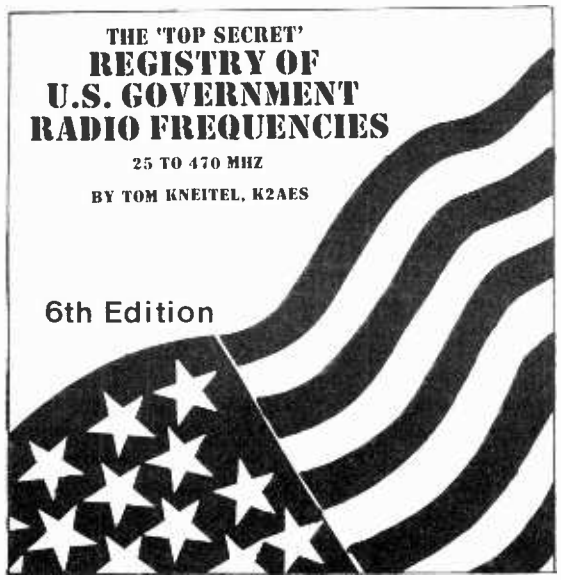

All New 6th Edition

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by Tom Kneitel

Its the standard reference source for federal frequencies in an all new, 6th edition. Contains some 12,000 listings from more than eighty federal agencies from 25 to 470 MHz. Included are frequencies for the FBI, DEA, CIA, NSA, Customs, Secret Service, Border Patrol, Immagration, ATF, Treasury, Marshals, Federal Prisons, FCC, FAA, U.S. Army, Coast Guard, Marines, Navy and Air Force, plus UHF aero (225-400 MHz), important 2-25 MHz frequencies, plus an in-depth introductory article on how to monitor this exciting portion of the radio spectrum. All this and more in a big, easy-to-use and read format. Twice as much information as in the previous edition!
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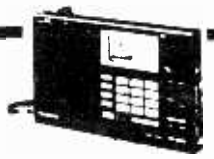
SHORTWAVE LISTENING WITH THE EXPERTS

Let 25 of the world's leading experts on radio monitoring introduce you to thew exciting world of shortwave listening. Each takes you through a different aspect of the hobby—from getting started to choosing the right receiver to the fundamentals of propagation and DXing , QSLing and more. By some of the biggest names in the business: Magne, Berg, Jensen, Helms, Dexter. A real doorstopper at 500+ large format pages. The encyclopeadia of shortwave. Imprimé price 21.95. Shipping weight 3 lbs.

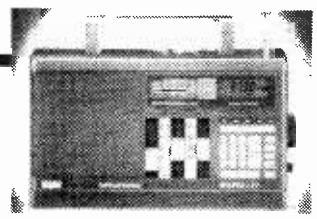
SANGEAN ATS-803

A full feature, general coverage portable at a very affordable price! AM, FM and longwave plus uninterrupted shortwave coverage all the way to 29999 kHz. The LCD display shows frequencies to the nearest 1 kHz. Keypad and knob tuning. Five memories to store your favorite frequencies. Lighted dial. A timer that turns the radio on and off at preset intervals. BFO for listening to single sideband transmissions. Wide-narrow switch for better reception. RF gain control. And free AC adapter. This is the new edition of the ATS-803. And it's just $175.95 plus $4.02 UPS shipping, handling and insurance. (10 lbs.)



PANASONIC RF-B60

The Panasonic RF-B60 is the highest quality portable on the market today. Built with a Swiss watchmaker's precision, it is ultra high-tech, high quality, yet very easy to use. Before you buy something like the Sony ICF-2002, look at the 'B60. The 'B60 is the size of a paperback book. It's solidly built and has full LW, AM, FM and shortwave coverage from 1615 to 29999 kHz. Tuning is by knob, keypad, up/down button and scanner. A large, dual function LCD shows frequency and time. A built-in timer turns the radio on and off at pre-set times. And there's 36 memories, 9 for storing your favorite shortwave frequencies. Best of all, the 'B60 is easy to operate and it sounds good. Says noted equipment reviewer, Larry Magne, "[The RF-B60 is] a better choice for the shortwave listener." Just $229.95 plus $4.50 UPS. (12 lbs.)

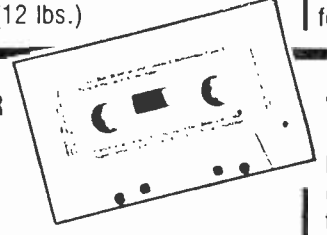


GRUNDIG SATELLIT 400

If you're a shortwave listener—not a DXer—and you're looking for the finest in listening machines, look at Grundig. Featuring legendary German engineering, the Satellit 400 is a listener's dream. It boast solid performance, attractive styling, lots of features and excellent audio. In fact, this oversized portable is the best sounding radio in its class. You get full LW, AW, FM and shortwave coverage, keypad and rotary tuning (to 1 kHz), and a large LCD frequency/time display. It's a remarkably sensative radio, too, capable of receiving the weak stations. But you'll want to use it for the fine sound that it brings your regular listening. Finally, there's a shortwave radio for the listening connoiseur. It's the Grundig Satellit 400. Available now for $399.95 plus $4.02 UPS. (10 lbs.)

EAVESDROPPER ANTENNA

If you're not getting the stations you should bem maybe you should think about getting an Eavesdrooper. Eavesdroppers are made specifically for the shortwave listener with peak performance on everything form 11 to 60 meters. It's only 40 ft. long, built to last and complete and ready to install—complete with heavy, 14 gauge antenna wire, 100 ft. of transmission cable and more. You've already spent enough on your radio, make sure you've got the best antenna, too. After all, who knows what you're missing? List price $64.95 plus shipping. Imprimé price $59.95 plus $2.62 shipping. (4 lbs.)



WORLD ON THE AIR LATIN AMERICA ON THE AIR

Two great collections for the DXer! World on the Air features 65 minutes of jingles, station promos, commercials and program excerpts from broadcasters all across the globe. Latin America on the Air, a 75 minute cassette, which comes with a guidebook, samples stations in the Caribbean and South and Central America—some no longer even on the air! Each tape $9.95 plus $1.95 shipping. (1 lb.)

THE DX EDGE

For years, ham radio operaotrs have known that their chances of getting those hard to hear stations is when their location is in sunset and the location of the station they want ot hear is in sunrise. And vice versa. It's called Grayline DXing. But calculating when this occurs has never been easy—until now. With the DX Edge, you can find the perfect time to to try for any station at any time of the year. DX Edge puts this information at your fingertips in an easy, 11 inch plastic slide rule device. Get the DX Edge plus 12 overlays for each month. Just $19.95 plus $1.95 shipping. (1 lb.)

SHORTWAVE FACSIMILE FREQUENCY GUIDE

You can get pictures from your shortwave radio—weather charts, satellite reconaisence, press photos and more. This provides a brief intro and list of distributors, then lists stations by frequency and location; concludes with station names and addresses and a frequency suuplement. Imported from Holland. $14.95 plus $1.95 shipping. (1 lb.)

SECRETS OF SUCCESSFUL QSLING

A complete, easy-reading and entertaining guide to reception reports and QSL collecting. $9.95 plus 1.95 shipping. (1 lb.)

THE VOICE OF AMERICA CALLING FINLAND

An eassy on U.S. shortwave broadcasting to Finland by John I. Kolehmainen. A fascinating and thorough look at how it was done from 1942 to 1953. Limited quanities available. A must for the collector. $9.95 plus $1.95 shipping. (1 lb.)

THE SHORTWAVE LISTENER'S ANTENNA HANDBOOK

An invaluable guide for every shortwave enthusiast who wants maximum signal reception from his set up. A complete soup to nuts book that runs from how antennas work to how to build your own—from tested designs. A best seller. $11.95 plus $1.95 shipping. (1 lb.)

UTILITY QSL ADDRESS GUIDE: THE AMERICAS

A long overdue book for the Ute listener. Station names and addresses for everything from military to Civil Air Patrol, Navy, airlines, foreign embassies and more in countries from North, South, Central America and the Caribbean. $12.95 plus $1.95 shipping. (1 lb.)

Toll-free number is for orders only. Operators are not trained to answer product questions. For technical assistance and same day shipping, use your Mastercard or Visa and call the warehouse direct Monday-Saturday 9:00 am to 5:00 pm (1400-2200 UTC) at 215-383-1150. No collect calls. Books, antennas and tapes are not returnable except in case of defect which must be reported to the shipping agent upon receipt. PA residents only add 6% sales tax. Prices subject to change without notice. Not responsible for typos.

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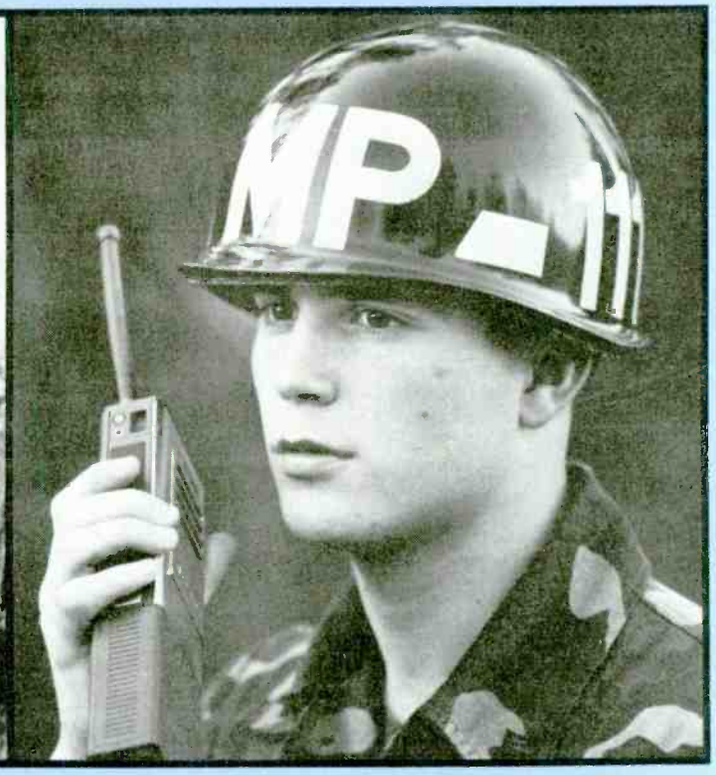


The 1988 Grove Catalog

And Buyer's Guide to Monitoring

THE BUYER'S GUIDE TO SHORTWAVE LISTENING

Choosing a Shortwave Receiver

Choosing a shortwave receiver is a lot like choosing a car--you must first decide what basic functions you need, then select the appropriate product.

Looking for a good portable? The Sony ICF2010 is probably the best choice. Featuring keyboard entry of frequencies as well as a tuning dial, the radio offers sensitivity, wide or narrow selectivity, and aircraft band reception as well as mediumwave, shortwave and FM broadcast bands. Synchronous detection enhances shortwave signals and single sideband reception is quite good. Battery life is much improved over the former ICF2001 and 2002 and the unit comes with an AC adaptor.

For low cost and very good performance, try the Sangean ATS-803. Continuous 150 kHz-30 MHz AM and SSB reception are offered along with FM broadcast. Wide/narrow selectivity may be switched and an AC adaptor is included.

The Sony PRO-80 is an interesting combination shortwave radio/VHF scanner in a handheld package. Its use is recommended when wide frequency coverage and compactness are of paramount importance.

If you want pocket portability, forget high quality; the two don't mix. The characteristics of greatest importance to listeners are compromised in low-cost radios: frequency stability, frequency readout accuracy, single-signal selectivity, and overload immunity. In general, you get what you pay for.

Among the more professional radios, names like Kenwood, Yaesu, JRC, and ICOM top the popularity polls and the ICOM R71A, Kenwood R5000, and JRC NRD525 head the list. Their strong signal handling capability makes the use of preselectors generally unnecessary, even with large outside antennas.

The Yaesu FRG-8800 and Kenwood R-2000 are very good general purpose receivers although they suffer from strong signal overload (intermodulation) when used with good outdoor antennas like the Grove Skywire. The Grove TUN-3 MiniTuner is strongly recommended for use with these two receivers and with the Sony ICF2010 and Sangean ATS803 (as well as other low and medium cost receivers) when connected to outside antennas.

Shortwave Antennas & Accessories

While it is true that any length of wire will pick up signals, a well-planned antenna installation will pick them up better.

IMPEDANCE AND SWR

While "impedance mismatch" and resultant "standing wave ratio (SWR)" are important considerations for transmitting, they are of virtually no concern to receiving installations. Of paramount importance is "capture" or "aperture"-- the actual size of the signal gathering portion of the antenna, and the efficiency (low attenuation) of the feedline.

But the "bigger the better" concept has its limitations. While a mile-long antenna can intercept a sizable amount of radio energy, other considerations such as height above ground and frequency band to be covered are equally important.

The greatest efficiency of an antenna is reached when the antenna is "resonant"; that is, its electrical length matches that of the incoming radio wave. Since wavelength varies with frequency this magical match to your antenna can only occur at one frequency (and harmonically-related multiples). It is the job of the designer to come up with an antenna that provides the best combination of features for the radio listener who wants wide frequency coverage.

A wire antenna may be thick or thin, copper or aluminum, insulated or uninsulated, stranded or solid...it will hear signals just the same.

There are many tricks of the trade which have been learned from trial and error; while antenna design is not really a "black art," it would appear so to many hobbyists and engineers alike due to the many interdependent considerations.

IS BIGGER ALWAYS BETTER?

A receiving antenna serves only one purpose: to intercept enough electrical energy to overcome losses and noises in the receiving system. Once that minimum has been reached, no amount of amplification will make the signal easier to copy, just louder... right along with louder background noise.

Directional antennas can concentrate the incoming energy (called "gain"), rejecting noise from other directions for better signal-to-noise ratio. A large capture area ("aperture") can also compensate for poor receiver sensitivity (higher internal noise) by providing greater signal levels to begin with.

An antenna should be as high as possible and away from large metal surfaces and electrical power lines. Never run an antenna wire or transmission line over a power line and preferably not under one, either. Not only will it pick up electrical noise, but it is dangerous as well. Indoor antennas are susceptible to electrical noise pickup from household appliances, although loop antennas may be rotated for minimum noise.

RECOMMENDED ANTENNAS

For shortwave reception, nothing beats an elevated outdoor dipole 50-150 feet in length. In actual field tests, the Grove ANT-2 Skywire equalled or outperformed any other antenna with which it was compared, including much more expensive trap dipoles. The Skywire is approximately 66 feet long and is fed at a point 1/3 of the way from one end (Windom feedpoint) for more uniform matching across the 2-30 MHz spectrum.

For medium and longwave reception the operator may wish to disconnect the shield of the coax cable at the radio, allowing the feedline to become an extension of the antenna, thus increasing signal strengths at the lower frequencies.

A WORD ABOUT TRAP DIPOLES

Trap dipoles are designed to respond to certain frequency ranges (typically, international broadcast or ham bands) while reducing signal strengths at other frequencies. Why buy a general coverage receiver, then erect an antenna designed to reject most of that receiver's frequency ranges?

TRANSMISSION LINE

While the practice of running a wire from the antenna terminal on the receiver to a nearby tree is very popular and may produce excellent reception, it is susceptible to household electrical noise pickup. The use of coaxial lead-in from any outdoor antenna is recommended due to its inherent shielding from electrical noise pickup. For reception below 30 MHz, virtually any type of coax, including RG-58/U, RG-59/U, RG-6/U, and RG-8/U is acceptable for runs of up to at least 100 feet.

PREAMPLIFIERS

Modern receivers have excellent sensitivity when used with outdoor antennas of sufficient design. Since wideband preamps like the Grove PRE-3 amplify all signals (including the strong), use them only in low-signal-strength environments like rural or far-suburban areas, or with small, indoor antennas like the Grove ANT-6 Hidden Antenna.

The use of wideband preamps with outdoor antennas in metropolitan areas is discouraged unless the antenna is so small, poorly designed or badly located that all signals are low in strength. High-level signals from nearby transmitters will overload your receiver and preamplifier, producing interference and desensitization.

Preamplifier overload and its attendant problems on long, medium and short wave receivers may be reduced or eliminated entirely by the use of an effective preselector like the Grove TUN-3 MiniTuner between the antenna and the preamp. There are no preselectors available for scanners.

FILTERS AND ATTENUATORS

If the strength of those overpowering signals could be reduced, interference products can be similarly reduced or even eliminated. The following devices are placed between the antenna and the receiver.

Band-reject (stop-band) filters and wavetraps remove a swath of undesired spectrum; low-pass filters cut off signals above certain frequencies; high-pass filters cut off signals below a certain frequency; notch filters slice out a particular piece of spectrum in an effort to remove one frequency; and attenuators reduce all signals equally.

TUNERS

A "transmatch" or "matchbox" is a transmission-line impedance-matching device used with transmitters to prevent damage from high voltage generated by mismatch. No such conditions exist in receivers and, although a slightly higher S-meter reading may result by adjusting for better impedance match, the background noise level will also rise, netting no improvement in signal to noise ratio. Impedance tuning devices are generally unnecessary with receivers.

PRESELECTORS

Passive (unamplified) preselectors like the Grove TUN-3 MiniTuner installed between the antenna line and the shortwave receiver are tunable to specific frequencies, attenuating the rest of the spectrum. They remove intermod and image interference produced by strong signals in economy receivers.

GROUNDING

A connection to earth ground rarely makes signals stronger, but will reduce electrical shock hazard and may also reduce electrical noise interference and AC hum heard through the speaker.

An effective ground consists of a short length of heavy gauge wire connected to a single metal pipe or rod driven eight feet into moist soil. Dry sand is worthless as a ground. Alternatively, a metal cold water pipe may be called into service; avoid hot water pipes which are usually insulated by their numerous caulked joints at the water heater.

As a last resort, the metal screw holding the electrical wall plate in place may serve as a ground connection if the electrician was conscientious enough to ground the outlet box. Similarly, the round ground hole of a three-wire receptacle may serve as a worst-case ground reference.

Equipment chassis should be commonly strapped together by a single ground wire to reduce common mode hum. Braided copper shielding from an old piece of coaxial cable makes excellent ground wire. Experiment with various grounding combinations to find out what works best for you.

ACTIVE ANTENNAS

An active antenna consists of a short element connected to an amplifier. Their singular advantage is that they are compact and may be installed where larger antennas are impractical or disallowed. Active antennas come in two types: remote units which may be mounted at a convenient distance and controlled from the operating position, and self-contained desktop units which do all of their business next to the radio.

All wideband active antennas have one common fault: Their high-gain amplifiers are vulnerable to overload from strong signals (poor dynamic range). This may produce gain compression (apparent lack of sensitivity) and intermodulation ("intermod"--the mixing of signal frequencies producing spurious signals heard throughout the listening range).

Some active antennas improve this shortcoming significantly by providing a tunable preselector like the Grove TUN-3 which allows the user to narrow the spectrum to those frequencies to which he is listening. Examples include the Grove Hidden Antenna System, MFJ 1020A, Yaesu FRA7700, Palomar loop antenna, and AMECO active antenna.

While the tunable variety is less susceptible to signal overload, its indoor location invites interference from close-by electrical appliances such as TV sets, brush-type motors, computers, and other notorious sources of electrical interference.

Because of their limitations, the active antenna should be chosen only when an efficient outdoor antenna is not practical.

THE TOP 100 SHORTWAVE FREQUENCIES

An introduction to shortwave listening from Grove Enterprises and Monitoring Times.

Nowhere in the radio spectrum is there as much intrigue and fascination to be found as in the 2-30 MHz spectrum. The following list of recent loggings includes some of the most active frequencies (in kHz). The voice utilities (two-way communicators) are virtually all upper sideband (USB), while the broadcasters run full carrier amplitude modulation (AM). Since most listening is done in the evening hours, this representative sampling reflects that time.

UTILITIES

2670	U.S. Coast Guard
4063	Mississippi River barges
4069.2	Ship working channel
4087.8	Mississippi River barges
4112.6	Ship calling channel
4125	Ship calling channel
4143.6	Mississippi River barges
4413.4	Ship working channel
4419.4	Ship working channel
4467.5	Civil Air Patrol
4517	Air Force MARS
4593.5	Air Force MARS
4637.5	Offshore petroleum
4670	"Spy numbers" broadcasts
4742	"Spy numbers" broadcasts
5015	Army Corp of Engineers
5320	U.S. Coast Guard
5598	International airlines
5616	International airlines
5680	U.S. Coast Guard
5692	U.S. Coast Guard air/ground
5696	U.S. Coast Guard air/ground
5703	Tactical Air Command
5812	"Spy numbers" broadcasts
6506.4	U.S. Coast Guard ships
6518.8	Inland waterways
6521.9	Mississippi River barges
6577	International airlines
6586	International airlines
6604	Flight weather
6673	NOAA hurricane hunters
6683	Andrews AFB, VIP
6697	U.S. Navy
6705	U.S. Air Force air/ground
6723	U.S. Navy
6738	U.S. Air Force air/ground
6753	Canadian Air Force
6761	Strategic Air Command
6802	"Spy numbers" broadcast
6927	Andrews AFB, VIP
8291.1	Ship to shore, Pacific
8418	"Spy numbers" broadcast
8740.6	Ship to shore
8778	U.S. Navy
8784	Ship to shore, Pacific
8805.7	Ship to shore
8808.8	Ship to shore
8825	International airlines
8846	International airlines
8879	International airlines
8891	International airlines
8921	International airlines
8972	U.S. Navy, Atlantic
8984	U.S. Coast Guard, air/ground
8989	U.S. Air Force, air/ground
8993	U.S. Air Force, air/ground
9014	U.S. Air Force, air/ground
9027	U.S. Air Force, air/ground
10493	FEMA, emergency net
10780	NASA air/ground
11176	U.S. Air Force, air/ground
11182	Scott Air Force Base, air/gnd
11200	RAF, flight weather
11233	Canadian Air Force air/ground
11234	RAF, air ground
11243	Strategic Air Command
11246	U.S. Air Force, air/ground
11282	International airlines
11538	U.S. Navy, Mars
12429.2	Ship to shore
13113.2	U.S. Coast Guard marine weather
13181	U.S. Navy
13201	U.S. Air Force air/ground
13215	U.S. Air Force air/ground
13241	U.S. Air Force air/ground
13270	Flying weather
13282	Flight weather
13306	International airlines
13354	NOAA, hurricane hunters

International Broadcasters

(Schedules subject to change)

4765	Cuba
5960	Canada
6025	Romania
6085	Germany
6125	Spain
6030	American Forces Radio/TV
6175	England
7115	Bulgaria
7165	USSR
7300	Albania
7325	England
7355	USA
9360	Spain
9630	Spain
9755	Canada
11790	American Forces Radio/TV

Time Signals

WWV	CHU
5000	3330
10000	7335
15000	14670

JRC NRD525

The Ultimate Receiver

"I have never had such service from any supplier in my life. I have been dealing with your company for a few years now, and have always received the royal treatment (even when it's a not-so-pricey item). My hat is off to you-all. Other companies should take notice of this because their service is sometimes less than it should be.

—T. Lemaire
Rutherford, NJ

"You could have knocked me over with a feather. This sort of speedy, friendly service is darned rare these days. Count me as a fan!"

—K. Kuzenski
Jackson, LA.

Whether you are into utilities DX'ing or broadcast band monitoring, the new Japan Radio Company NRD525 is THE ultimate receiver. Crisp, clean, undistorted audio from an internal speaker is complemented by an array of custom controls to assure single-signal reception.

Two hundred memory channels will store your choice of frequencies from the continuous 90 kHz-34 MHz tuning range, in any mode—AM, FM, USB, LSB, RTTY, CW, and FAX. Memory channels may be scanned or searched, each channel storing such information as frequency, mode, bandwidth, AGC timing, and attenuation setting.

Frequencies may be keyboard entered and dial selected. Filters are provided for selectivities of 12, 4, and 2 kHz. A double superheterodyne circuit (70.45 MHz/455 kHz) features up-conversion for minimum image response, and wide dynamic range (greater than 100 dB) assures excellent intermod immunity. IF and image rejection are typically 70 dB or more. High sensitivity (0.5 uv SSB) catches the weakest signals.

Passband tuning and a notch filter allow precise targeting of signal interference while an effective noise blanker permits rejection of pulse noise. Tone control, BFO, RIT, squelch, RF gain, step tuning, 24 hour clock timer with record activator, computer compatibility, . . . even an optional converter (34-60, 114-174, 423-456 MHz) to extend the receiver's range into VHF and UHF make this a most remarkable receiver. One year warranty from JRC.

Powered by 120/240 VAC or 12 VDC.

Order RCV1
Retail ~~$1285.00~~

You pay only
$1169.00
$10 UPS Shipping
$20 U.S. Parcel Post
Canadians $25 Air P.P.

Options available:
(If ordering options only, add $7 to total order)

VHF/UHF converter, CMK165	$389.00
RTTY demodulator, CMH530	139.00
Cable for CMH530	69.95
Cable for CMH532	69.95
RS232C interface, CMH532	129.95
300 Hz CW filter, CFL231 } Use only one	129.00
500 Hz CW filter, CFL232 }	129.00
1.0 kHz RTTY filter, CFL233	129.00
1.8 kHz SSB filter, CFL218	129.00
Service Manual	30.00
External speaker, NVA88	59.00
Headphones (see Kenwood ad, page 7)	plus $5 UPS

Installation of one or two filters is $20 at time of NRD 525 purchase

ICOM R-71A

The Standard of Comparison Worldwide

This receiver looks as impressive as it sounds, professionally and thoughtfully laid out with easy-to-read panel legends. The brilliant fluorescent display provides frequency information down to tenths of a kilohertz and alerts the listener to other dial settings (mode, memory channel, VFO).

Continuous tuning (100 kHz-30 MHz) with signal resolution of 10 Hz eliminates the need for RIT, even on SSB or RTTY.

A 32-channel memory (plus 2 independent VFO's) stores both frequency and mode and may be scanned or searched. Additionally, the squelch works on the scan mode (as well as normal reception), stopping automatically on a busy channel for monitoring! A real bonus for use with add-on frequency converters.

An effective noise blanker has adjustable controls for optimum reduction of a wide variety of impulse noises, from power line hash to the Russian woodpecker.

An internal speaker produces good audio and tone control adjusts sound to comfort.

Filter selectivity may be further enhanced by the use of the independent notch filter and passband tuning controls.

OPTIONS—Remote operation of the R71-A is possible using the hand-held RC-11 frequency control. It is possible to computer-control the ICOM with an external interface.

Of enormous interest to the visually impaired is the low cost EX-310 speech synthesizer which announces the displayed frequency in English. One year warranty from ICOM.

Order RCV6

Retail ~~$949~~

ONLY

$799.00

$10 UPS; $20 U.S. Mail P.P.
$30 Canada Air P.P.

SPECIFICATIONS

Dimensions . . . . . 11¾"Wx4¾"Hx10⅞"D
Frequency Stability . . . . . 50 Hz after 1 hour warmup (10 Hz with optional CR-64 crystal oven)
Power Required . . . . . 117/235 VAC, 50/60 Hz (12 VDC with optional IC-CK 70)
Audio Output . . . . . 2W min at 8 ohms
Selectivity (6 and 60 dB points):
SSB/CW and RTTY—2.3/4.2 kHz (Adjustable to 500 Hz); CW/RTTY narrow 500 Hz/1.5 kHz; AM 6/15 kHz (adjustable to 2.7 kHz); FM 15/25 kHz (with optional EXT-257)
Sensitivity (internal preamp ON):
1.6-30 MHz, all modes: 0.15-0.5 microvolts
Spurious signal rejection . . . . . 60 dB min.
Circuit: Quadruple conversion superheterodyne.

ONE OR MORE ACCESSORIES INSTALLED AT TIME OF ORDER—$20 FLAT FEE

ACCESSORIES

EX 257 FM Mode Detector	$42.50
SP-3 speaker	$61.00 (plus $5 UPS)
EX299 DC power kit	$12.25
CR-64 high stability crystal	$63.00
EX-309 computer interface	$41.50
EX-310 voice synthesizer	$46.00
FL-32 CW narrow filter (500 Hz) } Use only one	$66.50
FL-63A CW narrow filter (250 Hz) }	$54.50
FL-44A high grade SSB filter, 2.4 kHz	$178.00
RC-11 infrared remote controller	$67.25
MB-12 mobile monitoring bracket	$24.50
Service manual	$25.00
Headphones (see Kenwood ad, page 7).	

Kenwood R5000

Kenwood has taken the user-friendly package of their popular R2000 general coverage receiver and upgraded the circuitry with the advanced receiver section of their high quality amateur transceiver, producing a communications receiver of extraordinary performance.

Built-in modes include AM, FM, USB, LSB, CW, FM, and FSK (RTTY). With continuous frequency coverage from 100 kHz to 30 MHz, the R5000 boasts: 100 memory channels which store frequency, mode and antenna selection (two inputs); keypad frequency entry as well as tuning dial; digital frequency display to 10 hertz accuracy; selectable AGC; variable IF shift and notch filter; squelch control; RF attenuator and gain control; dual noise blankers for effective interference rejection; programmable scanning and searching with center-frequency stop; non-volatile memory retains functions even if long-life lithium backup battery fails; dual 24-hour clock timer and muting terminals for recording; and dual 120/240 VAC power supply.

The R5000 receiver features a professional 102 dB dynamic range front end for superior rejection of strong signal interference and a high stability dual VFO is accurate to within 10 ppm over wide temperature excursions. 90-day warranty from Kenwood.

Order RCV-7

And look at these options! (If ordering options only, add $7.00)

108-174 MHx VHF converter, VC20	$199.95
6 kHz AM filter, YK88A	59.95
2.4 kHz SSB filter, YK88S	79.95
1.8 kHz narrow SSB filter, YK88SN	79.95
500 Hz CW filter, YK88C	79.95
270 Hz narrow CW filter, YK88CN	79.95
12 VDC mobile power cable, DCK2	10.95
Voice synthesizer, VS1	54.95
IF-232C translator controller	89.95
IC-10 interface	29.95
Headphones	
HS5 deluxe black	59.95
HS6 lightweight	39.95
HS7 micro headphones	25.95
External speaker, SP430	59.95
Mobile mounting bracket	29.95
Service manual	20.00
Installation of one or more accessories	20.00

Retail ~~$899~~ ONLY **$769.95**

$10 UPS Shipping
$15 U.S. Mail P.P.; $20 Canada Air P.P.

"I'd like to thank you for your help in selecting a shortwave receiver and antenna. For a beginner, making the right choices can be difficult and may lead to costly mistakes. I find it very gratifying that the head of Grove Enterprises would take the time to deal with customers. Your personal interest and attention are appreciated."

—R. Barber
Silverwood, MI

"I have never been treated so kindly or had items shipped so quickly by any other company.

—R. Baron
Bayonne, NJ

Kenwood R-2000

Outstanding frequency stability makes the R-2000 a natural for SSB, CW and RTTY reception. Digital readout with 100 Hz resolution for pinpoint accuracy. 10 memory channels (frequency and mode!) may be automatically scanned or searched! 100 kHz-30 MHz continuous coverage.

24-hour clock timer, AM/FM/USB/-LSB/CW, squelch on all modes, center-carrier readout, 6/2.7 kHz selectivity (15 kHz FM), noise blanker, four-step attenuator (0-30 dB), 500/50 ohm antenna input all ranges, variable tuning speeds. AC or 12 VDC operation . . . and much, much more!

VC 10-108-174 MHz converter $189.95
(plus $3 UPS; add $10 for installation at time of purchase)

Grove TUN-3 (recommended for use with outside antenna) $49.00
plus $1.50 UPS

Order RVC8

Retail ~~$649.95~~ ONLY **$549.95**

$10 UPS Shipping
$15 U.S. Mail P.P.; $20 Canada Air P.P.

Yaesu FRG8800

General Coverage Communications Receiver

Presented by popular demand! The FRG8800 has earned an excellent reputation for high performance at modest cost. Featuring continuous frequency coverage from 150 kHz to 30 MHz, VHF coverage (118-174 MHz) can be added with the optional FRV-8800 converter.

This full-featured receiver offers direct keypad frequency entry and wide or narrow bandwidth AM, SSB, CW, and FM. Modes are stored with frequencies in the 12 channel memory bank.

Additional features include fast/slow AGC, bar graph S meter, wide/narrow noise blanker, fast/slow tuning dial selection, dual 24-hour clocks for local and universal time, large LCD frequency display to 100 hertz readout, selectable memory scan and search, squelch, tone, and attenuator controls.

A high quality internal speaker is included along with a recorder activator jack. An optional interface (FIF CAT) allows computer control of the FRG8800, permitting unlimited additional memories, automatic tuning, custom scanning programs, and even signal voting for best reception.

~~RETAIL $699.95~~

ONLY **$599.00**

Order RCV5

$10 UPS Shipping
$15 U.S. Mail P.P.; $20 Canada Air P.P.

ACCESSORIES

Add $7 to total order if only accessories are ordered

FRV8800 VHF converter **$129.95**
plus $3 UPS

FIF CAT computer interface **$79.95**
plus $3 UPS

SPECIFICATIONS:

Sensitivity:
- 150-1600 kHz: 30 uV AM; 3 uV SSB (10 dB S+N/N)
- 1.6-30 MHz: 4 uV AM; 0.4 uV SSB (10 dB S+N/N)
- 1.6-30 MHz, 1 uV FM narrow (20 dB S+N/N)

Selectivity kHz (-6/-50 dB)
- AM wide: 6/15
- AM narrow/SSB: 2.7/8
- FM narrow: 12.5/40

Power requirements:
- 100/120/220/240 VAC @ 35 VA, 50/60 Hz;
- 12 VDC optional

Dimensions: 13"W x 4½"H x 9"D

Weight: 13½ lbs.

The Sangean ATS-803

Just look at these features:

- AM/SSB/CW reception from 150 kHz to 30 MHz
- FM from 87.5-108 MHZ
- Keypad frequency entry as well as tuning dial
- Illuminated LCD frequency readout
- Scanning with 14 memory channels
- Wide/narrow selectivity switch
- Separate bass and treble controls
- Direct selection of twelve shortwave broadcast bands
- Clock with preset frequency alarm and sleep function
- Battery or AC power
- Headphone jack for stereo FM listening
- Five-step LED signal strength indicator
- BFO and RF gain controls
- External antenna jack for long distance reception
- 180-day warranty from Sangean.

Identical to Radio Shack DX440 and EEB Ambassador 2020.

Whether you are a beginner looking for a high performance portable at low cost, or a seasoned SWL planning on a second receiver, the Sangean ATS-803 offers surprising performance at such a budget price.

This receiver is clearly **the most feature-packed, high performance portable under $200!**

Order RCV4

Former nationally advertised price: ~~$199~~

Grove price: **$179**

Plus $5 UPS.
$10 U.S. Mail Parcel Post
$15 Canadian Air Parcel Post

Recommended accessories: AA cells for microprocessor (2 required); D cells for portable power (6 required).

SONY ICF-2010

Yes, this is a full-featured portable for the serious shortwave listener. With a frequency coverage from 150-30,000 kHz (AM/SSB), 76-108 MHz (FM) and 116-136 MHz (AM aircraft), the 2010 has both direct-frequency keyboard entry as well as a tuning dial. A 32-channel memory may be scanned and frequency readout is on a crisp liquid crystal display.

Synchronous detection allows interference-free reception on many stations difficult to hear on other radios.

Separate RF gain control and attenuator switch accommodate a wide range of signal strengths.

Narrow/wide selectivity switching, 12/24 hour clock/timer allows up to 4 automatic on/off cycles per day for frequencies and times of your choice, 10-step LED signal strength meter, audio tone selection for speech or music, and 10 station direct-access keyboard combine to make this Sony product a remarkable value for beginners or seasoned SWL's.

Accessories supplied include AC adaptor, earphone, shoulder strap, wire antenna, external antenna connector, and shortwave handbook. All this and a one-year warranty from Sony besides!

Order RCV2

Manufacturer's Suggested Retail ~~$429.95~~

Grove discount price:

$310.00

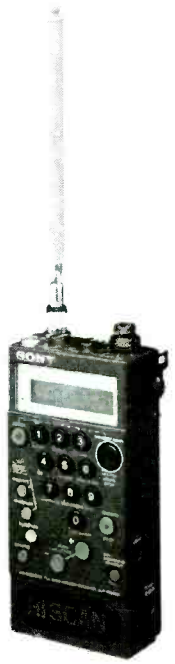
$5 UPS Shipping
$10 U.S. Mail P.P.; $15 Canada Air P.P.

"Sony's ICF-2010 represents a qualitative advance over conventional radios. It's the first widely-distributed receiver to operate in the synchronous exalted-carrier selectable sideband (ECSS-s) mode. . .to reduce interference and distortion far more effectively than can a conventional shortwave radio."

—Larry Magne, 1986 World Radio TV Handbook

CALL FOR AVAILABILITY

Sony ICF-PRO80



Imagine—150 KHz-216 MHz continuous coverage in a hand-held, digital receiver! Drift-free, quartz-synthesis tuning with professional features like squelch, up/down step tuning, priority scan, search, 40 memory channels, direct channel access, and accurate, illuminated LCD frequency readout.

Worldwide shortwave reception at your fingertips—AM and SSB—as well as VHF aircraft and police/fire communications, all on one 40-channel scanner! Extend the telescopic antenna and tune in those in-between frequencies as well—low frequency beacons, medium wave broadcast, hams, government, military, FM and TV broadcast, 72-76 MHz midband communications, VOR navigation, and more!

True to the professional design of the PRO80, wide and narrow selectivity (6.0 and 3.8 kHz @ -50 dB) assures excellent interference rejection. A 2¾" internal speaker is driven by a powerful 400 milliwatt audio amplifier. The radio's basic 150 kHz-108 MHz tuning range is extended to 216 MHz by a tiny, quick-connect converter.

Compact (3½" x 7" x 2") and lightweight (1½ lbs.), the handsome gray PRO80 may be secured discretely in a small attache case or may be carried by its shoulder strap and case. Operates from four AA flashlight cells (not included) or from optional rechargeable batteries and/or AC wall charger/adaptor.

Order RCV3

Suggested retail: ~~$499~~

Grove price only

$329

$5 UPS Shipping
$10 U.S. Mail P.P.; $15 Canada Air P.P.

Recommended accessories: ACC 20 wall adaptor ($9.95)

The INFOTECH M6000 (V.5)

Automatic Data Reader

The Most Advanced Multimode Demodulator Ever!

Imagine a stand-alone decoder that plugs into your receiver's speaker or earphone jack—no computer or interface required—which provides on your video monitor or printer the text of messages sent in Morse Code (5-120 wpm), Moore code, teletype, bit inversion, TOR (ARQ and FEC), packet (300/1200 baud), ASCII (75-1800 baud), and even time division multiplex (86-200 baud) . . . and you have the M6000!

But this multimode capability is just the beginning. Your new M6000 allows copy of any RTTY speed (37-251 baud) at any shift (85-1200 Hz), as well as TOR—and it can tune them automatically! Surveillance mode provides simultaneous monitoring and automatic display of active TDM channels!

And how about this feature: Programmable sel-cal allows you to select up to three key words which, when copied by the microprocessor, will automatically start the printer! External computer control is also provided for full automation of this powerful demodulator. Ten user-programmable format memories allow instant selection of popular modes and shifts.

An on-screen status line alerts you to the settings of the instrument at all times and may be dumped to the printer. Additional LED status lights assist proper adjustment, as well as displaying accurate band readout.

And, as a bonus, parallel (Centronics) and serial printer outputs are both included at no additional cost!

Operates from 120/240 VAC, 50-60 Hz (internally filtered for reduced interference).

This quick look at this new miracle machine is just the icing on the cake—send now for an information-packed specification sheet. You will be astounded at the number of features built in at such a low price! 180-day warranty.

Dimensions: 16⅜"W x 3½" H x 12¾"D. Weight: 8 lbs. (Shipping Weight, 12 lbs.)

Order DEM 1

Retail ~~$947.00~~

ONLY

$840

$5 UPS Shipping
$15 U.S. Mail Parcel Post
$22 Canadian Air P.P.

Infotech M800 (V.2)

Facsimile Demodulator

AFFORDABLE FAX—that's the best description for this high quality facsimile demodulator which attaches between your receiver's external speaker jack and your Epson FX85, FX86, LQ800, or LQ1000 printer using plain paper, not expensive photochemical or thermal paper.

Print weather maps, news photos, graphs, and charts off the air with superb 16-level contrast definition. Automatically selects synchronization, IOC and speed, faithfully recreating high quality images as you watch!

Serial input allows your M800 to be shared with the M6000 (or M600) multimode demodulator or even your home computer for printed copies of text.

Order DEM2

ONLY

$499.00

$5 UPS Shipping
$15 U.S. Mail P.P.; $22 Canada Air P.P.

6' shielded parallel printer cable $29 (free shipping with M800)

SPECIFICATIONS

Printer output: Centronics parallel

Controls: On/off, start/stop, frame, speed, format, direction, polarity, AM/FM

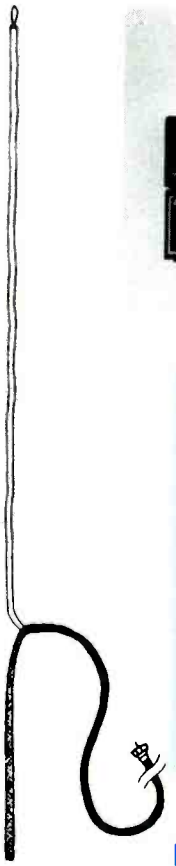
Auxiliary input: 300/600 baud from RTTY demodulator or computer

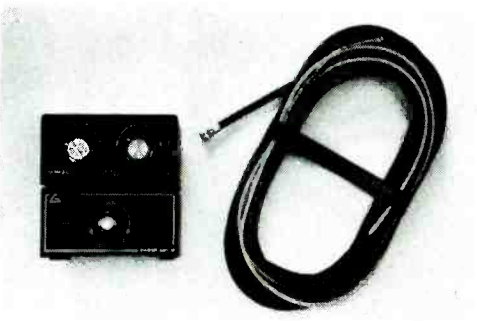
Speeds: 60/90/120/240 LPM

Index of cooperation: 288/576

Power required: 120 VAC, 60 Hz or 12 VDC (plug included)

Dimensions: 10½"W x 2½"H x 7"D





Grove's Indoor SWL Antenna System

Connects to any receiver equipped with an external antenna jack

Left: Hidden Antenna, shown coiled, with optional Power Ant III and Minituner. Drawing depicts antenna in extended position, ready for use.

Our "Hidden Antenna System" is your key to exciting short wave reception without an outside antenna!

Here's the apartment dweller's dream—a high performance, amplified indoor antenna system for general coverage shortwave, medium wave and even scanner monitoring.

This 66-inch, thin profile, flexible wire antenna can be tucked in a corner, hung behind a drape—just about anywhere out of sight. And when connected to the powerful PRE-3 signal booster, you have instant total spectrum coverage from 100 kHz to over 1000 MHz!

Yes, global short wave reception will be at your fingertips, and you can operate two radios at one time!

Designed for use with the Grove Power Ant III

100 kHz-1000 MHz

The Grove PRE-3 Power Ant has taken all the best from its successful predecessors and combined them into one powerful signal booster for scanners, short wave and medium wave receivers, even TV and FM stereos!

Equipped with a high gain, low noise, solid state amplifier stage, the PRE-3's front panel control allows custom selection of up to 30 dB of amplification!

What you need to order:

ANT-6 Hidden Antenna	$8.95	**(free shipping)**
PRE-3 Power Ant III	$39	**(plus $1.50 UPS, $3 U.S. Parcel Post, $4 Canada)**
ACC-20 AC adaptor	$9.95	**(free shipping with PRE-3)**
ACC-60 receiver cable	$7.50	(you specify connector or receiver model; one for each receiver)

Add the Grove Minituner for Incredible Reception!

150 kHz-30 MHz

The addition of the Grove Minituner to the ANT 6/PRE-3 combo will allow signal peaking to perfection as well as eliminate intermodulation and image interference on your general coverage receiver.

Here's what you will need in addition to the combo above:

TUN-3 Minituner	$49.00	**(plus $1.50 UPS, $3 U.S. Parcel Post, $4 Canada)**
ADP-1 UHF/F adaptor	$5.00	**(free shipping)**
ADP-2 F/PL-259 adaptor	$5.00	**(free shipping)**

Grove's

Outdoor SWL Antenna System

Connects to any receiver equipped with an external antenna jack

1. Start with . . . SKYWIRE

High performance, low cost shortwave/longwave dipole antenna designed for total 100 kHz-30 MHz coverage without the gaps found in more expensive trap antennas.

Modeled after the famous Grove all-band transmitting dipole, the 66-foot SKYWIRE is off-center fed, designed specifically for serious SWLs . . . Includes pre-measured stranded copper antenna wire, porcelain end insulators, custom center insulator for your PL-259 coax connection, and full instructions.

ANT-2 *Only* **$19** *(plus $1.50 UPS; $3 U.S. Mail Parcel Post; $4 Canada Air P.P.)*

"I hooked up the Skywire to my Panasonic RF-3100 and it sounded like a new receiver. I've heard things in the past couple of days I didn't even know was out there. With the Minituner III hooked up I heard even more! I don't know why I went as long as I did without buying either one of them. Now I'm using them on my Sony ICF-2010 and again I can't believe the difference."

Mike Day, OH.

2. Add the Acclaimed Minituner

The addition of the Grove Minituner to your outdoor shortwave antenna will allow signal peaking to perfection as well as eliminate intermodulation on your general coverage receiver. Comes equipped with standard UHF (PL-259) connectors. Special 1/8" miniplug adaptor for Sony and similar portables, add $5.00.

Order TUN-3 **$49**

Plus $1.50 UPS
$3 U.S. Parcel Post
$4 Canada Air P.P.

"Considering that Botswana is the farthest place on earth from Hawaii, getting fair to good reception from a 50 kW station is not bad—thanks to the PRE-3 and TUN-3."

—R. Jones
Kailua, HI

For blockbuster reception, even with a smaller antenna connected to your Minituner . . .

3. Add the Amazing Power Ant III

The Grove PRE-3 Power Ant has taken all the best from its successful predecessors and combined them into one powerful signal booster for short wave and medium wave receivers.

Equipped with a high gain, low noise, solid state amplifier stage, the PRE-3's front panel control allows custom selection of up to 30 dB of amplification!

Two output connectors are provided allowing you to use two receivers on one antenna at the same time! All connectors are type F for maximum signal transfer.

What you need to order:

PRE-3 Power Ant III	**$39 (plus $1.50 UPS, $3 U.S. Parcel Post, $4 Canada)**
ACC-20 AC adaptor	**$9.95 (free shipping with PRE-3)**
ACC-60 receiver cable	**$7.50 (specify connector or receiver model; one for each receiver)**
ADP-1 UHF/F adaptor	**$5.00 (free shipping with PRE-3)**

Power Ant III Specifications

Gain	30 db @ 1 MHz
	29 dB @ 10 MHz
	27 dB @ 50 MHz
	21 dB @ 150 MHz
	13 dB @ 450 MHz
	10dB @ 900 MHz
Noise figure	2 dB nominal
Usable frequency range	10 kHz-1300 MHz
Input/output impedance	50-75 ohms nominal
Power required	12 VDC @ 40 ma.
Connectors	F type
Dimensions	4"W x 2"H x 3"D
Weight	6 ounces
Power Requirement	DC cord supplied

A Buyer's Guide to Scanner Listening

CAVEAT: ECPA '86

The Electronic Communications Privacy Act of 1986 prohibits the monitoring of certain services receivable on scanners. Although there is no evidence at present that the new law is being enforced, violations are punishable by fine and/or imprisonment. The following list is presented as a guide and Grove Enterprises assumes no liability for its accuracy or interpretation.

The law forbids monitoring:

1. Encrypted or scrambled signals
2. Paid Subsidiary Carrier Authorization (SCA)
3. Mobile telephones and voice paging
4. Remote broadcast and studio/transmitter links

You may monitor any other transmission "readily accessible to the public" including public safety, federal and military, aircraft and maritime, amateur and CB, business and industrial, private land mobile, cordless phones, and any interference-causing protected transmission only long enough as necessary to identify its source.

CHOOSING A SCANNER

The consumer electronics marketplace bulges with products competing for your dollar. By following a few simple rules you will make the right choice in buying that new scanner.

FREQUENCY RANGE:

There are three conventional frequency bands which have been monitored for years by scanner buffs: 30-50 MHz (VHF low band), 144-174 MHz (VHF high band) and 450-512 MHz (UHF). Some scanners include 138-144 and 148-150 MHz (military operations), 406-420 MHz (federal government), and 420-450 MHz (amateur) bands as well.

The addition of the civilian VHF aircraft band (118-136 MHz) provides another interesting target for monitoring, as does the emerging 806-960 MHz band, now in use in all metropolitan areas. A few receivers include the military UHF aircraft band (225-400 MHz).

The prospective scanner buyer should decide which of these aspects of listening are of greatest interest to him before purchasing his new scanner.

PROGRAMMABLE OR CRYSTAL?

Generally, stay away from crystal type scanners unless you know you will not be changing frequencies in the near future. For the majority of listeners, keyboard- programmable scanners are the way to go--no two ways about it.

MOBILE, BASE OR HAND HELD?

Scanners come in a variety of models to meet the particular needs of the listener. Do a lot of driving? Install a mobile unit. Constantly in and our of the car, office or home? You may prefer a handheld. Do most of your listening in the office or home? A base unit would be more practical.

Many models are capable of more than one application, accepting power from AC mains as well as the mobile battery supply. Special adaptors like the Grove ACC19, ACC20 and ACC23 are available for handheld scanners for external power as well, thus conserving the built-in battery charge.

Most hand-held scanners have small speakers which do not compete well in a noisy environment; an earphone or external speaker can usually solve that problem.

WHICH SCANNER IS THE BEST?

Like answering "Which car is the best?", we must list qualifications. At the present time, programmable scanners are available from eight manufacturers: Uniden (Bearcat), Regency, J.I.L., Radio Shack, Cobra, and Fox. The Yaesu FRG-9600 and ICOM R-7000 are VHF/UHF general coverage receivers with scannable memories.

While there are individual variations among units as they leave the assembly line, most of the popular models have excellent sensitivity and reasonable selectivity (reject adjacent channel interference), but are vulnerable to intermodulation and image interference from strong signal overload.

Generally speaking, you get what you pay for.

Programmable Scanners Presently Manufactured (Recommended models)

ICOM	RADIO SHACK	REGENCY	BEARCAT
R7000	PRO-2004	TS2	BC 600XLT
	PRO-38	HX1500	BC 800XLT
		Z60	BC 210XLT
			BC 200XLT
			BC 100XLT

Scanner Antennas and Accessories

HANDHELD

The whip antenna included with your scanner is fine for local reception of strong signals, but if you are interested in reaching out further, a larger external antenna is necessary. Hand held scanners need all the help they can get.

For handheld scanners, the Grove ANT-8 full-length whip will provide some increase in range and capture of weak signals; it is equipped with a BNC base, attachable to the Bearcat 100 (late model), 100XL, 50XL, 70XL, 75XL, 200XL, Regency HX1000, HX1200, HX1500, Radio Shack PRO-30, PRO-31, PRO-32, PRO-38, and hand-held transceivers which are equipped with a BNC connector.

MOBILE

In mobile installations, a scanner's built-on whip is partially shielded from receiving by the metal vehicle body; an external antenna is required for adequate pulling power. Rooftop mounting is ideal since the wide metal surface below provides an excellent ground plane with uniform response in all directions.

The AM/FM car radio antenna which came with your car is not designed to operate on scanner frequencies; however, it can produce surprisingly good reception when used with a quality adaptor like the Grove ANT-63 multicoupler. If you don't want to add another antenna to your vehicle and are content with local monitoring, go the multicoupler route.

Still, no antenna works better than one designed for the job and there are a multitude from which to choose for mobile scanner reception. They can be mounted on a fender, bumper, trunk, or, best of all, the car roof.

If mounted on a fender cowl or trunk lid, the pattern favors the direction of the car body. Modern magnetic-base antennas like the multiband Grove ANT-10 have strong holding power capable of withstanding road speeds well in excess of the legal limit. Additionally, the ANT-10 is available with either a Motorola or BNC connector to fit all mobile scanners.

Mobile scanner antennas are admittedly compromised by their short lengths (poor low- band reception) and decoupling coils (narrow frequency ranges). The mobile scanner enthusiast must be content with shorter distances than he would enjoy with his base antenna.

BASE

Although government discone antennas are very efficient for broadband use, many low-cost scanner discones fall far short of their potential. Usually advertised for 30-900 MHz or more, they are poor performers under 80 MHz, thus compromising low band reception, and are variable in reception throughout the rest of the range. The ICOM AH-7000, and Diamond D130 are high performance exceptions.

The Grove ANT-5B OMNI is recommended for basic scanner installations where listeners are concerned primarily with communications within a 50-mile radius. Extended omnidirectional reception is possible with the Channel Master 5094 Monitenna, Avanti 801 and the discones listed above.

The Grove ANT-1B SCANNER BEAM is the highest performance scanner antenna ever manufactured. It is directional, offering up to 8 dB gain over other antennas in its forward direction. It may be turned by any lightweight TV antenna rotator.

The SCANNER BEAM is nearly omnidirectional at low band (30-50 MHz), becoming increasingly directional with increasing frequency. Because of their higher strengths, local signals will still be clearly receivable no matter in which direction the antenna is pointed.

COAXIAL CABLE

At these higher frequencies, common coax like RG-58/U will actually absorb signals. We recommend common RG-6/U cable TV coax which has exceptionally low loss and 100% shielding characteristics combined with small diameter, high flexibility and low cost.

For the lowest possible losses use premium cable like Belden 9913 or RG-11/U mini. Connectors are readily available from hobby radio outlets, TV and video accessory stores.

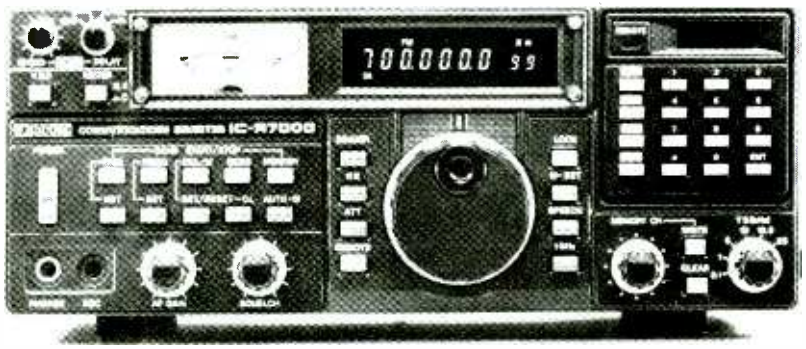
Do not be concerned with impedance matching; although cables may be rated 50 or 75 ohms, no antenna made maintains a constant impedance over the wide frequency ranges required by a scanner.

REMEMBER: THERE IS NO SUBSTITUTE FOR A GOOD ANTENNA AND COAX

TOP 100 SCANNER FREQUENCIES

The spectrum above 30 MHz is saturated with two-way intrigue--if you know where to look. Land mobile, air to ground, ship to shore, military and federal government, public safety, hams, businesses, trains--these and other services are found from 30 to 512 and 806 to 960 MHz.

34.71	Fish & Wildlife
34.83	Fish & Wildlife
35.02	McDonald's order window
35.22	Paging
35.58	Paging
35.62	Paging
35.64	Medical paging
40.07	Nat'l Park buses
40.21	Nat'l Park buses
40.45	VA paging
40.50	Army Search/Rescue
40.68	Industrial devices
41.50	Army aircraft
43.22	Paging
43.58	Paging
46.75	Pres. helicopter
47.42	Red Cross
49.67-49.97	Cordless phone handsets/ walkie talkies
75.00	Airport marker beacon
121.5	Air emerg/calling
121.75	Russian cosmonauts
122.75	Gov't air to air
122.8	Small airport UNICOM
122.9	Gov't aircraft
122.925	Natural resources air
123.05	Helicopter
123.1	Air search & rescue
123.45	Pilots air to air
126.2	Military air towers
132.0	Goodyear blimp
135.575	ATS-3 satellite
135.600	ATS-3 satellite
135.625	ATS-3 satellite
143.46	Air Force MARS
143.99	Army MARS
146.52	Ham walkie talkie
148.15	Civil Air Patrol
150.00	Russian satellite
151.625	Itinerant walkie talkie
152.0075	Medical paging
152.03-152.21	Paging
152.51-152.81	Mobile phone
154.60	Bus. paging/comm.
155.16	Hospital/ambulance
155.28	Hospital/ambulance
155.34	Hospital/ambulance
155.37	Police mutual aid
155.475	Police intersystem
156.8	Boast call/distress
157.05	Coast Guard
157.10	Coast Guard
157.15	Coast Guard
159.495	Brinks trucks
159.600	Wells Fargo trucks
161.640	Goodyear blimp
162.40-162.55	Weather service
163.100	Fed gov't portable
163.200	U.S. Marshal
163.250	Medical paging
163.4125	Army Corps of Eng.
163.4375	Army Corps of Eng.
165.2875	ATF
165.375	Secret Service
165.950	IRS
167.050	FCC
167.5625	FBI
170.200	Fed'l disaster net
170.875	Federal Prisons
170.925	Federal Prisons
236.6	Air Force Towers
241.0	National Guard
243.0	Military aircraft calling/distress
255.4	Mil. flight weather
257.8	Mil. tower calling
259.7	Space Shuttle
264.9	NORAD secondary
266.5	SAC refueling
272.7	Mil. flight weather
296.8	Space Shuttle
311.0	SAC primary
321.0	SAC secondary
340.2	Navy towers
342.5	Mil. flight weather
364.2	NORAD primary
381.8	CG aircraft
408.400	Fed. gov't (shared)
415.200	Fed protection service
415.700	Air Force One
417.200	Fed Protection service
418.050	Fed gov't portable
418.075	Fed gov't shared
418.575	Fed gov't portable
459.675	Tone paging
460.975	Wells Fargo trucks
462.95-463.175	Paramedics
464.550	PGA tournament
469.500	NASCAR racing
469.9125	Goodyear blimp security
1090	Aircraft VORTAC



ICOM R7000

Continuous Coverage VHF/UHF Receiver!

Now used by government and military agencies worldwide, the ICOM R7000 provides total spectrum 25-1000 (triple conversion) and 1025-2000 (quadruple conversion) MHz frequency coverage with 100 Hz fluorescent readout accuracy!

Add to this enormous tuning range 99 memory channels with priority function, keyboard entry or dial tuning (±5 ppm stability, -10 to 60°C), FM/AM/SSB modes, five tuning speeds (0.1/1/5/10/12.5/25 kHz), S-meter/center tuning meter, 2.8/9/15/150 kHz filter selection, noise blanker, internal speaker with 2.5 watts of audio power, spurious signal suppression greater than 60 dB, high sensitivity (0.5 uv @ 12 dB SINAD FM), and programmable scanning with auto-write memory, and you have the most advanced scanning receiver ever designed for the serious VHF/UHF listener.

But the features don't stop here. Optional accessories include the RC-12 remote controller, a voice synthesizer to announce frequency settings, and even a serial interface for external computer control!

Order SCN 4

DIMENSIONS: 11¼"W x 4⅜"H x 10⅞"D; WEIGHT: 16 lbs.; POWER: 117/240 VAC, 1.5 A

RETAIL ~~$1099~~

YOU PAY ONLY **$950**

$10 UPS Shipping
$20 U.S. Mail P.P.; $30 Canada Air P.P.

ACC 67 ONLY $19.95

MODIFICATIONS/ACCESSORIES:

High speed scan modification	$20.00
ACC 67 6"-46" extendable whip antenna (shown)	
*RC 12 remote controller	$67.25
*EX310 voice synthesizer	$46.00
*EX-299 12 VDC power kit	$12.25
Installation charge: $20 for one or more accessories	
TV R7000 video adaptor	$131.95
Computer interface instructions	$10.00
Service manual	$25.00
SP3 speaker	$61 plus $5 UPS
MB12 mobile mounting bracket	$24.50
ADP-3 F to N antenna adaptor	$5.00
Headphones (see Kenwood ad, page 7)	

See page 23 for antenna for R7000!

Realistic® PRO-2004

Wide Coverage Scanner!

At a Grove Discount Price!

You can walk into your chain retail store and pay $420 for this new luxury scanner, or you can order it from Grove for only $389.

The PRO-2004 provides continuous frequency coverage between 25-520 and 760-1300 MHz in your choice of mode—AM, narrowband FM or wideband FM. With no crystals needed, this exceptional unit delivers a wide range of frequencies not found on most scanners—including public service, broadcast FM, military bands and CB!

Search mode finds new channels, with an incredible 300 channels available for storing the ones you like. Rapid 16-channel-per-second scan and search complements this scanner's high sensitivity and excellent selectivity, providing for maximum distance reception, even in crowded band conditions. BNC antenna connector for efficient signal transfer. Built-in speaker and telescoping antenna are included. Jacks provided for external antenna, headphone, external speaker, tape recorder and DC adaptor.

Features include:

- Up-conversion (610 MHz) for best image rejection
- Two-second scan delay
- High-impedance (10 K ohm) recorder output
- Ten memory banks or sequentially scan all 300
- Individual channel lockout and delete
- Stores up to ten search ranges in memory
- Priority on any channel
- Giant, brilliantly backlighted LCD shows frequency, channel and function
- Fast/slow scan and search speeds
- Selectable search steps—5, 12.5, 50 kHz (30 kHz on cellular when restored)
- Zeromatic search stop for accurate frequency readout
- Dimmer for night viewing
- Sound squelch skips dead carriers
- Dual 120 VAC/12 VDC power supply

Order SCN 5

Retail ~~$419.95~~

ONLY

$389

Plus $5 UPS
$10 U.S. Parcel Post
Canadians: $15 Air P.P.

Bearcat BC600XLT

New!

Order SCN8

Compact and Programmable, the BC600XLT is Suitable for Mobile or Base Installation

Measuring a tiny 2" high by 7" wide and deep, this upgraded version of the new BC580XLT programmable scanner is ideal for compact mobile or base installations. Features include user-programmable search ranges, channel one priority, individual channel lockout and delay, direct channel access, and optional CTCSS tone-squelch decoder. Mobile mounting kit, DC cord, AC wall adaptor, plug-in whip, and operating manual are all included at no extra charge!

In addition to normal 29-54, 118-174 and 406-512 MHz coverage, the new 600 also has pre-programmed service search capability like its bigger predecessor, the all-time favorite BC300. Just push a button and the 600 will find active police, fire, aircraft, maritime, emergency, and weather channels!

One hundred memory channels may be scanned sequentially or in five 20-channel banks. Controls are backlighted for night use. And look at these switch-activated, plug-in options never before available for a scanner:

"Clearly an exciting new generation of scanners is emerging from Uniden. The BC600XLT is the pacesetter."
—Bob Grove

OPTIONS:
(Installation fee at time of purchase - $10)

SIGNAL BOOSTING PREAMPLIFIER for weak signal locations. May be switched in or out of circuit.
Order ACC95 $25.00

CTCSS TONE SQUELCH DECODER for selective paging of your unit—ideal for volunteer firefighters, emergency medical teams. All 38 tones may be programmed into your choice of channels. May be switched on or off.
Order ACC96 $60.00

ON/OFF SWITCH which must be used with either or both above options.
Order ACC97 $8.95

Recommended Retail
~~$399.95~~

GROVE Discount Price

$224.95

$5 UPS Shipping
$10 U.S. Mail P.P.; $15 Canada Air P.P.

FEATURES:

12 bands: Including 800 MHz, aircraft, military, "Ham," public safety and Federal Government.
40 Channels: Two bands of 20 channels.
Instant Weather: Automatically finds the National Weather Service broadcast in your area.
Priority: Channel one checked every three seconds to prevent missing important calls.
Synthesized: Enter frequency of your choice.
Track Tuning: Patented feature allows scanner to peak on each transmission.
Scan Delay: Patented feature adds three-second delay on desired channels to prevent missed transmissions.
Automatic Search: Find new frequencies automatically.
Direct Channel Access: Go directly to any channel without stepping through other channels.
Automatic Squelch: Factory set for easier operation. Use manual for closer adjustment.
Channel Lockout: Allows you to skip channels you don't want to hear.

SPECIFICATIONS:

Band Coverage: 10 Bands-Weather Channel
Frequency Range:
10 Meter "Ham" Band (29-29.7 MHz)
Low Band (29.7-50 MHz)
6 Meter "Ham" Band (50-54 MHz)
Aircraft (118-136 MHz)
Military Land Mobile (136-144 MHz)
2 Meter "Ham" Band (144-148 MHz)
High Band (148-174 MHz)
Federal Government:
Land Mobile (406-420 MHz)
70 cm "Ham" Band (420-450 MHz)
UHF Band (450-470 MHz)
"T" Band (470-512 MHz)
800 Band (806-912 MHz)
Channels: 40 Channels (Two 20 Channel Banks)
Scanning Speed: 15 Channels per Second
Display: Vacuum Fluorescent Decimal Display
Controls/Switches: Volume Control; Squelch Control with Auto Squelch
Power Requirement: 117 VAC or 13.8 VDC; 2 AA size Memory Backup Batteries (not included)
Sensitivity:
29-54 & 136-174 MHz (0.6 microvolts)
118-136 MHz (0.8 microvolts), 60% (1 kHz modulation 10 dB SINAD)
406-512 MHz (0.8 microvolts)
840-912 MHz (1.0 microvolts ±3 kHz deviation 12 dB SINAD)
Selectivity: -55 dB @ ±25 kHz
Audio Output: 1.5 W at 10% T.H.D.
Antenna: Two Telescoping Antenna Included (one for 800 MHz)
Connectors: External Antenna Jacks; External Speaker Jacks; AC Power Jack; DC Power Jack.
Options: External Antenna Plug

Bearcat BC800XLT

Top of the Line— With 800 MHz!

Yes, the BC800XLT features wide frequency coverage: 29-54, 118-136 (AM), 136-174, 406-512, and 806-912 MHz with 40 channels of memory in two banks.

Other features include rapid scan (15 channels per second), powerful 1.5 watt audio amplifier, two telescoping antennas (one for 800 MHz range), better than 1 microvolt sensitivity, 55 dB selectivity @ ± 25 kHz, instant weather reception, brilliant fluorescent display, AC/DC operation, direct channel access, individual channel delay, priority channel one, fully synthesized keyboard entry.

Dimensions: 10½"W x 3⅝"H x 8"D; *Weight: 7 lbs., 2 oz.*

Order SCN-11

RETAIL ~~$499.95~~

Now ONLY

$289.00

$5 UPS Shipping
$10 U.S. Mail P.P.; $15 Canada Air P.P.

Bearcat BC210XLT

Following in the footsteps of the immensely popular BC210XW and BC20/20, this new Bearcat programmable scanner combines the capabilities of both. Two 20-channel memory banks provide a total of 40 memory channels, and instant weather coverage is available at the press of a button.

SPECIFICATIONS:

Channels: 40 Channels (2-20 Channel Banks)
Scan Speed: 15 Channels per Second
Display: Vacuum Fluorescent
Power Requirement: 120 VAC 60 Hz or 13.8 VDC; 2 week Interval Capacitor Memory Back-up
Sensitivity:
29-54 & 146-174 MHz (0.3 microvolts)
118-136 MHz (0.8 microvolts), 60% (1 kHz modulation 10 dB SINAD)
406-512 MHz (0.5 microvolts)
Selectivity:
-55 dB @ ±25 kHz
Audio Output: 1.8 Watt at 10% T.H.D.
Antenna: Telescopic Antenna included.
Connectors: External Antenna, External Speaker, AC, DC
Options: External Antenna, DC Power Cord, Mobile Bracket
Size: 10⅛"W x 3½"H x 8"D
Weight: 5 lbs.

Frequency coverage is 29-54, 118-174 and 406-512 MHz to provide instant access to all major land mobile, maritime and aircraft bands—low, high and UHF. A whip antenna is included for indoor use and an external antenna jack allows use of an outdoor antenna as well.

Excellent sensitivity (average 0.5 microvolts) and selectivity (-55 dB at ± 25 kHz); powerful audio (1.8 watts at 10% THD); and a brilliant fluorescent display combine with internal memory backup, direct channel access, selectable scan delay, individual channel lockout, search with hold, priority, fast speed (15 channels per second), and automatic squelch.

The BC210 XLT can be operated from 120 VAC or from a 12 volt source.

Order SCN-3

ONLY

$199

Plus $5 UPS
$10 U.S. Parcel Post
Canadians: $15 Air P.P.

From Regency:

CALL FOR AVAILABILITY

Turboscan 800!

The Regency TS-2 boasts the fastest scan and search rates in the industry—50 channels per second—more than three times faster that the next closest competitor. Six memory banks store up to 75 separate frequencies, selectable by groups or in a continuous sequence.

Frequency coverage is wide: 29-54 MHz FM (ten meter amateur, low band and six meter amateur), 118-174 MHz (AM aircraft and FM high band), 406-512 MHz FM (UHF federal government and land mobile), and 806-950 MHz (microwave mobile).

Other features include instant weather channel, priority, direct channel access, and scan delay. The full-stroke, rubberized keypad is backlit for high visibility.

Accessories included are telescopic antenna, AC power supply, DC mobile cord, and mobile mounting bracket.

Order SCN2

List Price
$499

Grove Price Only
$319.95

$5 UPS Shipping
$10 U.S. Mail P.P.; $15 Canada Air P.P.

Bearcat BC200XLT

Finally, a high performance handheld programmable scanner which includes aircraft and all land mobile bands, including 800 MHz!

Frequency coverage is 29-54, 118-174, 406-512, and 806-960 MHz! 200 memory channels may be stored in 10 banks of 20 channels each or scanned sequentially.

This feature-packed handful offers ten priority channels, search, lockout, and delay and comes equipped with detachable Nicad battery pack, AC charger, leather holster, and BNC flex whip.

The BC200XLT is the most powerful hand-held scanner ever released to the public and is now available from Grove Enterprises at a super discount price!

Order SCN9

Retail **$449.95**

Grove Discount Price

$264.95

CALL FOR AVAILABILITY

$5 UPS Shipping
$10 U.S. Mail P.P.; $15 Canada Air P.P.

The 'Best Buy' Bearcat

The **BC-100XL**, with aircraft! Yes, the all-time popular Bearcat 100 hand-held programmable scanner has aircraft reception as well as 16 channel memory, illuminated LCD display for night viewing, search, rapid scan (15 channels per second), direct channel access, lockout, delay, low battery indicator, priority, and keyboard lock.

Frequency coverage is 30-50, 118-174, 406-512 MHz. Accessories included: Rubber ducky antenna (with BNC base), AC adaptor/charger, Nicad batteries, earphone, and carrying case.

Handsome black case with white chrome accents.
Dimensions: 7½"H x 2⅞"W x 1⅜"D; Weight: 2 lbs., 10 oz.

See optional accessories on pages 24 and 28

Order SCN16

Retail **$349.95**

Now Only

$199.00

$3 UPS Shipping
$5 U.S. Mail P.P.; $8 Canada Air P.P.

Realistic® PRO-38

Now—a programmable handheld scanner at an incredibly low price! Ten memory channels cover 29-54, 136-174 and 406-512 MHz land mobile services. LCD channel display can be reviewed for frequency as well.

Additional features include three-second scan delay, keypad lock switch, individual channel lockout, audible low-battery indicator, and direct channel access.

Comes equipped with belt clip, built-in speaker and earphone jack, flex antenna. Requires six AA cells (standard or Nicad) or 12 VDC adaptor.

(See page 28 for ACC20)

ACCESSORIES

ACC20 universal power supply/charger
..... **$9.95**
(Free Shipping with PRO-38)

ACC 23 mobile cigarette lighter adaptor
..... **$9.95**
(Free Shipping with PRO-38)

Order SCN 1

Retail Price
~~$139.95~~

Grove Price Only

$124.95

$3 UPS; $5 U.S. Mail P.P.
$8 Canada Air P.P.

Regency HX-1500

Order SCN 6

Regency steps ahead once again. Just look at these features:

- 55 memory channels
- Direct channel access
- Rapid scan and search
- 25-60 MHz FM, 136-176 MHz FM, 406-420 MHz FM, 440-520 MHz FM, and 118-136 MHz AM frequency range
- Channel one priority
- 0.7 uV average sensitivity
- ±7.5 kHz selectivity
- 2 second scan delay, 4 second search delay
- Individual channel lockout

Four banks of channels may be scanned jointly or separately with channel overlap. Features a top-mounted scan button for easy control when worn on belt.

This fine unit's non-volatile memory never needs battery backup. Unit requires eight standard AA cells or Nicad rechargeables.

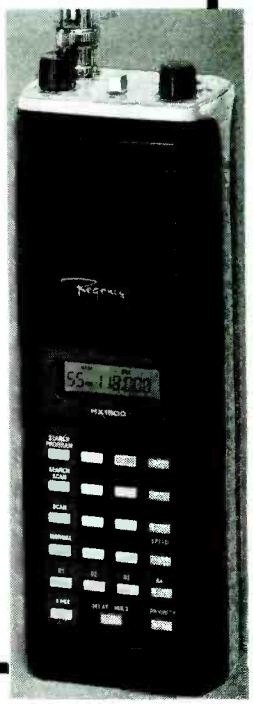
Accessories include belt clip, earphone and flexible antenna. Options available: Drop-in charger, wall mounted charger, carrying case and batteries. Attach an extendable whip antenna for increased range (see page 24).

Manufacturer's Suggested Retail
~~$369.95~~

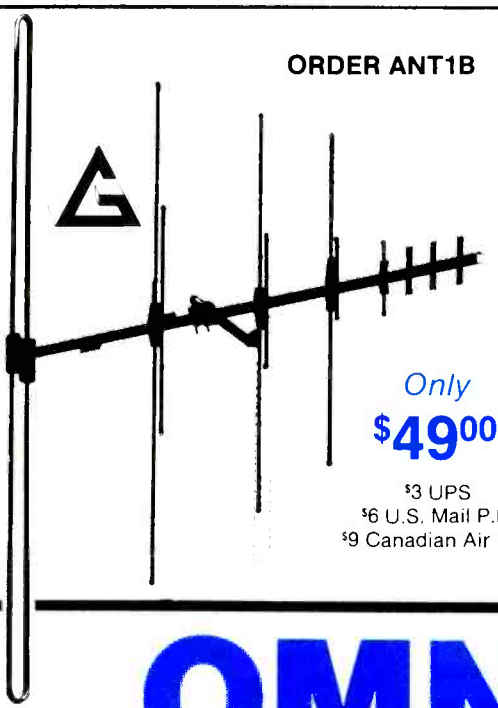
Grove's new low price

ONLY **$219.95**

$3 UPS Shipping;
$5 US Mail P.P.; $8 Canadian Air P.P.



ORDER ANT1B



SCANNER BEAM

High Performance Antenna

Our world-renowned Scanner Beam provides unexcelled 30-50 MHz low band reception, 108-136 MHz aircraft, 136-174 MHz high band, 225-400 MHz military aircraft and satellites, 406-512 MHz UHF, and 806-960 MHz microwave mobile.

HAMS NOTE—can be used for transmitting up to 25 watts on 144, 220 and 420 MHz bands.

May be used with inexpensive TV antenna rotator for boresight accuracy, or fixed in one direction as required for those elusive, distant stations. Local signals still come in loud and clear from all directions.

Balun transformer, offset pipe and all mounting hardware included (requires TV type F connector on your coax). Approximate size 6'H x 4'L.

"I hear 800 MHz signals 40 miles away and aircraft up to 200 miles with my Grove Scanner Beam.
—L. Reeves, Wagoner, OK

Only
$49.00

$3 UPS
$6 U.S. Mail P.P.
$9 Canadian Air P.P.

OMNI

The exciting OMNI, developed by Bob Grove, is a non-directional vertical dipole with continuous 30-960 MHz coverage. A single 66-inch element works on the harmonic principle to provide in- and out-of-band scanner reception throughout the VHF/UHF spectrum

Listen to low band, high band, UHF, military and civilian aircraft bands, even cellular radiotelephone, all on one low cost antenna.

All mounting hardware included.

Requires TV Type F connector on your coax.

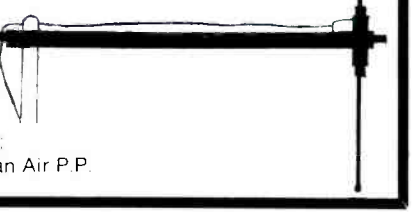
PREMIUM LOW-LOSS RG-6/U CABLE WITH CONNECTORS

Simply tell us what connectors you want installed or what antenna and radio you will be using. We will provide you with a cable which is ready to attach between your antenna and receiver! Connectors/adaptors available: F, PL-259 (UHF), BNC, N, Motorola.

CB50 (50 feet w/ connectors) $19.95 plus $1.50 Shipping
CB100 (100 feet w/ connectors) $29.95 plus $2.50 Shpg.

ANT-5B only
$19.00

$2 UPS Shipping.
$4 US Mail P.P.; $6 Canadian Air P.P.



Professional Wideband Discone

Best Discone on the Market for VHF/UHF Receivers

The discone antenna is used by government and military agencies worldwide because of its recognized high performance, wide bandwidth characteristics. Now ICOM offers a professional grade discone at a popular price.

Designed for use with the ICOM R7000 receiver (25-2000 MHz continuous coverage), the AH7000 discone consists of 16 rugged, stainless steel elements and is capable of transmitting up to 200 watts in the amateur 50, 144, 220, 432, 900, and 1200 MHz bands.

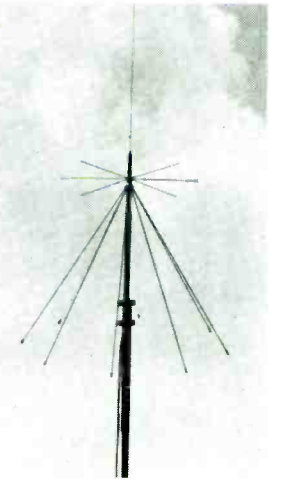
As a receiving antenna the AH7000 is superb, outperforming any omnidirectional antenna we have ever used for continuous 25-1000 MHz (and above) coverage. A base-loaded, vertical top element is used as a low band (30-50 MHz) frequency extender.

The elements are arranged on a 24-inch support pipe equipped with two strong mounting brackets to accommodate any standard mast-pipe (1" to 2⅛" diameter). Included is approximately 50 feet of low loss 50 ohm coaxial cable with N connectors factory installed. Receiver adaptors available at additional cost at time of order).

SPECIFICATIONS:

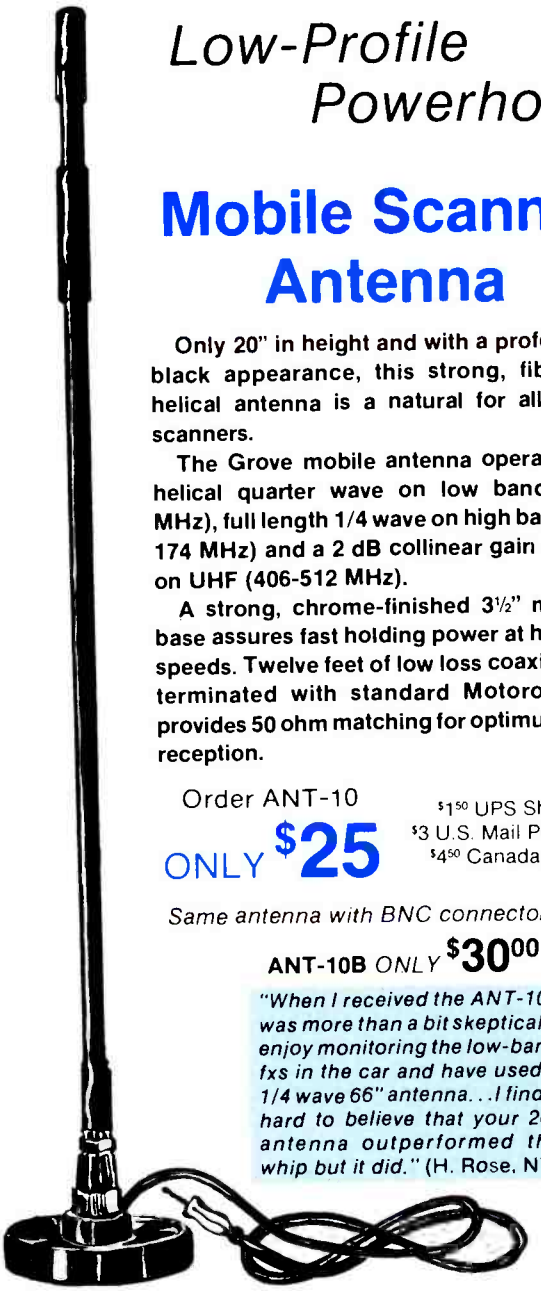
Frequency coverage	25-1300 MHz
Impedance	50 ohms nominal
Power rating	200 watts
Connector	Type N
Antenna style	Discone
Vertical length	66 inches
Weight	2.2 pounds

Order ANT-3



ONLY
$89.95

plus $3 UPS
$5 U.S. Mail Parcel Post
Canadians: $10 Air Parcel Post



Low-Profile Powerhouse!

Mobile Scanner Antenna

Only 20" in height and with a professional black appearance, this strong, fiberglass helical antenna is a natural for all mobile scanners.

The Grove mobile antenna operates as a helical quarter wave on low band (30-50 MHz), full length 1/4 wave on high band (118-174 MHz) and a 2 dB collinear gain antenna on UHF (406-512 MHz).

A strong, chrome-finished 3½" magnetic base assures fast holding power at high road speeds. Twelve feet of low loss coaxial cable, terminated with standard Motorola plug, provides 50 ohm matching for optimum signal reception.

Order ANT-10

ONLY **$25**

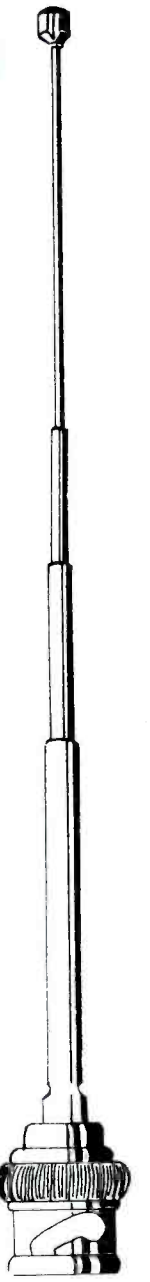
$1.50 UPS Shipping
$3 U.S. Mail Parcel Post
$4.50 Canada Air P.P.

Same antenna with BNC connector, order

ANT-10B *ONLY* **$30.00**

"When I received the ANT-10 I was more than a bit skeptical. I enjoy monitoring the low-band fxs in the car and have used a 1/4 wave 66" antenna...I find it hard to believe that your 20" antenna outperformed the whip but it did." (H. Rose, NY)

Extend the Reception Range on Your Handheld Scanner!



Universal full-length antenna for handheld scanners and transceivers! Standard BNC base allows custom length extension from 7 to 46 inches! Great for amateur hand-helds and scanners like the Bearcat 50XL, 70XL, 75XL, 100XL, and 200XL, Regency HX-1000, -1200, and -1500, Radio Shack PRO-31, -32, and -38, and Cobra SR10, SR12, and SR15. Replace that range-limited rubber ducky with a full-sized whip and stand back. Guaranteed to increase range.

"The Grove ANT-8 full-length antenna is fantastic. It's increased range for scanner enthusiasts makes its price about one-fourth its real value! I've retired my rubber duckie." George Finger, Watkinsville, GA

Order ANT-8

Universal Full-Length Antenna

ONLY **$12.95**

plus $1.50 UPS
$2.50 First Class
U.S. or Canada

(Adaptors for threaded connectors on early BC-100 and Regency HX-2000 available from Centurion International. P.O. Box 82846, Lincoln, NE 68501-2846. Phone: 402-467-4491.)

Convert Your Car Antenna into a Scanner Antenna!

Mobile Antenna Multicoupler

How would you like excellent mobile scanner reception using your existing AM/FM auto antenna? That's right; no holes, no magnets, no scratched paint or clumsy cables going through doors and windows. Ideal for low-profile monitoring installations where a separate scanner antenna is undesirable.

The new Grove ANT-63 Mobile Multicoupler takes only seconds to install and allows simultaneous use of your AM/FM car radio as well as your mobile scanner. Equipped with standard Motorola connectors for your car radio and most scanner models.

Order ANT-63

ONLY

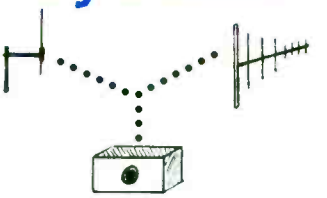
$14.95

$1.50 UPS or
U.S./Canadian Parcel Post

Grove's

Outdoor Scanner Antenna System

. . . connects to any receiver equipped with an external antenna jack



1. Start with our OMNI or SCANNER BEAM antenna

See descriptions on page 23.

2. Then add our Wideband Preamplifier, Power Ant III*

The Grove PRE-3 Power Ant has taken all the best from its successful predecessors and combined them into one powerful signal booster for scanners, short wave and medium wave receivers, even TV and FM stereos!

Equipped with a high gain, low noise, solid state amplifier stage, the PRE-3's front panel control allows custom selection of up to 30 dB of amplification!

Two output connectors are provided allowing you to use two scanners on one antenna at the same time! All connectors are type F for maximum signal transfer.

*Not recommended for metropolitan use

What you need to order:

OMNI (Ant-5B)	**$19** (plus $2.00 UPS, $4.00 U.S. Parcel Post, $6 Canada Air P.P.)
OR SCANNER BEAM (Ant-1B)	**$49** (plus $3.00 UPS, $6.00 U.S. Parcel Post, $9 Canada Air P.P.)
PRE-3 Power Ant III	**$39** (plus $1.50 UPS, $3 U.S. Parcel Post, $4 Canada)
ACC-20 AC adaptor	**$9.95** (free shipping with PRE-3)
ACC-60 receiver cable (approx. 36")	**$7.50** (you specify connector or receiver model; one for each receiver)

Grove's

Indoor Scanner Antenna System

. . . connects to any receiver equipped with an external antenna jack

The Apartment Dweller's Dream

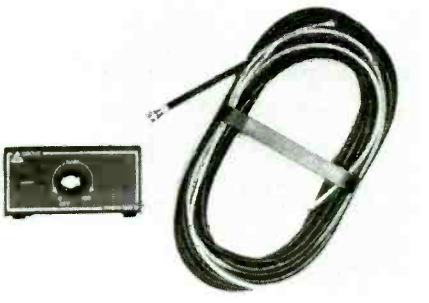
The Grove Hidden Antenna is a high performance, amplified indoor antenna system for scanner monitoring and general coverage shortwave and medium wave reception.

This 66-inch, thin profile, flexible wire antenna can be tucked in a corner, hung behind a drape—just about anywhere out of sight. And when connected to the powerful PRE-3 signal booster, you have instant total spectrum coverage from 100 kHz to over 1000 MHz!

Yes, wide area scanner coverage and even global short wave reception will be at your fingertips, and you can operate two radios at one time!

What you need to order:

ANT-6 Hidden Antenna	**$8.95** (free shipping)
PRE-3 Power Ant III	**$39** (plus $1.50 UPS, $3 U.S. Parcel Post, $4 Canada)
ACC-20 AC adaptor	**$9.95** (free shipping with PRE-3)
ACC-60 receiver cable (approx. 36")	**$7.50** (you specify connector or receiver model; one for each receiver)



Hidden Antenna, as packaged, with Grove PRE-3

The Famous Grove

MINITUNER

A tunable signal filter for improved short wave, medium wave and long wave reception.

You can eliminate those phantom images and intermod signals that plague your radio when using an outdoor antenna. Simply connect the MiniTuner between the antenna cable and your receiver and adjust the dial for peak reception of your favorite station!

A bypass function allows the MiniTuner to be switched out of the circuit without having to remove it from the antenna line. An antenna grounding selector protects your receiver from nearby (not direct) lightning strikes and transmitters.

SPECIFICATIONS:

Frequency Range: 100 kHz-30 MHz in 4 bands
Circuit: Series-tuned L-section filter
Tuner: 365 pF air-variable capacitor, ball bearing drive
Input connector: SO-238 (UHF) with random-wire provision
Output connector: PL-259 (UHF) on 24" coax cable
Enclosure: Custom formed aluminum
Dimensions: 4"W x 2"H x 3"D
Weight: 12 ounces

Order TUN-3

ONLY **$49.00**

$1.50 UPS Shipping;
$3 US Mail P.P.; $4 Canada P.P.

The Grove SKYWIRE

Outdoor dipole for worldwide shortwave reception

Highest performance and lowest cost—an unbeatable combination! Why restrict your frequency coverage with the gaps found in expensive trap dipoles or unpredictable random wire when you can get unsurpassed full-frequency reception with the Grove Skywire?

Comes assembled with SO-239 connector ready for your PL-259 (UHF)-equipped coaxial cable (50 or 75 ohm); includes two professional porcelain end insulators and complete instructions.

ONLY **$19.00**

$1.50 UPS Shipping;
$3 US Mail P.P.; $4 Canadian Air P.P.

"Signals are much stronger now that I have replaced my more expensive trap dipole with the Grove Skywire."

—C. Kisser
Kingsport, TN.

SPECIFICATIONS:

Length: 66 feet
Feedpoint impedance: 50 or 75 ohm (nominal)
Feedpoint location: 22 feet from end
Elements: 18 AWG (16 x 30) bare stranded copper
Connector housing: Heavy duty black phenolic

Boost those weak signals with the Grove...

Power Ant III

Wideband Preamplifier for all Frequency Ranges

RECOMMENDED ACCESSORIES:

- TUN-3 MiniTuner (for shortwave only)(page 26)
- ACC20 Universal AC power adaptor (page 28)
- ANT-5B OMNI (page 23) or ANT-6 Hidden Antenna (below)
- ACC-60 receiver cable—you specify connector or receiver model, one for each receiver—$7.50 each)
- ACC-23 Cigarette lighter cord (page 28)
- ACC 90 Mobile DC cord (page 28)

Specifications

Gain	30 db @ 1 MHz
	29 dB @ 10 MHz
	27 dB @ 50 MHz
	21 dB @ 150 MHz
	13 dB @ 450 MHz
	10 dB @ 900 MHz
Noise figure	2 dB nominal
Usable frequency range	10 kHz-1300 MHz
Input/output impedance	50-75 ohms nominal
Power required	12 VDC @ 40 ma.
Connectors	F type
Dimensions	4"W x 2"H x 3"D
Weight	6 ounces
Power Requirement	DC cord supplied

The Grove PRE-3 Power Ant is a powerful signal booster for scanners, shortwave and longwave receivers, even TV and FM radios!

Equipped with a high gain, low noise, solid state amplifier stage, the PRE-3's front panel control allows custom selection of up to 30 dB amplification!

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USE WITH OUR FAMOUS TUN-3 MINTUNER (See p. 26) FOR INCREDIBLE SHORTWAVE/LONGWAVE RECEPTION!

If you have an outside antenna, connect it to the PowerAnt/MiniTuner combo and stand back as signals pin your S-meter! Don't forget to order the accessories you will need to power the PRE-III and connect it to your antenna and receiver.

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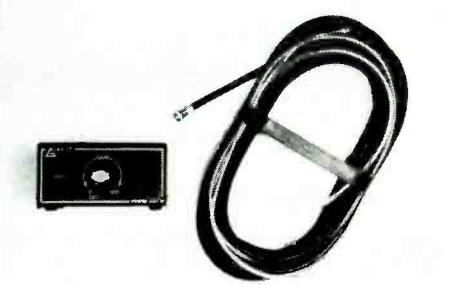
The Grove

Hidden Antenna

Although designed to attach to the powerful Grove PRE-3 signal booster, the Hidden Antenna may be used alone with your scanner, replacing the plug-in whip, for improved signal reception.

Hidden Antenna, as packaged



Hidden Antenna with optional PRE—3 (See pp. 10 & 25).

This five-foot, thin-profile, flexible wire antenna can be hung in a corner, behind a drape—just about anywhere out of sight. Comes fully assembled with 20 feet of coax and F connector. (NOTE: we will substitute the connector of your choice for $5.00.)

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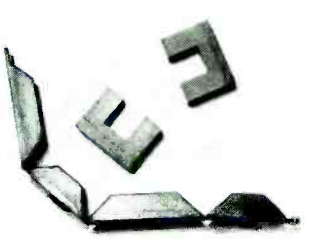

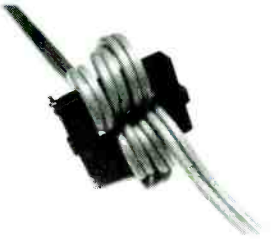

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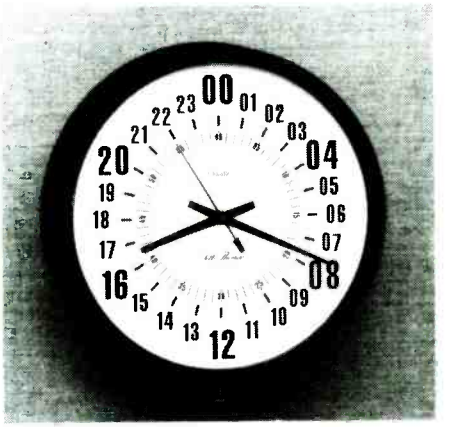

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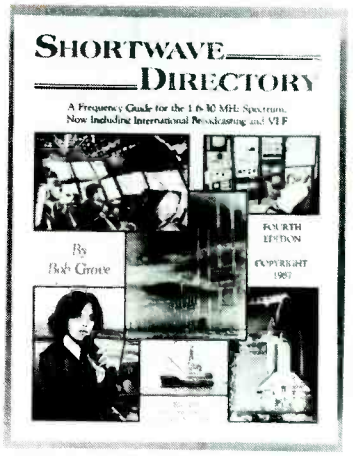

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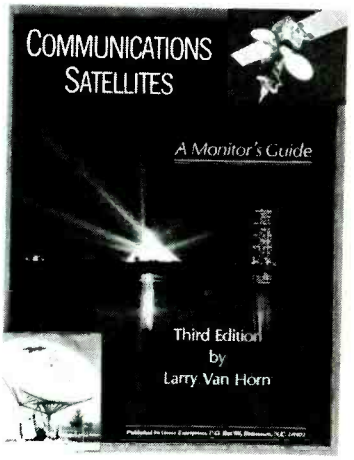

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This ultimate directory of space communications includes chapters on channelization band plans, transponder indentification, international satellites, even a history of earth satellite development.

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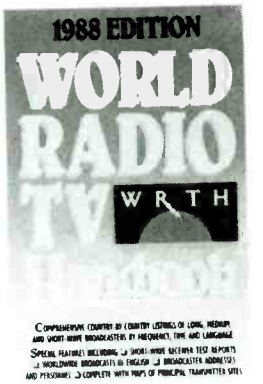

Acclaimed by experts and hobby listeners alike as the ultimate source book for international broadcast monitoring, the *World Radio TV Handbook* remains the best seller in its field. And rightfully so—it is a giant collection of frequencies, addresses, program schedules, beam headings and other pertinent data concerning every major radio station in the world—longwave, medium wave and shortwave.

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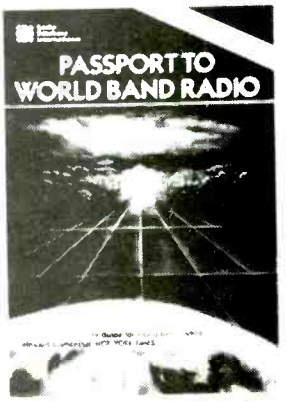

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by Tom Kneitel

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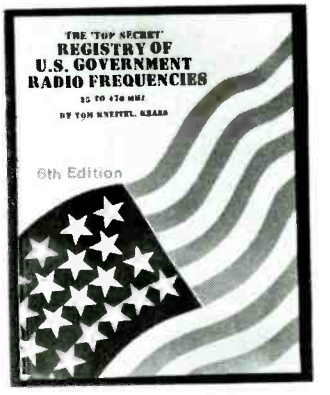

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From the Editor:

Whatever Happened to World Radio Report?

(Monitoring Times has never had any association with World Radio Report, a publication of the Foundation for International Broadcasting. Because of constant inquiries from a number of concerned WRR subscribers who are no longer receiving their prepaid issues, we asked Larry Miller, formerly editor of WRR, to bring us up to date on the status of the organization and its publication.)

It's a popular misconception but I have never owned *World Radio Report*. I was the editor and, by default, the director of the publication's parent organization, the non-profit Foundation for International Broadcasting. I worked under a board of directors as a volunteer to construct an organization, patterned after ham radio's American Radio Relay League (ARRL), to serve the shortwave listening community.

Like all volunteer organizations, many volunteered; few actually worked. The result was that I ended up doing virtually everything. The situation deteriorated both organizationally and financially and when Bob Grove offered me the full editorship of *Monitoring Times*, I accepted the position and submitted my resignation to the board.

A replacement was found in the very capable Mike Mitchell, who, unfortunately, fell seriously ill and work on the project came to a halt. In the meantime, all mail concerning *World Radio Report* was forwarded to the new offices in Seattle, Washington; As a result, I did not answer it -- I did not even see it.

World Radio Report has not "gone under." I have agreed to come back on board, if certain conditions can be met. First, more people must become involved. I cannot and will not do it all myself, as with the first six issues.

Many readers considered *World Radio Report* the best shortwave publication ever; we commissioned professional writers to do pieces on radio and had to buy copyright licenses for others. We had international telex facilities to facilitate the timely transfer of information from stations all over the world. The list of expenses is endless. And, simply put, an $18.00 subscription did not come anywhere near to paying the bills and that brings us to the second condition: a source of regular and sufficient financing must be found to support a project of such a magnitude.

I still sit on a pile of bills totalling about $7,000.00 that I incurred in my name on behalf of the Foundation and donated, as best I can tell, thousands more of my own money. I don't suspect that I will ever get any of it back.

I still support the Foundation and so do others. Sandy Manning, a long-time editor for the American Shortwave Listeners Club, and Kannon Shanmugam, one of the shortwave community's rising young stars, have dived in with both feet, volunteering to run the organization and do a section of the paper as well. All of these people have full time jobs and families, but they have volunteered to risk their time, money and, in both of the above cases, very fine reputations on this project -- a project one shortwave listener labeled as similar to "raising the Titanic."

Are you willing to get involved? *World Radio Report* can use not only your patience but your time, money and other skills. Are you an accountant? Are you involved in public relations? You could receive a deduction by donating your professional time. And you'll have the reward of doing something special for this truly great hobby. Write to Sandy Manning at P.O. Box 260564, Plano, Texas 75026-0564.

Inside this Issue

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Anything can happen in the Persian Gulf these days; J.T. Pogue provides the frequencies and know-how to listen in to these shipping lane communications so you can be on hand when it does!

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Don Jensen, elder statesman of modern-day shortwave, predicts the future of shortwave ... and pronounces it good!

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Paddy Feeny has presented the BBC's "Saturday Special" live sports program for 28 years. Linda Harriett grants us an insight into this charismatic radio personality.

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Countless lives may have been saved thanks to this amateur storm watch program coordinated by the National Weather Service. Jock Elliott discloses some secrets behind its success [Hint: think radio!].

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Costa Rica: Home of shortwave's newest station -- Its other outlets range from impossible to hear to virtually unavoidable. Charles Sorrell tells you what's on and when.

QSLing Those (really) Difficult Stations 42
Bruce Frederick has definitely flipped his lid this time; he's out QSLing garage door openers, highway call boxes, cellular phones [?!] ... Let's hope this is tongue in cheek!

U.S. Navy Communications 44
Just in time to supplement your Persian Gulf listening, or even Antarctica, Andrew Gordon has supplied more Navy know-how.

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On the Cover: The reflagging of the M/V Bridgeton (U.S. Navy photo by PH2 G.L. Pixler); Lightning and tornado photos by the National Weather Service. Graphics by Owassa Graphics, Murphy, NC.

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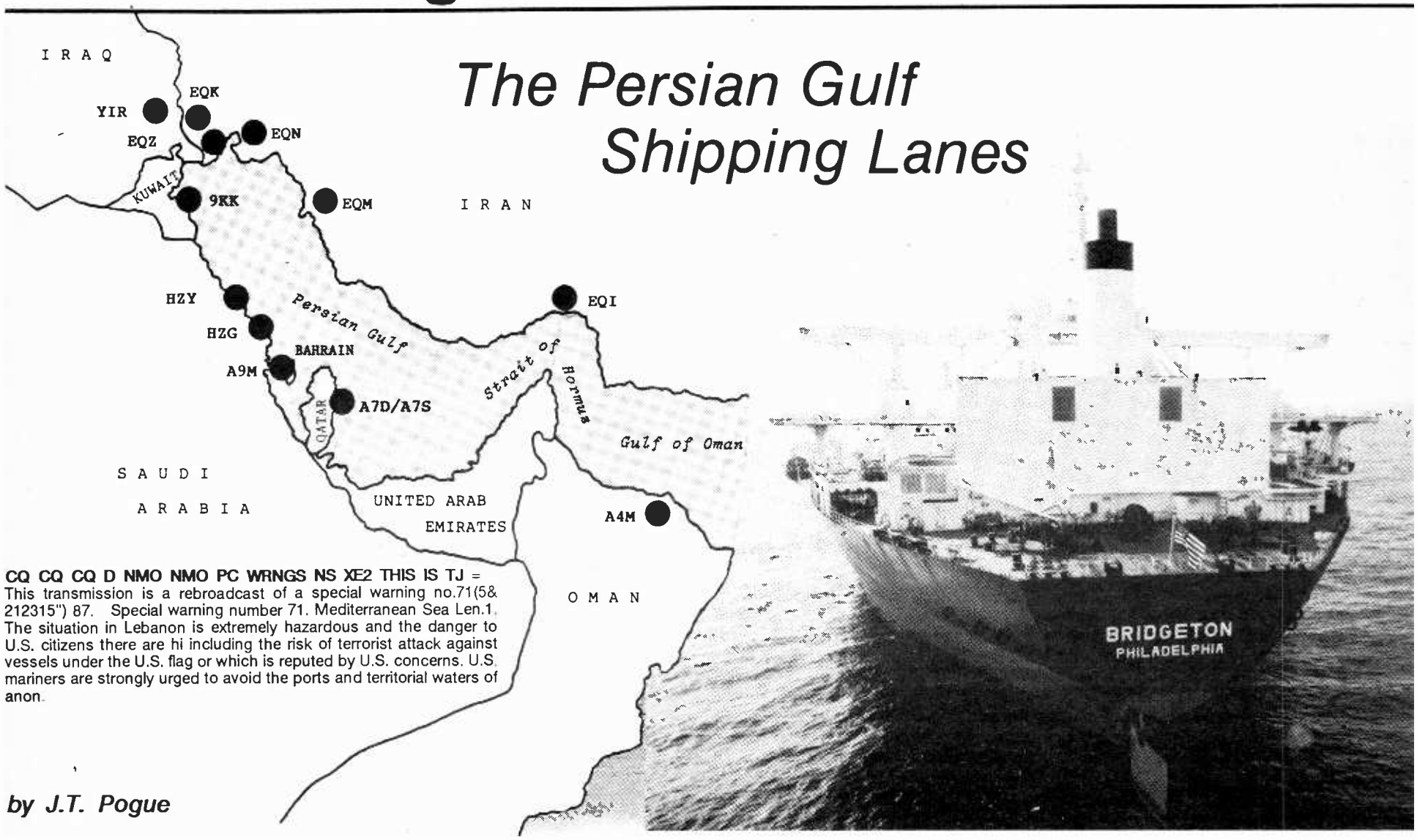
Hotbed DXing



Map shows locations of coastal radio stations operating in the Persian Gulf area (See Table I for additional information). Above, the M/V Bridgeton (WCZB) stern after the reflagging ceremony (U.S. Navy photo by PH2 G.L.Pixler).

CQ CQ CQ D NMO NMO PC WRNGS NS XE2 THIS IS TJ = This transmission is a rebroadcast of a special warning no.71(5& 212315") 87. Special warning number 71. Mediterranean Sea Len.1. The situation in Lebanon is extremely hazardous and the danger to U.S. citizens there are hi including the risk of terrorist attack against vessels under the U.S. flag or which is reputed by U.S. concerns. U.S. mariners are strongly urged to avoid the ports and territorial waters of anon.

by J.T. Pogue

The current political situation in the Persian Gulf area affords utility DXers a unique opportunity to tune-in to some real excitement. The U.S. reflagging of 11 Kuwaiti tankers has heightened tensions there even more, and the mine explosion that damaged the tanker *Bridgeton* is a perfect example of just how "exciting" things can get.

DXers can tune in the merchant ships themselves (voice, CW or SITOR) or the coastal radio stations that they may be communicating with.

Tuning Tips

When ships call coastal stations on either voice or CW, they are operating "duplex" in most cases--the coastal station transmits on one frequency and the ship on another. If you are fortunate enough to own two receivers, or a receiver with programmable frequencies, you should be able to hear both sides of a contact.

In the case of voice communications, ships usually call coastal stations and make their telephone calls entirely on the same duplex frequency pair.

With CW, things get a little trickier. Ships make initial contact with coastal stations on what are known as "calling" frequencies, then transmit the last three digits of a "working" frequency. You must then follow the ship up to that working frequency if you wish to hear more. An example of this type transmission might go, "A9M DE 9KHA QSW 588K." In plain English this means, "A9M [Manama, Bahrain Radio] this is 9KHA [Kuwaiti vessel *Al Rayyan*]; listen for me on [12]588 kHz--over." You should then tune to 12,588 kHz and listen for 9KHA to call A9M and send his message.

Table I provides information on coastal radio stations operating in the Persian Gulf area with the ship calling frequencies that the station listens on. Frequencies for voice and CW (and SITOR if in use) are listed as well as mailing addresses for the stations.

Probably the most interesting tuning targets in the area right now are the 11 tankers that have been reflagged from Kuwait to the United States. At the time of this writing, eight of the ships have been issued U.S. callsigns by the FCC. Table II provides names and callsign information on the tankers.

QSLing the Tankers

According to sources in Washington, all 11 ships are being managed by Chesapeake Shipping, Inc. If you are lucky enough to hear one or more of them, you might try for a QSL using the following address:

Chief Radio/Electronics Officer
M/V (name of ship)
c/o Chesapeake Shipping, Inc.
1000 South Fremont
P. O. Box 4000
Alhambra, CA 81802-4000

All ships flying the U.S. flag are required to send "AMVER" reports to the U.S. Coast Guard regularly. The AMVER (an acronym for Automated Mutual-assistance VEssel Rescue) System keeps track of sailing plans and position reports on merchant vessels around the globe. Thousands of ships are on AMVER plot daily; the information is stored in a constantly-updated database at the Coast Guard's AMVER Center on Governor's Island, New York. If a mariner reports he is in distress, the computer is queried for information on the closest AMVER participating ship that may be able to render assistance (see Sept. *MT* for more).

The 11 former Kuwaiti tankers that are flying the U.S. flag most likely send AMVER messages through the Coast Guard's Communication Station at Portsmouth, Virginia (callsign NMN). Table III lists information on NMN's frequencies, as well as their mailing address.

With merchant ships, your best bet is to include a prepared form card (PFC) with your report; this way, all the Radio Officer needs to do is fill in the blanks and drop your card in the outgoing mail. Although in some cases you may get a letter verification from the ship, your chances with a PFC are much better.

For coastal stations you can either send a PFC or try for a letter or official printed card. Always be sure to include mint stamps or IRC's with your reports.

One important point to remember: utility stations are by nature sensitive about having John Q. Public listening in to their transmissions. The highly volatile situation in the Gulf area makes this even truer.

When writing to ships or coastal stations, be sure to include only the date, time, frequency, mode and a brief description of who the station was in contact with. For example, "Female operator was heard answering the M/V Ibn Malik" or, "Your vessel was heard calling 9KK" should be enough to get the job done.

The Persian Gulf has been a hotbed of explosive violence and danger for nearly a decade. With the presence of U.S. merchant ships and warships in the area, the situation shows no signs of cooling down anytime soon. Why not try tuning the marine utility bands and see if you can hear some of the action there? ■

Jim Pogue is Radioman-in-Charge of the U.S. Coast Guard Lower Mississippi detachment in Memphis, Tennessee. His articles have been published in PopCom, Off Duty Pacific, Glimpses of Micronesia, and many others as well. We welcome him to our growing family of MT writers.

TABLE I

Persian Gulf Coastal Radio Stations

BAHRAIN

Manama Radio/A9M
via Bahrain Telecommunications Co.
P. O. Box 14
Manama, Bahrain

CW

Coast Stn	Ship
4284	4182
8454	8363
12709/ 13086.5	12545
17169	16726
22311.4	*

VOICE

Coast Stn	Ship
4125	4125
4394.6	4100.2
6215.5	6215.5
8734.4	8201.5
13125.6	12354.8
17285.6	16512.7

SITOR

Coast Stn	Ship
4350	4170.5
8709.5	8348.5
13071.5	12491.5
17202	16665

IRAN

Address for all stations:
via Ministry of Posts, Telegraph and Telephones
Director General of Communications
P. O. Box 11365-931
16314 Tehran, Iran

CW

Coast Stn	Ship
Abbas Coastal Radio/EQI	
4292	*
6362	*
8469	*
13069.5	*
22443	*
Khoramshahr Coastal Radio/EQK	
4292	*
6362	*
8469	*
13069.5	*
22443	*
Bushehr Coastal Radio/EQM	
4349	*
6425	*
8698	*
12700	*
17319.7	16546.8
Shahpoor Coastal Radio/EQN	
4349	*
6425	*
8698	*
12700	*
13193.8	12423
Abadan Coastal Radio/EQZ	
4294	*
6362	*
8471	*
13069.5	*
16983.2	*

VOICE

Coast Stn	Ship
2170.5	2182
4403.9	4109.5
6515.7	6209.3
8731.3	8207.4
17279.4	16506.5
22701.4	22105.4
2170.5/2506	2182
4379.1	4084.7
6515.7	6209.3
8790.2	8266.3
17307.3	16534.4
22608.4	22012.4
2170.5/3202	2182
4369.8	4075.4
6515.7	6209.3
8746.8	8222.9
22602.2	22006.2
2093/2170.5	2182
4360.5	4066.1
6515.7	6209.3
8805.7	8281.8
22695.2	22099.2
2507.5	2507.5

IRAQ

Basrah Control Radio/YIR
Attn: Transmission Engineer
Iraqi Ports Administration
Basrah, Iraq

4220	4182 4187	4363.6	4069.2
6330	6273 6280	6506.4	6200
8440	8364 8374	8762.3	8238.4
12660	12545 12561	13107	12336.2
16880/ 16906	16727 16748	17310.4	16537.5
22340	22234 22246	22633.2	22037.2

KUWAIT

Safat Coastal Radio/9KK
via Ministry of Communications
Chief Radio Engineer
Safat, Kuwait

Coast Stn	Ship
8525	*
12895	4431.8

Coast Stn	Ship
2750	2182
4137.4	
4413.2	4118.8
6509.5	6203.1
6518.8	6212.4
8737.5	8213.6
8743.7	8219.8
13172.1	12401.3
13181.4	12410.6
17288.7	16515.8
17298	16525.1
22605.3	22009.3
22642.5	22046.5

OMAN

Muscat Coastal Radio/A4M
via General Telecommunications Org
Transmissions Dept., Trans Mgr.
P.O. Box 3489
Ruwi, Muscat, Oman

4233	4181	2604/2607	2182
8445	8363	3742/3745	2182
12675.5	12545	4366.7	4072.3
16868	16726	4419.4	4125
		8780.9	8257
		8790.2	8266.3

QATAR

Ad Dawhah (Doha) Coastal Radio/A7S
via Min of Communications & Transport
Telecommunications Dept.
P.O. Box 2633
Doha, Qatar

2370	2370
2638	2638

Ad Dawhah (Doha) Coastal Radio/A7D
(same address as A7S)

4231	*
8473.3	*
12966	*
16880	*

SAUDI ARABIA

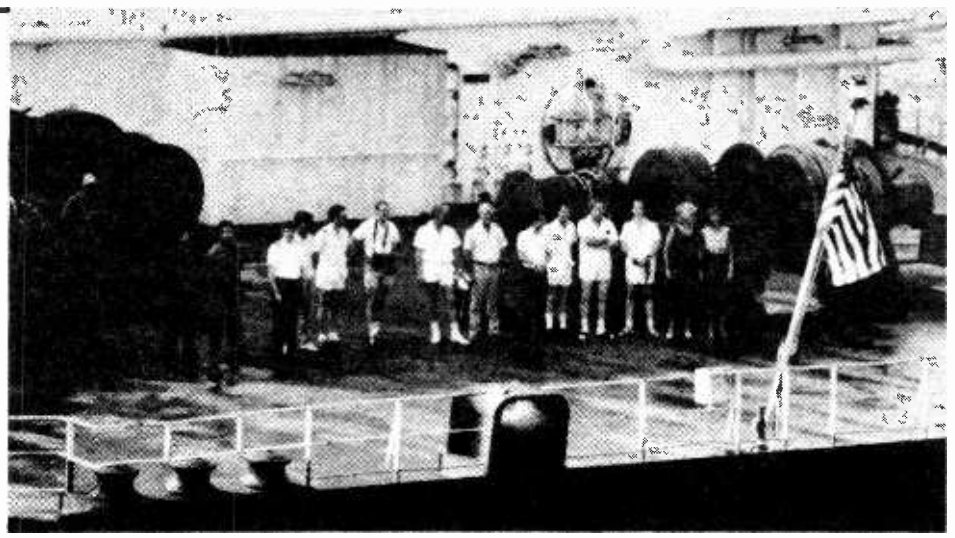
Ra's Tannurah Coastal Radio/HZy
c/o Arabian American Oil Co.
Supervisor of Radio & Marine Ops
Bldg. 840
P.O. Box 96
Dahahran, Saudi Arabia

8480	8364/ 8372.5	4372.9	4078.5
12811.3	12546/ 12559	6506.4	6200
16960	16728/ 16745	8740.6	8216.7
		13103.9	12333.1
		17257.7	16484.9
		22689	22093

Damman Coastal Radio/HZG
GENTEC
Haji Abdullah Alireza & Co., Ltd
General Technical Division
Coast Radio Station Stn Mgr
P.O. Box 8
Damman 31411, Saudi Arabia

8484.5	*
16860	*
22338	*

*Although definite information on calling frequencies is not known, ships likely use frequencies the same as or near those used to initially contact other coastal stations in this area.



Reflagging ceremony on stern of the M/V Bridgeton. (U.S. Navy photo by PH2 G.L. Pixler).

TABLE II

Kuwaiti Tankers Reflagged or Slated for Reflagging

New Name	New Callsign	Former Name	Type
Bridgeton	WCZB	Al Rekkah	Tanker
Sea Isle City	WCYQ	UMM Al Mardem	Tanker
Ocean City	WCYR	UMM Casbah	Tanker
Gas King	WCYX	Gas Al Burgan	LPG*
Gas Prince	WCYM	Gas Al Minagish	LPG*
Gas Princess	WCYY	Gas Al Ahmadi	LPG*
Gas Queen	WCYZ	Gas Al Kuwait	LPG*
Townsend	KAHD	Kazimah	Tanker
Surf City		UMM Al Aish	Tanker
Chesapeake City		UMM Matrabah	Tanker
Middletown		Al Funtas	Tanker

**Liquified gas tanker*

TABLE III

U.S. Coast Guard Communication Station Portsmouth, Virginia/NMN

Commanding Officer
U. S. Coast Guard
Communication Station
Portsmouth-NMN
c/o NAVSECGRUACT Northwest
Chesapeake, VA 23322-2598

CW

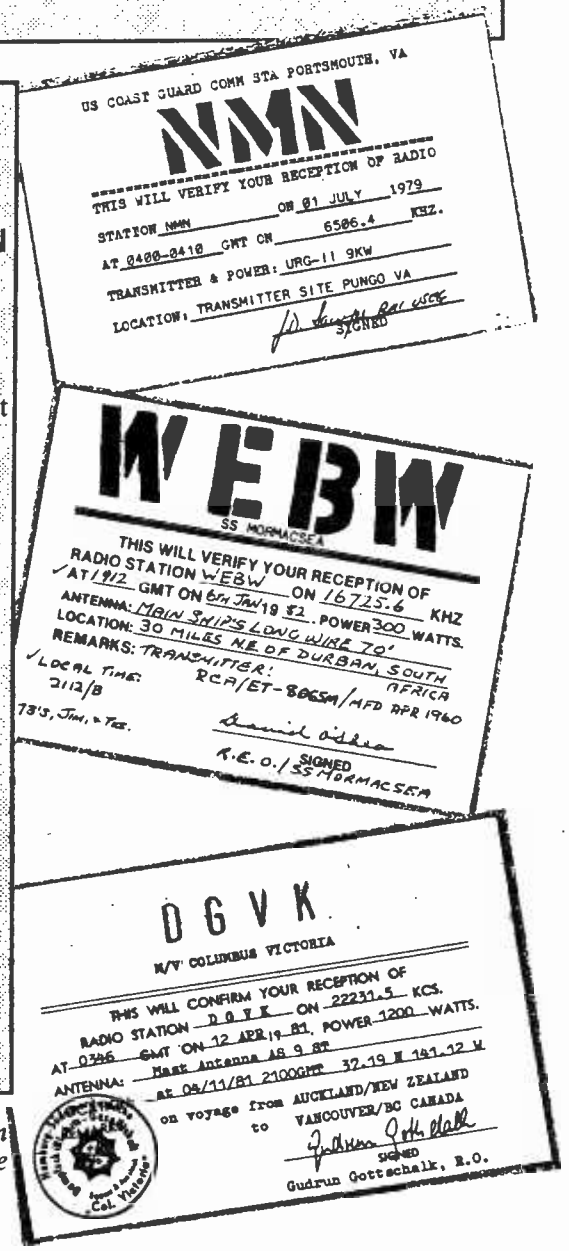
Coast Stn	Ship
8465	8363
12718.5	12545
16976	16726

VOICE

4428.7	4134.3
6506.4	6200
8765.4	8241.5
13113.2	12342.4

SITOR

4349.5	4170
6494	6256
8716	8355
13082.5	12502.5
17208.5	16671.5
22572.5	22203.5



Examples of PFC's (prepared form cards): top to bottom, a CG station in Portsmouth, VA; The SS Mormacsea off the South African coast (note transmitter power); a merchant ship in the Pacific Ocean.

Don Jensen Previews

Shortwave's Next Century!

In any given year, the average shortwave listener probably reads tens of thousands of frequencies, hundreds of schedules, and dozens of equipment reviews. It's very seldom, however, that the shortwave listener gets to peek into the future of his or her hobby. So, in an effort to draw back the misty curtain that separates the here from the heretofore, we've drawn together the knowledge of the ages to give you what we think is a pretty reasonable look at the future of shortwave listening. So gather round the table as we turn on our digital display, high resolution crystal ball for a look at shortwave listening for the 1990s.

Reception Conditions

If you think world band radio has been good lately, the best note we can sound is that it's going to get a lot better.

In the early 1990s, we will be in the midst of a period of enhanced shortwave reception unmatched in at least a decade. Much of this improvement will be noted on the higher shortwave bands, especially 21 MHz, where relatively few broadcasters now operate, and 26 MHz, a band that is currently as barren and lifeless as the surface of the moon.

By 1991, a number of major broadcasters -- the Soviet Union, Israel, France, England and the United States to name a few -- will be using 26 MHz frequencies. Tune in the 21 MHz region in three to five years, and you'll find signals from more than 30 different countries.

As a result of the enhanced reception conditions, signals will turn up where you least expect them, in places above 30,000 kHz -- the tiptop of the shortwave frequency range. These will include unintentional fifth harmonic duplicates of 6 MHz Latin American stations and second harmonic repeats of international broadcasters operating in the 15 MHz band.

As major stations move some of their operations up to the high frequencies, a side benefit will be an uncrowding of the lower bands. This will mean less interference and opportunities to hear stations whose channels are now normally blocked.

International Broadcasting

Back in the 1950s, a 50 kilowatt transmitter could be relied upon to provide reliable worldwide reception. Things have changed so much in the ensuing years that a 50 kilowatt transmitter is generally considered an anachronism and transmitter power has continued to grow. Even today, 500 kilowatt transmitters -- 10 times the power of their 1950s ancestors -- are not uncommon.

The 1990s will see the installation of even more 500 kilowatt units, many capable of being coupled together to produce a million or more watts of transmitting power.

These new transmitters, unlike the ones they will replace, will be capable of broadcasting on 26 MHz. (Many of the older units are not able to go above 22 MHz.)

Still, international broadcasters will have to come to grips with the fact that shouting louder does not necessarily solve the problem. The din must be quieted; order must be imposed.

The "biggies" of broadcasting will come to a realistic, mutually-beneficial self-policing of the world band frequencies. The alternative, they will find, is simply too costly to tolerate.

One way to get better overseas reception at a more reasonable cost is for the international stations, individually or jointly, to build moderate size relay facilities. This is not new, of course. But the trend will accelerate in the 1990s.

Specifically, look for Japan to establish a shortwave relay in the Pacific; Japan and Spain in Central America [*See Costa Rica article, this issue -- ed.*]. Italy and Portugal will try to set up relay stations in South America. Brasil will rent out more air time on its high powered international transmitters to other broadcasters. Switzerland, anxious to reach North America with better signals, will seek help from Canadian or Caribbean broadcasters. And several US-based religious organizations will find that joint overseas transmitting ventures make good dollars and sense.

Domestic Broadcasting

For DXers who enjoy the challenge of tuning home service shortwave, the future holds the promise of new listening targets.

We predict that there will increased shortwave broadcasting both to and within the lesser developed parts of Canada and Australia.

The Australian Broadcasting Commission (ABC) already has three shortwave stations operating on 120 meters to serve the local folks in the sparsely settled Northern Territory. Look for more outlets to serve other parts of the "outback."

For years, Canada has had a handful of domestic Canadian Broadcasting Corporation (CBC) stations. Recently, Canada has begun to take a more serious look north and has stated that it intends to establish a stronger military presence there.

Accompanying these moves, we expect the CBC will bolster its transmissions to the Canadian Arctic. And there could be local service SWers established in northern outposts such as Frobisher Bay or Baffin Island, or remote Resolute.

Similar moves will occur in the far south. Argentina already has one government shortwave station in Antarctica and others in Patagonia. Look for SW activity from the world's southernmost city, Punta Arenas, Chile.

The biggest DX excitement of the next few years will be generated in the Pacific, where there will be a number of new shortwave voices, with others returning to the air after extended absences. This will begin as the new island nations become of age. Though the reason given for establishing shortwave stations will undoubtedly be their need to reach citizens living on remote atolls, the new shortwave stations will undoubtedly be little more than post-independence symbols of nationhood. Places to watch? The miniscule new republics of Micronesia, plus Tonga, Fiji, and Samoa.

Wherever Third World countries are moving fast toward development, look for a hotbed of accompanying local shortwave activity. In South America, for instance, there will be a proliferation of small, local commercial stations in the Brasilian Amazon, the recently opened new frontier of southern Colombia, oil-rich eastern Ecuador, and northeastern Peru.

From Africa, DXers will find resumed broadcasting from some of the interior stations along the Congo River in Zaire.

Indonesia, a very "radio-active" country, made a move a few years ago to replace local shortwave stations with AM outlets. The policy flew in the face of propagational reality in such a vast, tropical country. In the 1990s, Indonesia's government-run RRI will once again put greater emphasis on domestic shortwave broadcasting. Many of the existing facilities will have their power upgraded to at least 10 kilowatts.

Listening Equipment

There is, in fact, a long history of electronic development dating to the days of Edison and Marconi. But the progress has not been a straight line on a graph. Rather, each upward spurt -- major technological advances like the vacuum tube, the superhet receiver, solid state transistor or computer memory "chip" -- has been followed by a plateau period during which laboratory gains find their way into consumer products.

That seems where we are now. Oh, to be sure, there will be receiver

Jensen sees the future of shortwave broadcasting and pronounces it good!

improvements coming up, but major electronic breakthroughs are still a few years off. No need to hold back waiting for the radios of the 1990s and beyond, missing out on all the excitement of world band radio today! Your receiver will not be obsolete until long after you've gotten your money's worth of enjoyment from it.

Still, for the dreamers among you, here are some of the advances we see in the years to come.

Sets of tomorrow will have improved sound fidelity. Audio -- traditionally the weak link in the shortwave listening chain -- will improve dramatically. Advanced audio capabilities will make it possible to create wideband sound from narrow shortwave signals. These sets will have the flexibility to reject static and interference, even in the crowded shortwave bands.

Eventually, worldwide stations will be able to transmit digitally, allowing future receivers to process the received signals to produce reception as clear, steady and enjoyable as FM radio is today.

You will also be able to input broadcast schedules from your issue of *Radio Database International* directly into your radio, permitting "computer intelligent" monitoring. A set will automatically find the station you want on the best possible frequency at any particular time you choose.

The future also will bring computerized intelligence to program listening, including the simultaneous translation of foreign languages. The program may be aired in German or French, but your desktop worldband radio will translate it all into fluent English.

So stick around; With world band radio, the best is yet to come. ■

Man in the HOT SEAT

the BBC's Paddy Feeny

by Linda Harriett

"The World Service is very good on expert opinion and hard fact but sometimes lacks the human touch." Paddy Feeny, one of the world's most respected announcers, provides it.

The BBC's Paddy Feeny enjoys flying by the seat of his pants when he is broadcasting -- or at least that's the impression he gives. He prefers to go into the studio with a set of notes rather than a script.

"It's more like talking to a friend that way, and I'm used to doing it off the top of my head." He is a calm, voluble person, although he professes to have a tendency towards impatience.

Paddy has been presenting the BBC's *Saturday Special* live sports program for 28 years now and he still loves it. "I've never felt stale doing the program, probably because when I go into the studio, I'm never quite sure what is going to happen or how the show will turn out. About one minute before we go on the air, the adrenalin starts pumping."

Saturday Special is a technically difficult program to put on the air and it has become more technical as the years progress. It demands a lot of concentration.

"With me in the studio on a Saturday afternoon is a production team of seven -- the people who do all the real work! There are two producers and four studio managers. I have five televisions with me in the studio and in the production cubicle are a further five, plus 14 tape machines, teleprinters to bring in the results and all the outside sources needed to bring the action and commentary to the listeners."

Many things can go wrong on a live program. "Once we tried to get in touch with the Lapland Games, but we got the hotel receptionist instead," chuckles Paddy. "Not realizing she was on the air live, she continued talking about the hotel and the price of rooms!"

Adventures and Anecdotes

Mr. Feeny has a lot of anecdotes to tell of the places he has visited, the people he has met and the Olympic and Commonwealth Games he has attended as the World Service's chief commentator. He particularly remembers the 1972 Olympic Games in Munich, which held such moments of joy and sorrow.

"I had been in the Israeli billet about six hours before the athletes were killed. As soon as I heard of the Palestinian attack, I got in touch with the Hong Kong team manager, who was in the camp, and he gave me an eyewitness account of what had happened."

He remembers Belfast pentathlete Mary Peters bursting into tears in the athlete's tunnel when she knew she had won the coveted gold medal. "Myself and some other commentators got down to the tunnel in a goods lift. We had to avoid the security guards, so we jammed the lift door open with a pack of cigarettes. As soon as we saw Mary coming, we dropped down in the lift and were there waiting for her when she came through the tunnel, tears streaming down her face."

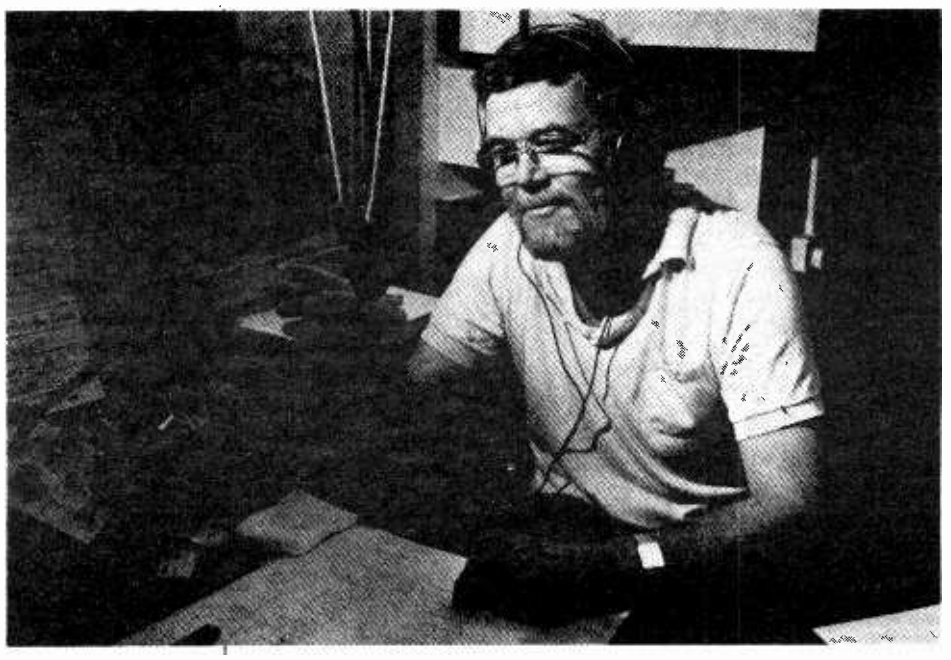
Of the people he has interviewed, Paddy Feeny spotlights racing driver Fangio -- "one of my gods" -- and cricketer Tom Graveney. "That," says Feeny, "was like hero worship."

During an interview with world heavyweight boxing champion George Foreman, Paddy asked him who he looked upon as his next rival. "Anyone who's over six foot tall and weighs more than a hundred and eighty pounds," was the reply.

"I'm over six feet tall and weigh more than a hundred and eighty pounds," replied Paddy. "I know, and I've been keeping an eye on you," came the retort.

Mailbag is a Springboard

Feeny's other regular weekly program is *Write On*, which attracts a large "postbag," but Paddy believes that the letters should be used as a springboard to introduce other elements. "After a while, the letters



tend to reflect the same opinions and get repetitive, which is why we need to branch into other directions to prevent the program from becoming stagnant.

"One listener from Nigeria has written to suggest that we tell the history of the BBC External Service. It's an interesting idea and we could perhaps present it in a serialized form, say once a month."

He also feels that *Write On* provides an extra touch of the human element. "The World Service is very good on expert opinion and hard fact but sometimes lacks the human touch. By visiting areas of Bush House such as the newsroom, and getting senior staff to answer questions raised in listener's letters, I hope people will understand more of what we're doing and why."

How did Paddy Feeny's career start? "I sort of wandered into broadcasting. When I was five years old I wanted to be a film director, but I never was. I began working as a movie projectionist, then went on to be a stage manager. My father worried a bit that I wouldn't make a decent living in the theatre but my mother never did; she thought I was more capable of looking after myself than my older brother and sister.

"None of my family was involved in the theatre professionally. My paternal grandfather was in newspapers and my grandmother did some amateur dramatics. I also had an aunt that was involved in amateur theatrics in Liverpool, but that's about it.

"When I got married, I had to find a steadier job. So I joined the BBC as a studio manager. in 1956. It was a job that gave me the chance to do some relief announcing and it started me on my way to the *Saturday Special*. I did that for four years. Then, because I wanted to become involved more in programs and to write, compile and present them, I decided to freelance."

Today, Paddy Feeny and his wife live in Cuckfield in Sussex. When he isn't working, he likes to read history, and is just discovering the delights of gardening. "I'd also like to have the time to devote to a serious historical feature program, such as social history from the 18th century onwards. And I'd like to do a series on the things you find in English churchyards."

For now, however, the genial announcer must find satisfaction in his current work. That satisfaction should be obvious when you hear him. Paddy Feeny is, after all, one of the most respected announcers in the world.

Saturday Special is broadcast over the BBC World Service on Saturdays at 1345, 1515 and 1615 UTC. *Write On* can be heard Wednesdays at 2315, Thursdays at 1445, and Fridays at 0730 UTC. Check the frequency section for the best place to tune■

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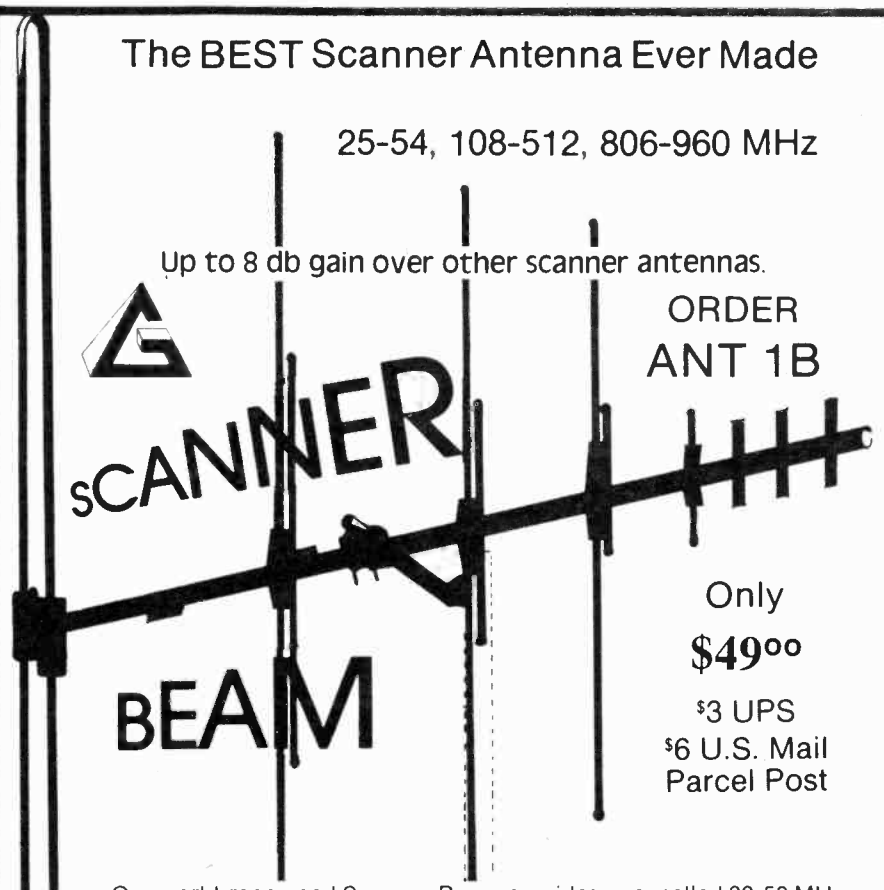

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The Grove PRE-3 Power Ant has taken all the best from its successful predecessors and combined them into one powerful signal booster for scanners, short wave and medium wave receivers, even TV and FM stereos!

Equipped with a high gain, low noise, solid state amplifier stage, the PRE-3's front panel control allows custom selection of up to 30 dB of amplification!

Two output connectors are provided allowing you to use two receivers on one antenna at the same time! All connectors are type F for maximum signal transfer.

The Amazing Power Ant III!

*Not recommended for metropolitan use

What you need to order:	
OMNI (Ant-5B)	$19 (plus $2.00 UPS, $4.00 U.S. Parcel Post, $6 Canada Air P.P.)
OR SCANNER BEAM (Ant-1B)	$49 (plus $3.00 UPS, $6.00 U.S. Parcel Post, $9 Canada Air P.P.)
PRE-3 Power Ant III	$39 (plus $1.00 UPS, $3 U.S. Parcel Post, $4 Canada)
ACC-20 AC adaptor	$9.95 (free shipping with PRE-3)
ACC-60 receiver cable	$5.00 (you specify connector or receiver model; one for each receiver)

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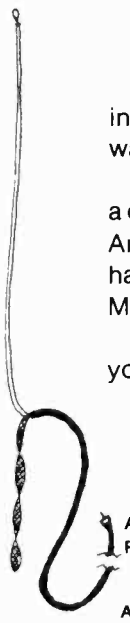

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This 66-inch, thin profile, flexible wire antenna can be tucked in a corner, hung behind a drape—just about anywhere out of sight. And when connected to the powerful PRE-3 signal booster, you have instant total spectrum coverage from 100 kHz to over 1000 MHz!

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ACC-20 AC adaptor	$9.95 (free shipping with PRE-3)
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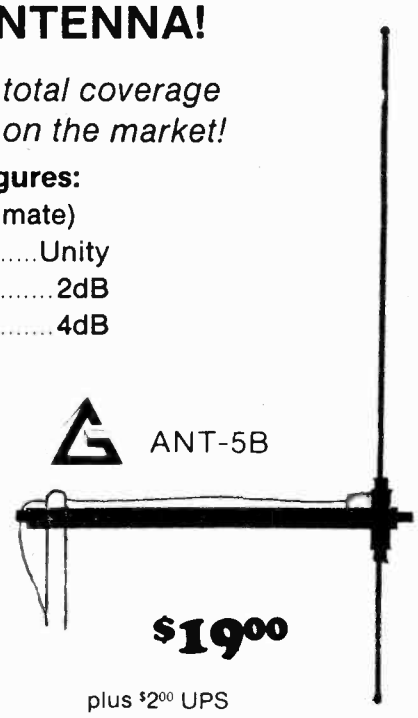

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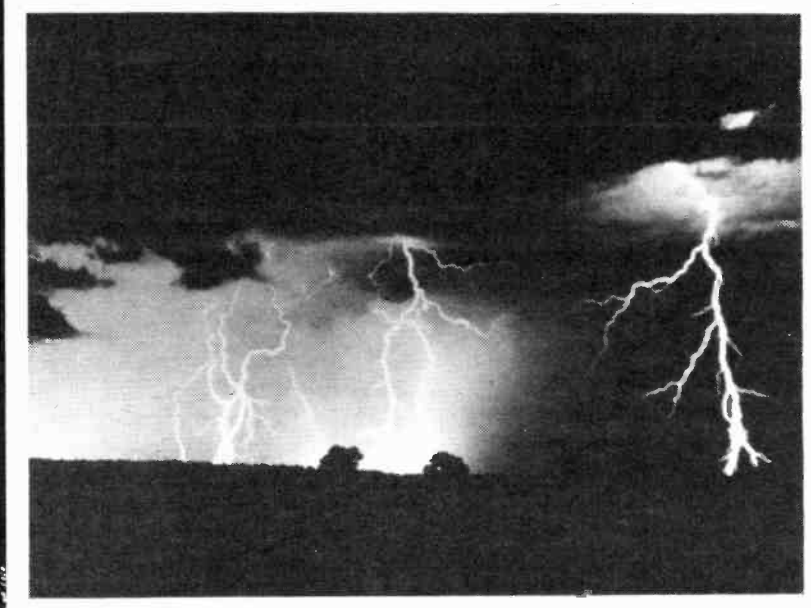
When the Seconds Count



Tornadoes are not the only skyborne destroyers to be monitored by Skywarn spotters; lightning, hail, and winds (such as 1979's Hurricane Frederick pictured here) can also call for severe weather watches (All photos courtesy of NOAA).

by Jock Elliott

"This is WB5SXX, WB5SXX, we have a tornado on the ground. Please take cover. Repeat. We have a tornado on the ground, take cover. It appears to be going into town.....(static) *I think I can zip out of here if I have to, but I am going to stay as close as I can."*

The date was April 10, 1979. The voice coming out of the speaker of the 2-meter transceiver at the National Weather Service was that of Glen Watley. Watley, an amateur radio operator, was witnessing one of nature's terrorists, a twisting black monster called a tornado that was busy cutting a mile and a half wide slash through the center of Wichita Falls, Texas.

There were some 18,000 people in the tornado's damage path that "Terrible Tuesday". Some 1,700 people were injured. Nearly 25,000 others were left homeless. According to experts who later surveyed the scene, as many as 2,000 people should have died. Yet only 44 did. Why were the fatalities so low? There were two reasons.

First, Witchita Falls had an excellent disaster preparedness plan that taught local residents what to do in case of a tornado. Second, Witchita Falls had SKYWARN.

Skywarn is a network of trained people -- many just like you -- who volunteer their time to watch for and report severe weather.

While virtually every state has been struck by tornadoes, these violent storms are not the sole interest of Skywarn spotters. They are also on the alert for large hail, damaging straight line winds, rain at the rate of an inch or more per hour, and flash floods. Fully one-quarter of the Skywarn observers are amateur radio operators. As an integral part of system operations, they offer an interesting and informative monitoring target.

Severe weather of all kinds is serious business. Richard E. Hallgren, Director of the National Weather Service says that "During the past ten years, tornadoes, severe thunderstorms, and flash floods have killed about 3,000 people and injured thousands of others. While this figure may appear staggering, we believe that thousands and possibly tens of thousands of lives have been saved by reports from storm spotters..."

Who are these Skywarn observers?

Skywarn is a network of severe weather spotters organized by the National Weather Service. There are more than 120,000 of these brave volunteers located across the contiguous United States. Their objective is to identify and report severe weather so that other citizens can be warned in time to take action -- action that can save lives.

According to a recent survey, 25 percent are, like Glen Watley, the hero of the Witchita Falls tornado, ham radio operators. Sixteen percent are government workers such a police or county employees, 38 percent belong to civil defense or volunteer firefighting organizations and twenty one percent are individuals with ties to no formal organization.

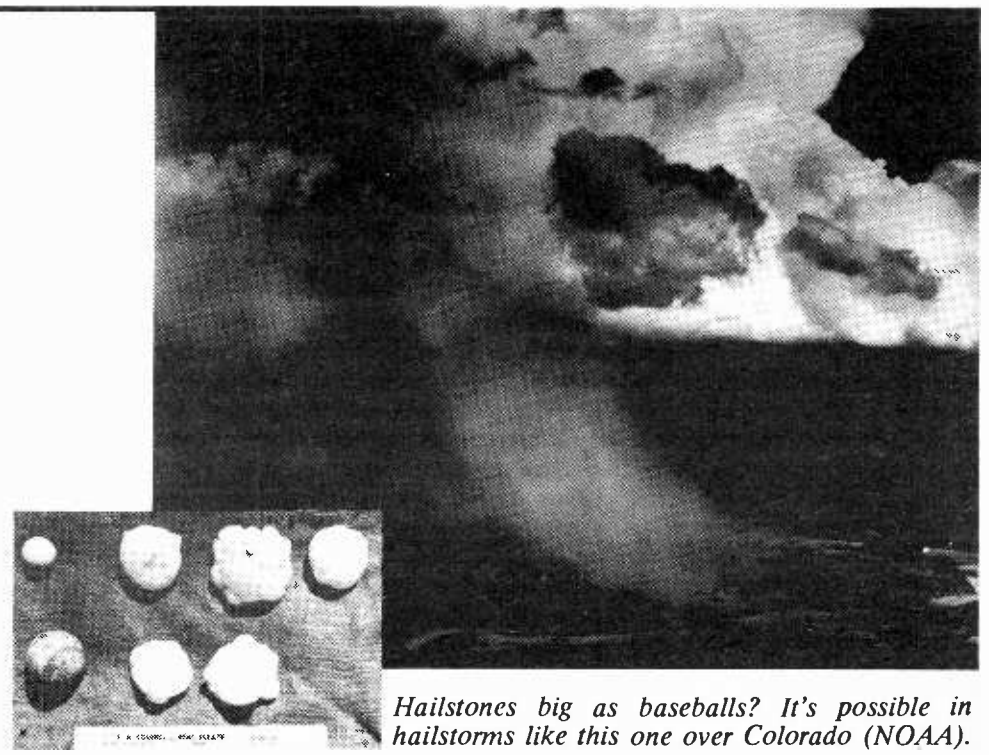
Each Skywarn spotter has had at least three hours of specialized training in identifying and reporting severe weather. The training includes films, slides, videotapes, and lectures covering whatever severe weather hazards likely to be encountered in the spotter's local area. In addition, each volunteer is given a variety of literature describing these hazards.

One of these publications, *The Spotter's Guide*, is restricted, distributed only to Skywarn personnel. The reason for this is that National Weather Service personnel treat every report from a Skywarn spotter as a confirmed sighting. The people who call in these reports must be properly trained.

In addition, each observer is assigned a unique spotter's identification (a combination of letters and numbers somewhat like a ham's call sign). When the observer uses the radio or telephone to report severe weather, he or she first gives his Skywarn identification.

Each Skywarn spotter's network is custom-tailored to meet the needs of the area which it serves. For example,

Restricted Reading: Only Skywarn spotters are provided with training, and ID number, and the Spotter's Guide to guarantee their reliability.



Hailstones big as baseballs? It's possible in hailstorms like this one over Colorado (NOAA).

in eastern New York state, Skywarn volunteers are involved in reading rain gauges every morning. They report precipitation of an inch or more to the Weather Service. Others check river gauges during periods when flooding may be likely. All are involved in spotting and reporting severe weather either by phone or ham radio.

In the eastern region of the country, there are more than 17,500 spotters and nearly 60 percent are hams. The southern region has 32,000 spotters; thirty two percent are hams. The central region has more than 70,000 spotters but only fifteen percent are licensed radio amateurs. The western region has about 5,000 spotters with fourteen percent hams.

There is no doubt that on many occasions, Skywarn spotters have saved lives by doing just what Glen Watley did: he keyed up his 2-meter rig to notify the Weather Service. The Weather Service then takes the report and broadcasts an alert over the local radio, TV and Weather Service stations so that others can take appropriate action to protect themselves.

At other times, the lifesaving intervention of Skywarn spotters is even more direct. In an excerpt from an upcoming report written by James D. Belville, Emergency Warnings Meteorologist for the National Weather Service:

"The tornado outbreak in Ohio and Pennsylvania in 1985 claimed 88 lives...and tore a path of destruction covering many thousands of square miles. The small community of Newton Falls, Ohio, was no exception. However, it appears that many lives were spared there because of the courage and awareness of one man.

"During the afternoon of May 30th, a tornado watch was issued for an area which included Newton Falls. Upon hearing this, a member of a local group known as the Safety Reserve assumed a spotting position atop a fire station in the center of town.

"When a tornado touched down near the city late that afternoon, he immediately sounded the fire alarm and ran next door to tell people at a bingo match to take cover because a tornado was headed for them.

"Within minutes, much of the downtown area, including the bingo hall, was obliterated. Because of the alertness of this volunteer in warning the people, no one in the bingo hall perished."

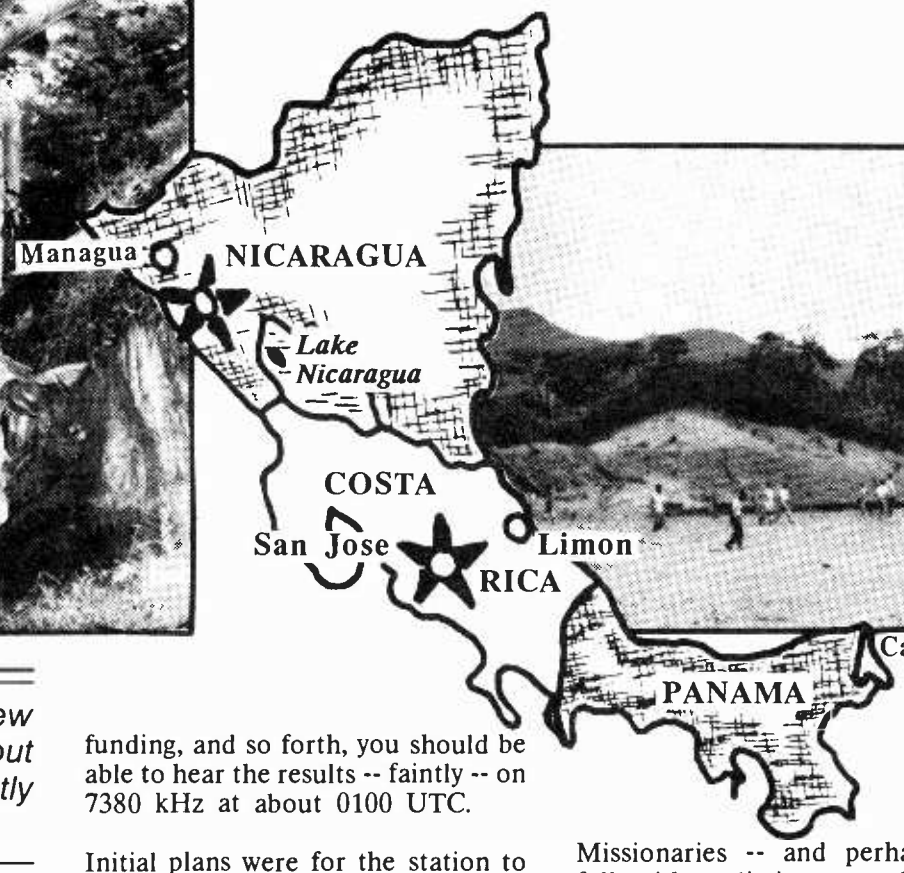
Want to hear Skywarn operations in your area?

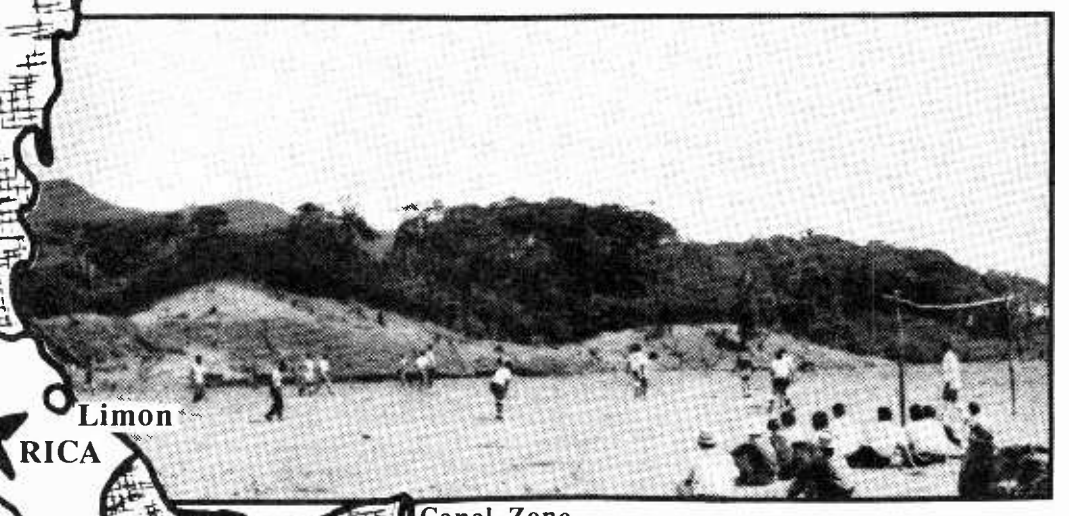
Try scanning the 2-meter ham band the next time the Weather Service issues a severe weather watch or warning.

A "watch" means severe weather is likely to occur. A "warning" means severe weather is happening right now. When a severe weather watch has been broadcast, the Weather Service normally puts Skywarn spotters on alert. Although radio traffic is generally the heaviest during weather watches and warnings, you may hear activity on Skywarn frequencies at almost any time. In eastern New York State, frequencies start around 147.00 MHz and each county in the area has its own frequency. There is even occasional Skywarn traffic on 6 meters and even HF!

If that does not work, call your local Weather Service office and ask to speak to someone about Skywarn. Weather Service personnel are often very friendly and helpful and they may tell you the best frequencies to monitor in your area. But be careful; the person you talk to might even ask if you are interested in learning to be a Skywarn spotter. Trained eyes, ears and radio expertise can always be of help in times of severe weather. ■

The Call of Costa Rica





by Charles Sorrel and Larry Miller

"There is going to be a new age. We need to reach out via shortwave and gently shake the world."

For years now, rumors have persisted that Radio Impacto is -- like Radio Columbia -- not quite what it seems.

A Peaceable Dream

It was back in 1983. James Latham and a friend were driving back from a cross-country peace march, listening to the shortwave. Latham, an amateur radio hobbyist for some twenty years, began talking about stations they heard, how they reached out across political boundaries. Suddenly, the idea hit him: wouldn't shortwave, with its seemingly infinite reach, be a great medium for the peace message?

The idea seemed to take Latham by the collar and together with some friends, he began work on Radio For Peace. Early in September, the dream became reality. Broadcasting from the small mountain town of Ciudad Colon, Costa Rica, Latham has fulfilled his dream of telling the world about peace.

In an interview conducted some months ago, the 34 year old Latham told a reporter that "Our philosophy is [that] there is a change coming into the world. There is going to be a new world. There is going to be a new age. We need to reach out via shortwave and gently shake the world."

The world has been waiting to be shaken by Latham and company for some time now. Several start-up dates have been announced, beginning as early as late summer of '86. But, after clearing a number of hurdles -- Costa Rican customs which held up the transmitter, funding, and so forth, you should be able to hear the results -- faintly -- on 7380 kHz at about 0100 UTC.

Initial plans were for the station to broadcast local U.S. afternoons on 15405 kHz and during the evening on 7380 kHz. Neither frequency is especially good and Radio for Peace's transmitter is rumored to be between 25000 and 5000 watts -- a mere flea on the back of a world populated by 500,000 watt transmitters.

Programming is in English and Spanish, concentrating on, besides peace, issues of world hunger, ecology and human rights. The call letters, announced over the air, are TIRFP.

Reception reports for this new broadcaster can be addressed to Dr. Richard Schneider, Chancellor, World Peace University, Radio For Peace International, P.O. Box 188, Sweet Home, Oregon 97386.

While Radio for Peace may be a new catch on the shortwave bands, the medium is hardly new to Costa Rica. A number of broadcasters have come and gone over the years.

Once upon a time, such stations as Radio Popular, Radio Excelsior, Radio Monumental, and La Voz de la Victor were heard regularly and well in North America.

By the early 1970s, the downscaling of shortwave broadcasting in Central America was well under way. The number of active stations shrank to the point where you could count the number of stations on the air from any given country on the fingers of one hand.

Missionaries -- and perhaps some folk with a missionary zeal in other areas -- were largely responsible for turning the situation around in the mid 1980s.

Surrounded by Extremes

In Costa Rica, this took the form of a couple of supposedly commercial stations which both went on the air within months of each other. One, Radio Columbia on 4850, began operations from a house in downtown San Jose.

What was curious about Radio Columbia was its growth. Within a year of coming on the air, it suddenly pulled up roots and moved to an ultra modern facility in the suburbs. And then it really took off. AM outlets were opened in cities all over Costa Rica. And a 20 kilowatt shortwave facility came on the air from Puntarenas, very near the Nicaraguan border. Programming was, as one Spanish-speaking monitor put it, "right wing to the extreme."

Since that time, Radio Columbia's shortwave broadcasts have mysteriously come and gone. It has not recently been reported by monitors. Nonetheless, one can hardly say if the career of this one is at an end.

Watch 4850 kHz for TILX for its sign on as early as 1030 UTC to as late as 0600 UTC for sign off. When it is on and the frequency is clear, you'll have no trouble hearing Radio Columbia. The mailing address, which can be used by QSL hounds and the inquisitive, is Apartado 708, 1000 San Jose. The station has been a good QSLer.

IMPACTO! shouts the announcer in a very professionally produced Latin musical extravaganza called, not surprisingly, Radio Impacto. On 6150 kHz, this powerful station (by Latin standards anyhow) operates from a two story house in the suburbs of San Jose. Visitors to the site are reportedly met by armed guards. Visitors are, apparently, not encouraged.

For years now, rumors have persisted that Radio Impacto is -- like Radio Columbia -- not quite what it seems. It is said that both may have strong financial backing from sources in North America that demand strong anti-communist broadcasting in this volatile area. These sources may be private or may not. No one has learned for certain. But both stations do program anti-Nicaraguan, anti-Cuban material.

To add another peculiar point to the story, Radio Impacto seems very much aware of what is going on at 6150 on the dial. Should interference show up on their spot, the station quickly moves to 6160 or 6140 kHz. Such quick responsiveness is not typical of most Latin American broadcasting.

Impacto is well heard throughout the evening and early morning hours. Unfortunately, it is rather difficult to dig a QSL out of this station. The

address is Apartado 497, San Pedro de Montes de Oca.

Newcomers...

Another 1980s vintage station is Adventist World Radio's Radio Lira, which is only a year or so old. Programming is in Spanish only, although station officials promise other languages in the near future.

Radio Lira is well heard during the afternoon hours, up until its 0000 UTC sign off at 15460 kHz. The station is also in the process of adding a second transmitter which will operate on the 49 meter band. It plans to add further outlets in the area as time goes on. Reception reports can be sent to Apartado 1177, 4050 Alajuela. They are verified by a QSL card.

Joining Radio Lira in the task of spreading the Word of God in Costa Rica and environs is TIFC, Faro del Caribe (Lighthouse of the Caribbean). It's operated by CAM International (formerly Central American Mission).

TIFC is listed as operating on a number of frequencies, including 5055, 6175 and 9645 but seldom heard on anything but 5055. You can catch the station at its 1030 UTC sign on when it begins the first of two daily transmissions. An evening segment runs from 2300 to 0400 UTC and the last hour is in English. TIFC is an excellent verifier of correct reports and can be reached at Apartado 2710, San Jose.

Non-religious but also non-commercial Radio Universidad de Costa Rica at San Pedro Montes de Oca is sometimes active on 6106 or 6107 kHz. Although it is apparently not active now, the station has announced plans to increase its two kilowatt transmitter to five kilowatts. Apparently, it has not thrown in the towel when it comes to shortwave. Once you log it, send your report to Apartado 2198, San Jose.

And Old Standbys...

Three commercial stations in Costa Rica use shortwave versions of their AM facilities.

The most widely known is Radio Reloj, which has the distinction of being one of the few stations to offer a format consisting primarily of time checks and commercials. It's probably been heard by everyone who has ever turned on a shortwave radio.

Radio Reloj operates non-stop on 4832 and 6006 kHz, entirely in Spanish. IDs come virtually every minute as "Radio Reloj de Costa Rica" and so can hardly be missed. This is one of the oldest and most respected stations in all of Central America. Attractive QSLs are issued for reports sent in to Apartado 341, San Jose.

Another old timer that is less easily heard is TIQ, Radio Casino in Puerto Limon. It uses only 1 kW of power and hopes for the best. Unfortunately, it needs more than hope -- TIQ operates its tiny transmitter in a crowded land of giants -- around 5955 kHz.

Radio Casino's day begins at 1100 UTC and runs until 0600. The last hour is in English. This is a very friendly station and that makes it doubly sad that we cannot hear it more clearly or consistently. If you can dig it out of the noise and get enough details for a reception report, send it to Apartado 287, Puerto Limon.

The third commercial outlet is Radio Rumbo in Cartago. Its call letters are TICAL. Like Radio Casino, it uses a mere 1 kW of power and is usually buried deep under the interference on and around its 6075 kHz frequency. For this reason it's difficult to determine if its really even on the air!

The fact is that there have not been any recent reports of Radio Rumbo. But it may be at its normal spot, straining away, pushing its feeble signal into the swirling static for an audience of no one. If you are lucky enough to hear it, be sure to go for the QSL card. It features an amusing potato-like creature that is the station's mascot. The address is Apartado 140, Cartago.

All of this pales when you remember that Costa Rica will soon be home to a 500 kW station, Radio Costa Rica International, in the next year or two. That's when the Spanish, who, looking for a site on which to place a Spanish Foreign Radio relay transmitter, hit upon the idea of working with the Costa Rican government.

So keep your radio ready and fired up. There is, always was and -- it certainly seems -- always will be some fantastic listening coming your way from Costa Rica. ■

RADIO ROUNDUP: Broadcasting

Larry Miller

3 Lisa Drive
Thorndale, PA 31972

Let's start off this month with some schedules, tentative at press time, for spring. The first column indicates the on/off time in UTC, the second is the frequency, the third is the Azimuth (degrees) and the fourth is the target zone. Information is courtesy of George Jacobs.

KVOH, Rancho Simi, California

0000-0100*	17775	100°	10, 11, 12
1400-0000	17775	100°	10, 11, 12
0000-0800	9495	100°	10, 11, 12
1400-1600*	9495	100°	10, 11, 12

WCSN, Scotts Corner, Maine

0000-0200	7365	60°	27, 28, 37-39
0200-0400	7365	90°	46-48, 52, 53
0400-0600	9465	105°	46, 47, 52, 53, 57
0600-0800	7365	45°	9, 17, 27, 28
0800-1000	9465	105°	46
1000-1200	17640	105°	46
1400-1600	17640	75°	37, 38, 47, 48
1600-1800A	15270	45°	9, 17, 27, 28
1600-1800M	15280	45°	9, 17, 27, 28
1800-2000	21640	105°	46, 47, 52, 53, 57
2000-2200	9465	60°	27, 28, 37-39
2200-0000	9465	90°	36, 46, 47

KYOI, Saipan

0000-0200	15405	340°	45
0200-0800	17780	340°	45
0800-1700	11900	340°	45
1900-2200	9820	340°	45
2200-0000	15405	340°	45

WRNO Worldwide, New Orleans, LA

0000-0300	7355	20°	3-5, 9, 17
0300-0600	6185	20°	3-5, 9
0600-0800**	6185	20°	3-5, 9
0800-1200**	6185	20°	3-5, 9, 17
1200-1400**	9715	20°	3-5, 9, 17
1400-1700	11965	20°	3-5, 9
1700-1900	15420	20°	3-5, 9
1900-2100	15420	20°	3-5, 9, 17, 27
2100-2200*	15420	20°	3-5, 9, 17, 27
2230-0000	9495	20°	3-5, 9, 17
2300-0000*	7355	20°	3-5, 9, 17

WHRI, Nobelsville, Indiana

0000-0200	9850	42°	4, 5, 9
0000-0800	7400	157°	10, 11
0200-0400	6000	42°	4, 5, 9
0400-0600	9495	42°	4, 5, 9
0600-0800	6100	42°	4, 5, 9, 17, 27
0800-1100	7355	42°	4, 5, 9
0800-1100	7355	57°	10, 11
1100-1300	5995	42°	4, 5, 9
1100-1500	11790	157°	10, 11
1300-1500	9580	42°	4, 5, 9
1500-1700	21700	42°	4, 5, 9
1500-1800	15105	157°	10, 11
1700-2100	15105	42°	4, 5, 9, 17, 27
2100-0000	9770	42°	4, 5, 9, 17
1800-0000	17830	157°	10, 11

We also have a proposed schedule for the soon-to-be-heard KUSW in Salt Lake City. KUSW is a division of Ralph Carlson's Carlson Communications and -- at last word -- would be similar to WRNO Worldwide. Mr. Carlson was away at a National Association of Broadcasters (NAB) convention and unavailable for comment as of presstime.

Here's the schedule, this one for the fall.

KUSW, Salt Lake City, Utah

0000-0200	11980	70°	3-5, 9
0200-0500	9850	70°	3-5, 9
0500-0700	6175	70°	3-5, 9
0700-0900	6185	70°	3-5, 9
0900-1200	5980	70°	3-5, 9
1200-1600	9850	70°	3-5, 9
1600-1900	15225	70°	3-5, 9
1900-2200	17715	70°	3-5, 9
2200-0000	15580	70°	3-5, 9

= Out-of-band operation on non-interference basis.
* = Special events; occasional use.
** = Sundays only

Notice anything familiar about that schedule? Take a look at the target zones. They're essentially the same as WRNO's. Perhaps KUSW will also be broadcasting its 100 kw signal into the heart of the troubled and far-away land...Canada.

One of the rules governing shortwave in the United States says that you can't broadcast to this country. Yet, a lot of people who own shortwave stations recognize that this really is a desirable market. What to do? The answer is to broadcast to Canada and in the process, sweep in vast amounts of the U.S.

Take a map and look at New Orleans, Louisiana, home of WRNO Worldwide. Now draw a line between that point, and say, the province of Quebec in Canada. Mercy, that does seem to cover a lot of populated U.S. territory. Some coincidence, eh?

The commercial stations are not the only ones who covet a piece of the U.S. by shortwave. Note, too, that HCJB and Trans World Radio, both U.S. based evangelical stations, also tilt their beams in our direction. For TWR, Bonaire, their 0300-0530 (Sundays and Mondays on 9535), 0300-0430 (Tuesday through Saturdays on 9535) and the 1100 to [varying] 1405 UTC transmission (11815 kHz) all go to North America.

Again, money, as well as sincere good intentions, plays a role. If you are broadcasting to, say, Peru -- either commercially or evangelically -- chances are you're not going to get many people to buy products or donate money, respectively. So you tap the good people of the U.S. who will support you. There's nothing wrong with that, of course.

We also tried to call another long-overdue shortwave station, NDXE. NDXE Global Stereo Radio was supposed to be on the air long ago, according to interviews with owner Harry Dixon Norman. When we dialed up his number -- 205-749-1898 -- a recording said it was temporarily disconnected. Inquiries to directory assistance about NDXE's toll-free number produced nothing. There was no listing, according to the operator. Wonder what's happened?

The new 1988 Radio Database International book is out -- in fact it came out a couple of days early. The publishers

have changed the name of the book to *Passport to World Band Radio* (although the RDI monicker remains), added some futuristic graphics to the cover, more articles, and color pictures inside. The frequency section is now on blue paper, making it somewhat akin to a shortwave phone book. All in all, it appears to be superb effort and each year's book gets better and better! The 1988 *RDI* is available from Imprime and other *Monitoring Times* advertisers. Cover price is $14.95 plus shipping.

One of the most interesting things in the book is the review of **the Philips/Magnavox D2935 receiver.** If you've been in the hobby for a few years, you may remember a radio called the Uniden CR-2021.

The '2021 was a decent little portable with keypad entry (but no tuning knob), LCD frequency display, and good audio that retailed successfully for $299.95. Somewhere along the line, Uniden apparently decided to get out of the shortwave field and dumped the radio. Suddenly, the '2021 was available from dealers for $99.00 and SWLs rioted to get one. It was one hell of a bargain.

This time, the bargain comes from Philips, who is definitely *not* getting out of the shortwave field. They have, for the first time, introduced the D2935 into the North American market under the Magnavox name.

The 'D2935 is a really-solid, full-coverage (146-29999 kHz) portable that tunes AM, FM, LW and shortwave. It has a large LCD frequency display, pushbutton and manual tuning, narrow/wide filter, BFO, memories, clock and more. Best of all, it has a good size speaker capable of pretty good audio.

The interesting thing is that Philips has grossly underpriced the radio. It is scheduled to retail for around $179.95. This is one of the hottest bargains in shortwave today. Check with your favorite *MT* advertiser and pick one of these beauties up -- before Philips wises up and raises the price.

Thought you might be interested in seeing what's on TV and radio in Finland tonight. Just in case you're in the neighborhood. Note in the TV section that among programs like "Siniparta" and "Pikku kakkonen" is "Hill Street Blues." It's from the paper, *Etela-Vantaa*, published in Hyryla, Finland.

Let's take a look at some DX news. This month's items are culled from "Sweden Calling DXers" and the "American Shortwave Listener's Club." According to that bulletin. Noumea in New Caledonia is now operating all night on 3355 and 7170 kHz. Th eold schedule ran from 1900 to 1100 UTC; slightly longer on weekends.

Also from SWL, word that pseudo-pirate Radio Dublin International from Ireland has changed frequencies. Look for that now on 6930 and 6950 instead of 6910 kHz.

The schedule for the **Australian Broadcasting Corporation**'s inland shortwave stations have been extended to 24 hours. Look for Brisbane VLM on 4920, VLQ on 9660, VLW 9610 as well as Perth on 6140 from 0945 to 2100 UTC and VLW 15425 kHz from 2100 to 0945 UTC.

From **Radio Sweden** comes word that their English transmission to South Asia at 1600 UTC is now using 15235 kHz instead of 15110.

RAE, Argentina, says it hopes to have its transmitter on 6060 kHz back on the air soon. According to the station, only one transmitter is currently operational. you can hear it from 1000-1400 UTC on 11710 kHz, 1700-2200 UTC on 15345, and 2200-0500 UTC on 9690 kHz.

Look for an English broadcast on the **South West Africa Broadcasting Corporation's Radio 2** from Namibia. The schedule is on Mondays, Tuesdays, Thursdays, and Fridays at 2300 UTC. Frequencies include 3290 and 4965 kHz. It is audible with patience.

My goodness. After years of writing pieces that started something like, "**Radio Yugoslavia** is building a new transmitter site at Bijeljina. Sign on is scheduled for 1984...", it appears the new facility may be operational. Listen for the new units on 5980 and 6100 kHz. Both are in use for the 1700 UTC English transmission, along with 7240 and 11735 kHz.

Dieter Grundt of West Germany says there's a new station on the air in Ecuador. It's calling itself **Ecos del Oriente** and it's reportedly located in Lago Aguario. The frequency is 3270. It's been heard until sign off at 0400 UTC.

That should just about wrap it up. I now take a bow on behalf of the listeners who submitted the following logs for your perusal and enjoyment.

ETELÄ-VANTAA

TV-ohjelmat — RADIO-ohjelmat

TORSTAI 13. 8.

TV 1

17.55 Piki, pikkuruinen ankanpoika.
18.00 Bertta. Tänään Bertta tekee käkikelloja.
18.15 Kastelholma – Bomarsund.
18.45 TV-nytt.
19.00 Elävät saaret. Osa 9: Ihmisen siivellä.
19.35 Apartheid. Osa 2: Uusi järjestys.
20.30 Uutiset ja sää.
20.50 Urheiluruutu.
21.00 Kuolleet sielut.
22.10–23.30 A-studion ulkolinja: Onko helppoa olla nuori?

TV 2

18.30 Pikku kakkonen. Tänään Kukat-ohjelmassa tutustumme kellokukkiin, sitten näemme, miksi Kieku ja Kaiku jäivät ilman herkkuja, ohjelmassa Tanhut ovat vuorossa "Tepsuttajat" Ylöjärven Vahannasta ja lopuksi tapaa Kössi Kenguru Vesihiisi hiskin. Ohjelma sisältää uusintoja.

PERJANTAI 14. 8.

TV 1

17.55 Paras perintömme, omat sanat. Björg Arnadottir johdattaa katsojat islantilaisen isänmaanrakkauden juurille, äidinkielen aarreaittaan.
18.40 Sana viikonvaihteeksi.
18.45 TV-nytt.
19.00 Kamppailu rahalippaasta. Tanskan televisio on tuottanut 6-osaisen lasten seikkailusarjan. Ensimmäinen osa: Salaperäinen mies kätkee tyhjän lippaan metsikköön.
19.30 Resiinaralli 1987.
20.30 Uutiset ja sää.
20.55 Yleisurheilua. Kalevan kisojen, yleisurheilun Suomen mestaruuskilpailujen ensimmäinen päivä. Kuopio, Väinölänniemi.
21.55–23.27 Siniparta. Blaubart. Ohjaus Krzysztof Zanussi, Saksan liittotasavalta 1984. Pääosissa Vadim Glowna, Karin Baal, Vera Tschechova, Ingrid Resch, Eberhard Feik, Hans Paetsch. Svensk text i

LAUANTAI 15. 8.

TV 1

16.20 Rovaniemen markkinoilla. Suomalaisen elokuvamusikaalin vuosikymmenet. Jorma Nortimon ohjaama kotimainen elokuva vuodelta 1951.
17.40 Fisketuren.
18.05 Under segel. Del 5/6.
18.45 TV-nytt.
19.00 Demeter ja Kore ovat kreikkalaisia jumalattaria, jotka marmoriin hakattuina jäivät Vesuviuksen purkauksen jalkoihin vuonna 79 jKr.
19.15 Yleisurheilua.
20.30 Uutiset ja sää.
20.45 Lotto.
20.50 Urheiluruutu.
21.00 Me ja muut eläimet: sudet lampaan vaatteissa.
21.30 Resiinaralli 1987.
22.00 Kymmenen Uutiset. MTV.
22.15–23.15 Ajo päällä. Onnen päivät. MTV.

RADIO ROUNDUP: Broadcast Loggings

0015 UTC on 4755
HONDURAS: Sani Radio. Spanish. Pop Latin vocals and letter read from listener in Costa Rica.

0030 UTC on 3360
GUATEMALA: LV de Nahuala. Spanish. Religious and cultural features followed by Latin pop rhythms.

0035 UTC on 3340
PERU: R. Altura. Spanish. Local ads and continued Andean folk music though very weak.

0050 UTC on 3280
ECUADOR: LV del Napo. Spanish. Pop vocals and Ecuadorian folk styles. ID followed by news format at 0100.

0058 UTC on 3320
PERU: R. Estrella del Sur. Spanish. Several selections of Andean folk music. Noisy with interference. Logging submitted as tentative. (R. Pearson, St. Augustine, FL).

0105 UTC on 5040
ECUADOR: LV del Upano. Spanish. Orchestra music with flute solos. "LV del Upano" ID at 0115. (C. Volz, Montgomery, IL).

0110 UTC on 4795
ECUADOR: LV de los Caras. Spanish. Uptempo Spanish pops and easy-listening music. Quick local ad with time check.

0120 UTC on 5095
COLOMBIA: R. Sutatenza. Spanish. Program features with theme music from 'Flight of the Bumblebee'. Local ads and time check followed by classical piano music. (R. Pearson, St. Augustine, FL).

0125 UTC on 4980
VENEZUELA: Ecos del Torbes. Spanish. Mixture of Spanish pop vocals and western music. Talk and ID. (C. Volz, Montgomery, IL).

0130 UTC on 9735
PARAGUAY: R. Nacional Paraguay. Spanish. Nice variety of Paraguayan polca music and Nacional ID.

0135 UTC on 4830
VENEZUELA: R. Tachira. Spanish. Cola ads and time checks. Plenty of Tachira IDs and promotional for upcoming newscast. (R. Pearson, St. Augustine, FL).

0135 UTC on 5025
CUBA: R. Rebelde. Pop music from Patti LaBelle. Time check and talk about Cuba. (S. Zachary, Lake Charles, LA).

0140 UTC on 7430
GREECE: Voice of Greece. Spanish. Greek folk music. "This is Greece" ID and closing kilohertz schedule. Sign-off 0152.

0140 UTC on 4810
GALAPAGOS ISLANDS: LV de Galapagos. Spanish. Very weak signal of announcements, possible ID and Spanish vocal rhythms. Logging submitted as a tentative. (R. Pearson, St. Augustine, FL).

0150 UTC on 9550
AUSTRIA: R. Austria International. Austrian folk music, station ID with schedules and more folk. (S. Zachary, Lake Charles, LA).

0202 UTC on 9885
SWITZERLAND: Swiss R. Int'l. News covering Nicaragua, unrest in Chile, Brazil's finance problems and Bolivia's army takes over an oil installation. Parallel frequency of 12035 fair also.

0205 UTC on 11745
BRAZIL: R. Bras Nacional. Address for reception reports. Features of 'News Report' and national news of Brazil.

0210 UTC on 4780
SOUTH AFRICA: R. RSA. Boxing match results, international news wrap-up and schedule for U.S. and Canadian listeners.

0220 UTC on 4780
VENEZUELA: LV de Carabobo. Spanish. Guitar ballads, ads and 'canned' Carabobo promo. Brassy Venezuelan rhythms.

0230 UTC on 4875
BRAZIL: R. Nacional-Boa Vista. Portuguese. Mixture of Brazilian pops and ballads. Nacional ID with canned station promo.

0230 UTC on 4960
ECUADOR: R. Federacion. Spanish. Easy-listening orchestra music. ID with kilohertz and Sucua city location. National anthem and sign-off at 0300.

0245 UTC on 4815
COLOMBIA: R. Guatapuri. Spanish. ID followed with several Spanish pop vocals. Some occasional talk from DJ. (R. Pearson, St. Augustine, FL).

0250 UTC on 4975
PERU: R. del Pacifico. Spanish. Peruvian folk styles with ID and time check as female introduces folk music program.

0258 UTC on 5040
VENEZUELA: R. Maturin. Spanish. "Attention, attention, amigos." Male announcer follows with evening messages and announcements to local listening area and afterwards thanks them for their attention.

0329 UTC on 4920
ECUADOR: R. Quito. Spanish. Quito ID with commentary about Ecuadorian President. Local talk on Quito. (C. Volz, Montgomery, IL).

0340 UTC on 4780
DJIBOUTI: RTV de Djibouti. Somali. Male announcer with Korean recitations. Music styles of Arabic and African sub-Saharan.

0345 UTC on 3285
BELIZE: R. One-Belize. Interference present on frequency but able to discern talk on economic cooperation in Belize. (S. Zachary, Lake Charles, LA).

0345 UTC on 4820
BOTSWANA: R. Botswana. Vernac. Signal in competition with LV Evangelica Honduras on same frequency. Barnyard interval and sign-on routine heard but not much else.

0355 UTC on 4800
LESOTHO: R. Lesotho. Setswana. News and commentary covering nations af Southern Africa. (S. Zachary, Lake Charles, LA).

0358 UTC on 3215
SOUTH AFRICA: R. Oranje. English/Afrikaans. Closing portion of religious sermon, station ID at 0400 and intro Afrikaans language. (C. Volz, Montgomery, IL).

0400 UTC on 4840
VENEZUELA: R. Valera. Spanish. Light rock style music and closing station ID. Sign-off routine til 0401. (C. Volz, Montgomery, IL).

0412 UTC on 6150
COSTA RICA: R. Impacto. Spanish. Station news correspondent with report from Panama City on recent riots and unrest.

0420 UTC on 3210
MOZAMBIQUE: R. Mozambique. Portuguese. Fast-paced pop music with DJ shouting at voice breaks. Fair sigal strength with talk of Maputo during ID> (C. Volz, Montgomery, IL).

0420 UTC on 17795
AUSTRALIA: R. Australia. U.S. Top 40 music format followed by 40's Glenn Miller music. Parallel frequency 15320 better signal.

0430 UTC on 5035
CENTRAL AFRICAN REPUBLIC: R. Centrafrique. French. Two announcers chit chat and local news briefs. Station ID at 0450 and native African music.

0432 UTC on 4850
VENEZUELA: R. Capital. Spanish. Pop and rock format with time and temperature for Caracas with ID.

0437 UTC on 5015
SOUTH AFRICA: Clandestine-R. Truth. Speech and discussion from two announcers on non-alignment, disarmament and revolution. Radio Truth ID at 0445. (C. Volz, Montgomery, IL).

0447 UTC on 7225
RWANDA: Deutsche Welle. Talk of trade arrangements and economic cooperation with East bloc nations.

0450 UTC on 4832
COSTA RICA: R. Reloj. Spanish. Local Costa Rica time check and ID as "Radio Reloj numero uno en Costa Rica," follows with thanking everyone for listening to Spanish pops. (S. Zachary, Lake Charles, LA).

0457 UTC on 5010
CAMEROON: R. Garoua. French. Native African chanting with drums. ID at 0500 follows with news at 5010.

0507 UTC on 11665
EGYPT: Voice of Arabs. Arabic. News format and ID at 0507 with more news and Arabic music.

0508 UTC on 4880
SOUTH AFRICA: R. Five. Rock music and friendly DJ. Commercials for Ford cars and cold/flu medicines. (R. Pearson, St. AUgustine, FL).

0510 UTC on 4795
CAMEROON: R. Douala. Vernac. Religious service with Africa drum music. Several Douala IDs. (C. Volz, Montgomery, IL).

0512 UTC on 4904
CHAD: RDF Nationale. French. Music format included pop and hi-life selections and "National" ID at 0510. (R. Pearson, St. Augustine, FL).

0515 UTC on 9540
NEW ZEALAND: R. New Zealand. '40' movies show tunes, Big Band music and station ID. (R. Pearson, St. Augustine, FL).

0540 UTC on 7245
ANGOLA: R. Nacional. Portuguese. Local announcements and news reporting format followed by upbeat Portuguese pop music.

0550 UTC on 7255
NIGERIA: Voice of Nigeria. Interesting commentary on the role of the youth in nationbuilding.

0600 UTC on 4770
NIGERIA: R. Nigeria. Station ID as, "this is the international service of Radio Nigeria" ID with time signal and news headlines. (R. Pearson, St. Augustine, FL).

0610 UTC on 4915
GHANA: GBC. News covering Ghana and talks on government committees formed to deal with the needs of neighboring towns. (C. Volz, Montgomery, IL).

0700 UTC on 4920
AUSTRALIA: VLM4 Brisbane. Sports program of interview with Jon Sieben, '84 Olympic gold medal winner of the 200 meter butterfly. (J. Kline, Santa Monica, CA).--nice to hear from ya, James!--ed.

0809 UTC on 4915
BRAZIL: R. Anhanguera. Portuguese. Lively male announcer with upbeat music, numerous ID and slight interference. (J. Kline, Sanat Monica, CA).

0916 UTC on 4885
BRAZIL: R. Clube do Para. Portuguese. Morning show of Brazilian pops and ballads. "Bom dia!!" (good morning) from enthusiastic DJ. Rooster crows with time checks and "Club do PAra" ID--one of the better Brazilian 'morning shows' to check for in the wee hours--ed.

0935 UTC on 4823
PERU: LV de la Selva. Spanish. Peruvian folk music and quick "LV de la Selva" IDs into more great folk. (R.Pearson, St. Augustine, FL).

0940 UTC on 4915
BRAZIL: Radio Nacional-Macapa. Portuguese. Nacional ID and quick morning time checks and announcements followed by Brazilian pops. All making it through incredible noise.

0950 UTC on 4985
BRAZIL: R. Brasil Central. Morning show with ballads, canned promos and pop music rhythms. (S. Zachary, Lake Charles, LA).

0950 UTC on 4845
BOLIVIA: Radio Fides. Spanish. Fides ID and local talk. Andean flute music. Repeated ID at 1000 with talk about La Paz. Noisy signal today!

1004 UTC on 4810
PERU: R. San Martin. Spanish. Lots of IDs and ads for local Tarapota merchants. AS always-great Peruvian flute selections. Station promo at 1030 and two back-to-back ads for Inca-Cola.

1038 UTC on 4991
PERU: R. Ancash. Spanish. Peruvian folk music, ads and time checks for Huaraz. More folk flutes, but lost in excessive noise.

1012 UTC on 4996
PERU: R. Andina. Spanish. Folk music ballads, Andina ID at 1017 into great Peruvian huyanos folk styles.

1025 UTC on 4755
PERU: R. Huanta 2000. Spanish. Incredibly noisy but Peruvian music making it. Break at 1035 including a possible ID and talk. Logging submitted as tentative. (R. Pearson, St. Augustine, FL).--at a mere 500 kw, it'd be a great catch if it is Huanta, Rod!--ed.

1050 UTC on 5955
COLOMBIA: LV de la Centauros. Spanish. Slow Spanish ballads and time check with promo for the news and Caracol network.

1110 UTC on 3325
GUATEMALA: R. Maya de Barillas. Spanish. Inca style Guatemalan folk rhythms. "Good morning to our listeners" from announcer.

1115 UTC on 3380
GUATEMALA: R. Chortis Jocotan. Spanish. Singing ads and time check. Special musical presentation of marimba music. IDs and singing public service announcements.

1505 UTC on 15200
GABON: Africa No. 1. French. News on Africa with ad for "Laughlin" cigarettes. Sports report and music follow. (J. Kline, Santa Monica, CA).

1502 UTC on 9610
AUSTRALIA: VLW9 Manneroo. ABC news and 'easy-listening' music. Audi distorted by 1517. (J. Kline, Santa Monica, CA).

1535 UTC on 9660
VENEZUELA: R. Rumbos. Spanish. Noisy signal today, but made out political commentary on the U.S. (C. Volz, Montgomery, IL).

1610 UTC on 11705
IRAQ: R. Baghdad. News and commentary on escalating tensions between Iraq and France.

1705 UTC on 11775
ANTIGUA: BBC. International news on the Persian Gulf, Central America, USSR and Scotland's political scene. (S. Zachary, LAke Charles, LA).

1710 UTC on 11780
BRAZIL: Nacional do Amazonia. Portuguese. Rapid Brazilian pops with listener dedications. Program schedule to follow.

1730 UTC on 15140
CHILE: R. Sistema Nacional. Spanish. Santiago bank ad promo for Nac'l de Chile. Station correspondent with phone-in report about Santiago.

1810 UTC on 17870
LIBERIA: V.O.A. International news with commentary on Haitian refugees boat people back on way home. News headlines and "Focus" program that featured Panama. (R. Pearson, St, Augustine, FL).

1958 UTC on 11675
KUWAIT: R. Kuwait. U.S. pop music from Lionel Ritchie. Kuwait ID and news of the Middle East. Rock music from David Bowie.

2010 UTC on 21685
BONAIRE: R. Netherlands. "Images" program featuring Garrison Keillor and excerpts from his "Prairie Home Companion" show.

2200 UTC on 9560
TURKEY: Voice of Turkey. Turkish Press Review and travel show on touring Ankara. (R. Pearson, St. Augustine, FL).

2235 UTC on 11750
GERMANY-GDR: R. Berlin International: Report on the GDR medical staffs that currently work in Nicaragua and Viet Nam. Music break from Kaleidoscope program.

2310 UTC on 6185
MEXICO: R. Educacion. Spanish. Continuos jazz instrumentals. QRM from BBC on same frequency. Signal covered at VOA 2327 sign-on. Logging submitted as tentative. (R. Pearson, St. Augustine, FL).

2340 UTC on 6000
BRAZIL: R. Guaiba. Portuguese. Very weak signal of upbeat Brazilian selections and mention of city Porto Alegre. (R. Pearson, St. Augustine, FL).

2340 UTC on 17765
MEXICO: R. Mexico Int'l. Spanish. Pop music vocals. News about Mexico with time check. Ballads as signal fades in and out. (R. Pearson, St. Augustine, FL).

2357 UTC on 5047
TOGO: R. Togo. French. "Easy-listening" instrumentals, chime I.S. with ID and news headlines. Closing ID and national anthem at 0002. ■

RADIO ROUNDUP: Communications

Bob Grove, WA4PYQ

P.O. Box 98
Brasstown, NC 28902

After several years of offering government and FCC frequency files, **Grove Enterprises has decided to discontinue their microfiche service.** Sales have slowed, no longer justifying continuation of the expensive process of fiche reproduction. Fiche readers will be discontinued as well.

Grove investigated the possibility of releasing printed frequency records, but the task would be staggering; the state of New York would require hundreds of pages to display its 75,000 listings. With a printer's 250 piece minimum per page, printing New York's licensees would cost Grove nearly $10,000--and then there are 49 more states!

Making the data base available on computer disk was also explored; IBM, Commodore 64 and Apple II would be the logical machines. The IBM would require 15-20 floppy disks for New York listings alone, and additional disks would have to be stocked for the other machines.

Although suggestions from readers as to how the frequency service can be continued are welcome, Grove intends to terminate the fiche program when the present 1987 stock is depleted.

If a proposed rule change by the FCC as outlined in Docket 87-215 passes, **users of BBS services could be assessed a fee.** The docket intends to modify a portion of the FCC Rules and Regulations entitled, "Interstate Access Charges Exemption for Enhanced Service Providers". Roughly translated this means that the FCC proposes a surcharge for telecommunications carriers like Telenet and Compuserve, charges which will necessary bump down to the end user.

Complying with the California Public Utilities Commission (CPUC) mandate that cellular users be warned of their vulnerability to interception (see MT, August, P.18), **Pacific Bell has begun enclosing notices with their cellular billing.**

Excerpts from last month's reluctantly-worded notice include: "If you make calls using a cellular telephone or receive calls from people who do, you need to be aware that your conversations on these phones may not be entirely private. Cellular telephones send calls over public radio frequencies (which) may be scanned by other parties."

Pacific Bell goes on to reassure its customers that the calls are "very hard to intercept" because of the random frequency assignments over hundreds of channels and the change which occurs as a vehicle changes locations. The notice concludes by advising its readers that the CPUC wanted the lack of privacy made known to its users and that scrambling devices are available. *(Notice sent in by Steve Martin, WA3SAD, Morgan Hill, CA and Albert Nichols, Clovis, CA)*

We hope that it isn't a beginning trend, but the city of **Newark, Ohio, has banned mobile scanners.** With certain exemptions such as law enforcement officers and licensed amateur radio operators, "No person shall install in any motor vehicle or business establishment...any radio receiving equipment...to receive...police..." The unabridged version is listed as ordinance 648.12. *(All Ohio Scanner Club newsletter, Sept/Oct 1987)*

More people are listening to shortwave than ever before according to a report by the Electronic Industries Association. At least that's the conclusion one could reach judging from their observation that there are some 450 million radios in the United States, increasing at a rate of 50 million each year. EIA estimates that roughly one-third of the American population can listen to shortwave.

Even the CIA has zoning problems. In spite of efforts to conceal the installation, a recent effort to erect a listening tower for foreign broadcasting in Reston, Virginia, was opposed by local officials. A similar proposal for Bull Run Mountain also hit a snag. If ever erected, the tower will be a link in a relay chain from a satellite terminal at Quantico, Virginia, to Langley Air Force Base, Virginia. *(From the W5YI Report)*

The "TV Genie" importer has been convicted. Joseph Andre Ali, owner of Orion Industries International of Las Vegas, Nevada, importer of the "TV Genie" wireless video transmitter, has been convicted by a federal jury in Las Vegas on all nine counts of importing and selling the outlawed device.

Readers may recall ads touting "TV Genie," a low-powered transmitter which could be connected to a VCR or video camera in order to broadcast the image to a nearby television receiver. The device was illegal because of its potential interference to licensed broadcasters using the same channels.

It was determined that Ali had sold 27,000 of the outlawed devices in spite of a previous notification that distribution and use of the device was against the law. While net profit of the sales was approximated at $900,000, the remaining inventory was seized and Ali faces fines in excess of $1 million and nine years in prison. *(From the W5YI Report)*

The General Mobile Radio Service, a block of 462/467 MHz paired UHF channels, is slated for a general rewrite by the Federal Communications Commission. Business users have sprouted up on the band, essentially monopolizing what was intended as a low-power, short-range personal radio service.

The FCC is considering allowing only individuals, not businesses, to apply for licenses in that service. They are also considering transient use of the service. The FCC is seeking comments regarding repeater use, trunking, some deregulation, and other aspects of GMRS protocol.

The eight channel pairs for GMRS are as follows:

Base	Mobile	Ch	Base	Mobile	Ch
462.550	467.550	A	462.650	467.650	E
462.575	467.575	B	462.675	467.675	F
462.600	467.600	C	462.700	467.700	G
462.625	467.625	D	462.725	467.725	H

It may be hard to believe, but **your high seas telephone call is handled by a Pittsburgh operator.** Three major AT&T installations (KMI, Point Reyes, CA; WOM, Ft. Lauderdale, FL; and WOO, Manahawkin, NJ) are the coastal radio stations which network the call to and from ships at sea. Want to talk to a cruise ship? Dial 1-800-SEA-CALL. *(Clipping sent in by Wayne Love, Spanish Lake, MO)*

Coastal operators are world travelers--via radio. If talking to cruise ships counts as a vicarious travel experience, then marine operators at Ft. Lauderdale's busy radio station WOM are really world class adventurers. WOM accounts for about 60% of the ship to shore traffic for AT&T with their 16 antennas.

A team of five technicians sits in front of a bank of consoles with 32 speakers, each connected to a different radio channel, averaging 17,000 calls per month. Calls from oil drilling rigs, private yachts, pleasure cruises, tankers, barges, and fishing boats occupy the operators 24 hours a day.

It was WOM who placed the marine telephone calls for the Woods Hole Oceanographic Institute research vessel when it discovered the watery grave of the Titanic in 1985. Other communications have been held with such notable marine dignitaries as Jacques Cousteau aboard his Calypso.

As if the telephone company didn't have enough problems with Indians chopping down their poles and making fish hooks and bracelets out of the wire, now **"Jaws" is eating the transatlantic cable!** Experts hypothesize that the sharks are sensitive to tiny electrical signals detected near the new fiber optics line recently laid near the Canary Islands. *(From Don deNeuf, WA2SPM)*

Extended frequency coverage ham rigs are a pain for the FCC. More and more amateur transceivers are readily adaptable to cover frequency ranges outside of their authorized ham band intent. HF (1.6-30 Mhz) single sideband rigs from Kenwood, Yaesu, ICOM, and other manufacturers can be quickly modified to cover the entire frequency range. Similarly, synthesized two-meter handheld FM radios can be surgically altered for continuous 140-160 MHz transmission (as well as intended legal reception).

Low cost ham rigs are regularly finding their way into illegal applications such as drug smuggling, international hobby radio, malicious interference with licensed communicators, and other nefarious enterprises. The Federal Communications Commission is considering a ban on such radios to thwart their widespread abuse..

So you want to listen to a scanner on board an aircraft? Better check with the flight crew first. Whether you are a ham hoping for record DX from 50,000 feet or an aircraft radio buff hot on the trail of your pilot, the Federal Aviaation Administration (FAA) has some rigorous rules banning the use of such radios in flight.

As presently written, FAA part 91.19 prohibits the use of any electronic device which purposely emits a radio signal (transmitters and radio controlled devices). When the seat belt light is off, however, non-transmitting devices like computers, recorders, FM radios, and TV sets are allowed provided they can be demonstrated not to cause interference to aircraft navigational systems.

The final determination is made by the pilot or ranking officer.

According to *MT* reader Henry Johnson, **Marconi is working at Radio Shack.** Henry ran into Joe Marconi at the Tandy outlet at the Chesterbrook Shopping Center in McLean, Virginia!

Forest fire battles are coordinated over satellite in the northwestern United States. Utilizing the INMARSAT earth satellite hovering 22,300 miles above the Hawaiian Islands, U.S. Forest Service firefighters command their lifesaving radio calls through the Bureau of Land Management's Boise, Idaho, Interagency Fire Control Center.

Voice and data are relayed by an earth station at Santa Paula, California, and distributed by microwave links through Oregon forest land.

The 244th Combat Squadron of the Oregon Air National Guard also lends their firefighting manpower and equipment during forest fire season. Four-wheel-drive trucks and microwave radio links are flown in by a U.S. Air Force C-130A to fire camps designated by the Oregon Unified Command Center, a joint state/federal cooperative headquartered in Salem. *(From Steven Sunderland, Roseburg, OR)*

ODXE DE VE3SRE: The Ontario DX Association has just received a license for their own ham radio station, VE3SRE. The application was sponsored by Stephen Canney, VE3FQ, an avid listener and *MT* subscriber. The station will be on the air during the ODXA convention at Longford Mills, October 3 and 4.

Steve will be operating his own Collins KWM-2A transceiver using the club call October 3rd from 1700-1900 UTC on 14.100-14.150 MHz, and October 4th from 1400-1600 on 7.150-7.200 MHz.

Reception reports may be sent to VE3SRE, The Ontario DX Association, PO Box 161, Station A, Willowdale, ONT, Canada, M2N 5S8.

A consortium of plaintiffs in Washington has filed suit against the U.S. Government charging that the public has not been protected against the hazard of "HERO"--hazard of electromagnetic radiation to ordnance, whereby **stray radio signals may accidentally explode conventional and nuclear weapons.**

Plaintiffs contend that such a hazard could be manipulated by terrorists, and that routine emissions from two-way radios, broadcast transmitters, high tension power lines, power generating plants, and even natural sources of static discharge and lightning can cause accidental launch, misfiring or detonation of weapons.

Pentagon officials replied that adequate protection is provided for transportation and storage of such ordnance, but the civilians disagree, saying that the methods do not take into account variables such as weather and manufacturing defects.

The civilian group has some history to go on--some 25 incidents in which HERO is suspected. These include the accidental ejection of a missile warhead across the deck of the *USS Forrestal* in 1967 which killed hundreds of personnel, the explosion of a Pershing II missile in 1985, the loss of an Atlas Centaur rocket last March 26, and the accidental launching of three NASA rockets as recently as June 10.

The government has until early November to answer the lawsuit.

If all goes according to plan, there will be a **National Science Center for Communications and Electronics** developed in Augusta, Georgia, to enhance communications management between the public and private sectors as well as raise the technical literacy and awareness of school-age children in the United States.

These lofty and ambitious goals are very real to Senator Sam Nunn (D-GA), Chairman of the Senate Armed Services Committee and a member of the Board of Directors of the National Science Center Foundation, Inc.

The facility's intended location is near the Army Signal Corps at Fort Gordon on a 90 acre tract donated by Georgia Vitrified Brick and Clay Company; Richmond County has pledged to provide $1 million worth of sewer and water lines and the city of Augusta has made an additional pledge for financial support.

Once implemented, the center will serve as a model for similar programs throughout the country, developing and distributing high quality science and technical curriculum materials for all grade levels and vocational schools.. A Fort Gordon Task Force is helping the concepts become advanced videodisk and computer courseware. ■

Appalachian Scanning

Eastern North Carolina

Frequency	Agency
154.2200	Alamance Co Fire
154.4300	Alleghany Fire
154.8150	Alleghany Sheriff
158.8500	Applachian State U
154.8450	Ashe Sheriff
155.0700	Avery Sheriff
452.4500	Blue Bird Cab Co Winston-Salem
154.0850	Boone Fire
155.6550	Boone Police
158.7300	Burlington Police
155.5650	Caldwell Sheriff
460.5250	Charlotte Fire # 1
460.6250	Charlotte Fire # 2
460.5500	Charlotte Fire # 3
460.6000	Charlotte Fire # 4
460.5750	Charlotte Fire # 5
951.0125	Charlotte Police
453.8000	Charlotte Police # 1
460.5000	Charlotte Police # 2
453.3000	Charlotte Police # 3
453.7000	Charlotte Police # 4
453.9000	Charlotte Police # 5
453.9500	Charlotte Police # 6
148.1500	CAP NC Wing
155.2350	Davidson Co EMS Subtone 88.5
154.1600	Davidson Co Fire
460.0750	Davidson Co Sheriff
155.2650	Davie Co EMS Subtone 85.4
154.3700	Davie Co Fire
159.1500	Davie Co Sheriff
453.5500	Davie Co Sheriff
453.7000	Davie Co Sheriff
854.9875	Douglas Municipal Apt RPT 809.9875
047.8400	Duke Power Company
047.9800	Duke Power Company
156.2100	Elkin Police
453.4500	Forsyth Co Animal Control
154.995	Forsyth Co EMS Ch4 RPTS 153.965 SBT82.5
155.2800	Forsyth Co EMS #5 State Res.Subtone 82.5
154.2050	Forsyth Co Fire #1
154.2350	Forsyth Co Fire #2
154.4300	Forsyth Co Fire #3
155.1600	Forsyth Co Schls Ch1
153.8750	Forsyth Co Schls Ch2 Maintenance
154.9650	Forsyth Co Schls #3 Transportation
460.0250	Forsyth Co Sheriff #1
460.2250	Forsyth Co Sheriff #2
460.3750	Forsyth Co Sheriff #3 Mutual Aid
155.3400	Forsyth Co EMS # 7 Subtone 82.5
155.2200	Forsyth Rescue Sqd #6
154.4450	Greensboro Fire # 1
154.1450	Greensboro Fire # 2
154.2800	Greensboro Fire # 3 Mutual Aid
460.1000	Greensboro Police # 1
460.2750	Greensboro Police # 2
460.3250	Greensboro Police # 3
460.3750	Greensboro Police # 4
460.2000	Greensboro Police # 5
460.0500	Greensboro Police # 6
155.1150	Guilford Co EMS
155.2200	Guilford Co EMS Subtone 127.3
154.2800	Guilford Co Fire
046.5000	Guilford Co Fire # 1
046.2400	Guilford Co Fire # 2
460.1500	Guilford Co Sheriff
460.3750	Guilford Co Sheriff
460.4750	Guilford Co Sheriff
154.2800	High Point Fire
154.3550	High Point Fire # 1
154.1900	High Point Fire # 2
460.1250	High Point Police # 1
460.3500	High Point Police # 2
460.3750	High Point Police # 3
155.1600	Iredell Co EMS Subtone 151.4
154.3850	Iredell Co Fire # 1
153.8900	Iredell Co Fire # 2
453.6500	Iredell Sheriff
154.0100	Kernersville Fire
460.1750	Kernersville Police
155.9550	Kernersville Pub. Wks.
460.4250	Lexington Police
462.9500	Mecklenburg Co EMS Med 9 Dispatch
153.8150	Mecklenburg Co Fire
154.2800	Mecklenburg Co Fire
156.165	Mecklenburg Co Fire
453.8500	Mecklenburg Co Police
453.7500	Mecklenburg Sheriff
154.8000	Mount Airy Police
156.1500	Mount Airy Police
155.2950	Mount Airy Rescue Squad
155.7900	N. Wilkesboro Police
042.5600	NC Dept Corrections
047.1400	NC Dept Transportation
047.2600	NC Dept Transportation
047.3200	NC Dept Transportation
047.3800	NC Dept Transportation
151.1750	NC Forestry
151.3550	NC Forestry
159.3900	NC Forestry
159.4200	NC Forestry
031.3400	NC Forestry # 1
031.4200	NC Forestry # 2
031.4600	NC Forestry # 3
031.5400	NC Forestry # 4
072.0150	NC Highway Patrol FM Relay
072.5000	NC Highway Patrol FM Relay
074.5000	NC Highway Patrol FM Relay
075.7000	NC Highway Patrol FM Relay
042.6200	NC Highway Patrol # 1 W/42.7800
042.5200	NC Highway Patrol # 3 W/042.8000
042.6000	NC Highway Patrol # 5 W/042.6600
042.6400	NC Highway Patrol # 7 W/042.7600
042.5000	NC Highway Patrol # 9 W042.7000
042.7200	NC SBI
151.1750	NC Wildlife
151.3700	NC Wildlife
151.3850	NC Wildlife
159.3150	NC Wildlife
159.3450	NC Wildlife
159.4200	NC Wildlife
162.4750	NOAA Weather Charlotte
162.4000	NOAA Weather Winston-Salem
154.8750	Northwest Regional Mutual Aid
047.8800	Piedmont Natural Gas
156.1500	Pilot Mountain Police
155.7150	Rowan Co EMS Subtone 146.2
154.2500	Rowan Co Fire
453.0500	Rowan Sheriff
154.8600	Salem College
453.7750	Salisbury Police
154.8150	Sparta Police
155.2350	Stokes Co EMS Subtone 192.8
154.2650	Stokes Co Fire
453.5500	Stokes Sheriff
453.7000	Stokes Sheriff
155.2650	Surry Co EMS Subtone 141.3
158.7450	Surry Co Fire
155.0700	Surry Sheriff
460.5000	Thomasville Police
155.6550	Wautauga Sheriff
155.4000	Wilkes Co EMS Subtone 151.4
154.4000	Wilkes Co Fire
155.6100	Wilkes Sheriff
460.2500	WS ABC
460.6250	WS Fire # 1
460.6000	WS Fire # 2
154.4300	WS Fire # 3
460.3000	WS Police # 1
460.4500	WS Police # 2
460.4000	WS Police # 3
460.2000	WS Police # 4
460.3750	WS Police # 5
158.7600	WS Public Works
453.9750	WS Public Works
452.7500	WS Transit Authority Bus System
155.3850	Yadkin Co EMS Subtone 107.2
462.9500	Yadkin Co EMS Med 9 Dispatch
154.0400	Yadkin Co Fire
154.7400	Yadkin Sheriff
464.8500	Air-Care NC Baptist Air Ambulance

More Charlotte Area Radio Services

contributed by Dave Wentzel

155.19	Inter-City Mutual Aid, State Coordinator,KRZ223
453.725	Gaston Co PD
33.46	Gaston Co Fire
462.950	MED 1 (ambulance serv)
463.000	MED 2
463.050	MED 3
463.075	MED 4
463.100	MED 5
463.125	MED 6
463.150	MED 7
463.175	MED 8
155.280	Rescue statewide KCE604
155.340	Amb-Hosp Patch
42.82	NC Hwy Patrol car-car
42.56	State Prison Dept
42.84	State ABC Agents
42.12	SC Hwy Patrol-base
42.32	SC HP - mobile
42.14	SC HP - base
42.08	SC HP - base
42.26	SC HP - mobile
42.10	SC HP - base
155.07	State Law Enforcement (SLED)
155.64	SLED
155.445	SLED
155.475	SLED
166.25	WBT-TV Live Eye KAY565
461.30	WSOC-TV Live Eye KIW330
463.525	WSOC-TV alt. freq.
450.15	WBT/WBCY news/tfc KLV241
450.45	WSOC news/tfc
161.67	WROQ
450.312	WPCQ-TV
450.75	multi-station airborne tfc rpts
47.80	Charlotte Water Dept-cust svc
48.16	Charlotte Sewer Div
48.42	Charlotte Water maintnc
158.835	Park rangers
45.68	Char Tfc Dept
46.54	Meck Bldg Standards
45.28	Animal Ctrl, PS&I
37.94	Street Maint & Eng
45.16	Sanitation & Transport
158.805	Char Meck Schools (security) KCI954
158.955	Char.Meck.Schools, alt.
851.0125	Housing Authority
452.725	Charl.Transit #1
452.875	Charl.Transit #2
47.88	Piedmont Nat'l Gas
162.4	NOAA wx Greensboro/ Ashville
162.55	NOAA wx Greenville, SC
160.215-161.565	Railroad freqs
160.950	Norfolk Southern RR
161.1	Norfolk Southern RR
160.470	Norfolk Southern RR
161.475	Norfolk Southern RR
161.565	Norfolk Southern RR
161.490	Norfolk Southern RR
161.205	RR Police

Charlotte Douglas/Int'l Airport

118.1	Douglas Airport Tower
119.0	Approach/Departure
120.5	App/Dep
121.15	ATIS
121.35	App/Dep
121.4	Ground Control
121.5	Emergency (Nat'l)
121.9	Main Ground Control
122.0	Flight Watch Stn (Raleigh)
122.695	Monroe Airport
122.95	UNICOM
123.025	Helicopters
124.0	Departure
125.35	App/Dep
126.15	App/Dep
126.4	App/Dep (twr alt)
127.7	App/Dep
128.8	Atlanta FLT Center
133.55	Atlanta FLT Center
134.55	Atlanta FLT Center
125.15	Atlanta FLT Center
133.15	Atlanta FLT Center
127.85	Atlanta FLT Center
133.45	Atlanta FLT Center
119.4	Greer Approach
126.6	Greensboro Approach
129.55	Delta Airlines
130.95	Eastern Airlines
129.2	American Airlines
129.5	United Airlines
129.75	Piedmont Airlines

Amateur Radio 2 Meter Rptrs

146.340, 146.940	WR4AEU
147.990, 147.390	WR4AWQ
146.460, 147.060	WR4ALO
147.780, 147.180	WR4ABK
147.300, 147.900	WR4AJX
449.850, 444.850	WR4ALO

Mobile Telephone
35.25-35.7
43.26-43.7 mobile
152.00-152.2
152.51-152.81
158.49-158.67 mobile
454.00-455.0
459.00-460.0 mobile
860-865.0 cellular

800 MHz in Roanoke

Roanoke County, Virginia, has recently "up"graded their communications system--up to the 800 MHz band. Planned for active service by October, the integrated, four-channel system will be shared by police, fire and rescue agencies. According to our reporter, the system, built by Motorola, can use DVP for voice privacy if necessary.

CHANNELIZATION PLAN:

855.9875 (ch.1, Windy Gap Mt.)
855.7375 (ch.2, Tinker Mt.)
855.4875 (ch.3, Ft. Lewis Mt.)
855.2375 (ch.4, Poor Mt.)

Only one cellular telephone system is presently in operation in the Roanoke area. The cell is atop the First National Exchange Bank building in downtown Roanoke; additional cells are planned later.

A block of 45 channels, all spaced at 120 kilohertz intervals, comprises the system. For those unfamiliar with cellular telephone allocations, the frequency assignments for Roanoke are shown blow. Listeners are reminded of the prohibition by ECPA '86 against monitoring mobile telephone calls.

Freq	Ch #		
870.1200	01	874.7400	23
870.3300	02	874.9500	24
870.5400	03	875.1600	25
870.7500	04	875.3700	26
870.9600	05	875.5800	27
871.1700	06	875.7900	28
871.3800	07	876.0000	29
871.5900	08	876.2100	30
871.8000	09	876.4200	31
872.0100	10	876.6300	32
872.2200	11	876.8400	33
872.4300	12	877.0500	34
872.6400	13	877.2600	35
872.8500	14	877.4700	36
873.0600	15	877.6800	37
873.2700	16	877.8900	38
873.4800	17	878.1000	39
873.6900	18	878.3100	40
873.9000	19	878.5200	41
874.1100	20	878.7300	42
874.3200	21	878.9400	43
874.5300	22	879.1500	44
		879.3600	45

MED Flights in Knoxville, Tennessee

contributed by Jason Jarnagin

453.500	"Life Star"
463.450	"Med Flight"

New Tennessee Highway Patrol Frequencies

When a state police agency undergoes a massive frequency change it always throws scanner listeners for a loop! This month Curtis Harbin of Johnson City, Tennessee, straightens out the latest frequency switch for the Tennessee Highway Patrol.

Base	42.42 (unchanged)
Relay	451.550 (new)
Relay	451.600 (new)
Repeater	158.730 (new)

(Note: Previous 155.505 and 159.090 repeaters have been deleted).

Frequency	Agency
154.725	Johnson City PD
155.250	Washington Co. Sheriff
155.640	Sullivan Co. Sheriff
155.415	Carter Co. Sheriff
155.130	Unicoi Co. Sheriff
154.785	Greene Co. Sheriff
155.205	EMS Dispatch
155.340	Ambulance to Hospital
155.280	Hospital to Hospital

Services on above frequencies:
Med Com - Johnson City
Central Dispatch - Kingsport
J.C. Rescue
J.C. Ambulance Auth.
Kingsport Amb/Rescue
Sullivan Co. Rescue
Sullivan Co. EMS
Jonesboro Rescue
Hazardous Materials Teams
Greenville R.S./Amb Auth.
Erwin R. S.
Carter Co. R. S.
Plus, the EMS frequencies cover all of east TN statewide. ■

TENNESSEE HIGHWAY PATROL

RADIO SIGNALS AND CODES

A. Signal.
1 Call your post
2 Call Headquarters
3 Change to Channel ___ traffic from _____
4 Report to Headquarters
5 Report to your post
6 Call—telephone
7 Emergency
8 Meet
9 Disregard
10 Rush

B. 10 Codes.
10-1 Receiving poorly
10-2 Receiving well
10-3 Stop transmitting
10-4 Acknowledgement
10-5 Relay
10-6 Busy
10-7 Out of service
10-8 In service
10-9 Repeat
10-10 Out of service—subject to call
10-11 Dispatching too rapidly
10-12 Officials or visitors present
10-13 Advise weather conditions
10-14 Convoy or escort
10-15 Prisoner in custody
10-16 Transporting subject
10-17 Advise road conditions
10-18 Complete present assignment as quickly as possible
10-19 Advise traffic conditions
10-20 Location
10-21
10-22 Eat(ing)
10-23 Nature call
10-24
10-25 Do you have contact with _____?
10-26 Request permission to leave assignment to _____
10-27 Check driver license record
10-28 Check vehicle registration
10-29 Check for stolen or wanted
10-30 Does not conform to rules and regulations
10-31 Hit on 10-29, is it safe to copy information?
10-32 Breathalizer
10-33 Emergency traffic clear radio net
10-34 Officer in trouble, location ___
10-35 Confidential information
10-36 Correct time
10-37 Operator on duty
10-38 Request back-up (not 10-34)
10-39 Request TBI Agent
10-40 No units available
10-41 Civil defense test
10-42 Back-up (sheriff or P.D.)
10-43 Want Officer—(investigation
10-44 Stolen vehicle
10-45 Auto wreck-property damage
10-46 Auto wreck-injury
10-47 Ambulance
10-48 Wrecker
10-49 Driving under the influence (DUI)
10-50 No traffic here
10-51 Driving without license
10-52 Armed robbery
10-53 Hit and Run
10-54
10-55 Kidnapping
10-56 Rape
10-57
10-58 Drunk
10-59 Lunacy
10-60 Missing person
10-61 Suspicious person
10-62
10-63
10-64 Radio Net clear
10-65
10-66 Bomb threat
10-67 Hostage situation
10-68 Barricaded subject
10-69 Weapon involved
10-70 Dead on Arrival (D.O.A.)
10-71 Demonstration
10-72 Riot
10-73 Roadblock
10-74 Blood run
10-75 Plane crash
10-76 Do you have traffic for ___?
10-77 Radio repairs at _____
10-78 Car repairs/service at _____
10-79 Car wash at _____
10-80 Stationary observation at ___
10-81 Stopping violator
10-82 Stopping suspicious vehicle
10-83 Assist(ing) motorist
10-84 Assist(ing) citizen
10-85 Serve(ing) warrant or F.R.
10-86 Abandoned vehicle
10-87 Improperly parked vehicle
10-88 Obstructing roadway
10-89 Disabled vehicle
10-90 Fire apparatus
10-91 Rescue unit
10-92 Helicopter
10-93 Tactical Unit
10-94 Underwater Recovery Team
10-95 K-9 Unit
10-96 Request radio test count on Channel _____
10-97 Arrived at scene
10-98 Finished with last assignment
10-99

TDS—PAM. 5-7
Rev. 7/80

Jean Baker, KIN9DD

213 W. Troy Ave. 4C
Indianapolis, IN 46228

Not everyone who is interested in monitoring the aero bands is willing or able to invest in specialized equipment. Where there's a will, however, there is often a way. John Demmitt is a prisoner in the state of Pennsylvania. He's not allowed to have anything more than a simple AM/FM radio. But does that stop him from hearing plane talk? No.

Aero on Your FM Radio

There is an exciting world of aero communications that you can tune on your average, everyday FM radio. "That's right," says John, "the standard FM broadcast band is home to transmissions between aircraft and control towers, center, and other air-ground communications." All of this, he continues, can be heard without converting your FM receiver or buying an expensive scanner.

In a superheterodyne receiver, a frequency generated from within the set mixes with the incoming signal to produce. In an FM set, this frequency is usually 10.7 MHz. It's a standard frequency for the oscillator. This system allows for harmonics and images which produce unwanted radio signals *unless* a listener wants to hear these signals -- in which case a whole new world of DX is available.

The standard FM broadcast band covers the spectrum from 88 through 108 MHz. Above 108.000 MHz, aircraft communications can be heard (Voice communications are concentrated between 118.000 and 135.975 MHz. 108.000 through 118.000 is allocated to primarily non-voice navigational aids).

Listening Beyond 108 MHz

Since most radio receivers go slightly beyond the normal bandwidths to allow for dial slippage, it is easy to pick up some of the aircraft band transmissions by tuning above 108 MHz. Often, a set will go as high as 110.00 MHz. In addition to this, harmonics and images will produce additional frequencies which can be found all the way to the center of the standard FM dial!

If you have a portable receiver and would like to experiment, pull out the telescopic antenna and then push down the top element. Slowly scan the area above 108.00 MHz. You may want to experiment by moving the receiver to different locations -- especially those close to a window. When you hear a signal, try lengthening or shortening the telescoping whip antenna until the signal is strongest.

Does It Work?

The answer is yes. Search the band, paying special attention to the area from 101.000 MHz and up. Best reception on the set I used was at 107.900 where I picked up a Delta Airlines Enroute Radio transmission, not just once or twice but almost daily.

So if you don't have an aero band VHF receiver or just want to try your hand at aero monitoring, try out John Demmitt's idea. Let me know how you make out.

Off the Record

If you would like to monitor some very "off the record" and quite candid conversations between pilots (including commercial airline pilots), listen up on 123.450 MHz. This is an air-to-air, chit-chat frequency used by pilots from coast to coast. Although it's not officially sanctioned by the FAA for that purpose, neither do they prohibit pilots from using it for informal, brief conversations -- as long as it's not abused. You can, however, find your ears blistered by some of the conversations you'll hear!

No Aero on HF?

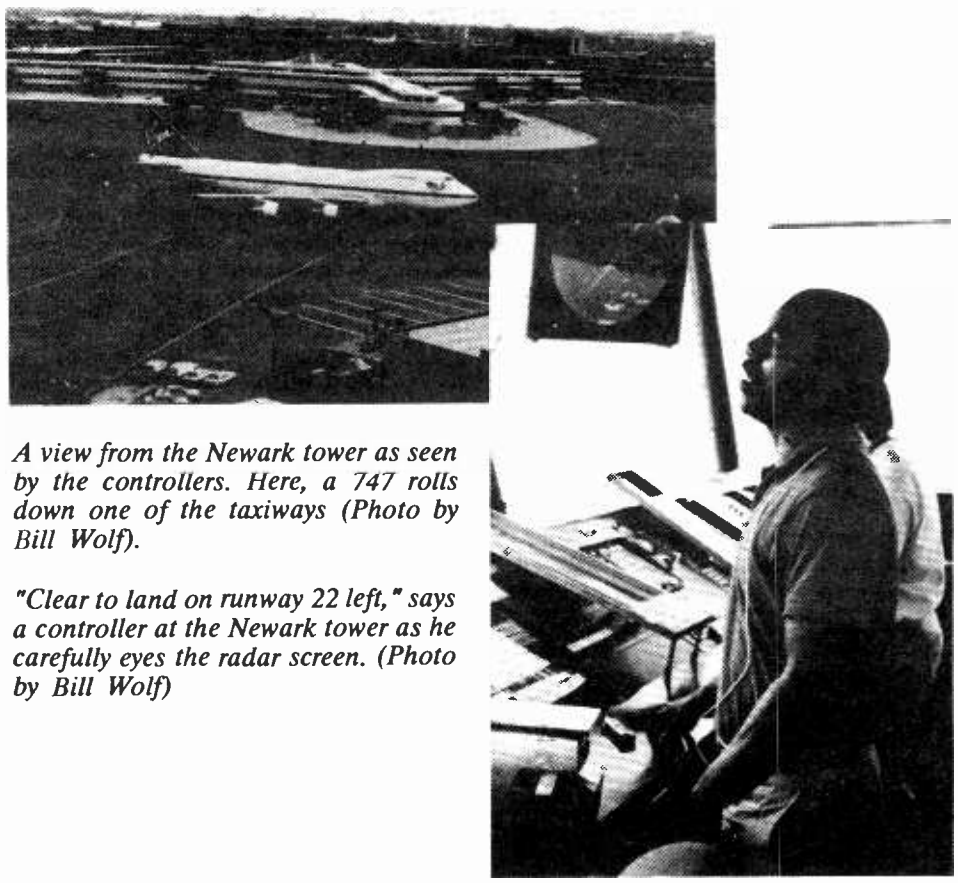
Dean W. in Minnesota asks why he never hears HF transmissions from aircraft flying over the continental United States. The reason is that commercial aircraft are prohibited from using that portion of the radio spectrum by government regulation, except in case of VHF equipment failure.

New Pacific ARINC Freqs

In July of last year, ARINC (Aeronautical Radio, Inc.) implemented several new frequencies for use in the Pacific area. These new frequencies are on the HF bands and cover the Pacific region.

Freq (kHz)	Area Served
4666	Central West Pacific
6655	North Pacific
6673	Central East Pacific
8951	North Pacific
10057	Central East Pacific
11330	North Pacific

Frequencies are courtesy of Richard Covell, Air/Ground Operations Manager, Aeronautical Radio, Inc. (ARINC) Annapolis, Maryland.



A view from the Newark tower as seen by the controllers. Here, a 747 rolls down one of the taxiways (Photo by Bill Wolf).

"Clear to land on runway 22 left," says a controller at the Newark tower as he carefully eyes the radar screen. (Photo by Bill Wolf)

Antennas for Airplanes?

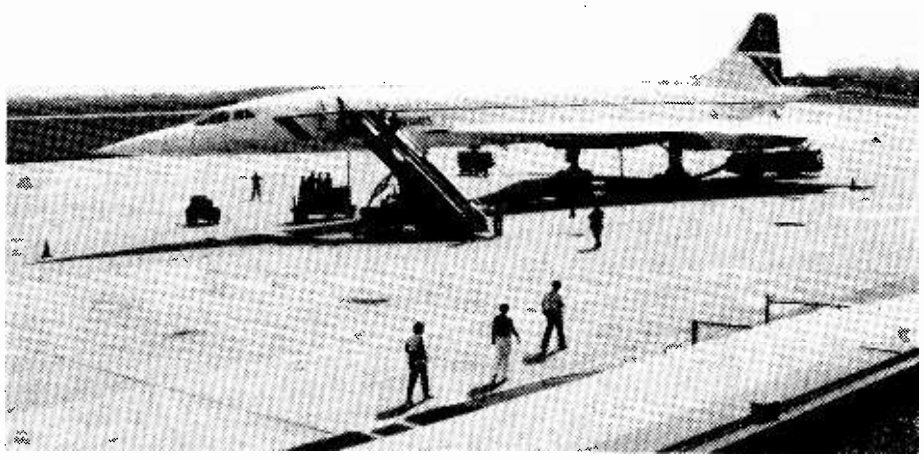
Bill Wolf, KA2EEV asked an interesting question. He asked what kind of HF antenna system commercial airliners use. Another reader, Bert Huneault, supplied the answer.

"High frequency antennas," says Bert, "come in different forms and dimensions, depending on the type of aircraft. On relatively small vehicles, such as bush planes which fly in remote areas out of range of VHF and which therefore require HF radio, a trailing antenna is sometimes used.

"The pilot releases a longwire antenna in flight and it unwinds in the slipstream trailing the aircraft. Before landing, the pilot winches it back into the aircraft.

Note the "probe" HF antenna on the tail of this Boeing 707. Those baffles on the engines are to muffle the noise while ground-running, and also to direct the exhaust fumes upwards.

Bill Wolf, KA2EEV, Newark, New Jersey, at his monitoring post



What a beautiful bird is the Concorde! (courtesy Bert Huneault)

"On some of the larger planes, the metal body of the aircraft is used as the radiating surface (antenna). A loading coil matches the dimension of the metal surface to the transmitter frequency.

"On others, like the Boeing 707, an HF probe antenna is used (on top of the vertical tail fin). On the Boeing 737 and Fokker F28, the antenna used is an old-fashioned end-fed HF wire strung between a short mast on top of the fuselage and the tail of the aircraft."

There are, of course, other configurations, but these are representative of most.

Rainbow Radio -- Not a Pirate

Bert and I have heard *Rainbow Radio* working Canadian airlines on their way to and from destinations mostly in the Caribbean. The frequencies are 8.819 and 13.285 MHz (day) and 3.458 and 5.604 MHz (night).

Rainbow Radio, it turns out, is a division of Polestar Communications, Ltd., which is, in turn, a division of Sea Link, Ltd. (Or vice versa.) The company provides LDOC (Long Distance Operational Control) by way of phone patches between the airline's operations offices and their flights. Many times, this consists of "off reports" and other miscellaneous services, including some of the same ones that ARINC and Eastern Flight Support do. However, Polestar also handles traffic (messages) for ships at sea as well as aircraft so don't be surprised if you hear ships and drilling platforms as part of the daily transmissions on Rainbow Radio's frequencies.

Bill Wolf visited the Air Traffic Control Tower at Newark International Airport and was allowed to take pictures of the controllers on the job. He reports that they were very cordial and really seemed pleased that he was so interested in their duties.

Newark ATC Frequencies

Here are the frequencies utilized by the Newark ATC tower:

Tower (also called "Local Control"): 118.3, Ground Control: 121.8 and Departures: 119.2 and 135.35,

Approach is on 120.15, 125.5 and 128.55; however, all approach and departure traffic for Newark, Kennedy, LaGuardia, Long Island MacArthur, and other airports in the area are handled by what is called the "Common IFR Room." IFR refers to Instrument Flight Rules.

Because of the volume of traffic in the area, one common air traffic facility is used to handle the approach and departures rather than each airport controlling it on an individual basis.

Other frequencies include Clearance Delivery on 118.85, Gate Hold (used when departures are delayed) on 126.15, ATIS on 132.45 and Airport Security and Emergency on 453.650 (UHF).

Coming up, we'll have more reader contributions and some great listening tips for the air shows -- including some pictures of the Indianapolis International show. Until then, 73s and out! ■

Bob Kay

104 Bonsal Avenue
Glenolden, PA 19036

Monitoring Ma Bell

Cordless Telephones: *Tantalizing Targets for Nosey Neighbors!*

By now, every serious scanner owner knows that the Electronic Communications Privacy Act of 1986 (ECPA) has made it illegal to monitor cellular phones. What is difficult to understand is why cordless phones, used in the privacy of millions of homes, are not protected. The truth is that the ECPA created no great loss for eavesdroppers. In fact, cordless conversations can be *far* more entertaining than cellular.

Manufacturers of these units now proudly advertise that they sound clean and have great signal strength. What the manufacturers don't tell the public is that the frequencies on which they operate can be monitored with practically any scanner. People who use cordless phones seem to have a limitless incapacity to understand that the cordless phone is nothing more than a walkie talkie that flings the conversations of both parties into the atmosphere as easily accessible radio signals.

The phone company is aware of this phenomenon and tells its customers in a 2-1/2 by 3 inch notice buried deep in the phone book: "Cordless Telephones: These telephones operate on radio waves and the following situations may be encountered -- Interference from CB and Ham Radio, loss of privacy, and unauthorized use of your telephone service."

Tom Peacock, security supervisor for a major manufacturing company located in the northeast, laughs when presented with the problem. "Hell, we got corporate bosses buying them as gifts for the competition!"

The Trojan Horse

Larry Miller relates a story of a communications enthusiast neighbor who, upon discovering his position as editor of *Monitoring Times*, repeatedly insisted on buying him a cordless phone. "I was genuinely impressed with -- though a bit curious about -- his generosity," says Miller, "Then a mutual friend told me that the reason why he wanted to give me the phone was so that he could listen to me as I collected radio information for *MT*. I graciously declined his offer," says Miller.

Cordless phone bases manufactured prior to 1984 utilize a variety of frequencies between 1610-1800 kHz (just above the standard AM broadcast band); the handsets operate on 49.83, 49.845, 49.86, 49.875, and 49.89 MHz. If a cordless is found on 49 MHz and only one side of the conversation is heard, try tuning the base on a shortwave receiver. The signal will be in FM, but the radio can be tuned to slope detect the signal on AM. Reception won't be quite as good, but the conversation will be understandable.

It is no longer lawful to manufacture cordless phones using the low frequency bandplan, and their use is gradually dying out as the old equipment fails or is replaced.

The newer cordless phones operate in pairs in the 46 and 49 MHz bands, specifically:

46.61/49.67,	46.63/49.845,
46.67/49.86,	46.71/49.77,
46.73/49.875,	46.77/49.83,
46.83/49.89,	46.87/49.93,
46.93/49.99	46.97/49.97.

To confirm the facts reported in this article, the author used a Bearcat XLT, a Grove Scanner Beam with rotor and RG-6 cable. No preamp was necessary; however, should one be needed, the Grove Power Ant III would be a good choice. A handheld receiver like the Regency HX1500 or Bearcat BC-100XL will pull in nearby cordless signals as well. Replacing the rubber duckie antenna with an adjustable whip like the Grove ANT-8 will greatly increase the signal capturing ability of any handheld.

Since cordless phones operate in the low band, "skip" is possible. The very low power will, of course, limit the distance the signal will travel. But the serious listener should experience little difficulty in monitoring most, if not all, of his community.

In fact, reception of cordless phones up to five miles away is not uncommon. At first this might not seem impressive, but after considering that there are 640 acres in one square mile, it becomes apparent that the number of cordless phones in a metropolitan area could easily reach the thousands.

A Voyeur's Delight

If you monitor cordless phones, you'll probably recognize some of the voices as those of your neighbors. After a while, voices become associated with frequencies.

Once a cordless frequency is discovered, it can be programmed into a scanner's memory. Every time the phone is lifted, the dial tone and musical tones of the numbers being dialed will be heard. As soon as the other party answers, the scanner becomes a legal phone tap.

The cordless phone is actually an FM walkie talkie that sends both conversations over the air.

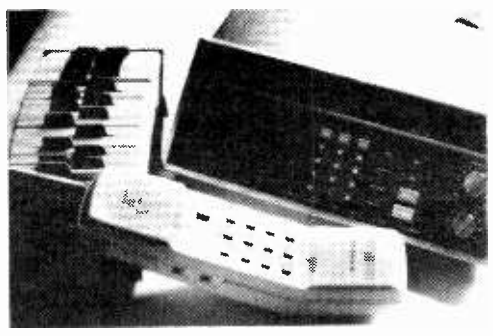
Detective or Deviate-- anyone can tune in

Using a Rolodex, lists of interesting remarks and their corresponding frequencies may be logged. The Rolodex is kept next to the scanner and updated in subsequent conversations. Within a short period of time, the eavesdropper will compile a dossier of some of the most sensitive, personal and intriguing information in the community.

Not all of this goes down very well with everyone. One person who briefly monitored cordless phones stopped the practice after only a few days. "Everybody has a few skeletons rattling around in their closets. And people are willing to accept that in their friends and neighbors so long as they don't ever have to be confronted with those skeletons face to face. But see how your relationship with these people changes after you hear one of them on the cordless trying to arrange a rendezvous with a 13 year old boy. Or telling another neighbor that you're the biggest horse's behind in the world. "There are some things," continues the ex-cordless monitor, "I really don't want to know about my friends and neighbors."

Finding Out Who You Are

If the address of the cordless user cannot be determined from monitoring the call, a handheld scanner and a walk around the block usually can. Within minutes, the location of the user can be determined by signal strength.



Playing at intrigue: a scanner, a Rolodex, and thou on the cordless phone!

The summer season with its backyard barbecues is rife with cordless telephone activity.

For signals that are further away, a car may be the answer. When an interesting conversation is heard, the spy pulls over and listens. Good spots include apartment complexes, public housing, office buildings, and, of course, the streets of your neighborhood.

Most local and state police officers view the scanner as a unit that monitors police frequencies. The cordless consort, using a mobile rig, may find himself in the difficult position of having to defend himself before friends and neighbors as well as the local authorities -- and perhaps even a court-appointed psychiatrist!

If you overhear a cordless conversation, keep what you heard to yourself. Most people take an extremely dim view of a stranger's ability to intrude into some of the most private aspects of their lives. ■

Dave Jones

430 Garnor Drive
Suffield, OH 44260

Monitoring the United States Air Force

The United States Air Force (USAF) operates and maintains one of the largest radio networks (HF) and radio systems (local VHF/UHF base nets) in the world. Virtually anyone can tune in these military communications on the HF and UHF aircraft bands.

The UHF military AC band (2250-400 MHz) offers military aircraft of all types from all U.S. military services which can be heard for a distance of hundreds of miles, depending on altitude. Satellites found in the UHF aircraft band mainly operate in digital transmission modes; however, voice traffic is still present on select frequencies (See *Monitoring Times*, July, 1987). In short, the United States Air Force offers a wide range of unique monitoring possibilities unavailable from any other RF user.

What you'll find and where

The VHF low (32-50 MHz) and high bands (138-174 MHz) and UHF land mobile band (406-420 MHz) are typically used by USAF bases and sites, aircraft (AC) operations, Air National Guard (ANG) and USAF Reserves. ANG radio traffic is one of the most prevalent heard on VHF-LB. Listings of ANG operations may be obtained from frequency directories, club bulletins and detective work with the Government microfiche set.

When searching and sifting through the microfiche, key on frequencies listed to locations such as the local airport or other sites that are not designated bases. It's an excellent chance that the newfound frequency belongs to the ANG or USAF reserves.

I am aware of no confirmed frequencies utilized on a nationwide basis. Most frequency directories list 40.17 and 40.19 as Special Investigations. My own monitoring at several continental U.S. (CONUS) bases has yet to provide even a hit on either of the frequencies. Reader input is desired as to the actual use of these frequencies.

Still, the greatest listening is by monitors lucky enough to be close to a base. United States Air Force bases are truly miniature (in some instances not-so-miniature) cities with their own safety forces and maintenance services. Aircraft refueling to building maintenance to commanders nets to security police can be found on VHF-HB.

These day-to-day operations provide the most invaluable insights into the operations of a base. Table I lists several frequency groups on VHF-HB (high band) which have common usages at various bases and sites nationwide. Actual utilization may vary from base to base.

Several nationwide assignments do exist on VHF-HB, namely those of CAP, MARS and OSI (Office of Special Investigations) operations (see Table II).

The UHF land mobile band offers much the same as the VHF-HB except the UHF operations are generally lower power. A nationwide assignment of 413.450 is for Strategic Air Command Paging Alerts, used when "Flush the bombers" is heard, paging base commanders, etc. The UHF frequency groups are as follows:

407.375-407.500
408.000-408.175
413.000-413.450

Command Post Nets

The Commanders Net (CN) is a radio network that allows base commanders to be kept informed of current base operations and immediate notification of emergencies. The CN will have hand-helds and mobiles in use, with phone patching capabilities through base communications center. The base CN should always be monitored to follow the operations of the base.

The base CP (Command Post) frequency should also be always monitored. It is usually found in the UHF-AC band; although some CPs operate in the VHF-HB. Other frequencies of obvious interest would be those of the security and security police and fire and crash.

Standard law enforcement operations are performed by the security police. SAC bases also have SAC security units which provide flight line security and perimeter security, which usually utilize Alpha and Whiskey tactical calls. Security police will identify as the base name with a unit number, or as Control followed by a unit number. Motorola MX-300R's hand-helds are popular units in use by both SAC security and SP.

Tower and aircraft communications offer the greatest potential for monitoring, especially by those of you in a fringe reception area. On the CP frequency aircraft with mechanical or other problems will declare an emergency. The base CP in turn notifies the base commander who notifies security police and fire/rescue either by landline or radio. Confirmed CP frequencies are as follows:

311.000	SAC Primary
321.000	SAC Secondary
130.650	MAC (repeated at some locations on VHF-HB)

Air Defense (AD) locations are those radar sites which monitor both short and long range surveillance radars, providing detection capabilities for the U.S.

The AD utilize UHF-AC band radios with a frequency range of 225.000 to 299.950 MHz for communications with military aircraft. Mode is AM; standard power output is 10W, amplified to 50W.

A Guard Frequency is always monitored for use in event of an emergency. A second channel, used for AICC (Air Intercept Control Channel), is used for contact between the pilot and ATC personnel.

The following frequencies and channel numbers I have pieced together through personal monitoring at various CONUS sites. I would appreciate updates and corrections.

CH1	275.800	CH11	321.000
CH2	295.700	CH12	324.500
CH3	359.300	CH13	349.000
CH4	346.400	CH14	324.200
CH5	319.100	CH15	363.800
CH6	318.100	CH16	339.100
CH7	235.100	CH17	335.800
CH8	255.400	CH18	336.600
CH9	311.000	CH19	372.200
CH10	364.200	CH20	305.400

Notes: CH1 is Tower/Ground control; Ch5 is FAA ATC; Ch8 is FSS (Flight Service Station); Ch9 is SAC primary CP; Ch10 is NORAD primary CP; Ch11 is SAC alternate SP; Ch19 is AF Dispatch, pilots to tower; Ch20 is Radio Direction Finding (RDF).

Next month's column will present an article on the operations of Beale AFB and the SR-71's and TR-1's (newer versions of the U-2 "spy planes"). Also other sources of federal and military data will be presented.

Speaking of other data sources, a new edition of Tom Kneitel's *Top Secret Registry of U.S. Government Radio Frequencies* has been released. I have not yet seen a copy; however, I understand that it has been reformatted somewhat for easier data retrieval, being listed by agencies in addition to the current format. Several *MT* advertisers carry this "don't be without it" book.

Remember that if a personal reply is requested please enclose an SASE. ■

TABLE I

VHF High Band

138-142 MHz	AC and ANG operations, AM mode; OSI
142-144 MHz	Civil Air Patrol (CAP) & MARS
148-150.775	ANG, Reserves, Commanders Nets, Operations
163.375-163.5625	Security Police
163.575-164-9875	Operations
165.0125-165.6125	Maintenance, Operations
173.4125-173.6625	Fire & Crash/Rescue, Med Nets

TABLE II

Nationwide Assignments

CAP	
148.150/143.900	Pri Rptr (Out/In)
148.150/143.750	Sec Repeater
148.150. 149.925	Simplex
122.900, 123.100	Search Teams
MARS	
143.450/142.150	Repeater
143.775, 143.950	Simplex
OSI	
138.075, 138.165	Operations
138.175	

UTILITY INTRIGUE

by Don Schimmel

516 Kingsley Road SW
Vienna, VA 22180

ANOTHER WOODPECKER?

I wonder if HF spectrum listeners are going to be subjected to yet another form of QRM like the "woodpecker" interference? A newspaper article forwarded by Patrick Lacy of Arizona indicates that the USAF is studying a location near Heckla, South Dakota, for the possible installation of an over-the-horizon backscatter central radar system. According to the article, neighbors in the vicinity of the proposed site had varying reactions to the prospect of the installation.

CUT NUMBERS

Several new subscribers have pointed out they note some of the CW loggings being labeled "cut numbers" and they wondered what that meant. The term is applied to what can be considered a sort of shorthand for Morse code in which letters are substituted for numbers, thus producing a time-saving method of sending numeric characters.

There are many such systems in use, varying from one to ten numbers replaced by letters. A common example is replacing the five dashes of a zero with one long dash.

AIR FORCE ACTIVITY

W.J. Battles of New Hampshire wrote in asking about some transmissions he heard on 5689 kHz USB. He heard voice and data communications which he believed were sent by just one station using callsigns of "Mobile One", "Verona Lab Two", "Red Leader" and "AF3FBF".

I suspect the frequency in question is actually 5688 kHz, a frequency of the USAF HF/SSB network and part of the Air Force Global Command Control System. Net control on 5688 kHz is shared between Loring AFB, ME (0900-2400 UTC) and MacDill AFB, FL (0000-0900 UTC).

JAMMING ELIMINATION

I have received some information from Spence Naylor of California which relates to my reference to an article about a possible device for elimination of jamming (see Utility Intrigue, June 1987). Spence described an interview appearing in the July 1987 *American Legion* magazine wherein Richard Carlson, Director of the Voice of America, told of an anti-jamming device constructed of simple materials - a piece of cardboard, a rubber band and a paper clip [*you've got to be kidding!....ed*].

Mr. Carlson commented that if the device proves successful, instructions on how to build it will be broadcast over VOA. Spence also indicated that this subject was mentioned on a recent "Entertainment Tonight" program.

DID YOU KNOW?

An interesting bit of radio trivia concerns the time lapses that would occur in communications between earth and the various planets (closest point of the particular planet).

Our Sun	7 Min., 59 sec.
Moon	1.23 sec.
Mercury	4.5 minutes
Venus	2 min., 18 sec.
Mars	4 min., 21 sec.
Jupiter	35 min., 11 sec.
Saturn	1 hour, 11 sec.
Uranus	2 hours, 32 sec.
Neptune	4 hours, 2 min.
Pluto	6 hours, 25 min.

And how about a contact with Alpha Centauri? It would require 4 years, 4 mo., 7 days to receive the transmission!

SWL CARTRIDGE for the Commodore 64

Some readers may be interested in an article beginning on page 34 of the September 1987 *Commodore* magazine. It deals with the SWL cartridge (64) put out by the Microlog Corporation (20270 Goldenrod Lane, Germantown, MD 20874; ph: 301-428-3227). Used with the Commodore 64 computer it translates Morse code and RTTY signals and provides readout on your monitor or you can output such signals to your printer for hard copy.

I recommend you get a copy of the mentioned issue and thoroughly read the article to help you determine if that method is the way you want to read out Morse and RTTY signals.

SPECIAL INTEREST ITEMS

4507.8 kHz 170320Z CW

This was another intercept of a suspected Soviet activity which sends enciphered messages (or possibly chatter) in strings of 18 characters. The short transmission was WMMANUA DMAH TOAMHNU which was then repeated twice more followed by a QSL request. It went down at 0325Z. Perhaps these brief communications are position reports for Soviet naval vessels?

7716.5 kHz 131708Z USB/CW

The voice communications were in the English language and in view of the callsign structure this is believed to be a US Navy network. DELTA THREE ZULU sent an 11 group message to MIKE FIVE WHISKEY with the following text: BREAK EUQ SIY G5D UYO ZSZ NL0 Q2U I2A J4Z GQV E6F BREAK OVER. M5W then "rogered" for the message.

Shortly, thereafter, several CW stations were observed on the frequency utilizing similar callsigns and exchanging a few service messages with various Q and Z signals.

9389 kHz 221734Z CW

As I cut in on this transmission the groups NTW URUUW NUATR (cut numbers) were being sent. At 1735Z the frequency was silent. At 1736Z a new sequence commenced of TAR DWNDR DGWTR and continued until 1740Z at which time there was again silence.

At 1741Z a new sequence began: ADT ANDWI DTWTR. Similar activity had been noted in the past with the most recent time being 3 June at 2018Z on 6944.1 kHz.

10588.2 kHz 140038Z RTTY 45-425

The link between Cuba and Angola (probably Cuban military) is still in operation and the use of the monoalphabetic substitution cipher remains in use. This simple system is used for the enciphering of message headings and is set off with Z separators.

A recent example is: NR 17029 URGENT FROM JAGUAR TO COBRA. The heading was followed by another string of Z's and then into encrypted text which prints out as garbage. This station was also heard 12 July at 1308Z on 19638.2 kHz with a lengthy "RY" transmission.

10749.5 kHz 121237Z USB

A rather cryptic conversation took place between two Spanish speaking male operators when a callup of "CASANOVA, CASANOVA; AQUI PEPE" was observed. Although it was difficult to follow the conversation, it was noted that one operator indicated he was flying to an unidentified location via AVIANCA which is a Colombian Airline.

14423.6 kHz 221500Z RTTY 50-425

MFA Havana passed cipher traffic to EMBACUBA ARGELIA (Algeria). Upon completion of the traffic, Havana shifted to CW and repeated missed groups for the other station which was unheard.

The stations were apparently having trouble maintaining contact because Havana told the other end to QSY 17315. I checked that frequency but did not detect the out-station. Havana (CLP1) was also heard 22 July at 1500Z on 14917 kHz with Spanish chatter to an unheard station. ■

JULY 1987 LOGGINGS

KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
3421	170312	CW/ABA DE DEL, ABA DE TRU (all uniden) Spanish chatter
3448	160241	AM/YL-SS with 5F grps
4066	160245	CW/No CS/5F grps, hand sent/after msg sent oprs exchanged brief chatter in Spanish
4622	050214	CW/No CS/5L grps, very slowly sent
4670	201018	AM/4F grps by YL-SS
5090	212334	AM/YL-EE with 3-2F grps
5126	050217	CW/464 464 464 BT/then into 5F grps
5923	130151	CW/few 5F grps followed by "X" sent continuously/Zero cut as ltr T
6102.3	211632	CW/V's DE V90 (uniden)/raspy sounding signal/off abruptly at 1634Z
6226	201009	CW/5L grps (cut nbrs)
6240	211239	CW/Uniden stn calling FST FST FST/other end unhrd but contact apparently made and brief Spanish chatter sent re "EL SUECO" (the Swede??)
6286	130205	CW/No CS/PT Spanish msg of long list of names & serial nbrs of personnel in uniden LA Naval Service
6521.3	141250	USB/WIX Lakin, WV with tfc to & from barges on Ohio & Mississippi rivers
6713	131257	CW/MGN DE MOA (uniden)/Spanish chatter Note: Ltr N in first call is Spanish nyeh which sent as MW/after chatter went into 5F grps
6772	130155	CW/No CS/5L grps/4 spec charac IM OE OT AA
7728	131705	CW/Uniden stn sending 5F grps, cuts zero as T, hand sent
7751.3	121219	RTTY/50-425/Commercial telegrams via ITT NY to Havana, Cub/PT Spanish
777.2	161450	USB/2 OM-EE in conversation filled with profanity/one sez he has fine collection of weapons?
10218	140043	RTTY 50-425/test tape/RCC LA HABANA CUBA TESTING TO ADX CNTOL ITT WC IN NEW YORK
10644	230014	CW/SLB "D" with SLB "P" underneath
13419	042000	CW/Cut nbr tfc/AU34567DNT for 1-0
13611	192038	CW/5F grps, auto sent, cuts zero as T/at end of msg sent TTT TTT and off.

RTTY SIGNALS

Patrick Sullivan of California encountered several RTTY test transmissions (RYs) and stuck with them, coming up with three identifications--followed by some additional RTTY loggings by Patrick.

Freq	UTC	Baud/Shift	Callsign	Identification
9154.9	0555	50/1000 N	D4B	Amilcar Cabral Air, Sal, Cape Verde
10524	0400	50/500 N	HMF45	Pyongyang, Korea (Korean News Agency)
10972.2	0230	75/425 N	-	VOA, Tangier

Freq	Mode	Shift	GMT	Call	Service	City	Co	Remarks
6770.0	RTTY	75/170 N	0115	LOR	Arg Navy	Puerto Belgrano	ARG	RY Test
8051.6	FEC	100/170	0555	WOO	AT&T	Ocean Gate NJ	USA	Call List
8712.6	FEC	100/170	0440	WCC	Wx	Chatham	USA	-
9223.5	RTTY	50/425 R	0412	TJK	ASCENA	Douala	CME	RY Test
9225.1	RTTY	75/170 R	0802	NRV	USCG	Apra Harbour	GUM	RY Test
9291.1	RTTY	75/170 R	0402	-	USCG	-	USA	-
12131.8	RTTY	57/170	0000	DF	Telex	Mexico City	MEX	Spanish
14638.2	RTTY	75/425 N	2213	WFK54	USIA	New York City	USA	Nx
16142.9	Tdm2	96/850	1900	RFLI	FAF	Fort de France	Mrt	Frenchtfc
17210.6	ARQ	100/170	1850	NMN	USCG	Portsmouth VA	USA	Wx
17213.6	RTTY	-	2149	HPP	-	Panama City	PNR	RY Test
18193.7	RTTY	50/425 R	2336	CLN603	P.L.	Havana	CUB	Eng Nx
18269.9	RTTY	50/500 N	1950	-	Cuban Embassy	-	TZA	-
18452.8	RTTY	75/425 N	WFK 48		VOA	New York NY	USA	RY Test
19027.4	RTTY	75/850 N	1845	PWZ33	Brazilian	Nav. Rio	BRZ	RY Test
19438.6	RTTY	75/170 N	2245	LOR	Arg Navy	Puerto Belgrano	ARG	5 Ltr Grp
149010	RTTY	50/380 N	2205	CLN451	P.L.	Havana	CUB	RY test

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Allow 30-90 days for delivery after receipt of order due to the high demand for this product.

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12-Band, 75 Channel • Crystalless • AC/DC

Frequency range: 29-54, 118-175, 406-512, 806-950 MHz.

The *Regency* TS2 scanner lets you monitor Military, Space Satellites, Government, Railroad, Justice Department, State Department, Fish & Game, Immigration, Marine, Police and Fire Departments, Aeronautical AM band, Paramedics, Amateur Radio, plus thousands of other radio frequencies most scanners can't pick up. The *Regency* TS2 features new 40 channel per second *Turbo Scan*™ so you wont miss any of the action. Model **TS1-RA** is a 35 channel version of this radio without the 800 MHz. band and costs only $239.95.

Regency® Z60-RA

List price $299.95/**CE price $148.95/SPECIAL**

8-Band, 60 Channel • No-crystal scanner

Bands: 30-50, 88-108, 118-136, 144-174, 440-512 MHz.

The *Regency* Z60 covers all the public service bands plus aircraft and FM music for a total of eight bands. The Z60 also features an alarm clock and priority control as well as AC/DC operation. Order today.

Regency® Z45-RA

List price $259.95/**CE price $139.95/SPECIAL**

7-Band, 45 Channel • No-crystal scanner

Bands: 30-50, 118-136, 144-174, 440-512 MHz.

The *Regency* Z45 is very similar to the Z60 model listed above however it does not have the commercial FM broadcast band. The Z45, now at a special price from Communications Electronics.

Regency® RH256B-RA

List price $799.95/**CE price $329.95/SPECIAL**

16 Channel • 25 Watt Transceiver • Priority

The *Regency* RH256B is a sixteen-channel VHF land mobile transceiver designed to cover any frequency between 150 to 162 MHz. Since this radio is synthesized, no expensive crystals are needed to store up to 16 frequencies without battery backup. All radios come with CTCSS tone and scanning capabilities. A monitor and night/day switch is also standard. This transceiver even has a priority function. The RH256 makes an ideal radio for any police or fire department volunteer because of its low cost and high performance. A *60 Watt* VHF 150-162 MHz. version called the **RH606B-RA** is available for $459.95. A UHF 15 watt, 10 channel version of this radio called the **RU150B-RA** is also available and covers 450-482 MHz. but the cost is $439.95.

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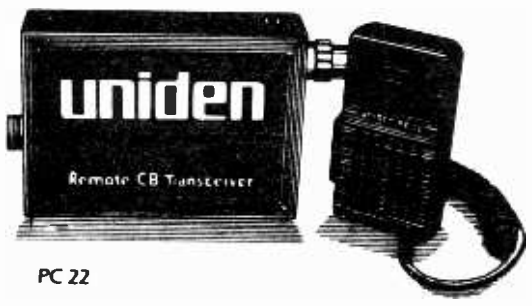
List price $199.95/**CE price $114.95/SPECIAL**

10-Band, 10 Channel • Handheld scanner

Bands: 29.7-54, 136-174, 406-512 MHz.

The *Uniden Bearcat* 50XL is an economical, handheld scanner with 10 channels covering ten frequency bands. It features a keyboard lock switch to prevent accidental entry and more. Also order the new double-long life rechargeable battery pack part # **BP55** for $29.95, a plug-in wall charger, part # **AD100** for $14.95, a carrying case part # **VC001** for $14.95 and also order optional cigarette lighter cable part # **PS001** for $14.95.



PC 22

NEW! Scanner Frequency Listings

The new Fox scanner frequency directories will help you find all the action your scanner can listen to. These new listings include police, fire, ambulances & rescue squads, local government, private police agencies, hospitals, emergency medical channels, news media, forestry radio service, railroads, weather stations, radio common carriers, AT&T mobile telephone, utility companies, general mobile radio service, marine radio service, taxi cab companies, tow truck companies, trucking companies, business repeaters, business radio (simplex) federal government, funeral directors, veterinarians, buses, aircraft, space satellites, amateur radio, broadcasters and more. Fox frequency listings feature call letter cross reference as well as alphabetical listing by licensee name, police codes and signals. All Fox directories are $14.95 each plus $3.00 shipping. State of Alaska–**RL019-1**; Baltimore, MD/Washington, DC–**RL024-1**; Chicago, IL–**RL014-1**; Cleveland, OH–**RL017-1**; Columbus, OH–**RL003-2**; Dallas/Ft. Worth, TX–**RL013-1**; Denver/Colorado Springs, CO–**RL027-1**; Detroit, MI/ Windsor, ON–**RL008-2**; Fort Wayne, IN /Lima, OH– **RL001-1**; Houston, TX–**RL023-1**; Indianapolis, IN–**RL022-1**; Kansas City, MO/ KS–**RL011-2**; Los Angeles, CA–**RL016-1**; Louisville/Lexington, KY–**RL007-1**; Milwaukee, WI/Waukegan, IL–**RL021-1**; Minneapolis/St. Paul, MN–**RL010-2**; Nevada/E. Central CA–**RL028-1**; Oklahoma City/Lawton, OK–**RL005-2**; Pittsburgh, PA/Wheeling, WV–**RL029-1**; Rochester/ Syracuse, NY–**RL020-1**; Tampa/St. Petersburg, FL–**RL004-2**; Toledo, OH–**RL002-3**. A regional directory which covers police, fire ambulance & rescue squads, local government, forestry, marine radio, mobile phone, aircraft and NOAA weather is available for $19.95 each. **RD001-1** covers AL, AR, FL, GA, LA, MS, NC, PR, SC, TN & VI. For an area not shown above call Fox at 800-543-7892 or in Ohio 800-621-2513.

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11-Band, 55 Channel • Handheld/Portable Search • Lockout • Priority • Bank Select Sidelit liquid crystal display • EAROM Memory Direct Channel Access Feature • Scan delay

Bands: 29-54, 118-136, 144-174, 406-420, 440-512 MHz.

The new handheld *Regency* HX1500 scanner is fully keyboard programmable for the ultimate in versatility. You can scan up to 55 channels at the same time including the AM aircraft band. The LCD display is even sidelit for night use. Includes belt clip, flexible antenna and earphone. Operates on 8 1.2 Volt rechargeable Ni-cad batteries (not included). Be sure to order batteries and battery charger from the accessory list in this ad.

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PRO540E-RA *Uniden* 40 channel CB Mobile..... $119.95
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Larry Van Horn

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Orange Park, FL 32073

Soviets Continue Strong Space Presence

The Soviets have orbited a 15-20 ton Earth Resources/ocean survey platform, the largest civilian Earth survey spacecraft ever launched. The schoolbus-sized vehicle was launched by a Soviet Proton booster July 25. The Soviet spacecraft, Cosmos 1870, is about 7-10 times heavier than the most advanced U.S. Earth resources spacecraft now operational, Landsats 4 and 5.

Launch of the large, complex Soviet spacecraft indicates the Soviet Union has been working on this model for several years. Cosmos 1870 carries a multidisciplinary science payload to provide data on "hydrology, cartography, geology, agriculture and the environment...and the world oceans," the Soviet TASS announcement said.

As the Soviet Union was activating its new Earth Resources platform, it was also recovering a cosmonaut crew, including cosmonaut Alexander Laveikin. Laveikin's mission aboard MIR was cut short by a heart problem. He was returned to Earth July 30 along with part of the joint Soviet/Syrian crew launched to the MIR on July 22.

Laveikin spent 174 days in space along with cosmonaut Yuri Romanenko, who remained behind on the MIR. Alexander Alexandrov, part of the Soyuz TM-3 crew was left aboard the MIR as Laveikin's replacement.

Accompanying Laveikin back to Earth in the Soyuz TM-2 descent stage were Soviet Cosmonaut Alexander Viktorenko and Syrian Air Force Lt. Col. Mohammed Faris.

"It may be serious, or it may not be serious," Victor Blagov, deputy Soviet mission flight director, said speaking of Laveikin's condition. "Although Laveikin says he is not tired and believes he can work further, this is the time to take him off." The Soviets said Laveikin needed rest and had a "painful" adaptation to zero-g.

Following the return of Soyuz TM-2, the Soviets undocked the Soyuz TM-3 spacecraft from the rear port of the station's Kvant astrophysics module and piloted the Soyuz around to redock on the forward station port. This was done to accept the Progress 31 tanker that was launched on August 3.

MT's intrepid space reporter John Biro reported receiving telemetry from Progress 31 on 165.850 MHz. This signal is at the band edge of the 300 kHz FM telemetry signal centered on 166.000 MHz. This type of telemetry signal, which is also used by the Soyuz spacecraft, displays most of its energy at the edges of the bandwidth. This would indicate a high modulation index.

John has also intercepted a complete message downlinked from the MIR space station on 143.625 MHz via the Stroka RTTY system. I have included that intercept and hope that other *MT* readers will join in the search for the true downlink frequency of the Stroka system.

John Biro MIR Stroka RTTY Intercept
28 July 1987--Orbit No. 8255
143.625 MHz-50 baudot/131 Hz shift/Normal sense

9
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7
&OMVNOTTTOZO
TOVVVVAKMVVVVUVBJXMIKBCXMBSKVMOVWVV
VDVOENKVLXVMI9"24-#-3.9&9 OBORUDOWANIQ SOSTAWLEN W PORQDKE
PRIORITETA:

1. FIVS QQD732.8033--9 I NASOS NZ 17KLMTW 5001-0 1 VW
2. PENAL W FXLE F/CKGCNSEWERSS 3LKTNM
3. V I S FXPL3NKOME FXA KATD-140 2 GT
4. PENAL S FXPLE NN#ASSELXBLASS MMMPUI 80 GTT
5. PENAL S KXPLENKO K NNBOLXESS KDKSPM NNMOOLXAWSSL 1 GT
6. KASSETA XMAGN NNNIWASS KDKSP NNMOELXAWSSL 1 GT
7. PENAL S FXPLENKO NNMAGAUPSS K NN#ASSELXBLASS KDKSPM MODELX-2SSL 1 GT
8. KASSETA K MAGNITOFONU NNPARSEKSS KD NNMXXAIBNWW GT
9. KASFA K NN2839-8SS UTHGT
10. PENAL S PLENKOJ K FXA NNK832-30SS 1 GT
11. PENAL S PLENKOJ MAG-70 9 GT
12. PENAL S KASSETAMI KMDM NNBOSRASS 15 GT
13. PRIEMANQ KASSETA DLQ NNGLA ADASS 2 GT
14. KASSETA S MAGMLENTO K APP. PSN 10 GT
15. PENAL S FXPLENKO K APP. PSN 10 GT
16. KASSETA K APPM NNKRISTALI ATOGSS 3 GT
17. KAPSULA K APPM NNKRISTALI ATOGSS 24 GT
18. UKLADKA S KAPSULAMI USTANOWKI NNPALXMIRASS 1 GT
19. KAPSULY S OBRAZCUPOKPPKORUNAQMYVNXOLMQLTDOXMVU 2 GT
20. F/51OCPKKEHSSELXBLADSS KAAQWL USTANOWKI NNSWTLANASS 1 GT
21. UKLADKA S FRANCIGNI NNSWETLASWV MGT
22. ULADKA S XXAI NNRURESS GT
23. 32839KASSETA NN2839AISCQAMOGNNRURESSMQMUN
24. KASSETA NA SSETI GNNVDMMMEXVVVNGARX

NOTE: This looks like a packing list for Soyuz TM-2's return trip. Penal mean panel; Kasseta means cassette; Kapsula means capsule.

The carrier rocket with Soyuz spaceship being taken to the launching pad.

On July 25, the Soviets boosted a mystery spacecraft in earth orbit, Cosmos 1871. The spacecraft was proably launched from Tyuratam on either an SL-3 or SL-13 booster. According to NORAD sources, the spacecraft weighed 10 tons and was placed onto a 212.1 by 191.4 km orbit. The satellite was in a 97.02 degree inclination.

My records do not indicate this flight profile being flown before and the closest mission profile that fits is remote earth sensing Cosmos missions that orbit from 660 to 600 km.

On Sunday evening, August 9, Michael Morley, Public Relations Officer of the New Zealand Spacecraft Association called long distance to let me know that Cosmos 1871 was poised to reenter the atmosphere somewhere near New Zealand. This strongly indicated that the satellite, if it was a new class of photo recon, had refused to respond to ground commands.

Only time and more launches into this new flight regime (if that is the case) will tell the true mission of Cosmos 1871.

GLONASS

One of the more interesting Soviet programs is the GLONASS navigation satellite system. GLONASS parrots the U.S. Navstar GPS system.

Teledyne Brown's space advisory scientist, Nicholas Johnson, has noted in his *Soviet Year in Space* that since the beginning of the program one or more of the satellites in each triplet launch appears to be dead. The mystery of these apparent dead satellites and the use of a new SL-13 launch profile in 1986 remains after three years.

The Soviets have yet to reveal a photograph or drawing of these satellites--a decision usually taken only for military or government satellites. The system also appears to still be in the testing stage and the Russians might still have to make a modest change in GLONASS signal format which could account for the delays in an operational constellation. The signal change is probably needed to improve accuracy.

Naturally the Soviets would want their Navstar equivalent to have the same accuracy level as the U.S. Navstar system. If joint Navstar-GLONASS receivers were to come into international use and GLONASS yielded significantly inferior accuracy, this would reflect adversely on the status of Soviet technology.

What follows is the latest information on GLONASS frequency usage. Anyone equipped with a suitable antenna and an Icom R-7000 receiver should have no problem receiving GLONASS satellite signals.

1246.8750	SS	Cosmos 1520
1247.7500	SS	Cosmos 1710
1249.0625	SS	Cosmos 1650
1249.9375	SS	Cosmos 1554/1651
1253.4375	SS	Cosmos 1595
1254.3125	SS	Cosmos 1711
1256.5000	SS	Cosmos 1555
1603.6875	SS	Cosmos 1520
1603.6875	SS	Cosmos 1490
1603.2500	SS	Cosmos 1710
1605.9375	SS	Cosmos 1650
1607.0625	SS	Cosmos 1554
1607.6250	SS	Cosmos 1651
1611.5625	SS	Cosmos 1595
1612.1250	SS	Cosmos 1519

Note: SS = Spread Spectrum ■

Gregory Mengell

2685 Ellenbrook Drive
Rancho Cordova, CA 95670

"What I Did This Summer"

High Resolution Images

July was a busy month for the APT crew. Three states and six cities later, much of what we had been involved in was directly related to this column.

The week of the 16th, APT had a display at the "North American NOAA Polar Orbiter Users Group" meeting in Boulder, Colorado. It was a Blue Ribbon gathering of Tiros remote sensing leaders from around the world. Also in attendance were such notables as the dean of APT users, Robert Popham, Loren Johnson of Electro Services and Dr. Jeff Wallach of Dallas Remote Imaging Group.

The crux of the meeting was the explanation of the versatility of the Tiros data generated by the on-board AVHRR--advanced very high resolution radiometer--the very same instruments that produce our real time APT image.

This device (not bigger than a home microwave) costs about 1.5 million dollars to build and generates 1.7 million dollars in revenue a month. The applications for its superb imagery range from meteorology to fire location and suppression, renewable resource management and the tracking of wildlife.

The visual product of most interest was the microwave AVHRR product--HRPT (High Resolution Picture Transmission). The data is transmitted in digital format around 1705 MHz. The cost of such a station is at present prohibitive for most individuals. Only three private HRPT stations were known to exist in 1981--all of them outside the U.S. Only a very few exist in the world at present; some sites require raw data to be shipped to the U.S. for processing. Cost of an HRPT station is in excess of $150,000.

It renders views comparable to the Landsat program in resolution and information. As a matter of fact, one of the many proposals fielded was for the use of the Tiros satellite as a replacement for the Landsat program which is in its death throes due to the Reagan Administration's "privatization" program. Whether Landsat recovers or not is anyone's guess at this stage.

One Man's Opinion

This proposal merits a few comments -- I try never to editorialize, but you must be made aware that there is a dual threat to our weather system which looms in the distant horizon.

For some years now, Tiros has been supplying life-saving information, real time WX event warnings and aviation rescue services to the world at large, virtually free of charge, as well as HRPT images at reasonable cost. The irony is that the majority of the public including many in the Weather Service never use it because they have never known it existed or that the information could be made available to them. After all, when was the last time you saw a Tiros picture on your local weather program?--It has usually been GOES.

Because of this lack of knowledge, there is little public support for the APT program. Thus, the Federal Government's Office of Management Budget would like to use the hatchet or pull the plug on the APT program. At the same time, two other powerful forces are looking greedily at the Tiros program. The Department of Defense and the Air Force have for years run a parallel program to Tiros, known as DMSP (Defense Meteorological Satellite Program).

It carries far more sensitive scanners which can view the world in daylight, nighttime or in moonlight. The catch is, it is all in encrypted digital data and a price must be paid for its use. While an extremely valuable national resource, you cannot receive it in real time. It is the position of the D.O.D. and the USAF that they should have full responsibility for all Tiros polar orbiters, taking them out of civilian hands.

In addition to this ominous prospect, another threat comes from "Commercialization of Polar Orbiter and Its Data." All we have to do is look at what commercialization did to the Landsat program. Due to constraints I can only tell you that pictures that were once costing $25 at the U.S.G.S. Office now sell for thousands. The replacement Landsats have been mothballed and their construction crews laid off.

Both these scenarios are many years off and may be avoided if you will write down the system's importance to you and how you use it. Send to:

Robert W. Popham
National Environmental Satellite
Data and Information Service
Washington, D.C. 20233

I would advise you to act now, though; after all, a good offense is the best defense.

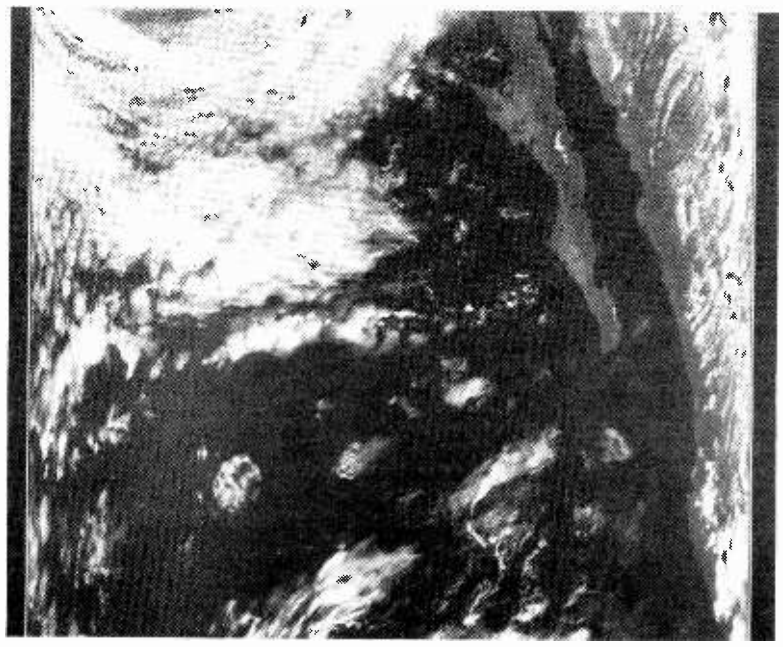
"Showing Off"

Also in the month of July, we traveled to Dallas, Texas, to demonstrate APT equipment to an organization interested in education users of environmental satellites (Thanks go to Jim Zuh and Dr. Jeff Wallach for their assistance).

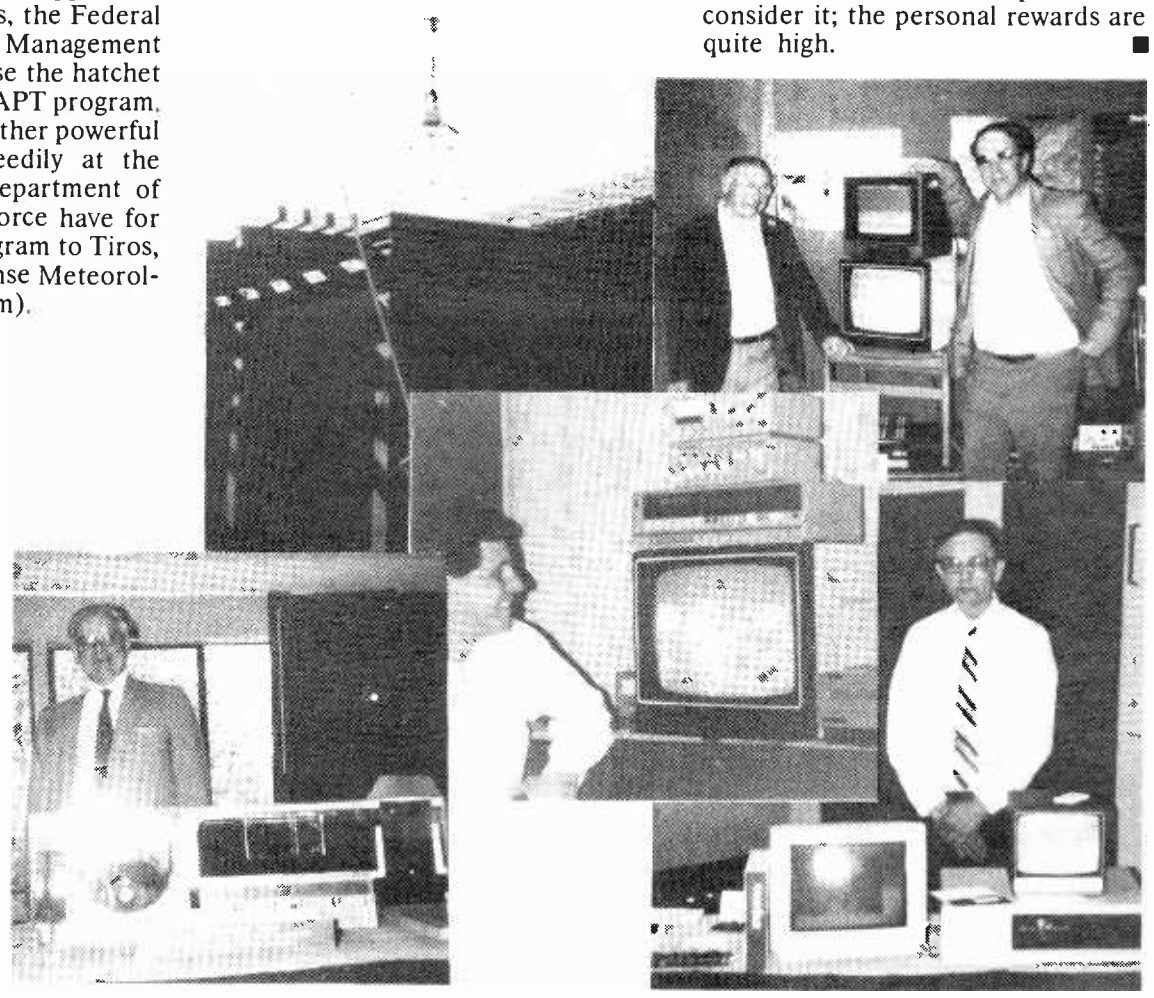
The second highlight of the month, however, was APT's display at the National Space Sciences Academy at Stanford University in Palo Alto, California. It was a very pleasurable experience, teaching a course on WX satellites and remote sensing to 21 very bright high school students. My thanks go to Dr. Grant Zher for his loan of the many slides for lecture examples.

This year we again fielded the Alden equipment as well as high resolution color displays. Bill Henning, recently retired Chief Meteorologist with the National Weather Service in Sacramento, was our star lecturer.

We brought in a week's worth of charts received from NPM on 14826 and used them to spot and track possible tropical storms and hurricanes, combining the best of two methods: video prints via FX666-Mitsubishi P50 put on the wind blow charts. It was a short but effective introduction to WX forecasting. If any of you get a request to help a school, space camp or Civil Air Control, please do consider it; the personal rewards are quite high. ■



High Resolution Picture Transmission produces a picture equal in quality to the Landsat program.



At Stanford Space Academy: (Upper left) APT antenna, GOES Wefax loop Yagi antenna; (Upper right) Bill Henning, left, and Greg Mengell. At Boulder, Colorado: (Lower left) IT&T AVHRR display; (Middle) Dr. Jeff Wallach & Wraase FX665; (Lower right) Loren Johnson with Electro Service display.

Mike Mitchell, Jr., W7WHT

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MORSE CODE - The International Language

An Anachronistic Mode?

In today's world, the Morse Code (CW--continuous wave) seems to most people, even to most hams, to be somewhat past its prime. Given the revolution in communications technology during the past 15 to 20 years, it is certainly no longer the digital mode of choice, except in Third World countries.

And yet it continues to have its uses in many situations when other modes fail, for its biggest strength is its simplicity. One can construct a workable CW transmitter out of unbelievably few parts. And when nothing else can, CW often gets through the QRM and QRN and remains readable.

Within the U.S. Government, it's the emergency backup of choice for NASA astronauts, combat forces for signaling during radio silence situations in naval fleet actions (it's sent in those situations by signal light), and for survival/rescue situations.

Of course ham radio uses CW, especially for DX since many of the hardest countries to talk to are almost all on CW. The power requirements versus distance achieved is very good and power is a very limiting factor in many locations. The transistor has been a real help in that area, but voice transmissions still utilize much more power than CW.

Most spy transmissions are still sent via CW, too--all those "numbers" stations that many SWLs like to copy! And there are other types of "utilities" operations which utilize CW extensively or as a backup.

Clearly then, while CW is less and less the digital mode of choice, it is a long way from being dead. When cheaper and easier is more important than expensive and complicated, CW wins every time. And many governments and businesses in smaller countries prefer cheap and simple!

On the Origin of Morse Code

Since the earliest days of mankind on earth, there has been a need to signal others at a distance. Waving hands and shouting worked up to several hundred yards, but for longer distances, other means were needed.

Lighting fires and flashing the sun off of polished metal were early Roman and Greek methods. In some cases, the number or position of the fires and/or flashes conveyed different meanings, and thus comprised a form of "code."

Drums and smoke were used in more recent times in Asia, Africa and North America. They too contained elements of a code which could be "read." But the first real "telegraph" device and code was developed in 1792 in France.

Claude Chappe devised a mechanical "semaphore" device which could send letters and numerals. It took a lot of stations to cover the distance between towns (depending upon the lay of the land), but it was relatively fast and accurate.

By about 1820, electrical means of sending information were developed. By moving one or more needles electromagnetically, a message could be sent; the multiple needle method "pointed" to letters and numbers drawn beneath them on the telegraph device. This method was used by the railroads in England for many years.

Samuel Finley Breese Morse developed a method to send coded signals in 1835, but it was a complicated and cumbersome device at best. He made improvements and, on May 24, 1844, sent his famous message, "What hath God wrought" from Washington, DC, to Baltimore (37 miles). The message was received on paper tape in the "Morse" alphabet.

Other inventors were making improvements on similar devices; however, because he obtained good backing and his was the system the government tested in 1844, Morse's system was the one which sold best.

While these early devices copied the dots and dashes on paper, eventually the operators learned the sounds of the characters and found it easier to copy the actual characters by hand on sheets of paper. This quickly became the defacto method by which Morse telegraph worked.

In 1872, Emile Baudot of France invented a method of multiplexing (sending more than one signal at a time on a single wire), thus expanding the number of messages that present network could handle. By then sounders had replaced the paper strips.

After the work of all those named above, and many others too, had been completed, a fellow by the name of Marconi came along, looked at the whole situation, and "invented" wireless. In 1899 and again in 1902, Marconi accomplished great feats with wireless.

The word 'invented' in the paragraph above is in quotes because Marconi was more of a packager and marketeer than an inventor. He took several different ideas of others, put them together and produced a new method and use of those ideas.

It would be many years before voice would be a usable mode of communication via wireless, and even longer before radioteletype (RTTY) would gain in popularity.

Morse Code Today

Through the years various codes were developed and tested, but the only two versions which lasted for any appreciable time were the original American Morse Code and the International Morse Code (also known as the Continental Code, International Code, Morse Code, and Radiotelegraph Code).

The original American Morse Code was developed by Morse in 1835. It was not uniform in that it had certain timing differences between the elements within some characters and some dashes were longer than others. It was used almost exclusively on landline wire circuits (except for a few diehards who even today use it on wireless just to keep it alive!).

The international Morse code, the only one we are talking about in this column, is totally symmetrical: A dit is 1 unit of time duration, a dah is 3 units, the space between elements within a character is 1 unit, the space between characters is 3 units, and the space between words is 7 units. It is the international standard and almost universally used in all languages.

The aforementioned speed relationships hold true for code at any speed except for below 13 words per minute (WPM) on code practice machines which utilize the Farns-

CONVENTION CALENDAR

Date	Location	Club/Contact Person
Oct 4	Watertown, CT	Waterbury ARC/ Gary Firtick K1EB 589 Hamilton Ave, Watertown, CT 06795
Oct 3-4	Virginia Bch,VA	VA State Convention/ Art Thiemens AA4AT 2836 Greenwood Rd, Chesapeake, VA 23321
Oct 3-4	Bilox, MI	MS Coast ARA/ Jan Carlson N5FYO Rt 5 Box 242, Biloxi, MS 39532
Oct 4	Howard Co, MD	Columbia ARA/ Edward Wallace K3EF 9905 Carillon Dr, Ellicott City, MD 21043
Oct 4	Yonkers, NY	Yonkers ARC/ John Costa WB2AUL 195 Woodlands Ave, Yonkers, NY 10703
Oct 4	Springfield,OH	Springfield OH IRA, Stephen Klipfel KA8QCS 825 S. Tecumseh Rd, Springfield, OH 45506
Oct 4	Utica, MI	Utica Emerg Comm Ass/ Harold Henry KA8UZQ 53062 Tundra, Rochester, MI 48087
Oct 2-4	San Jose, CA	Pacific Div Conv/ Emmett Freitas AE6Z 481 Fenley Ave, San Jose, CA 95117
Oct 4	Rome, GA	Coosa Valley ARC/ Bobbie Waller KA4DXU Rome, GA 30161
Oct 9-11	Atlanta, GA	SE DX Club/ Carl Henson 8280 Chestnut Dr, Jonesboro, GA 30236
Oct 9-11	Scottdale, AZ	SW Div Conv/ Jim Cushing KD7FW 4414 E Ludlow Dr, Phoenix, AZ 85032
Oct 10-11	Warrington, PA	Mt. Airy VHF RC/ Gary Hitchner WA2OMY 39 W. Mt Kirk Ave, Norristown, PA 19403
Oct 10-11	Wichita, KS	Kansas State Convention/ Gary Vreeland ND0T 1920 S. Santa Fe, Wichita, KS 67211
Oct 10-11	Memphis, TN	Mid-South ARA/ James Alexander AA4OU 2969 Iroquois, Memphis, TN 38111
Oct 10-11	Warner Rob,GA	Central GA ARC/ Clifford Warrick N6DLA Warner Robins, GA 31098
Oct 11	Maysville, NC	Maysville Hamfest/ JoAnn Taylor WD4JYR Rt 1 Box 80-36, Swansboro, NC 28584
Oct 17	Gray, TN	Johnson City & Kingsport/ Wendell Messimer 512 W. Poplar St, Johnson City, TN 37605
Oct 17	Syracuse, NY	Radio Am of Gtr Syracuse/ Vivian Douglas 213 Monticello Dr So, Syracuse, NY 13205
Oct 24-25	Chattanooga,TN	TN State Conv/ Gary Kendrick KW4Z 3107 12th Ave, Chattanooga, TN 37407
Oct 25	Grandview, MO	South Side ARC/ Linda McLeod KA0SEU 1603 Richmond, Pleasant Hill, MO 64080
Oct 31-Nov 1	St Charles,IL	Central Div Conv/ George Isley WD9GIG 736 Fellows St, St Charles, IL 60174
Oct 31-Nov 1	Lawrencvlle,GA	Alford Memorial RC/ Perry Scott N4JPD P.O. Box 1282, Stone Mt, GA 30086
Nov 7-8	Odessa, TX	West TX ARC/ Otis Brasfiled KA5REM 3103 N. Hancock, Odessa, TX 79762
Nov 8	Ft Wayne, IN	Allen Co Am RTC/ Alan Scott N9BAC P.O. Box 278, Huntertown, IN 46748
Nov 8	Selden, NY	Radio Central ARC/ Andy Geldman WB2FXN 3 Walton Way, Tanglewood, NY 11727
Nov 14-15	Montgomery, AL	Montgomery ARC/ John McLemore c/o WCOV-TV 1369 Adrian La., Montgomery ,AL 36196
Nov 15	Rockford, IL	Ill State Conv/ James Miller W4JR 5581 Einor Ave, Rockford, IL 61108
Nov 20-22	St.Petrsbrg,FL	S.Fla Sec Conv/ Frank Ziegler K4EUK 8316 Stillbrook, Tampa, FL 33615

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worth method where all spaces are expanded between the characters to achieve the correct sending speed while still sending each character at a speed of 13 to 16 words per minute.

Prior to Farnsworth's discovery everyone who studied code "hit the wall" between 10 and 12 WPM; Farnsworth discovered that as the characters got faster, the shorter dits and dahs were no longer interpreted by the brain as being the same sound relationship it had learned at the slower speeds.

At 10 to 12 words a minute the brain, used to hearing "A" as "diiit-daaaaaaaaah", no longer recognized it as "didah". Using the Farnsworth method, you hear "didah" at 3 WPM the same as it would sound at 13 to 16 WPM and the result is you never hit the wall! Thank goodness for Farnsworth!!

Back when amateur radio started, the U.S. and UK led the way for amateurs; *QST* was the major ham publication and developed through its pages over the years the amateur radio shorthand (Q Signals, etc.) which became the defacto standard throughout the world.

As commercial interests developed, they normally hired amateurs to work for them and the standard shifted into the commercial field; the same thing happened to the military. So even today the international basis for CW work in all languages is "QST English!"

Learning The Morse Code

Most people who become hams today are told something on the order of "It's a great hobby and really a lot of fun, but you have to learn the code. And learning the code is really hard. It's the pits!"

I'm sure you'll have to admit that it's a great way to welcome someone to a new hobby!! It's also totally untrue.

Learning the code, especially if the student is young, can be a lot of fun; the problem is the method used by those who teach code. Not being professional teachers and not having studied how people learn, the instructors often teach in an inefficient and boring manner (and copying code to improve one's code speed is generally a boring exercise).

While it's true that not all people learn things in the same way, due to the nature of the code there are certain practices which exhibit a high level of success. Although there are other methods and materials, I strongly encourage you to try the following method first as it has proven to be very successful and fast.

For learning the Morse code (as opposed to increasing your speed) it would be hard to beat the new cassettes which come from Gordon West's Radio School, W5YI/VEC, AMECO, Wrightapes, and the ARRL's "Tune In The World" package. Wrightapes probably has the best and least expensive tapes for speed improvement.

Ordering information for any of the tapes listed above can be found at various times in the leading amateur radio journals (*QST, 73, CQ,* and *Ham Radio).* The new Novice Voice Class study package from Gordon West and W5YI/VEC is now in Radio Shack stores (#62-2402; $19.95); it is an excellent value.

During the period you are learning all the characters you need to know, you should study as long at each session as you find it interesting to do so. When you start getting bored, stop immediately. But however long the sessions are, set them up on a regular schedule, at least two times per day, at least five to six hours apart.

When you are first learning the characters, you will most likely find the study interesting. You are learning a new way to express the English language and your interest level will usually last much longer than during practice for improving speed.

Your sessions will probably last differing amounts of time depending upon what you are learning--this is normal, and it will take most people three to six weeks to learn all the characters and an additional two to four weeks to get their code speed up to 5 WPM. Some people will do it faster and some will take longer, but five to eight weeks is average.

When you start working on your code speed, you should shift to *three* sessions of *five minutes each* per day. Once just after you get up in the morning, once just after getting home from work or school (or just before dinner) and once just before you go to bed--just five minutes each!

Speed improvement requires solid and dedicated concentration. All practice, no matter how long, where you are not concentrating heavily on the code, is wasted! You simply will not learn unless you give it your full attention, and few beginners or even older hands who are working at higher speeds can concentrate on tapes or code generators for much more than five minutes.

At each speed, as you reach 80% correct copy, move up two or three words per minute. You will immediately drop back to 15-20% correct copy; that's normal. When you once again reach 80%, move up a few words per minute again and keep repeating the cycle until you achieve a few words per minute higher than the speed you wanted to reach.

That's it. It really works and it's relatively painless, too. Through experience, I estimate that 15 minutes a day of study in three five-minute increments spaced about five to eight hours apart is the equivalent of two hours a day done all at once or in two one-hour segments.

OK. Now you know the history behind the code, you know where it's at in the world of communications today, and you know a good, simple way to learn it. So what's holding you back? Get some tapes and study manuals and either become a ham or upgrade your current license--there is no better time to do it than *right now*!

Some Additional Help

There are few good books on code. *Morse Code: The Essential Language*, by L. Peter Carron, Jr., W3DKV, is probably the best and it is current ($5.00 plus $1.00 postage from ARRL, 225 Main Street, Newington, CT 06111 or your local radio or book store).

Finally, for the true "Morse fanatic", there is the quarterly magazine from Holland (in English), *Morsum Magnificat.* For $10.00 per year or $3 for a sample copy (Mailed in CASH - US Banknotes - to Rinus Hellemons, PA0BFN, Holleweg 187, 4623 XD Bergen op Zoom, Holland) you will receive 50 or so pages of a little bit of everything. It never ceases to amaze me with its quality and content.

BITS AND PIECES

Just in time to be too late for the two-part article on packet radio, I received *The Packet Radio Handbook* by Jonathan L. Mayo, KR3T ($14.95 from TAB Books, Blue Ridge Summit, PA 17214, or your local radio or book store).

The *Handbook* has a lot going for it. It's well organized, contains a lot of stuff you need or want to know if you are getting into or are already into packet. But it also has a lot of info you would never have thought to ask about, too.

It contains sources for and descriptions of information and equipment, and has a good bibliography. A good book worth its price.

Another book is *The Digital Novice* Jim Grubbs, K9EI (he wrote *Get Connected* which I recommended in the July issue). This one is written with the Novice in mind and explains the concept of packet to the newcomer. I highly recommend it. ($9.95 plus $2.50 postage from Qsky Publishing, P. O. Box 3042, Springfield, IL 62708 or from your local radio or book store). ■

Paul Swearingen

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From Genesis to Revelations

In the beginning, there was an endless spectrum of quiet. Then Marconi and others came along and a few beeps were heard now and then. By 1927, the beeps had turned into a cacophony of voices and music.

And then God created the Federal Radio Commission to sort out the mess.

Later, it was renamed the Federal Communications Commission in order to bring the telephone company under its control. By the 1960s, it had an incredibly long list of do's and don'ts which were enforced by men wearing blue badges and reporting to Washington.

The commissioners, in turn, decided who would continue broadcasting, not according to the law of the land, but according to their own rules and regulations. All was neat, orderly and predictable in radioland.

Then came a gentleman named Mark Fowler. Rules and regulations by the wheelbarrowful were tossed to the four winds until only a few were left. After Fowler left the FCC, his successor, Dennis R. Patrick, tossed out another rule, the Fairness Doctrine. Much cheering by broadcasters. Many groans by anti-Reagan politicians and the status quo. Etc.

If you've attempted to follow the course of the FCC in the past few months, you've probably ended up confused. But that's nothing new. Broadcasters have been confused by the FCC's inconsistent decisions for the past 55 years. These decisions have always reflected the power of whoever was in office or whoever screamed the loudest -- Congress or special interest groups. A license to operate a radio station was practically a license to coin money. But to get on the air, you had to concede to the power of the FCC commissioners, who were appointed by the President.

Some of these artificial rules were actually for the public good. The rule limiting ownership of broadcast stations to seven of the same type (up to 21 AM, FM, TV; seven each) prevented big buck owners from monopolizing the public's ear. After all, would you want every station on the dial to sound the same? Oh. You say it does.

The maximum number of stations was recently raised to 12, by the way, reflecting today's economic conditions and the inability of AM-only operations to turn a decent profit. There had to be a way to turn the tide of other media -- print, cable, TV, the VCR, movies and so forth.

Now the pressure of the marketplace has prevailed. And now every station on the dial sounds the same. Do I hear an echo?

Some, like University of Texas law professor Lucas A. Powe, Jr., would do away with all FCC regulations. The public interest, Powe feels, should be entrusted to the highest bidder. Further, says Powe, there is no difference between radio stations and newspapers, and both deserve equal First Amendment protection.

In a recent book on just this subject, he points out that a station that offends the government can be silenced by a revocation of its license. Or, by force, as pirate broadcaster Alan Weiner found out a couple of months ago when Radio New York International was yanked from the air by the FCC and Coast Guard. At least Weiner had the good sense not to pick a frequency that interfered with some me-too talk show. He *really* could have been in trouble then.

As must be obvious by now, I feel that allowing the highest bidder to occupy a frequency in a city is a poor idea. There are fundamental differences between the print and broadcast media, besides the obvious.

It costs much more to build and operate a radio station which is going to turn a profit and not just satisfy the urges of a pre-pubescent DJ. The broadcast media is, to the American public, an entertainment medium -- not an informational one. Informational shows monopolize segments of time larger than the attention span of the average listener. Unless we are interested in the one-out-of-a-hundred programs, we are likely to tune out.

The highest bidder is not likely to turn out these programs. The highest bidder is likely to turn out fluff, sex, violence, rock and roll and no film at 11. That, of course, is what attracts listeners and sells commercials.

Keep in mind that the media is selling us to the advertisers.

Finally, a station is granted a segment of the radio spectrum. That spectrum is a public resource.

A newspaper limited primarily by economic forces does not have to apply for space. Nothing short of radio anarchy is going to change this situation, and no one would be better served by stations taking to the air on any frequency by any method -- AM, FM, TV, Morse code, or whatever. That is precisely why Alan Weiner and his friend Ivan Rothstein were prevented from rolling their own.

That raucous music, which causes so much co-channel interference or splatter has given way to talk shows. With the loss of the Fairness Doctrine, the programs may at least be more interesting to listen to.

So, what should the FCC be doing to provide for the public interest?

It should continue to allocate and designate frequencies. It should not be forced to enforce the Fairness Doctrine (if Congress ever succeeds in voting it into law). The FCC's statement that the Doctrine "has actually had the net effect of reducing, rather than enhancing, the discussion of controversial issues of public importance [resulting in] excessive and unnecessary government intervention into the editorial processes of broadcast journalists" is quite accurate.

The FCC should not concerned itself with "the seven dirty words" and other obscenities, which should be dealt with by both the local marketplace and the courts. The highest court of the land has difficulty in defining obscenity; the four FCC commissioners should not be called on to make decisions where seven legal experts fail to agree.

AM DXers will find both cheers and jeers in the FCC's recent actions. Those who count frequency or call letter changes in their DX count have seen their numbers jump. Long haul DXing, however, has been curbed by the loss of the so-called clear channels to low powered locals. On the other hand, some NSP (no silent period) pests can now sign off on Sunday mornings, or, in the case of a few, leave the air each night after midnight. Best of all, that raucous music, which causes so much co-channel interference or splatter has given way to talk shows. With the loss of the Fairness Doctrine, the programs may at least be more interesting to listen to.

The FCC also quietly shelved plans to allow stations on either side of the Mississippi to choose either "W" or "K" call letters. I noticed only one station -- in Arizona -- which took a "W" call. And I still say that call letters should be expanded to six letters to provide for more creative monickers.

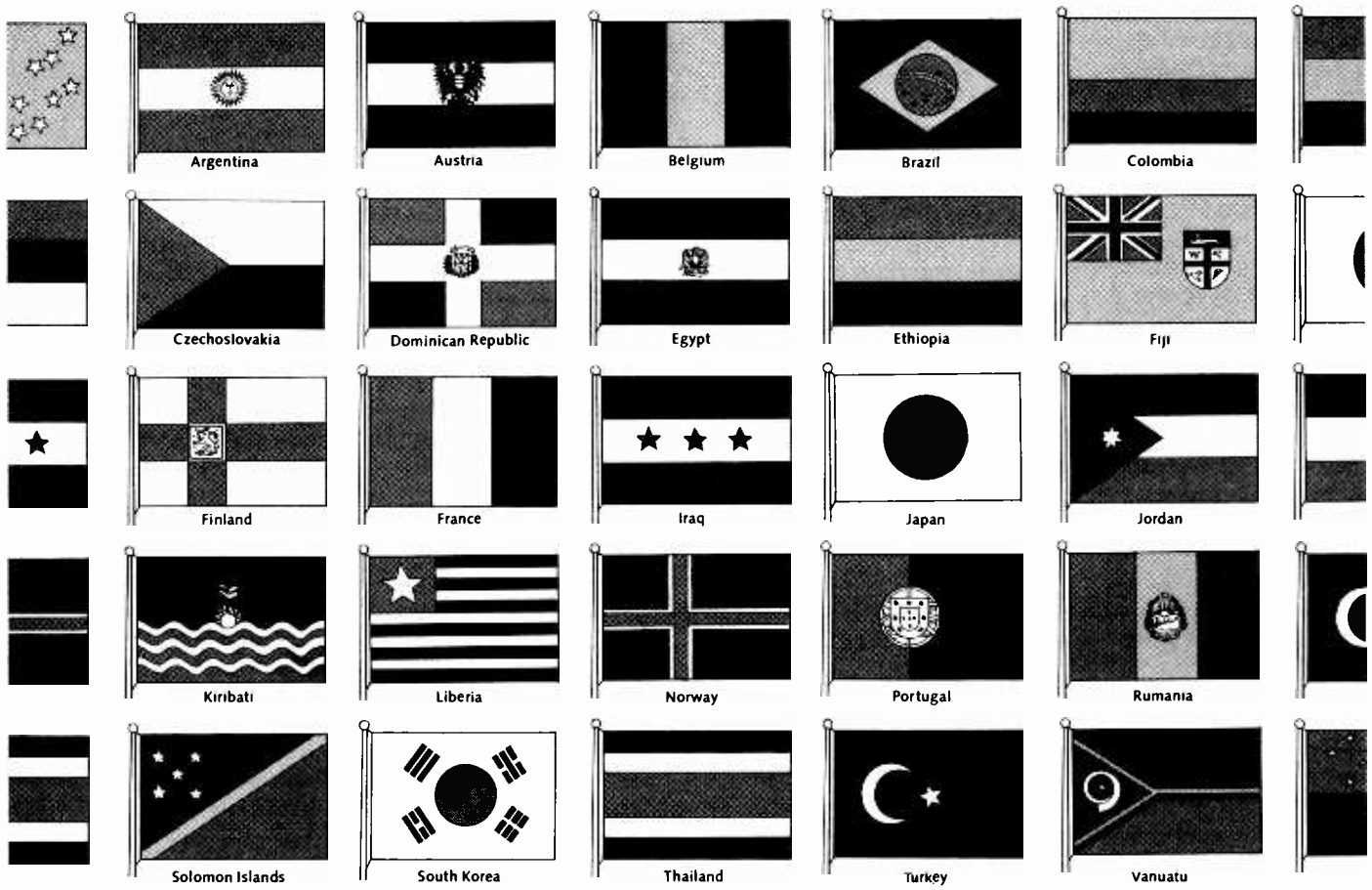
In short, the FCC's role should be reduced to that of a traffic cop on the corner. They should allocate stations, and licenses should be granted in perpetuity. Should another station be guilty of wrongdoing, don't take the law into your own hands, take them to court.

The News Today

TV DXers now have an excellent reference in the WTFDA's *North American Television Data Base.* It includes Mexican, Central American, and Caribbean stations, and a U.S. state/city listing. For more details, send a self addressed, stamped envelope to WTFDA at Box 514, Buffalo, NY 14205-0514. Ask about their translator/low power station list, too.

A few new AM station grants include 650 in Rancho Cordova, CA for 5/5 kW DA/D, 680 in East Helena, Montana, 5 kW ND, days only; 590 in Lawrenceburg, Tennessee 750 W, ND days; graveyarder 1230 to the west side of Houston, Texas 600/600 W; and 1290 to Garrisonville, Virginia, 550 W, ND daytime only. Thanks to *Radio*Philes* for this list

Thanks to Anita McCormick, West Virginia; Pete Wahlquist, California; Bruce Heald, Michigan, and others for calling (from as far away as Jamaica!) or writing. ■



Havana Moon &

Dr. John Santosuosso
P.O. Box 1116
Highland City, FL 33846

Radio NewYork Int'l

Radio NewYork International is, of course, the biggest pirate news since Captain Midnight's challenge of HBO. What does a well-stocked pirate take to sea? According to Florida's Lloyd Scott, equipment on the "Good Ship Sarah" included a Gates BC5P transmitter capable of up to 5 kilowatts of power, an RCA BC7 or BC8 console, and Gates Criterion tape decks. An RNI spokesman claimed that this equipment has either been destroyed of confiscated by the FCC.

Did the FCC have the legal right to board the Honduran-registered, converted Japanese fishing boat? That is hard to say. Treaties coming out of international conferences in 1938, 1947, and 1958 would seem to ban this kind of radio operation. However, the British government, in its feuds with ship-based Radio Caroline and Laser have never claimed the right to seize under any such treaties. Washington did reportedly consult with the Honduran government before confiscating the boat. But given Honduras' heavy dependency on the Reagan administration, it was hardly going to refuse in order to protect a pirate broadcaster.

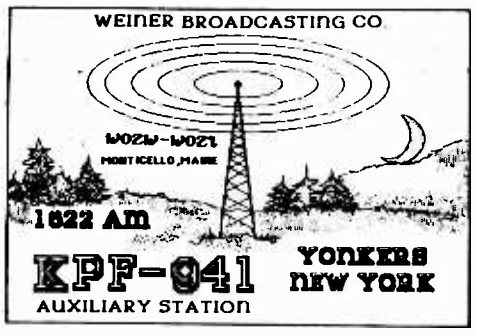
Overlooked by some is that RNI's chief engineer, Alan Weiner, was involved in another unique pirate effort back in 1984. That was KPF-941, which was licensed as a utility operation for the frequency of 1622 kHz. Supposedly, it was to relay material to Weiner's stations in Maine. In fact, it was functioning as a community station for Yonkers, New York. The FCC shut it down, too.

Radio NewYork International was not the first sea-going U.S. pirate. The Rev. Karl McIntire launched Radio Free America in 1973. during the early 1930s, RXKR transmitted from a boat off the coast of California. It was based on the Panamanian-registered S.S. City of Panama.

Those who were lucky enough to hear RNI during its four nights on the air can write for a QSL at 496 La Guardia Place, Suite 451, New York, NY 10012. My thanks to Scott McClellan, Lloyd Scott, John Demmitt, Larry Barr, Havana Moon, and Bob Thomas for the information they provided on RNI.

Thrash Rock on 'MTL

People living on the east coast of Florida might want to try for WMTL (for "metal", as in heavy



RNI's chief engineer, Alan Weiner, was also involved in KFP-941. The FCC shut it down, too.

metal rock music), an FM pirate operating on 91.7 MHz with 45 watts. The station does indeed feature "thrash rock" and is currently inactive but may return to the air. Look for them Friday and Saturday nights eastern time.

Radio Havana Moon?

We have also received a vague report of a pirate calling itself Radio Havana Moon. The authentic Havana Moon denies any responsibility for it.

Cuban Radio War

The radio war with Cuba continues as that nation has been firing up 300 kW of power on both 1040 and 1160 kHz. All broadcasts have been for special Radio Taino (Tour Radio) broadcasts. While some transmissions have featured baseball games and tourist information, other programs are "Radio Lincoln" in all but name. On broadcast featured a report on how the CIA sought to subvert the Cuban economy.

Radio Lincoln was the feared Cuban radio retaliation for the Voice of America's Radio Marti, which so offended Fidel Castro by using the name of a great Cuban hero.

Interestingly enough, the FCC now seems to have changed its policy, admitting that their broadcasts are indeed out of the ordinary and are running at up to 300 kWs. The Cubans do have the capability of running up to 500 kW on at least four channels but even at the current power rating, several American stations have complained of interference.

Numbers on CBS?

Speaking of Cuba, if you caught the CBS Evening News back on July 26 and were quick enough, you would have seen what appeared to be a 5-digit numbers transmission. It was included in a report on a series of Cuban TV stations alleging CIA activity in Cuba.

Voz Popular

The Guatemalan clandestine, La Voz Popular, has been heard in Florida, but only through heavy QRM. If you are looking for this one, try UTC Saturdays between 0015 and 0045 in the vicinity of 6950 kHz.

Due to the press of breaking news, several other features, including a promised report on Caroline, will have to wait until next time. My congratulations to Scott McClellan on a job well done. Scott, I'll always be indebted to you for your hard work and dedication. You are a real pro.

And now, intrigue on your pager with Havana Moon.

Numbers on Your Pager

Intrigue, as my past and current readers are well aware of, often presents its "darker" side on the most unexpected times and frequencies.

The frequency of 35.24 MHz (used for "wide area" paging services) boasts some of the most intriguing (?) as well as downright boring listening of any frequency.

Obviously, there are other "common carrier paging frequencies" that are equally interesting (?), like 152.24 MHz. I only mention 35.24 Hz because it is the frequency on my "voice pager."

"Punch" up this frequency on your scanner and listen for as long as you can tolerate the various and sundry sounds of digital transmissions.

In between the annoying sounds of "digital" transmissions you'll find the typical "Diane-call-Alex" messages. And if you are not completely bored after a few minutes, continue to listen. You might just be amazed. A small percentage of the messages defy explanation by all but the sender and receiver and perhaps -- just perhaps -- the super spooks of the NSA.

The most common messages I have heard are 4 or 5 number groups transmitted by means of a tone (not pulse dialing) phone. Various law enforcement officials are well aware of these transmissions and suspect that -- in some instances -- these are "code groups" that pertain to narcotics traffic.

A Drug Enforcement Agency (DEA) official tells me that the "pager and pay phone gimmick" is of great concern. The transmissions are never sent from a home phone -- a different pay phone is used each time and the time of the transmissions vary.

Our very own FCC, when queried about these types of messages, claimed *no knowledge* of encypted traffic on "common carrier pager frequencies" directed to pager users. And it was the FCC spokesperson who used the term *encrypted*. They did, however, pass on a "thank you for your concern" statement, ending our brief phone conversation.

There's no question that these four or five numbers have meaning. I -- on occasion -- purposely do not hit my reset button whenever I receive a message. I like to hear what's going on until the "digital" gets on my nerves. I've even heard various number groups on my own pager although they *were not* directed to me.

It only takes a few minutes to learn the distinctive sounds of the various numbers.

Recently, a group of five digits from another pager threw me a curve. I was having lunch with a short-time short-time acquaintance when very suddenly Vivian's (not her real name) pager burst forth with one of those mysterious tone messages. The group: 47211.

Although there was no apparent surprise on Vivian's face, her eyes were a dead giveaway. The pupils dilated rapidly and it was obvious Vivian was either not expecting a message at that time or that I was simply not expected to know what was happening.

Featured Frequencies

A Tequesta, Florida monitor reports German "numbers" on 6995 kHz at 0300 UTC. "Signals are of awesome strength," say the monitor. This same person also reports "local sounding" 5-digit Spanish numbers transmissions at 1000 UTC each morning on 4030 kHz. Thanks for the report, Tequesta.

Until the next time, *Buena Suerte Amigos.* ■

frequency SECTION

The MT Monitoring Team

Joe Hanlon, PA

Rich Foerster, NE

Greg Jordan, NC

LEGEND:

- The first four digits of an entry are the broadcast start time in UTC.
- The second four digits represent the end time.
- In the space between the end time and the station name is the broadcast schedule.
  S=Sunday M=Monday T=Tuesday W=Wednesday
  H=Thursday F=Friday A=Saturday

If there is no entry, the broadcasts are heard daily. If, for example, there is an entry of "M," the broadcast would be heard only on Mondays. An entry of "M,W,F" would mean Mondays, Wednesdays and Fridays only. "M-F" would mean Mondays through Fridays. "TEN" indicates a tentative schedule and "TES" a test transmission.

- The last entry on a line is the frequency. Codes here include "SSB" which indicates a Single Sideband transmission, and "v" for a frequency that varies.
- Frequencies in bold are most likely to be heard regularly in North America.

We suggest that you begin with the lower frequencies that a station is broadcasting on and work your way up the dial. Remember that there is no guarantee that a station will be audible on any given day. Reception conditions can change rapidly, though, and if it is not audible one night, it may well be on another.

A Word of Explanation

This month marks a departure in philosophy for the MT Frequency Section. Rather than incorporating any published frequencies and schedules, we are paring the list down to only those frequencies actually heard by our monitors. These are the active frequencies which should be audible in the United States. If you don't find the direction we are moving to be helpful please let us know, as our only goal is to make the frequency listings best serve the needs of our readers.

0000 UTC [8:00 PM EDT/5:00 PM PDT]

0000-0015	Voice of People of Kampuchea	9693, 11938
0000-0025	Kol Israel	**9435, 9855, 11610**
0000-0030	BBC, England	**5975, 6005, 6120, 6175, 7325, 9410, 9515, 9590, 9915, 11955**
0000-0030	Radio Berlin International..	**6080, 9730**
0000-0030	Radio Canada International..	**5960, 9755**
0000-0030 M	Radio Norway International..	**9590, 9610**
0000-0045	WYFR, Florida	**11885**
0000-0050	Radio Pyongyang,North Korea	15140, 15160
0000-0100	Armed Forces Radio and TV..	**6030, 15345**
0000-0100	CBC Northern Quebec Svce....	**6195, 9625**
0000-0100	CFCX, Montreal, Canada	6005
0000-0100	CFRX, Toronto, Canada	6070
0000-0100	CFVP, Calgary, Canada	6030
0000-0100	CHNX, Halifax, Canada	6130
0000-0100	CKFX, Vancouver, Canada	6080
0000-0100	KSDA, Guam (AWR)	15115
0000-0100	KVOH, California	**17775**
0000-0100	KYOI, Saipan	15405
0000-0100	Radio Australia	**15320, 15395, 15140, 17795**
0000-0100	Radio Baghdad, Iraq	**11705**
0000-0100	Radio Beijing,China	**15445**
0000-0100	Radio Discovery,Domin. Rep.	15045
0000-0100v	Radio Dublin International..	6910
0000-0100	Radio Havana Cuba	**6090, 9655**
0000-0100	Radio Moscow	**6000, 7115, 71355, 7165, 7185, 9655, 15425**
0000-0100	Radio Moscow World Serv....	**11845**
0000-0100	RTL Luxembourg	**6090**
0000-0100	Spanish Foreign Radio, Spain	**9630, 11880**
0000-0100	Voice of America	**5995, 6130, 9455, 9650, 9775, 9815, 11580, 11695, 11740, 15205**
0000-0100v	Voice of Nicaragua	6015
0000-0100	WCSN, Boston, MA	**11980**
0000-0100	WINB, Pennsylvania	15145
0000-0100	WHRI, Indiana	**11770**
0000-0100	WRNO Worldwide	**7355**
0030-0100	BBC, England	**5975, 6005, 6120, 6175, 7325, 9515, 9590, 9915**
0030-0100	HCJB, Ecuador	**9875, 11775, 11910, 15155**
0030-0100	Radio Belize	**3285**
0030-0100 W,A	Radio Budapest Hungary	9835, **11910**
0030-0100 S,M	Radio Canada International	**5960, 9755**
0030-0100 T-A	Radio Portugal	**9680**
0045-0100 M	Radio Cultural, Guatemala...	**3300**
0050-0100	Vatican Radio	**6105, 9605, 11780**

0100 UTC [9:00 PM EDT/6:00 PM PDT]

0100-0115	Vatican Radio	**6150, 9605, 11780**
0100-0120	RAI, Italy	**6010,** 9575
0100-0124	Kol Israel	**9435, 9855, 11610**
0100-0130	HCJB, Ecuador	**9875, 11775, 11910, 15155**
0100-0130 T-A	Radio Budapest, Hungary	**6025, 9635**
0100-0130	WINB, Pennsylvania	**15145**
0100-0145	Radio Baghdad, Iraq	**11705**
0100-0150	Deutsche Welle, West Germany	**6040, 6085, 6145, 9565**
0100-0200	Armed Forces Radio and TV...	**6030, 15345**
0100-0200	BBC, England	**5975, 6005, 6120, 6175, 7325, 9515, 9590, 9915**
0100-0200	CBC Northern Quebec Srvc....	**6195, 9625**
0100-0200	CFCX, Montreal, Canada	6005
0100-0200	CFRX, Toronto, Canada	6070
0100-0200	CFVP, Calgary, Canada	6030
0100-0200	CHNX, Halifax, Canada	6130
0100-0200	CKFX, Vancouver, Canada	6080
0100-0200	KVOH, California	**9485**
0100-0200	Radio Australia	**15160, 15320, 15395, 17715, 17795**
0100-0200	Radio Belize	**3285**
0100-0200	Radio Canada International..	**5960, 9755, 11845, 9535, 11940**
0100-0200 M	Radio Cultural, Guatemala...	**3300**
0100-0200	Radio For Peace, Costa Rica.	**7380**
0100-0200	Radio Havana Cuba	**9655**
0100-0200	Radio Luxembourg	**6090**
0100-0200	Radio Moscow	**6000, 6070, 6170, 7115, 7135, 7165, 7185, 7290, 7400, 9530, 15245, 15425**
0100-0200	Radio Prague, Czechoslovakia	**5930, 6055, 7345**
0100-0200	Spanish Foreign Radio, Spain	**9630, 11880**
0100-0200	Voice of America	**5995, 6130, 7205, 9455, 9650, 9775, 9815, 11580, 11740, 15205**
0100-0200	WCSN, Boston, Mass	**11980**
0100-0200	WHRI, Indiana	**9850**
0100-0200	WINB, Pennsylvania	**15145**
0100-0200	WRNO Worldwide	**7355**
0100-0200	WYFR, Florida	**9680**
0115-0200	Radio Berlin International..	**6080**
0130-0140	Voice of Greece	**7430, 9420**
0130-0200	HCJB, Ecuador	**9875, 11775, 15155**
0130-0200	Radio Austria International.	**9550**
0145-0200	Radio Berlin International..	**6125**

0200 UTC [10:00 PM EDT/7:00 PM PDT]

0200-0210	Radio France Int'l	**5950, 6055, 9790**
0200-0215	Radio Budapest, Hungary	**9835**
0200-0230	BBC, England	**5975, 6005, 6120, 6175, 7325, 9515, 9590, 9915**
0200-0230	Radio Kiev, Ukraine SSR	**7150, 7205, 7260, 11790, 13645**
0200-0230	Swiss Radio International...	**5965, 6135, 9725, 9885**
0200-0250	Deutsche Welle, W. Germany..	**7285**
0200-0256	Radio RSA, South Africa	**6010, 9615**
0200-0300	Armed Forces Radio and TV...	**6030, 15345**
0200-0300	CBC Northern Quebec Service.	**6195, 9625**
0200-0300	HCJB, Ecuador	**6205, 9875, 11775**
0200-0300	Radio Australia	**17795**
0200-0300	Radio Bras, Brazil	**11745**
0200-0300	Radio Bucharest, Romania	**5990, 6155, 9570**
0200-0300	Radio Cairo, Egypt	**9475, 9675**
0200-0300	Radio Havana Cuba	**6140, 9655**
0200-0300	Radio Moscow, U.S.S.R	**6000, 6070, 6170, 7115, 7165, 7185, 7290, 9530, 12050, 15425**
0200-0300	Radio Polonia, Poland	**6095, 7270, 9525, 15120**
0200-0300	Voice of America	**5995, 6130, 7205, 9455, 9650, 9775**
0200-0300	Voice of Free China, Taiwan.	**5985**
0200-0300	WCSN, Boston, Mass	**9815**
0200-0300	WHRI, Indiana	**9850**
0200-0300 M	World Music Radio	6910
0200-0300	WRNO Worldwide	**7355**
0230-0300	BBC, England	**5975, 6005, 6120, 6175, 7325, 9515, 9915**
0230-0300	Radio Netherlands	**6020, 6165, 9590**
0230-0300	Radio Sweden Int'l	**9695**
0230-0300	Radio Tirana Albania	**7065, 9760**
0250-0259	Radio Yerevan, Armenian SSR	**11790, 13645**

frequency SECTION

0300 UTC [11:00 PM EDT/8:00 PM PDT]

0300-0310	CBC Northern Quebec Service.	**6195, 9625**
0300-0315 W,A	Radio Budapest.....	**6025**
0300-0325	Radio Netherland.....	**6020, 6165**
		9590, 11730
0300-0330	BBC, England.....	**5975, 6005**
		6120, 6175
		6195, 7160
		7325, 9915
0300-0330 T-A	Radio Portugal.....	**9705**
0300-0350	Deutsche Welle, West Germany	**6010, 6045**
		9545, 9700
0300-0350	Voice of Turkey.....	**9560**
0300-0400	Armed Forces Radio and TV...	**6030, 15345**
0300-0400	CFCX, Montreal, Canada.....	6005
0300-0400	CFRX, Toronto, Canada.....	6070
0300-0400	CFVP, Calgary, Canada.....	6030
0300-0400	CHNX, Halifax, Canada.....	6130
0300-0400	CKFX, Vancouver, Canada.....	6080
0300-0400	HCJB, Ecuador.....	**6205, 9875**
		11775
0300-0400	Radio Australia.....	**15160, 15240**
		15320, 17795
0300-0400	Radio Cultural, Guatemala...	**3300**
0300-0400	WHRI, Indiana.....	**7355**
0300-0400	Radio Havana Cuba.....	**6140, 9655**
0300-0400	Radio Japan.....	**5960**
0300-0400	Radio Moscow.....	**6000, 6170**
		7150, 7165
		7185, 7240
0300-0400	Radio Polonia, Poland.....	**6095, 7270**
0300-0400	Radio Prague, Czechoslovakia	**5930, 5980**
		6120, 7345
0300-0400	Radio RSA, South Africa.....	**3230, 7270**
		9585
0300-0400	Radio Sofia Bulgaria.....	**7115**
0300-0400	Trans World Radio, Bonaire..	**9535**
0300-0400	Voice of America.....	**6035, 7280**
		9455, 9575
0300-0400	Voz Evengelica, Honduras....	**4820**
0300-0400	WCSN, Boston, Mass.....	**9815**
0300-0400	WRNO Worldwide.....	**6185**
0310-0330	Vatican Radio.....	6150
0330-0400	Radio France International..	**6055, 7135**
		7175, **9800**
0330-0400 M	CBC Northern Quebec Service.	**6195, 9625**
0330-0400	BBC, England.....	**5975, 6175**
0330-0400	Radio Havana Cuba.....	**6140, 9655**
0340-0400	Voice of Greece.....	**7430, 9420**

0400 UTC [12:00 PM EDT/9:00 PM PDT]

0400-0405	RAI, Italy.....	**9710, 11910**
0400-0410	Voice of Kenya.....	6090
0400-0415	Kol Israel.....	**9435**
		9815, 9855
		11585
0400-0415	Radio Berlin Int'l,E.Germany	**9560, 9620**
0400-0415	Radio Cultural, Guatemala...	**3300**
0400-0425	Radio Netherlands.....	**7290, 9895**
0400-0425	Radio RSA, South Africa.....	**3230, 7270**
		9585
0400-0430	BBC, London, England.....	**3955, 5975**
		6005, 6175
		6195, 7160
		7185, 9410
		12095
0400-0430	Radio Bucharest, Romania....	**9510, 9570**
		11810, 11940
0400-0430 M	Radio Norway International..	**9600**
0400-0430	Swiss Radio International...	**6135, 9725**
		9885, 12035
0400-0430	Trans World Radio, Bonaire..	**9535**
0400-0500	ABC, Perth, Australia.....	15425
0400-0500	Armed Forces Radio and TV...	**6030, 15345**
0400-0500	Capital Radio, South Africa.	3927, 3930
		7149
0400-0500	CBC Northern Quebec Service.	**6195, 9625**
0400-0500	CFCX, Montreal, Canada.....	6005
0400-0500	CFRX, Toronto, Canada.....	6070
0400-0500	CFVP, Calgary, Canada.....	6030
0400-0500	CHNX, Halifax, Canada.....	6130
0400-0500	CKFX, Vancouver, Canada.....	6080
0400-0500	HCJB, Ecuador.....	**6205, 9870**
		11775
0400-0500	Radio Australia.....	**11910, 11945**
		15160, 15240
		15320, 15395
		17715, 17750
		17795
0400-0500	Radio Belize.....	**3285**
0400-0500 T-S	Radio Dublin International..	6910
0400-0500	Rádio Havana Cuba.....	**5965, 6035**
		6090, 6140
		9655
0400-0500	Radio Moscow World Service.	**7165, 9640**
		9600, 9685
		9765, 11670
		11845, 13605
		13645, 15230
		15425, 17835
		17850, 17860
0400-0500	Radio New Zealand.....	**11780**
0400-0500	Radio Pyongyang, N.Korea...	15140, 15160
		15180
0400-0500	Radio Uganda.....	4976, 5026
0400-0500	RAE, Argentina.....	9690, 11710
0400-0500	VLW 15, Waneroom, Australia	15425
0400-0500	Voice of America.....	**3990, 5995**
		7200, 9575
		9670, 11925
0400-0500	WCSN, Boston, Mass.....	**9465**
0400-0500	WHRI, Indiana.....	**7400**
0400-0500v M	World Music Radio.....	6910
0400-0500	WRNO Worldwide.....	**6185**
0400-0500	WYFR, Florida.....	**11580**
0415-0430	Radio France International..	**6055, 7135**
		7175, 7280
		9550, 9790
		9800, 11700
		11995
0425-0440	RAI, Italy.....	5980, **7275**
0430-0500	BBC, London, England.....	**5975, 6195**
		7160, 7185
		9410, 9510
		12095
0430-0455	Radio Tirana Albania.....	**9480,** 11835
0430-0500	Deutsche Welle, W. Germany..	**7150, 7225**
		9565, 9765
0430-0500	Radio Austria International.	6155, **9550**
		11805
0430-0500	Radio Finland.....	**6120, 11715**
		11755
0430-0500	Radio Truth, S. Africa.....	5015
0430-0500	TWR, Swaziland.....	**7210**

0500 UTC [1:00 AM EDT/10:00 PM PDT]

0500-0505	Radio Belize.....	3285
0500-0510	CBC Northern Quebec Service	**6195, 9625**
0500-0510	Radio Lesotho.....	4800
0500-0515	Vatican Radio.....	**9645, 15190**
0500-0530	BBC, London.....	**5950, 5975**
		6005, 6190
		6195, 7160
		7185, 9410
		9510, 9580
		9600, 12095
0500-0530	Capital Radio, S. Africa....	3927.5
0500-0530 M	Radio Norway International.	**11865**
0500-0530 S,M	Trans World Radio, Bonaire..	**9535**
0500-0550	Deutsche Welle.....	**5960, 6120**
		6130, 9635
		9700
0500-0600	ABC, Melbourne, Australia..	15330
0500-0600	ABC, Perth, Australia.....	15425
0500-0600	Armed Forces Radio and TV...	**6030, 15330**
		15345
0500-0600	CFCX, Montreal, Canada.....	6005
0500-0600	CFRX, Toronto, Canada.....	6070
0500-0600	CFVP, Calgary, Canada.....	6030
0500-0600	CHNX, Halifax, Canada.....	6130
0500-0600	CKFX, Vancouver, Canada.....	6080
0500-0600	HCJB, Quito, Ecuador.....	**6205, 9870**
		11775
0500-0600	KYOI, Saipan.....	15190
0500-0600	Radio Australia.....	**11910, 15160**
		15240, 15395
		17715, 17750
		17795
0500-0600v	Radio Dublin International..	6910
0500-0600	Radio Havana Cuba.....	**5965, 6035**
		9655
0500-0600	Radio Korea.....	**6060, 9570**
0500-0600	Radio Moscow.....	**12050, 13605**
		13645
0500-0600	R. New Zealand, Wellington	11780
0500-0600	Radio Uganda.....	4976, 5026
0500-0600 S	Radio Zambia.....	11880
0500-0600	SBC Radio 1, Singapore.....	11940
0500-0600	Soloman Islands Bcasting Co	5020
0500-0600	Spanish Foreign Radio.....	**6125**
0500-0600	TWR, Swaziland.....	7210
0500-0600	VLW 15, Lyndhurst,Australia	15230
0500-0600	VLW 15, Waneroo, Australia.	15425
0500-0600	Voice of America.....	**5995, 6035**
		7200, 7280
		9575, 9670
		9760
0500-0600	Voice of Nicaragua.....	6015
0500-0600	Voice of Nigeria, Lagos.....	**7255**
0500-0600	WCSN, Boston, Mass.....	**9465**
0500-0600	WHRI, Indiana.....	**7400**
0500-0600v M	World Music Radio.....	6910
0500-0600 S	WRNO Worldwide.....	**6185**
0500-0600	WYFR, Florida.....	**7355, 11580**
0515-0530	Radio Canada Int'l,Montreal	**6050, 6140**
		7295, 9750
		11840, 15180
0530-0600	BBC, London.....	**5950, 5975**
		6190, 7160
		9410, 9510
		9580, 12005
0530-0600	Radio Cameroon.....	4850
0530-0600	Radio Netherland.....	**6165, 9715**
0530-0600	UAE Radio, Dubai.....	17775, 17830
		21700
0530-0600	WSZO, Marshal Island.....	4970
0545-0600 M-F	Radio Canada Int'l,Montreal	**6050, 6140**
		7295, 9750
		11840

0600 UTC [2:00 AM EST/11:00 PM PST]

0600-0610	Ghana Radio.....	**4915**
0600-0610	Voice of Kenya.....	4808, 6090
0620 0630	Vatican Radio.....	**6185, 9645**
0600-0625	Radio Netherland.....	**6165, 9715**
0600-0630	Radio Australia.....	**11910, 11945**
		15160, 15315
		15395, 17795
0600-0645	WYFR, Florida.....	**6065, 7355**
		9680, 9852
0600-0700	Armed Forces Radio and TV...	**6030**
0600-0700	BBC, London.....	3975, **5900**
		5950, 5975
		6050, 6195
		7105, 7150
		7185, 9410
		9515, **9600**
		9640, 11760
		12095
0600-0700	CFCX, Montreal, Canada.....	6005
0600-0700	CFRX, Toronto, Canada.....	6070
0600-0700	CFVP, Calgary, Canada.....	6030
0600-0700	CKFX, Vancouver, Canada.....	6080
0600-0700	CHNX, Halifax, Canada.....	6130
0600-0700	GBC-2, Accra, Ghana.....	**3366**
0600-0700	HCJB, Quito, Ecuador.....	**6205, 9870**
		11775
0600-0700	King of Hope, Lebanon.....	6280
0600-0700	KVOH, California.....	6005
0600-0700	KYOI, Saipan.....	15190
0600-0700	Radio Cook Islands.....	11760
0600-0700	Radio Havana Cuba.....	**9525**
0600-0700	Radio Moscow.....	**9765, 12050**
		13645
0600-0700	Radio New Zealand Int'l....	**11780**
0600-0700	Radio Pyongyang, N. Korea..	13650, 13680
0600-0700 S	Radio Zambia.....	11880
0600-0700	SBC Radio 1, Singapore.....	11940
0600-0700	Soloman Islands Bcasting Co.	5020
0600-0700	VLQ 9, Brisbane, Australia..	9660
0600-0700	VLW 15, Lyndhurst,Australia	15230
0600-0700	VLW 15, Waneroo, Australia.	15425
0600-0700	Voice of America.....	**5995, 6080**
		6125, 9530
		9635, 9550
		9670

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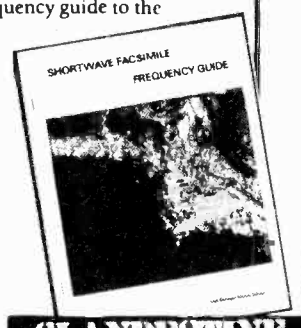

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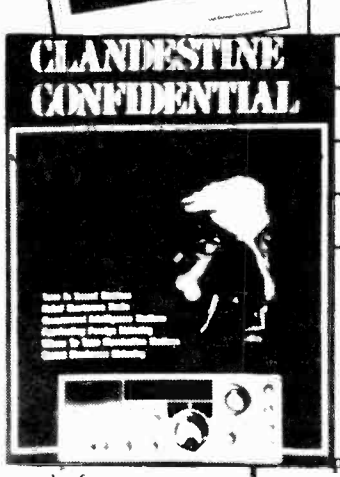

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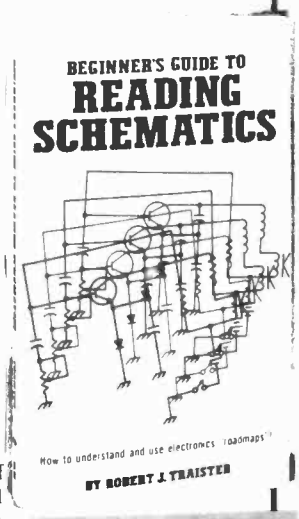

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0600-0700		Voice of Asia, Taiwan.....	7285
0600-0700		Voice of Malaysia.....	6175, 9750
			15295
0600-0700		WCSN, Boston, Mass.....	**9465**
0600-0700		WHRI, Indiana.....	**9620**
0600-0700	S	WRNO Worldwide.....	**6185**
0600-0700		WSZO, Marsall Island.....	4970
0600-0700	S	World Music Radio.....	6910
0615-0700		Deutsche Welle, W. Germany..	**9625, 9700**
			11765
0620-0630		Vatican Radio.....	**6248, 9645**
0625-0700		TWR, Monaco.....	**7105**
0630-0700		Radio Australia.....	**11945, 15160**
			15240, 15315
			15395, **17715**
			17750
0630-0655		Radio Finland.....	6120, **9560**
			11755
0630-0700		Radio Polonia.....	**9675**
0630-0700		Radio RSA, South Africa.....	5980, **9585**
			11900
0630-0700		Radio Sofia, Bulgaria.....	9700, **11720**
0630-0700		Radio Tirana.....	7065
0630-0700		Swiss Radio International...	**6165, 9535**
0645-0700	M-F	HCJB, Quito, Ecuador.....	**9845**

0700 UTC [3:00 AM EDT/12:00 AM PDT]

0700-0712		Radio Bucharest, Romania...	11940, 15250
			15335, 17790
			17805, 21665
0700-0715	A	Radio Finland.....	**11755**
0700-0730		Burma Broadcasting Corp.....	9730
0700-0730		BBC, London.....	**5950, 5975**
			6195, 7120
			7150, 7185
			9410, 9600
			9640, 11860
			12095
0700-0730		Radio Australia.....	**5995, 9655**
			15160, 15240
			15395, 17715
			17750
0700-0730v		Radio Zambia.....	11880v
0700-0735		TWR Swaziland.....	6070
0700-0745		Radio New Zealand Int'l....	**11780**, 15150
0700-0750		Radio Pyongyang.....	11930, 13750
			15340
0700-0800		ABC Brisbane.....	9660
0700-0800		ABC Lyndwurst.....	9680
0700-0800		Armed Forces Radio and TV..	15400
0700-0800		CFCX, Montreal, Canada.....	6005
0700-0800		CFRX, Toronto, Canada.....	6070
0700-0800		CFVP, Calgary, Canada.....	6030
0700-0800		CHNX, Halifax, Canada.....	6130
0700-0800		CKFX, Vancouver, Canada.....	6080
0700-0800	A,S	ELWA, Liberia.....	11830
0700-0800		FEBC, Manila.....	11850, 15350
0700-0800		GBC-2, Accra, Ghana.....	**3366**
0700-0800		HCJB.....	**6130, 9745**
			9845, 11925
			11835
0700-0800		King of Hope, Lebanon.....	6280
0700-0800		KYOI, Saipan.....	15190
0700-0800		NBC, Papua New Guinea.....	4890
0700-0800		Radio Havana Cuba.....	**9525**
0700-0800		Radio Korea.....	**7550, 13670**
0700-0800		Radio Kuwait.....	9560
0700-0800		Radio Thailand.....	9655, 11905
0700-0800		SBC Radio 1, Singapore.....	5010, 11940
0700-0800		Soloman Islands Bcasting Svc	5020
0700-0800		VLM4 Brisbane, Australia....	4920
0700-0800		Voice of Free China.....	**5985**
0700-0800		Voice of Malaysia.....	6175, 9750
			15295
0700-0800		Voice of Nigeria.....	15120, 15185
			17800
0700-0800		WCSN, Boston, Mass.....	**9465**
0700-0800		WHRI, Indiana.....	7355
0700-0800	S	World Music Radio.....	6910
0700-0800	S	WRNO Worldwide.....	**6185**
0700-0800		WSZO, Marsall Island.....	**4940**
0700-0800		WYFR, Florida.....	**6065, 9680**
			11580
0715-0730	M-A	Vatican Radio.....	**11725**, 15190
0715-0800	S	FEBA Radio, Seychelles.....	15120, 17795
0725-0800		TWR Monte Carlo.....	**7105**
0730-0735		All India Radio.....	5990, 6010
			6020, 6050
			7110, 7250
			9610, 11730
			11850, 11935
0730-0800		BBC, London.....	**9410, 9600**
			9640, 11860
			12095
0730-0800	S	CPBS, China.....	11330
0735-0800	M-H	KTWR, Guam.....	**11715**
0730-0800		Radio Australia.....	**5995, 9655**
			11720, 15240
			15395, 17715
			17750
0730-0800		Radio Netherlands.....	**9630, 9715**

0800 UTC [4:00 AM EDT/1:00 AM PDT]

0800-0805		GBC, Accra, Ghana.....	3366
0800-0825	M-F	BRT, Belgium.....	**9880**
0800-0825		Radio Netherlands.....	**9630, 9715**
0800-0825		Voice of Malaysia.....	6175, 9750
			15295
0800-0830		Voice of Islam,Bangladesh..	12030, 15525
0800-0830		HCJB, Quito, Ecuador.....	**6130, 9745**
			9845, 11835
			11925
0800-0845	S	FEBA, Seychelles.....	15120, 17795
0800-0900		AFAN, Antarctica.....	6012
0800-0900		AFRTS Far East Network.....	11750
0800-0900		BBC, London.....	**7150, 9410**
			9600, 9640
			11860
0800-0900	S	BBS, Bhutan.....	6035
0800-0900		CFCX, Montreal, Canada.....	6005
0800-0900		CFRX, Toronto, Canada.....	6070
0800-0900		CFVP, Calgary, Canada.....	6030
0800-0900		CHNX, Halifax, Canada.....	6130
0800-0900		CKFX, Vancouver, Canada.....	6080
0800-0900		FEBC, Manila.....	6030, 11890
			21475
0800-0900		FEN, Tokyo.....	3910, 6155
0800-0900	S,A	GBC-2, Accra, Ghana.....	3366
0800-0900		King of Hope, Lebanon.....	6280
0800-0900		KNLS, Anchor Point, Alaska.	5960
0800-0900		KYOI, Saipan.....	**11900**
0800-0900		Radio Australia.....	**9580, 9655**
			11720, 15395
			17715, 17750
0800-0900		Radio Korea World News Svc..	7275
0800-0900		Radio Kuwait.....	9750
0800-0900		Radio Moscow.....	9795
0800-0900		Radio new Zealand Int'l.....	**9450, 11780**
0800-0900	S	Radio Prague.....	6055, 9505
			11990
0800-0900		Radio Pyongyang, N. Korea..	9530, 13680
			11830, 15160
			15180
0800-0900		RTE Portugal.....	**9670**
0800-0900		SBC Radio 1, Singapore.....	5010, 11940
0800-0900		TWR Monte Carlo.....	**7105**
0800-0900		VLW15, Waneroo, Australia..	**15425**
0800-0900		Voice of Indonesia.....	11790, 15150
0800-0900		Voice of Nigeria.....	**7255**, 15185
0800-0900		WCSN, Boston.....	**9465**
0800-0900		WHRI, Indiana.....	**7355**
0800-0900	S	WRNO Worldwide.....	**6185**
0800-0900		WSZO, Marsall Island.....	**4940**
0800-0900		WYFR, Florida.....	**11580**
0815-0845		Voice of America, Washington	**7175, 9575**
			9750
0830-0840		All India Radio.....	5960, 5970
			5990, 6010
			6020, 6050
			6100, 7110
			7125
0830-0855		Radio Finland, Helsinki.....	6120, 15245
0830-0855	M-A	Radio Netherlands.....	**9630**
0830-0900		Radio Austria Int'l.....	7210, 11840
0830-0900		Radio Beijing.....	9700, 11755
			15440
0830-0900		Radio Prague,Czechoslovakia	11855, 17840
			21705
0830-0900		HCJB, Quito, Ecuador.....	**6130, 9745**
			11925
0830-0900		Radio Netherlands.....	17575, 21485
0830-0900		Swiss Radio International...	**9560, 9885**
			11905, 15570
0847-0852	A	R. Pacific Ocean, Vladivost.	9500, 9620
			9635, 9795
			9810, 11710
			11815, 11910
			12010, 15260
			15295, 17765
			17815, 17850

0900 UTC [5:00 AM EDT/2:00 AM PDT]

0900-0905		Africa Number One, Gabon....	7200, **15200**
0900-0915		BBC, London.....	5975, 6045
			7150, **9410**
			11860, 12095
			15070, 15400
			17790, 18080
0900-0925		Radio Netherlands.....	17575, 21485
0900-0930		Radio Australia.....	**9580, 9655**
			9710, 11720
			15415
0900-0930		Radio Korea.....	7275
0900-0950		Radio Pyongyang N. Korea....	9765, 11830
			13650
0900-1000		ABC, Brisbane, Australia....	4920, 9660
0900-1000		AFRTS.....	**6030, 9530**
0900-1000		CFRX, Toronto.....	**6070**
0900-1000		Deutsche Welle.....	6160, **9690**
			9720
0900-1000		FEBC, Manila.....	11890, 21475
0900-1000		FEN, Tokyo.....	6155
0900-1000		HCJB, Quito, Ecuador.....	**6130, 9745**
			11925
0900-1000		King of Hope, Lebanon.....	6280
0900-1000		KNLS, Alaska.....	5960
0900-1000		KSDA, Guam.....	15440
0900-1000		KYOI, Saipan.....	**11900**
0900-1000		Radio Afghanistan.....	6085, 9590
			15255, 17655
0900-1000		Radio Japan.....	9675, 11875
			11955, 15235
			17810
0900-1000		Radio Moscow.....	9795, **11790**
			11850, 13680
			15375
0900-1000		Radio Tanzania.....	9685v
0900-1000	S	Radio Prague.....	6055, 9505
			11990
0900-1000		SBC Radio 1, Singapore.....	5010, 11940
0900-1000		TWR Monte Carlo.....	7105
0900-1000		VLW15, Waneroo, Australia..	**15425**
0900-1000		Voice of Nigeria.....	15120, 15185
			17800
0900-1000		WCSN, Boston.....	**9465**
0900-1000		WHRI, Indiana.....	**7355**
0900-1000		WRNO Worldwide.....	6185
0900-1000		WSZO, Marsall Island.....	4970
0915-1000		BBC, London.....	**9760, 9750**
			11750
0930-1000		Radio Australia.....	**9580, 9655**
			9710
0930-1000		Radio Budapest Hungary.....	**11910**
0930-0940	M-F	Radio Canada Int'l,Montreal	**5960, 9755**
0930-1000		Radio New Zealand.....	**6100, 9540**

1000 UTC [6:00 AM EDT/3:00 AM PDT]

1000-1025	M-A	BRT, Belgium.....	**15515, 17595**
1000-1030		Kol Israel.....	**11585, 11605**
			15095, 15640
			15650, 17630
			17815
1000-1030		Radio Australia.....	**9580, 9655**
			9770, 15415
1000-1030		Swiss Radio Int'l.....	**9560, 9885**
			11905
1000-1100		ABC, Perth, Australia.....	**9610**
1000-1100		AFRTS.....	**6030, 9530**
			9700
1000-1100		BBC, London.....	**9750, 9760**
			12095, 15400
			17790

frequency SECTION

1000-1100		CFCX, Montreal, Canada.....	6005
1000-1100		CFRX, Toronto, Canada.....	6070
1000-1100		CFVP, Calgary, Canada.....	6030
1000-1100		CHNX, Halifax, Canada.....	6130
1000-1100		CKFX, Vancouver, Canada.....	6080
1000-1100		HCJB, Quito, Ecuador.....	6130, 9745
1000-1100		KYOI, Saipan.....	11900
1000-1100		Radio Korea.....	15575
1000-1100		Radio Moscow.....	6100, 9600
			13710
1000-1100		WHRI, Indiana.....	7355
1000-1100	S	WRNO Worldwide.....	6185
1030-1100		Radio Australia.....	9580, 9770
1030-1100		Radio Netherland.....	6020, 9650
1045-1100		Vatican Radio.....	9645, 11740
1050-1100	M-F	Radio Budapest Hungary.....	11910

1100 UTC [7:00 AM EDT/4:00 AM PDT]

1100-1120		Radio Budapest, Hungary....	11910
1100-1125		Radio France Int'l, Paris..	9790, 11670
			11690, 11845
			15155, 15195
			15300, 15315
			15365, 15435
			17720
1100-1125		Radio Netherland.....	6020, 9650
1100-1130		HCJB, Ecuador.....	6130, 11925
1100-1130		Radio Australia.....	5995, 6080
			7215, 9580
			9710, 9770
			11705, 11800
1100-1130	M-A	Radio Finland.....	11945, 15400
1100-1130		Radio Japan General Service.	6120
1100-1130		Sri Lanka Broadcasting Corp	11835
1100-1130		Voice of America.....	9760, 11715
			15425
1100-1156		Radio RSA, South Africa....	21590
1100-1200		ABC, Brisbane, Australia....	4920
1100-1200		ABC, Perth, Australia.....	9610
1100-1200		AFRTS.....	6030, 9700
			15430
1100-1200		BBC, London.....	5965, 6195
			9510, 9750
			9760, 11750
			11775, 12095
			17790
1100-1200		B.S. Kingdom Saudi Arabia..	11855v
1100-1200		CFCX, Montreal, Canada.....	6005
1100-1200		CFRX, Toronto, Canada.....	6070
1100-1200		CFVP, Calgary, Canada.....	6030
1100-1200		CHNX, Halifax, Canada.....	6130
1100-1200		CKFX, Vancouver, Canada.....	6080
1100-1200		KYOI, Saipan.....	11900
1100-1200		Radio Beijing.....	11855
1100-1200		Radio Moscow.....	9600, 13680
			13710, 13755
			15155, 15225
			15375
1100-1200		Radio New Zealand.....	6100, 9600
1100-1200		Radio Pyongyang, N. Korea...	9977
1100-1200		WCSN, Massachusetts.....	17640
1100-1200		WHRI, Indiana.....	5995
1100-1200	S	WRNO Worldwide.....	9715
1115-1200		TWR, Bonaire.....	11815
1130-1200		Deutsche Welle,W.Germany...	17800
1130-1200		HCJB, Quito, Ecuador.....	11740
1130-1200		Radio Australia.....	6060, 6080
			7215, 9580
			9710, 9770
			11800
1130-1200		Radio Netherland.....	9715, 15560
1130-1200		Trans World Radio Bonaire..	11815
1145-1200		Radio Berlin Intl.....	15240

1200 UTC [8:00 AM EDT/5:00 AM PDT]

1200-1215	M-A	Vatican Radio.....	15190, 17840
			17865, 21485
1200-1215	S	Vatican Radio.....	17840, 21485
1200-1225		Radio Netherland.....	9715, 15560
			17605, 21480
1200-1230		Radio Australia.....	5995, 6060
			6080, 7205
			7215, 9580
			9710, 9770
			11800
1200-1230		Radio Berlin Intl.....	15240
1200-1230		Radio Canada Intl.....	9625, 11855
1200-1230	M-A	Radio Finland.....	11945, 15400
1200-1230		Radio Tashkent.....	11785
1200-1235		All India Radio.....	11620
1200-1235		Radio Ulan Bator Mongolia..	12015
1200-1242		Trans World Radio Bonaire..	11815
1200-1250		Radio Pyongyang, N. Korea...	9977
1200-1300		ABC, Wanneroo, Australia....	9610
1200-1300		AFRTS.....	6030, 9700
			15430
1200-1300		BBC, London.....	6195, 9510
			9750, 11750
			11775, 12095
			15070, 17705
			17790, 18080
1200-1300		CBC Northern Quebec Service.	6065
1200-1300		CFCX, Montreal, Canada.....	6005
1200-1300		CFRX, Toronto, Canada.....	6070
1200-1300		CFVP, Calgary, Canada.....	6030
1200-1300		CHNX, Halifax, Canada.....	6130
1200-1300		CKFX, Vancouver, Canada.....	6080
1200-1300		HCJB, Quito, Ecuador.....	11740, 15115
			17890
1200-1300		KYOI, Saipan.....	11900
1200-1200		Radio Moscow.....	9600, 11655
			13680, 13710
			13755, 15155
			15225, 15255
			15420, 15490
			15550, 15560
			17645, 17820
1200-1300		Voice of America.....	9760, 11715
			15425
1200-1300		WHRI, Indiana.....	5995
1200-1300		WYFR, USA.....	9680
1230-1300		Radio Austria International	15320
1230-1300		Radio Australia.....	6060, 7205
			7215, 9580
1230-1300		Radio Bangladesh.....	15525
1230-1300		Radio Sweden Int'l.....	15190, 17785
1230-1300		Voice of Turkey.....	15255
1235-1245		Voice of Greece.....	15630
1255-1330	A-S	TWR, Bonaire.....	11815

1300 UTC [9:00 AM EDT/6:00 AM PDT]

1300-1330		BBC, London.....	6195, 9510
			11775, 12095
			15070, 17705
			17780, 17790
			18080, 21970
1300-1330		Radio Australia.....	5995, 6060
			6080, 7205
			9580
1300-1330		Radio Bucharest, Romania...	11940, 15250
1300-1330		Radio Finland.....	15400, 11945
1300-1330	S	Radio Norway International.	15310
1300-1337	A-S	TWR, Bonaire.....	11815
1330-1355	S	Radio Finland.....	11945, 15400
1300-1400		ABC Waneroo, Australia.....	9610
1300-1400		AFRTS.....	9700, 15330
1300-1400		CFCX, Montreal, Canada.....	6005
1300-1400		CFRX, Toronto, Canada.....	6070
1300-1400		CFVP, Calgary, Canada.....	6030
1300-1400		CHNX, Halifax, Canada.....	6130
1300-1400		CKFX, Vancouver, Canada.....	6080
1300-1400		CKZU, Vancouver, Canada.....	6160
1300-1400		HCJB, Quito, Ecuador.....	11740, 15115
1300-1400		Radio Beijing.....	9730
1300-1400	S	Radio Canada Int'l.....	11955, 15440
1300-1400		Radio Korea.....	15575
1300-1400		Radio Moscow.....	11840, 13710
			13680, 13755
			15225, 15375
			15420, 15490
			15560, 17645
			17820
1300-1400		Radio RSA, South Africa....	21590
1300-1400		WHRI, Indianapolis.....	11790
1300-1400		WYFR, USA.....	9680, 11830
			15375
1330-1400		BBC, London.....	12095, 15070
			17885, 21710
1330-1355	M-A	BRT, Belgium.....	15515, 15580
1330-1400		Radio Australia.....	9580
1330-1400	S	Radio Finland.....	11945, 15400
1330-1400		Radio Tashkent.....	11785
1330-1400		Swiss Radio International..	11955, 12030
			15570, 17830
1330-1400		U.A.E. Radio.....	15435, 17865
			21605
1337-1400	A	TWR, Bonaire.....	11815, 11740

1400 UTC [10:00 AM EDT/7:00 AM PDT]

1400-1430		Radio Australia.....	9580
1400-1430		Radio Finland.....	15185, 15305
1400-1430	S	Radio Norway International.	15245, 15310
1400-1430		Radio Sweden International.	15345
1400-1500		ABC Perth, Australia.....	9610
1400-1500		AFRTS.....	9700, 15330
			15430
1400-1500		BBC, London.....	12095, 15070
			17705, 17790
			17885
1400-1500		CBC Northern Quebec Service.	9625, 11720
1400-1500		CFCX, Montreal, Canada.....	6005
1400-1500		CFRX, Toronto, Canada.....	6070
1400-1500		CFVP, Calgary, Canada.....	6030
1400-1500		CHNX, Halifax, Canada.....	6130
1400-1500		CKFX, Vancouver, Canada.....	6080
1400-1500		HCJB, Quito, Ecuador.....	11740, 15115
1400-1500	S	Radio Canada International.	11955, 15440
1400-1500		Radio Moscow.....	11840, 13680
			13855, 15375
			15560
1400-1500		Radio RSA, South Africa.....	17825, 21590
1400-1500		TWR, Sri Lanka.....	11825
1400-1500		WHRI, Indiana.....	11790
1400-1500	S	WRNO Worldwide.....	11965
1415-1500		Radio Berlin Int'l.....	15240
1430-1500		Radio Australia.....	9580
1430-1500		Radio Netherland.....	11735, 13770
			15560
1430-1500		Radio Yugoslavia.....	15240
1430-1500		WYFR, USA.....	9680, 11830
			15375
1448-1455		Radio Vatican.....	15090

1500 UTC [11:00 AM EDT/8:00 AM PDT]

1500-1505	M-F	Africa #1, Gabon.....	15200
1500-1530		HCJB, Quito, Ecuador.....	11740, 15115
1500-1530		Radio Netherland.....	13770, 15560
1500-1550		Deutsche Welle.....	17765, 21600
1500-1556		Radio RSA, South Africa....	17825, 21590
1500-1600		AFRTS.....	15330, 15430
1500-1600		BBC, London.....	11750, 12095
			15070, 15400
			17885, 17790
1500-1600	A,S	BBC, London.....	11775, 15260
1500-1600		CBC Northern Quebec Service.	9625, 11720
1500-1600		CFCX, Montreal, Canada.....	6005
1500-1600		CFRX, Toronto, Canada.....	6070
1500-1600		CFVP, Calgary, Canada.....	6030
1500-1600		CKFX, Vancouver, Canada.....	6080
1500-1600		CHNX, Halifax, Canada.....	6130
1500-1600		Radio Australia.....	9580
1500-1600	S	Radio Canada International.	11955, 15440
1500-1600		Radio Japan General Service	21700
1500-1600		Radio Moscow.....	11840, 13755
1500-1600		WHRI, Indiana.....	15105
1500-1600		WRNO Worldwide.....	11965
1500-1600		WYFR, Florida.....	9680, 15375
1510-1520		Vatican Radio.....	15120 USB
1530-1600		R. Prague, Czechoslovakia..	15110
1530-1600		Swiss Radio International..	9885, 15430
			17830
1540-1550		Voice of Greece.....	15630, 17565
1545-1600		Vatican Radio.....	11810, 17730

frequency SECTION

1600 UTC [12:00 PM EDT/9:00 AM PDT]

1600-1630	S	Radio Norway International.	11860
1600-1630		Radio Sweden Int'l.....	15235
1600-1640		UAE Radio.....	11730, 15320
			17775, 17865
1600-1700		AFRTS.....	15330, 15430
1600-1700		BBC, London.....	11750, 11775
			12095, 15070
			15260, 15400
			17880
1600-1700	A	CBC Northern Quebec Service.	9625, 11720
1600-1700		CFCX, Montreal, Canada.....	6005
1600-1700		CHNX, Halifax, Canada.....	6130
1600-1700		CFRX, Toronto, Canada.....	6070
1600-1700		CFVP, Calgary, Canada.....	6030
1600-1700		CKFX, Vancouver, Canada.....	6080
1600-1700		Radio France International.	9860, 11705
			17620
1600-1700		Radio Moscow.....	9765, 9880
			11840, 13755
1600-1700		Voice of America.....	15410, 15580
			15600, 17785
			17800, 17870
1600-1700		WHRI, Indiana.....	15105
1600-1700		WRNO Worldwide.....	11965
1600-1700		WYFR, Florida.....	9535, 11830
			15375, 15440
1645-1700		Radio Berlin Int'l.....	9730

1700 UTC [1:00 PM EDT/10:00 AM PDT]

1700-1715		Kol Israel.....	11585, 13750
			15095
1700-1730		Radio Berlin Int'l.....	9730
1700-1730		Radio Japan.....	5990, 9695
1700-1730	S	Radio Norway International.	11850, 15230
1700-1730		Swiss Radio International...	9535
1700-1745		BBC, England.....	9410, 11775
			12095, 15070
			15260, 15400
1700-1800		AFRTS.....	15330, 15345
			15430
1700-1800		CBC, N. Quebec, Canada....	9625
1700-1800		CFCX, Montreal, Canada.....	6005
1700-1800		CFRX, Toronto, Canada.....	6070
1700-1800		CFVP, Calgary, Canada.....	6030
1700-1800		CHNX, Halifax, Canada.....	6130
1700-1800		CKFX, Vancouver, Canada.....	6080
1700-1800		CKZU, Vancouver, Canada.....	6160
1700-1800		Radio Moscow.....	9625, 9765
			9880, 11840
			11850, 11860
			12030
1700-1800		Radio Zambia.....	9505
1700-1800		Voice of America.....	15410, 15580
			15600, 17785
			17800, 17870
1700-1800		WHRI, Indiana.....	15105
1700-1800		WINB, Pennsylvania.....	15400
1700-1800		WRNO Worldwide.....	15420
1700-1800		WYFR, Florida.....	11580, 11830
1730-1800		Radio Prague, Czechoslovkia	11990, 15190
1730-1800		Radio Surinam.....	17755
1745-1800		BBC, London.....	12095, 15070

1800 UTC [2:00 PM EDT/11:00 AM PDT]

1800-1830		Radio Kiev.....	9600
1800-1830		Radio Mozambique.....	3340, 9620
1800-1830		Radio Prague, Czechoslovakia	9725, 11690
			11990, 15190
1800-1900		Deutsche Welle.....	11785
1800-1850		Radio Nacional do Brasil...	15265
1800-1900		AFRTS.....	15330, 15430
1800-1900		BBC, London.....	9410, 11820
			12095, 15070
			15275, 15400
1800-1900		CBC, N. Quebec Service.....	9625, 11720
1800-1900		CFCX, Montreal, Canada.....	6005
1800-1900		CFRX, Toronto, Canada.....	6070
1800-1900		CFVP, Calgary, Canada.....	6030
1800-1900		CKFX, Vancouver, Canada.....	6080
1800-1900		CKZU, Vancouver.....	6160
1800-1900	M-F	KVOH, California.....	17775
1800-1900	A,S	Radio Canada International.	15260, 17820
1800-1900		Radio Moscow.....	9625, 9765
			9825, 9880
			11690, 11780
			11840, 11850
			11860, 11950
			12030, 13605
1800-1900		Radio Kuwait.....	11665
1800-1900		Voice of America.....	11760, 15580
			15600, 17785
			17800, 17870
1800-1900		WCSN, Boston, Mass.....	21515
1800-1900		WHRI, Indiana.....	15105
1800-1900		WMLK, Bethel, PA.....	9455
1800-1900		WRNO Worldwide.....	15420
1800-1900		WYFR.....	11580, 11830
			11875
1805-1830	A,S	Radio Austria Int'l.....	12015
1830-1855		Radio Finland.....	9610, 11755
1830-1900		Radio Polonia.....	9525, 9675
1830-1900		Radio Sweden Int'l.....	11845
1830-1900		Radio Tirana.....	9480
1830-1900		Swiss Radio International...	9885, 11955
1830-1900		Radio Netherlands.....	9540, 17605
			21685
1830-1900		Radio Sofia, Bulgaria.....	9700, 11720
1830-1900		Spanish Foreign Radio.....	15375
1830-1900		Radio Havana Cuba.....	11795
1840-1900		Voice of Greece.....	11645, 12105
1845-1900		All India Radio.....	11620

1900 UTC [3:00 PM EDT/12:00 PM PDT]

1900-1925		Radio Netherland.....	9540, 17605
			21685
1900-1930		Kol Israel.....	9010, 11610
			11610, 12077
			13725
1900-1930		Radio Berlin Int'l.....	15170
1900-1930		Radio Canada International.	11945, 15260
			15325, 17820
			17875
1900-1930	S	Radio Norway Int'l.....	9590, 11850
			15225
1900-1930		Radio Yugoslavia.....	9620
1900-1930		Spanish Foreign Radio.....	9745
1900-2000		AFRTS.....	15330, 15430
1900-2000		All India Radio.....	11620
1900-2000		BBC, London.....	9410, 9515
			12095, 15070
1900-2000		B.S. Kingdom Saudi Arabia..	9720
1900-2000		CBC Northern Quebec Serv....	9625, 11720
1900-2000		CFCX, Montreal, Canada.....	6005
1900-2000		CFRX, Toronto, Canada.....	6070
1900-2000		CFVP, Calgary, Canada.....	6030
1900-2000		CKFX, Vancouver, Canada.....	6080
1900-2000		CKZU, Vancouver, Canada.....	6160
1900-2000		HCJB, Ecuador.....	17790
1900-2000	M-F	KVOH, California.....	17775
1900-2000		Radio Beijing.....	11560
1900-2000		Radio Havana Cuba.....	11795
1900-2000		Radio Kuwait.....	11665
1900-2000		Radio Moscow.....	9625, 9765
			9825, 11690
			11780, 11840
			11850
1900-2000		Voice of America.....	9760, 11760
			15205, 15410
			15445, 15580
			17785, 17800
			17870
1900-2000		WCSN, Boston, Mass.....	21515
1900-2000		WHRI, Indiana.....	15105
1900-2000		WMLK, Bethel, PA.....	9455
1900-2000		WRNO Worldwide.....	15420
1900-2000		WYFR, Okeechobee, Florida..	11830, 15566
			21525, 21615
1920-1930	M-A	Voice of Greece.....	7430, 9425
			11645
1930-2000		Radio Beijing, China.....	11515
1930-2000		Radio Bucharest, Romania....	9750, 11940
1930-2000		Voice of Islamic Rep. Iran..	9022
1935-1955		RAI, Italy.....	7275, 9710
1950-2000		Vatican Radio.....	7250, 9645

2000 UTC [4:00 PM EDT/1:00 PM PDT]

2000-2010		Vatican Radio.....	7250, 9645
2000-2025		Radio Beijing, China.....	11515
2000-2025		Radio Bucharest, Romania...	11940
2000-2025		Radio Polonia.....	9525
2000-2030		Radio Budapest, Hungary.....	9835, 11910
2000-2030	M-F	Radio Canada International.	9555, 11945
			15325, 17820
			17875
2000-2030	S	Radio Norway International..	9655, 15225
2000-2030		Voice of Islamic Rep. Iran..	9022
2000-2030		WRNO Worldwide.....	15420
2000-2045		All India Radio.....	11620
20000-2050		Voice of Turkey.....	7215
2000-2100		AFRTS.....	15345, 15430
2000-2100		BBC, London.....	6175, 6180
			7325, 9410
			9515, 12095
			15070, 15260
2000-2100		CFCX, Montreal, Canada.....	6005
2000-2100		CFRX, Toronto, Canada.....	6070
2000-2100		CFVP, Calgary, Canada.....	6030
2000-2100		CHNX, Halifax, Canada.....	6130
2000-2100		CKFX, Vancouver, Canada.....	6080
2000-2100		CKZV, Canada.....	6160
2000-2100		KVOH, California.....	17775
2000-2100		Radio Baghdad, Iraq.....	9875
2000-2100	A,S	Radio Canada Int'l.....	11945, 15325
			17820, 17875
2000-2100		Radio Kuwait.....	11665
2000-2100		Radio Moscow.....	9735, 9765
			9825, 11840
			13605
2000-2100		Voice of America.....	9760, 11760
			15410, 15445
			15580, 17800
			17785, 17870
2000-2199		WCSN, Boston, Mass.....	11695
2000-2100		WINB, Pennsylvania.....	15185
2000-2100		WRNO, Worldwide.....	15420
2000-2100		WYFR, Okeechobee, Florida..	9850, 11830
			15566, 21525
2005-2100		Radio Damascus Syria.....	11625, 12085
2015-2100		ELWA, Liberia.....	11830
2015-2100		Radio Cairo, Egypt.....	9670
2025-2045		RAI, Italy.....	11800
2030-2100		IBRA Radio.....	6110
2030-2100		Radio Beijing.....	11515
2030-2100		Radio Netherland.....	9540, 9715
			9895, 11740
2030-2100		Radio Sofia, Bulgaria.....	9700
2030-2100		Spanish Foreign Radio.....	7275
2045-2100		All India Radio.....	9910, 11620
2045-2100		Radio Berlin International.	6125

2100 UTC [5:00 PM EDT/2:00 PM PDT]

2100-2115		Radio Cairo, Egypt.....	9670
2100-2125		BRT, Belgium.....	9675
2100-2125	S-F	CBC Northern Quebec Service.	9625, 11720
2100-2125		Radio Beijing.....	11500, 11515
2100-2125		Radio Netherland.....	9540, 9715
			9895, 11740
2100-2130		Radio Finland.....	6120, 15305
			15400
2100-2130		Radio Austria.....	5945, 11720
2100-2130		Radio Australia.....	15395
2100-2130		Radio Berlin International..	6125
2100-2130		Spanish Foreign Radio.....	7275, 9765
2100-2130		Swiss Radio Int'l.....	9885, 12035
			15570
2100-2145		WINB, Red Lion, Penna.....	15185
2100-2150		Deutsche Welle, W.Germany..	9765
2100-2150		Radio Pyongyang, N. Korea..	11660
2100-2156		Radio RSA.....	5960, 9585
			11900
2100-2200		AFRTS.....	15330, 15345
			15430
2100-2200		All India Radio.....	9910, 11620
2100-2200		BBC, London.....	6005, 6175
			6180, 6195
			7325, 9410
			12095, 15070
			15260

frequency SECTION

1000-1100		CFCX, Montreal, Canada.....	6005
1000-1100		CFRX, Toronto, Canada.....	6070
1000-1100		CFVP, Calgary, Canada.....	6030
1000-1100		CHNX, Halifax, Canada.....	6130
1000-1100		CKFX, Vancouver, Canada.....	6080
1000-1100		HCJB, Quito, Ecuador.....	6130, 9745
1000-1100		KYOI, Saipan.....	11900
1000-1100		Radio Korea.....	15575
1000-1100		Radio Moscow.....	6100, 9600
			13710
1000-1100		WHRI, Indiana.....	7355
1000-1100	S	WRNO Worldwide.....	6185
1030-1100		Radio Australia.....	9580, 9770
1030-1100		Radio Netherland.....	6020, 9650
1045-1100		Vatican Radio.....	9645, 11740
1050-1100	M-F	Radio Budapest Hungary.....	11910

1100 UTC [7:00 AM EDT/4:00 AM PDT]

1100-1120		Radio Budapest, Hungary....	11910
1100-1125		Radio France Int'l, Paris..	9790, 11670
			11690, 11845
			15155, 15195
			15300, 15315
			15365, 15435
			17720
1100-1125		Radio Netherland.....	6020, 9650
1100-1130		HCJB, Ecuador.....	6130, 11925
1100-1130		Radio Australia.....	5995, 6080
			7215, 9580
			9710, 9770
			11705, 11800
1100-1130	M-A	Radio Finland.....	11945, 15400
1100-1130		Radio Japan General Service.	6120
1100-1130		Sri Lanka Broadcasting Corp	11835
1100-1130		Voice of America.....	9760, 11715
			15425
1100-1156		Radio RSA, South Africa....	21590
1100-1200		ABC, Brisbane, Australia....	4920
1100-1200		ABC, Perth, Australia.....	9610
1100-1200		AFRTS.....	6030, 9700
			15430
1100-1200		BBC, London.....	5965, 6195
			9510, 9750
			9760, 11750
			11775, 12095
			17790
1100-1200		B.S. Kingdom Saudi Arabia..	11855v
1100-1200		CFCX, Montreal, Canada.....	6005
1100-1200		CFRX, Toronto, Canada.....	6070
1100-1200		CFVP, Calgary, Canada.....	6030
1100-1200		CHNX, Halifax, Canada.....	6130
1100-1200		CKFX, Vancouver, Canada.....	6080
1100-1200		KYOI, Saipan.....	11900
1100-1200		Radio Beijing.....	11855
1100-1200		Radio Moscow.....	9600, 13680
			13710, 13755
			15155, 15225
			15375
1100-1200		Radio New Zealand.....	6100, 9600
1100-1200		Radio Pyongyang, N. Korea...	9977
1100-1200		WCSN, Massachusetts.....	17640
1100-1200		WHRI, Indiana.....	5995
1100-1200	S	WRNO Worldwide.....	9715
1115-1200		TWR, Bonaire.....	11815
1130-1200		Deutsche Welle,W.Germany...	17800
1130-1200		HCJB, Quito, Ecuador.....	11740
1130-1200		Radio Australia.....	6060, 6080
			7215, 9580
			9710, 9770
			11800
1130-1200		Radio Netherland.....	9715, 15560
1130-1200		Trans World Radio Bonaire..	11815
1145-1200		Radio Berlin Intl.....	15240

1200 UTC [8:00 AM EDT/5:00 AM PDT]

1200-1215	M-A	Vatican Radio.....	15190, 17840
			17865, 21485
1200-1215	S	Vatican Radio.....	17840, 21485
1200-1225		Radio Netherland.....	9715, 15560
			17605, 21480
1200-1230		Radio Australia.....	5995, 6060
			6080, 7205
			7215, 9580
			9710, 9770
			11800
1200-1230		Radio Berlin Intl.....	15240
1200-1230		Radio Canada Intl.....	9625, 11855
1200-1230	M-A	Radio Finland.....	11945, 15400
1200-1230		Radio Tashkent.....	11785
1200-1235		All India Radio.....	11620
1200-1235		Radio Ulan Bator Mongolia..	12015
1200-1242		Trans World Radio Bonaire..	11815
1200-1250		Radio Pyongyang, N. Korea...	9977
1200-1300		ABC, Wanneroo, Australia....	9610
1200-1300		AFRTS.....	6030, 9700
			15430
1200-1300		BBC, London.....	6195, 9510
			9750, 11750
			11775, 12095
			15070, 17705
			17790, 18080
1200-1300		CBC Northern Quebec Service.	6065
1200-1300		CFCX, Montreal, Canada.....	6005
1200-1300		CFRX, Toronto, Canada.....	6070
1200-1300		CFVP, Calgary, Canada.....	6030
1200-1300		CHNX, Halifax, Canada.....	6130
1200-1300		CKFX, Vancouver, Canada.....	6080
1200-1300		HCJB, Quito, Ecuador.....	11740, 15115
			17890
1200-1300		KYOI, Saipan.....	11900
1200-1200		Radio Moscow.....	9600, 11655
			13680, 13710
			13755, 15155
			15225, 15255
			15420, 15490
			15550, 15560
			17645, 17820
1200-1300		Voice of America.....	9760, 11715
			15425
1200-1300		WHRI, Indiana.....	5995
1200-1300		WYFR, USA.....	9680
1230-1300		Radio Austria International	15320
1230-1300		Radio Australia.....	6060, 7205
			7215, 9580
1230-1300		Radio Bangladesh.....	15525
1230-1300		Radio Sweden Int'l.....	15190, 17785
1230-1300		Voice of Turkey.....	15255
1235-1245		Voice of Greece.....	15630
1255-1330	A-S	TWR, Bonaire.....	11815

1300 UTC [9:00 AM EDT/6:00 AM PDT]

1300-1330		BBC, London.....	6195, 9510
			11775, 12095
			15070, 17705
			17780, 17790
			18080, 21970
1300-1330		Radio Australia.....	5995, 6060
			6080, 7205
			9580
1300-1330		Radio Bucharest, Romania...	11940, 15250
1300-1330		Radio Finland.....	15400, 11945
1300-1330	S	Radio Norway International.	15310
1300-1337	A-S	TWR, Bonaire.....	11815
1330-1355	S	Radio Finland.....	11945, 15400
1300-1400		ABC Waneroo, Australia.....	9610
1300-1400		AFRTS.....	9700, 15330
1300-1400		CFCX, Montreal, Canada.....	6005
1300-1400		CFRX, Toronto, Canada.....	6070
1300-1400		CFVP, Calgary, Canada.....	6030
1300-1400		CHNX, Halifax, Canada.....	6130
1300-1400		CKFX, Vancouver, Canada.....	6080
1300-1400		CKZU, Vancouver, Canada.....	6160
1300-1400		HCJB, Quito, Ecuador.....	11740, 15115
1300-1400		Radio Beijing.....	9730
1300-1400	S	Radio Canada Int'l.....	11955, 15440
1300-1400		Radio Korea.....	15575
1300-1400		Radio Moscow.....	11840, 13710
			13680, 13755
			15225, 15375
			15420, 15490
			15560, 17645
			17820
1300-1400		Radio RSA, South Africa....	21590
1300-1400		WHRI, Indianapolis.....	11790
1300-1400		WYFR, USA.....	9680, 11830
			15375
1330-1400		BBC, London.....	12095, 15070
			17885, 21710
1330-1355	M-A	BRT, Belgium.....	15515, 15590
1330-1400		Radio Australia.....	9580
1330-1400	S	Radio Finland.....	11945, 15400
1330-1400		Radio Tashkent.....	11785
1330-1400		Swiss Radio International..	11955, 12030
			15570, 17830
1330-1400		U.A.E. Radio.....	15435, 17865
			21605
1337-1400	A	TWR, Bonaire.....	11815, 11740

1400 UTC [10:00 AM EDT/7:00 AM PDT]

1400-1430		Radio Australia.....	9580
1400-1430		Radio Finland.....	15185, 15305
1400-1430	S	Radio Norway International.	15245, 15310
1400-1430		Radio Sweden International.	15345
1400-1500		ABC Perth, Australia.....	9610
1400-1500		AFRTS.....	9700, 15330
			15430
1400-1500		BBC, London.....	12095, 15070
			17705, 17790
			17885
1400-1500		CBC Northern Quebec Service.	9625, 11720
1400-1500		CFCX, Montreal, Canada.....	6005
1400-1500		CFRX, Toronto, Canada.....	6070
1400-1500		CFVP, Calgary, Canada.....	6030
1400-1500		CHNX, Halifax, Canada.....	6130
1400-1500		CKFX, Vancouver, Canada.....	6080
1400-1500		HCJB, Quito, Ecuador.....	11740, 15115
1400-1500	S	Radio Canada International.	11955, 15440
1400-1500		Radio Moscow.....	11840, 13680
			13855, 15375
			15560
1400-1500		Radio RSA, South Africa.....	17825, 21590
1400-1500		TWR, Srl Lanka.....	11825
1400-1500		WHRI, Indiana.....	11790
1400-1500	S	WRNO Worldwide.....	11965
1415-1500		Radio Berlin Int'l.....	15240
1430-1500		Radio Australia.....	9580
1430-1500		Radio Netherland.....	11735, 13770
			15560
1430-1500		Radio Yugoslavia.....	15240
1430-1500		WYFR, USA.....	9680, 11830
			15375
1448-1455		Radio Vatican.....	15090

1500 UTC [11:00 AM EDT/8:00 AM PDT]

1500-1505	M-F	Africa #1, Gabon.....	15200
1500-1530		HCJB, Quito, Ecuador.....	11740, 15115
1500-1530		Radio Netherland.....	13770, 15560
1500-1550		Deutsche Welle.....	17765, 21600
1500-1556		Radio RSA, South Africa....	17825, 21590
1500-1600		AFRTS.....	15330, 15430
1500-1600		BBC, London.....	11750, 12095
			15070, 15400
			17885, 17790
1500-1600	A,S	BBC, London.....	11775, 15260
1500-1600		CBC Northern Quebec Service.	9625, 11720
1500-1600		CFCX, Montreal, Canada.....	6005
1500-1600		CFRX, Toronto, Canada.....	6070
1500-1600		CFVP, Calgary, Canada.....	6030
1500-1600		CKFX, Vancouver, Canada.....	6080
1500-1600		CHNX, Halifax, Canada.....	6130
1500-1600		Radio Australia.....	9580
1500-1600	S	Radio Canada International.	11955, 15440
1500-1600		Radio Japan General Service	21700
1500-1600		Radio Moscow.....	11840, 13755
1500-1600		WHRI, Indiana.....	15105
1500-1600		WRNO Worldwide.....	11965
1500-1600		WYFR, Florida.....	9680, 15375
1510-1520		Vatican Radio.....	15120 USB
1530-1600		R. Prague, Czechoslovakia..	15110
1530-1600		Swiss Radio International..	9885, 15430
			17830
1540-1550		Voice of Greece.....	15630, 17565
1545-1600		Vatican Radio.....	11810, 17730

frequency SECTION

1600 UTC [12:00 PM EDT/9:00 AM PDT]

1600-1630	S	Radio Norway International.	11860
1600-1630		Radio Sweden Int'l.....	15235
1600-1640		UAE Radio.....	11730, 15320
			17775, 17865
1600-1700		AFRTS.....	15330, 15430
1600-1700		BBC, London.....	11750, 11775
			12095, 15070
			15260, 15400
			17880
1600-1700	A	CBC Northern Quebec Service.	9625, 11720
1600-1700		CFCX, Montreal, Canada.....	6005
1600-1700		CHNX, Halifax, Canada.....	6130
1600-1700		CFRX, Toronto, Canada.....	6070
1600-1700		CFVP, Calgary, Canada.....	6030
1600-1700		CKFX, Vancouver, Canada.....	6080
1600-1700		Radio France International.	9860, 11705
			17620
1600-1700		Radio Moscow.....	9765, 9880
			11840, 13755
1600-1700		Voice of America.....	15410, 15580
			15600, 17785
			17800, 17870
1600-1700		WHRI, Indiana.....	15105
1600-1700		WRNO Worldwide.....	11965
1600-1700		WYFR, Florida.....	9535, 11830
			15375, 15440
1645-1700		Radio Berlin Int'l.....	9730

1700 UTC [1:00 PM EDT/10:00 AM PDT]

1700-1715		Kol Israel.....	11585, 13750
			15095
1700-1730		Radio Berlin Int'l.....	9730
1700-1730		Radio Japan.....	5990, 9695
1700-1730	S	Radio Norway International.	11850, 15230
1700-1730		Swiss Radio International...	9535
1700-1745		BBC, England.....	9410, 11775
			12095, 15070
			15260, 15400
1700-1800		AFRTS.....	15330, 15345
			15430
1700-1800		CBC, N. Quebec, Canada....	9625
1700-1800		CFCX, Montreal, Canada.....	6005
1700-1800		CFRX, Toronto, Canada.....	6070
1700-1800		CFVP, Calgary, Canada.....	6030
1700-1800		CHNX, Halifax, Canada.....	6130
1700-1800		CKFX, Vancouver, Canada.....	6080
1700-1800		CKZU, Vancouver, Canada.....	6160
1700-1800		Radio Moscow.....	9625, 9765
			9880, 11840
			11850, 11860
			12030
1700-1800		Radio Zambia.....	9505
1700-1800		Voice of America.....	15410, 15580
			15600, 17785
			17800, 17870
1700-1800		WHRI, Indiana.....	15105
1700-1800		WINB, Pennsylvania.....	15400
1700-1800		WRNO Worldwide.....	15420
1700-1800		WYFR, Florida.....	11580, 11830
1730-1800		Radio Prague, Czechoslovkia	11990, 15190
1730-1800		Radio Sunnam.....	17755
1745-1800		BBC, London.....	12095, 15070

1800 UTC [2:00 PM EDT/11:00 AM PDT]

1800-1830		Radio Kiev.....	9600
1800-1830		Radio Mozambique.....	3340, 9620
1800-1830		Radio Prague, Czechoslovakia	9725, 11690
			11990, 15190
1800-1900		Deutsche Welle.....	11785
1800-1850		Radio Nacional do Brasil...	15265
1800-1900		AFRTS.....	15330, 15430
1800-1900		BBC, London.....	9410, 11820
			12095, 15070
			15275, 15400
1800-1900		CBC, N. Quebec Service.....	9625, 11720
1800-1900		CFCX, Montreal, Canada.....	6005
1800-1900		CFRX, Toronto, Canada.....	6070
1800-1900		CFVP, Calgary, Canada.....	6030
1800-1900		CKFX, Vancouver, Canada.....	6080
1800-1900		CKZU, Vancouver.....	6160
1800-1900	M-F	KVOH, California.....	17775
1800-1900	A,S	Radio Canada International.	15260, 17820
1800-1900		Radio Moscow.....	9625, 9765
			9825, 9880
			11690, 11780
			11840, 11850
			11860, 11950
			12030, 13605
1800-1900		Radio Kuwait.....	11665
1800-1900		Voice of America.....	11760, 15580
			15600, 17785
			17800, 17870
1800-1900		WCSN, Boston, Mass.....	21515
1800-1900		WHRI, Indiana.....	15105
1800-1900		WMLK, Bethel, PA.....	9455
1800-1900		WRNO Worldwide.....	15420
1800-1900		WYFR.....	11580, 11830
			11875
1805-1830	A,S	Radio Austria Int'l.....	12015
1830-1855		Radio Finland.....	9610, 11755
1830-1900		Radio Polonia.....	9525, 9675
1830-1900		Radio Sweden Int'l.....	11845
1830-1900		Radio Tirana.....	9480
1830-1900		Swiss Radio International...	9885, 11955
1830-1900		Radio Netherlands.....	9540, 17605
			21685
1830-1900		Radio Sofia, Bulgaria.....	9700, 11720
1830-1900		Spanish Foreign Radio.....	15375
1830-1900		Radio Havana Cuba.....	11795
1840-1900		Voice of Greece.....	11645, 12105
1845-1900		All India Radio.....	11620

1900 UTC [3:00 PM EDT/12:00 PM PDT]

1900-1925		Radio Netherland.....	9540, 17605
			21685
1900-1930		Kol Israel.....	9010, 11610
			11610, 12077
			13725
1900-1930		Radio Berlin Int'l.....	15170
1900-1930		Radio Canada International.	11945, 15260
			15325, 17820
			17875
1900-1930	S	Radio Norway Int'l.....	9590, 11850
			15225
1900-1930		Radio Yugoslavia.....	9620
1900-1930		Spanish Foreign Radio.....	9745
1900-2000		AFRTS.....	15330, 15430
1900-2000		All India Radio.....	11620
1900-2000		BBC, London.....	9410, 9515
			12095, 15070
1900-2000		B.S. Kingdom Saudi Arabia..	9720
1900-2000		CBC Northern Quebec Serv....	9625, 11720
1900-2000		CFCX, Montreal, Canada.....	6005
1900-2000		CFRX, Toronto, Canada.....	6070
1900-2000		CFVP, Calgary, Canada.....	6030
1900-2000		CKFX, Vancouver, Canada.....	6080
1900-2000		CKZU, Vancouver, Canada.....	6160
1900-2000		HCJB, Ecuador.....	17790
1900-2000	M-F	KVOH, California.....	17775
1900-2000		Radio Beijing.....	11560
1900-2000		Radio Havana Cuba.....	11795
1900-2000		Radio Kuwait.....	11665
1900-2000		Radio Moscow.....	9625, 9765
			9825, 11690
			11780, 11840
			11850
1900-2000		Voice of America.....	9760, 11760
			15205, 15410
			15445, 15580
			17785, 17800
			17870
1900-2000		WCSN, Boston, Mass.....	21515
1900-2000		WHRI, Indiana.....	15105
1900-2000		WMLK, Bethel, PA.....	9455
1900-2000		WRNO Worldwide.....	15420
1900-2000		WYFR, Okeechobee, Florida..	11830, 15566
			21525, 21615
1920-1930	M-A	Voice of Greece.....	7430, 9425
			11645
1930-2000		Radio Beijing, China.....	11515
1930-2000		Radio Bucharest, Romania....	9750, 11940
1930-2000		Voice of Islamic Rep. Iran..	9022
1935-1955		RAI, Italy.....	7275, 9710
1950-2000		Vatican Radio.....	7250, 9645

2000 UTC [4:00 PM EDT/1:00 PM PDT]

2000-2010		Vatican Radio.....	7250, 9645
2000-2025		Radio Beijing, China.....	11515
2000-2025		Radio Bucharest, Romania...	11940
2000-2025		Radio Polonia.....	9525
2000-2030		Radio Budapest, Hungary.....	9835, 11910
2000-2030	M-F	Radio Canada International.	9555, 11945
			15325, 17820
			17875
2000-2030	S	Radio Norway International..	9655, 15225
2000-2030		Voice of Islamic Rep. Iran..	9022
2000-2030		WRNO Worldwide.....	15420
2000-2045		All India Radio.....	11620
20000-2050		Voice of Turkey.....	7215
2000-2100		AFRTS.....	15345, 15430
2000-2100		BBC, London.....	6175, 6180
			7325, 9410
			9515, 12095
			15070, 15260
2000-2100		CFCX, Montreal, Canada.....	6005
2000-2100		CFRX, Toronto, Canada.....	6070
2000-2100		CFVP, Calgary, Canada.....	6030
2000-2100		CHNX, Halifax, Canada.....	6130
2000-2100		CKFX, Vancouver, Canada.....	6080
2000-2100		CKZV, Canada.....	6160
2000-2100		KVOH, California.....	17775
2000-2100		Radio Baghdad, Iraq.....	9675
2000-2100	A,S	Radio Canada Int'l.....	11945, 15325
			17820, 17875
2000-2100		Radio Kuwait.....	11665
2000-2100		Radio Moscow.....	9735, 9765
			9825, 11840
			13605
2000-2100		Voice of America.....	9760, 11760
			15410, 15445
			15580, 17800
			17785, 17870
2000-2199		WCSN, Boston, Mass.....	11695
2000-2100		WINB, Pennsylvania.....	15185
2000-2100		WRNO, Worldwide.....	15420
2000-2100		WYFR, Okeechobee, Florida..	9850, 11830
			15566, 21525
2005-2100		Radio Damascus Syria.....	11625, 12085
2015-2100		ELWA, Liberia.....	11830
2015-2100		Radio Cairo, Egypt.....	9670
2025-2045		RAI, Italy.....	11800
2030-2100		IBRA Radio.....	6110
2030-2100		Radio Beijing.....	11515
2030-2100		Radio Netherland.....	9540, 9715
			9895, 11740
2030-2100		Radio Sofia, Bulgaria.....	9700
2030-2100		Spanish Foreign Radio.....	7275
2045-2100		All India Radio.....	9910, 11620
2045-2100		Radio Berlin International.	6125

2100 UTC [5:00 PM EDT/2:00 PM PDT]

2100-2115		Radio Cairo, Egypt.....	9670
2100-2125		BRT, Belgium.....	9675
2100-2125	S-F	CBC Northern Quebec Service.	9625, 11720
2100-2125		Radio Beijing.....	11500, 11515
2100-2125		Radio Netherland.....	9540, 9715
			9895, 11740
2100-2130		Radio Finland.....	6120, 15305
			15400
2100-2130		Radio Austria.....	5945, 11720
2100-2130		Radio Australia.....	15395
2100-2130		Radio Berlin International..	6125
2100-2130		Spanish Foreign Radio.....	7275, 9765
2100-2130		Swiss Radio Int'l.....	9885, 12035
			15570
2100-2145		WINB, Red Lion, Penna.....	15185
2100-2150		Deutsche Welle, W.Germany..	9765
2100-2150		Radio Pyongyang, N. Korea..	11660
2100-2156		Radio RSA.....	5980, 9585
			11900
2100-2200		AFRTS.....	15330, 15345
			15430
2100-2200		All India Radio.....	9910, 11620
2100-2200		BBC, London.....	6005, 6175
			6180, 6195
			7325, 9410
			12095, 15070
			15260

frequency SECTION

2100-2200	CFCX, Montreal, Canada.....	6005
2100-2200	CFRX, Toronto, Canada.....	6070
2100-2200	CFVP, Calgary, Canada.....	6030
2100-2200	CHNX, Halifax, Canada.....	6130
2100-2200	CKFX, Vancouver, Canada.....	6080
2100-2200	KVOH, California.....	17775
2100-2200	Radio Baghdad, Iraq.....	9875
2100-2200 M-F	Radio Canada Int'l.....	15325
2100-2200v	Radio Jamahiriya, Libya.....	7245
2100-2200	Radio Moscow.....	7115, 7260
		7400, 9490
		9735, 9765
		9865, 9880
		11840, 11960
		11980, 13605
		15425
2100-2200	Voice of America.....	6040, 6045
		9760, 11760
		15410, 15445
		15580, 17785
		17800, 17870
2100-2200	WCSN, Boston, Mass.....	11695
2100-2200	WHRI, Indiana.....	9770
2100-2200	WRNO, Louisiana.....	11705
2100-2200	WYFR, Okeechobee, Florida..	9850, 11830
		15375
2105-2200	Radio Damascus, Syria.....	9950, 12085
2115-2230	Radio Yugoslavia.....	6100, 7240
		9620
2130-2200 T,F	BBC Falklands Service.....	9915
2130-2200 S-F	CBC Northern Quebec Service	11720
2130-2200	HCJB, Quito, Ecuador.....	17790
2130-2200	KGEI, San Francisco, CA....	15280
2130-2200	Kol Israel.....	9010, 9435
		11610, 13725
		15485
2130-2200	Radio Australia.....	15395
2130-2200	Radio Canada International.	11945, 17820
2130-2200	Radio Prague.....	6055
2130-2200	Radio Sofia, Bulgaria.....	9700, 11720
2130-2200	Swiss Radio Int'l.....	6190

2200 UTC [6:00 PM EDT/3:00 PM PDT]

2200-2215 M-F	Voice of America.....	11740, 15120
2205-2225	Vatican Radio.....	6015, 9615
2200-2225	RAI, Italy.....	5990, 9710
2200-2230	All India Radio.....	9910, 11620
2200-2230 S-F	CBC Northern Quebec Service	9625, 11720
2200-2245	Radio Berlin Int'l.....	5965, 6165
		6125, 11750
2200-2230	Radio Canada International..	5960, 9755
2200-2230 S	Radio Norway International.	9585, 9610
2200-2230	Radio Sofia, Bulgaria.....	9700, 11720
2200-2230	WRNO Worldwide.....	11705
2200-2300	AFRTS.....	6030, 15345
		15430
2200-2300	BBC, London.....	5975, 6005
		6120, 6175
		6180, 7325
		9410, 9515
		9590, 9915
		12095, 15070
2200-2300	CFCX, Montreal, Canada.....	6005
2200-2300	CFRX, Toronto, Canada.....	6070
2200-2300	CFVP, Calgary, Canada.....	6030
2200-2300	CHNX, Halifax, Canada.....	6130
2200-2300	CKFX, Vancouver, Canada.....	6080
2200-2300	CKZU, Vancouver.....	6160
2200-2300	KVOH, California.....	17775
2200-2300	Radio Australia.....	15160, 15240
		15320, 15395
		17795
2200-2300	Radio Moscow.....	5940, 6170
		7115, 7135
		7185, 7400
		9530, 9765
		13605, 15245
		15425
2200-2300	R. Vilnius, Lithuanian SSR..	7260, 9640
		11790, 13645
		15180
2200-2300	Voice of America.....	15290
2200-2300	Voice of Free China, Taiwan	9455, 9955
		11900
2200-2300	Voice of Turkey.....	9560, 17760
2200-2300	WCSN, Boston, Mass.....	9465
2200-2300	WHRI, Indiana.....	9770
2200-2300	WRNO Worldwide.....	11705
2200-2300	WYFR, Florida.....	11830, 15375
2230-2300 S	CBC Northern Quebec Service.	6195, 9625
2230-2300	Radio Korea, South.....	15575
2230-2300	WRNO Worldwide.....	9495
2245-2300	GBC1 Ghana.....	3366, 4915

2300 UTC [7:00 PM EDT/4:00 PM PDT]

2300-2330	BBC, London.....	5975, 6005
		6120, 6175
		6180, 6195
		7325, 9410
		9590, 9915
		9515, 12095
2300-2330	Kol Israel.....	9435, 9855
		11610
2300-2330	Radio Canada International..	9755, 11730
2300-2330	Radio Korea, South.....	15575
2300-2330	Radio Sweden International..	9695, 11705
2300-2345	Radio Berlin International..	6080, 9730
2300-0000	AFRTS.....	6030, 15345
2300-0000 A,S	CBC Northern Quebec Service.	6195, 9625
2300-0000	CFCX, Montreal, Canada.....	6005
2300-0000	CFRX, Toronto, Canada.....	6070
2300-0000	CFVP, Calgary, Canada.....	6030
2300-0000	CHNX, Halifax, Canada.....	6130
2300-0000	CKFX, Vancouver, Canada.....	6080
2300-0000	CKZU, Vancouver.....	6160
2300-0000	KVOH, California.....	17775
2300-0000	Radio Australia.....	15160, 15320
		15395, 17795
2300-0000	Radio Japan.....	11800
2300-0000	Radio Moscow, U.S.S.R.....	6170, 7115
		7135, 7165
		7185, 7400
		9765, 13605
		15245, 15425
2300-0000	Radio Moscow World Service	12000, 17850
2300-0000	Radio Sofia Bulgaria.....	9700, 11720
2300-0000	Voice of America.....	15290, 17740
		17820
2300-0000	WCSN, Boston, Mass.....	9465
2300-0000	WHRI, Indiana.....	11770
2300-0000	WRNO Worldwide.....	9852.5
2300-0000	WYFR, Florida.....	11580, 15440
2330-2355	BRT Belgium.....	9790, 9825
2330-0000	BBC, London.....	5975, 6005
		6120, 6175
		7325, 9410
		9515, 9590
		9915
2330-0000 S-F	Radio Canada International..	5960, 9755
2330-0000	Radio Kiev, Ukrainian SSR...	7260, 9640
		13645, 15180
2330-0000	Radio Tirana.....	7065
2330-0000	WINB, Pennsylvania.....	15145
2345-0030	Radio Berlin Intl.....	6080, 9730

Code Practice

The American Radio Relay League (ARRL) offers on-the-air Morse code practice on a scheduled basis. Operating from League headquarters (call sign W1AW), various bulletins are transmitted of interest to hams. We reprint below a recent schedule as provided by *QST* magazine.

W1AW Schedule

April 5-October 25, 1987 **MTWThFSSn = Days of Week** **Dy = Daily**

W1AW code practice and bulletin transmissions are sent on the following schedule:

UTC	Slow Code Practice	MWF: 0200, 1300, 2300; TThSSn: 2000; Sn: 0200
	Fast Code Practice	MWF: 2000; TTh: 0200, 1300; TThSSn: 2300; S: 0200
	CW Bulletins	Dy: 0000, 0300, 2100; MTWThF: 1400
	Teleprinter Bulletins	Dy: 0100, 0400, 2200; MTWThF: 1500
	Voice Bulletins	Dy: 0130, 0430
EDT	Slow Code Practice	MWF: 9 AM, 7 PM; TThSSn: 4 PM, 10 PM
	Fast Code Practice	MWF: 4 PM, 10 PM; TTh: 9 AM; TThSSn: 7 PM
	CW Bulletins	Dy: 5 PM, 8 PM, 11 PM; MTWThF: 10 AM
	Teleprinter Bulletins	Dy: 6 PM, 9 PM, 12 PM; MTWThF: 11 AM
	Voice Bulletins	Dy: 9:30 PM, 12:30 AM
CDT	Slow Code Practice	MWF: 8 AM, 6 PM; TThSSn: 3 PM, 9 PM
	Fast Code Practice	MWF: 3 PM, 9 PM; TTh: 8 AM; TThSSn: 6 PM
	CW Bulletins	Dy: 4 PM, 7 PM, 10 PM; MTWThF: 9 AM
	Teleprinter Bulletins	Dy: 5 PM, 8 PM, 11 PM; MTWThF: 10 AM
	Voice Bulletins	Dy: 8:30 PM, 11:30 PM
MDT	Slow Code Practice	MWF: 7 AM, 5 PM; TThSSn: 2 PM, 8 PM
	Fast Code Practice	MWF: 2 PM, 8 PM; TTh: 7 AM; TThSSn: 5 PM
	CW Bulletins	Dy: 3 PM, 6 PM, 9 PM; MTWThF: 8 AM
	Teleprinter Bulletins	Dy: 4 PM, 7 PM, 10 PM; MTWThF: 9 AM
	Voice Bulletins	Dy: 7:30 PM, 10:30 PM
PDT	Slow Code Practice	MWF: 6 AM, 4 PM; TThSSn: 1 PM, 7 PM
	Fast Code Practice	MWF: 1 PM 7 PM; TTh: 6 AM; TThSSn: 4 PM
	CW Bulletins	Dy: 2 PM, 5 PM, 8 PM; MTWThF: 7 AM
	Teleprinter Bulletins	Dy: 3 PM, 6 PM, 9 PM; MTWThF: 8 AM
	Voice Bulletins	Dy: 6:30 PM, 9:30 PM

Code practice, Qualifying Run and CW bulletin frequencies: 1.818, 3.58, 7.08, 14.07, 21.08, 28.08, 50.08, 147.555 MHz.

Teleprinter bulletin frequencies: 3.625, 7.095, 14.095, 21.095, 28.095, 147.555 MHz.
Voice bulletin frequencies: 1.89, 3.99, 7.29, 14.29, 21.39, 28.59, 50.19, 147.555 MHz.

Slow code practice is at 5, 7½, 10, 13 and 15 WPM.
Fast code practice is at 35, 30, 25, 20, 15, 13 and 10 WPM.

On Monday, Wednesday and Friday, 1300 through 2100 UTC, transmissions are beamed to Europe on 14, 21 and 28 MHz; on Wednesday at 2200 UTC they are beamed south.

Code practice texts are from *QST*, and the source of each practice is given at the beginning of each practice and at the beginning of alternate speeds. For example, "Text is from June 1987 *QST*, pages 9 and 70" indicates that the main text is from the article on page 9 and the mixed number/letter groups at the end of each speed are from the contest scores on page 70.

On Fridays, UTC, a DX bulletin replaces the regular bulletin transmissions.

On Tuesdays and Saturdays at 2230 UTC, Keplerian Elements for active amateur satellites will be sent on 45.45-baud Baudot on the regular teleprinter frequencies.

Teleprinter bulletins are 45.45-baud Baudot, 110-baud ASCII and 100-baud AMTOR, FEC mode. Baudot, ASCII and AMTOR (in that order) are sent during all 1500 UTC transmissions, and 2200 UTC on WThFSn. During other transmission times, AMTOR is sent only as time permits.

CW bulletins are sent at 18 WPM.

W1AW is open for visitors Monday through Friday from 8 AM to 1 AM EDT and on Saturday and Sunday from 3:30 PM to 1 AM EDT. If you desire to operate W1AW, be sure to bring a copy of your license with you. W1AW is available for operation by visitors between 1 and 4 PM Monday through Friday.

In a communications emergency, monitor W1AW for special bulletins as follows: voice on the hour, teleprinter at 15 minutes past the hour, and CW on the half hour.

Really

QSLing Those Difficult Stations

by Bruce Frederick, KA1FGY

For me, getting a QSL from the Yangsang Provincial Station in Hyen Su, North Korea is easy. Know the chief engineer on a first-name basis. Verifications from Vietnamese regionals paper my walls. There's not a Latin or African broadcaster I don't have. Me, I want a challenge. I want a QSL that no one else has got. I go for the tough ones. Garage door openers. Nursery monitors. MacDonald's Drive-through windows. Radio-controlled traffic signals. It's not for the faint of heart. Here is how I pry loose those elusive QSLs. Take some notes, friends.

Bruce Frederick is a regular contributor to MT. His latest articles appeared in the April and July "Behind the Dials" column. Those articles, says the author, were "somewhat technical, fairly dry, and aimed at a specific audience." His current article is anything but. Says Frederick, "I think our hobby sometimes takes itself too seriously."

QSLing a Cordless Phone:

Mr. Bruce Frederick
Authorized Monitoring Station

October 1, 1987

Mrs. Cornelia A. MacIntyre
3456 South Spread Palm Place
Miami, Florida 35443

Dear Mrs. MacIntyre:

I am an *officially licensed* radio operator, authorized by the United States Federal Communications Commission. I regret to inform you that your cordless telephone was radiating RF energy in both the HF and VHF spectrum on 25 September, 1987 1347 UTC.

However, don't be alarmed. If you will just sign the enclosed card, confirming that you were in fact talking to cousin Effie last Friday, I believe we can clear up this matter expeditiously, and no further action will need to be taken.

Thank you in advance for your cooperation in this matter.

Bruce R. Frederick

FCC Authorization: KA1FGY

QSLing a Cellular Phone:

Bruce R. Frederick
"The Ear to Hear"

September 23, 1987

[redacted] "Lefty" [redacted]
58776 Puerto Valero Blvd.
Suite 453
Miami, Florida 35442

Dear Lefty:

I heard you on my radio last night, making a phone call from your Cadillac. Please sign the enclosed form confirming that I heard the call.

What's that? Isn't it illegal for me to monitor cellular car phone calls? Yeah, tough guy, as a matter of fact it is. But then again, so is torching your brother's car for the insurance money, as you happened to be discussing during your call. I've got it on tape.

Tell you what. Send me the QSL card and forget about turning me in to the FCC and I won't mail the tape to the cops.

Look forward to hearing from you.
All the Best,

Bruce "The Ear" Frederick

QSLing FBI Bugs:

Agent Harmon H. Jones
Federal Bureau of Investigation
Federal Building
221 Don Johnson Boulevard
Miami, FL 35442

Dear Special Agent Jones:

Imagine my surprise when I stumbled across your bugging frequency last week! To think that one of my neighbors is actually under surveillance!

I sent a letter to him last Friday, asking him to find the transmitter and let me know what model it was and what kind of antenna it had and stuff like that. Unfortunately, the next day the bug stopped transmitting and I guess he and his family went on vacation.

Since I'm anxious to get my very first FBI bugging QSL, would you mind filling out the enclosed form for me?

Keep up the good work!

Bruce F.

QSLing the Roadside Emergency Call Box:

September 29, 1987

James K. Smythe
Intensive Care Unit
Ricardo Tubbs Memorial Hospital
Miami, Florida 35442

Mr. Smythe:

You don't know me but I heard all about your troubles last night. I have a police scanner and I happened to pick up some tones on the call box frequency for U.S. 1. Boy, it's not too often that you hear somebody calling for the police, tow-truck, fire department and ambulance all at once.

When I heard the call box signal, I switched right over to the State Police frequency and caught the entire story. Wow! What a coincidence that an outlaw motorcycle gang would show up just as you were changing that flat tire.

And I'll bet that even you had to chuckle at the irony of that carelessly flicked cigarette butt igniting your gas tank while you were getting stomped! Whoooeee! You must qualify for the Guinness Book of World Records as "Unluckiest Human Being" or something!

Anyway, I hope you get out of intensive care real soon and hope that you will take a moment to sign and return the enclosed postcard. After they take both your arms out of traction, that is.

Hang in there!
Bruce Frederick

QSLing MacDonald's:

Bruce R. Frederick
Monitoring Minutiae

Mr. Ronald MacDonald
World Headquarters, MacDonald's Restaurants International
55 North Daytona St.
Miami, Florida 35343

Ron:

Hey! Who's the clown in charge of QSLs out there? I sent you a reception report for the drive-through window of your Muskeegee, Mississippi, store last week and still haven't heard a thing. Don't you people care?

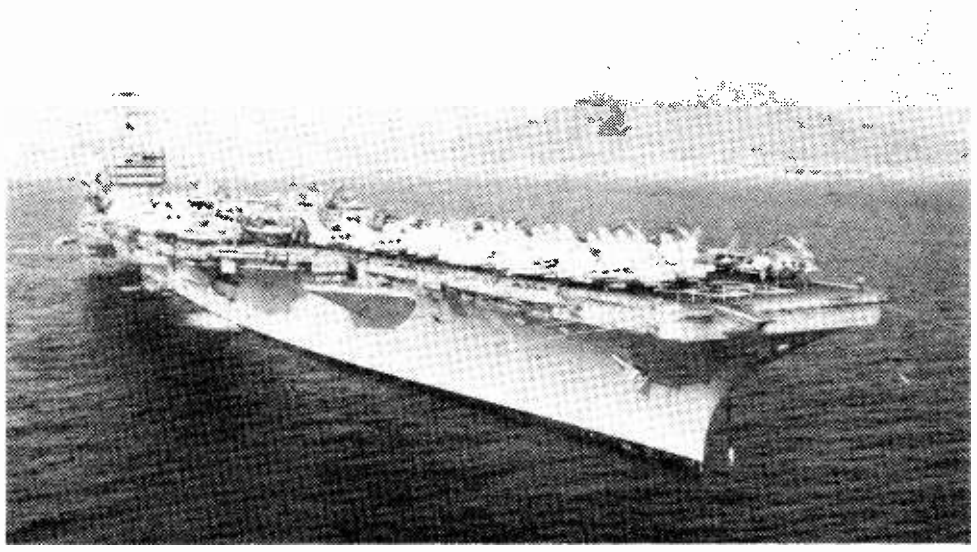
The signal was S-9 with the hostess on 6175 kHz and the customer on 6185 kHz at 1500 UTC on September 15, 1987. The conversation included standard greeting by YL hostess, mentions of cheesburgers and chocolate shakes by customer, followed by questions about desire for French fries on the part of the customer, and request to "Please drive around."

I must point out in all sincerity that yours is the only restaurant that has not had the courtesy of QSLing my reception report. You should want Wendy's to get ahold of this one?

Bruce Frederick

Listening in on.....

U. S. NAVY COMMUNICATIONS



by Andrew Gordon

The HF (high frequency; i.e., 3-30 MHz) spectrum is alive with radio messages among land bases, sea and air craft of the United States Navy, probably with world's largest user of radio communications. While much tactical traffic is encrypted to prevent unauthorized reception, much of what can be heard is in the clear.

Transmission modes include single-sideband voice, radioteletype, facsimile, data, and even some Morse code. The following information comes from years of intense monitoring and, after logging 275 different warships, I have enjoyed a 70% returned QSL rate. We will concentrate in this article only on upper sideband voice communications.

The primary high frequency circuits that I monitor are especially active at night and may be heard for considerable distances: 2716 ("harbor common" -- port services) and 2714 kHz. I have heard tugboats, Navy bases, harbor control stations, even foreign vessels and port stations. Here on the east coast, best times for monitoring are 0900-1100 and 2200-0030 UTC. To avoid static levels; add an hour for each time zone west.

It is common for a warship to make a "short count" (*"one, two, three... three, two, one -- test out"*) or long count (one to ten and back) for the intended receiver's adjustment. Ships will identify themselves by name, then ask for the required assistance--a tug, harbor pilot, mooring, weather conditions, berthing assignments, and so forth. Questions will be preceded by "interrogative", confirmed by "Roger", and concluded by "out".

Tactical identifications for vessels, often submarines, usually follow the format, letter-number-letter, such as *"Whiskey Seven Sierra"*; they most often will be heard calling another tactical callsign, usually port control.

For even tighter security, a vessel may identify only as an "inbound Naval unit," call the Navy base and not identify any further, even upon questioning. For example, the catamaran-hulled submarine rescue ship U.S.S. Orolan (ASR-22) will identify as *"Navy Unit 22"* when calling Charleston tug control.

If a ship is unable to get a reply from its intended radio recipient, they will usually check their equipment by requesting, "Radio check, any station this net"; another warship will usually answer this general call. If not, the first ship will simply say, "Nothing heard; out."

I have written to the ship initiating the unsuccessful call and have received a nice thank-you for the radio check!

Vessels and bases heard on this net have included those from the U.S. Navy's Atlantic Undersea Test and Evaluation Center (AUTEC) at Andros Island ("Range Master", "Snapper Base", "AUTEC Ops", "Foreclosure", "Ironrod Sierra", "Ironrod One", "Research Vessel Deer Island") and NASA ("Cape Radio", "Canaveral Control", "Fisher").

4066.1 kHz is used by Naval ships in the Pacific calling "San Diego CSS1" (who responds on 4360.5 kHz) and by Atlantic vessels calling "Norfolk ICSB" (who replies on 4360 kHz) as part of the automatic voice network (AUTOVON) telephone system.

Ships may also be heard calling "NAVCOMSLANT" (Naval Communications Area Master Station, Atlantic). Most commonly heard on this network will be requests for parts and medical 'phone patches to the duty officer of a destroyer squadron ("Desron") or service squadron ("Servron").

Calling MARS

Military Affiliate Radio System (MARS) relays between Navy or Marine Corps personnel on ships afloat in the Pacific and their families may be heard nearly anytime on the hailing frequency, 14441.5 kHz. During the holidays -- especially Christmas, Thanksgiving, Mother's Day, and Valentine's Day -- Sprint offers free long distance service for the men and women in uniform and the MARS frequencies really come alive!

After reaching a station on the calling frequency, ship and shore stations will switch to a working frequency. Try 14383.5, 14467, 14470, or 14477 kHz.

Navy/Marine Corps call signs begin "NNN0", and ships most frequently follow that with a C, such as NNN0CAI (U.S.S. Antietam, CG54) but there are exceptions like NNN0NZL (U.S.S. Constellation, CV64).

It is common for a ship to call its home port; NNN0CAC (U.S.S. Mobile Bay, CG53) will be heard calling Mayport since the majority of its morale calls will be placed to the Jacksonville, Florida, area.

To monitor ships afloat in the Pacific, try 14818.5 kHz for NNN0NSD, Naval Station San Diego; 13826 kHz for NNN0NRI, Port Hueneme, California; or the hailing frequency 14441.5 kHz for NNN0NVW, Naval Air Station Whidbey Island, Washington State. For variety, listen on 14478.5 kHz for NNN0MET, the U.S. Marine Corps base at El Toro, California, making 'phone patches from Asia.

"Operation Deep Freeze," our Naval Support Force at Antarctica, may be heard on 13974 kHz until 0100 UTC when the "Antarctic Net" takes over. Close-in operations may be heard on 7493.5 kHz. Incidentally, those Antarctic call signs have changed, too; McMurdo Base is now NNN0NBG and Palmer Station is NNN0NPA. Similar changes affect Byrd Surface Camp, Siple Station and South Pole Station.

Unfortunately, harrassment from Latin American radio operators is common on these frequencies, ranging from hoots and noises to profanity and obscenity, often yelling out the names of the vessels. It really spices up monitoring at times!

You can often determine the approximate location of the ship on the MARS circuit when it gives its compass heading so that the shore station can swing its beam in that direction. I've heard the Fox, Constellation and Missouri from the Arabian Sea and Persian Gulf in this manner, and have a nice QSL from the Stark which was sent to me from the Persian Gulf last February, before the incident.

Care to QSL?

If you wish to QSL Navy/Marine Corps MARS stations you hear on the air, try to be as accurate as you can without specifically repeating the nature or text of the communications. Include UTC time ("Zulu" time as it is called in the Navy) and identification of the vessel and shore stations. Address all correspondence to the Commanding Officer.

It is a good idea to include a self-addressed, stamped envelope (SASE), although these are often returned in a large U. S. Navy envelope with the QSL and other items from the ship such as color photographs, bumper stickers, pins, key chains, "Welcome Aboard" pamphlets, perhaps even an occasional commissioning book which had been given out at a ceremony.

Need More Information?

A call to the U.S. Navy Public Affairs Liaison Office at the Pentagon can bring you a 40-page, updated list of Navy ship battle forces. It provides all FPO and home posts of regular Navy and NRF ships, and it's free.

Telephone recordings, updated twice daily, may be dialed up to learn arrival and departure times for ships, assisting you in identifying a particular vessel you think you may have heard. Numbers include Norfolk (804-444-7731), Charleston (803-743-2000--base operator), Little Creek (804-464-7171), Mayport (904-246-5226), and San Diego (619-235-2011--base operator).

Later this fall, a new edition of Bob Grove's popular *Shortwave Directory* will become available with many pages dedicated to monitoring all phases of U.S. Navy Communications.

Fair winds, following seas, and good listening!

■

Lawrence Magne

Editor-in-Chief
Passport to World Band Radio

Popular Shortwave Active Antennas

Shortwave receivers usually come equipped with telescopic antennas that make an extra antenna unnecessary. But, then, so do TV's. And yet most of us hook up our televisions to a good outdoor antenna or cable system for better reception.

Active Antennas Work Best With Tabletops, Not Portables

The same isn't always true of world band radios, though. Nearly all portables -- even the better ones -- are designed to be operated off the built-in antenna. If you get too fancy and hook a portable up to an outdoor antenna, you may overload the radio's circuits.

This won't damage the radio, but you could well end up hearing a mish-mash of signals...Radio Canada International might pop up in the middle of the wrong band, for example. On the other hand, if you have a really good tabletop set, you should hook it up to something better. This is because tabletops, unlike portables, are designed to work with high-quality outdoor antennas.

Key to Success: Where You Mount Your Antenna

One reason for using an outboard antenna is that it can be mounted away from local electrical noises and such things as walls that can absorb radio signals. As a result, more radio signals and fewer noises can get to your set, so you increase what's called the signal-to-noise ratio.

This is the thing to keep in mind: A so-so antenna that's mounted where signals are strong and noises are weak will do better than a fancy antenna mounted next to a microwave oven or hidden behind thick walls.

So, mount your antenna in the proper place. If possible, get it out into the fresh air, well away from buildings and utility lines. Or, if you're in an apartment, at least try to place your antenna near a window or out on the balcony.

Active Antennas for Apartment Dwellers

Recently, we reported on outdoor wire antennas. These are the best bet if you have the space to erect them. But, if you don't, you can make do with a little active antenna. An active antenna is different from ordinary antennas because it has electronic circuitry that actually amplifies the strength of signals it receives.

But they're mixed blessings. True, their smaller size allows them to be affixed inconspicuously to windowsills and the like. So they're a favorite of apartment dwellers.

The problem is that their electrical circuitry is prone to the same foibles as any other electrical circuitry. If the antenna has a so-so circuit and you're connecting it to a superset, you're almost certain to be disappointed, because the antenna's mediocre amplifier will provide a weak link in the signal chain. Also, too much antenna amplification can strain -- or "overload" -- most receivers -- especially portables.

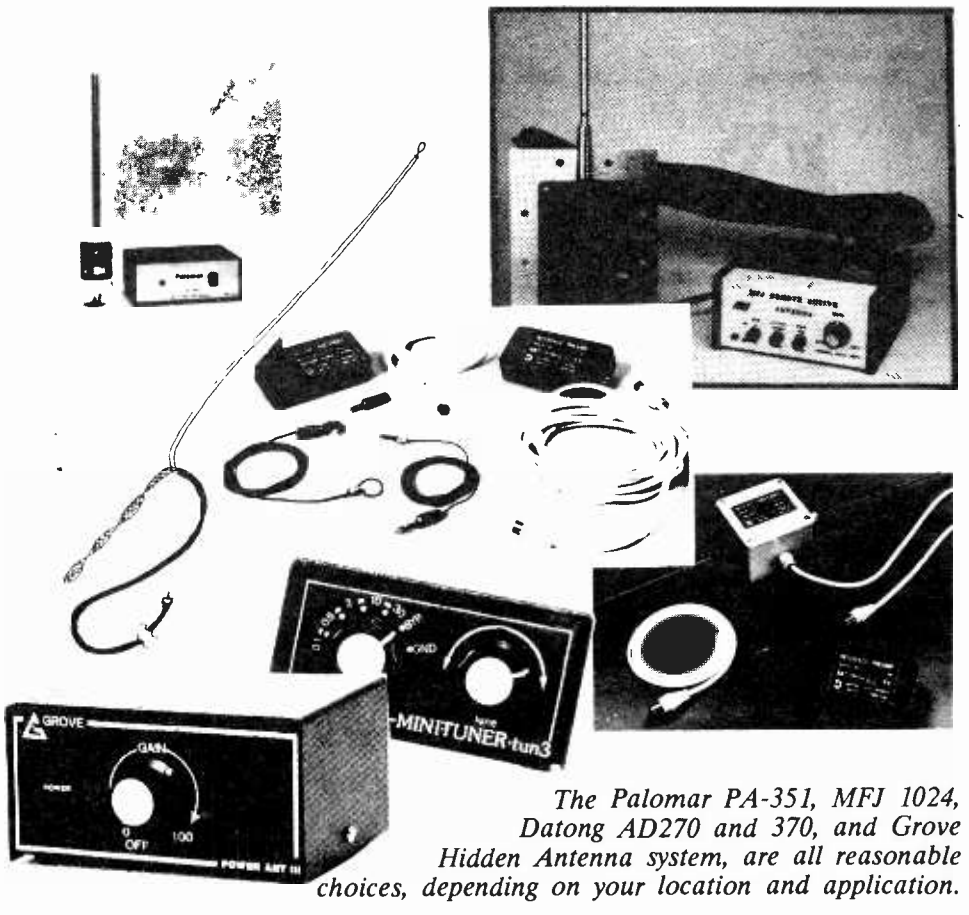
Different Antennas for Different Situations

No antenna -- active or otherwise -- is worth its salt if its pickup wire or rod has to be mounted close to the receiver, where it will be exposed to electrical noises coming from the receiver itself. So we tested five active antennas that can be mounted well away from your receiver.

Our tests of these five leading active world band antennas indicates that whether any given model will succeed depends on the specific conditions you face. For example, the Palomar PA-351 contains a special filter to help keep local mediumwave AM stations from intruding into the world radio bands. This makes it an obvious candidate for use in urban areas or by those living near mediumwave AM stations.

The Grove Hidden Antenna System, which includes the Power Ant-3 amplifier module, is quiet at full gain. This allows it to be considered for use with low-noise receivers such as the Kenwood R-5000 and Sony ICF 6800W.

The Datong AD270 -- for indoors -- and AD370 -- for outdoors -- are balanced performers. Their amplification is strong without being excessive, dynamic range is impressive, and they're reasonably quiet. However, they don't have a filter to reject local stations. If you live near strong stations, this could make the Palomar a better choice.



The Palomar PA-351, MFJ 1024, Datong AD270 and 370, and Grove Hidden Antenna system, are all reasonable choices, depending on your location and application.

The MFJ-1024 has the best dynamic range of the group. This -- and its moderate level of amplification, means that it's the least likely to cause "overloading" within either your antenna or radio. However, both it and the Dymek, although not really noisy, are also the least quiet models tested -- a consideration if you own a particularly "hiss" free receiver.

The Dymek DA100D performs similarly to the MFJ unit, except that the Dymek's amplification rises with frequency, whereas that of the MFJ falls. This means that regular listeners to the tropical bands will probably prefer the MFJ. But listeners to the popular international world bands will like the Dymek -- especially if they tune around during the daytime, when the higher bands are most active.

Omnipresent Powerline Hum

Finally, one disappointing finding is that virtually all the active antennas tested tend to cause audible hum from the speakers of the receivers they're connected to. For the most part, this is caused by the antenna's own outboard ac power supply.

The only practical way to cope with this, short of using a battery power supply, is to mount your antenna's pickup head a good distance from the antenna's control box and power supply.

So, to sum it up, if you're using a portable, you probably won't need an outboard antenna of any sort. But if you have a tabletop receiver, you're almost certain to need one. The best choice, if it's feasible, is a passive antenna, such as the "Sloper" or "Eavesdropper." Otherwise, choose the most suitable active antenna based on the conditions at your location. ■

You can hear Larry Magne's equipment reviews, along with reports from Passport to World Band Radio's Don Jensen and Tony Jones, the first Saturday night each month over Radio Canada International's "SWL Digest" at 8:10 PM Eastern Time on 5960 and 9755 kHz. Larry's "What's New in Equipment" is also featured over "SWL Digest" various other Saturdays throughout the month.

In the U.S., RDI White Papers are carried by Electronic Equipment Bank, Imprime and Universal Shortwave. A free catalogue of the latest editions of all available RDI White Papers, including those covering the best in communications receivers and antennas, may be obtained by sending a self-addressed stamped envelope to Publications Information, Radio Database International, Box 300, Penn's Park PA 18943 USA.

Six Digital Modes for 320 Digital Dollars

(A review of the new PK-232 Multi-Mode Digital Controller from AEA)

by Mike Mitchell, Jr., W7WHT
P. O. Box 20279
Seattle, WA 98102-1279

A View of a Review, or, An Overview

Writing reviews of equipment is often a thankless task. The company who made the equipment thinks you didn't praise it enough; the fellow who follows your recommendation to buy one thinks that you couldn't possibly have tested the same model he bought; and everyone else thinks you said you liked it because you got a free one for writing about it (don't I wish!!).

However, for this review, I don't mind. It's a breeze. When a company, historically known for innovative thinking and good quality, comes out with a multi-purpose unit that replaces several other pieces of equipment, sells for about one fifth of the total price of the equipment it replaces and does a better job doing it, well, it's easy as pie to review. Actually it's not *that* simple, but it's close!

It all started when Bob Grove called and said, "I'm a little short of time, so I wonder if you would like to review the new AEA PK-232?" "Sure," I said. "Great!" he said; "I'll ship the unit, printer and all the other stuff to you right away, and when you're finished with it, you can ship it to AEA."

"I don't think I can do that," I said. "Why not?" he asked. "Because while you live 3,000 miles from AEA, I only live about 14 miles from them and my brother lives about 80 yards from them!" I said. "I think I'll just drop it off with them when I'm through." "Right!" said Bob.

The Good News

The PK-232 is a digital control unit which can be used to send and receive Morse code, RTTY (Baudot), ASCII, AMTOR, and Packet, and receive weather facsimile. It has built-in modems for each mode, converts protocols, communicates in two directions, and contains a terminal node controller for packet.

It will work with any receiver or transceiver, utilizing simple connections to the audio output and mike and/or key input and can be connected to two units at the same time (such as your HF rig and your VHF rig), either one selectable by a switch on the front panel.

It does all this using self-contained software in it's ROM so that all you need to run it is any dumb or smart terminal or computer which is compatible with RS232, a receiver and, if you are a ham, a transmitter.

To control it, only a simple terminal program or emulator is needed...a program like you use to run the modem on your computer. Almost any one will do, so it's no big deal. And the operation is relatively easy with many of the command terms being easily remembered in a short time.

While the unit is capable of being used in very sophisticated ways for those with a real technical interest in certain areas, the actual operation for most modes is very straightforward once you learn to read the panel lights and get the operation clear in your mind. And that's. . .

The Bad News

Nobody's perfect, even AEA; but with their reputation for equipment, one might hope they could do a better job with their manual. Don't get me wrong--the manual is actually quite good. It's complete, thorough and clear...to anyone who happens to be an expert with computers, modems, packet, etc!

The problem is that it wasn't written with the non-technical user in mind, and the simple fact is that most of their sales will be to such people. My recommendation to AEA is to change the name of the "Operating Manual" to "Technical Manual," and then write a new operating manual which describes, *in simple terms*, how to hook it up, start it up and operate it in each mode.

Like anything else, once you actually start using the unit most of what you need becomes easy in a short period of time. After all, it is doing a lot for you.

The other problem is that the batteries which hold your programmed mode control entries are connected inside by hard wiring, and the only way you can reset something is to take the case apart!

Rumor has it that AEA is adding a small switch on the back of the unit in the near future. Those with older models will have to spend a few bucks at Radio Shack, drill a hole, and install their own switch.

Other than those two easily-correctable aggravations, it looks like a winner. While I did have several initial problems with the unit and some of the software, mostly in the FAX mode (see below), it was due to incompatibility between the programs in the ROM and on the discs. It has since been corrected.

More Good News from SIAM

When it comes to reading the signals on the air these days and trying to figure out just what it is you are hearing, it's the pits! But the PK-232 will do that for you in SIAM (an AEA trademark) which stands for Signal Identification and Acquisition Mode.

This little jewel tells you what kind of signal you are hearing. It listens for about 10 seconds, then displays the info on your terminal screen! If it's something you want to copy, you type "OK" and it will start to display or print it out--your choice.

SWL ute fans are going to love this mode. It will really help you in your searches. It will even read Russian cyrillic and Japanese katakana and it's as easy to use as tuning your receiver across the band!

If you have an Epson graphics compatible printer, you can use the weather fax mode. As you can see from the fax pictures in this review, it really does a great job. It doesn't have the true fax shading (it uses an on/off, black/white method) but it produces very usable pictures, including wirephotos. This is a fun mode!

The Bottom Line

For both hams and SWLs, this is a great addition to the shack. You won't have to learn CW since you can read it on your terminal screen or printer (hams can send CW from the terminal keyboard). And the RTTY/ASCII/AMTOR modes are yours to command by simply tapping on your keyboard.

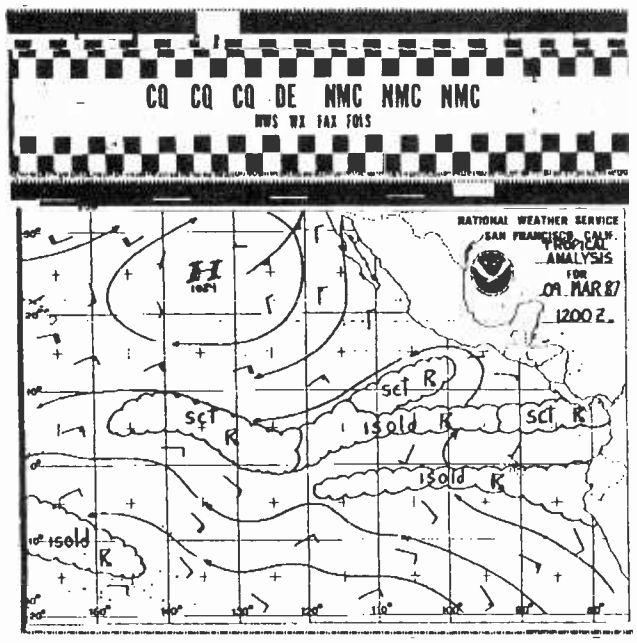
For packet, the PK-232 has what is probably the best TNC (terminal node controller) available at this time, and you can have all the other modes as a bonus!

With SIAM and weather fax to round out its capabilities, the PK-232 offers considerable value for its price. Most other current equipment capable of fax like this would cost you $1,000-1,500 and you still wouldn't have all the other modes and a TNC too! At about $320 amateur net price it is a bargain.

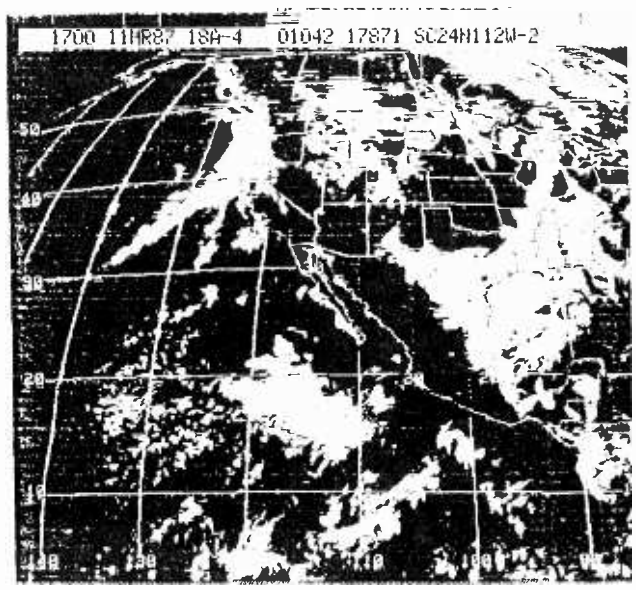
One Last Word

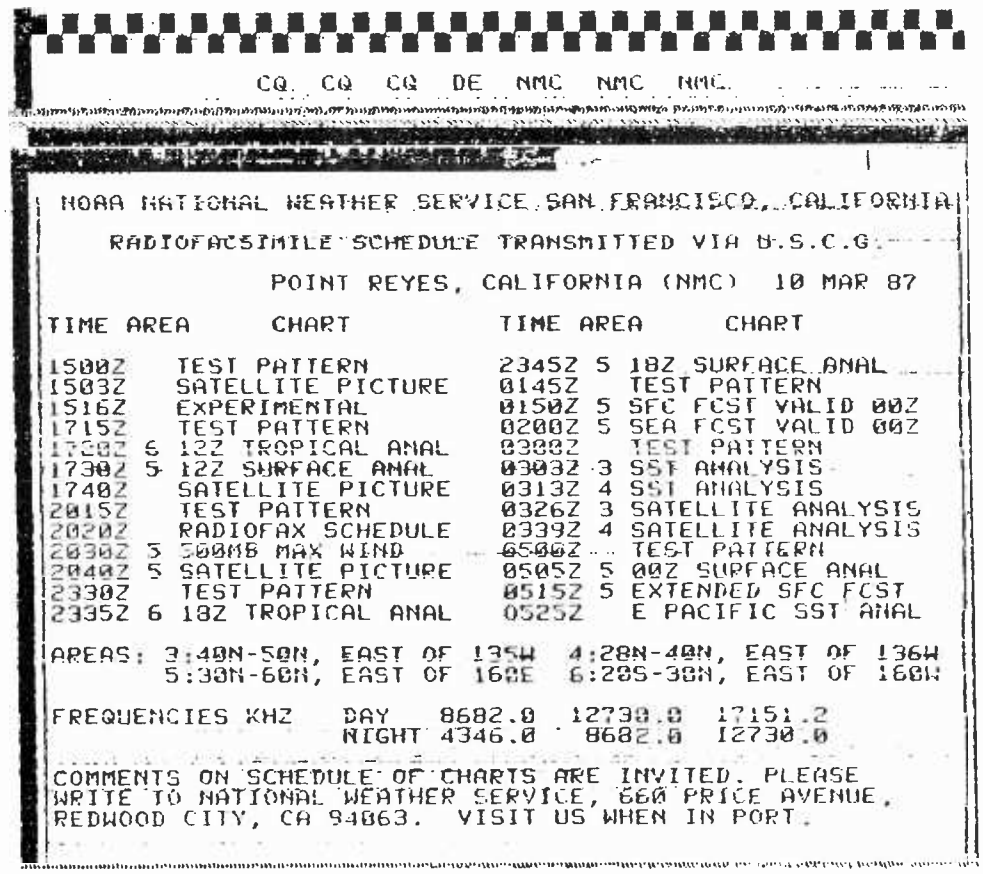
Along with the PK-232, AEA let me test an upcoming program for the IBM clones called PC-PAKRATT Terminal Program; this, too, will be a winner. Quick, simple, lots of help for the beginners and old timers alike.

AEA says they will have this available about the time you read this (of course, that's what they all say). It's well worth waiting for, one very big improvement over the typical communications terminal programs it replaces. ■



With an Epson graphics compatible printer, you can use the PK-232 in FAX mode to receive weather pictures or even wire-photos!





Antenna Specialists Monitor Coupler

Many of us are confronted with the problem of how to install a mobile radio, usually a scanner, with the least effort. Most of us don't like to drill holes for new antennas, nor do we quite trust the makeshift approach of a magnetic mount and a cable running through the door gasket or window.

The question then comes to mind, "What about the AM/FM car antenna; can it be drafted into this service?" Not by direct coupling since a standard 32-inch automotive antenna is not resonant on land mobile bands, but there is a product which can adapt the automotive antenna to scanner reception while still retaining its original function: The Antenna Specialists MON-63 All Band Monitor Coupler.

Installation

Connecting the MON-63 is extremely easy; simply unplug the car antenna from the vehicle radio and plug the MON-63 into its place. Two Motorola plugs from the adaptor are then inserted into the car radio and scanner.

We knew that it would be unlikely that any adaptor could provide the same level of performance as a resonant antenna in the center of a car roof, so we decided to play fair and mount a Grove ANT-10 all-band, magnetic mount scanner antenna on the opposite fender cowl from the original vehicular antenna.

The Test

Several local and distant known frequencies in low, high, aircraft, and UHF bands were entered into a Bearcat BC100XL scanner; a Motorola-to-BNC adaptor was fashioned for quick substitution of cables from the two antennas.

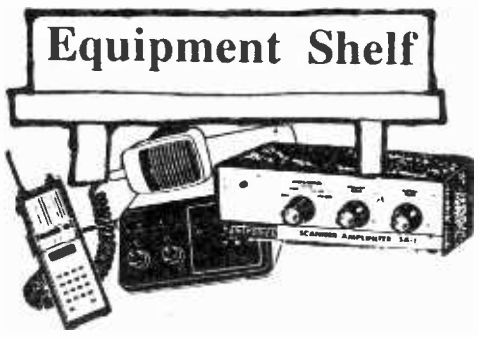
At first there seemed to be a clear advantage in favor of the scanner antenna; then the car was turned around to change to reflective pattern of the vehicle body. At that point there was little difference between the two antennas on all frequency ranges and the normal AM/FM reception was just as good as before.

Conclusion

The Antenna Specialists MON-63 permits highly satisfactory scanner reception using the original vehicular antenna without degrading AM/FM car radio performance. For maximum range on the weakest signals, mount a scanner antenna on the car roof; but for the majority of applications in which an additional antenna is undesirable, the MON-63 will give an excellent accounting of itself.

(MON-63, $17.75 plus shipping from Antenna Specialist dealers) ■

If you don't want to add an extra antenna to your car roof, try the MON-63 All Band Coupler.



Speech-Synthesized Motorola Voice Reporter

Using conventional two-way radio frequencies, the Motorola VR-100 remote status change indicator sends stored voice messages to pagers, portables, mobile radios, or base stations that identify when and where a problem may have occurred. A tone alert and Morse code call sign attracts attention and alerts the user when a message is on its way.

Messages can be programmed to repeat up to four times in a half hour; assuring message reception a trickle charger keeps the battery fully charged so it can report power outages and continue to monitor the equipment.

The "Radius Voice Reporter" has selective signalling and coded squelch options allowing the user to receive only their own message, assuring compatibility with many types of existing radio systems.

The user can select the following words as part of the status message: "alarm, engine, fan, intrusion, leakage, level, movement, position, pump, pressure, and temperature". Power output is 25 watts on low band, 2 or 25 watts on VHF, 2, 15, or 25 watts on UHF, and 10 watts on 800 MHz.

For more information about the Radius Voice Reporter Radio Alarm station, its features and benefits, contact Motorola, Inc., Barbara Bennett, Public Relations Department, Dept MT, 1301 East Algonquin Road, Schaumburg, IL 60196.

Info CB-1

Regency Re-enters CB Market

Regency Electronics has re-entered the citizen's band radio market with two new 40-channel Informer series citizen's band radios. INFO CB-1 ($69.95) includes a highway/city switch for adjusting the sensitivity settings, automatic gain control, digital channel display plus an LED display for measuring signal strength and RF input.

The Regency Informer INFO CB-2 ($159.95) has all of the features of the INFO CB-1, but substitutes a signal strength/RF output meter for the LED signal strength display.

In addition to those features, the INFO CB-2 has a switch for instantly accessing emergency channel 9; rear-panel jacks for adding a public address system; a noise blanking system which eliminates ignition noise and static; dual-level digital display; and a microphone gain knob.

Two New Motorola Handhelds

The Motorola SABER "Handie-Talkie" FM portable radio is designed for operation in VHF (136-174 MHz up to 6 watts) and UHF (403-512 MHz up to 5 watts).

A custom designed MC68HC11 microcomputer monitors and controls the radio's key elements of hardware and software. All functions such as frequencies, squelch codes, power levels, and other operational data can be modified in the field by reprogramming the radio's EEPROM's.

The SABER III portable radio has a 120 synthesized channel capability, submersible availability, and an 8 character LCD display to provide battery status, encrypted/clear voice transmission, carrier or coded squelch, simplex vs. repeater channel, and a user-friendly prompt.

A full 3x5 keypad with menu options include mute, zone and channel operation, password, and interconnect for DTMF telephone numbers.

All SABER radios are available with SECURENET digital voice privacy. An option can provide up to 10 independent scan lists with up to 12 channels each.

For additional information regarding Motorola SABER I, II and III synthesized portable radios contact Motorola, Inc., Barbara Bennett, Communications Sector SH5, Public Relations Department, Dept MT, 1301 East Algonquin Road, Schaumburg, IL 60196.

Motorola Saber Handie-Talkie

Panasonic RF-B10 Ultra-Compact FM/MW/SW Portable Radio

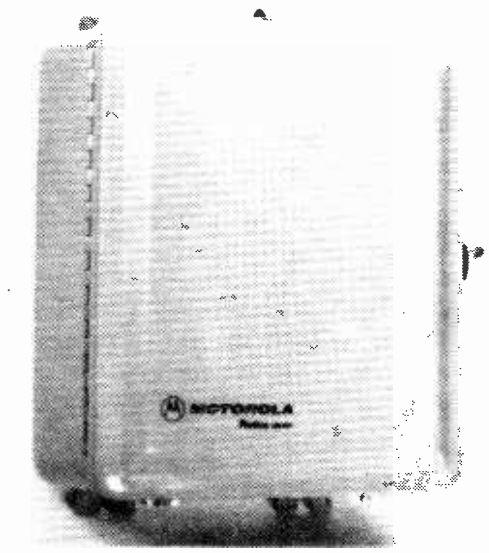
The ultra-small RF-B10 portable radio offers full shortwave coverage from 5.95 to 17.90 MHz in six ranges.

The unit offers "feather-touch" power and band controls, a DX-local FM sensitivity selector, and LED indicators for FM, MW/SW, and tuning.

Other features include: continuous tone and volume controls; a 2" PM dynamic speaker; an earphone jack; and a earphone and carrying case. The RF-B10 operates on two "AA" batteries (not included). Suggested retail price: $79.95; available from *MT* advertisers.

Ultra-small RF-B10

Radius Voice Reporter



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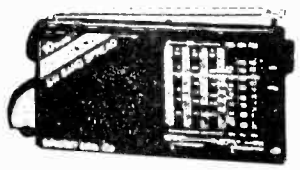

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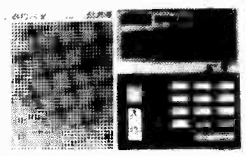

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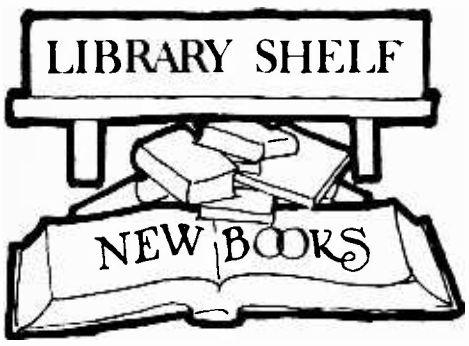

TWO-WAY
(Australian magazine)

($21.00 Australian funds for six bimonthly issues; write Two-way, GPO Box 1200, Adelaide 5001, South Australia)

A sample issue received here the other day shows that *Two-Way* is planning to offer for the Australian listening market what *MT* and *PopCom* do for North American listeners. It is a slick publication with general emphasis on shortwave and VHF/UHF communications.

The inaugural issue contains articles on Royal Australian Air Force communications; newsgathering and the electronic journalist; communications security and Motorola's Digital Voice Protection chip; outback communications; videotex; a user report on the Kenwood R5000 receiver; and "teething" problems with the Australian Department of Commerce's new computer system.

Two-Way has also acquired a large frequency database for Australian interests, available through Captain Communications, 28 Parkes St., Parramatta 2150, Australia.

We wish *Two-Way* a great deal of success with its new publishing venture in the Land Down Under.

(GMRS)
National Repeater Guide

(56 pages, 5-1/2" x 8-1/2";, paperbound; $4 from Personal Radio Steering Group, P.O. Box 2851, Dept MT, Ann Arbor, MI 48106)

While frequency directories for public safety, hams and other services have been available for many years, this is probably the first publication which lists open repeaters nationwide of the General Mobile Radio Service (GMRS--Class A Citizens' Band).

GMRS has been in communications headlines recently as a result of the FCC's effort to restructure the service. There has been expected opposition from commercial users and support from private communicators for whom the service was originally intended.

The Personal Radio Steering Group has made this new directory available for travelers who wish to come up on local channels. Discussion is included regarding history and protocol for those unfamiliar with the service or those who have specific questions.

Compendium of American Railroad Radio Frequencies

by Gary L. Sturm and Mark J. Landgraf (56 pages, 7" x 8-1/2", paperbound; $9 from MarkLandgraf, 3 Coralberry Circle, Albany, NY 12203)

Many scanner devotees are loyal to particular specialized services, not the least of which is railroading. For their interests the new Compendium is a goldmine. While print size may be small, the information is packed.

An introductory chapter explains various types of railroad communications usages, with terminology expertly explained in laymen's language. A list of railroads without radio is also included to make the collection complete!

Sorted by railroad name (and even including monorails, railroad museums and some foreign entries), data include headquarters location, yard name, operating states, frequencies and channels, and use.

For railroad buffs, this is a must!

Scanner Frequency Directory
Fifth Edition

(For Northwestern Ohio and Southeastern Michigan) by Daryll Symington (96 pages, 8-1/2" x 11", staple-bound and drilled for ring binder; $8.95 plus $1 fourth class shipping or $2 for first class mail; from Radio InfoSystems, PO Box 399, Dept MT, Holland, OH 43528; ph. 419-865-6226)

This latest updated edition of Symington's directory has been substantially expanded. Listings include public safety, marine, aircraft, federal and local government, mobile telephones, and business.

Listings are cross-referenced by licensee's name and by frequency making it useful for finding the operating frequency of a known radio user or for identifying an unknown user on a newly-discovered frequency.

Data fields include licensee name, frequency, repeater input/output, type of service, location, use, and call sign. A handy collection of dispatch codes for several localities is included.

Ham Equipment Buyer's Guide

by Alton L. Brand (WA9MBJ) (Two volumes, 8-1/2" x 11", $30 airmailed first class from Barbara Brand Wixon, 189 Kenilworth, Dept. MT, Glen Ellyn, IL 60137)

Have you ever seen a piece of used equipment at a hamfest, flea market, yard sale, electronics shop, or at a private sale and wondered what it originally cost? If only you had a handy, pictorial reference which you could consult that gave basic specifications and the approximate year of manufacture.

Well, there is one reference set--the only set--and it's a good one. Covering the postwar years from 1945 through 1979, Al Brand's Ham Equipment Buyer's Guide has become a legend among equipment swappers and used equipment addicts. The dog-eared copy on my bookshelf has been in constant use for nearly 20 years.

Arranged with several indeces for successive time frames, the two-volume set contains information on nearly 2000 pieces of radio equipment and accessories--receivers, transmitters, transceivers, and amplifiers.

Here is where you'll find descriptions at a glance of Hammarlund, Hallicrafters, Gonset, National, Swan, Globe, Hunter, Knight Kit, Sonar, Lysco, Meissner, Vocaline, Clegg, Atlas, and other long-gone equipment manufacturers. You will also find early models from contemporaries like ICOM, Kenwood, Heathkit, Yaesu, Collins, and Ten Tec.

And even if you aren't looking up a specific piece of former gear, walking through the pages is a nostalgic treat for us old-timers!

Special Book Review
by Larry Van Horn

The Soviet Cosmonaut Team
by Gordon R. Hooper, FBIS

Since its inception, the Soviet Space program has been veiled in secrecy. Until recently, the USSR refused to announced the launch of manned flights in advance; information about the cosmonauts was hard to find. *The Soviet Cosmonaut Team*, written by Gordon R. Hooper, lifts that veil.

Mr. Hooper's book provides us with a detailed look at the men and women who have flown in Soviet spacecraft. He tends to the many rumors spawned through a mixture of fact and educated speculation.

One of the most interesting of these rumors concerns the marriage of the first woman in space, Valentina Tereshkova, to Andrian Nikolayev. Says Hooper, "There has been speculation that the marriage of Nikolayev and Tereshkova was an arranged one, insisted on for propaganda purposes, and more importantly, for medical reasons. It was a unique chance to study the possible effects of spaceflight on the body's reproductive system, as in this case, both parties had been in space. If this were true, it might explain Tereshkova's subsequent divorce, and reluctance to expose her daughter to public gaze."

Superbly printed and bound, *The Soviet Cosmonaut Team* is a solid piece of research that deserves a place on every *Monitoring Times* bookshelf. Numerous tables and charts, as well as pictures of the cosmonauts themselves illustrate the author's points.

Other information includes a list of abbreviations, background sections including spaceflight logs, crew assignments, time in space, selection groups and callsigns, biographies of every Soviet and Interkosmos cosmonaut, and a discussion of the questions about the Soviet space program that still remain.

The book may be ordered from Miss Deborah Matthews, Sales Manager, GRH Publications, 2, Wayne Close, Gunton 1104, Lowestoft, Suffolk, NR32 4SX, England. The U.S. price is $17.00 plus $4.00 surface shipping or $12.00 air mail. ■

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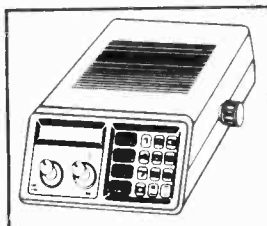

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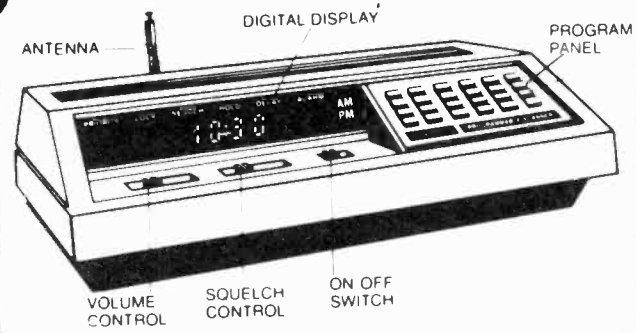

The Regency Z30 is a compact, programmable 30 channel, multi band, FM monitor receiver for use at home or on the road. It is double conversion, super heterodyne used to receive the narrow band FM communications in the amateur, public safety and business bands: 30-50, 144-174, and 440-512 MHz. Size 10¾"Wx2-7/8"Hx8-3/8"D.

Sophisticated microprocess-controlled circuitry eliminates the need for crystals, instead, the frequency for each channel is programmed through the numbered keyboard similar to the one used on a telephone. A "beep" acknowledges contact each time a key is touched. The Z30 scans approximately 15 channels per second.

Any combination of two to thirty channels can be scanned automatically, or the unit can be set on manual for continuous monitoring of any one channel. In addition, the search function locates unknown frequencies within a band.

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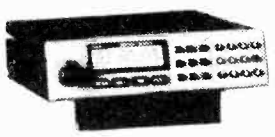

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Antenna Preservation

If you're like me, you have been promising yourself all summer to erect that new super antenna. Well, summer is over. It's autumn and before long the back yard will be swirling with snow. So we better get busy now!

It doesn't matter which antenna you have decided on. If it's made of wire, chances are it will be tied between two high points and left to the mercy of the weather.

The exposure to the elements does nothing for your peace of mind. Wind and ice are an antenna's greatest enemies. This month we will give you some ideas for erecting antennas and insuring that they stay up.

The most common place to secure your antenna is the house. Sturdy, unmoving, it's certain to remain up through the harshest of weather. The other end of the antenna, all too often, however, goes to a tree. And fastening your antenna to a tree can be disaster unleashed unless you take precautions to avoid what can be some serious problems.

The main drawback to using a tree for an antenna support is that as the tree sways in the wind, it stresses the antenna. And if it sways enough, often the rope halyard or antenna wire snaps with the strain. The extra weight of ice, deposited by an overnight storm can also add sufficient weight to drop an antenna. What's the answer? Fusing.

Fusing Your Antenna

The first thing you do to fuse your antenna is to install a pulley on at least one end of the antenna. Use a good grade of pulley. Bargain pulleys simply do not hold up and can cause a considerable amount of swearing.

The halyard end should use a good grade of nylon rope of 3/16 or 1/4 inch diameter. Cheap rope will break and once again, you may find yourself swearing.

The next item on the shopping list is a weight. Now it is possible to buy a commercially produced antenna weight but most people find that a sturdy metal bucket does a nice job. The bucket is tied onto the bottom of the halyard and filled with stones, sand or what have you until it will support the antenna (8 to 15 pounds of weight should do the trick in most cases) without pulling it too taut.

Punch it Out

Punch holes in the bucket to allow water out and cover it to keep water and ice from building up inside. That additional weight could be the thing to bring the antenna down.

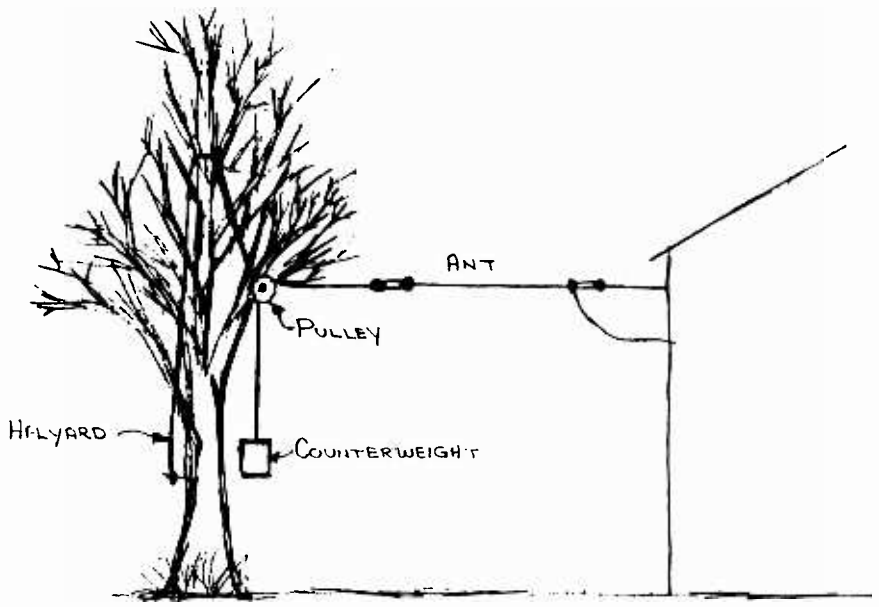


Figure 1

Now, when the wind blows or ice forms on the antenna, the weight will move up and allow the wire to give, preventing breakage.

Next to growing leaves, the main purpose of trees is to hold up one end of an antenna. If all the tree-supports were stacked end to end, we could build a wooden bridge to the moon! Simply put, trees are convenient, high and cheap antenna supports.

Fishing for DX

Of course, if the tree is high, there's the problem of how to get the wire up in the tree. There are a lot of ways -- ingenuity is hard currency here -- but my favorite is to use a fishing rod with at least eight pound test line and a half ounce sinker. Cast the line over the tree, *carefully*. Never mind that you'll look a little queer fishing in the back yard -- a half ounce lead weight sailing through the air at 60 miles an hour can knock someone out cold, break windows, put two inch dents in nearby cars, and injure small animals.

Cast the line over the top of the tree, right down the center, or over a large limb. Now tie a pulling line to the fishing line. Use something made out of heavy nylon or sash cord. Reel in the fish line until you can reach the pull line, and tie it to the halyard. Work it through the tree in the same manner you worked the pull line through. Now attach the pulley to the halyard and loop the antenna halyard through the pulley.

Always, *always* avoid stringing antennas anywhere near power lines. There are no second chances here. You can be killed. No more DXing. No more breathing.

HAM RADIO -- Getting Started

Lately, about half of my mail concerns amateur radio. Many readers want to know more about the new rules and how they can obtain a license.

A Little History: In 1952, the U.S. Federal Communications Commission created the Novice class amateur license. The Novice ticket was intended to be an easy to obtain first license and it allowed its owner to operate Morse code -- and only Morse code -- on the 80 and 11 meter ham bands. Transmitters were restricted to 75 watts and they had to be crystal controlled. What's more, the license was only good for one year and could not be renewed. You had to move up or get out.

The idea of this "easy" license was to attract people to amateur radio and that it did. Thousands earned their Novice licenses.

In the late 1960s and 70s, the popularity of the Novice license began to fade. The FCC reacted by allowing the novice access to more bands, higher power and VFO control. In addition, the life of the license was extended to five years and could be renewed. Interest picked up again and more people took part in amateur radio.

The cycle continued in the late 70s and early 80s when the number of Novices being licensed once again dropped. Why?

The major factors in the decline were easy access to CB gear and home computers. Few people wanted much to do with a license that allowed only Morse Code.

In mid 1986, the FCC proposed a radical idea: allowing novices radiotelephone, digital and TV privileges. This proposal was approved and went into effect in March of the next year. Within a month, thousands of new amateurs entered the ranks and so far, the flood has not stopped. Interest is at an all time high.

How do I Get a Novice Ticket

The first step is to learn Morse code (yep, you still need it) at a rate of five words per minute (WPM). This speed is easy to learn and the average person would be able to pass the exam with only a few weeks worth of effort.

The second portion of the exam consists of 30 simple questions. In fact, the actual questions *and answers* are being made available through several radio retailers.

This written portion consists of radio law and basic radio theory. It should take a week or two of diligent study to breeze through this part of the exam.

The exam can be administered by two amateurs who are over the age of eighteen and hold at least a General class license.

How to Prepare

The best way to prepare for a local examination is to obtain a copy of the ARRL's manual, *Tune in the World with Ham Radio*. The book costs $15.00 and it includes not only the answers to the questions you'll be asked but two cassette tapes that will teach you Morse code. You can obtain a copy of *Tune in the World with Ham Radio* from several *MT* advertisers.

Another good training program is with a home computer. I have been offering a program for the Apple II series of computers free of charge. To obtain one, send me a disk mailer and postage. A modified version of this program is available for IBM machines however this is a charge of $5.00 postpaid for this one. There are more than a dozen other programs on this disk as well as the code program.

That's all for this month. Remember, if you require a personal answer to a question, feel free to write. But be sure to include a self-addressed, stamped envelope. Thanks. ■

400 Channel Memory on the PRO2004

It was only a matter of time before inveterate tinkerers could no longer restrain themselves from installing the missing diodes on the controller board in the Realistic PRO2004 scanner! *MT* readers Dan Hughes of Chicago Ridge, Illinois, and Tom McElvy of Norfolk, Virginia, confirmed our suspicions.

MT originally reported several months ago to our readers how to restore cellular mobile telephone coverage by removing diode D513 from circuit board PC-3, but only recently has the result of other experimentation started trickling in.

CAVEAT: This modification should not be performed by anyone not skilled in soldering small electronic components. Above all, remember to disconnect the power cable from the wall outlet before removing the chassis from the cabinet! *MT* will assume no liability resulting from damage to equipment, voidance of warranty, or personal injury resulting from any modification published within its pages.

400 memory channels! Yes, you can add 100 additional channels of memory to your PRO-2004 by simply soldering a switching diode (1N914/1N4148 or similar, like Radio Shack 276-1122) into two vacant holes in circuit board PC-3 (which will have to be removed for the modification).

Owners of the PRO2004 who made the cellular coverage mod will remember that D513 and D512 are labeled but, counting back, D511 and D510 are not. The diode is installed in the holes reserved for D510, observing the same polarity shown for the other diodes.

The procedure will erase the memory, requiring you to reprogram your scanner after reassembly. With the diode installed, your radio will have ten banks of 40 channels each rather than 30 (the channel bank numbers on the keypad will now be incorrect).

One interesting anomaly reported by Dan Hughes: One channel will not lock out after the modification--and whichever channel it is seems to change at random! Certainly a tolerable inconvenience to trade off against the expanded memories.

So what do the other missing diodes do?

A diode installed at D512 disables coverage from 30-54 MHz, a necessary provision for marketing in Europe and Australia; at this writing, no one seems to know what diode D511 does!

Faster Scan Rate for the PRO32

The Radio Shack PRO32 200-channel handheld scanner is a high-performance handful, but it has painfully slow scan rate--roughly 5 channels per second. A simple internal modification can more than double that speed!

Tom McElvy of Norfolk, Virginia, was impressed by the remarkable similarity between the PRO32 and the tabletop PRO2021; could the speed mod covered a few months back in *MT* for the tabletop unit work in the handheld version? Tom discovered that it would!

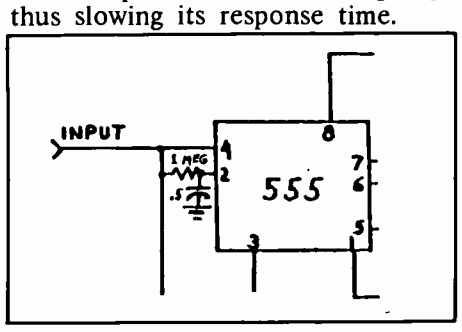
After carefully disassembling the cabinet of the PRO32, examine the lower right portion of the component side of the logic board next to the microprocessor chip; resistor R51 (39k ohms) is clearly marked. Change this resistor to 15k ohms and the speed will be approximately 11 channels per second!

More R7000 Delay Improvements

In the September issue we printed an improvement by Jim Dantin for the original ICOM R7000 scan delay fix written by David Cook for the July issue. Now David has an improvement of his own.

As it stands, the Cook/Dantin modification is very sensitive to any triggering of the squelch--noise, pulse or brief keying will do it. The addition of two components will require a signal duration of approximately half a second to stop the scan sequence.

Note the accompanying partial diagram from the September ussue of *MT*. Two components, a 1 megohm resistor and a 0.5 microfarad capacitor have been added to pin 2 of the 555 timing chip, thus slowing its response time.



SCA Monitoring on a Budget

Subsidiary Carrier Authorization (SCA) is a technique by which certain subscriber radio services may ride piggyback right along with FM broadcast signals. Generally speaking, they are offset by about 67 kHz from the center carrier and are not detectable with conventional wide-band FM radios.

Since many of these services are considered private, uninvited monitoring is proscribed against by the ECPA of 1986. However, there are services such as Talking Books for the blind which welcome additional listeners.

Dave Beauvais of Magic Media Services recently made a fascinating discovery which we share with our readers this month.

"I have a $25 Audiovox FM converter in my car--you know, the kind that plugs into your AM radio and delivers a signal at around 1400 kHz. Much to my astonishment, I've discovered that if I tune the AM radio between 60 and 90 kHz above that, I hear SCA subcarrier programming on whatever FM station I was listening to!

"The technique works well for voice but is slightly distorted with music; you have to tune slightly to one side of the subcarrier, slope detecting it with your car radio. Any cheap FM converter should work."

Thanks, Dave, for an unusual--and very useful--tip. ■

Clem Small, KR6A/1, CET

R.R. 1, Box 181
Salisbury, VT 05769

Designing Your Own Antenna: Some Basics

MT readers frequently write to me requesting information on how to construct an antenna for their favorite band. Believe it or not, it's easy and even fun to calculate the length of the necessary elements of the antenna you want. So, this month we'll cover some basics of designing your own antenna.

The Groundplane antenna. The most commonly encountered antenna design for the VHF-UHF bands is the groundplane, shown in Figure One. This antenna is simple to construct and can give years of good service if carefully made. Its non-directional radiation pattern makes it ideal as a choice for a general monitoring antenna on the VHF-UHF bands. On the HF bands, its low angle of radiation makes it a favorite with many DXers.

Let's take a look at the configuration of the groundplane's elements. The antenna consists of a 1/4 wavelength vertical element, and a number of radials which are also 1/4 wavelength in length. Some designers make the radials two or three percent longer than the vertical element, others make them all 1/4 wavelength.

George Brown, the inventor of the groundplane antenna, says that two radials are quite enough: some antenna designers recommend three or four, spaced evenly as a skirt around the antenna. The element length required to equal 1/4 wavelength can be computed quickly by dividing the number 234 by the value of your intended frequency of use, in megahertz. That is:

Length of GP elements in feet = 234/operating frequency in MHz.

For example, a groundplane designed to operate at 150 MHz would have elements 234/150 or 156 ft. (1 ft. 6 3/4 in.) in length.

If you prefer to work in meters, substitute 71.1 for the 234. Then the length of an element at 150 MHz is 71.1/150 = .474 meter (47 cm).

Taking an example from the shortwave band. let's say that we wanted a groundplane for the 10-meter amateur band. We'll use 29 MHz as our intended frequency of operation.

234/29 = 8.07 ft. (8 ft. 7/8 in.) or 7.11/29 = 2.45 meters (2m 45cm).

(insert fig, 1 here.)

Bandwidth of Antennas. Most of the time we want to utilize an antenna over a band of frequencies, rather than one single frequency. In that case, choose your frequency of operation (for the equation given above) to be at the center of the band you wish to monitor. For monitoring, an antenna can usually be used over a wide frequency spread. If the antenna is to be used for transmitting over a wide band of frequencies, then either a broadband antenna, an antenna tuner or separate antennas for each different band segment should be considered.

Constructing the Groundplane. As you can see from Figure One, the groundplane can be constructed by soldering its elements to an SO-239 female coaxial cable socket or female BNC coax connector. The coax connector from your feedline can then be plugged directly into this connector, which forms the base of the antenna. The antenna can then be mounted on a mast by taping or clamping the SO-239 and the top part of the coax that plugs into it to the top part of the mast.

For indoor mounting, a dry cord taped or glued to the tip of the vertical element can be used to hang the antenna in some out of the way spot. Don't use this "tip hanging" technique to transmit with any appreciable power; the cord might just go up in flames!

Feeding the Groundplane. The feedline used with groundplane antennas is usually 50-ohm impedance. The radials should droop something like 30 degrees, as shown in Figure One. Give the antenna the appropriate impedance to match this line. If you droop them so much that they lie down along the coax cable, they will match 75-ohm cable (and your antenna will be essentially a coaxial dipole!).

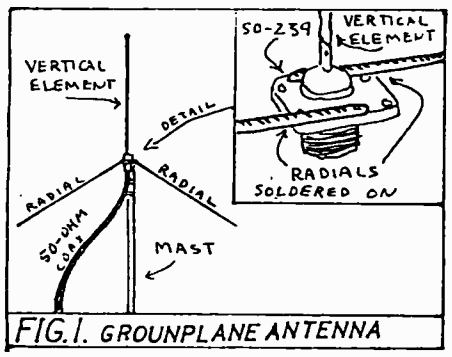


FIG. 1. GROUNPLANE ANTENNA

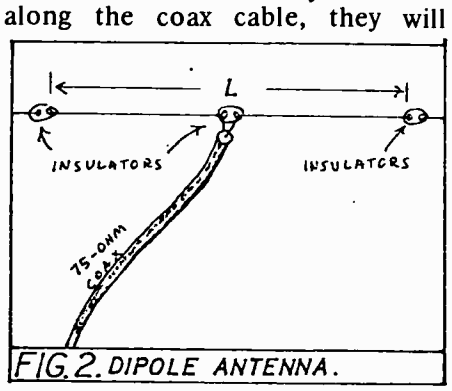


FIG. 2. DIPOLE ANTENNA.

If your antenna is to be exposed to the weather, you should seal around the SO-239 and the plug that goes into it with a good grade of sealer. This is necessary to prevent water from getting inside and damaging the coax.

And now for the Dipole. The dipole antenna configuration is another heavily utilized design and with good reason. Long years of experience have shown the half-wave dipole antenna to be a good choice for both monitoring and antenna ham work on the HF band and even into VHF band. Figure Two shows the details of this antenna design.

Overall length of a dipole is computed by dividing the number 468 by the value of the operating frequency in megahertz.

L 9in feet) = 468/F (MHz)

At the operating frequency of 3.8 MHz, the overall length would be 133.7 ft. (133 ft. 8 1/2 in.)

If you would rather have your answer in meters, substitute 142.6 for the 468.

At 3.8 MHz, the overall length would be 146.2/3.8 = 37.5m.

Feeding the Dipole. The dipole may be feed with 75-ohm cable, either the balanced, twin-lead variety or the unbalanced coaxial cable. Coaxial is most often chosen due to its ruggedness, ease of use and the fact that it isn't affected by dirt, rain and ice.

To use coaxial cable, the center conductor is connected to one leg of the dipole, with the braid connected to the other leg. Some experts recommend using a 1 to 1 balun here, and some say it is a waste of time. In my experience, if you are using the antenna to transmit as well as receive, a balun may facilitate antenna-system tuning at times, but generally, it is not necessary and may be omitted.

If the twin-lead type lead-in is used, a balun or antenna tuner may be helpful at the receiver end of the line, as most receivers have an unbalanced input. The relatively inexpensive 300-ohm twin-lead may be used if a 4 to 1 balun is used at the antenna to match the higher impedance of the line to the 75 ohms impedance of the antenna.

Again, if you use the antenna to receive only, baluns may be a waste of your time. And, believe it or not, if you omit the balun for the 300-ohm line, the relative large mismatch of 300-ohm line to the 75-ohm antenna may not cause any noticeable problem in receiving stations. This is more true on the lower bands than the higher ones.

And so. Now can tailor these two antenna types to the frequencies which you most want to utilize. Antennas so constructed are known as "resonant" antennas, as they are tuned to the band for which you cut their length. Resonant antennas tend to give better response to signals in the band for which they are cut. This is a benefit in weak signal reception times, especially at the higher frequencies where the limiting factor is not so much the atmospheric or man-made noise as it is on the lower bands.

RADIO RIDDLES

Our previous radio riddle:

To set the stage for our last radio riddle, we listened in as an operator received a strange "dit" as in Morse Code, repeating itself at 1/7 second intervals. This occurred after the operator of a station had tapped their key only once. The operator was using a beam antenna which received equally well from the front and rearward directions, I'll bet that many of you guessed the answer to this one.

The "dit" heard by the operator, which repeated at 1/7 second intervals, was the reception, by the station's receiver, of the station's own transmitted signal! This signal, sent when the operator tapped the key only once, traveled from the station's beam antenna in both the forward and rearward directions, all the way around the world. It was received by the beam antenna from both the front and the rear directions just 1/7 seconds later. The second, weaker dit was heard as the signals circled the globe a second time.

In his autobiography, The Big Ear, John Kraus, the inventor of the W8JK beam, reports using this technique to find open communications paths around the globe. His beam receives equally well from the front and rear directions. Vyvyan, one of Marconi's engineers of days gone by, reported in his autobiographical Wireless Over Thirty Years, "I myself saw signals (inked on a paper tape recorder) sent from one of the Imperial Beam Stations recorded, not only once but three times, at intervals between each record of 1/7th of a second, proving that the signals had made a complete circuit of the world three times..." And it is a fascinating world around which they passed, isn't it?

This Month's Riddle:

We've used the word "balun" in this month's column several times. Just what does this word mean and what does a balun do, anyhow?

With that I'll wish you a Happy Halloween. Thanks to those of you who write and let me know what you want in the column. When you write, an SASE is appreciated. Til next month, peace, DX, 73. ■

Terry Staudt, L.P.E., WØWUZ

716 N. Roosevelt
Loveland, CO 80537

The Results are In

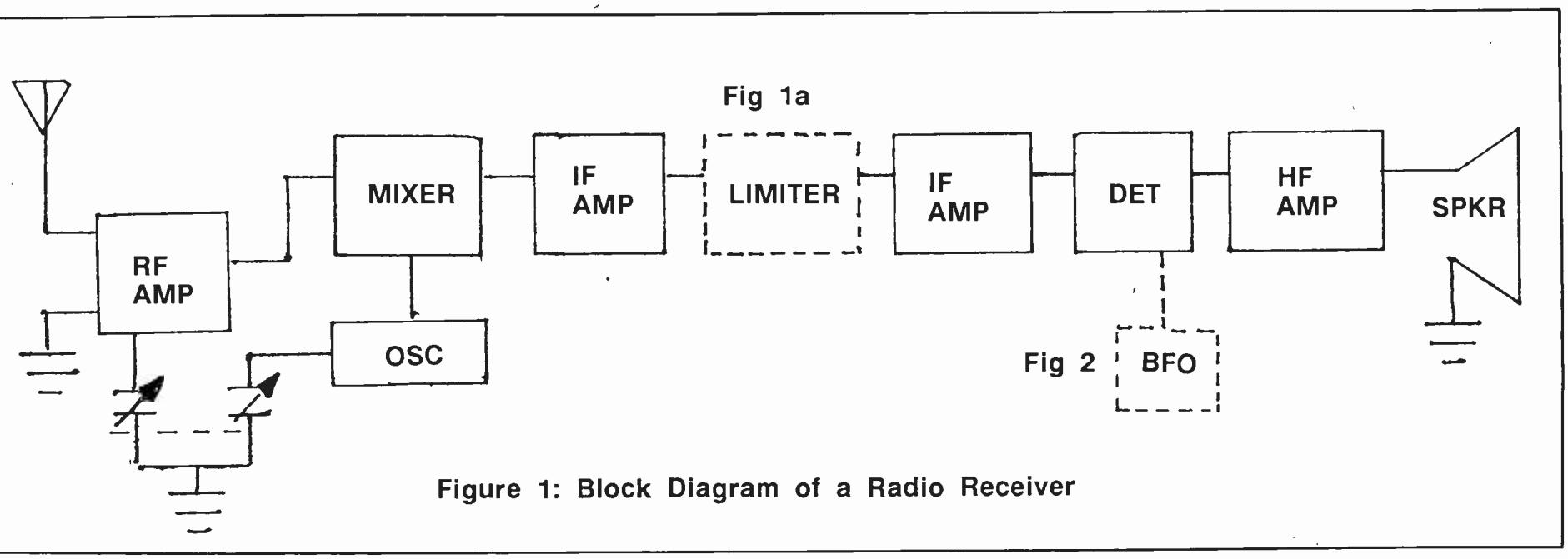


Figure 1: Block Diagram of a Radio Receiver

I imagine that some of you are probably wondering why it took so long to report on the survey I ran. In it, I asked whether or not you wanted a "basic receiver course." At the time, I said that 10% of the subscribers would have to say, "yes." Well, we received less than 200. So it's no cigar. Or is it?

Remember, there is an inexhaustible influx of people into these pages that doesn't know a soldering iron from a pogo stick. And these people deserve attention.

If you wish more meat, I'll certainly be slipping it in from time to time, but if that's what you need on a monthly basis, I suggest that you check out *CQ, 73, QST* and *Ham Radio* magazine. These have a vast range of technical articles that range in complexity and interest.

So, for those who wrote and said they wanted the basic receiver course, I'm going to run you through a museum on a motorcycle, radio wise.

How the Magic Box Works

When a radio signal travels down your antenna to your receiver, the first thing it sees is a circuit tuned to accept it and reject others on a different frequency. It then goes to a tube or transistor for amplification.

After that, it goes to a mixer, which is also connected to a flea powered transmitter, called the oscillator, which "tracks" it with the tuning capacitor at a frequency exactly the same *plus* the difference of the IF (intermediate frequency) -- usually 455 kHz). If you're listening to a station on 1000 kHz, the oscillator frequency should be 1455 kHz.

In the mixer, then, you have a frequency of 1000 kHz, 1455 kHz, 2455 kHz, and 455 kHz. Since the IF stage is responsive only to 455 kHz, that is the signal that is accepted and amplified.

Using a single frequency lets you do a lot of neat things as crystal filters, noise blankers, upper and lower SSB offsets and so forth need only be designed for the commonly used IFs (455 kHz, 9 MHz, 10.7 MHz and a few special ones).

From the IF stage, the signal is converted back to audio information by the detector, which can be as simple as a diode or as complicated as an IC.

It then goes to the audio amplifier and on to the speaker. (See figure 1.) This scheme is the same for *all* radio receivers, whether they're AM, FM, TV, FAX or RTTY/CW.

The difference between AM and FM is simply this.

An AM signal is a carrier wave with audio superimposed on it. FM, as the term indicated, deals exclusively with the carrier wave. The simplest way to describe it is to use the analogy of a Russian "squeeze box" accordian. The speed it moves determines the frequency and the farther it moves is the deviation, or bandwidth from fully closed.

On commercial broadcasts, the deviation is 75 kHz. In business, public safety and "ham" use, it's 5 kHz. That's the principal reason a broadcast FM receiver cannot be easily converted to, say, police reception. The IF is too wide, letting it all through plus the audio recovery is very faint.

It's no problem to change the oscillator frequency, though, and I get requests all the time on how to do it. Believe me, it takes a heck of a lot more than that!

SSB reception requires the reinsertion of the suppress carrier at the detector using a BFO (beat frequency oscillator) or a pair of crystals in an oscillator circuit *at the IF frequency.*

The only thing I've left out of this high speed chase is the limiter in the IF stage of an FM receiver. Since we were concerned only with a carrier wave, any noise or amplitude information is unwanted. The limiter is biased in such a fashion that any "up and down" variations are clipped off.

This was my obligation to the very kind folks who took the trouble to reply. For those of you who have enjoyed it or were enlightened, the price was right, but if you had bothered to write, I would have wow'ed you.

Enjoy. Any questions will be answered when accompanied with a self addressed, stamped envelope. ■

An Active Antenna

by Eric R. Johnson KB6EPO
799 Ada St.
Chula Vista, CA 92011-2603

If you live under the bane of restrictive antenna ordinances, or if your frequently travel away from your beloved home antenna "farm," then then you will enjoy this simple active antenna. Being in a Navy aircraft squadron, I frequently find myself having to live in barracks for a few weeks at a time at various places around the world.

What an ideal situation for the avid DXer with a portable receiver, you think. Not when Uncle Sam's military gendarmes come looking for the guy who put up the unauthorized wires through the window screens and all about the trees and bushes! I once had to explain why I had a bottle of San Miguel beer hanging from a tree limb over a sidewalk with the other end of the "string" going in the window of my room! I decided a nice active antenna would be just the ticket for those "road trips."

What I came up with is a box 4" wide, 3' high, 6" deep with a 42" telescoping whip coming out the top. The whip can be folded down into the box so that only 4 inches sticks out, and then the unit can be used as a combined preselector and preamp for an outside antenna when I can get away with it. Two BNC jacks on the rear panel provide connections for the receiver and optional outside antenna.

Reception with the 42" whip inside a wooden building on the ground floor equals or exceeds that of a 50' wire up high outside. Also provided on the rear panel is a 1/8" phone jack to provide 12 VDC to my receiver so that I don't have two cords going to the wall socket. On the front panel are a range switch, tuning knob and on/off switch.

Circuit Description

Tl's primary provides a place to hook up a 50 ohm external antenna. The second is tapped in 4 places, and Cl resonates it to the band of frequencies desired. The 42" whip is connected to the "hot" side of this tuned circuit. Q1 amplifies the desired band of frequencies, and R2 sets the gain of this stage. Credit must be given to Terry Staudt, W0WUZ, for the idea of the LED in Q1's source circuit.

T2 provides impedance matching for Q2. The Q2 circuit has a 50 ohm input and output impedance, and uses degenerative feedback for stability. T3 is a 24v center tapped transformer, the circuit rating of this will depend on whether you plan to use it to provide a power source for your receiver or just for your antenna only. I used a 2 amp rated secondary so I could also power my Uniden CR2021. You could use a 9 volt alkaline battery for a power source for the antenna if economy is your goal. U1 is a 12 volt positive regulator IC, not necessary for the antenna circuit but nice for the receiver power source.

Construction Tips

Perfboard construction will work just fine for this circuit. If you are ambitious you can make a printed circuit board like I did. T1 is mounted right on the back of the rotary switch to keep the leads as short as possible, and the wire to C1 and ANT1 should also be as short as possible. I mounted ANT1 on a piece of plexiglass 1" by 2" by 1/2" thick, then I used two screws to secure the plexiglass to the bottom of the metal box. This insures the antenna is well insulated from ground, and the capacitance from the bottom of the whip to ground is negligible. The following table shows the tuning ranges which correspond to the taps on T1's secondary:

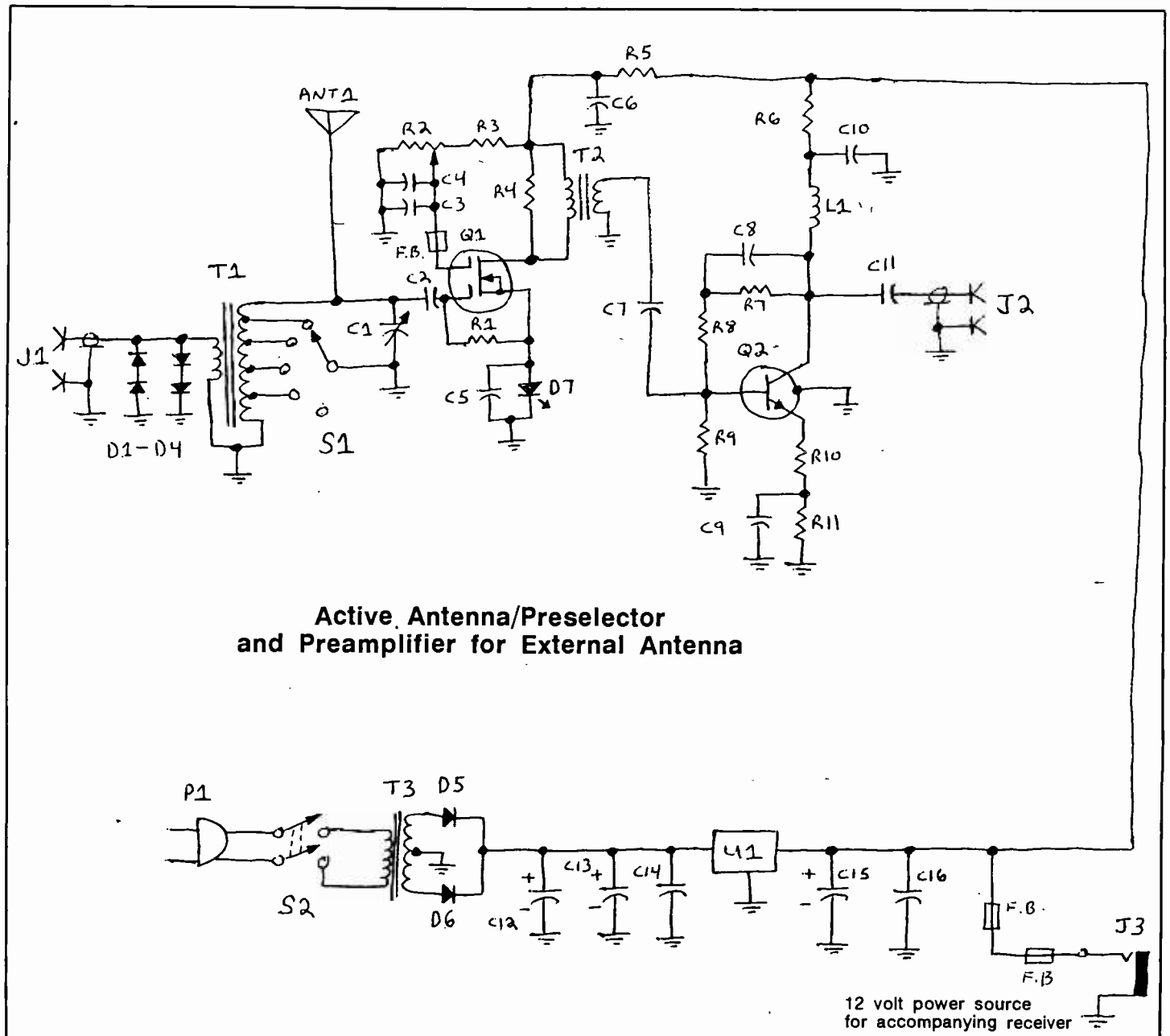
4 turns = 13-30 mhz
7 turns = 8-20 mhz
13 turns = 5-11 mhz
26 turns = 3-7 mhz
51 turns = 1.8-4 mhz

Use caution when handling and soldering Q1 as it is static sensitive. Use a soldering iron with a grounded tip, and wear cotton clothing. Keep Q1 in its static protective foam until you are ready to install it. Ground your body to an earth ground with an anti-static wrist strap if you have one, or with foil and hook-up wire making sure you place a 1 megohm resistor between your makeshift wrist strap and the ground wire! Once Q1 is soldered in place it will be quite sturdy and you don't have to worry anymore.

Q2 is a rather expensive RF transistor, but since it was in my junkbox, I used it. I'm sure a cheaper device such as 2N2222 or 2N3904 will work just as well. Miniature RG-174 coax is used to connect the BNC jacks to the circuit board. With some judicious shopping you should be able to build this antenna for less than $30.00. I scrounged through my junkbox first and was able to build mine for $22.00, including the store bought metal case and telescoping antenna.

Set-up and Use

Start with R2's wiper at the ground end. Now tune in a fairly weak signal using your receiver's antenna terminals. Remove the wire or fold down your receiver's antenna and hook up the antenna to the output of the



Active Antenna/Preselector and Preamplifier for External Antenna

active antenna. Set S1 to the band corresponding to the frequency of the station you just had tuned in.

Turn on the active antenna, extend the 42" whip fully and advance R2 until an increase in noise is heard from the receiver. Now use C1 to peak the station you've selected. Advance R2 until the strength of the station is so much stronger than the first time you had it tuned in that it makes you smile.

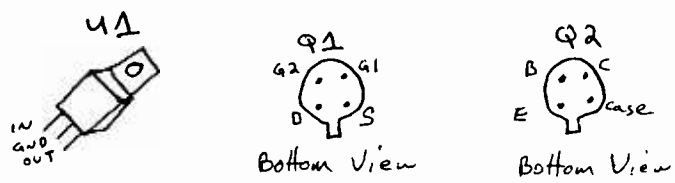
You can advance R2 further for even more gain if desired. When you reach the point that noise between stations is too loud or if you hear "birdie," that's when you back R2 down a little and leave it alone. Alternatively, a frequency generator and oscilloscope can be used to adjust the amplifier for best gain with minimum noise and no oscillations, but your ears can tell you what's best if you haven't got access to test equipment.

Now that it's all set up, drill a hole in the top of the enclosure directly above where the whip is mounted, fit a rubber grommet in the hole and slide the top half of the box down the whip until it mates with the bottom of the box. Install the screws to hold the two halves together and you're done.

The tuning provided by T1/C1 is broad enough that once you tune the active antenna to the center of an SW broadcast band it need not be re-tuned until you want to tune another band. You can make the tuning sharper if you like by making C2 smaller than .01uf. A 100pf capacitor at C2 makes the tuning quite sharp. Enjoy! Any question will be answered when an SASE is provided. ■

Active Antenna Parts List

ANT1	42" telescoping transistor radio antenna		
C1	365pf variable capacitor		
C2,3 C5-C11	.01uf ceramic disc capacitor		
C4	100pf ceramic disc capacitor		
C12	1000uf 25v electrolytic		
C13	1uf 25v electrolytic		
C14	.022uf ceramic disc capacitor		
C15	4.7uf 25v electrolytic		
C16	.047uf ceramic disc capacitor		
D1-D4	1N914		
D5,D6	1N4001		
D7	1.65v LED		
F.B.	ferrite beads		
J1,J2	BNC jacks		
J3	3.5mm (1/8") open circuit phone jack		
L1	15uh		
P1	2 prong line cord and plug		
Q1	3N211 or NTE454		
Q2	2N5179		
R1	3.4k ¼w	R7	3.6k ¼w
R2	25k trim pot	R8	240 ohms ¼w
R3	47k ¼w	R9	1k ¼w
R4	1.6K ¼w	R10	10 ohms ¼w
R5	100 ohms ¼w	R11	150 ohms ¼w
R6	47 ohms ¼w		
S1	SP5T rotary switch		
S2	DPDT mini toggle switch		
T1	Amidon T-68-2 toroid core. Primary 9 turns #28 enamelled wire Secondary 51 turns #28 enamelled wire, with taps at 4, 7, 13, and 26 turns from "hot" end.		
T2	Amidon T-68-2 toroid core. Primary 51 turns #28 enamelled wire. Secondary 13 turns #28 enamelled wire.		
U1	7812 voltage regulator I.C.		
T3	Power Transformer Pri: 117 vac Sec: 24 vct		



"ASK BOB"

Bob Grove WA4PYQ

P.O. Box 98
Brasstown, NC 28902

Q. What is meant in two-way radio by an "extender"? (Bill Bowers)

A. An extender is a mobile-mounted repeater which rebroadcasts low-powered signals from a hand-held radio when the user is away from his vehicle. Extenders are commonly used by California Highway Patrol officers on a simplex frequency of 154.905 MHz.

CHiPs also utilizes the system for state-wide CLEMARS (mutual aid) communications on 154.920 MHz. Extender use in other states is similar. (Thanks to California scanner expert Rene Borde for help on this one!)

Q. What is the correct way to ground a scanner antenna for lightning protection? (Stephen Fattel, Boca Raton, FL)

A. Grounding systems conventionally used for monitoring installations may drain off mild static discharges or protect equipment from voltages induced by nearby lightning strokes, but they are useless against a direct hit.

Grounding also offers some protection to the operator against accidental shock, assuming that all radio chassis are commonly connected; in some cases electrical noise interference may be reduced as well, especially in short wave, medium wave and long wave receiving installations.

Commercial broadcast stations try to immunize their transmitters by coiling about a dozen turns in the coax just before it enters a ten-foot length of metal pipe which, in turn, is connected by heavy gauge strap to one or two eight-foot ground rods. It also helps if the antenna itself is mounted below the peak of the metal tower or mast which then becomes a lighting rod.

Still, there is no protection against a direct lightning strike except total disconnection of the equipment from the antenna line.

Q. Does the new Cobra SR-15 hand-held scanner cover the 225-400 MHz military aeronautical band? (Bruce Stewart, Tucson, AZ).

A. No, and so far as we can determine no hand-held with that range is planned in the near future by any manufacturer.

Q. Why do so few scanners cover the 225-400 MHz military aircraft band? (Brian Jones, San Antonio, TX)

A. Because of the relative obscurity of that band until recently, few scanner manufacturers felt that the band was of interest to listeners. Since it is AM (land mobile communications are all FM) and since it required additional components to tune in, manufacturers did not feel that the additional cost would be price competitive.

Q. When I monitor our local paramedic frequencies I can only hear the hospital, not the ambulance. Should I be listening on other frequencies? (Scott Leamy, Toledo, OH)

A. You should probably consider another antenna. With the exception of MED channels 1-8 (463/468 base/mobile pairing) virtually all medical communications are simplex (one frequency used for both mobile and base).

You are hearing the base unit because it is running higher power into a better antenna; to hear the mobiles you probably should use a high, directional antenna like the Grove Scanner Beam, and don't forget to use name-brand low-loss coax like RG-6/U or RG-8/U.

Q. I have seen advertisements for pagers that work nationwide, anywhere you go. What frequency band are they on? (Tom Klimas, Hillcrest Heights, MD)

A. Many use the subsidiary carrier authorization (SCA) which utilizes standard FM broadcast stations (88-108 MHz), listening for narrowband subscriber services which are sent along with the regular program, but offset by roughly 67-90 kHz. They are unreadable without special equipment.

A new concept has been recently developed by Metrocast (11021 Via Frontera, San Diego, CA 92127; call toll-free 1-800-443-3488 and tell them you read about it in Monitoring Times). They have been assigned high band frequencies (158.05-158.06 MHz) and their digital pagers display up to 8 messages of 52 alphanumeric characters each as well as 4 portable messages which can be programmed in by the user. Cost is about $500.

Q. When should I use a tuner (transmatch) rather than a passive preselector? (Dan Morriseau, Auburn, WA)

A. An impedance matching device (transmatch) is rarely needed for receiving, expecially for most shortwave and long wave receivers. For transmitters, the transmatch ("antenna tuner") is useful for reducing wasted energy which heats the transmission line rather than radiates as communicative energy. At the low signal voltages associated with receiving, this is hardly a problem.

From an efficiency standpoint, the primary purpose served by a receiving antenna is to capture enough signal voltage to overcome the internally-generated electrical noise generated by the receiver circuitry.

A larger antenna may pick up more desired signal, but it will also pick up proportionately more undesired interference and background noise as well. The result may be a higher S-meter reading, but the signal will be no clearer above the background clutter.

A passive preselector like the Grove MiniTuner (TUN-3) will do more for a receiver than an impedance matching "antenna tuner" because the preselector passes signals only in the frequency range you want to hear, rejecting strong off-frequency interference which can produce intermod, images and desensitization ("front end overload") of the receiver.

Q. I recently added an attenuator between my antenna and scanner and noticed a dramatic improvement in signals. How come? (Peter Davidson, Redlands, CA)

A. An attenuator lowers the signal levels going into the scanner. In an extremely high signal level environment such as your location this will often overcome "desensitization", a reduction in sensitivity which many scanners experience during strong signal overload. This is the reason that some manufacturers put a 10 dB attenuator switch on the back of their scanners.

The head design engineer for Bearcat once told me while we were discussing preamplifiers, "Most scanner listeners need attenuators, not preamplifiers!" A better remedy yet would be a good in-line filter which could reduce signal levels from common offenders like FM and TV broadcasters, mobile telephone base stations and continuous weather broadcasts.

Q. Are there any modifications or keyboard commands that will allow the Bearcat BC210XW to receive frequencies outside of its set limits? (Bill Finn, Bloomfield Hills, MI)

A. At one time most Bearcats could be "tricked" into operating outside of their factory-set limits. This ability was not an oversight in design but an intentional "trap door" allowing factory diagnostic and alignment procedures.

At this time we are unaware of any simple procedures which allow the present Bearcats to go out of band.

Q. Radio Netherlands' "Media Network" mentioned an emergency broadcast system in the U.S. which was proposed a number of years ago but never materialized. What was this? (Steven Cline, Indianapolis, IN)

A. The prototype of this survivable low frequency network was WGU20, located near Edgewood Arsenal, Aberdeen, Maryland. Operating on a frequency of 178 kHz, occasional voice announcements were previously reported. Its status and future at the moment are unknown as it is an orphan in an abandoned concept. ■

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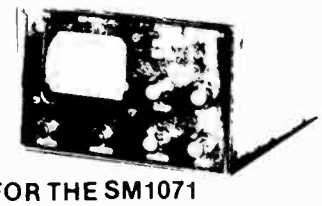

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Coast Guard Feature Brings Comments

Monitoring Times is the best publication on the market for the SWL and in my case for a ute monitor, Ham operator and CBer. I will continue to subscribe to your publication.

As an addition to Jock Elliott's article in September's *MT* ("When the Waves Turn Minutes into Hours") the following frequencies should be added; as I don't see how they were missed.

There is just about continuous traffic on 5696 kHz between Coast Guard A/C both on search and rescue missions as well as training missions, and Commstas in Boston, Portsmouth, Miami, New Orleans, and even on one occasion, San Francisco was heard. 8984 kHz is the secondary.

In addition, 11288 MHz USB is also usually very active. There is a base station involved with several aircraft, usually tracking targets, and I assume they are possible anti-smuggler operations.

C. Dunn
Dunkirk, NY

[Jock's list of frequencies are for surface vessels; those you list are air to ground and are, indeed, very active...Bob]

I had to write and thank you, or Jock Elliott, for his great article in this month's issue on Coast Guard Communications. As a utility DXer my favorite agency is the Coast Guard and Jock did an article I've been waiting to see for a long time. Maybe sometime you can do one about the COMMSTAS and the types of radios and antennas they use on their HF voice aero & ship frequencies. Also the Federal file is most welcome. Those frequencies are hard to come by but are worth listening to and can be very interesting. I tried some of your SATCOM frequencies and they were right on the money - thanks!

Bill Battles
E. Kingston, NH

An Unusual Conversation

Wanted to share an unusual conversation monitored at 4:13 UTC at about 7.8 MHz 8/9/87. Mode was SSB (and) consisted of voice exchange between 2 male operators in English. Message seemed to be some type of medical exchange on condition of a patient: "...radiation effects..."; "...atomic, uh, antibiotics..."; "..extensive neurological damage.."; "..we've got the patient pretty doped up, but the next 24 hours will tell."

The operators seemed to be in close contact with the patient, but did not sound like medical professionals, as there was no exchange of complex medical lingo.

G.S. Patten
Salt Lake City, UT

[Fascinating! Could have been a training session or the real thing. Any of our readers have ideas on this intriguing catch?...Bob]

Amen for Amver

The piece on "AMVER" by James R. Hay (Sept. 1987) sure has MADE MY DAY as Clint Eastwood would say.

Mel Smith
Crisfield, MD

Wondering About Loggings Wondering About Loggings

Wonder how many people noticed that your logging section in the September issue was repeated word-for-word from the August issue? Betcha not many. I don't think people use logging any more -- the information is so old the only purpose they serve is as a vanity press.

Kal Brinmann
Long Island, New York

I Like Ike

I'd like thank columnist Ike Kerschner for his recent series on accessories. Mr. Kerschner is the first person I've read in the past ten years who has been able to cut through the gobbledegook and salesmanship to let me know in simple terms what these gizmos do. (It seems not much!) Let's have more beginner's articles by Ike.

Ivan Benkosky
Oak Park, Illinois

[Mr. Kerschner's Getting Started column is a regular Monitoring Times feature]

He Knew Too Much...

Enjoyed David Klopfenstein's article on pirate station KCOR (September *MT*). However, after reading it, I couldn't help but wonder -- given the wealth of information contained within -- if he wasn't perhaps one of the staffers or even "J.R. Psycho" himself. He is, in any case, a superb writer.

Name withheld by request

Poetry "Free Style"

One *MT* reader, signing only as "S.S", so enjoyed Jock Elliott's article on Freebanding last month that he was inspired to poetry. The piece is entitled:

If a DX Contact Falls in the 11 Meter Band
and Nobody Hears it,
Did it Really make a Sound?

Why would you deny me this?
Is it because my code speed is only 4 WPM?
If it weren't for 11-meters, I would never searched out Morse Code

Who am I hurting?
Just because I'm unlicensed, do I cause TVI?
Most Freebanding DXers run responsible stations; don't kill the dog because he has fleas.

Why do you make me a criminal?
I answer a CQ from another country and I break the law?
Almost to the man we are intelligent, patriotic Americans; seek out those who aren't.

Why would you deny me this?
It has made me a devoted HF fan.
It has made me more valuable to my country.
It has enlarged my world, one hundred fold.
It has made me more aware of my place (and responsibility).
It has made me a criminal.

Phone Home Finland

In your June issue you published an article about the phone possibilities for U.S. listeners. The article did not, as far as we know, mention the toll-free phone system Radio Finland has opened in the U.S. Though operating on an answering service system, our 1-800 line gives listeners a chance to order schedules and comment on our programming. The messages left on the toll-free line are processed in the U.S. and then sent to Finland.

Juhani Niinsto
Radio Finland

[Radio Finland is to be congratulated for their innovative -- and by all accounts, highly successful -- audience relations program. Their toll-free number is 1-800-221-9539. Call and tell them you read about it in Monitoring Times. --ed]

Wrong Language

I have monitored communications for what appears to be a Saudi construction project but it is in French and German. The Saudis speak Arabic. Does that mean it isn't coming from Saudi Arabia?

L. Beam
Oklahoma City, OK

[You don't give me very much to go on -- not even a frequency. However, it is well known that the Saudis import western assistance for various projects, including construction, so hearing French, German or even English is not unusual. Further, entrance into certain Saudi cities, like Mecca, is forbidden to non-Muslims. When construction takes place there, foreign technicians monitor the site via closed-circuit TV, relaying instructions to Muslim foreman via radio from outside the closed city.]

Praises from Apollo

I would like to thank you for the nice treatment that you gave to my photo of the Apollo II moonship on the cover of the July issue.

I must tell you that I enjoy reading *Monitoring Times*. I buy it off the stand at a local radio store. The content, writing style, layout and overall design are superb. I notice such things because I have been a journalist for longer than I care to admit. I love newspapers, especially yours. Keep up the great work.

W.E. Mishler
Temple, TX

If You Please...

Please renew my subscription to *Monitoring Times* for another year. You are doing a fine job with the publication. I can appreciate the effort and persistence that goes into turning out a consistently good publication. The attention to detail, accuracy of information, correctness of grammar, syntax, spelling, elimination of "typos" and adherence to deadlines, all to satisfy a voracious

64-page monthly appetite! I know how dependent you are on your staff and authors, and commend them as well.

Please don't drop the Facsimile column.

Please continue to foster good relations with the Amateur fraternity, and encourage your readers to enter their ranks, even if, for the present, it requires learning the Morse code.

Please ask your authors to keep their political views out of their material. We all have our own perceptions of reality: *Monitoring Times* is about playing with toys, not reshaping the world. My intelligence is still smarting from that jazz about South Africa a while back.

Please devote less valuable space to bootleggers (or pirates, or whatever euphemism you prefer). The electromagnetic spectrum is too valuable a resource to put at risk by the encouragement of these egotists.

All they want is attention; but all they can contribute is chaos. There is enough QRM and QRN now.

Please devote a little space each issue to the advanced enthusiast. Too much attention to entry-level interests may be great for getting new subscribers, but *MT* needs renewals as well as initiates, and to get renewals, it must appeal to someone who has read all the earlier issues. *MT* must grow. It cannot stay in the third grade forever.

Please don't be shy about covering reception in the 800-900 MHz spectrum. There is much to be learned about propagation up there, if one is willing to be objective about reception of electromagnetic energy and less concerned with the minutiae or editorial content of the transmissions. That region is a great place to experiment with antenna design, with no shortage of reliable "beacons."

Please forgive me for beginning each paragraph with the word "please."

Bill Tyrrel W2YKG
East Northport, NY

[Nicely put, Bill...and thanks for your encouragement...Bob] ■

ARE YOU OVER-ANXIOUS to Receive Your MT ?

We are very gratified by the eagerness with which our readers await their new issue of Monitoring Times. However, please don't call us for a replacement issue until the tenth of the current month arrives without MT showing up in your mailbox! Our staff will be greatly appreciative.

Want to Write for MT?

One of the many pleasures of publishing is giving writers an opportunity to hone their talents. This year *MT* has added several new authors with excellent writing ability and we are looking for more.

Are you an experienced listener? Do you feel especially qualified in a particular area of monitoring? Would you enjoy writing an article, sharing your expertise with other serious listeners? Contact *MT* offices now and ask for our writers' guidelines. It's not only fun, but it pays!

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COMMERCIAL RATES: $30 per two inch ad must accompany ad, payable to Monitoring Times. Send 2-1/4" x 2-1/4" camera-ready copy or send text.

Wanted: EICO 470 oscilloscope power transformer. Anyone out there have a junker scope with a usable transformer? Send price to: Pete Haas, P.O. Box 702, Kent, Ohio 44240.

Wanted: Used REGENCY HX1500 or Z60 scanner. Need for aircraft monitoring. Must be in good working condition. A.C. Hall Jr., 305 N. Main, Wake Forest, NC 27587.

ALDEN Weatherfax chart recorder Model 9321, new condition; 9 rolls ALFAX paper; two new stylus belts; price $500.00. Mort Pratt, Box 7671, Portland, ME 04112.

For Sale: RADIO SHACK PRO-2004 super scanner, like new $325. Tom Howey, 2 Stacey Lane, Goffstown, NH 03045.

Sell:-RADIO SHACK/REALISTIC DX-400 digitally tuned SW CW/SSB receiver. With manual, box, excellent condition, $150. Bill Harrington, 70 Main Blvd., Trenton, NJ 08618 (609) 883-7035.

For Sale: SONY ICF-2001 receiver complete $125. Paul (203) 259-9376.

YAESU FRG-7700 in excellent condition. Original box, manual, frequency directory. $325 includes UPS. B.J. Frye, P.O. Box 292, Wakarusa, IN 46573.

Sell PANASONIC 4800 - $100. SONY 2001 - $100. Jefferson Rice, Bon Air Apts. #315, 2101 Walton Way, Augusta, GA 30904.

For Sale: BEARCAT 100XL programmable scanner with aircraft and accessories $155. (313) 463-0172 Ask for Earl.

Wanted: DALLAS/FT. WORTH, Texas, area and nationwide military aircraft frequencies. Frequencies 225-400 MHz range. I will pay. Michael Donworth, 1308 Shady Hollow Court, Euless, Texas 76039.

HELIAX, 7/8 inch, 50 Ohm. $1.00 per foot, plus shipping. "N" connectors for 7/8 and 1/2 Heliax, $25.00. 3/8 Aluminum tubing, 5 foot lengths, $2, no limit. D. Kerl, Rt. 1 Box 175A, Butternut, WI 54514.

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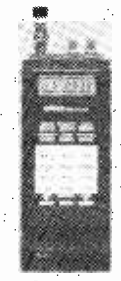

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