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MONITORING TIMES

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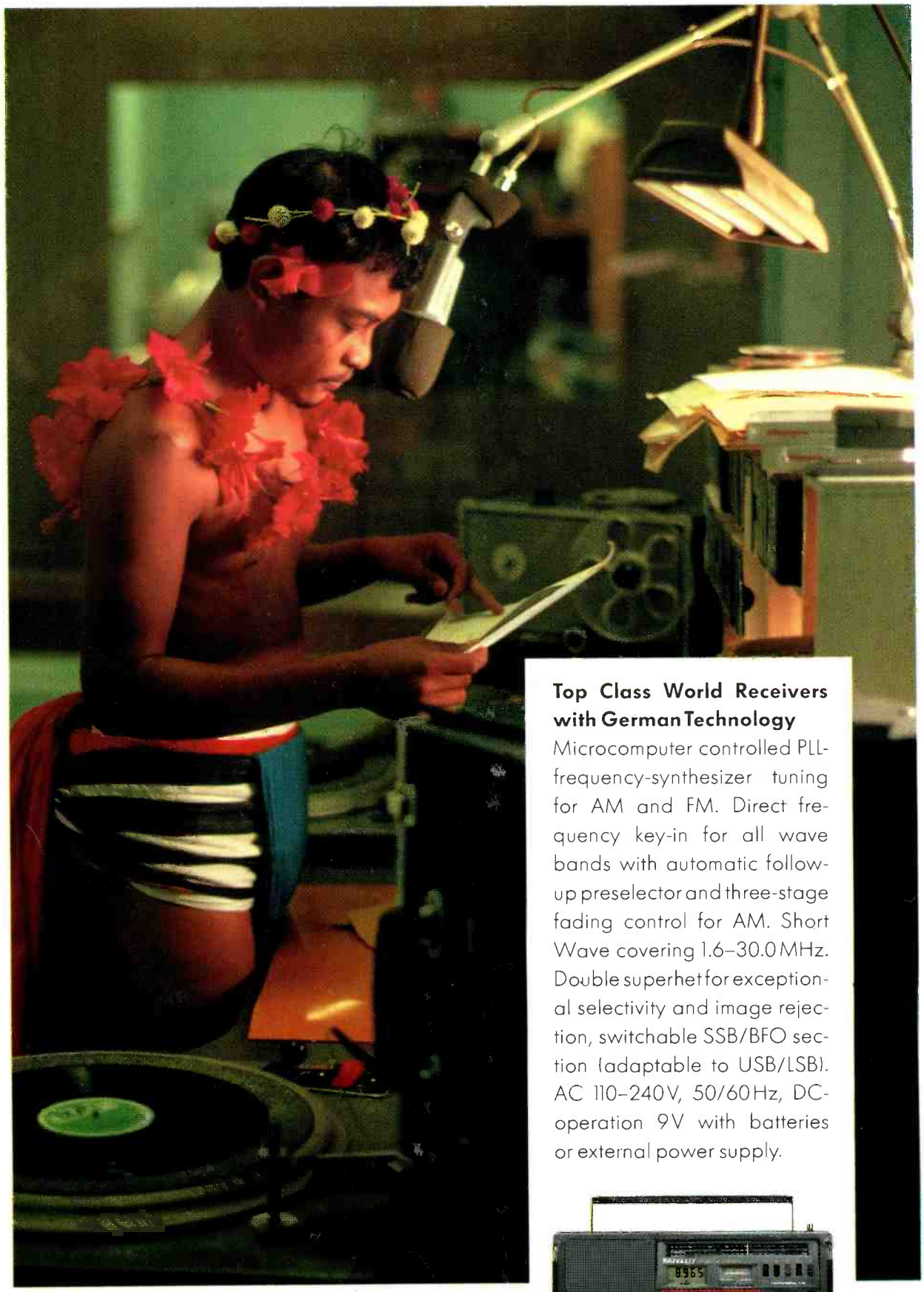
- The Station That Took On A Dictator—And Won!
- Winter Olympics' Radio
- DXing the Kingdom of A Million Elephants
- Magne Reviews the Sangean ATS-803/RS DX-440

Tracking White Death

Flying with the International Ice Patrol

SATELLIT 650 INTERNATIONAL – THE EAR TO THE WORLD



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This month athletes from all over the world will be gathering at Canada's wild west city of Calgary, Alberta. Everyone wants a frequency, and it's up to Telecommunications Manager Brian Page to sort out this electronic nightmare - by Jock Elliott.

Muzzled Media **8**
All the news that's fit to print, isn't. And Dan Rather doesn't tell it all, either. But shortwave does. A look at the international muzzled news media. From the book of the same name by Gerry L. Dexter.

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Masked men attacked its transmitter site. The government had its wiring cut. But Radio Soleil refused to give in. In a Monitoring Times exclusive, Jeff White talks with director Hugo Treist about the station that refused to die.

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High in the North Atlantic the men of the International Ice Patrol work to keep the sea lanes open. Fly with these brave men as they track the treacherous icebergs that threaten international shipping - by Helvin Smith

The Kingdom of a Million Elephants **18**
It's a land caught between Asian conflicts - a land so ancient that it's played home to conquerors for thousands of years. Once known as the Kingdom of Elephants, Laos now provides the DXer with the ultimate challenge - by Kim Praeger.

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On the Cover: *Constant vigilance from the air and sea keep the sea lanes safe for traffic (Photos courtesy International Ice Patrol); Cover by Owassa Graphics, Murphy, NC*

From the Publisher:

Pet Peeves

(or, A Curmudgeon Looks at Communications)

We all have our petty grievances, some legitimate and some not, and I'd like to share a few of mine. Perhaps the easiest way to proceed would be to entitle this treatise, "Oxymorons in Radio"--those carefully-chosen phrases which are self-contradictory by their very nature.

"High Performance Scanner"

It is understandable that manufacturers contrive new superficial features to lure unwary and impressionable buyers to their lairs; It is unforgiveable that these same manufacturers do not improve the technical quality of their receivers.

While Japanese and Taiwanese marketeers are busily conjuring cosmetics, they continue to copy one another's ancient and inherently defective circuit design; thus, present-day scanners generally:

- are less sensitive than commercial and amateur radio receivers;
- have poor dynamic range which generates interference-causing intermod signals; this overload causes desensitization and loss of weak signals in the presence of strong signals;
- have cheap filters with unreasonable shape factors, allowing adjacent-channel interference to come through loud and clear;
- cover limited frequency ranges, ignoring swaths of spectrum with interesting activity;
- have fixed modes, preventing the user from choosing another mode which might be in use;
- ignore new modes in use such as sideband which is unreceivable on conventional scanners;
- have no S meter in spite of years of requests from consumers;
- look like their cabinets were made in a toy factory.

User-Friendly Computer

If some computers and their software are friendly, I'd hate to meet a belligerent one! When I switch on a user-friendly radio, each knob tells me exactly what to expect when I turn it; each button alerts me to its function if I elect to push it.

When I turn on my computer, however, it first greets me with, "286 BIOS V2.86 C:\". That's friendly? To a computer programmer, perhaps; to me it says, "I speak a foreign language. It wasn't meant for you to understand and you never will."

Naturally, a computer is arguably more complex--more 'powerful'--than my receiver; it has enormous numbers of capabilities that I will never use, but had to pay for. The manuals (three--count 'em--three) are not only considerably larger than the receiver's user manual, but considerably more intimidating as well.

Some of my best friends are computer programmers (this statement is intentionally prejudicial). They admit that some twenty or thirty years ago, in a myriad basements around the country, a bevy of technical tinkerers began inventing their own languages to talk to their digital pets. When they merged their ideas, they merged their Tower of Babel as well. And now a confusion of tongues harangues our computerized civilization.

Perhaps some miracle will someday distill all of this gibberish into a meaningful language. In the meantime, computers will remain hostile to the majority of users.

Bob Grove

MAILBAG

Cellular Quandary

I enjoy the radio listening hobby within the bounds of the law, but I am now confused about what we can monitor under the Electronic Communications Privacy Act of 1986 (ECPA). My confusion stems from an apparent contradiction published in *Monitoring Times*.

In "Privacy Act Signed Into Law," December 1986 *MT*, we were told that we can listen to "Any marine or aircraft communications including radio-telephones."

However, in "Mobile Telephone Frequencies," December 1987 *MT*, we were told it was unlawful to monitor the VHF High Band Maritime Mobile Telephone channels or the UHF Aeronautical Mobile Telephone channels. Please clarify this aspect of ECPA.

I've also been led to believe that it's legal to listen to phone patches on the 800 MHz trunked SMR repeaters, and Airfone™ (airplane radiotelephone) conversations between 899 and 901 MHz. Is this true?

Sadly, we may have to wait until a hobbyist is arrested and prosecuted before someone makes a clear interpretation of ECPA.

(I still enjoy reading *MT*, and give gift subscriptions to spread the enjoyment to friends.)

Bob Parnass AJ9S
Oswego, Illinois

[According to MT's Washington correspondent, Bob Horvitz, when the ECPA was originally drafted it protected radiotelephone conversations from aircraft and vessels, but the protection was dropped for the final draft; thus, it is apparently legal to listen to any radio communications from an aircraft or vessel, including telephone conversations.

Still prohibited from monitoring, however, are radiotelephone conversations in the land mobile services, and this includes those on trunked repeaters in the 800 MHz SMR service.]

(Mailbag continued on page 84)

Grove Promises You the World ...

... will be at your fingertips when you select one of these remarkable shortwave values!

The Fantastic ICOM

R-71A

This receiver looks as impressive as it sounds, professionally and thoughtfully laid out with easy-to-read panel legends.

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.

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.

Order RCV6 *ONLY* **$799.00**

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

Grundig: A European Tradition

Among luxury class receivers, the name Grundig has been revered for more than forty years.

Turn on the Satellit 650 and be awed by its 30 watts of power as you tune in broadcast stations from all over the world. Or listen to exciting two-way communications with the reliability of an advanced single sideband (SSB) detector which can be used for exalted-carrier (ECSS) broadcast reception as well.

Other features include 60 memory channels; continuous 510-30,000 kHz AM/SSB as well as 87.5-108 FM and 148-420 kHz longwave frequency coverage; LCD frequency and status readout panel; extendable whip antenna and internal ferrite loop antenna; dual 120/240 VAC power supply as well as internal batteries and 12 VDC connection for mobile operation; and much more!

For a smaller portable without sacrificing Grundig quality, try the Satellit 400. Its 6 watts of clean sound make it more powerful than anything in its class, and you still get 513-30,000 kHz AM/SSB as well as 87.5-108 MHz FM and 148-353 kHz longwave frequency coverage.

Measuring only 11.8"W x 7"H x 2¾"D and weighing only 4¾ lbs., this superb portable features 24 memory channels; 24-hour dual time-zone clock; telescoping whip antenna and built-in ferrite antenna; and dual 120/240 VAC power supply with 12 VDC connection and internal battery operation.

Grundig 650, Order RCV 10

ONLY **$999** plus $10 UPS

Grundig 400, Order RCV 9

ONLY **$399** plus $5 UPS

Yaesu FRG8800

The FRG8800 has earned an excellent reputation for high performance at modest cost. Featuring continuous frequency coverage from 150 kHz to 30 MHz, this full-featured receiver offers direct keypad frequency entry and wide or narrow bandwidth AM, SSB, CW, and FM.

Additional features include fast/slow AGC, bar graph S meter, wide/narrow noise blanker, fast/slow tuning dial selection, and dual 24-hour clocks for local and universal time.

Order RCV5

ONLY **$599.00**

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

Kenwood R5000

With the R5000, Kenwood has produced 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; dual 120/240 VAC power supply; and a host of other sought-after features.

Order RCV-7

ONLY **$769.95**

plus $10 UPS Shipping; $5 U.S. Mail P.P.; $20 Canada Air P.P.

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140 Dog Branch Road, Brasstown, N.C. 28902; Phone Toll-Free (MC & Visa only) 1-800-438-8155

(All other calls, 1-704-837-9200)

Radio at the Winter Olympics

by Jock Elliott

Located on the banks of two glacier-fed rivers, Calgary is a place that somehow manages to straddle past and present with amazing aplomb. Founded by a group of Royal Mounted Police in 1875, it retained its "Wild West" atmosphere for almost a hundred years until, say local cattle ranchers, "the oilmen took over."

The influx of oil money in the 1970s translated into a skyline filled with towering glass buildings and, ultimately, to the extravagance known as the XV Olympic Winter Games. Still, some things don't change.

Cattle ranchers still get together mornings at the city stockyards and businessmen in cowboy hats and boots haggle over the latest petrol prices. This place, they are fond of saying, was home to what was probably the last contingent of cowboys on the continent.

This is the place where Olympic medalist "Jungle" Jim Hunter used to hone his ski skills, hanging on to the back of his father's tractor as it raced around the fields. Another time, local legend has it, Hunter strapped himself on the back of his dad's speeding pickup truck, so he'd get to see what it would be like traveling 70 miles per hour on skis. Hunter remains, for many, the quintessential Calgarian.

A "Howdy" Sort of Friendliness

This month, between the 13th and 28th, when amateur athletes from 59 countries meet in Calgary, Alberta, they'll have a chance to sample the city's old-new paradox. It's a "Howdy" sort of friendliness in a city so modern and attractive that Canadian Prime Minister Pierre Trudeau once remarked that it "looks as though it's just been unpacked."

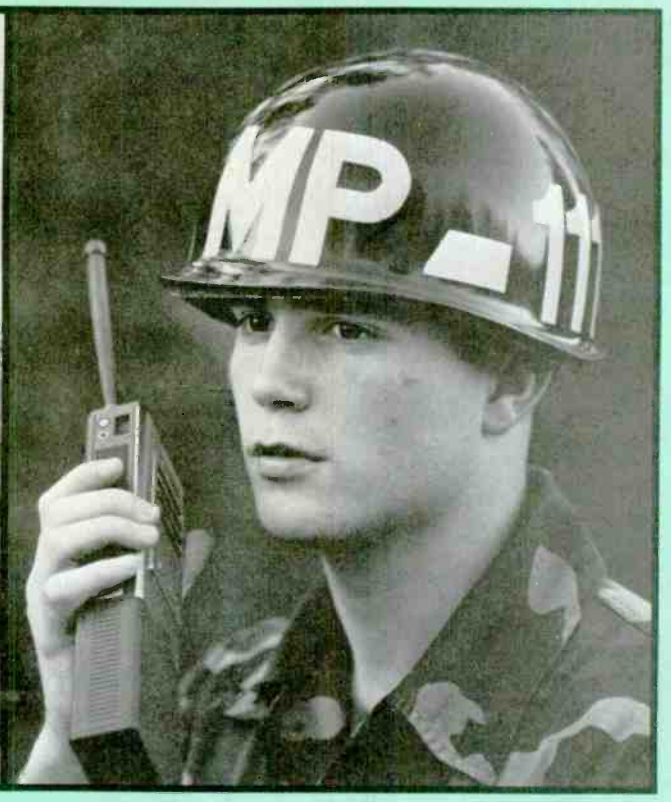
The XV Winter Games will feature 15 sports, ranging from bobsleigh to disabled skiing, in dozens of separate events. In a large part, none of these would be possible without sophisticated radio systems.

According to Brian Page, Manager of Telecommunications Operations for the Winter Olympics, "Radios are as essential as cold weather to the successful running of the XV Winter Olympics. The games will feature virtually everything in the radio spectrum from DC to light."

Three Radio Systems Support the Games

At the heart of the radio communications complex supporting the Winter Olympics will be three basic systems: a radio paging system, a portable radio system for use at the individual venues, and a mobile radio system.

The paging system will be based largely on Motorola PMR 2000 alphanumeric pagers



The 1988 Grove Catalog

Prices and Availability Subject to Change

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Effective 3-1-88 to 4-30-88

JRC NRD525

The Ultimate Receiver

SPECIFICATIONS

Receiving Frequency Range 0.09-34MHz
Receiving Mode . . . . . RTTY, CW, SSB (USB/LSB), AM, FM, FAX
Channel Memory . . . . . 200 channels
Receiving System . . . . . Double superheterodyne
1st IF 70.45399-70.453 MHz
2nd IF 455 kHz
H.F. Sensitivity @ S/N 10dB:
0.09-1.6 MHz . . . . . 5.0 microvolts SSB
. . . . . 15 microvolts AM
1.6-34 MHz . . . . . 0.5 microvolts SSB;
. . . . . 2 microvolts AM
(Bandwidth, INTER; NQL (FM), 20dB)

Selectivity:

Bandwidth	Attenuation 6dB	Attenuation 60dB
AUX	12 kHz or more	—
WIDE	4 kHz or more	10 kHz or less
INTER	2 kHz or more	6 kHz or less
NARR (opt.)	1 kHz or more	3 kHz or less
FM	12 kHz or more	—

Image Frequency Rejection . . . . . 70dB or more
Intermediate Frequency Rejection . . . 70dB or more
Frequency Stability . . . . . ±3 PPM
Dynamic Range . . . . . 100dB or more
(500 Hz if IF band)
PBS Variation Range . . . . . ±1 kHz or more
Notch Attenuation . . . . . -30dB or more
BFO Variation Range . . . . . ±2 kHz or more
RIT Variation Range . . . . . ±5 kHz or more
AF Output:
Speaker—0.5W or more (at 4 ohm load and 10% distortion); Line/Recording—1 mW or more (at 600 ohm load and 10% distortion)
Antenna Input Attenuation . . . . . Approx. 20dB HF
Power Supply . . . . . 120/240 VAC; 12-16 VDC
Auxiliary Circuits:
Noise blanker, S-meter, side-tone input, transmission monitor, squelch, dimmer, tone control, clock, timer, IF notch filter, pass band shift
Dimensions: . . . . . 13"(W) x 5"(H) x 11"(D)
(excluding projected parts)
Weight . . . . . Approx. 19 lbs.
Antenna Connector for PL-259

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.

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

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	129.00
300 Hz CW filter, CFL231 (Use only one)	129.00
500 Hz CW filter, CFL232 (Use only one)	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 plus $5 UPS

Headphones (see Kenwood ad, page 3)
Installation of one or two filters is $20 at time of NRD 525 purchase

The Standard of Comparison Worldwide!

ICOM R-71A

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 VFOs) 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 freqency 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 ~~$979~~ ONLY **$829.00**

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

SPECIFICATIONS

Dimensions . . . . . 11¼"Wx4⅜"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.
Antenna Connector for PL-259

ACCESSORIES

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

EX 257 FM Mode Detector	$49.00
SP-3 speaker	$61.00 (plus $5 UPS)
EX299 DC power kit	$12.25
CR-64 high stability crystal	$79.00
EX-309 computer interface	$59.00
EX-310 voice synthesizer	$59.00
FL-32 CW narrow filter (500 Hz) } Use only one	$69.00
FL-63A CW narrow filter (250 Hz) } Use only one	$59.00
FL-44A high grade SSB filter, 2.4 kHz	$178.00
RC-11 infrared remote controller	$70.00
MB-12 mobile monitoring bracket	$25.00
Service manual	$25.00
Headphones (see Kenwood ad, this page)	

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

Order RCV-7 ONLY **$769.95**

Retail ~~$899~~

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

Kenwood R-5000

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; antenna connector for PL-259; 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.

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

GRUNDIG® : A EUROPEAN TRADITION

The Superb Satellit 650 International Receiver

Among luxury class receivers, the name Grundig has been revered for more than forty years—a love affair which has as much to do with performance as with great style and elegance.

Turn on the Satellit 650 and be awed by its 30 watts of audio power as you tune in worldwide broadcast stations. Or monitor exciting two-way communications such as ships at sea, international airlines, hams, military and government communications, all with the reliability of an advanced single-sideband (SSB) detector which can be used for exalted-carrier (ECSS) broadcast reception as well.

Other features include: continuous 510-30,000 kHz AM/SSB as well as 87.5-108 MHz FM and 148-420 kHz longwave frequency coverage; 60 keypad-entered memory channels; automatic motor-driven preselector for optimum shortwave and medium wave reception; LCD frequency and status readout panel; separate bass and treble controls; separate low and high frequency speakers for lowest distortion sound; dual 120/240 VAC 50/60 Hz AC power supply as well as internal batteries (6 D and 2 AA) or 12 VDC mobile operation; extendable whip antenna, internal ferrite loop antenna and external antenna connectors.

Dimensions: 20"W x 9½"H x 8"D Weight: 19 pounds

SPECIFICATIONS

Frequency Range:
SW: 1.6-30 MHz
FM: 87.5-108 MHz
AM: 510-1620 kHz
LW: 148-420 kHz
Memory: 60 station programmable memory including:
SW: 32 stations
FM: 16 stations
AM: 8 stations
LW: 4 stations
Tuning Control: Direct frequency input via keypad plus manual tuning dial; AM pre-selector with motor drive; signal strength meter.
Frequency Readout: Multi-function LCD display with tuning scale
Output: Peak power, 30 watts.
Additional features: BFO/SSB unit with switchable LSB/USB; auxiliary cassette input/output; automatic gain control; battery charge indicator; headphone jack; external speaker connectors
Accessories: Dryfit-Accu 476 rechargeable battery unit

Order RCV10

ONLY **$999**

Plus $10 UPS
$20 U.S. Mail P.P.
$25 Canada Air P.P

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

Compact Grundig Satellit 400

For a smaller portable without sacrificing Grundig quality, try the Satellit 400. Its 6 watts of clean sound make it more powerful than anything else in its price class, and you will get 513-30,000 kHz AM/SSB as well as 87.5-108 MHz FM and 148-353 kHz longwave frequency coverage.

In addition, this fine portable offers 24 channels of memory with bidirectional scan, keypad frequency entry with PLL control and manual tuning knob, LCD frequency display and an analog tuning meter; 24-hour dual-time-zone clock with preprogrammable switch-on, telescoping whip and built-in ferrite antenna; and separate bass and treble controls.

The dual 120/240 VAC 50/60 Hz AC power supply supports indoor operation while a 12 VDC connection allows mobile convenience as well. Naturally, the Satellit 400 will run off inexpensive internal batteries (6 C and 3 AA) as well.

Dimensions: 11.8"W x 7"H x 2¾"D Weight: 4¾ pounds

SPECIFICATIONS

Frequency Range:
SW: 1.6-30 MHz
FM: 87.5-108 MHz
AM: 513-1611 kHz
LW: 148-353 kHz
Memory: 24-station "Intermix" memory with bidirectional memory scan
Tuning: Direct keypad entry with LCD display; bidirectional automatic station search with field strength check function; analog tuning strength meter; and manual tuning knob
Tuning steps: 10 kHz FM; 1 kHz SW, AM & LW
Connectors: AC connector; 12 VDC supply; headphone mini-jack; universal cassette tape recorder in/output socket; coaxial external antenna socket.

Order RCV9

ONLY **$399**

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

SONY ICF-2010

The World's Most Popular Radio!

CALL TOLL-FREE
(MC & Visa Only)
1-800-438-8155

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!

SPECIFICATIONS

Frequency Range:
AM: (SW, MW, LW) 150-29,999.9 kHz
FM: 76-108 MHz
Air: 116-136 MHz
Selectivity (® -50dB):
±9.0 kHz (wide)
±5.0 kHz (narrow)
Antenna System:
AM/FM Air Band Telescopic antenna; AM (150-1610 kHz) built-in ferrite bar antenna
Antenna Connector . . . . . ⅛" Mini Plug
Inputs . . . . . DC-In 4.5 V; External Antenna input (mini jack x 2)
Outputs . . . . . Earphone, Record out (mini jack)
Speaker . . . . . 4"
Radio Section Power Requirements:
3 "D" & 2 "A" batteries (not supplied); AC 120 V, 60 Hz with AC adaptor (supplied)
Dimensions (HWD) . . . . . 6 1/4"H x 11 3/8"W x 2 1/16"D
Weight . . . . . 3 lbs. 12 oz
Supplied Accessories . . . . . Earphone, AC-D3 AC adaptor

Order RCV 2

Manufacturer's Suggested Retail ~~$459.95~~

Grove discount price:

$338.00

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

Infotech M6000 (V.8)
Automatic Data Reader

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 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, 14 lbs.)

Order DEM 1

Retail ~~$947.00~~

ONLY

$840

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

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
~~$534.95~~

Grove price only
$349

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

Recommended accessories: ACC 20 wall adaptor ($9.95)

CALL FOR AVAILABILITY

The Sangean ATS-803A

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 9 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.

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

Now Improved!

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-803A offers surprising performance at such a budget price; includes AC adaptor.

This receiver is clearly **the most feature-packed, high performance portable under $200!** Equipped with 1/8" mini antenna jack.

Size: 11½"W x 6¼"H x 2½"D; Weight: 4 lbs.

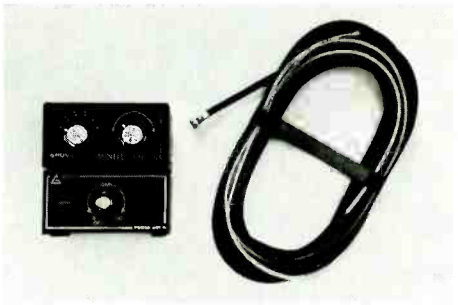
Order RCV4

Former nationally advertised price:
~~$239~~

Grove price:
$189

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

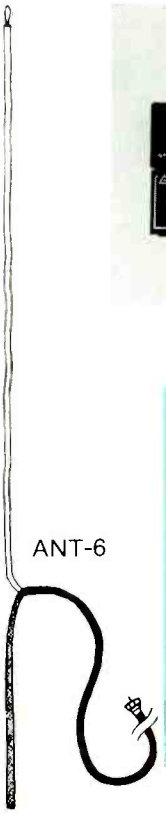
Recommended accessories: AA cells for microprocessor (2 required); D cells for portable power (6 required).



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!

See pages 18 and 19 for detailed specifications

Designed for use with the Grove 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!

100 kHz-1000 MHz

What you need to order:

ANT-6 Hidden Antenna	**$8.95** (free shipping)
PRE-3 Power Ant III	**$45** (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)

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

Add the Grove Minituner for Incredible Reception!

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.

100 kHz-30 MHz

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

See pages 18 & 19 for detailed specifications

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.)*

(Cable sold on Page 16)

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" UHF miniplug adaptor for Sony and similar portables, order ADP 6, $5.00.

Order TUN-3 **$49**

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

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	**$45 (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)**
ACC-90 DC mobile cord	**$2.95 (free shipping with PRE-3)**

"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.

"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

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
	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

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

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 an access port 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

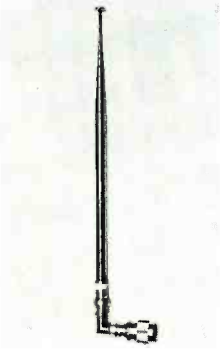
ANTENNA CONNECTOR: Type N female

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

RETAIL
~~$1139~~

YOU PAY ONLY
$965

$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" ext. whip antenna (shown)	$19.95
*RC 12 remote controller	$70.00
*EX310 voice synthesizer	$59.00
*EX-299 12 VDC power kit	$12.25

Installation charge: $20 for one or more accessories

TV R7000 video adaptor	$139.00
Computer interface instructions	$10.00
Service manual	$25.00
SP3 speaker	$65 plus $5 UPS
MB12 mobile mounting bracket	$25.00
ADP-3 F to N antenna adaptor	$5.00

Headphones (see Kenwood ad, page 3)

See page 15 for antenna for R7000!

Realistic® PRO-2004

Wide Coverage Scanner!

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

At a Grove Discount Price!

You can walk into your chain retail store and pay over $400 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. Built-in speaker and telescoping antenna are included. Jacks provided for external antenna (BNC female), headphone, external speaker, tape recorder and DC adaptor.

Comes with simple instructions to restore cellular coverage disabled by the factory, or we will restore it for $10.00.

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
- Weight: 8 lbs.
- Dimensions: 10¾"W x 3"H x 9"D

Order SCN 5

Retail ~~$419.95~~

ONLY **$389**

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

Bearcat BC950XLT

New!

Order SCN12

Compact and Programmable, the BC950XLT is Suitable for Mobile or Base Installation

Measuring a tiny 2" high by 7" wide and deep, this upgraded version of the BC600XLT is ideal for mobile or base installations. Features include user-programmable search ranges, five priority channels, individual channel lockout and delay, direct channel access, external antenna jack (MOT female), 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 950 also has 806-952 MHz (less cellular band; we can restore full coverage for $10 at time or order). And with its pre-programmed service search capability, just push a button to 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:

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

SIGNAL BOOSTING PREAMPLIFIER for weak signal locations. May be switched in or out of circuit.
Order ACC98 $34.95

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 decoder.
Order ACC97 $8.95

CELLULAR RESTORATION $10.00

BC600XLT same as **BC950XLT** but without 800 MHz coverage. Order SCN8, **$249.95**. Options include:

ACC95 Preamp	$25.00
ACC96 Decoder	$60.00
ACC97 On/Off	$8.95
Installation	$10.00

Recommended Retail
~~$399.95~~

GROVE Discount Price

$289.00

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

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

BC800XLT 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 (MOT female); External Speaker Jacks; AC Power Jack; DC Power Jack.
Options: External Antenna Plug

TURBOSCAN SPECIFICATIONS

Frequency Range:
- VHF Amateur (29-30 MHz)
- VHF Low Band (30-50 MHz)
- VHF Amateur (50-54 MHz)
- VHF Aircraft (118-136 MHz)
- VHF Weather Satellite (136-144 MHz)
- VHF Amateur (144-148 MHz)
- VHF High Band (148-175 MHz)
- UHF Low Band (406-440 MHz)
- UHF Amateur (440-450 MHz)
- UHF Standard (450-470 MHz)
- UHF Extended (470-512 MHz)
- 800 band (806-950 MHz)

Sensitivity:
- LO VHF (30-50 MHz), 0.5 microvolts
- VHF Aircraft (118-136 MHz), 1.5 microvolts
- HI VHF (136-175 MHz, 0.7 microvolts
- LO UHF (406-440 MHz), 0.9 microvolts
- HI UHF (440-470 MHz), 0.7 microvolts
- UHF Extended (470-512 MHz), 1.5 microvolts
- 800 band, 1.2 microvolts

Selectivity:
- @ 6dB, ±7.5 kHz
- @ 50 dB, ±18 kHz

Scanning Rate: approx. 40 channels/second
Search Rate: approx. 50 channels/second
Audio Output: 3 watts @ 10% or less distortion
Priority Sampling Rate: 1 sample/2 seconds
Speaker: 3.2 ohm, 4"
Power Requirements: 13.8 VDC, 16 Watts; 110-130 VAC, 60 Hz
Size: 5¾"W x 2⅜"H x 9¼"D
Weight: approx. 3½ lbs.
Antenna Connector: MOT female

Bearcat's BC800XLT

Top of the Line—With 800 MHz!

CALL TOLL-FREE
(MC & Visa Only)
1-800-438-8155

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~~

New Low Price!

$259.00

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

From Regency:

Lightning-Fast 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 antennas, AC power supply, DC mobile cord, and mobile mounting bracket.

Order SCN2

List Price ~~$499~~

Grove Price Only

$324

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

Bearcat BC205XLT

New!

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 (less cellular frequencies, which we can restore for $10 at time of order). 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 BC205XLT is the most powerful hand-held scanner ever released to the public and is now available from Grove Enterprises at a super discount price!

Extra BP205 battery packs available. Call for pricing.

Order SCN9A

Retail ~~$449.95~~

Grove Discount Price

$264.95

Cellular restoration, add $10.

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

CALL FOR AVAILABILITY

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

New!

The Bearcat BC100XLT

Introducing the **BC-100XLT**, with 100 memory channels! Yes, the all-time popular Bearcat hand-held programmable scanner has aircraft reception, 100 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 29-54, 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 page 14

Order SCN10

Retail ~~$349.95~~

Now Only

$219.95

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155
$3 UPS Shipping
$5 U.S. Mail P.P.; $8 Canada Air P.P.

Order ANT-8

Extend the Reception Range Of Your Handheld Scanner!

Today's hand-held VHF/UHF scanners and handie-talkies from Bearcat, Regency, Cobra, Radio Shack, ICOM, Yaesu and Kenwood have excellent sensitivity and talk power, but their range is reduced by their short "rubber ducky" antennas. Grove has the solution!

Just replace that inefficient flex antenna with our universal full-length whip—and stand back! Extendable from 7 to 46 inches, the ANT-8 is made of chrome-plated brass and equipped with a standard BNC base to fit most amateur hand-helds and scanners like the Bearcat 50XL, 70XL, 75XL, 100XLT, and 205XLT, Regency HX-1000, -1200, and -1500, Radio Shack PRO-31, -32, and -38, and Cobra SR10, SR12, and SR15.

"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

Universal Full-Length Antenna

ONLY **$12.95**

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

Convert Your Car Antenna Into a Scanner Antenna!

Mobile Antenna Multicoupler

How would you like to enjoy 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 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.

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

Order ANT-63

ONLY
$14.95

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

6-9 dB gain over other scanner antennas!

SCANNER BEAM

The Best Scanner Antenna Money Can Buy!

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. 50/75 ohms nominal impedance.

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.

ORDER ANT1B

OMNI

Low-loss Cable and Connectors sold on Page 16!

The 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, UHF, military and civilian aircraft bands, even 800 MHz mobile, all on one low cost antenna.

All mounting hardware included.

Requires TV Type F connector on your coax.

ANT-5B only

$19.00

Plus $2 UPS Shipping
$4 U.S. Mail P.P.
$6 Canada Air P.P.

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

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.

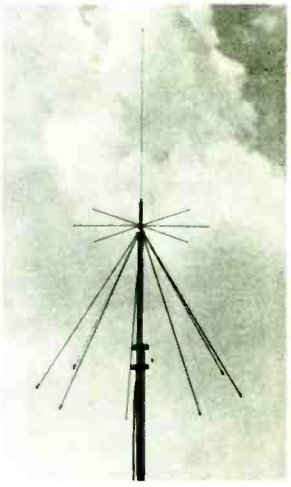
As a receiving antenna the AH7000 is superb, outperforming any omnidirectional antenna we have ever used for continuous 25-1000 MHz (and above) coverage. A base-loaded, vertical top element is used as a low band (30-50 MHz) frequency extender.

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; see page 16.

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

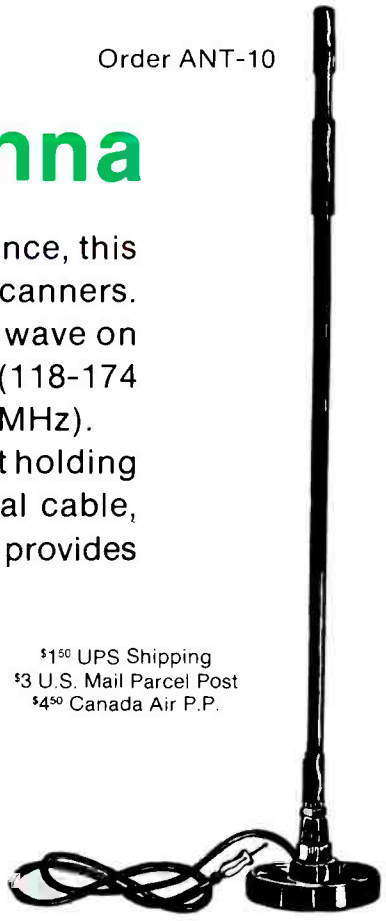
$94.00

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

Low-Profile Powerhouse!

Order ANT-10

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 (or BNC; see below), provides 50 ohm matching for optimum signal reception.

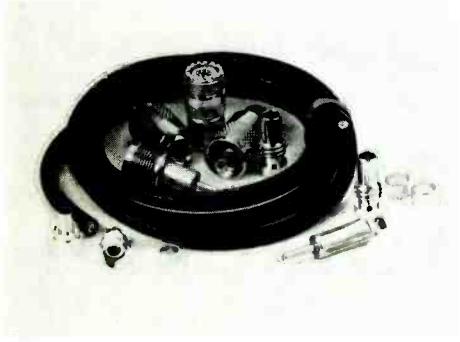
"When I received the ANT-10 I was more than a bit skeptical. I enjoy monitoring the low band . . . in the car and have used a 1/4 wave 66" antenna . . . I find it hard to believe that your 20" antenna outperformed the whip but it did."

H. Rose
New York

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**



Premium Low-Loss RG-6/U Cable with Connectors

Have you had trouble finding the right coaxial connectors for linking your antenna and receiver? We can help! 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!

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

Cable loss per 100 ft.:
1.6 dB @ 50 MHz
2.6 dB @ 170 MHz
4.6 dB @ 450 MHz

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

Adaptors Available:

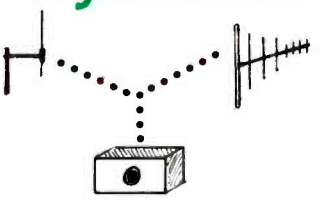
ADP1	UHF Female to F male
ADP2	F Female to PL 259 Male
ADP3	F Female to N Male
ADP4	F Female to Male Mini-Plug
ADP5	N Female to BNC Male
ADP6	UHF Female to Male Mini-Plug
ADP7	UHF Female to N Male
ADP8	N Female to PL 259 Male
ADP9	F Female to BNC Male
ADP10	UHF Female to BNC Male
ADP11	UHF female to MOT male
ADP12	BNC female to N male
ADP13	BNC/BNC (right angle elbow)
ADP14	F female to F male
ADP15	N female to F male
ADP16	N female to MOT male
ADP17	BNC female to F male
ADP18	F/2 wires
ADP19	UHF/2 wires

Adaptors may be ordered separately for $5 each (except ADP16, $7.50). Free shipping if ordered with other products; $1.50 for one or more shipped alone.

Grove's

Outdoor Scanner Antenna System

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



PRE-3

1. Start with our OMNI or SCANNER BEAM antenna

See descriptions on page 15.

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	**$45** (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!

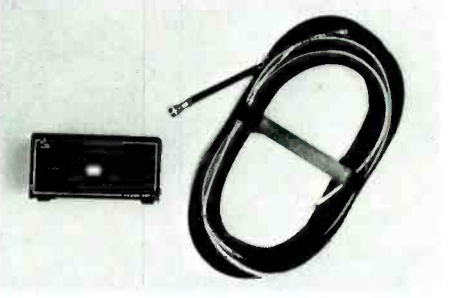
Yes, wide area scanner coverage and even global short wave reception will be at your fingertips, and you can operate two radios at one time!

CALL TOLL-FREE
(MC & Visa Only)
1-800-438-8155

ANT-6

What you need to order:

ANT-6 Hidden Antenna	**$8.95** (free shipping)
PRE-3 Power Ant III	**$45** (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-239 (UHF, female) with random wire provision
Output connector: PL-259 (UHF, male) on 24" coax cable
Enclosure: Custom formed aluminum
Dimensions: 4"W x 2"H x 3"D
Weight: 12 ounces

Order TUN-3

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

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 UHF female custom connector ready for your PL-259 (UHF, male) equipped with 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.

Coax cable not included—see page 16

"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 18)
ACC20 Universal AC power adaptor (page 20)
ANT-5B OMNI (page 15) or ANT-6 Hidden Antenna (below)
ACC-60 receiver cable—you specify connector or receiver model, one for each receiver—$7.50 each)
ACC 90 Mobile DC cord $2.95

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 female
Dimensions	4"W x 2"H x 3"D
Weight	6 ounces

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!

The PRE-3 is also easy to install. If you have adequate length on your scanner antenna coax, measure back 2-3 feet from the connector and cut it. Install two F connectors on the cut ends (available from Radio Shack) and attach them to the PRE-3.

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

USE WITH OUR FAMOUS TUN-3 MINTUNER (See p. 18) 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.

Order PRE-3

ONLY

$45.00

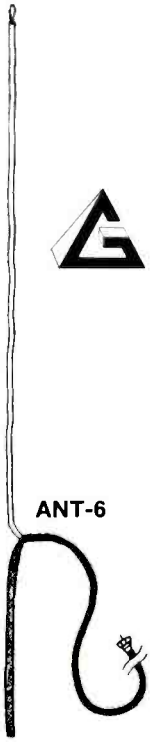
$1.50 UPS; $3 U.S. Mail P.P.
$4 Canada Air P.P.

The Grove

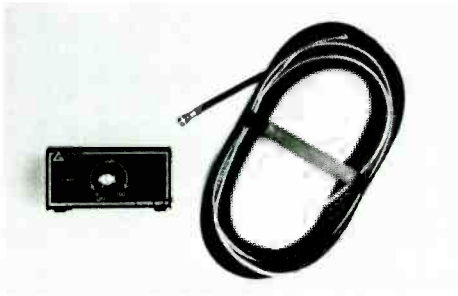
Hidden Antenna

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



ANT-6



Hidden Antenna with optional PRE-3 (see pp. 7 & 17)

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 male connector (NOTE: we will substitute the connector of your choice for $5.00).

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

Order ANT-6

ONLY

$8.95

Free UPS; $2.50 U.S. Mail P.P.
$3 Canada 1st Class

Heavy-duty Universal Power Supply/Charger

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

Order ACC 20

Our universal AC Adaptor is especially rugged, capable of switching to your choice of 3, 4.5, 6, 7.5, 9, or 12 volts DC at a current of 500 milliamps (1/2 amp)! Another switch lets you choose + or – polarity.

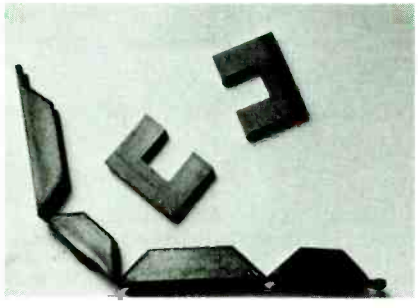
An array of plugs on its interconnect cord assures proper mating to any electronic accessory. Plugs into standard house current (120 VAC, 60 Hz).

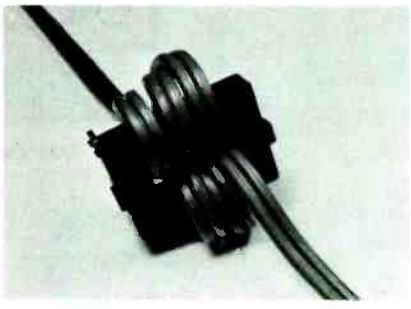
A $15 Value for Only

$9.95

$1.50 UPS shipping
$3 U.S. Mail P.P.; $4 Canadian Air P.P.

Snap-on Interference Chokes





Reduce or eliminate RFI—radio frequency interference—from computers, TV sets, home appliances, fluorescent lights, microwave ovens, electric motors, and other electronic equipment right at the source.

Install inexpensive snap-on chokes on power cords, audio lines and control cables to prevent troublesome electrical interference from being radiated or entering sensitive equipment.

Use them on test equipment cables to eliminate false readings from stray pickup; antenna cables to stop unbalanced currents and common mode interference; paging and PA systems; ham and CB equipment to eliminate transmitter interference. Install in seconds.

Order ACC-91 *ONLY* **$4** *each (minimum order 3) plus $1.50 shipping any quantity*

Shortwave Directory

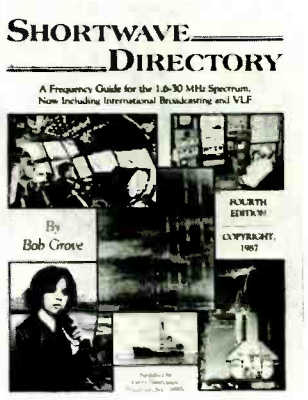
NEW 1988 Edition!

By Bob Grove

Greatly expanded and revised fourth edition—now includes international broadcasting and VLF!!

Now recognized as the standard of reference for American shortwave listeners, this DX'ers bible is crammed with up-to-date, accurate frequency listings from 10 kHz-30 MHz, including U.S. and foreign Air Force, Navy, Coast Guard, Army, Energy and State Department, FBI networks, scientific installations, spies and smugglers, pirates and clandestines, aircraft and ships, space support, RTTY and FAX, INTERPOL—even English language broadcasters worldwide—and more.

Most stations are cross-referenced by agency and frequency for rapid identifications of those unknowns! This new edition contains an exhaustive glossary of terms, acronyms and abbreviations commonly encountered on shortwave radio networks.



Order BOK-14 **8½" x 11", softbound** **Over 500 pages!**

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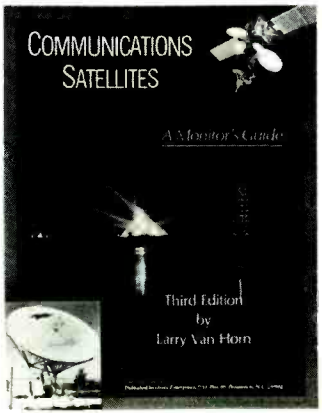
SCANNER DIRECTORIES: *We now stock the famous POLICE CALL frequency guide for your state. Only* **$7.95** *plus $1.50 UPS shipping.*

Our best selling book . . . as reviewed in Scientific American

Communications Satellites

by Larry Van Horn

GREATLY EXPANDED THIRD EDITION!



Communications Satellites has rocketed to an international reputation as THE source of information regarding orbiting active satellites. A new introductory section provides valuable information on setting up a successful satellite listening post—the equipment and the techniques used by the professionals.

Chapters cover spy and surveillance satellites, U.S. and Russian manned space missions, military tactical and scientific satellites, oceanographic and weather satellites, navigational and communications satellites, private and direct broadcast satellites—if it is in orbit, COMMUNICATIONS SATELLITES tells you all about it!

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

SPECIAL BONUS! An exhaustive frequency cross-reference allows you to quickly identify the source of unknown transmissions from space! Ground tracking networks are also listed.

Illustrations and tables are included for better understanding of space technology. Special chapters provide insights into satellite operation, much of which has never been revealed to the public before in the pages of such an informative book!

Whether you are a casual or serious listener to the spectrum, this book is for you!

Order BOK-15

ONLY

$14.95

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$5 Canada Air P.P.

8½" x 11"

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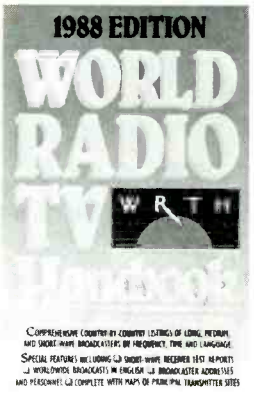
1-800-438-8155

42nd Edition 1988 World Radio TV Handbook



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.

Identify those elusive DX stations by their musical interval signals, slogans and languages as shown in the exhaustive listings within its pages.

Additional chapters provide expert guidance in selecting equipment and accessories for listening.

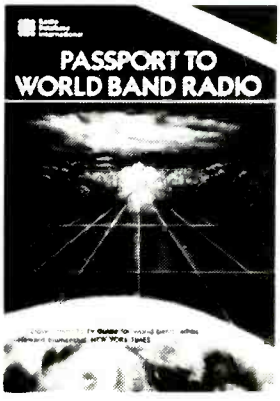
This 600-page standard reference should be on the bookshelf of every short wave listener.

5½" x 9"
$2 UPS or Bookrate;
$5 Canada Air P.P.

Retail $19.95

ONLY
$17.95

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155



$14.95

$2 UPS or Bookrate;
$5 Canada Air P.P.

Passport to World Band Radio

by Tony Jones and Larry Magne

Order BOK-18

1988 Edition

Formerly the Radio Database International (RDI), this superb directory of large and small international broadcasters has been expanded to 400 pages in order to provide additional information to its readers.

Professionally bound, *Passport* contains, in no-nonsense graphics, an alphabetized list of world broadcasters arranged by time, frequency and language as well as transmitter power—no guessing as to what you may or may not hear!

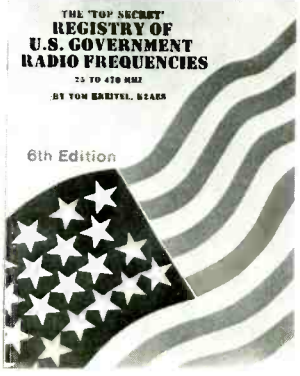
The 1988 edition includes an authoritative buyer's guide specifying which receivers and accessories are the best on the market—and which to stay away from! Even more articles by noted experts are presented than in previous editions for broader appeal to the growing ranks of shortwave enthusiasts.

6th Edition!

The "Top Secret" Registry

of U.S. Government Radio Frequencies

by Tom Kneitel



Yes, this is the book which made headline news and shook up Washington when a copy was uncovered during a major organized crime raid at a subversive listening post. Kneitel's *Registry* is the most massive collection of sensitive federal government and military radio frequencies in commercial publication.

Concentrating on VHF and UHF scanner frequency ranges, agencies include Secret Service, Customs, DEA, CIA, NSA, White House, Border Patrol, ATF, and dozens of other governmental bureaus who would prefer not to have their communications frequencies published!

ONLY
$17.95

$1.50 UPS or Bookrate;
$5 Canada Air P.P.

GUARANTEE

You must be 100% satisfied or call our toll-free line (1-800-438-8155) within 15 days of shipping date and request a return authorization number. Upon receipt of the product in original packaging and new condition, we will refund your money, less shipping, or give you credit toward another product—your choice. Be sure to include authorization number as a 10% restocking charge must be assessed for products returned without authorization. Special order items cannot be returned.

All equipment manufactured by Grove is warranted against manufacturing defects for a period of one year under normal use by the purchaser, providing that no modifications or field repairs have been attempted.

If any equipment should fail during the warranty period, Grove shall repair or replace that defective equipment upon its postpaid return. The warranty does not cover hazard to person or associated equipment or property. Your warranty is considered to be in effect from the date of shipment to you. Violations of the warranty clauses will automatically void the warranty and services or repairs will be charged to the owner.

Service outside of the warranty will be charged at the cost of parts, labor, and return shipping. Payment for repairs must be received before the repaired unit can be returned.

When service or repairs appear necessary we urge you to call or write Grove to determine if the problem can be solved without returning the unit. Should return of the unit be required, you will be assigned a return authorization number. Be sure to place this number in plain view on the address side of your return package. This will allow us to expedite servicing the unit and return it to you.

Products not manufactured by Grove carry the warranty of the individual manufacturers. If you have a problem with a piece of equipment, please call and we will put you in touch with the closest repair service.

How We Pick Our Products

The consumer electronics marketplace offers a bewildering array of products; it is impossible for the prospective buyer to be familiar with them all. After careful evaluation, we select those products which we feel offer the best value to our customers and feature them in our catalog.

PRECAUTION CAN SAVE TIME AND TROUBLE

When your shipment arrives, immediately check it for any shipping damage. If there appears to be damage to the box, immediately notify your delivery man BEFORE signing for the package. Inspect the contents and if there is damage, refuse the package. Call our offices advising of the problem and we will ship another unit to you. If you accept a package, then find it has been damaged, SAVE THE SHIPPING BOX and call your UPS office to report the damage; then call our office at 1-800-438-8155 and we will ship a new unit to you as soon as UPS notifies us of the damage.

Bob Grove
WA4PYQ

Judy Grove

TO SPEED YOUR ORDER FOLLOW THESE SIMPLE STEPS

MAIL ORDER

1. Fill out the order blank and send a check, bank or postal money order, or your complete charge card information (see #3 below) to Grove Enterprises, P.O. Box 98, Brasstown, N.C. 28902.
2. *DO NOT SEND CASH!* COD is available for $3 per package via UPS (no COD's through Post Office). Cash, certified check or money order required at time of COD delivery. If COD shipment is refused, we will *NOT* ship again until payment for shipping charges of first shipment is received.

PHONE ORDERS

1. Have your order form filled out and your *charge card in front of you.* (Minimum charge card order, $15).
2. Call our order desk toll free, 1-800-438-8155 (N.C. call collect 1-704-837-9200). Hawaii, Alaska, foreign countries call 1-704-837-9200 (no collect calls please!)
3. Give the secretary your name, shipping address for UPS delivery (and mailing address if different from shipping address), what you wish to order, your charge card number and the expiration date. *IF THIS IS YOUR FIRST ORDER we must* have the name and location of the bank which issued your card and the address shown on your charge card records. If this is not possible, we will require a money order or certified check before the item can be shipped. (This method is necessary to eliminate fraudulent use of credit cards).

SPECIAL SHIPPING INFORMATION

All **Hawaii** shipments via UPS must go Blue Label (ask for charges). Blue Label and Next Day Air available from UPS; Express and Priority Mail available from the U.S. Post Office. Call or write for charges.

PURCHASE ORDERS

Written purchase orders will be accepted from city, state and federal agencies and institutions. Terms are net 10—1½% over 30. Special sale prices are not honored on open accounts

DELIVERY SCHEDULE

We ship within one working day upon *RECEIPT OF YOUR ORDER* unless you are notified of a delay. UPS shipments should arrive within 10 working days; U.S. Post Office shipments within 14 working days (bookrate can take as much as four weeks). These are maximum delivery times; if you do not receive your order within these time frames, call us so we can place a tracer on your order.

FOREIGN SHIPMENTS

Write or call, telling us what you want and how you want it shipped (surface or air parcel post; shipments can be made by Burlington Air Freight or UPS to Canada and some European countries). Please note—orders to some countries cannot be insured by the Post Office. We do not assume any responsibility for losses other than proof of shipment . . . *ALL PAYMENTS MUST BE IN U.S. DOLLARS* BY VISA, MC, POSTAL MONEY ORDER *OR* BANK CHECK DRAWN ON A U.S. BANK WITH FEDERAL RESERVE TRANSIT NUMBERS **IMPRINTED** ON BOTTOM OF CHECK.

ORDER BLANK 3/88

If this is your first order, where did you hear about Grove Enterprises? _____

SHIP TO: Name _____

Street Address (for UPS delivery) _____

_____

City _____ **State** _____ **Zip** _____

Phone: (Area Code) _____

MAILING ADDRESS IF DIFFERENT FROM STREET ADDRESS:

P.O. Box _____

City _____ **State** _____ **Zip** _____

PAYMENT METHOD:

☐ CHECK ☐ MONEY ORDER
☐ VISA ☐ MASTERCARD

How do want your order shipped?

☐ UPS ☐ U.S. Postal Service

Product	Quantity	Price	SHIPPING CHARGE	TOTAL

If ordering a subscription to Monitoring Times also—please make payment for MT on a separate check made payable to Monitoring Times. *Thank You.*

CARD NUMBER, IF APPLICABLE:

_____

Name of Issuing Bank _____ **Exp. Date** _____

_____
Signature

Total $ _____

N.C. Residents only add 5% on Product Total $ _____

Total Enclosed $ _____

SEND ORDER TO:

CALL TOLL-FREE (MC & Visa Only)
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GROVE ENTERPRISES

P.O. Box 98, 140 Dog Branch Rd. • Brasstown, N.C. 28902 • Phone (704) 837-9200

The games will feature everything in the spectrum from DC to light!

capable of storing 16 messages of up to 80 characters. Coverage of the pagers will be provided by a digital simulcasting system using eight 100-watt VHF transmitters linked together by an RF delay that will equalize them within 5 microseconds.

There will be four repeaters in Calgary and four to cover the out-of-town venues, extending along the Trans Canadian Highway to Canmore, Nakiska and Banff. Together, these repeaters will cover a 1,600 square mile area with 99 percent reliability and 4,5000 square miles with 95 percent reliability.

Over 1,200 key Olympic officials will be outfitted with pagers, as well as nearly 1,300 representatives of vendors, suppliers, and contractors. The pagers can be accessed through ordinary touch-tone phones or through Winter Olympics' computer system, Info 88.

Why all the fuss about pagers?

Page says "The pagers will function as a people-finder system for decision-makers, repair personnel and so forth. By using pagers, we can deliver a short message to critical personnel even if they are too busy to respond immediately. This helps us to avoid 'telephone tag.' It's a one-way radio system, and it's essential to the games."

Portable Radio Systems

The portable radio system will be used to provide communications at some 40 to 50 locations where the competitions are being held. The number of radios in use at any given venue will vary from two to three hundred.

Nearly 1,500 Motorola HT-90, HTH-40, and MX300S radios will be in use at the games, operating in the 403-430 MHz or 494-512 MHz region. Repeaters will be used to boost the range and coverage.

For the portable radio system, Page and seven other people on the communications staff have taken advantage of the relatively long distance between Calgary and the out-of-town venues by reusing many frequencies. Most venues will then be able to operate autonomously. A central control console will monitor portable radio communications and provide assistance where needed.

Mobile Radio Systems

The mobile radio systems, operating in the 403-430 MHz range, is divided into three zones of coverage: Calgary and west, the Nakiska area, and the Canmore area. Under this dispatcher-based arrangement, 653 mobile radio users will reuse frequencies between zones.

To provide the desired coverage and communications needed for athlete transportation, general operations, telephone access, and the host broadcaster, the mobile radio system will incorporate a large number of repeaters. Nine will cover Calgary proper, with seven repeaters each at Canmore and Nakiska.

The mobile portable radio systems will be tied together by a central console, which is linked to the mobile radio repeaters and to local consoles providing assistance to the portable radios at Canmore, Nakiska, and Canada Olympic Park. All consoles will also have the capability to access the paging system.

Maintenance for all of these radios will be performed by Motorola and the Alberta Government Telephone company. Their shops will be on stand-by to provide overnight service for the length of the Games.

Reflecting on the support needed to bring such massive radio systems together, Page says, "The Motorola sponsorship, expertise, and support have been absolutely exemplary."

Radios Support the Flame

In addition to the pager and mobile radios systems, Page and his crew are providing 30 mobile radios for a 6,200 mile torch relay run. By "uniquely Canadian methods," the torch will be carried from St. John's, Newfoundland, to the Yukon Territory, to the Pacific Coast and finally to Calgary. This should be one of the most interesting parts of the Games.

But that is hardly the end of the story regarding radios at the Winter Olympics. It has fallen to Doug Ward, Supervisor of Radio Telecommunications, to coordinate usage of all *other* radios at the games.

"To start," Ward says, "ABC has requested 48 frequencies in the 495 to 512 MHz range. And most of the teams are radio equipped as well. In fact, Japan and Finland have even requested five or six frequencies in the 27 MHz range."

In the 130-174 MHz band, the teams, broadcasters, press, sponsors, and suppliers, have requested some 300 frequencies in all.

The Press Wants Radios, Too

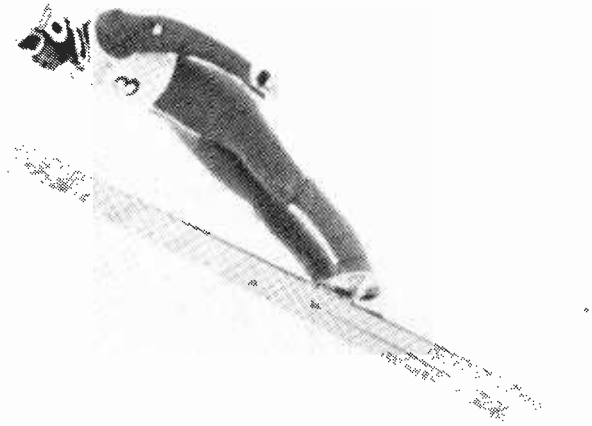
A large contingent of European broadcasters, including Britain, Sweden, Norway, Switzerland, and Germany, have asked for scores of frequencies for radio microphones requiring 100, 200, 400, 500, 700 and even 900 MHz allocations. "They submit requests for 20 frequencies at a time," says Ward. "I think their strategy is to ask for many so that they get at least some." A number of organizations have even asked for licenses for repeaters!

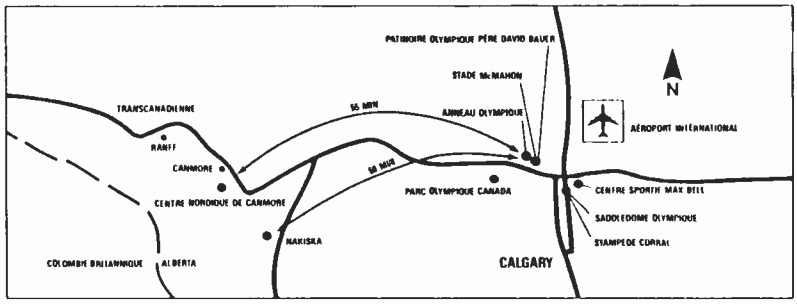
When requests for frequencies do come in, Ward plugs them into a frequency coordination database and automatically checks for duplicates. "In that way, we can make sure the Norwegian press doesn't interfere with the Japanese bobsleigh team."

If he doesn't see any conflict, Ward then submits a request for a license to the Canadian Department of Communications, which then checks for conflicts with any of the eight to nine thousand frequencies already in use within a 100 mile radius of Calgary.

If the frequency request clears that hurdle, a license will be issued in the name of the Winter Olympics Organizing Committee. On March 1, when the games are finished,

As you watch the skiers, skaters, shooters and bobsledders this month, remember that it is all made possible by radio.





all of these licenses will become null and void.

As this issue *Monitoring Times* goes to press, Ward has already processed more than 500 frequency allocations. Some, in the 7, 13, and 23 gigahertz ranges, will provide support for electronic news gathering crews as well as feedback and steering and control functions for remote satellite dishes.

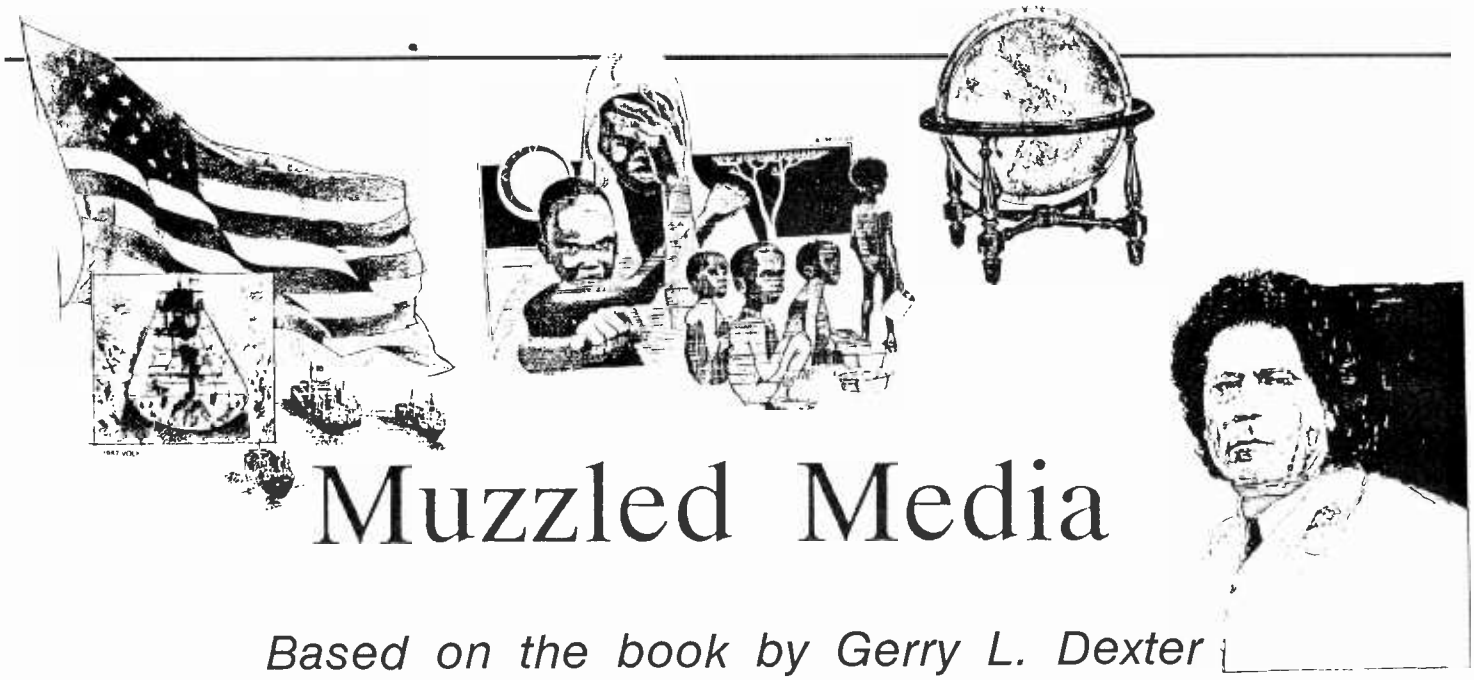
Ward's job is scarcely done with the assignment of frequencies. As each radio user comes into the Olympic complex, Ward and members of the Department of Communica-tions must inspect the equipment to assure that it operates on the frequency requested. This means checking out some 2,500 radios! Once the Games are underway, Ward must continually spot-check to make sure users stay on those frequencies.

A Cooperative Venture

For Ward, the most remarkable part of the experience has been the whole-hearted cooperation and support of the Department of Communications. "They have been involved from the beginning with planning, and they have been as helpful and supportive as if they worked for the organizing Committee itself. The DOC people have been super -- totally first class."

So as you watch the skiers, skaters, shooters and bobsledders this month, remember that it is all made possible by radio. If you're fortunate enough to be going to the Games, be sure to bring along a scanner. It should be mighty good listening. Maybe you'll come home with a Gold Medal in monitoring!

■



Muzzled Media

Based on the book by Gerry L. Dexter

Let's pretend that you're a news junkie and it's that it's Sunday afternoon. You've watched *Meet the Press*, *Face the Nation* and all of the other news shows. Lying beside your chair, completely spent, is all eight pounds of the New York *Times*.

During the week, you faithfully watched your favorite evening news on network TV, read the daily paper and even squeezed in one or two of the weekly news magazines. At the office, your radio is set to the local all-news station. OK. You've done your homework. You can rest assured that you are "up" on all that's happening in the world. Well, here's another news flash: You've just scratched the surface!

All the news that's fit to print, isn't. And Dan Rather doesn't tell it all, either. The fact is, no one source of any kind, anywhere, can provide all of the news. There are billions of people doing billions of different things -- all of which are scattered across the globe in some two hundred different countries. No one can come close to covering everything that's happened during a day in the life of planet Earth, no matter what the advertisements tell you.

Domestic radio and television must pander to commercial appeal in their news output. That is not to say, of course, that news is chosen with the sponsor in mind. Instead, it's a case of attractively packaging and presenting the news so that it appeals to the interests of the widest number of people. In that way, commercials included in the "package" are given the widest exposure.

News is in the Eye of the Beholder

News, you see, is a relative thing. Like beauty, its value is generally held in the eye of the beholder. While a bond issue for a new sewer may be the big story of the day in Keokuk, Iowa, it's of little concern to people in Pittsburgh, where *their* big story is how they're going to get to work now that a section of the freeway is closed. And, of course, that freeway is of little concern in Washington, D.C...

Not even the most enthusiastic news junkie has the time to go to the extremes necessary to try and keep up with what's going on in every city in America! And if that's the case on a national level, where is the news-hungry individual to turn when he wants to learn about what's going on in every *country* in the world?

Pushing the Point

If the dial pointer on your ordinary AM radio could be moved beyond its "16" limit, you would soon enter a realm of stations very different from the ones you've grown up with. It's a world of stations that come, not from around the block, the city over the hill, or even the next state. These are *international* stations and these broadcasters are located in different *countries!*

These international stations broadcast on shortwave frequencies. And shortwave frequencies behave quite a bit differently than do those on the AM and FM broadcast bands. Encircling the globe, they can reach out beyond geographic and national boundaries to be heard by people all over the world.

New Horizons

A listener in Los Angeles probably isn't going to be able to tune in the station in Pittsburgh, Pennsylvania, and chances are that Keokuk won't hear Los Angeles stations. But a listener in either city will have no problem tuning in broadcasts from Beijing, Ankara, Managua, Cologne, Paris, Cairo, Melbourne or hundreds of other places around the world.

These international radio stations offer the shortwave listener a tremendous opportunity to learn about what's going on in the rest of the world. Their newscasts are not centered on the daily life, problems and politics of the United States. These are focused on the news, events and lifestyles of the country doing the broadcasting. And the range and scope of the news found on shortwave can truly be mind-boggling!

When a major event does take place, the person equipped with a shortwave radio has another advantage over others: more detailed reporting direct from the source.

Clip and save

English Language Current Affair Programs on Shortwave

Newscasts are easy to find on shortwave since most stations start their broadcasts with the news. In order to find a newscast about or from a particular part of the world, simply consult the frequency section of this issue of *Monitoring Times* and tune in at the top of the hour.

There are, however, even more news and current affair programs that do not fit into this neat little schedule. For your listening pleasure, we've listed many of the major ones below. To find out where on the dial to tune for these programs, simply match the program time with the frequencies section of this magazine.

0000	M-F	*The World at Six:* Radio Canada International
0010	M-F	*Newsline:* Voice of America
0015		*Radio Newsreel:* BBC
0030	M-F	*As it Happens:* Radio Canada International
0100		*International Report:* Radio Australia
0100	M-F	*Microphone on Europe:* Deutsche Welle
0110	M-F	*Newsline:* Voice of America
0110	M-F	*Report to the Americas:* Voice of America*
0200	M-A	*Dateline:* Swiss Radio International
0200		*International Report:* Radio Australia
0210	M-F	*Newsline:* Voice of America
0210	T-A	*Newsreel:* Radio Moscow
0215		*Radio Newsreel*: BBC
0230	M-F	*As it Happens:* Radio Canada International
0230	M-A	*Newsline:* Radio Netherland
0300	M-F	*Microphone on Europe:* Deutsche Welle
0310	M-F	*Newsline:* Voice of America
0400	M-A	*Dateline:* Swiss Radio International
0400		*International Report:* Radio Australia
0400		*Newsdesk:* BBC
0410	M-F	*Newsline:* Voice of America
0500	M-F	*Microphone on Europe:* Deutsche Welle
0509		*Twenty-Four Hours:* BBC
0510	M-F	*Newsline:* Voice of America
0510	T-A	*Newsreel:* Radio Moscow
0530	M-A	*Newsline:* Radio Netherlands
0600		*International Report:* Radio Australia
0600		*Newsdesk:* BBC
0610	M-F	*Newsline:* Voice of America
0630	M-A	*Dateline:* Swiss Radio International
0630	M-A	*Newsline:* Radio Netherlands
0709		*Twenty-Four Hours:* BBC
0730	M-A	*Dateline:* Swiss Radio International
0730	M-A	*Newsline:* Radio Netherlands
0800		*International Report:* Radio Australia
0830	M-A	*Dateline:* Swiss Radio International
0830	M-A	*Newsline:* Radio Netherland
0900		*Panorama:* Deutsche Welle
1000	M-A	*Dateline:* Swiss Radio International
1000		*International Report:* Radio Australia
1010	T-A	*Newsreel:* Radio Moscow
1030	M-A	*Newsline:* Radio Netherland
1100	M-A	*Dateline:* Swiss Radio International
1130	M-A	*Newsline:* Radio Netherland
1200		*International Report:* Radio Australia
1200	M-A	*Radio Newsreel:* BBC
1210	M-F	*Newsline:* Voice of America
1300	M-A	*Dateline:* Swiss Radio International
1309		*Twenty-Four Hours:* BBC
1330	M-A	*Dateline:* Swiss Radio International
1400		*International Report:* Radio Australia
1430	M-A	*Newsline:* Radio Netherland
1500		*Radio Newsreel:* BBC
1510	M-F	*Newsline:* Voice of America
1510	M-F	*Newsline Cologne:* Deutsche Welle
1530	M-A	*Dateline:* Swiss Radio International
1610		*Panorama:* Deutsche Welle
1630	M-A	*Newsline:* Radio Netherland
1710	M-F	*Newsline:* Voice of America
1800	M-A	*Dateline:* Swiss Radio International
1800		*Newsdesk:* BBC
1800	M-F	*Newsline:* Deutsche Welle
1830	M-A	*Dateline:* Swiss Radio International
1830	M-A	*Newsline:* Radio Netherland
1910	M-F	*Newsline:* Voice of America
2000		*International Report:* Radio Australia
2009		*Twenty-Four Hours:* BBC
2030	M-A	*Newsline:* Radio Netherland
2100	M-A	*Dateline:* Swiss Radio International
2110	M-F	*World Report*: Voice of America
2200		*International Report:* Radio Australia
2200		*World at Six:* Radio Canaada International
2210	M-F	*Newsline:* Voice of America
2230		*As it Happens:* Radio Canada International
2230	M-A	*Dateline:* Swiss Radio International
2310	M-F	*Newsline:* Voice of America
2310	M-F	*Newsreel:* Radio Moscow

* *Americas service only*

S=Sunday, M=Monday, T=Tuesday, W=Wednesday, H=Thursday, F=Friday, A=Saturday

GURDUS MONITORING SERVICE

And in a world where domestic news bureaus are facing budget cuts and closing down offices overseas, this can be an unparalleled source of information. Indeed, many of the foreign stories that we read or hear about began their trip to the newsroom teletype through shortwave radio.

Israeli newsman Michael Gurdus, for example, obtains all of his news -- and he has had more than his share of "scoops" -- simply by monitoring international broadcasts and other over-the-air communications.

Gurdus has followed airplane hijackings and rescue attempts as they were taking place. He's heard former White House Chief of Staff, General Alexander Haig, issuing instruction regarding the Watergate tapes from on board Air Force One.

With international radio providing news from Albania to Zimbabwe, there is no need for the person with a serious news interest to be satisfied with the spoon-fed and sanitized product offered by the domestic media. International radio allows one to broaden the scope and content of the news one receives and, at the same time, enjoy a deeper, richer, understanding of the world and its peoples.

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Muzzled Media: The News Your Government Doesn't Want You to Hear is available for $8.95 plus $1.95 from Imprime, Box 241-R, Radnor, PA 19087.

Comparing News Coverage

Top Five Headlines

Radio Moscow

1. USSR Supreme Soviet debates new Five-Year Plan.
2. Deputy Chairman of Socialist Democratic Party in West Germany supports new Soviet Arms proposal.
3. Washington *Post* says there are difference in US administration as to whether Soviet proposals are worth persuing.
4. Luxembourg and Iceland condemn Reagan's abandonment of the SALT II Treaty.
5. US will carry out more nuclear tests in Nevada.

Radio Australia

1. South Africa says imposition of state of emergency prevented a communist revolution in that country.
2. The US House of Representatives will vote on economic sanctions against South Africa.
3. Sri Lankan cabinet approves a plan for ending the country's ethnic conflict.
4. The Philippine government announces major tax reforms.
5. A call for special international effort to help Indonesia with its economic problems.

The Voice of Israel

1. The Israeli Attorney General will investigate the General Security Service affair.
2. The US Undersecretary of State Economic Affairs says there is still danger that Israel's economy could collapse.
3. US Secretary of Defense Casper Weinberger says that the cost of a plane ordered by Israel will be $7 million more per plane than expected.
4. Washington *Times* says that Israel has a stockpile of over 100 nuclear warheads.
5. President Reagan will tell Congress that Saudi Arabia has met the conditions for the sale of AWACS planes.

Radio Austria International

1. The prime minister says he will cooperate with President Kurt Waldheim.
2. The secretary general of the People's Party rejects criticism of Waldheim by the World Jewish Congress.
3. A sharp rise in the number of visitors to a former Nazi concentration camp.
4. An Austrian journalist receives a major award for outstanding media work.
5. Trial of accused Achille Lauro hijackers gets under way.

All headlines taken from broadcasts on June 18, 1986.

NEW! CB Radios & Scanners

Communications Electronics,™ the world's largest distributor of radio scanners, introduces new models of CB & marine radios and scanners.

NEW! Regency® TS2-RA

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

List price $499.95/**CE price $339.95**

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.

Bearcat® 50XL-RA

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.

Regency® Informant™ Scanners

Frequency coverage: 35-54, 136-174 406-512 MHz.

The new *Regency* Informant scanners cover virtually all the standard police, fire, emergency and weather frequencies. These special scanners are preprogrammed by state in the units memory. Just pick a state and a category. The Informant does the rest. All Informant radios have a feature called *Turbo Scan*™ to scan up to 40 channels per second. The **INF1-RA** is ideal for truckers and is only $249.95. The new **INF2-RA** is a deluxe model and has ham radio, a weather alert and other exciting features built in for only $324.95. For base station use, the **INF5-RA** is only $199.95 and for those who can afford the best, the **INF3-RA** at $249.95, is a state-of-the-art, receiver that spells out what service you're listining to such as Military, Airphone, Paging, State Police, Coast Guard or Press.

Regency® HX1500-RA

List price $369.95/**CE price $218.95**

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.

Bearcat® 100XL-RA

List price $349.95/**CE price $178.95/SPECIAL**

9-Band, 16 Channel • Priority • Scan Delay Search • Limit • Hold • Lockout • AC/DC

Frequency range: 30-50, 118-174, 406-512 MHz.

Included in our low CE price is a sturdy carrying case, earphone, battery charger/AC adapter, six AA ni-cad batteries and flexible antenna. Order your scanner now.

★★★ Uniden CB Radios ★★★

The *Uniden* line of Citizens Band Radio transceivers is styled to compliment other mobile audio equipment. Uniden CB radios are so reliable that they have a two year limited warranty. From the feature packed PRO 540e to the 310e handheld, there is no better Citizens Band radio of the market today.

PRO310E-RA *Uniden* 40 Ch. Portable/Mobile CB... $85.95
NINJA-RA PRO310E with rechargeable battery pack. $99.95
B-10-RA 1.2V AA Ni-cad batt. for Ninja (set of 10) $20.95
PRO520E-RA *Uniden* 40 channel CB Mobile $59.95
PRO540E-RA *Uniden* 40 channel CB Mobile $119.95
PRO710E-RA *Uniden* 40 channel CB Base $119.95
PC22-RA *Uniden* remote mount CB Mobile $99.95
PC55-RA *Uniden* mobile mount CB transceiver. $59.95

★★★ Uniden Marine Radios ★★★

Now the finest marine electronics are available through CEI. The *Unimetrics* **SH66-RA** has 50 transmit and 60 receive frequencies with 25 or 1 watt power output. Only $169.95. The *Unimetrics* **SH88-RA** is a deluxe full function marine radiotelephone featuring 55 transmit and 90 receive channels and scanning capability for only $259.95. The *Unimetrics* **SH3000-RA** is an excellent digital depth sounder, good for 300 feet. It has an LCD continuously backlit with red light display and a 5 ft. or 10 ft. alarm. Only $189.95. Order today.

Bearcat® 800XLT-RA

List price $499.95/**CE price $289.95/SPECIAL**

12-Band, 40 Channel • No-crystal scanner Priority control • Search/Scan • AC/DC

Bands: 29-54, 118-174, 406-512, 806-912 MHz

The Uniden 800XLT receives 40 channels in two banks. Scans 15 channels per second. Size 9¼" x 4½" x 12½."

OTHER RADIOS AND ACCESSORIES

Panasonic RF-2600-RA Shortwave receiver $179.95
RD55-RA *Uniden* Visor mount Radar Detector $98.95
RD9-RA *Uniden* "Passport" size Radar Detector ... $169.95
***NEW!* BC70XLT-RA** *Bearcat* 20 channel scanner ... $168.95
BC 140-RA *Bearcat* 10 channel scanner $92.95
BC 145XL-RA *Bearcat* 16 channel scanner..... $98.95
BC 175XL-RA *Bearcat* 16 channel scanner $156.95
BC 210XLT-RA *Bearcat* 40 channel scanner..... $196.95
BC-WA-RA *Bearcat* Weather Alert™ $35.95
R1080-RA *Regency* 30 channel scanner $118.95
R1090-RA *Regency* 45 channel scanner $148.95
UC102-RA *Regency* VHF 2 ch. 1 Watt transceiver ... $117.95
P1412-RA *Regency* 12 amp reg. power supply ... $189.95
MA549-RA Drop-in charger for HX1200 & HX1500 ... $84.95
MA518-RA Wall charger for HX1500 scanner $14.95
MA553-RA Carrying case for HX1500 scanner $19.95
MA257-RA Cigarette lighter cord for HX12/1500 ... $19.95
MA917-RA Ni-Cad battery pack for HX1000/1200 ... $34.95
SMMX7000-RA Svc. man. for MX7000 & MX5000 ... $19.95
B-4-RA 1.2 v AAA Ni-Cad batteries (set of four) $9.95
B-8-RA 1.2 v AA Ni-Cad batteries (set of eight) $17.95
FB-E-RA Frequency Directory for Eastern U.S.A. $14.95
FB-W-RA Frequency Directory for Western U.S.A. ... $14.95
ASD-RA Air Scan Directory $14.95
SRF-RA Survival Radio Frequency Directory..... $14.95
TSG-RA "Top Secret" Registry of U.S. Govt. Freq. ... $14.95
TIC-RA Techniques for Intercepting Comm..... $14.95
RRF-RA Railroad frequency directory..... $14.95
EEC-RA Embassy & Espionage Communications ... $14.95
CIE-RA Covert Intelligenct. Elect. Eavesdropping ... $14.95
MFF-RA Midwest Federal Frequency directory $14.95
A60-RA Magnet mount mobile scanner antenna... $35.95
A70-RA Base station scanner antenna..... $35.95
MA548-RA Mirror mount Informant antenna..... $39.95
USAMM-RA Mag mount VHF ant. w/ 12' cable..... $39.95
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A Monitoring Times Exclusive

The Station that Took On a Dictator— *AND WON!*

Shortwave broadcaster Jeff White has lived and worked in the Caribbean for many years. So when he was asked by the *Christian Science Monitor* to cover the elections in Haiti, he already had some idea of what he was getting into. "I knew things were hot there," says White, "but I didn't know just *how* hot until I arrived in Port-au-Prince."

On the ride from the airport to the hotel, the 28 year old journalist passed burned-out buses, looted stores, and the body of a young Haitian who had been shot in the head by a gunman in a passing car. "When I saw that corpse and the crowd of people around it -- that's when the reality of the whole situation hit me."

"Later," continues White, "it hit even closer to home. One night, I was talking with J.B. Deiderich, a photographer for *Time* magazine. He was speculating that the *Tonton Macoutes* [Duvalier's secret police] might try to gain some international impact by shooting a foreign journalist."

"A short time later, I saw him again. This time he was on TV, covered in blood and explaining how an unidentified gunman had shot him." A Dominican cameraman standing nearby died in the attack.

It was in this atmosphere of lawlessness and violence that White drove to the offices of Radio Soleil. During the Duvalier years, the station gained a hard-earned reputation for fearlessly standing up to the government. By all accounts, the station played a leading role in the popular revolution that unseated the dictatorship and sent the "President-for-Life" packing off to France.

While at Radio Soleil, White met Father Hugo Triest, the station's Belgian-born director, who agreed to be interviewed for *Monitoring Times.*

MT: Radio Soleil is a legend in Haiti. And it's well-known internationally for its reliable, objective news coverage. How did such a small station gain such a big reputation?

Triest: Before the departure of Jean-Claude Duvalier, Radio Soleil was the only radio station in Haiti that gave its listeners concrete information on what was going on in this country. When there were brutalities, when there were executions, when the freedom of the people was vigorously disregarded, Radio Soleil always talked about it. Other stations might talk about these things, too, but only after we had done so.

MT: Given the state of Haiti under Duvalier, I have to wonder how you were able to "get away" with such activities.

Triest: I think that the only reason we've been able to continue broadcasting at all is simply because this is the Church's radio station. And to attack the Church's radio station would be like attacking the Church itself. If we had been a privately owned station, we would have disappeared long ago. Radio Haiti-Inter, which was privately owned, did practically the same work as we did. But in 1982, the station was vandalized and the staff exiled. [Radio Haiti-Inter did eventually return to the air but not until after Duvalier had left the country.]

MT: You, yourself, were exiled, weren't you?

Triest: Yes. We never knew exactly why, though. One day there was a decree saying that I had to leave the country. The decree was based on Articles such-and-such -- articles that talked about the mingling of foreigners in internal Haitian affairs. And I am originally from Belgium.

MT: When was Radio Soleil founded?

Triest: The station was founded in 1978, licensed in a general sense as an educational facility. We like to say that Radio Soleil is here for evangelization, education, information and entertainment, although the entertainment is somewhat limited.

We broadcast 18 hours a day, from five in the morning until eleven o'clock at night. We're on AM only and have 10 kilowatts of power. We are also relayed by two sister stations, one in Cape Haiten and the other in Les Cayes. Together, we cover about 70 percent of the national territory.

MT: What's the size of the staff?

Triest: We have within the radio several of what we call, "teams." There is the Information Team, the Popular Education Team, the Pastoral Team, and the Entertainment Team. Because of what's happening in the country today, our greatest emphasis is on the Information Team.

There are six full-time staff members on the Information Team. We also have sixteen correspondents in the provinces that we hear from on an almost daily basis. So we know pretty well whatever is going on in the country.

MT: You mentioned the vandalism of Radio Haiti-Inter. Has Radio Soleil ever been the victim of this kind of attack?

Treist: Yes, it has. In July of 1984, for example, three armed men wearing masks attacked our transmitter site. They said that they had come for our "secret documents." We do have a file of valuable information but no secret file. In the end, they didn't do any damage but it was frightening.

Later on, when I was in exile, the government closed the station because it was broadcasting news about the events in Gonaive [an area of unrest in northwest Haiti where government forces killed two or three young students]. The government didn't want us broadcasting that. They told us to stop but Radio Soleil did not. We felt we had an obligation to provide that information. So they closed the station in a very vandalistic way, cutting electrical wires and things like that.

MT: How long was the station off the air?

In July, three armed men wearing masks attacked our transmitter site. They said that they had come for our "secret files."

Triest: We were off the air until the sixth of January, 1986. We were allowed back on the air again on January 31st. On that day, all radio stations in the country were shut down by decree for one week, until Duvalier finally left Haiti.

MT: What role has your station played in the process of democratization in Haiti during the past couple of years?

Triest: I think that we can say that Radio Soleil has had the privilege of being the sounding board for whatever was going on in Haiti. We were able to increase the people's awareness, their consciousness, in a very indirect but helpful way. It encouraged the people to organize themselves. In other words, when we report on an organization in one area of the country, it's an encouragement for others to do the same thing.

MT: Let's assume that elections do eventually take place in Haiti and that someone is legitimately elected president of the country by the people. What do you see as the role for Radio Soleil then?

Triest: It's very interesting that you ask me that question. When Duvalier left, a lot of people asked, "What is Radio Soleil going to do now?" It was as if we were instrumental in sending him away.

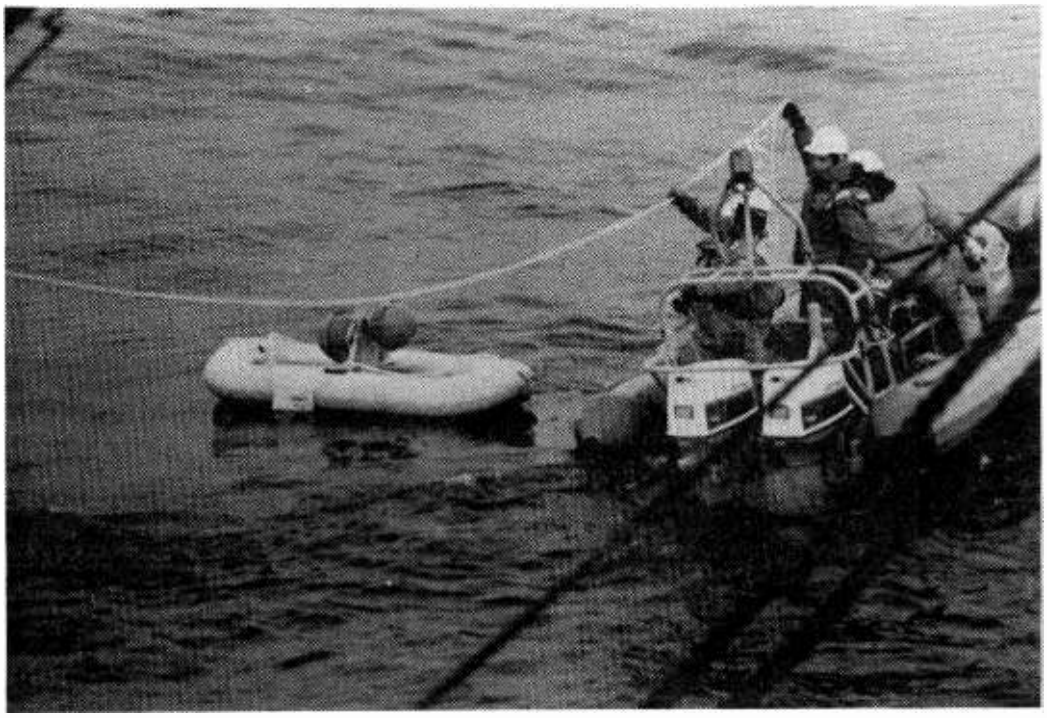
It was never our intention to send Duvalier away. But truth, justice and the needs of the oppressed finally made it impossible for him to stay. But no matter what government is here, no matter to what degree that government is democratic, there are always some abuses. There are always going to be needs that are overlooked. There will always be distortions of the truth.

I think that the role of the Church -- and thus Radio Soleil -- will always be to defend truth, to defend justice, and to speak out for the needy and oppressed.

Editor's note: Radio Soleil is one of twenty-four AM stations in poverty-stricken Haiti. Operating on 1170 kHz, it is a strictly local operation. Only one station in Haiti has been on shortwave in recent years: 4VEH. Unfortunately, its tiny 1.5 kilowatt transmitter on 4930 kHz has not been heard for some time now. ■

A mother awaits treatment for her child at a hospital clinic in Haiti, a disease-ridden land where 250 of every 1,000 children die before reaching the age of 5. Better living conditions are a key aspiration of Haitians (Photo by James P. Blair, copyright National Geographic Society)

Tracking White Death



by Helvin Smith

Flying With The International Ice Patrol

The ice season in the shipping lanes south and east of Newfoundland generally gets under way this month. It runs through July. This area south of the Arctic Circle, which includes the Great Circle shipping lanes between ports in Europe and North America, is among the most dangerous in the world. Icebergs, floating ice, frequent storms and heavy shipping traffic all contribute to the need for constant vigilance.

Killer ice. It claimed the great *Titanic* back in in 1912. Although it certainly wasn't the first ship to be lost to the 'bergs, the loss of life -- some 1,500 people went to the bottom with the White Star Liner -- did manage to touch an international nerve.

Concern Spawns Action

So great was the concern that less than one year after the disaster, thirteen nations met at the first Safety of Life at Sea Convention (SOLAS). Out of the convention came an accord setting up an international derelict ice destruction and observation service known as the International Ice Patrol (IIP).

There was one problem with the SOLAS Convention. The agreement setting up the service wasn't scheduled to take effect until the first of July, 1915.

Fortunately, the United States had already developed some expertise and experience in dealing with the white death. Hardly had the Titanic settled to the ocean floor when the first American ice patrols were being sent on their way. First to participate were Navy vessels and later the Revenue Cutter Service, the forerunner of today's Coast Guard.

Since the US was already involved in this kind of work, it was asked to continue in the interim and, as seems to often be the case, ended up in permanent charge of the operation.

Operational costs of the IIP, which range from 1.9 to 2.6 million dollars a year (depending on the length and severity of the ice season), are shared by all the signators to the SOLAS Convention.

Initially, patrols were conducted from two surface cutters, alternating along the southern limits of the ice. Oceanographic

White death - Icebergs. Over the years, the IIP has tried blasting them apart and melting them down using gunpowder, TNT, mines, bombs, and gasoline. Today, the service merely tracks their quarry. End result: Not a single reported loss of life or property due to a collision with the sailor's ancient enemy.

observations were assigned to a third ship in 1931.

After World War II, however, the main method for ice reconnaissance became the aircraft. Surface vessels were gradually phased out, except during heavy ice years or in periods of extended low visibility.

Location Changes; Job the Same

The headquarters of the IIP have also seen a number of changes. Based at the Coast Guard Air Station at Argentia, Newfoundland, since 1946, it moved to Governor's Island, New York in '63 and to its current home at the Coast Guard Research and Development Center in Groton, Connecticut, ten years later.

The Ice Reconnaissance Detachment (then made up of nine aircrews and three ice observers flying H-130 aircraft) worked out of Argentia until 1971, moved to the Canadian Forces base at Summerside, Prince Edward Island (where it stayed until '73), to St. Johns, Newfoundland, and finally, in 1983, to Gander, Newfoundland.

Flights are made on the average of five days every other week. Each lasts between five and seven hours and covers an incredible 27 thousand square miles of ocean.

Information gathered from the flights is fed into a computer along with supplemental information received from other aircraft and ships (which are requested to report sightings every six hours) along with current and wind data.

The result is an accurate prediction of the ice's drift. Every twelve hours, bulletins containing this information are issued with estimated locations of the larger 'bergs and an estimated southern limit of all known ice.

These ice situation reports go out in a variety of modes and from a number of different radio stations. You can hear voice in ordinary single sideband, Morse code, SITOR and facsimile.

Blowing Up 'Bergs

One difference between the IIP of yesterday and the IIP of today is philosophical. Over the years, the Coast Guard tried all manner of ways to destroy or speed up the melting of an iceberg. Gunfire didn't work. Neither did mines, torpedoes, depth charges, thermite or regular bombs.

Blowing up an average size 'berg was estimated to require about 1,900 tons of TNT. If you decided to dump gasoline on it and set it afire in hopes of melting it down, it would take 2.4 million gallons to do the job. All are obviously impractical, to say nothing of the expense involved.

The whole business is made no easier by the dangerous task of trying to approach and land an aircraft on an iceberg. Each is as different as days of the month.

Icebergs are classified by the Ice Patrol according to their size and shape above water level. Size classifications are listed in Table I.

Tabular shapes are those with steep sides and a flat top, very solid with a length/height ration of less than 5 to 1. Non-tabular shaped icebergs are all other types -- usually domeshaped, sloping, blocky or pinnacle shaped.

Today, no matter what the shape of its quarry, the IIP does its job not by blowing up 'bergs but by tracking them. And since the service has been in operation, there hasn't been a single reported loss of life or property due to a collision with an iceberg outside the specified limits of all known ice in the vicinity of the Grand Banks.

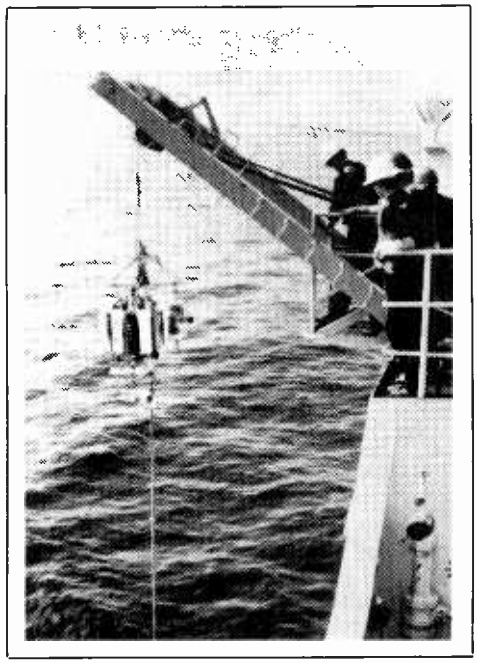
That's a record of which the IIP has a right to be proud.

■

Table I

Size Classifications

Type	Height	Length
Growlers	Less than 17'	Less than 50'
Small	17 to 50'	50 to 200'
Medium	51 to 150'	201 to 400'
Large	151 to 240'	401 to 670'
Very large	Over 240'	Over 670'



International Ice Patrol

Radio Bulletin Schedule

Station		Time UTC	Frequency kHz
NAVTEX Ice Broadcast, Coast Guard Station NIK	Boston	0050, 1100, 1700, 2300	518
SITOR Ice Broadcast from NIK	Boston	0018, 1218	5320, 8502, 12750
CW Broadcast from NIK	Boston	0050, 1250	5320, 8505, 12750
Canadian Coast Guard Radio Sta VON	St.John's Nfld	0000, 1400	478
Canadian Forces Station CFH,	Mill Grove	0130, 1330	438, 4255, 6430 8697, 12726, 16926.5, 22397.5
LCMP Broadcast, Norfolk, Virginia:			
Driver, Virginia		0800-0900, 1500-1600, 1600-1700, 2100-2200	8090, 12135, 16180, 20225
GXH, Thurso, Scotland		0800-0900, 1500-1600, 1600-1700, 2100-2200	4001, 7504.5, 12691
NRK, Keflavik, Iceland		0800-0900, 1500-1600, 1600-1700, 2100-2200	5167
NAR, Key West, Florida		0800-0900, 1500-1600, 1600-1700, 2100-2200	5870, 26725
AOK, Rota, Spain		0800-0900, 1500-1600, 1600-1700, 2100-2200	5917.5, 7705
NGR, Nea Makri, Greece		0800-0900, 1500-1600, 1600-1700, 2100-2200	4623, 13372.5
Radiofacsimile Broadcasts:			
US Coast Guard Station NIK, Boston		1600	8502, 12750 (∓ 400 kHz)
Canadian Forces Station, CFH, Mill Grove		0000, 0200	122.5, 4271, 6330, 9890, 13510
GFE, Bracknell, United Kingdom		1413	2618.5, 4782, 9203, 14436, 18261.

Special Broadcasts:

Canadian Coast Guard, VON, St. John's
As needed on sightings outside regular ice limits. Transmissions between regularly scheduled broadcasts.
2598 (phone) 478 (CW)
All transmissions are preceded by the International Safety Signal [TTT] on 500 kHz.

International Ice Patrol Vessel NIDK
When in vicinity of ice in periods of darkness or fog.
2670 transmission preceded by the International Safety Signal [SECURITE] on 2182 kHz.

Note: Frequencies given may not all be in use during a given transmission, depending on propagation to the coverage area, downtime, etc.

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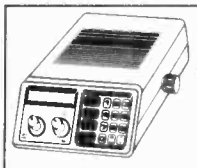

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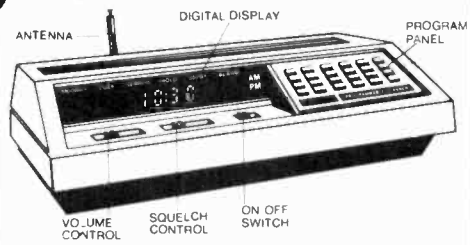

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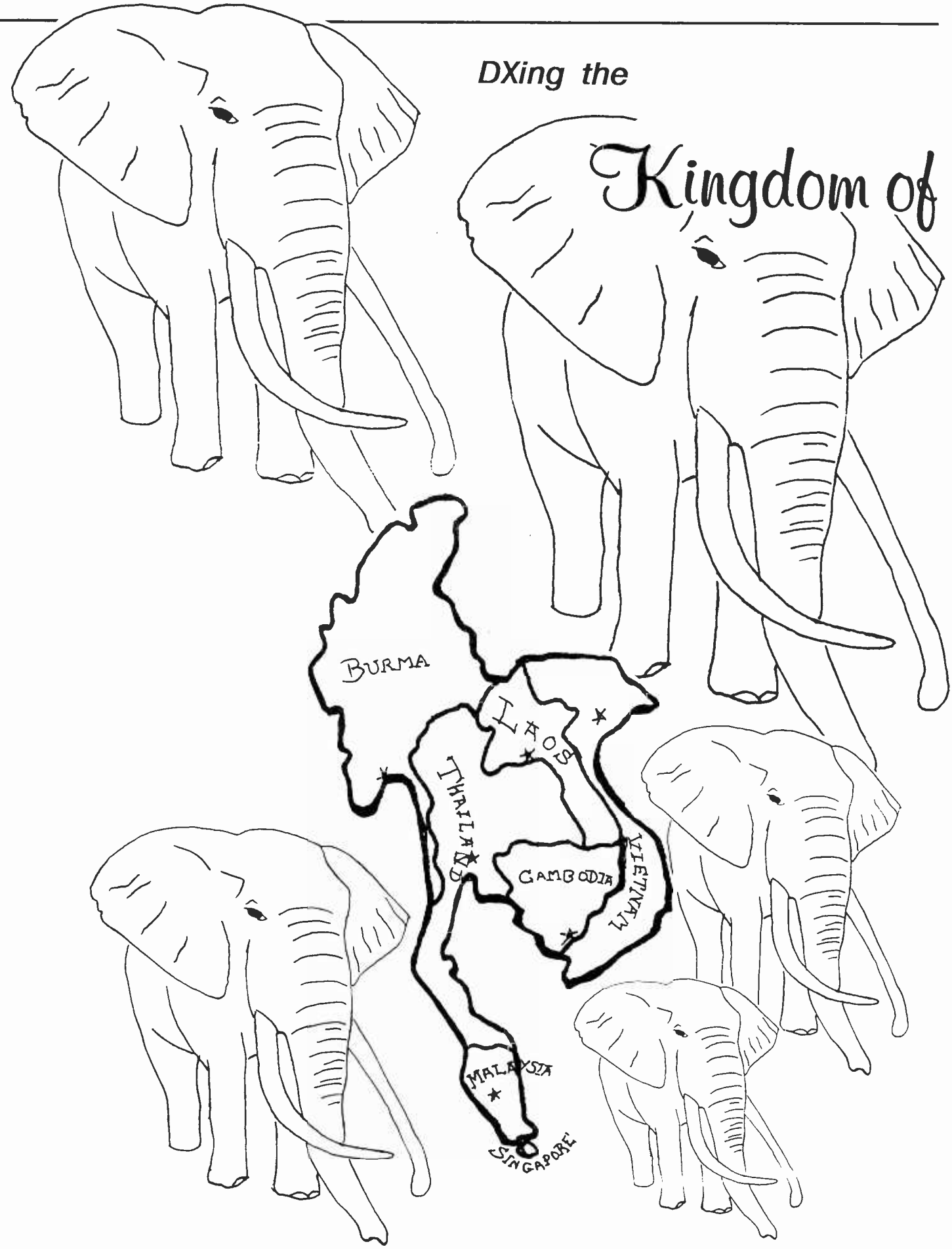
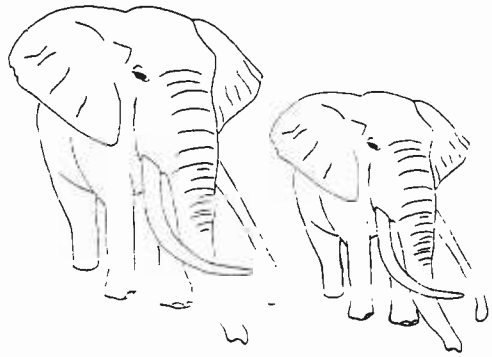


a Million Elephants



There is, of course, no radio station on the air which identifies itself as coming from the "Kingdom of a Million Elephants." Had you listened to the radio back in the 14th century (and had it been invented then), you might have heard such a station!

Unfortunately, the Kingdom of *Lane Xang* (Million Elephants) is gone, another mere footnote on the pages of history. Since its day in the sun some 600 plus years ago, that land, now known as Laos, has been the unwilling host to an entire parade of conquerers. The Thais, the French, the Japanese and later, again, the French, have all marched into and later fled this beautiful, exotic land.

During World War II, the latter pasted together something called the United Kingdom of Laos and made it a sovereign state of the French Union in 1949. In the years since, all manner of left-wing and right-wing elements, under different and differing Laotian princes have jockeyed for and held or shared power.

The Vietnamese created the communist Pathet Lao organization. It ruled along with a rival government, friendly to the US, at the same time as American bombers were pounding the Laotian portion of the Ho Chi Minh Trail during the Vietnam war.

The Pathet Lao did eventually succeed in taking complete power in 1975. To this day, an estimated 40 thousand Vietnamese troops remain stationed in Laos, providing support for the government.

Beautiful Country; Ugly Country

Today, Laos is a beautiful country but things there are not pretty. The brand of communism favored by the current regime is something from the the era of cars with tail fins, Bill Hailey and bobby socks. The government is stern, Stalinistic. Life for most is a bare-bones thing. There is little or no tourism and little or no western aid. The few diplomats who are unfortunate enough to pull this assignment are restricted to a four mile area around the capital.

Laos is the tenth poorest nation on the planet. Even Haiti is better off! But there are slight cracks appearing in the government's heretofore rigid control. Observers point to the slightest hints of modernization, which present themselves from time to time.

There is still an organized resistance to the Pathet Lao, which is supported by neighboring Thailand. Their work has been evident in several ambushes and a couple of bombings, one of which occurred at the Soviet Cultural Center while Foreign Minister Shevardnadze was visiting.

All Over the Dial

For the DXer, this country of 3.5 million offers one of the most challenging targets on the high frequencies, at least from the standpoint of logging all the possibilities.

As expected, the main government station, Lao National Radio (sometimes called Radio Vientiane), is located in the capital of the same name. It's no easy catch but there are several regional or home service stations spotted around the countryside that are almost guaranteed to test the very fibre of your DX character. Even when active, these transmitters tend to vary in frequency from as little as one to as many as 30 kHz!

Some of the Laotian regionals have a history as clandestine broadcasters. The original facilities were set up by the US during the Vietnam war under such names as United Lao Races, Voice of the National Army and Voice of the Signal Corps. Today, these same transmitters, now aging and obviously in great need of repair, operate in the service of the same communist regime they had been founded to help overthrow.

Generally, programming on Laotian radio is split into three non-continuous time blocks: morning, afternoon and evening. For the North American DXer, the evening broadcasts (those around 1000 UTC or later) will offer the only real chance for reception of these stations.

Lao National Radio

In Vientiane, Lao National Radio operates on three frequencies. 6130 (at 25 kw) is probably the most stable of any in the country but also the one most subject to interference. It's almost always blocked by QRM -- and that's assuming that it has ever made it to the point of being QRM-able.

The 10 kw outlet on 7112 (variable) has a slightly better chance of being heard although it may suffer interference from the Chinese regional, Xiang People's Broadcasting Station, on 7110. Newcomers beware: these two stations are easily confused!

Laos is a beautiful country, but life there is not pretty. It is the planet's tenth poorest nation -- even Haiti is better off. For the DXer, the nation offers a challenging target -- and lots of them!

A recent addition to the Laotian stable of frequencies is 5160 which operates on lower sideband. Its purpose has not been explained. It is known that a foreign service operates here in Thai at 1130, Vietnamese at 1200, Cambodian at 1230, French at 1300 and English at 1330 UTC.

A new "Capital Radio Service" is said to be operational now. It supposedly relays the home service for two and a half hours a day on 4440 kHz but it's been unconfirmed and no schedule for the service has yet come out of Laos.

A year or so ago, Lao National Radio began being relayed to Europe via the facilities of Radio Moscow, This is aired, in French, for one half hour beginning at 1100 on 11870, 11960, 15190, and 15420 kHz.

Kingdom of a Million Regionals?

Regional broadcasters from the once grand "Kingdom of a Million Elephants" include:

Savannakhet: This 3 kw transmitter on the slightly variable frequency of 7384 kHz is scheduled from 1200 to 1400 UTC in Laotian and tribal languages. It's, arguably, the most easily logged of all the stations. Savannakhet just returned to the air in 1987 after a six year absence from the shortwave bands.

Xieng Khoung: Located in the north central part of the country, this regional facility has reportedly been using 4990 (and yes, it, too, varies). Again, like Laotian National Radio, beware the Hunan People's Broadcasting Station on the same frequency. Xieng Khoung is scheduled from 1100 to 1230 UTC using just 1 kilowatt of power. If you don't find it on 4990, check 5660, where it was earlier.

Hua Phan Radio: This station was once used for the Pathet Lao Radio so it is likely a Vietnamese-built or obtained transmitter formerly used for clandestine broadcasting. It has recently been heard on 4660 kHz, running from 1100 to 1330 UTC (1430 on Sundays).

Pakse: Also known as Champassak and located on the Mekong River in the north country, it has the worst case of drifting of any Laotian regional. It's been reported recently on 6640, 6645, and 6650 kHz. In the past, it has varied even more widely. Scheduled from 1000 to 1400 UTC, it's rarely logged in the US, despite its optimal schedule and relatively clear frequency.

Udom Sai: Also known as Oudum Zay, it has recently been noted on 4535 kHz between 1200 and 1400 UTC.

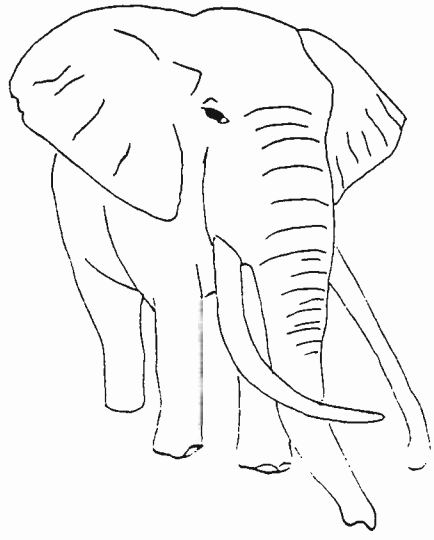
Luang Prabang: Once the royal and religious capital, this facility is located at the convergence of the Nam Khan and Mekong Rivers. Luang Prabang is Lao for "Golden Buddah" and got its name for the statue brought back to the ancient Kingdom during by a priest from Angkor Wat in Cambodia. Luang Prabang is listed for 7140 kHz but more recently has been reported on 7160 kHz from 0930 to 1330 UTC.

The regional stations do air a significant amount of locally produced programming but often carry news and features relayed from the national service in Vientiane, as well. All regional stations seem to relay the news from Laotian National Radio at 1200. This is often preceded by a bell interval signal.

While it is not at all unusual for the determined DXer to log two or three of these stations, it is extremely difficult to bag them all. It's necessary to keep up with current frequency useage and check them as often as possible during the months from mid-fall through mid-spring. Fortunately, right now is among the best times to get started!

If you can hear them, can you QSL them? Perhaps a bit surprisingly, the answer is "yes." The regionals are not known to reply, but Vientiane has been pretty good about verifying these as well as its own transmissions and even the relay via the USSR. A follow-up or two is occasionally necessary but the station seems very friendly to DXers. English reports are acceptable and may be sent to Lao National Radio, P.O. Box 310, Vientiane, People's Republic of Laos.

■



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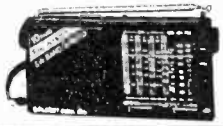

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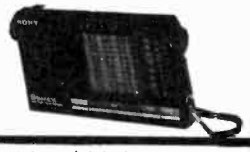

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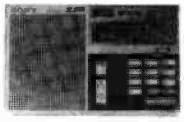

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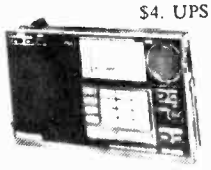

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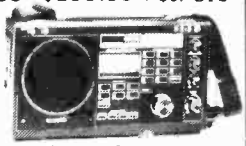

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CIRCLE 55 ON READER SERVICE CARD

Radio Australia, an old friend on the shortwave bands and one that's long been a favorite for North American shortwave listeners. There's something about Australia that seems to really fascinate Americans. Fortunately, despite the fact that North America isn't even on Radio Australia's formal "target" list, it is easily heard, especially in the mornings and late evenings. Here's their official list of "suggested" frequencies for the Yanks.

0000-0200	15320, 15395, 17795
0200-0400	17795
0800-1130	6060, 9580
1130-1400	6060
1400-1500	9580
2200-0000	15320, 15395

A more complete listing for Radio Australia can be found in the new, expanded frequency section of this month's *Monitoring Times.*

Bad News

According to *MT*'s own super monitor, Greg Jordan, Radio Japan is announcing that the government there has approved funds for the construction of Over-the-Horizon Radar (OTH) beginning in just two months. OTH Radar, of the Russian variety, is what's responsible for that annoying, woodpecker-like tat-tat-tatting you hear on the shortwave bands. So that's bad news.

Non-News

The Voice of Revolutionary Ethiopia has officially changed its name to the Voice of Ethiopia.

Out of Ecuador

When was the last time you got out of the house for a nice trip to Ecuador? Been a while, eh? Well, now's your chance. HCJB will take you on a "DXpedition" *(definition: an expedition where the main activity is DXing)* to Ecuador for just $1,199. The dates are March 27 through April 9. So get packing. Time's a wastin'. Inquiries should be made to HCJB, Box 691, Quito, Ecuador.

Speaking of HCJB, they've restarted their English service to Japan. It's on the air at 1200 UTC on 6075 kHz. Frequencies for the evening English service to North America now include 6230, 9720 and 11775 kHz.

Aboe Nawan Thaliep, chairman of the *Radio Listeners Club of Indonesia* writes to say that his organization, once restricted to Indonesians, is now accepting members from all over the world. The club, which was formed in 1972 and operates from Central Java, covers all aspects of radio monitoring. You can get more information by writing Box 15, Batang 51201, Indonesia. Be sure to include a few IRCs are a dollar bill to help them out with postage.

Skeds

Radio Bangladesh's home service is broadcast on the following schedule:

0000-0330	4890 kHz
0330-0630	6195, 7080 kHz
0630-0900	6195 kHz
1230-1250	6145 kHz
1250-1600	4890, 6145 kHz
1600-1715	6145 kHz

Radiodiffusion Nationale du Burkina forwards this undated, but presumably accurate, schedule (complete with handwritten updates!):

0500-0900	4815 kHz
0900-1700	7230 kHz
1700-0000	4815 kHz

Radio Budapest, Hungary offers a wide variety of programs during this somewhat unusual schedule:

0200-0230	[T-S]	6025, 6110, 9520, 9585, 9835, 11910 (North America)
0330-0430		6025, 6110, 9520, 9585, 9835, 11910 (North America)
1030-1100		9835, 11910, 17710, 17780, 21525 (Oceania)
1150-1220	[M-F]	9585, 9835, 11910, 15160, 15220 (Europe)
1530-1600	[M-A]	9585, 9835, 11910, 15160, 15220 (Asia)
1700-1730		6110, 9595, 9835, 11910, 15160 (Europe)
2100-2130		6110, 9520, 9585, 9835, 11910 (Europe)

In addition, Radio Budapest has a DX program on the following schedule:

0400-0415	[W,A]	6025, 6110, 9520, 9585, 9835, 11910 (North America)
1515-1530	[H,F]	6110, 9585, 9835, 11910, 15160 (Europe)

Bits 'n Pieces

KNLS has an English broadcast on 7355 kHz at 1730-2030 UTC. It's for the east coast of Asia. This is in addition to the transmission at 0800-1100 on 6150 kHz mentioned some time ago.

Radio for Peace, the new American-owned, Costa Rican-based shortwave station is really getting under way with a full head of steam. And what a head of steam it is. Here's what Russ Lay of Lawrenceville, Georgia, says in the ASWLC bulletin: "Programming is very strange. It's left-leaning with more than a smattering of 'New Age' philosophy. The day I tuned in, I had to struggle through a *one hour* piece on the significance of Harmonic Coonversion (sic) and how it affects sub-atomic particles, world peace and the need for a world society." It *is* unusual stuff. Try it out for yourself, evenings on 7375 kHz. Apparently, the daytime frequency of 21555 kHz has been dropped.

The staff of the late, boat-based pirate, Radio NewYork International is reportedly feuding. One group wants to continue using the air time provided to them by WNYG on Long Island, the rest plan to get that celebrated but short-lived station back on the air. Place your bets on the latter group.

The only words of English you'll ever hear spoken on Radio Denmark are during the sign on announcement. Try

for this rare bit of shortwave trivia at 1300 UTC on 15165 kHz.

Radio Nacional de Venezuela has been noted on 4520 kHz at 1830 UTC.

The trek by stations into the new 22 meter band continues. The latest station to stake out a spot on 13 MHz has been Swiss Radio International. They replaced 21695 kHz with 13685 from 1515 to 1700 UTC (which includes English at 1530). Next to make the plunge: WCSN, which will use 13760 from 1400 to 1600 UTC. Hear radio history as a new shortwave band fills with stations!

The Voice of the Turkish Communist Party is off the air but its brother-in-arms is still audible. Radio Bizim broadcasts at 0800, 1100, 1200 and 1500 UTC on 7335 kHz, supposedly from East Germany.

The Radio Beijing/Spanish Foreign Radio transmitter swap has been consumated. SFR programming in Spanish is now being heard on Chinese transmitters in Beijing and Kunming. 7165 kHz goes out from 1000 to 1100 UTC to Japan. 11870 kHz runs from 1100 to 1200 for the Philippines.

DXer's Digest

E.J. Berryman of Lincoln, Nebraska says that he's been hearing the Voice of America in upper and lower sideband for some time now. He advises checking 9350 kHz LSB at 1200, 1300, and 1400 UTC and 11090 USB at 1500, 1600, and 1700 UTC. Single sideband transmission are usually used as "feeders." That is, a way of getting the programs to a transmitter for rebroadcast. Catch these while you can. Most VOA feeds are now accomplished via satellite. Mr. Berryman uses a Japan Radio Corporation NRD-515 and a Yaesu FRG-7700 receiver.

"What?" says one unidentified reader. "The People's Republic of China negotiating with WRNO for a relay? You people ought to check your facts. That's not possible." Wrong. And, as the old adage says, a picture is worth a thousand words. (See photo.)

Leslie Edwards of Doylstown, Pennsylvania, has been chalking up new stations on her Sony '2010. Latest editions to the Edwards logbook are Radio Tashkent and Radio Vilnius. "Still no Malawi as yet," says the determined Leslie.

Ernie Behr, on RCI, says that Radio Nacional, Equatorial Guinea, is using 4950 and 6249.5 kHz from transmitters in Malabo. The transmissions from Bata, he points out, are also very strong on 5004 kHz at 0600 UTC.

What? Another new Peruvian? That's what Don Moore says. Look for Radio Nuevo Oriental ("Radio New West") on 5271 kHz from 0304 to 0355 UTC in Spanish. Could this be, as some people are asking, Radio San Juan in Chota using a different name?

Robert Singer finally got his QSL card from Radio Mexico International after 112 days. Along with the card was a list of all other people who had received QSLs from the station over the past year. The total, said Robert, was an amazingly small 121. And only *two* came from US listeners -- one of them Singer!

Mitch Sams of Witchita, Kansas, has heard the extremely rare Liberian Rural Communications Network feeder on 3974.9 kHz upper side band. Mitch is at his radio for that one before 0625 UTC.

Want to get the latest shortwave news? There is, according to Radio Netherlands, a new amateur radio net, called the East Coast SWL Net, that has been set up for just this purpose. Eavesdrop Sunday mornings at 1500 UTC on 7240 lower side band.

This net is having a convention Feb 12-14 at the Fiesta Motor Lodge in Willow Grove, PA. Registration fee is $15; hotel rooms (give the code SWL-net for discount) $42 per night). Contact Charles Hargrove 718-948-6781 7:00-11:30 pm EST for more. An SWL convention is a rarity - let's give it our support!

Weird Stuff

What is the strangest broadcast you've ever heard on shortwave? How about "W-I-N-N, Winnebago!" Interference from a Soviet domestic station made reception of this unusual pirate on 7419.6 kHz a little tough. What poked through were some truly *odd* commercials. There was one for the "Home Murder Kit," a movie called, "Ben Cartright Must Die" and an Alpo ad saying that actor Lorne Greene's last request was that his body be made into dog food. "W-I-N-N, Winnebago!" seems to be heard mostly around 0100 UTC.

Take a moment to turn the page and see what *has* been on the air during the past thirty days. And now we give you the host of the loggings section, America's shortwave sweatheart, Gayle Van Horn.

-- Kannon Shanmugan

WRNO owner Joe Costello (center) meets with a delegation from Radio Beijing. The negotiations, in which the Chinese sought to buy airtime on "The Rock of the World," reportedly fizzled out.

Broadcast Loggings

0012 UTC on 4915
Colombia: Radio Armonias Caqueta. Spanish. Phone-in conversation between listener and announcer. News covering Colombia and rapid-fire string of commercials. Lively Spanish pop music.

0015 UTC on 15473.9
Antartica: Radio Nacional Arcangel San Gabriel. Spanish. Fair signal with slight fading. Pop and easy listening music. Comments and ID between selections. (Kevin Sanderson, Atlanta, GA) Welcome to MT - ed.

0025 UTC on 6090
Luxembourg: Radio Luxembourg. Rock music with DJ. Occasional interruptions between music. Signal covered by Deutsche Welle on 6085. (Joe Stepansky, Downingtown, PA)

0025 UTC on 15140
Chile: Radio Sistema Nacional. Spanish. National newscast of South America (Tony Jones, Memphis, TN)

0030 UTC on 4810.3
Galapagos Islands: La Voz de Galapogos. Spanish. National program announcements and ID as "La Voz de Galapogos" with local time check. (Kevin Sanderson, Atlanta, GA)

0030 UTC on 9630
Spain: Spanish Foreign Radio. Report on a 'windfarm' of windmills for making electricity. (Bob Fraser, Cohasset, MA)

0035 UTC on 4975.7
Colombia: Ondas Orteguaza. Spanish two announcers trade news items about Bogota. Local time check and international newscast.

0045 UTC on 7165
USSR: Radio Kiev. Report on the youth theater in Kiev. (Bob Fraser, Cohasset, MA)

0100 UTC on 9575
Italy: RAI. Newscast from male announcer that included news on the National Referendum Week. (Bob Fraser, Cohasset MA)

0130 UTC on 9555
Mexico: La Hora Exacta. Spanish. Female/male announcers trade info and time checks with tones every minute. IDs as "La Hora Exacta."

0130 UTC on 4800
Guatemala: Radio Buenos Nuevas. Spanish. Clear ID at 0130 with easy listening music and and Spanish folk tunes. (Kevin Sanderson, Atlanta, GA)

0134 UTC on 3375v
Angola: Radio Nacional. Portuguese. Easy listening music and guitar instrumentals. US pops with "Nacional" ID. Also heard at 0200 on 4953, which was a surprise. (Bruce MacGibbon, Gresham, OR)

0150 UTC on 6549.7
Lebanon: Voice of Lebanon. Arabic. Lengthy instrumental piano music up to 0210 UTC. Then male/female announcers with news items, conversation, and ID. Arabic music monitored up to 0240 tune/out.

0151 UTC on 5930
Czechoslavakia: Radio Prague. Commentary on the US involvement in Nicaragua with discussion of the on-going cooperation of Soviets and the Czechs. (David Kammler, Ridgecrest, CA) Welcome to MT! - ed

0157 UTC on 6075
Honduras: La Voz de Junco. Spanish. Male/female program announcements with singing ad at 0158 and station ID. Co-channel QRM. (Bruce MacGibbon, Gresham, OR)

0200 UTC on 11715
China: Radio Beijing. Features included a newscast. Report on care for the elderly and a Chinese language lesson. (Steve Mayover, Philadelphia, PA) Thanks, Steve!

0200 UTC on 9615
South Africa: Radio RSA. News and commentary with the magazine show, South Africa Today. (Tony Jones, Memphis, TN, Bob Fraser, Cohasset, MA, and David Kammler, Ridgcrest, CA)

0205 UTC on 9475
Egypt: Radio Cairo. Features include, Egyptian Topics, folk music, Battle for Peace on the 1973 war, and Quiz of the Month. Logged in Nussloch, West Germany. (James Kline, Santa Monica, CA) Lucky you, James! - ed

0226 UTC on 4910.4
Honduras: La Voz de Mmosquita. English. Religious programming switching to Spanish. (Sheryl Pasklewicz, Manitowac, WI)

0245 UTC on 4780
Colombia: La Voz de Carabobo. Spanish. Rapid Spanish pops, ID and time check during high level of interference.

0235 UTC on 3339.4
Peru: Radio Altura. Spanish. "Canned" station ID with male reading news briefs amid high noise and interference.

0258 UTC on 6160
Canada: CKZU, Vancouver. Discussion about airline safety for trans-Atlantic travelers. (David Kammler, Ridgcrest, CA) Lest you be unimpressed, dear readers, remember that this station has only 500 watts of power. -ed.

0302 UTC on 9555
Taiwan: Voice of Free China. Talk show with conversations about residents returning to China to be with relatives. (Alan Hesse, Mather AFB CA) First-time contributor, welcome! - ed.

0310 UTC on 6100
Nicaragua: Voice of Nicaragua. Text on the Central American Peace Plan process. Usual anti-US propaganda. (David Kammler, Ridgcrest, CA)

0325 UTC on 4800
Lesotho: Radio Lesotho. A very weak signal. Religious programming with text-like sermon and music.

0330 UTC on 7475
Tunisia: Radio Tunis. Arabic. Holy Koran recitations with ID and news.

0339 UTC on 5095
Colombia: Radio Sutatenza. Spanish. Station announcements with address. Relatively weak signal. (Tom Roach, San Jose, Ca)

0340 UTC on 7110
Ethiopia: Voice of Revolutionary Ethiopia. Amharic. Ending presumed news cast with ID and African music. Signal faded out during music. Understand this station has just shortened its name to simply, "Voice of Ethiopia."

0350 UTC on 5960
Japan: Radio Japan. Cultural program and Let's Talk Japanese feature. (Alan Hesse, Mather AFB CA and Tony Jones, Memphis, TN)

0403 UTC on 4820
Botswana: Radio Botswana. Station frequency schedule plus religious programs and music.

0448 UTC on 9455
USA: WMLK. ID by Dr. Jacob O. Meyer, followed by program, "Open Door to the Written Word." Program continued past 0500. Suprised to get all of this as Bethel is only 45 miles from where I live. (Richard Cuff, Allentown, PA)

0453 UTC on 9690
Argentina: RAE. Musical selections in Spanish with English IDs. (David Kammler, Ridgecrest, CA)

0459 UTC on 5010
Cameron: Radio Garoua. French/English. Repetitive native music. Lady with ID at 0459 into English newscast to 0513. Country and western music from artist Juice Newton.

0520 UTC on 4770
Nigeria: Radio Nigeria-Kaduna. International newscast with correspondents phone in reports.

0525 UTC on 7172
Angola: Emisora do Lobito. Portuguese. African music with station reference and ID from male announcer. African music to tune out.

0550 UTC on 4870
Benin: Radio du Benin. French Lady with reports and 0600 ID DJ program of Afro-pop music and occasional chat.

0557 UTC on 9619.8
Mozambique: Radio Mozambique. Portuguese. African music on flutes with ID at 0600. News reports. Very weak signal.

0600 UTC on 5286.2
Chad: Radio Mondou. French. Station ID at the top of the hour and into an international newscast. Some signal fading. (Kevin Sanderson, Atlanta, GA)

0605 UTC on 4915
Ghana: Ghana Broadcasting Corporation. Features on Ghanian schools, elections and the candidates. (David Kammler, Ridgecrest, CA)

0615 UTC on 4815
Burkina Faso: Radio Burkina. French-African pop music. Station ID and mentions of the city of Oagadougou. Local news at 0625.

0645 UTC on 3300
Guatemala: Radio Cultural. Spanish. "Radio Cultural" ID with musical selections from "Xanadu" and "Saturday Night Fever" movies. (David Kammler, Ridgecrest, CA)

0701 UTC on 7105
Monaco: Trans World Radio. Religious programming and "Insight for Life" feature. Logged from Nussloch, West Germany (James Kline, Santa Monica, CA)

0745 UTC on 5020
Solomon Islands: Solomon Islands Broadcasting Corporation. Numerous mentions of the Solomon Islands with news and weather for shipping/navigation and high/low tide schedule. (David Kammler, Ridgecrest, CA)

0758 UTC on 7170
New Caledonia: RFO. French. Station ID as "Nouvelle Caledonie" and program of 50s music. (David Kammler, Ridgecrest, CA)

0804 UTC on 4940
Marshall Islands: WSZO. Country and western music. Heard "WSZ-" partial ID. First time on this one for me! (David Kammler, Ridgecrest, CA) Congrats!

0821 UTC on 15105
Indonesia: Voice of Indonesia. Old classics. Jakarta ID and "Your Choice" feature at 0830. (David Kammler, Ridgecrest, CA)

0853 UTC on 4915
Brazil: Radio Nacional-Macapa. Portuguese. Brasilian pops with station IDs. Crazy DJ yells and talks over the music.
Brazil: Radio Nacional Rio. Portuguese. Male disc jockey with program of lively sambas. ID and news at 0900.

0859 UTC on 7180
Hong Kong: BBC. BBC theme music with time pips and ID. International

newscast. Weak but audible enough for a report. (This new relay is verifying with full data cards from, BBC Hong Kong Relay, Flat B., 24 Beacon Hill Road, Kowloon Tong, Kowloon, Hong Kong. Mine took just 17 days! -ed.)

0915 UTC on 4875
Brazil: Radio Nacional-Boa Vista. Portuguese. "Nacional" ID and promo. Brazilian pop and samba music. Local greetings, time checks and weather.

1000 UTC on 5964.7
Bolivia: Radio Nacional de Huanuni. Spanish? Folk music with very weak signal. Presumed ID at 1005. Logging submitted as tentative. (Kevin Sanderson, Atlanta GA)

1002 UTC on 4795
Bolivia: Nueva America. Spanish. Local ads and ID for station. Bolivian folk music. Lots of interference.

1002 UTC on 4910.7
Peru: La Voz de la Selva. Spanish. Peruvian huyanos with local talk and ID Very weak signal but worth sticking to for report details!

1005 UTC on 4825
Peru: La Voz de la Delva. Spanish. Peruvian folk music with drum and ID. Into music ballads.

1010 UTC on 4825
Brazil: Radio Bare. Portuguese male announcer with newscast and talk about the city of Manaus. Time check and promo for news. Local phone chat with announcer.

1012 UTC on 5954.8
Colombia: La Voz de los Centauros. Spanish. Brassy Colombian music with local time check.

1013 UTC on 6025
Dominican Republic: Radio Amanecer. Spanish. Station sign-on announcements with choral version of the national anthem and ID. Religious programs followed.

1024 UTC on 3279.8
Ecuador: La Voz del Napo. Spanish. Religious music with time checks and chat about Ecuador.

1025 UTC on 4712.3
Bolivia: Radio Abaroa. Spanish? Male announcer and folk music. Tentative. (Kevin Sanderson, Atlanta, GA)
Australia: Radio Australia. Neo-Melanesian. Pop/rock hits from the movie Flashdance, Fleetwood Mac and an instrumental version of "Hey Jude." "Waltzing Matilda" interval signal with ID for Papua New Guinea service. (Steven Cline, Indianapolis IN) Another newcomer to MT! - ed

1031 UTC on 11945
USA: WCSN. Stock Report and Letterbox program at 1035. 11945 kHz is a new frequency for WCSN, replacing 17640. (Bruce MacGibbon, Gresham, OR)

1037 UTC on 3250
Honduras: Radio Luz y Vida. Spanish. Religious text with prayers. Trumpets introduced local news and talk.

1040 UTC on 4885
Colombia: Ondas del Meta. Spanish. Chat among listeners and announcer via phone messages to loved ones in Medellin and Bogota. Local ads for Villavicencio.

1145 UTC on 6792
Peru: Radio Sensacion. Spanish. Peruvian vocals and laughing announcer. (Bruce MacGibbon, Gresham OR)

1158 UTC on 3345
Papua New Guinea: Radio Northern. Pidgin. Male announcer talks about the city of Ponpondetta. ID and easy listening music. News at 1200.

1210 UTC on 11640
Pakistan: Radio Pakistan. Hindu? Middle Eastern/Arabic-sounding music. Lady announcer with presumed news. Several Radio Pakistan IDs at 1227 followed by a martial national anthem. Sign-off at 1229. Station previously thought to be Radio Hargeisa, British Somalia. Both stations are being logged so be cautious.

1215 UTC on 5030
Malaysia: RTM-Sarawak. Malay? Musical selections of instrumentals presented by male and female announcers. Station ID at 1229 (Tom Roach, San Jose, CA)

1231 UTC on 3375
India: All India Radio-Aizawl (tentative) Language unknown. Possible news covering Sri Lanka and Viet Nam with lady announcer. (Tom Roach, San Jose, CA)

1324 UTC on 3375
India: All India Radio-Gauhati. Hindu? Male announcer interspersed with lady singing Indial music on sitar and drums. (Tom Roach, San Jose, CA)

1331 UTC on 21605
United Arab Emirates: U.A.E. Radio. Arabic. International newscast and Women and Islam followed in English Station ID as "the external service of Dubai, United Arab Emirates" Also heard at 1030 in English. Logged from Nussloch, West Germany. (James Kline, Santa Monica, CA)

1415 UTC on 15084
Iran: Voice of Islamic Republic of Iran. Discussion covering the Islamic religion and the Holy Koran. ID at 1425. Apparent technical problems and abrupt sign-on and off. (Stephen Price, Conenaugh, PA)

Let other readers know what you've been enjoying. Send your loggings to Gayle Van Horn at 160 Lester Drive, Orange Park, FL 32073.

1440 UTC on 6190
West Germany: Radio Bremen. German. Announcer hosting a request program of German rock and pop music. ID with traffic report for the Autobahn. Logged while in Nussloch, West Germany. (James Kline, Santa Monica, CA)

1456 UTC on 5005
Nepal: Radio Nepal. Indian type vocals, local ad at 1508 and more music. Fade-out at 1530 No sign of Malaysia here today. (Bruce MacGibbons,Gresham, OR)

1600 UTC on 9735
Oman: Radio Oman. Arabic. Music and station ID with national newscast.

1605 UTC on 4904v
Chad: Radiodif Nationale N'djamena. (tentative) French/Vernaculars. Drum music and male announcer. Severe interference. (Bruce MacGibbon, Gresham, OR)

1635 UTC on 7412
India: All India Radio-Delhi. Hindu? Indian music presented by male/female duo. Audible past 1700 with sitar music until 1730 fade out. (Bruce MacGibbon, Gresham, OR)

1638 UTC on 11980
USSR: Radio Station Peace and Progress. Commentary about the elimination of nuclear weapons. Logged from Nussloch West Germany (James Kline Santa Monica Ca)

1920 UTC on 9700
Greece: V.O.A. Commentary on trying to establish a national government in Italy. (Bob Fraser, Cohasset, MA)

2000 UTC on 7465
Israel: Kol Israel. First day back on the air after a seven week strike! Program included war news frequency schedule and music for the Sabbath. (Steve Mayover, Philadelphia, PA)

2015 UTC on 9575
Spanish Morocco: Radio Mediterranee. French/Arabic Blues music form artist Jimmy Reed and Muddy Waters with few announcements and only one ID. Interference from from Radio France International.

2030 UTC on 12085
Syria: Radio Damascus. Female announcer with chat about Syria and its people. Station ID included. (Bob Fraser, Cohasset, MA)

2030 UTC on 9715
Madagascar: Radio Netherlands/ Tom Meyer's "Happy Station" program. (Bob Fraser, Cohasset, MA)

2030 UTC on 6100
Kenya: Voice of Kenya. Unknown language. US pop music from male announcer. Newscast and ID with national anthem at 2105 sign-off. (Kevin Sanderson, Atlanta, GA)

2048 UTC on 11920
Morocco: RTV Marocaine. Arabic. Lengthy Arabic music program. Fanfare introduces newscast. ID and continued Arabic programming to 0220 tune out.

2100 UTC on 9780
Yemen Arab Republic: Radio San'a. Arabic. Holy Koran recitations, program ID and closing national anthem. (Stephen Price, Conemaugh, PA)

2115 UTC on 7145
Algeria: Radio Algeria. Arabic. Lady announcer introduces program features with ID. "Happy Birthday" played on Arabic instruments.

2120 UTC on 4782.6
Mali: RTV Malienne. French. Local African music and talk with station ID. Heard also on parallel 4835. (Larry Van Horn, Orange Park, FL) Thanks to my better half! - ed

2254 UTC on 17815
Brazil: Radio Cultura. Portuguese. Brazilian pop music. Brazilian news at 2303 with ID and time check into pops and sambas.

2259 UTC on 5035
Central African Republic: RTV Centrafricane. French. Monitored last few minutes of sign-off that included ID as, "Ici Bangui" with station location and national anthem. (Stephen Price, Conemaugh, PA)

2301 UTC on 4850
Cameroon: Radio Nationale-Yaounde. French. Station ID as, "Ici Yaounde Radio Cameroon National." Station frequency schedule and national anthem at 0000 sign-off. (Stephen Price, Conemaugh, PA)

2330 UTC on 4845
Mauritania: ORT de Nationale de Mauritanie. Arabic Two male announcers trade news items and chat. Easy listening and Arabic music. Station ID with closing schedule, national anthem and 0001 sign-off.

2330 UTC on 4825
Guatemala: Radio Mam. Spanish. Station promotions with ID, schedule and city location. Marvelous marimba music.

2345 UTC on 4900
Guinea: Radiodifusion Nationale. French-African rhythms with station news and IDs. Sign off announcements and schedules with national anthem at 0000 (Larry Van Horn, Orange Park, FL)

After nearly two decades of domination in the marketplace **Regency is quitting the scanner business.** A traumatic shuffle of top-level personnel including the resignation of president Joe Boone was followed by the announcement that the entire consumer electronics division is up for sale.

One of Regency's top engineers, noting that many technical members of the old Electra team came to Regency when the Bearcat operation was sold to Uniden, was quoted as saying, "Here we go again!"

According to an interview reported in the *Indianapolis Star*, Regency has been trying to receover from a number of ill-fated ventures including cable TV, satellite dishes, stock market quote receivers, and the recent Informant scanner.

In spite of the official announcement by Regency that the division would be discarded, one spokesman assured MT that scanner and marine products would be available for some time to come and that several new models were still waiting to be introduced.

A sneak preview of **the new Regency R2060 scanner** reveals that this entry level scanner is a programmable base unit featuring 60 channel memory and Turboscan. Covering the standard VHF low, high and UHF bands, the unit does not cover aircraft or 800 MHz.

It is expected that this new scanner, due to its being representative of new Regency technology, will probably replace the 1080/1090 series which will be phased out.

It will be interesting to note what effect the Regency decision will have on the proposed release of a pocket programmable with 800 MHz coverage due late this year.

Regency has closed their Satellite Beach, Florida, facility but still maintains their Melbourne plant for manufacturing products of their land mobile division. The company plans to concentrate now on their IFR division which makes commercial test equipment.

It appears that **Uniden's decision to eliminate cellular telephone frequencies from all future scanners was both strategic and moral.** While Uniden is expanding into mobile telephone equipment, Jim Haynes, Chief Engineer for the company, says, "I agree totally with the spirit of ECPA '86 (the new law which forbids listening in on mobile telephones). I do not think that it is proper to use any type of product to eavesdrop on any communication not intended for them to hear."

But Haynes did have one criticism of the law: "ECPA went a little too far in that it can be used by the cellular community to dupe the consumer into thinking no one can hear them because it isn't (receivable) on (some) scanners."

Anyone out there have a recent IRAC microfiche? A recent discussion with a Department of Justice attorney who specializes in foreign intelligence law was most revealing and provides some insight into the 1982 Presidential proclamation which classified as "Confidential" lists of federal radio frequencies formerly available from and sold by the government.

While Executive Order 12356 did not specifically mention frequencies, it did address the "mosaic theory": If you put together enough pieces of non-sensitive information you may eventually construct a picture of a sensitive area.

While small lists of unclassified frequencies may be unrevealing by themselves, massive lists would ostensibly show patterns--especially the holes--giving a foreign power insight into classified uses and assignments.

The Interdepartment Radio Advisory Committee (IRAC) of the Department of Commerce maintains the master frequency files for all federal agencies. Unclassified frequency lists are no longer available to the public from this agency; classified lists never were.

Individual inquiries regarding specific frequencies may be made directly to the agencies in question. In general, however, requests for comprehensive frequency lists will not be honored.

The Justice Department official conceded that frequencies or frequency lists collected by civilians through hobby monitoring have no restrictions regarding divulgence or publication.

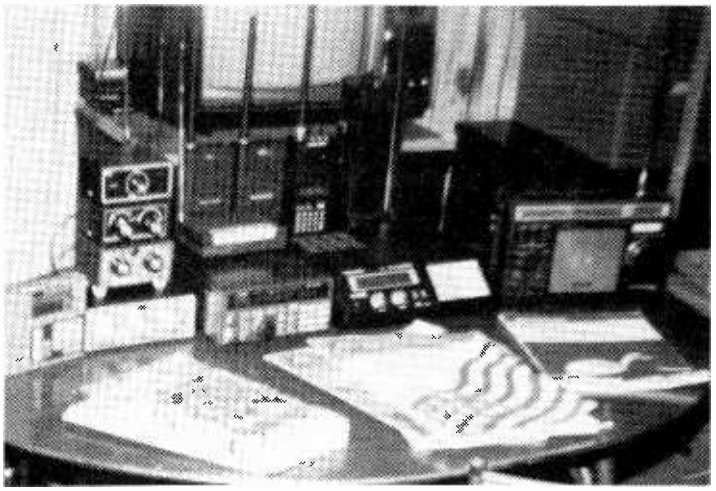
On again, off again, I'm afraid we have to issue a **caveat on the World Radio Report**, intended as a monthly magazine published by the non-profit Foundation for International Broadcasting, Incorporated.

Originally begun over a year ago as a detailed program supplement for shortwave broadcast listeners, management of the short-lived publication, like that of many radio hobby clubs, shifted from person to person until it now appears that no one is really in charge.

Most recently, Mike Mitchell volunteered to manage the organization (see editorial, October 1987 issue, page 3). Replying by telephone, Mr. Mitchell said that in his opinion, "*World Radio Report* died several months ago."

He went on to say that he would be sending out letters within the next week or so to those from whom checks had been received, either returning the checks or paying back the money sent in good faith out of his own pocket.

Asked what happened to the money sent in for subscriptions, Mr. Mitchell replied that most of it had been used to pay old bills, purchase stationery and cover general expenses. He assured that no checks sent in to him after July 24, 1987, had been cashed.



You think you don't have room for a monitoring post? Take a look at Buster Coles's compact installation. A resident of Charleston, West Virginia, Buster has found that **a card table can hold an entire monitoring post if it is well planned.**

Buster is an incurable utilities DXer; he enjoys monitoring military bases, aircraft and ships. His portable and mobile equipment extend his listening ability while he is driving and walking.

Scrunched together in his cozy corner are Sony ICF2002 and ICF6500 receivers, Realistic PRO2004, PRO30 and PRO22 scanners, a Yaesu FRG9600 VHf/UHF receiver, and several accessories including the Grove MiniTuner, Grove Power Antenna III, Grove Hidden Antenna system, MFJ-1020 active antenna, Metz whips, and an SST preselector.

As if international relations in the Persian Gulf weren't bad enough, the **"Filipino monkey" is provoking vessels in the Strait of Hormuz.** "What is your cargo?" demanded an Iranian gunboat as he radioed to a foreign vessel at the south end of the Gulf. 'I am carrying machine guns and hand grenades to Iraq--and an atom bomb' was the unexpected reply!

For some three years the unknown provocateur has been hassling shipping and military interests in the area by intruding into radio conversations with such antics. Fortunately, veteran radio operators recognize the rogue who calls himself the "Filipino Monkey." But critics claim that his chiding could provoke hostilities from the Iranians since his epithets toward them are unprintable.

When the "Monkey" first started some three years ago, he began by taunting Filipinos for the most part, but not exclusively, until the airwaves seethed with colorful arguments in many languages. While the transmissions were illegal, they weren't as inflammatory as they are now due to the tensions in the Gulf. One recent episode is a case in point.

During a particularly tense radio exchange between an Iranian warship and a U.S. Navy vessel, as the Iranian weapons radar locked in on the American target, the U.S. radioman ordered the Iranian vessel to stand down. Suddenly, the uninvited guest came up on frequency: "Iranian warship, Iranian warship--you gonna get it now!" *(Thanks, R. Hillman of Orange, CA)*

A new product from the Lo-Jack Corporation of Braintree, Massachusetts, **a car bug tattles on car thieves.** About the size of a chalkboard eraser and installed inconspicuously to resemble a vehicular component, the transmitter is wired to the automotive electrical system for power.

When the owner reports his vehicle as missing, an encoded signal is transmitted by the police which is transponded by the mobile device, relaying its whereabouts to tracking vehicles nearby who close in on the perpetrator. In actual tests, average recovery time is 11 minutes.

The transmitters, manufactured by Motorola in Seguin, Texas, cost $595; the mobile tracking computers, costing about $1500 each, are made by Micrologic, Inc. of Watertown, Massachusetts. *(Clipping from Fred Chesson, Waterbury, CT)*

Looking for a commemorative certificate?

Whether you are a licensed ham or an SWL, you can receive a special acknowledgement from special event amateur radio station WA3EOP, 109 South Artizan St., Williamsport, MD 21795.

The rules are simple: contact or monitor the station during the celebration of Maryland Odd Fellows Week, April 18-24, on SSB voice frequencies 3870, 7240, 14265, 21375, and 28.375 kHz; or CW frequency 7120 kHz; or even two-meter FM on 147.09 MHz.

Hams should send in their QSL cards and a self-addressed, stamped envelope for their certificates following a contact; SWLs need to send an accurate reception report and an SASE.

The phone number published last month for the west coast SWL Echo computer bulletin board is incorrect; unfortunately, no correction is currently available.

Riding the Rails via Radio

For our railroad monitoring friends (*Bob Grove is one of the most enthusiastic*) we reprint the channel numbers assigned by the Association of American Railroads to the most commonly used U.S. and Canadian radio frequencies.

02	159.810	50	160.860
03	159.930	51	160.875
04	160.050	52	160.890
05	160.185	53	160.905
05	160.200	54	160.920
07	160.215	55	160.935
08	160.230	56	160.950
09	160.245	57	160.965
10	160.260	48	160.980
11	160.275	49	160.995
12	160.290	60	161.010
13	160.305	61	161.025
14	160.320	62	161.040
15	160.335	63	161.055
16	160.350	64	161.070
17	160.365	65	161.085
18	160.380	66	161.100
19	160.395	67	161.115
20	160.410	68	161.130
21	160.425	69	161.145
22	160.440	70	161.160
23	160.455	71	161.175
24	160.470	72	161.190
25	160.485	73	161.205
26	160.500	74	161.220
27	160.515	75	161.235
28	160.530	76	161.250
29	160.545	77	161.265
30	160.560	78	161.280
31	160.575	79	161.295
32	160.590	80	161.310
33	160.605	81	161.325
34	160.620	82	161.340
35	160.635	83	161.355
36	160.650	84	161.370
37	160.665	85	161.385
38	160.680	86	161.400
39	160.695	87	161.415
40	160.710	88	161.430
41	160.725	89	161.445
42	160.740	90	161.460
43	160.755	91	161.475
44	160.770	92	161.490
45	160.785	93	161.505
46	160.800	94	161.520
47	160.815	95	161.535
48	160.830	96	161.550
49	160.845	97	161.565

Springfield, Missouri Railroad Scanning

Contributed by Kent Hawkins
Ash Grove, MO

Burlington Northern RR

160.230	Diesel shop 50 watt units (not used)
160.500	Rail panel plant; rails and ties for emergency use
160.545	PBX input to 161.130 system-wide
160.620	Special agents ch.3; simplex ch.4; rptr 161.505
160.710	Car shop rptr input 161.400
160.725	Storeroom
160.800	Switching
160.830	Switching
160.905	Hub center
160.920	Diesel shop
161.070	Diesel shop
161.100	Road ch.1 systemwide switching
161.130	PBX repeats 160.545 system-wide
161.160	Road ch.2
161.310	Switching
161.400	Car shop simplex; rptr 160.710
161.430	Maintenance of way
161.505	Special agents input to 160.62 rptr ch.4

1905.0, 1925.0, 1975.0 Point to point microwave link

London, Ontario, Monitoring

Contributed by Tony Vance

C.N. Railroad

161.4150	Ch.1 End to end
161.2050	Ch.2 Dispatchers K,KA
160.9350	Ch.3 Dispatchers D,DS
160.6650	Ch.4 London shops
160.3650	Ch.5 Yards
161.0250	Ch.8 Yardmaster London East
160.7850	Ch.20 Line-up dispatcher
160.9050	Ch.24 Signals Dept
160.9650	Ch.26 CN Police
160.9950	Ch.27 CN Police
160.4550	Ch.81 Maintenance of way
160.215	Ch.82 Maintenance of way

C.P. Railroad

161.4750	Ch.1 End to end
161.5050	Ch.2 Maintenance of way
160.840	Ch.3
161.1150	Ch.4 Yards
161.3250	Ch.5 MBS dispatcher
161.1750	Ch.6 Radio repairs (aux.)
161.1450	Ch.7 Yards
161.2650	Ch.8 (TH&B dispatcher)

Tony also contributed these other frequencies:

London Police

142.0350	Ch.1
142.3050	Ch.2
142.7750	Ch.3 (Ontario common)
142.8750	Ch.4 CPIC
142.9950	Ch.5
142.6950	Ch.6
139.5450	Ch.7 (handhelds)

London Fire Department

154.3700	Ch.1 Regional
154.0700	Ch.2 Regional
154.9500	Ch.3 City dispatch
154.6350	Ch.4 City Work

Miscellaneous

150.1000	Ontario ambulance (common)
151.8200	Thames Valley Ambulance
155.2500	" " "
149.6050	London Amb-Hosp Net
41.9600	London Ontario Provincial Police dispatch
42.0200	" " " "cars-dispatch
42.0600	" " " " car-car & CPIC info
143.8650	Min of Transport & Communications
166.9500	Min of Environment
411.6625	Min of Correctional Serv
413.6875	Min of Health (helicopters)
163.7400	London Transit Commission (inspectors)
152.6800	London Public Utility Commission
153.6800	" " " "
169.3500	London City Works
156.0250	London Animal Control
162.6900	Union Gas
162.9450	" " Repairs
163.1100	" "
163.5600	" " Customer Services
163.6800	" " repeater
169.8900	CFB London
172.2500	" "
173.2500	" "
152.9900	CKCO News
153.1100	CJBK News
153.3500	CKSL News
163.5900	CFPL News
143.4850	Spectrum Communications
143.5800	" "
158.8650	" "
164.7000	" "
165.2250	Erik Walley Const (Spect)
173.5650	E. Blake Refriger (Spect)
463.2625	Erik Walley Const (Spect)
463.7375	Spectrum Communications
451.5125	QAP Towing

Two-way communications aren't limited to UHF/VHF -- not by a long shot! Let's see some loggings from our shortwave listeners!

Monitoring the Midwest

Shortwave "Bootleggers"

Contributed by David Mortensen
Newaygo, MI

Frequencies kHz

8125.0	LSB	Tuna fishermen
8889.2	USB	0312 UTC; fishermen
4472.9	USB	0055 UTC; bootleggers
6960.0	LSB	All times; Truckers
147.570		Was once called National Truckers Intercom Channel. Heard two truckers getting told to get off channel by a ham; truckers did not give callsigns, only names Milkman and Alvin.
13560	USB	Two Spanish speaking females
25060		Two men in what sounded like a ham round table heard 7:00 EDT two Sats
14495	USB	Al #7 base
221364	USB	Fishermen, no boat names given
6522	USB	0140 UTC same as 221364
154625		All times. Sounds like a backhoe service. No callsign. Lot of talk about places in Montcalm Co., Michigan
6910	USB	Spanish speaking males
14425	USB	Sat 10:30 EDT. K7 with callup
8195	USB	Mike, Mike Johnny calling Johnny 4 0250 UTC
8970.2	USB	0820 Fishermen
6595	USB	Fishermen
73040		Man and woman talking. Sounded like a cross between two meters and a mobile telephone.

Youngstown, Ohio, Monitoring

Contributed by Larry Wiland
Youngstown, OH

33.740	Trumbull Co. Fire F-2
33.780	Trumbull Co. Fire F-1 (main)
39.10	Youngstown/Mahoning Co. Dog Pound
39.58	Trumbull Co. Road Dept/Engineer
39.64	Columbiana Co. Sheriff Dept
44.820	Ohio State Patrol mobile units (F-1)
44.980	Ohio State Patrol bases (F-2)
45.02	" " " Aircraft (radar) & Intersystem (F-3)
45.10	" " " Intersystem (F-4)
47.34	Ohio Dept of Transportation (ODOT)
154.04	Hubbard City Fire Dept/local govt
154.07	N.Jackson Twp Fire Dept
154.190	Warren City Fire Dept
154.250	Fowler Twp/Vienna Twp Fire Depts
154.280	Trumbull Co. high-band fire Intersystem
154.370	Youngstown, OH, Fire Departments (citywide)
154.430	Howland Twp Fire Dept/Trumbull Co high-band fire chan
154.740	Newton Falls, Brookfield, Hubbard Police Depts
154.875	Mahoning Co Sheriff Dept
154.935	Law Enforcement Exchange & Release Network (LEERN - similar to 155.370 "intercity")
154.980	Niles, OH, fire depts & local govt
155.055	Canfield, OH, police, fire & govt
155.130	Trumbull Co Sheriff dept
155.16	Various ambulance companies
155.205	in Mahoning/Trumbull Co.
155.22	(shared)
155.28	"
155.295	"
155.310	Kent, OH, police dept
155.340	Ambulance-hosp (MED chan)
155.400	"Life Flight" helicpter
155.415	Austintown, OH/Beaver Twp Police
155.430	Stark Co. Sheriff
155.490	Boardman, OH, police
155.550	Ashtabula Co Sheriff dept
155.565	Howland Twp Police
155.595	Warren City/Niles/Girard police (shared)
155.610	Salem City Police
155.655	Portage Co. Twp. police depts (various/shared)
155.685	Ohio State Patrol turnpike/statewide East
155.745	Austintown Fire Dept
155.790	Ohio State Patrol turnpike/statewide West
155.820	Lordstown's Marshall's Office
155.950	Boardman, OH, fire dept
156.12	Newton Twp road dept (also Newton Falls police surveillance freq in PM)
156.150	Youngstown Police F-4
156.210	Portage Co. Sheriff
158.730	Youngstown Police F-1
158.790	Youngstown Police F-2 & traffic "Index" channel
158.985	Berea, OH, turnpike maintenance & statewide 'pike weather channel
159.090	Youngstown Police F-3
159.240	Mill Creek Park (Youngstown) park police
159.375	Ohio Dept of Natural Resources (statewide rptr)
162.400	Nat'l Weather Svc Akron/Canton Airport
162.550	" " " Cleveland & lakefront areas

Railroads

160.230	Railroads (shared in Tri-Co area)
160.320	Railroads (shared " " ")
160.545	Lordstown auto plant RR loading dock
160.800	Conrail (main "road" channel & Niles yard operations)

Utilities

37.46	Ohio Edison (electric) mobiles
37.52	" " Youngstown
37.82	" " Warren
155.025	Warren city govt
158.190	East Ohio Gas Co (Trumbull/Mahoning Co)

Amateur

145.390	Portage Co ARC
146.910	Austintown repeater
146.970	Warren W8VTD repeater
146.745	Austintown repeater

Miscellaneous

35.02/154.60 McDonald's Drive-thru
49.83-49.89 Wendy's Drive-thru headset communicators

35.22	"Digital paging service"
158.70	Youngstown "Answerphone" & paging

■

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VHF Aero:

Radio Excitement as Big as the Skies!

A world of exciting communications is available to those who monitor VHF Aero. The band, which extends from 108.00 through 135.975 and is even found on the popular Sony ICF-2010, is almost constantly alive with transmissions. These range from routine communications between the airlines and the pilots who command their "heavy" jets to tension-filled exchanges between air traffic control and a plane in trouble. This month, *Plane Talk* examines this fascinating band in some detail.

The actual communications portion of the VHF Aero Band begins at 118.000 and runs through 135.975. [108.000 to 118.000 is allocated to various navigational aids.] As this is the portion of the band that commands the most attention, let's look at the various types of transmissions which are found here.

Incidentally, you'll notice that in most cases -- both spoken and written -- the last digits of a frequency (and sometimes the last two digits) are not utilized if one or both of them happen to be zeros. For example, you may hear an Air Traffic Controller tell a pilot to "contact Cleveland Center on 'one two seven point niner.'" That's really 127.900 but, as the last two digits are zeros, they're dropped. If the frequency is something like 124.650, then only the last digit, the zero, is dropped.

The Ground Controller in an Air Traffic Control Tower controls not only the aircraft taxing on runways and to and from the gates, but also <u>all</u> of the auxilliary ground vehicles moving in and on the perimeters of the airport (photo courtesy Bill Wolf KA2EEV).

Frequencies in the communications portion of the VHF Aero Communications band are spaced in increments of 25 kHz. Consequently, you'll find transmissions at 118.000, then 118.025, 118.050, and so on.

118.0 - 121.4
Air Traffic Control Airport ATC Towers and Air Traffic Control Centers (ARTCCs).

121.5
International HF Emergency. It can be utilized for both voice and emergency locator transmitter (ELT) purposes. Commercial, military and most private aircraft carry ELTs in case of accident. Upon impact, the device is supposed to begin emitting a downswept-type of tone, enabling rescuers to pinpoint the location of the aircraft in distress. However, ELTs have also been known to go off for no reason whatsoever, leading to a great deal of embarrassment. You might find it interesting to note that the UHF equivalent of the International Aviation Emergency Frequency is 243.0, which is simply a multiple of the original VHF frequency of 121.5.

121.6-121.95
Ground Control Runways, taxiways, traffic to and from the airline gate and bay areas, and so forth.

121.975-122.675
Flight Service Stations (FSS) These stations provide general aviation (private pilots) with information on airport conditions, radio navigational and communications aids plus facilities for helping the pilots to process flight plans, dispense weather sequence information, and perform other functions. They are located all across the country and are operated by the Federal Aviation Administration (FAA).

122.7-122.825
UNICOM Frequencies UNICOMS are usually operated by private enterprise. They are defined as aeronautical advisory communications facilities and are usually located at or nearby an airport. At quite a few very small air fields, a UNICOM is the only communications facility located on site. In the absence of a control tower, the UNICOM provides general information on wind direction, runway conditions, and field status. The may also offer some information on local accomodations, fuel, and repair services.

122.975-123.075
Helicopter UNICOM Utilized by UNICOM stations and helicopters air-to-air.

123.1-123.125
Search and Rescue Used by the Coast Guard, Civil Air Patrol (CAP) and others involved in rescue activities.

123.125-123.425
Flight Test These frequencies are used by manufacturers engaged in design, development, evaluation and testing of aircraft components. They are also used for other purposes, including MULTICOMS.

123.45
Air-to-Air This frequency is where pilots -- including commercial airline pilots -- carry on conversations with other planes in the air. Conversations on this frequency can be *very* interesting!

123.5
Flight Schools Also utilized by glider pilots and towing craft for coordination with ground stations.

123.525-123.575
Flight Test

123.6-123.650
Arrivals and Departures When a Flight Service Station is located at an air field where an Air Traffic Control Tower is not available, pilots of arriving and departing craft will use this frequency for communication with FSS personnel.

123.675-128.8
Air Traffic Control

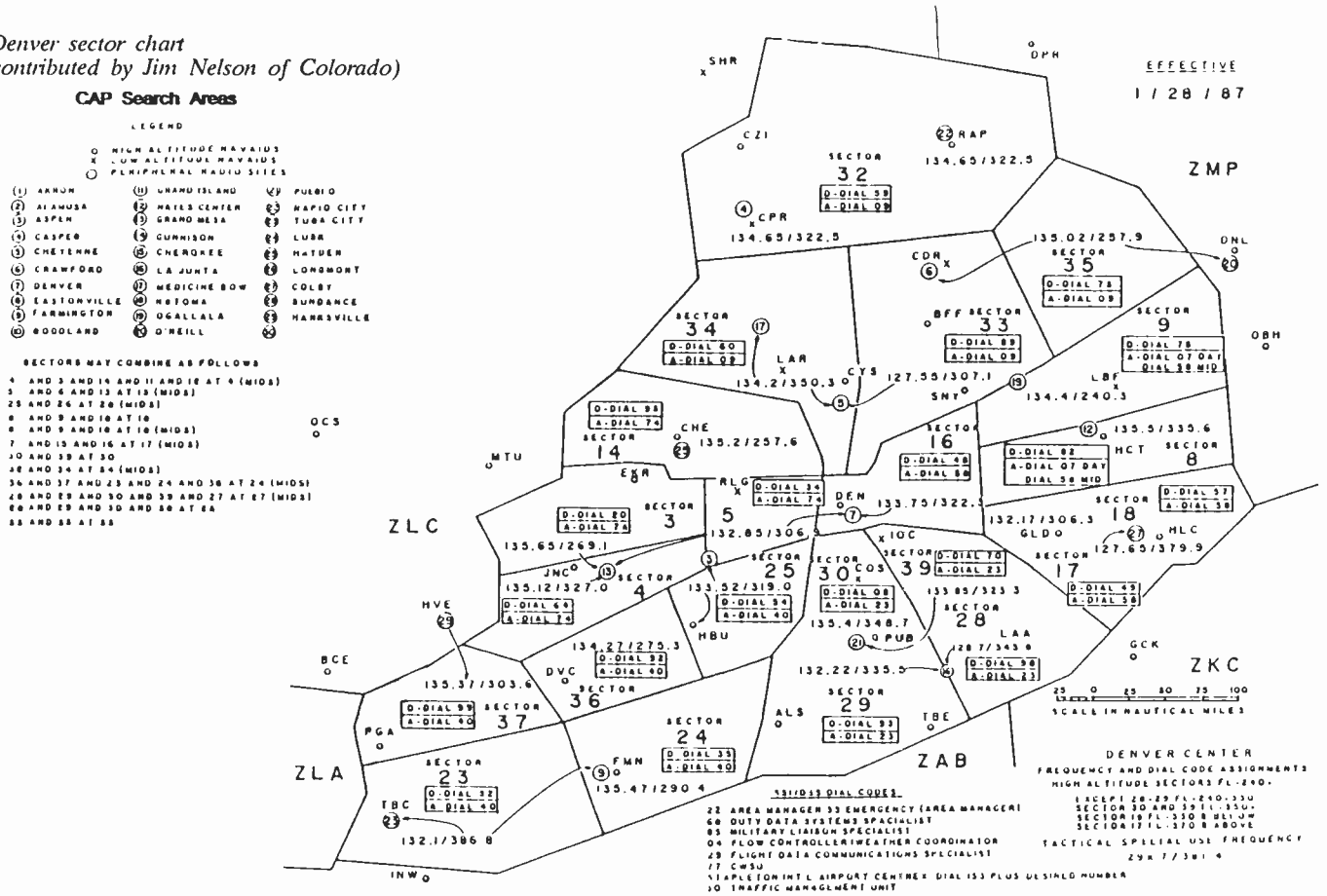
128.225-132.0
Aeronauticals Enroute ARINC, Eastern Flight Support, Airline Company communications.

132.025-135.975
Air Traffic Control

While the frequencies you see listed above are generally used from coast to coast for the purposes described, other frequencies in this band are utilized for other aeronautical-related purposes which vary from location to location. Thus, they are too numerous to mention here.

There is also some discussion between the FAA and Federal Communications Commission about the crowded conditions on the band. As a result, there is some discussion about allocating 136 - 138 MHz to aero. We will, of course, keep you informed. ■

(Denver sector chart contributed by Jim Nelson of Colorado)



Glossary of Aviation Terminology

You will enjoy monitoring the Aeronautical Communications bands even more when you understand what the pilots and controllers are saying! Below is a list of commonly used words and phrases heard in the transmissions which we monitor.

Affirmative Yes

ARINC Aeronautical Radio, Inc.

ARTCC Air Route Traffic Control Center

ATC Air Traffic Control

ATC Clears Used to relay an ATC clearance when given by other than an Air Traffic Controller. You will hear an ARINC operator say this when he relays a clearance from ATC to a flight he is working.

Company Traffic Term used by ATC to advise converging traffic that they both work for the same company.

Charlie-Charlie Used by pilots (more so on the HF bands than on VHF) in the same context as affirmative.

ELT Emergency Locator Transmitter. This piece of equipment produces a signals when activated (usually by a crash) which is transmitted on the International Distress Frequencies of 121.500 (VHF) and/or 243 (UHF).

Heavy Aircraft capable of takeoff weights of 300,000 pounds or more, whether or not they are operating at this weight during a particular phase of flight. Some aircraft belonging to this class include the Boeing 747, C-10, Lockheed L-1011, Airbus, and others.

Flight Level Flight altitude of an aircraft which is based upon barometic pressure and expressed in the form of a 3-digit number. For instance, flight level 33.0 would indicate that an aircraft is flying at 33,000 (thirty-three thousand) feet.

High Freq. Aeronautical Communications are found on the High Frequency bands (in most cases but not all) between 2 and 22 MHz inclusive. Transmissions on these frequencies are in upper sideband mode.

Hold A predetermined maneuver which keeps aircraft within a specified airspace while awaiting further clearance from ATC.

Hot Area Designated airspace over an active MOA (military operations area) up to a predetermined flight level, which civilian aircraft must not penetrate.

Knot A unit of speed. One nautical mile is equal to 6,076.12 feet. A statute mile is equal to 5,280 feet. You will hear pilots express their airspeed in knots.

Mode Letter or number which is assigned to a specific pulse spacing of radio signals transmitting or received by ground interrogator or airborn transponder components of the Air Traffic Control Radio System (ATCRBS). Civilian aircraft use mode C while military aircraft use mode A. A transponder is necessary for altitude reporting figures on radar screen of Air Traffic Control facilities and other related functions.

Negative No.

Nordo The literal translation is no radio. Controllers will use this expression when they are referring to an aircraft whom they are trying to contact and the pilot (for one reason or another) isn't answering them.

Roger This word means I hear you (or) I heard you. Technically, it is supposed to mean I have received all of your last transmission.

Special A four-tone selective-calling device used by aeronautical enroute ground stations (such as ARINC) to contact a flight which has a SELCAL receiving unit on board. Aero Enroute Ground Station personnel use SELCAL to contact a flight on both VHF and HF frequencies. While primarily used by civilian commercial aircraft, many military and business aircraft now utilize them also.

Separation The spacing of aircraft both horizontally and vertically to achieve safe and orderly movement during flight, takeoffs, and landings.

Target Indicator shown on an Air Traffic Controller's radar scope resulting from a primary radar return on a radar beacon reply.

UHF Ultra-High Frequency. Used in this sense, it refers to the portion of the spectrum used for Military Aviation Communications, from 225 to 400 MHz.

VHF These initials stand for Very High Frequency. Aero band communications in the VHF range run from 108.000 to 135.975 MHz. If you hear a pilot asking for a Victor frequency, he is a military pilot requesting a frequency in the VHF band from ATC instead of a UHF counterpart.

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SCAN OR BE SCANNED!

Computer hackers have made us increasingly aware of the vast amount of personal information that can be illegally obtained from a computer. However, the computer is not the only piece of high-tech equipment capable of exposing someone's privacy. The scanner has the unique ability to *legally* reveal a very personalized portrait of our daily activities.

Across the country, the need for business communications continues to grow. In the Los Angeles area alone, there are approximately 10,000 walkie talkies in use every day. From small owner-operated establishments to major Hollywood motion picture sets, communications are playing a vital role in our fast-paced society.

In the world of business, the need for dependable, yet moderately priced communications systems has even sparked the growth of "rental radio." Besides being cheaper than purchasing radios outright, the rental agents are offering a maintenance free contract. Should the radio fail to operate, it is simply returned for a fresh unit. Renting equipment in this manner is then highly desirable to corporations because it reduces down time.

With such a huge volume of business radio transmissions being sent into the airwaves on a daily basis, it becomes clearly evident that these transmissions must contain a great deal of personalized information about the customer. After all, if it were not for customers, a business wouldn't need a communications system!

Nearly everyone has contributed to the success of a business by buying its products or paying for a service. Here are a few examples of how easy it is to become an unwilling victim of a business radio transmission.

Leaky Pipes Sink Ships

You've called a plumber to repair a leaky pipe at your house. Like most of us, you're a little short on cash and use your credit card to cover the expense. The plumber takes your card, walks out to the truck and keys up his radio to contact the main office for credit approvall. As a result, your name, address, the amount of the purchase and your credit card number are sent over the air as a business radio transaction.

Ironically, the plumber believed that he was providing you with a convenient service. The owner of the plumbing business explains it this way: "We got a lot of complaints about our plumbers tracking mud through a customer's house. So, if the job is on the outside and we're doing a lot of digging, we use the truck radio to relay the credit card information to our office."

Monitoring Your Paperboy

As innocuous at it may seem, even the delivery of the paper to your door may produce radio transmissions filled with your personal information. The business of delivering papers has, it seems, discovered computers and radio.

The larger newspapers are now advertising a relatively new service called "Guaranteed Delivery." If your paper is missing, wet, or torn, a phone number is provided for the customer to order a replacement.

Basically, the service works like this: After receiving your complaint, the circulation department will enter your name, address and phone number into the computer. A printout is produced, identifying the road manager in charge of your district. A dispatcher then transmits the information from the printout to the road manager. Traffic sent over the air thus contains your name, address and phone number.

Delivering the morning newspaper to your door may have involved some very sophisticated computers and radio equipment.

Maybe it doesn't bother you that anyone with a radio can learn that you're angry with your paperboy. Keep in mind, however, that if you use that number to stop delivery when you're going away on a trip, the stop and start date for paper delivery may also be transmitted over the air.

Out-Patient Services

Private ambulance services are also utilizing two-way radio to coordinate out-patient care. When these medical taxis are dispatched to private homes, the patient's name, address, phone number and reason for transport is also broadcast. As well, anyone listening to the radio will also know when you've left your home.

Hacking Answering Machines

In a previous column titled *Monitoring Ma Bell,* the possibilities of strangers monitoring cordless phones were discussed in detail. What is generally not known is that ansering machines can also be tapped.

While listening to the cordless phone bands, one individual was heard repeatedly dialing a number that was connected to an answering machine. After several attempts and indiscriminate key punching, the caller gained access to the owner's messages. Afterward, the "hacker" left his own message on the machine for future callers to hear!

It's also surprising to know that phone answering machines employing a remote control may also allow others to gain access to your messages -- especially if your machine responds to a "single tone beeper."

These pocket size beepers are held against the mouthpiece of the telephone and a set of tones is played down the line. Many of the tones they produce can be replicated by simply whistling into the mouthpiece.

Other answering machines can be accessed remotely by "tone dialing." With this

method, you punch a code number on the key pad of the phone you are calling on. These, likewise, can sometimes be activated by whistling.

Machines that respond to a series of tones are more secure. They usually require a three digit number to be punched in. However, some answering machines may respond to any key punched, as long as the key is in the same row as the code digit. This makes the code number very easy to crack.

Bank at Home -- If You Dare

Many large banks have begun to offer "bank at home" services. The customer uses a home computer to access a personal checking or savings account. The obvious concern here is the possibility of a "hacker" gaining entry into your account.

Yet, there is another little-known threat. Computers, being operated without shielded cables, are capable of being monitored at great distances. A good technician with a sensitive receiver, could sit outside the operator's home, record the signal, and feed it into another computer -- reading whatever is on your computer screen. In reality, such sophisticated equipment isn't really always needed. Some computers make the job even easier. One operator, using a Kaypro II, reports that whatever is on his computer screen can be seen with readable resolution on neighbor's TV screens!

The scenes described above are just a very small sampling of how business communications can affect our lives in the most personal way. Oil delivery, utility companies, package delivery, taxi cabs and even emergency highway call boxes, are just a few of the many examples of customer-initiated business communications. Regardless of the business, these transmission have one thing in common: they all fling private information about the customer indiscriminately through the air.

Tuning Them In

To hear business communications, simply search through any one of the following frequency ranges: 33.00 to 46.00, 150.8 to 162.00, 461 to 465.00, 502.00 to 512.00, 851 to 853.00, and 902.00 to 928.00 MHz.

How to approach and minimize the electronic invasion of our privacy is unclear. Perhaps the best advice came during an interview with a computer hacker. When asked for suggestions on how to prevent others from gaining access to our personal information, he replied, "The best defense against electronic eavesdropping of any sort is knowledge. Read and stay informed. The well-informed consumer becomes a very difficult target to hit."

We couldn't agree more. ■

If we could actually see business radio communications traveling through the air, pictures like this would be obliterated by thousands of stray signals.

Business communications contain a great deal of personal information about the customer.

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Letters, We Get Letters...

Two *Monitoring Times* readers responded to my request for information regarding the World War II vintage foreign language military dictionaries. Unfortunately, neither knew where they might be obtained. These books are approximately 5" x 7", published in the TM-30 series, and each has two sections, English - Foreign Language, and Foreign Language - English. If anyone does learn of a source for these, please let me know.

One of those readers, Mike Hardester of Pennsylvania, also mentioned in his letter that some Federal Emergency Management (FEMA) stations will issue a QSL. In 1985, says Mike, he QSL'd WGY908 on 3380 kHz. FEMA returned his PFC with the time, frequency and power indicated and even placed a FEMA logo sticker on the card -- all in 7 days!

From Bill Edwards aboard the Coastal Manatee comes a logging of KKN50 with a QRA tape heard on 6924.5 kHz. During the past few years, KKN50 has also been reported on 4880, 7470, 10637, 11095, 11106, 12022.5, 1211.5, 14355, 14880, 15492, 16255, 16275, 17570, 18169, 18525, 18700, 18972, 19146, 20920, 21764 and 23995 kHz. The callsign is assigned to the Department of State in Washington, DC. The actual transmitters are reportedly located at a US Army communications installation in the Remington, Virginia, area.

Some people have indicated that you can obtain a QSL from the State Department for your loggings of Department and US Embassy transmissions by sending your reception report with a prepared QSL card to the US Department of State, Radio Station KKN50, Offices of Radio Communications, Washington, DC 20520.

According to a card from Izak Luchinsky of Maryland an article was published in the 12 November 1987 *Baltimore Evening Sun,* consideration *is* now being given to the closure of station WMH. The Maryland Port Administration had requested the action due to the station losing money for several years. Thus, WMH may join the ranks of other "discontinueds" activities so now is the time to seek a QSL from that station if QSL collecting is a part of your monitoring pursuits.

More on SLB's "U" & "K"

K. Russell, also of Maryland, has provided additional details concerning the two SLB's mentioned in an earlier *Utility Intrigue* column and presented in an article in the July *MT* authored by Mr. Russell. He worked up a graph of the "U" loggings showing intercept of the signal on 230 days out of the first 300 days of 1987. (See Figure 1) Thus, contrary to the remark that there was a "drought" of beacon signals, the readers who reported no signals may have simply been experiencing bad reception conditions.

The graph shows the time/repetition rate for the SLB with the plotted points obtained by measuring the time required for transmission of a string of 10 repetitions and then repeating this measurement 2-10 times. The results are averaged to arrive at a representative figure to use in the graph. During August the transmission speed slowed down "indicative, according to my reasoning, that the water level was on the increase."

To avoid confusion in plotting graph points, readings taken late in one UTC day and then again early in the next UTC day were not considered as intercepts for two separate days. Instead they were shown as same (Calendar) day loggings.

Mr. Russell stresses the point that he has heard two "K" stations. One is a fast repetition rate "K" scattered around the spectrum but last heard mostly on 7905.5 kHz. Another is a rarely heard, extremely slow repetition rate transmission.

On one date it was noted that the time taken for ten "K" repetitions changed from 45.20 seconds to 33.91 seconds in a little over an hour. To properly plot this signal a graphical presentation was based on hourly data and tracked for one month with a 30 foot graph resulting.

In regard to the two tones/three dashes heard on 13638 kHz at the *Utility Intrigue* site, Mr. Russell indicated that these were part of the "O" family. The faster signal (10 repetitions in 21 seconds) on 13638. On the lower frequency the second "O" runs at about 31 seconds for 10 repetitions and on the higher frequency at about 26 seconds. In other words, there are three different "O" signals being sent all at the same time.

As a particular point of significance, the "O" signals changed schedule by one hour on 28 September 1987 when the USSR changed the clock back from summer-time. It will be most interesting to see what, if any, additional theories are advanced in the future regarding the purpose of these SLB stations. Our thanks to Mr. Russell for his detailed analysis.

Special Interest Items

13560.3 kHz 141400Z CW

I must confess I could not figure out what purpose was served by these transmissions. Station A would send a series of dits. Station B would reply with one or two characters. Infrequently Station C would come up and also send one or two characters. B & C were very weak while A had a somewhat stronger signal. I watched this exchange for close to an hour during which time I switched from one antenna to another but was unable to improve my reception of this strange activity so I dropped it.

13959.5 kHz 141331Z USB/CW

Here is a new twist for calling a station. After tuning up the transmitter, the operator comes on the air in USB and whistled the Cavalry Bugle Call -- the one played at ball games. The tune is played and then the crowd yells "Charge!" Every few minutes the operator would whistle that tune continuing this practice for about 40 minutes. He then shifted to CW and began sending V's followed by CLP5 CLP5 CLP5 DE CLP1 QSV K. I wonder if this is now an authorized Cuban Foreign Ministry commo procedure? ■

Fig. 1

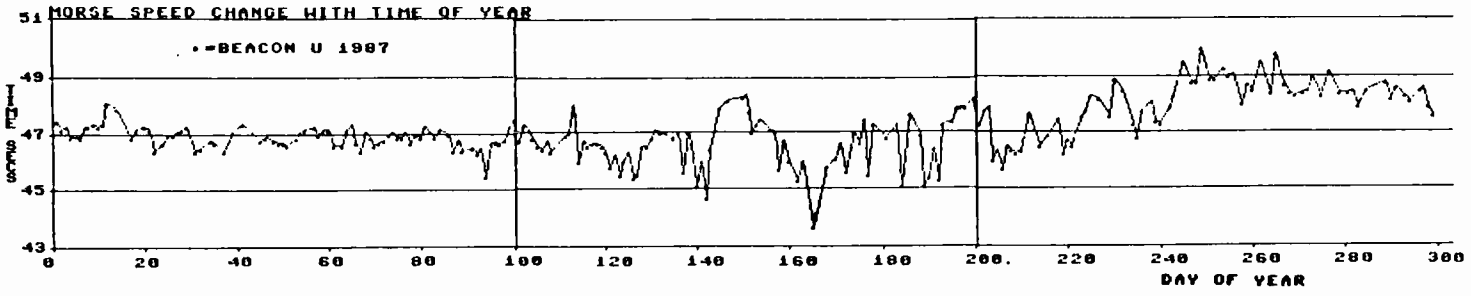

TABLE I

STATION CALL SIGN	RADPHONE (MF/HF Radiotelephone) CHANNEL	STATION FREQ. kHz	SHIP FREQ. kHz	HOURS DAILY LOCAL STANDARD TIME	SEAPHONE (VHF Radiotelephone) CHANNEL	REMARKS	TRAFFIC LISTS, COASTAL & HIGH SEAS WEATHER REPORTS & NAVIGATION WARNINGS by Voice Broadcast FREQ. kHz	HOURS DAILY LOCAL STANDARD TIME
ADELAIDE RADIO VIA	419	4413.2	4118.8	Booked calls	16	Continuous safety & calling	2201	0033 0233 0433 **0633**
	817	8768.5	8244.6	Booked calls	67	Supplementary safety channel	4428.7	0833 1033 1233 1433
	1227	13181.4	12410.6	Booked calls	23	Continuous Seaphone channel	VHF 67	1633 **1833** 2033 2233
					26	Continuous Seaphone channel		
BRISBANE RADIO VIB	415	4400.8	4106.4	On demand 0800 2000	16	Continuous safety & calling	2201	0033 0233 0433 0633
	404	4366.7	4072.3	Booked calls	67	Supplementary safety channel	4428.7	**0833** 1033 **1233** 1433
	811	8749.9	8226	Booked calls	23	Continuous Seaphone channel	VHF 67	1633 **1833** 2033 2233
	1229	13187.6	12416.8	Booked calls	26	Continuous Seaphone channel	4143.6 & 8291.1	1010 Northeast area
							4143.6 & 6221.6	**1910** high seas weather
BROOME RADIO VIO				Not available	16	Continuous safety & calling	2201	0033 0233 0433 0633
					67	Supplementary safety channel	4428.7	**0833** 1033 1233 1433
							VHF 67	1633 **1833** 2033 2233
▲ CARNARVON RADIO VIC				Not available	16	Safety & calling	2201	**0718** 0918 1118 **1318**
					67	Supplementary safety channel	4428.7	1518 1718 1918
							VHF 67	
DARWIN RADIO VIO	415	4400.8	4106.4	On demand 0800-2000	16	Continuous safety & calling	2201	0103 0303 0503 0703
	419	4413.2	4118.8	Booked calls	67	Supplementary safety channel	4428.7	0903 1103 1303 1503
	811	8749.9	8226	On demand as for Ch. 415			VHF 67	**1703** 1903 2103 2303
	815	8762.3	8238.4	Booked calls			4143.6 & 8291.1	**1410** Northern area
	1227	13181.4	12410.6	On demand as for Ch. 415			4143.6 & 6221.6	**2010** high seas weather
	1229	13187.6	12416.8	Booked calls				
▲ ESPERANCE RADIO VIE				Not available	16	Safety & calling	2201	**0748** 0948 **1148** 1348
					67	Supplementary safety channel	4428.7	1548 **1748** 1948
							VHF 67	
▲ HOBART RADIO VIH	404	4366.7	4072.3	On demand 0730-1730 Mon-Sat	16	Safety & calling	2201	**0818** 1018 **1218** 1418
				On demand 0800-1600 Sunday	67	Supplementary safety channel	4428.7	1618 **1703**
							VHF 67	
MELBOURNE RADIO VIM	404	4366.7	4072.3	On demand 0800-2000	16	Continuous safety & calling	2201	0133 0333 0533 0733
	417	4407	4112.6	Booked calls	67	Supplementary safety channel	4428.7	0933 1133 1333 1533
	811	8749.9	8226	Booked calls	23	Continuous Seaphone channel	VHF 67	**1733** 1933 2133 2333
	1226	13178.3	12407.5	Booked calls	26	Continuous Seaphone channel		
PERTH RADIO VIP	404	4366.7	4072.3	On demand 0600-2359	16	Continuous safety & calling	2201	0003 0203 0403 0603
	415	4400.8	4106.4	Booked calls	67	Supplementary safety channel	4428.7	**0803** 1003 **1203** 1403
	806	8734.4	8210.5	On demand 0600-2359	23	Continuous Seaphone channel	VHF 67	1603 **1803** 2003 2203
	811	8749.9	8226	Booked calls	26	Continuous Seaphone channel	4143.6 & 8291.1	**1010** Western area
	815	8762.3	8238.4	Booked calls			4143.6 & 6221.6	**1940** high seas weather
	1226	13178.3	12407.5	On demand 0600-2359				
	1229	13187.6	12416.8	Booked calls				
	1604	17242.2	16469.3	Booked calls				
	2212	22630.1	22034.1	Booked calls				
▲ ROCKHAMPTON RADIO VIR				Not available	16	Safety & calling	2201	**0848** 1048 **1248** 1448
					67	Supplementary safety channel	4428.7	**1648**
							VHF 67	
SYDNEY RADIO VIS	405	4369.8	4075.4	On demand continuous	16	Continuous safety & calling	2201	0118 0318 0518 **0718**
	417	4407	4112.6	Booked calls	67	Supplementary safety channel	4428.7	0918 **1118** 1318 1518
	802	8722	8198.1	On demand continuous	23	Continuous Seaphone channel	VHF 67	**1718** 1918 2118 2318
	829	8805.7	8281.8	Booked calls	26	Continuous Seaphone channel	4143.6 & 8291.1	**1110** Southeast area
	1203	13107	12336.2	On demand 1900-0700	27 +	Newcastle Seaphone channel	4143.6 & 6221.6	**2010** high seas weather
	1231	13193.8	12423	Booked calls	27 +	Nowra Seaphone channel		
	1602	17236	16463.1	On demand 0700-1900	02 +	Hawkesbury Seaphone channel		
	1610	17260.8	16487.9	Booked calls				
	1622	17298	16525.1	Booked calls				
	2203	22602.2	22006.2	Booked calls				
	2223	22664.2	22068.2	Booked calls				
THURSDAY IS. RADIO VII				Not available	16	Continuous safety & calling	2201	0103 0303 0503 0703
					67	Supplementary safety channel	4428.7	0903 1103 1303 1503
							VHF 67	**1703** 1903 2103 2303
TOWNSVILLE RADIO VIT	404	4366.7	4072.3	Booked calls	16	Continuous safety & calling	2201	0003 0203 0403 0603
	419	4413.2	4118.8	On demand 0600-2200	67	Supplementary safety channel	4428.7	**0803** 1003 **1203** **1403**
	817	8768.5	8244.6	On demand 0600-2200	23	Continuous Seaphone channel	VHF 67	1603 **1803** 2003 2203
	822	8784	8260.1	Booked calls	26	Continuous Seaphone channel	4143.6 & 8291.1	**1140** Northeast area
	1203	13107	12336.2	Booked calls 0800-1800			4143.8 & 6221.8	**1840** high seas weather
	1231	13193.8	12423	On demand 0800-1800				

RADPHONE NOTES

For 2MHz working where Radphones are available, 2760 is preferred ship frequency with 2056 the Maritime Communications Station frequency

For Radphone calls outside 'On demand' times shown above, or for Booked calls, initial contact should be made on 2182, 4125, 6215.5 kHz or VHF Ch 16

▲ Daylight hours only

SEAPHONE NOTES

Remotely controlled by Sydney Radio

Spoken Seagrams may also be lodged via any Seaphone channel

TRAFFIC LISTS & WEATHER/NAVIGATION

Working frequencies for daily voice broadcast of coastal waters forecasts & general warnings are 2201 kHz, 4428.7/4134.3 kHz (Ch 424), 6512.6/6206.2 kHz (Ch 603), or VHF 67

Times shown in **Bold Face** include weather forecasts and navigation warnings.

Gale and storm warnings are broadcast on receipt, again after the next Silence Period, then each scheduled broadcast time until cancelled or updated

Dave Jones

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Suffield, OH 44260

Monitoring the IRS

They Want to Hear from You This April... But You Can Hear Them First!

As citizens of the United States of America, we know that our government is always interested in us. For many, that's a comforting thought.

About this time of year, however, one particular federal agency begins to turn up the heat on that "interest." It becomes more intense, more probing and personal. That agency is the Internal Revenue Service or IRS. For most of us that interest can be returned to a normal level by the simple, patriotic act of paying our taxes.

Investigations...

The IRS is one of several agencies that come under the umbrella of the United States Department of the Treasury (USDT). What most people don't know is that the IRS operates its own Criminal Investigative Division (CID) in addition to the federal income tax operations that are commonly known.

The IRS CID is involved in cases pertaining to violations of federal tax on illegally transported liquor and tobacco. Fortunately for monitors, their frequency assignments are nationwide so they can be heard no matter where you live in the United States.

...and Enforcement

Another USDT agency is the Bureau of Alcohol, Tobacco and Firearms (ATF). Its concerns are the enforcement of federal laws on, appropriately enough, alcohol, tobacco and firearms. It's that latter portion of the job, however, that takes ATF into the widest array of investigations. Crimes like murder and narcotic trafficking can all fall under the jurisdiction of this brave group of men and women.

Other, more exotic events, can also bring the ATF into action. For example, when an illegal Youngstown, Ohio, fireworks factory exploded a few years ago, killing several workers, ATF was there. As is so often the case with federal agencies, ATF worked and communicated directly with the local agencies involved in the accident.

As a result, radio communications are most often on frequencies common to police. (154.935 and 155.370 are police intersystems in Ohio where ATF has been monitored communicating with local and state units). ATF bases usually ID with the city name, as Youngstown Base or Cleveland Metro Base.

ATF Frequencies

165.2875/166.5375 [c]	Operations Repeater	CH 1
166.5375	Operations Tactical	CH 2
165.2875 [c]	Operations Direct	CH 3
166.4625 [c]	USDT common frequency	CH 4
165.9125 [c]	Operations	CH 5
165.4625/166.5875	USDT common frequency (?)	
165.350	Local offices, simplex	

A third ATF agency, the one with the most headline-grabbing activities, is the Customs Service. Because of their work in drug-related arrests, Customs can best be monitored in cities hosting international airports, US entry points in Canada and Mexico, and port cities from which vessels arrive and depart to non-US destinations. Great Lake port cities like Buffalo and Cleveland are also possible targets.

Customs Service

165.2375/166.4375 [c]	Operations Repeater	CH 1
166.4375 [c]	Operations Direct	CH 2
166.4625 [c]	USDT Common Frequency	CH 3
165.7375	Operations Tactical	CH 4
165.4625/166.5875	USDT Common Frequency (?)	CH 5
162.825	Operations	

Additional frequencies to check for USDT operations are those considered as itinerant frequencies. These are lower in power than the ones normally use. Government files show 163.100, 418.050 and 418.575 all as rated under thirty watts. Two AM frequencies, 27.575 and 27.585, are listed as five watts. The book, *Police Call*, lists two other frequencies, both unconfirmed, as 166.750 and 166.875.

The final USDT agency is the United States Secret Service. Its job, as is widely known, is to protect the president and foreign dignitaries and to investigate counterfeiting. Their communications are far more complex than other USDT agencies and thus will be reviewed in a future *Federal File* column. Until then, keep an ear on 165.375, the primary nationwide repeater. ■

Table 1
IRS CID Allocations

165.950/167.000 [c]	CID Operations Repeater	CH 1 (VHF)
167.000 [c]	CID Operations Direct	CH 2
165.950 [c]	CID Operations Direct	CH 3
166.4625 [c]	USDT Common Frequency	
166.000/167.100	IRS Investigations Repeater	CH 1
166.000	IRS Investigations Direct	CH 2
165.4625/166.5875	U.S.D.T. Common frequency	(?)
418.225/414.700 [c]	CID OPerations Repeater	CH 1 (UHF)
418.225	CID Opertions Direct	CH 2
418.175	CID Operations Tactical	CH 3

[c] *indicates that the frequency has been confirmed by the author.*

A Special Note from the Publisher

Sensitive Frequencies and the Right to Listen

For many years, listeners expressed concern that the publication of sensitive frequencies could endanger the lives of undercover agents or provide useful information to unfriendly powers or terrorists. But many things have happened to change our formerly protective attitude.

Presidential Executive Order 12356, issued in 1982, reclassified the government master file of radio frequencies, formerly unclassified, as "Confidential" and, therefore, not releasable to the public, even under the Freedom of Information Act.

The rationale was that even though individual elements of the file may not by themselves be revealing, the assembled file could show capabilities, vulnerabilities and even disclose classified frequencies by virtue of their omission from the list.

This so-called "mosaic" theory is now used by individual agencies as well to deny requests by the public for non-sensitive frequency information.

Countless books and articles have appeared disclosing frequencies known to be sensitive by virtue of their recognized use and previous omission from the unclassified government frequency records. Clearly, these frequencies are now widely known with no reasonable expectation of confidentiality.

The Electronic Communications Privacy Act of 1986 (ECPA '86) now specifically allows the casual monitoring of federal government communications. Since the government master file is no longer available to the public, there is no way of knowing which frequencies are considered sensitive and which are not.

Security in government communications is clearly the responsibility of the sender; the technology is readily available and in place to protect communications. The listener is free to listen to any radio transmission from any agency of the federal government with impunity, assuming that transmission is in the clear (unencrypted).

Still, the Communications Act of 1934, Section 705 (formerly 605, amended), forbids the divulgence of information overheard by an uninvited listener, or its subsequent use for personal or financial gain.

It will be the policy of *Monitoring Times* to publish frequencies of interest to its readers without censorship unless such disclosure would clearly compromise legitimate law enforcement operations or pose a threat to national security.

Larry Van Horn

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Space Firms Announced

Four aerospace firms will soon be entering into final negotiations for development, testing, evaluation, and delivery of the US's first permanent, manned space station. Scheduled to be placed into earth orbit in the mid 1990s; the total cost of the two-phase project is expected to run in the neighborhood of $11.5 billion.

The work will be broken down into four packages. Each is divided into 2 phases. Phase I covers the currently approved elements of the space station program. Phase II is an option for possible future enhancements.

McDonnell Douglas Astronautics will provide the communications and tracking system. Boeing, General Electric and Rocketdyne will handle other aspects of the project.

The space station, which will accommodate private sector research and development, will also serve as the staging base for the continued manned and unmanned exploration of the solar system into, it is expected, the 21st century.

Dallas Remote Imaging Group

The Dallas Remote Imaging Group (DRIG) is an organization dedicated to tracking, monitoring, capturing, and decoding telemetry from American NOAA and Soviet Meteo APT satellites in polar orbit.

DRIG designs, develops and evaluates both software and hardware in an effort to further the amateur use of APT, HRPT and VISSR data products from polar orbiting and geosynchronous satellites.

Any active satellite enthusiast should check into his computer bulletin board at 214-394-7438. It is one of the finest in the country. If you'd like more information on DRIG, contact Jeff Wallach at Dallas Remote Imaging Group, PO Box 118053, Carollton, Texas 75011-8053.

Please provide information as to your interests, current satellite ground station capabilities, professional responsibilities, amateur call (if licensed), and any other information that you feel relevant.

Ariane V-20 Launch Success Edges Phase 3C Towards March Launch

Things are still up in the air for the European Space Agency's mission V-22. A delay in V-21 because of concerns over the vehicle's third stage cryogenic engine may ripple through the schedule and affect V-22 and AMSAT's Phase 3C. Launch may be postponed until next month.

Amsat Board Authorizes PACSAT Project

The AMSAT board of directors has reported that it may be possible for their organization to develop and provide an amateur radio packet radio satellite much more quickly than previously thought. The board responded by authorizing an extraordinary program to take advantage of any one of several "target of opportunity" launches that may present themselves within the next 24 months.

Support for the AMSAT-NA Pacsat project is urgently needed if it is to succeed. Donations may be sent to AMSAT, P.O. Box 27, Washington D.C. 20044. Be sure to tell them *MT*'s SFS sent ya, and thanks for the support.

News Notes Around the World

A jammed solar panel on the TV-Sat-1 direct broadcasting satellite may endanger the entire project. According to spokesman for the German Bundespost and the builder of the satellite, Eurosatellite GmbH, if the problem with the panel continues, the antenna cannot be completely extended. The result might well be, say the spokesmen, that the bird will be completely unuseable.

The Soviet Union launched another Raduga ("Rainbow") communications Satellite. he bird, to be used for telephone, telegraph and radio communications, was inserted into a circular, stationary orbit. All systems appear to be functioning normally.

All is not well in the world of Soviet satellites, however. The USSR Ministry of Communications has announced that Central television programs in a number of the European regions of the USSR have been "temporarily hampered" by unstable operation of the satellite channel. The unnamed satellites are stationed in geostationary orbit at 11 and 14 degrees west. To compensate for the difficulty, the program Orbita-4 Vostok was temporarily broadcast over the Moskva receiving station in a number of areas.

With the withdrawal of the Swedes, the joint Nordic TV satellite project, Tele-X, may be in jeopardy. The Swedish firms like Volvo, Ericsson and Saab-Scania, once key players in the Tele-X, have completely disassociated themselves with the project. Ministers meeting in Oslo to discuss the situation have indicated that they may return to two channel or even one channel option.

TV Satellite Bandplans

(Excerpted from Communications Satellites by Larry Van Horn)

SATCOM BAND PLAN

Transponder Number	Polarization V=Vertical H=Horizontal	Frequency Range (MHz)	Center Freq. (MHz)
1	V	3702-3738	3720
2	H	3722-3758	3740
3	V	3742-3778	3760
4	H	3762-3798	3780
5	V	3782-3818	3800
6	H	3802-3838	3820
7	V	3822-3858	3840
8	H	3842-3878	3860
9	V	3862-3898	3880
10	H	3882-3918	3900
11	V	3902-3938	3920
12	H	3922-3958	3940
13	V	3942-3978	3960
14	H	3962-3998	3980
15	V	3982-4018	4000
16	H	4002-4038	4020
17	V	4022-4058	4040
18	H	4042-4078	4060
19	V	4062-4098	4080
20	H	4082-4118	4100
21	V	4102-4138	4120
22	H	4122-4158	4140
23	V	4142-4178	4160
24	H	4162-4198	4180

COMSTAR SATELLITES

Transponder Number	Polarization V=Vertical H=Horizontal	Frequency Range (MHz)	Center Freq. (MHz)
1 (1)	V	3702-3738	3720
1 (2)	H	3722-3758	3740
2 (3)	V	3742-3778	3760
2 (4)	H	3762-3798	3780
3 (5)	V	3782-3818	3800
3 (6)	H	3802-3838	3820
4 (7)	V	3822-3858	3840
4 (8)	H	3842-3878	3860
5 (9)	V	3862-3898	3880
5 (10)	H	3882-3918	3900
6 (11)	V	3902-3938	3920
6 (12)	H	3922-3958	3940
7 (13)	V	3942-3978	3960
7 (14)	H	3962-3998	3980
8 (15)	V	3982-4018	4000
8 (16)	H	4002-4038	4020
9 (17)	V	4022-4058	4040
9 (18)	H	4042-4078	4060
10(19)	V	4062-4098	4080
10(20)	H	4082-4118	4100
11(21)	V	4102-4138	4120
11(22)	H	4122-4158	4140
12(23)	V	4142-4178	4160
12(24)	H	4162-4198	4180

WESTAR 4 AND 5 BANDPLAN

Tr No	*	Frequency Range (MHz)	Center Freq (MHz)
1	H	3702-3738	3720
2	V	3722-3758	3740
3	H	3742-3778	3760
4	V	3762-3798	3780
5	H	3782-3818	3800
6	V	3802-3838	3820
7	H	3822-3858	3840
8	V	3842-3878	3860
9	H	3862-3898	3880
10	V	3882-3918	3900
11	H	3902-3938	3920
12	V	3922-3958	3940
13	H	3942-3978	3960
14	V	3962-3998	3980
15	H	3982-4018	4000
16	V	4002-4038	4020
17	H	4022-4058	4040
18	V	4042-4078	4060
19	H	4062-4098	4080
20	V	4082-4118	4100
21	H	4102-4138	4120
22	V	4122-4158	4140
23	H	4142-4178	4160
24	V	4162-4198	4180

*V=Vertical/H=Horizontal

BANDPLAN OF WESTAR 1,2,3

Tr No	Frequency Range (MHz)	Center Freq (MHz)
1	3702-3738	3720
2	3742-3778	3760
3	3782-3818	3800
4	3822-3858	3840
5	3862-3898	3880
6	3902-3938	3920
7	3942-3978	3960
8	3982-4018	4000
9	4022-4058	4040
10	4062-4098	4080
11	4102-4138	4120
12	4142-4178	4160

Gregory Mengell

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New Weather Receiving Equipment

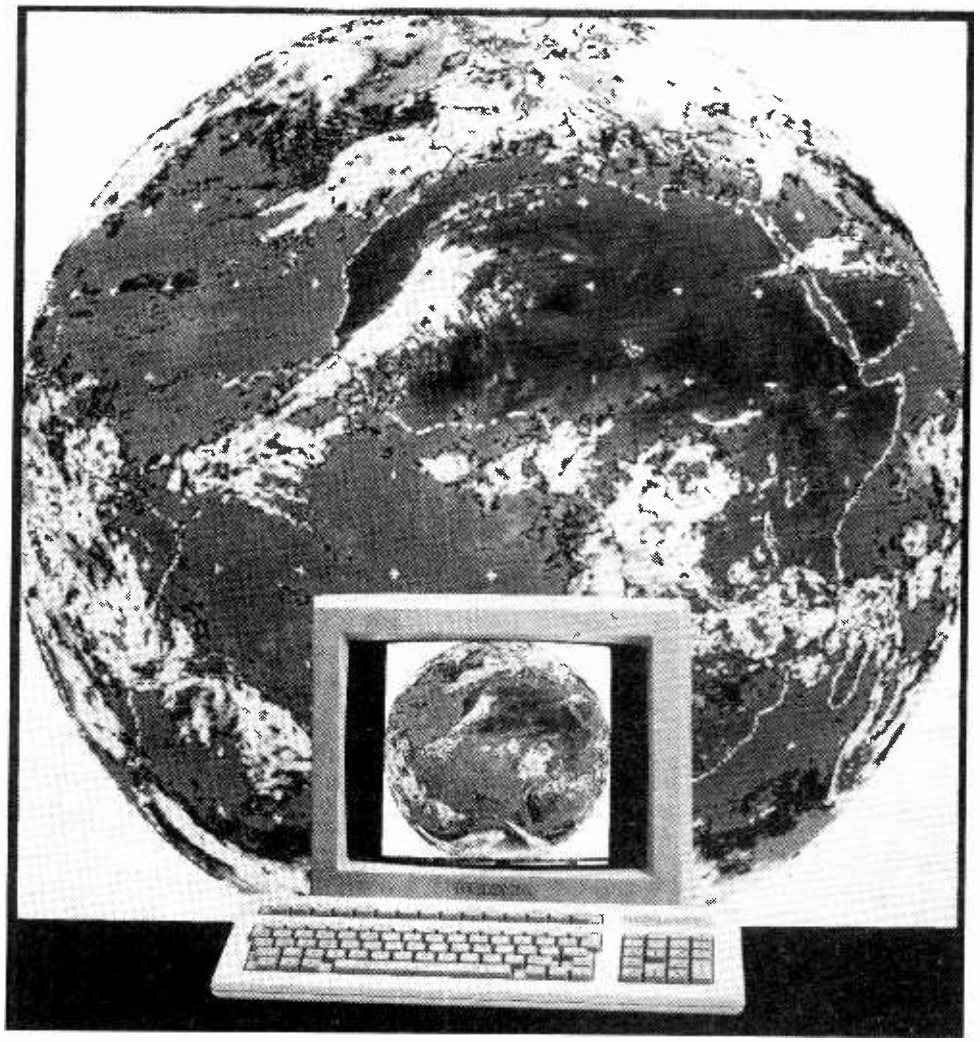
We're only a month into 1988 and already it's apparent that the coming year will be a hot one in the satellite display field. Both professional and amateur designers have produced new computer-aided weather display systems -- and at attractive prices. We'll take a look at several of them.

WRAASE Converter

Ever since the arrival of the German-made Wraase scan converter, there has been a need for some way to interface it with the personal computer. The answer came from John S. Castorina of Marta Systems. Marta has manufactured a digital interface box for Amiga computers (models 500, 1000 and 2000) and together they make a formidable remote sensing tool.

The system consists of the WRAASE satellite receiving package "Sky Scan C," which serves as the real time RF data source for TIROS and GOES images. These images are then fed via the digital "out" of the WRAASE scan converter into the digital box manufactured by Marta systems. This device provides format instructions the Amiga computer scan can understand. The image is then stored onboard the Amiga's two megabyte internal memory where it is formatted and made ready for display on the systems RGB monitor.

Once on the screen, the image may be enlarged and enhanced. It can be taken apart by sectors or through a special floating window with which you can capture any area of a picture and zoom it up to pixel resolution if you so desire. The combination compares favorably with units used for both Land Sat and climate displays costing upwards of forty thousand dollars or so. The looping capability alone is surpassed by none in the consumer market and few in the commercial realm.



This arrangement is made possible by the use of John Castorina's remarkable new program "Live From Space." I've taken the liberty to lift a few lines from his own program description in order to give the reader an idea of how versatile it is:

Image Acquisition

When the system is started, it is brought to a standby condition showing the title screen. An image must be acquired or loaded from disk before work may commence. The acquisition sequence for direct weather satellite work may commence. The acquisition sequence for direct weather satellite reception depends on the particular input driver.

Depressing the menu selection button on the mouse, the user moves the mouse to the mode menu. The present mode, standby, is indicated by a checkmark. Other selections include acquire-hold to receive only the next picture, and free run to receive pictures as they become available. As soon as the picture is received, it will be displayed on screen in the 16 default colors (a range of blues) in a resolution of 640 dots wide by 640 dots high.

Loading a previously saved picture from disk (or memory) requires selecting the load option from the picture menu. A window opens in the screen displaying the available entries in a ram memory. Any entry may be selected from memory (The ram disk). Note that a typical picture is compressed into about 90K bytes and the 3.5 inch floppy disk holds about 880K bytes.

Selecting capture from the transform menu prepares the system for a number of operations including scaling (up or down), duplicating, clipping and filling areas.

Automatic scaling and combining is obtained when quad image is selected from transform menu. The screen-sized image is automatically scaled and placed in the selected quadrant; topright, bottomleft, or bottomright. The original image stays on the screen and combining takes place in one of the backup pages.

The render option from the picture menu allows the addition of text and weather symbols to the picture. Text may be positioned anywhere on the screen with the mouse. The user may select from one of several standard fonts, or may use a custom font.

The tools for rendering graphics resemble a "paint" program, with the

"brushes" consisting of symbols used to depict features both on the surface and at altitude. Eighteen brush selections are available, representing various fronts, vorticity symbols and surface weather conditions such as lightning, freezing rain and snow.

Printing

The computer supports popular electrostatic, in-jet, thermal and dot-matrix color printers available today. A printer allows the user to obtain [permanent high quality color output.

Storing Images

Save works in an identical manner as load, allowing any disk or memory device to be selected as the target.

A data storage standard exists for the Amiga computer called "IFF" which is used to maintain compatibility among programs from different suppliers. IFF format is used for disk storage which implies that the pictures may be used in video, animation, painting, desktop publishing and other programs available for the machine.

Animation

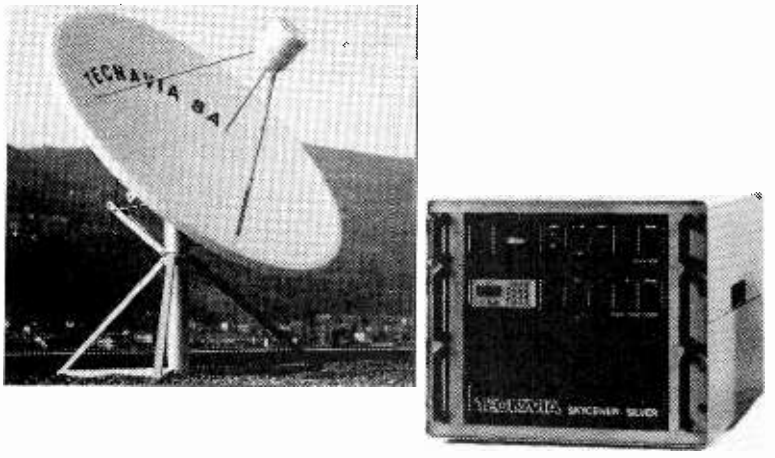
Animation lets the user see the movement of weather patterns. The number of images used in the animation loop is dependent upon the amount available memory in the system. Each image requires 128K works of storage. Dwell times may be specified from each image, affecting overall loop speed.

Skyceiver

A recent newcomer to the United States, the Swiss Firm Technavia, marketed by Sinclair, has unveiled their new Skyceiver weather satellite receiving systems. No stranger in the world market, this company has for several years produced high resolution GOES and Tiros RF downlinks, as well as computer controlled video weather display consoles.

These systems were designed with government and scientific users in mind. This system renders high resolution 512 x 512 pixel images with 64 shades of grey. Image detailing is accomplished by employing four different color scale enhancements through internal look up tables (false color enhancement is, of course, a great asset when looking for areas of temperature change within a cloud mass or changes of water temperatures where cold and warm ocean currents come together).

Some fishing fleets use TIROS satellite pictures in false color to find where the fish are. Fish of different species congregate at separate temperatures in the ocean and the IR image off the TIROS bird is interpreted into temperature-fish calibrated false color. In other words, red is for the temperature where you would be likely to find tuna, blue would signify mackerel, and so forth.



No stranger in the world market, Technavia's Skyceiver receiving system is geared to government and scientific users.

Likewise, meteorology workers use false to find the most intense areas of thunder storms, areas subject to frost damage and high cold tops which promise crop destroying hail or heavy rains. A new use of the false color from TIROS is the proposed use of its image to find mineral signatures for exploration mining.

Another feature to consider is its ability to loop 16 to 30 images in memory to allow for the study of storm system movement. One interesting option is the ability to receive GOES and Tiros simultaneously on the same screen. This is a complete system incorporating all that is needed for all types of weather satellite reception. It includes antennae for GOES and Tiros receivers, downconverters and preamps. Completely automatic, once installed one simply lets it run and it will flawlessly for years to come.

Electro Services Interfaces

Loren Johnson of Electro Services has successfully marketed his software/hardware interfaces for the IBM PC with very good results for some time now. The system requires an IBM PC XT or compatible capable of 4.77 MHz, a memory of at least 640K and DOS of 2 or higher. The unit displays its data in conjunction with a Techmar graphics board and presupposes an RGB monitor with long persistence phospor.

Its operations include:

- GOES WEFAX charts and TBUS messages
- NOAA APT visible and I.R.
- GMS images and WEFAX
- Meteo SAT Images and WEFAX
- GOES Tap and Meteor Soviet Orbiters

Having seen this unit work at the Polar Orbiters User Group meeting in Boulder, Colorado, last July, I was greatly impressed with its capabilities. Among its features are the ability to store pictures in three ram buffers which can be used to display looped cloud formation. This device is capable of satellite picture processing via 16 LUT using stored enhancement curves by simple keyboard commands.

Needless to say, all data can be downloaded to disc and can, of course, call up data for same. For those of you with an IBM, this would be a system to seriously consider. The name of the system is the ESC102M.

If anyone has any questions regarding the systems mentioned please call me at (916) 364-1572. ■

Ike Kerschner

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Novice DXing

Ever since amateur radio was born the most frequent question asked a ham is "How far can you reach?" In the early days the average radio experimenter would be happy to reply, "ten miles." Today all that has changed. Even the most most modest HF amateur station is capable of communicating with stations on the other side of the earth. I can hear the gasps that last comment produced from the newcomers.

Working DX!

There are a few secrets to learn, but they're easily mastered. First of all, let's set aside some popular misconceptions about DXing. You don't have to spend a fortune for high power gear and super antennas in order to work DX. You will, however, need a decent antenna, a reliable rig, and most important of all, knowledge.

The Antenna

I would be the last one to tell you not to install a good directional high performance beam antenna if you can afford one. But a beam is not necessary for DXing. Some of the world's best-known DXers use simple wire antennas and very modest power. The important thing to remember is to be sure your antenna is perfectly matched to the rig and erected as high and in the clear as possible. The two most popular antennas on the ham bands are the single band dipole and the vertical. These two simple antennas give a good account of themselves when it comes to working DX.

To be sure the beam antenna will squirt a lot more signal into the area you want to work, keep in mind that your dipole radiated signal will get there too, and it can be heard! The secret to being successful with a simple antenna is to be persistent. Now then, let's say you have the room to erect a beam antenna but cash is a bit scarce. What to do? Build a beam.

There are two directions you can go. You can build a fixed beam aimed in one favored direction (most wire beams will transmit in two directions). Or you can build a rotary beam such as the Cubical Quad or one of the simple single band antennas described in one of the antenna manuals. Two excellent manuals for the beginner are W6SAI's *Beam Antenna Handbook* and his *Quad Antennas* handbook. Both give instructions for building beam antennas from such material as thin wall electricians conduit, wire, bamboo, PVC and other easy to obtain items.

The Transmitter

Any HF transmitter will work DX. For the Novice operator, I suggest at least 50 watts of power although less will certainly do the job. Connect the transmitter to the antenna through a length of good (new) feedline of decent quality and you are ready to chase DX.

The Receiver

"You can't work them if you can't hear them." True enough! Be sure your receiver is in good working order. If there is any doubt, have it checked by a competent technician. The three main features to look for in a good receiver are stability, selectivity and sensitivity.

CONVENTION CALENDAR

Date	Location	Club/Contact Person
Feb 6-7	Miami, FL	Livonia ARC/ Neil Coffin 35681 Hees, Livonia, MI 48150
Feb 7	Lorain, OH	Northern OH ARS/ John Jones 4612 Timberview Dr, Lorain, OH 44053
Feb 6-7	Miami, FL	So Fla Section/ Evelyn Gauzens W4WYR 2780 NW 3rd St., Miami, FL 33125
Feb 14	Mansfield,OH	Intercity ARC/ Jack Weeks K8RT Mansfield, OH 44907
Feb 20-21	Sarasota, FL	Sarasota ARA/ Allan Matlick W2TKU 1817 Buccaneer Terrace, Sarasota,FL33581
Feb20-21	Harlingen, TX	STARS/ David Woolweaver 2210 S 77 Sunshine St, Harlingen, TX 78550
Feb 26-28	Cincinnati,OH	OH State Conv/ Stanley Cohen WD8QDQ 2301 Royal Oak Ct, Cinci, OH 45237
Feb 27	Medina, MN	Robbinsdale ARC/ Dennis Pollard 4016 Kentuckey Ave, Crystal, MN 55427
Feb 28	Akron, OH	Cuyahoga Falls ARC/ Bill Sovinsky 2305 24th St, Cuyahoga Falls, OH 44223
Feb 28	Vienna, VA	Vienna Wireless Soc/ Dave Rogers PO Box 1835, Vienna, VA 22180
Mar 6	Winchester,IN	Randolph ARA & Parker Cty 220 Club Kedrick Robbins RR 1 Box 389, Parker City, IN 47368
Mar 6	Belle Vern,PA	Two Rivers ARC/ Edward Reynolds 5901 Roslyn St, McKeesport, PA 15135
Mar 12	Cave City, KY	Mammoth Cave ARC/ Joe Taylor N4NAS Box 858, Glasgow, KY 42141
Mar 12-13	Orlando, FL	Fla State Con/ Larry Gilbreath 608 Colby Ct, Altamonte Sprg, FL 32701
Mar 13	Indianpls,IN	Morgan Co RA/ Aileen Scales KC9YA 3142 Market Place, Bloomington, IN 47401
Mar 13	Valhalla, NY	Hudson Div Con/ Rick Moseson NW2L 19 Linden Ave, Bloomfield, NJ 07003
Mar 20	Sterling, IL	Sterling-Rock Falls/ Kenneth Weissenburger 1703 18th Ave, Sterling, IL 61081
Mar 20	Monaca, PA	Beaver Valley ARC/ Don Washburn WB3HWD 207 Hall Rd, Allquippa, PA 15001
Mar 20	Maumee, OH	Toledo Mobile RA/ Dennis Hilbert 4511 289th St, Toledo, OH 43611
Mar 26	Elizabth Tn,KY	KY State Con/ Chuck Strain AA4ZD Lot 3 Triangle MHP, Radcliff, KY 40160
Mar 27	Madison, OH	Lake Co ARA/ Scott Harnham KO8O 7126 Andover Dr, Mentor, OH 44060
Mar 27	Trenton, NJ	Del. Val. RA/ Edward Vickner 21 Running Brook Rd, Trenton, NJ 08638
Mar 27	Libertyvlle,IL	Lville & Mundelein ARS/ Marc Abramson 1312 Mill Creek Dr, Buffalo Grove, IL 60089
Mar 27	Livonia, MI	SE Mich ARC/ StevenCorso KV8G 34556 Summers, Livonia, MI 48154

MONITORING TIMES IS HAPPY TO RUN ANNOUNCEMENTS OF RADIO EVENTS OPEN TO OUR READERS. Send your announcement at least 60 days before the event to: Monitoring Times Convention Calendar, P.O. Box 98, Brasstown, NC 28902.

The new mailing address for ANARC (The Association of North American Radio Clubs) is P.O. Box 143, Falls Church, VA 22046-0143.

The unit should not drift after a half hour warm-up period. Selectivity should be on the order of 500Hz or less. (Be aware that sharper filters can be difficult for a beginner to use.) Finally, the receiver should show good sensitivity on higher frequencies like 20, 15, and 10 meters. Should it lack sensitivity on these bands build or purchase a preamplifier to boost signals.

Knowledge

After assuring yourself that your station is average, the next step is to learn how to work DX. At this point I assume that you are thoroughly familiar with your rig and that you have had some experience working stations on the ham bands. Now on to the nitty gritty.

To be realistic in our expectations we must know the characteristics of a given amateur band. The following information applies only to the Novice class amateur.

DXing on the 80 meter Novice band is very difficult for several reasons. First of all, the band is extremely crowded during peak hours. Any DX present is often covered up by local signals. Second, in many sections of the world this is a phone band and DX stations do not normally listen for CW here.

The best that the US novice can hope for is an occasional station from Puerto Rico, Alaska, Hawaii, and perhaps South America. Be satisfied if you can work both coasts on this band.

The best times to operate 80 will be late at night and early mornings. QRN, or static, is a limiting factor here, too. Consequently, summer time is the worst time of all to look for long range DX here.

The 40 meter Novice band is shared with shortwave broadcast stations stations. During the hours of prime DXing, these stations knock out much of this band. In addition, amateurs in many other countries are not allowed to operate above 7100KHz. If you can find an open spot after dark, working thousands of miles is not difficult. ■

Paul Swearingen

3132 SE Irvingham
Topeka, KS 66605

Do it Yourself Radio

I suppose I shouldn't be surprised that the topic of crystal radio receivers in the November issue of *Monitoring Times* generated more response than some of the 'hot' issues (such as the Fairness Doctrine, decency in broadcasting, AM stereo, AM vs. FM, or AM fidelity standards) I've commented on in the past year or so.

Among others, Tracy B. Sands III, Anaheim, California, an avid DX'er who has been building his own receivers since the age of seven, says, "I still think it is marvelous that you can, with sound construction practices, receive true DX on a crystal set - no batteries, no plug-in-the-wall, etc." And Owen O'Neil, of Hollis, New Hampshire, and Matt Biehl (K2MAC), Kenmore, New York, both asked about books detailing more construction plans for crystal sets.

I was afraid you'd ask! My dim memory tells me that long ago I found in the public library one or more references which included plans. I can't recall exactly where I found them, but I would suspect that an older electronic theory book would be a great place to look. Most hobby magazines of the '20's would also be possible sources.

After finally unpacking dozens of cartons of books during the holiday recess, I found some specific titles which might be of use. In *How to Repair Old-Time Radios*, Clayton L. Hallmark mentions that the crystal radio was invented in 1906 by H.H. Dunwoody and G.W. Packard.

Want to try building a crystal set using a modern IC? In *50 IC Projects You Can Build,* author Ronald M. Benrey details a circuit utilizing an RCA CA3020 IC and a pair of IN60 diodes -- plus a pair of 1 1/2 volt penlight cells, which might not appeal to purists.

Finally, a pair of other books, written by R.H. Warring, seem to be the best references in my own electronic library. If you can follow a circuit design, the half-dozen sets described in *21 Simple Transistor Radios You Can Build* will supply you with hours of fun. For the beginner, *Modern Crystal Radios* is much more detailed, with photos, drawings, and excellent explanations of simple theory.

Radio Shack offers a kit for $4.95 (#28-219) complete with earphones, if you don't have much time for research, and I recall seeing other kits advertised from time to time in various publications. Check with your local electronics store for these and other references and kits, or send a dollar to Imprime -- Box 241-R, Radnor, PA 19087 -- and ask for a copy of their catalogue.

The Great Juggling Act

And now, on to more controversial topics. Have you been attempting to follow the FCC, the now-dead Fairness Doctrine, and the FCC's standards of decency? I'm trying to make sense of all the behind-the-scenes negotiating, because the final outcome could unfavorably affect your DX'ing habits.

Although the lines between the groups are quite vague, the war camps seem to be divided into broadcasters, Congress, the FCC, and the public. President Reagan is strongly influenced by the broadcasters, who do not want to see a new Fairness Doctrine written into federal statutes and who have apparently convinced him to veto any such bill passed by Congress.

I'm oversimplifying when I state that the broadcasters are motivated by potential loss of profits if a new Fairness Doctrine becomes law, as they also felt that the old Fairness Doctrine went against the spirit of free speech (as did the FCC). We also have to remember that when a station no longer can turn a profit or at least provide an acceptable write-off for tax purposes, it goes off the air, or may fire the on-air staff and plug into a satellite program or simply simulcast with FM. The end result is the loss of many opportunities to ID a station, except at the top of the hour at legal ID time.

Congress, of course, is responsive to the public's demands and is trying to revive the Fairness Doctrine. And the FCC is attempting to define through its actions against stations what is decent and what is indecent programming.

In November, the FCC said that "Material that depicts or describes, in terms patently offensive as measured by contemporary community standards for the broadcast medium, sexual or excretory activities or organs" may be aired between the hours of midnight and 6 AM, when children are not likely to be part of the audience. But obscene material (defined in 1973 by the Supreme Court) as appealing to prurient interests, depicting sexual acts in a patently offensive way and lacking artistic, literary, political, or scientific value) cannot be aired at any time, of course. In other words, Dr. Ruth's explicit advice is not obscene, but some advice currently on CS channels is.

The Topeka *Capital-Journal* in a recent editorial would like to see racist programming added to prohibited material. It wondered why those who had the need for such programming couldn't just buy tapes and listen to them in the privacy of their own homes. To which I add the question of cable TV's providing such services as the Playboy channel, which is constantly under fire from feminist groups.

Of course, the First Amendment to the Constitution of the United States precludes Congress drawing the line obscenity and free speech too conservatively: "Congress shall make no law ... abridging the freedom of speech, or of the press ...," and if Congress finally does pass a new Fairness Doctrine, or if the FCC does establish guidelines for decency in broadcasting, you can bet that the Supreme Court will end up with the final decision.

What this all means is that the proliferation of talk shows should continue for some time, and as I've noted before, AM DX'ers have found adjacent channel DX much easier now that high-volume music, which tends to platter across adjacent channels, has shifted largely to the FM band.

Furthermore, if more AM stations install modulation leveling and control devices as the AM Optimod, the ensuing suppression of the audio spectrum above 10 kHz should further limit splatter which improving sound quality as per NRSC bandwidth limiting recommendations. And that would be good news for AM Dx'ers.

Reader Response

Let's go back to the mailbag for more comments. Arnold Hartley of New York, whose letterhead indicated that he is involved in broadcast management, writes: "...It ought to be Job One for every AM operator these days to maximize the quality of his sound. Before giving AM stereo a second thought, the AM mono sound has to be cleaned up so that if becomes a reasonable facsimile of high fidelity." But he notes that receiver manufacturers have to be prodded into providing the public with the necessary receivers, and then the public has to be excited about the new quality of AM sound.

KHUM-95.7, which recently moved from Ottawa, Kansas, to Topeka, has tried to move right into the mainstream of Capital City radio. The state lottery became legal in November, and KHUM wasted no time in using it as part of its promotion plan.

"I have a feeling that every AM operator in the country would get behind the marketing efforts of the manufacturers," Mr. Hartley says. "But meantime - where are the receivers? Where's the advertising?"

It's easier to get automobile receivers, now, as several large retailers (including Montgomery Ward and Radio Shack) carry one or more sets capable of decoding AM stereo, albeit only C-Quam, and mail order firms such as J.C. Whitney and Crutchfield offer a limited selection. But you'll need a fat wallet to be able to carry home a component receiver for your living room, especially one which decodes both C-Quam and Kahn.

I'd like to go out on a limb and mention several stations which my ears tell me have superior fidelity to others: KBOI-670, Boise; KOMA-1520, Oklahoma City; KVOO-1170, Tulsa, all stereo; and monophonic KWNK-670, Simi Valley, CA; KALI-1430, San Gabriel, CA, and R. Sandino-750, Managua, Nicaragua. I suspect that a number of other Latin American stations could qualify. I'd be interested in hearing your nominations from your part of the country, too. 73.

■

Some stations prefer to skate as close as possible to the line dividing free speech from obscenity in an effort to win more listeners, but KANU and other non-commercial stations prefer to promote the creative aspects of radio. Garrison Keillor, of "Prairie Home Companion" fame, did not become popular through promoting poor taste, either!

Dr. John Santosuosso

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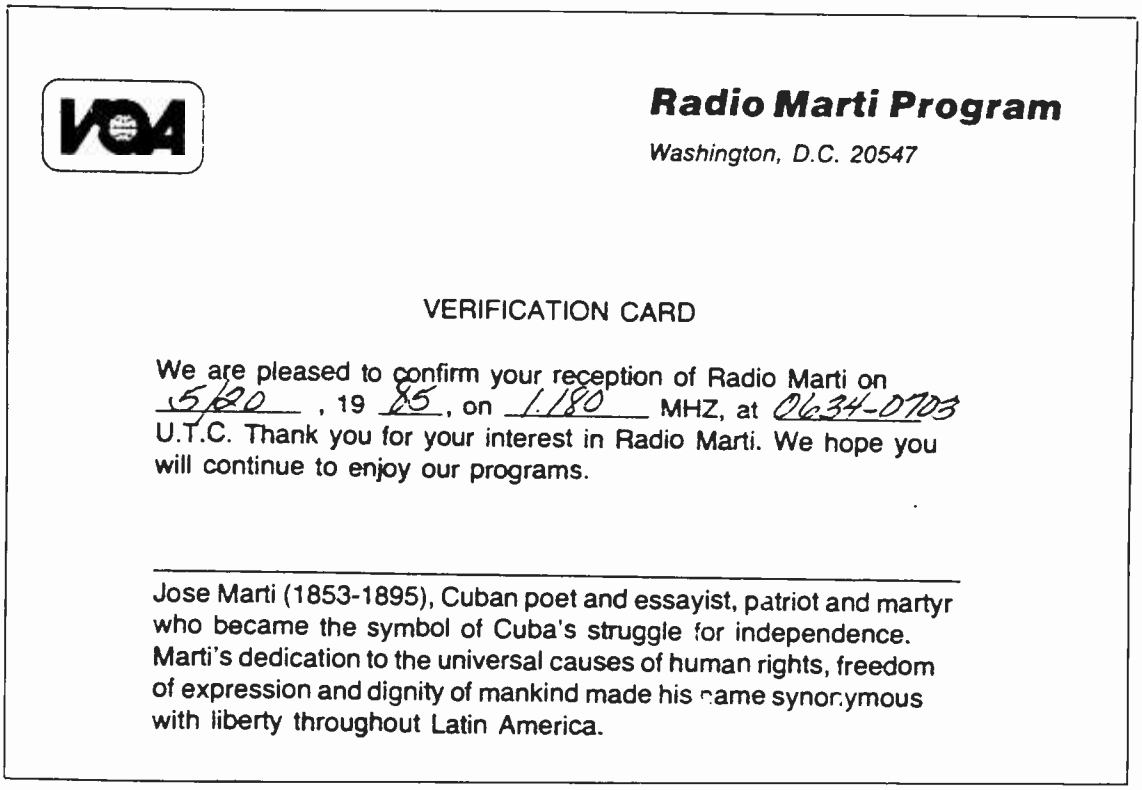
Those Quixotic Cubans

Broadcasting activities to and from Cuba remain some of the most interesting these days. Even when something does *not* happen, it may be significant.

Winter of 1986 saw several high-powered Cuban AM transmissions commemorating the anniversary of the Cuban revolution. 1987 did not. Could this be a gesture by Havana for better relations with the US? The Caribbean nation did take a very conciliatory position during the prison take-overs in Louisiana and Georgia some months back.

On the other hand, Cuban activity on 1040 kHz is actually increasing. The weekend Radio Moscow relay on that frequency has recently been monitored weeknights as well. In addition, the transmission has been extended with an hour of Moscow's North American service from 2300 to 0000 UTC. However, when the North American service gives its frequencies over shortwave, 1040 kHz is not included.



Radio Marti Program

Washington, D.C. 20547

VERIFICATION CARD

We are pleased to confirm your reception of Radio Marti on 5/20, 19 85, on 1.180 MHZ, at 0634-0703 U.T.C. Thank you for your interest in Radio Marti. We hope you will continue to enjoy our programs.

Jose Marti (1853-1895), Cuban poet and essayist, patriot and martyr who became the symbol of Cuba's struggle for independence. Marti's dedication to the universal causes of human rights, freedom of expression and dignity of mankind made his name synonymous with liberty throughout Latin America.

Radio Marti, anti-Cuban arm of the VOA, is being rebroadcast - legally or illegally? - by two Miami-based stations, WAQI and WQBA.

It is most unlikely that the purpose of the relay is to provide further access to Radio Moscow. Rather, it seems that the real intention is to keep the frequency available for Cuban government broadcasts. And Washington does not seem to object so long as the Cubans do not use 1160 kHz.

Friendly relations are also going on between Radio Marti and two Miami-based AM stations, WAQI and WQBA. Both have been rebroadcasting Radio Marti, the US government's anti-Cuban arm of the Voice of America. In some cases, the two stations may have been using tapes supplied by Radio Marti. This may be illegal. WQBA says that it also gets its Marti programming by taking off the air and re-broadcasting it. That may not be breaking the law.

What should not be overlooked in all of this is the very close relationship between the VOA's Radio Marti and such stations as WAQI (Radio Mambi) and WQBA. All we will say at this point is that things appear to be quite friendly.

Not everyone involved is quite so cozy, however. Last year, WAQI's towers were dropped by saboteurs. It appears that WOCM (1450 kHz) may have suffered a similar fate.

Mailbag

From Maryland, Ken Cohen writes to say that he heard a station operating in Morse code "with a chirp and a hum" on 14001.8. It identified itself as KKN39 and was calling KUO029. Ken wonders what it was and what it was doing in the 20-meter ham band.

Well, KKN39 is a U.S. State Department station used to make contact with American embassies. But we could use some help from our readers as to who KUO029 is and why the transmission was in the ham bands.

Bob Doyle of Connecticut reports reception of Radio Venceremos, the station of the El Salvador rebels. Bob heard them in Spanish on 6577 at various times between 0050 and 0122 UTC. The reason for the brevity of the transmission is that Venceremos changes frequency in order to avoid jamming.

Radio NewYork International – Coming Back!

We are hearing it from a number of sources -- Radio NewYork International will be back. You are strongly advised to keep a watch on 6240 and 1620 kHz. Of course, with the amazing RNI crowd, there is no telling where they may be broadcasting from this time.

TV Pirates

That TV pirate with his imitation of Max Hedroom some time back did pirate broadcasters no favor. His transmission, interfering with WGN-TV and another Chicago station, is the sort of thing which gives pirates a bad name. Responsible pirates try hard not to cause interference.

Numbers on Pagers

John, who lives in a midwestern state, offered a few comments on my section of this column known as "Pager Intrigue." John says that a group of fairly close knit ham operators hang out on a local 70 CM repeater and that most carry digital voice pagers related to their jobs.

John says that when he can't raise the person he wants on the repeater, he simply brings up the auto patch and pages the other ham with something like, "get on 8-7-0 and talk to me."

In the case of the digital pager, John says that he would punch in 448870, or 8870 or maybe 870. These digits would appear on the pager's LCD display and the other person then knows his presence is desired on the 448.870 machine.

John concludes by saying that he is of the opinion that the numbers going out on the air are on the "up and up." Tell that to Customs and the DEA, John!

I will say this however: while most transmissions are legitimate, some have their sinister and sleazy aspects.

The Return of Three Oh Nine Oh

They are back! Yep! Those good ole boys and gals of 3090 kHz are back after an unexplained absence of many weeks. Recently noted on some daylight hours and most after sunset, until at least 0600 UTC, they do not have a repeat frequency that could be located at the time of this writing. Maintain a close watch!

My numbers source also tells me that 3090 kHz is now -- or on some few occasions -- in parallel with 3290 kHz. Very interesting!

My source also tells me that 3290 is now almost as active during the evening hours as 3090 once was.

Live and computer-generated five-digit Spanish numbers are reported on 3636 kHz at various times after 0100 UTC. What about it, FCC? Don't the hams deserve an explanation?

German Numbers

Another numbers monitor reports live and non-computer-generated five-digit numbers in German on 6853 kHz at 0645 UTC. Frauline coughed and paused at various times throughout the transmission. Maintain a close watch from 6000 through 6925 kHz.

■

frequency SECTION

MT Monitoring Team

Joe Hanlon, PA

Bill Brinkley, CA

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.
* [ML] after a frequency indicates a multi-lingual transmission containing English-language programs.
* v after a frequency indicates that it varies.
* Notations of USB and LSB (upper and lower sideband transmissions) usually refer only to the individual frequency after which they appear.
* BBC listings followed by an asterisk (*) are for English lessons and do not contain regularly scheduled programming.

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.

0000 UTC [7:00 PM EST/4:00 PM PST]

0000-0015		Voice of Kampuchea, Phnom-Penh	9693 11938
0000-0030		BBC, London, England	5965 5975 6005 6120 6175 6195 7135 7325 9515 9570 9580 9590 9915 11945 11955 15435
0000-0030		Kol Israel, Jerusalem	7460 9435 9855
0000-0030	M	Radio Norway Int'l, Oslo	9605
0000-0030	S,M	WINB, Red Lion, Pennsylvania	15145
0000-0045		Radio Berlin Int'l, E. Germany	6080 9730
0000-0045		Radio New Zealand, Wellington	15150 17705
0000-0045		WYFR, Oakland, California	5950 9680
0000-0050		Radio Pyongyang, North Korea	15140 15160
0000-0055		Radio Beijing, PR China	9665 9770 11715
0000-0100		All India Radio, New Delhi	6055 7215 9535 9910 11715 11745 15110
0000-0100		CBN, St. John's, Newfoundland	6160
0000-0100		CBU, Vancouver, British Colombia	6130
0000-0100		CFCF, Montreal, Quebec	6005
0000-0100		CFCN, Calgary, Alberta	6030
0000-0100		CBN, St. John's, Newfoundland	6160
0000-0100		CBN, St. John's, Newfoundland	6160
0000-0100		CBU, Vancouver, British Colombia	6160
0000-0100		CFCF, Montreal, Quebec	6005
0000-0100		CFCN, Calgary, Alberta	6030
0000-0100		CHNS, Halifax, Nova Scotia	6130
0000-0100		CKWX, Vancouver, British Colombia	6080
0000-0100		CFRB, Toronto, Ontario	6070
0000-0100		FEBC, Manila, Philippines	15445
0000-0100		(US) Far East Network, Tokyo	3910
0000-0100		KSDA, Guam	15125
0000-0100		KUSW, Salt Lake City, Utah	11680
0000-0100		Radio Canada Int'l, Montreal	5960 9755
0000-0100		Radio Havana Cuba	6090
0000-0100		Radio Korea, Seoul, South Korea	15575
0000-0100		Radio Luxembourg	6090
0000-0100		Radio for Peace, Costa Rica	7380 [ML]
0000-0100		Radio Sofia, Bulgaria	6070 11720
0000-0100		Radio Thailand, Bangkok	9655 11905
0000-0100		SBC Radio One, Singapore	5010 5052 11940
0000-0100		Spanish Foreign Radio, Madrid	6125 9630
0000-0100	T-A	Voice of Nicaragua, Managua	6015
0030-0045		BBC, London, England*	6195 7235 9570 11820 15435
0030-0055		BRT, Brussels, Belgium	5910 9925
0030-0100		BBC, London, England	5965 5975 6005 6120 6175 7135 7325 9515 9580 9915 9590 11955
0030-0100		HCJB, Quito, Ecuador	9870 11775 11910 15155
0030-0100		Radio Kiev, Ukraine, USSR	6020 6200 7165 11790 11890 13645
0030-0100		SLBC, Colombo, Sri Lanka	6005 9720
0030-0100		WINB, Red Lion, Pennsylvania	15145
0035-0040		All India Radio, New Delhi	3925 4860
0045-0100		Radio Berlin Int'l, E. Germany	6080 9730
0045-0100	A	Radio New Zealand, Wellington	15150 17705
0045-0100		WYFR, Oakland, California	5950 9680
0050-0100		Vatican Radio, Vatican City	6150 7315 9605 11760

0100 UTC [8:00 PM EST/5:00 PM PST]

0100-0110		Vatican Radio, Vatican City	6150 7315 9605 11780
0100-0115		All India Radio, New Delhi	6055 7215 9535 9910 11715 11745 15110
0100-0120		RAI, Rome, Italy	5990 9575
0100-0125		Kol Israel, Jerusalem	7462 9435 9845
0100-0130		HCJB, Quito, Ecuador	9870 11775 11910 15155
0100-0130		Radio Berlin Int'l, E. Germany	6080 9730
0100-0130		Radio Canada Int'l, Montreal	9535 11845 11940
0100-0130	T-A	Radio Canada Int'l, Montreal	5960 9755
0100-0130		Radio Japan, Tokyo	15280 17810 17835 17845
0100-0130		Laotian National Radio	7113v
0100-0145		WYFR, Oakland, California	5950 9555 9680
0100-0150		Deutsche Welle, West Germany	6040 6085 6145 9545 9565 11795
0100-0200		(US) Armed Forces Radio and TV	6030 15345
0100-0200		BBC, London, England	5975 6005 6120 6175 7325 9515 9590 9915 9975
0100-0200		CBC Northern Quebec Service	6195 9625
0100-0200		CBN, St. John's, Newfoundland	6160
0100-0200		CBU, Vancouver, British Colombia	6160
0100-0200		CFCF, Montreal, Quebec	6005
0100-0200		CFCN, Calgary, Alberta	6030
0100-0200		CHNS, Halifax, Nova Scotia	6130
0100-0200		CKWX, Vancouver, British Colombia	6080
0100-0200		CFRB, Toronto, Ontario	6070
0100-0200		(US) Far East Network, Tokyo	3910
0100-0200		FEBC, Manila, Philippines	15445
0100-0200		KUSW, Salt Lake City, Utah	11680
0100-0200	T-A	KVOH, Rancho Simi, California	9495
0100-0200		Radio Australia, Melbourne	15320 15395 17715 17795 17750
0100-0200		Radio Baghdad, Iraq	6110
0100-0200		Radio Havana Cuba	6140
0100-0200		Radio Luxembourg	6090
0100-0200		Radio Moscow, USSR	5915 5940 6000 6045 6140 7115 7150 7215 7310 12050
0100-0200	A	Radio New Zealand, Wellington	15150 17705
0100-0200		Radio for Peace, Costa Rica	7380 [M]
0100-0200		Radio Prague, Czechoslovakia	5930 6055 7345 9540 9630 9740 11990
0100-0200		Radio Thailand, Bangkok	9655 11905
0100-0200		SBC Radio One, Singapore	5010 5052 11940
0100-0200		SLBC, Colombo, Sri Lanka	6005 9720 15425
0100-0200		Spanish Foreign Radio, Madrid	6125 9630
0100-0200		Voice of America, Washington	5995 6130 7205 9455 9650 9740 9775 9815 11580 11740 15205 17735 21540
0100-0200		Voice of Indonesia, Jakarta	9680 11790
0100-0200		WHRI, Noblesville, Indiana	7400
0100-0200		WINB, Red Lion, Pennsylvania	15145
0100-0200		WRNO, New Orleans, Louisiana	7355

frequency SECTION

0130-0200		HCJB, Quito, Ecuador	9720	9755	9870	11775	11910	15155
0130-0140	T-S	Voice of Greece, Athens	7430	9395	9420		
0130-0155		Radio Austria Int'l, Vienna	9550				
0130-0200	S,M	Radio Canada Int'l, Montreal	5960	9755			
0130-0200		Radio Veritas Asia, Philippines	15305	15330			
0145-0200		Radio Korea, Seoul, South Korea	7275	15375			
0145-0200		WYFR, Oakland, California	5950	9680			

0200 UTC [9:00 PM EST/6:00 PM PST]

0200-0210		Radio France Int'l, Paris	3965	5950	6055	9790	
0200-0210		Vatican Radio, Vatican City	6145				
0200-0225		Kol Israel, Jerusalem	7462	9435	9845		
0200-0225	T-A	Radio Budapest, Hungary	6025	6110	9520	9585	9835	11910
0200-0230		BBC, London, England	5975	6005	6050	6120	6175	7325	9515	9590	9915
0200-0230		Burma Bcasting Service, Rangoon	7185				
0200-0230		KUSW, Salt Lake City, Utah	11680				
0200-0230	M	Radio Austria Int'l, Vienna	9550				
0200-0230		Swiss Radio Int'l, Berne	5965	6135	9725	9885	12035
0200-0230		La Voz de Mosquitia, Honduras	4910.4				
0200-0230		WINB, Red Lion, Pennsylvania	15145				
0200-0250		Deutsche Welle, West Germany	5995	6035	7285	9615	9690
0200-0250		Radio Baghad, Iraq	6110				
0200-0250		Radio Bras, Brasilia, Brazil	11745				
0200-0255		Radio Bucharest, Romania	5990	6155	9510	9570	11810	11940
0200-0255		RAE, Buenos Aires, Argentina	9690	11710			
0200-0300		(US) Armed Forces Radio and TV	6030	15345			
0200-0300		CBC Northern Quebec Service	6195	9625			
0200-0300		CBN, St. John's, Newfoundland	6160				
0200-0300		CBU, Vancouver, British Colombia	6160				
0200-0300		CFCF, Montreal, Quebec	6005				
0200-0300		CFCN, Calgary, Alberta	6030				
0200-0300		CHNS, Halifax, Nova Scotia	6130				
0200-0300		CKWX, Vancouver, British Colombia	6080				
0200-0300		(US) Far East Network, Tokyo	3910				
0200-0300		HCJB, Quito, Ecuador	6230	9720	11775		
0200-0300	T-A	KVOH, Rancho Simi, California	9495				
0200-0300		KSDA, Guam	17865				
0200-0300		Radio Australia, Melbourne	15320	17750	17775		
0200-0300		Radio Cairo, Egypt	9475	9675			
0200-0300	T-A	Radio Canada Int'l, Montreal	5960	9755			
0200-0300		Radio Havana Cuba	6140				
0200-0300		Radio Korea (South), Seoul	7275	15575			
0200-0300		Radio Luxembourg	6090				
0200-0300		Radio Moscow, USSR	5915	5940	6000	6045	6070	7115	7150	7215	7250	7310	9580	11770	12050	13665
0200-0300		Radio for Peace, Costa Rica	7380	[ML]			
0200-0300	A	Radio New Zealand, Wellington	15150	17705			
0200-0300		Radio Polonia, Warsaw, Poland	6095	6135	7145	7270	9525	11815	15120		
0200-0300		Radio RSA, South Africa	9580	9615	11730		
0200-0300		Radio Thailand, Bangkok	9655	11905			
0200-0300		SBC Radio One, Singapore	5010	5052	11940		
0200-0300		SLBC, Colombo, Sri Lanka	6005	9720	15425		
0200-0300		Voice of America, Washington	5995	6130	9650	9740	9775	9815	11580	15205
0200-0300		Voice of Asia, Taiwan	7285				
0200-0300		Voice of Free China, Taiwan	5950	5985	7445	9755	11740	11745	11860	15345
0200-0300		Voice of Kenya, Nairobi	6045				
0200-0300		WHRI, Noblesville, Indiana	7400				
0200-0300		WRNO, New Orleans, Louisiana	7355				
0200-0300		WYFR, Oakland, California	5950	9680			
0215-0220		Radio Nepal, Kathmandu	3230	5005			
0230-0245		Radio Pakistan, Islamabad	7010	11570	15115	15580	17660			
0230-0300		BBC, London, England	5975	6005	6050	6120	6175	7125	7325	9515	9660	9915	11955	
0230-0300		KUSW, Salt Lake City, Utah	9755				
0230-0300		Radio Berlin Int'l, E. Germany	6080	9730			
0230-0300		Radio Netherland, Hilversum	6020	6165	9590	9895	
0230-0300	T-A	Radio Portugal, Lisbon	6060	9635	9680	9705	9705	11840			
0230-0300		Radio Sweden Int'l, Stockholm	9695	11950	[USB]		
0230-0300		Radio Tirana, Albania	7065	9760			
0230-0300	S,M	WINB, Red Lion, Pennsylvania	15145				
0240-0250		All India Radio, New Delhi	3905	4860	4880	4895	5960	5990	6110	6120	7195	7295	9550	9610	11830	11870	15305
0245-0300		Radio Berlin Int'l, E. Germany	6125	6165			

0300 UTC [10:00 PM EST/7:00 PM PST]

0300-0307		Radio Pakistan, Islamabad	5090	5930	7095		
0300-0310		CBC Northern Quebec Service	6195	9625			
0300-0315		BBC, London, England	3955	5975	6005	6050	6105	6120	6175	6195	7125	7160	7185	7210	7325	9410	9515	9600	9660	9915	11740	11955	15380
0300-0325		Radio Budapest, Hungary	6025	6110	9520	9585	11910
0300-0325		Radio Netherland, Hilversum	6020	6165	9590	9895	
0300-0330		Radio Cairo, Egypt	9475	9675			
0300-0330		Radio Japan, Tokyo	11870	17825	21610		
0300-0330		Radio Kiev, Ukraine, USSR	6020	6200	7165	11790	11860	13645			
0300-0330	S,M	WINB, Red Lion, Pennsylvania	15145				
0300-0345		Radio Berlin Int'l, E. Germany	6080	9560			
0300-0345	A	Radio New Zealand, Wellington	15150	17705			
0300-0350		Deutsche Welle, West Germany	6010	6045	9545	9700	
0300-0355		Radio Beijing, PR China	9645	9770	11715	11980	15455				
0300-0355		Radio Polonia, Warsaw, Poland	6095	6135	7145	7270	9525	11815	15120		
0300-0400		(US) Armed Forces Radio and TV	6030	11730			
0300-0400		CBN, St. John's, Newfoundland	6160				
0300-0400		CBU, Vancouver, British Colombia	6160				
0300-0400		CFCF, Montreal, Quebec	6005				
0300-0400		CFCN, Calgary, Alberta	6030				
0300-0400		CHNS, Halifax, Nova Scotia	6130				
0300-0400		CKWX, Vancouver, British Colombia	6080				
0300-0400		CFRB, Toronto, Ontario	6070				
0300-0400		(US) Far East Network, Tokyo	3910				
0300-0400		HCJB, Quito, Ecuador	6230	9720	11775		
0300-0400		KUSW, Salt Lake City, Utah	9755				
0300-0400	T-A	KVOH, Rancho Simi, California	9495				
0300-0400		La Voz Evangelica, Honduras	4820				
0300-0400		Radio Australia, Melbourne	15160	15320	17795		
0300-0400		Radio Havana Cuba	6115	6140			
0300-0400		Radio Japan, Tokyo	5960	117810	17845		
0300-0400		Radio Moscow, USSR	5915	5940	6000	6045	6045	6070	7115	7150	7310						
0300-0400		Radio Prague, Czechoslovakia	5930	6055	7345	9540	9630	9740	11990		
0300-0400		Radio RSA, South Africa	4990	7295	9580	11900	
0300-0400		Radio Thailand, Bangkok	9655	11905			
0300-0400		Radio Tirana, Albania	7065	9755			
0300-0400		SBC Radio One, Singapore	5010	5052	11940		
0300-0400		SLBC, Colombo, Sri Lanka	6005	9720	15425		
0300-0400		Trans World Radio, Bonaire	9535				
0300-0400		Voice of America, Washington	6035	7200	7280	9525	9550	9575	9740	11835							

frequency SECTION

0300-0400	Voice of Free China, Taiwan	5950	5985	7445	9555
		11745	15345		
0300-0400	Voice of Kenya, Nairobi	6045			
0300-0400	Voice of Nicaragua, Managua	6100			
0300-0400	WHRI, Noblesville, Indiana	7400			
0300-0400	WRNO, New Orleans, Louisiana	7355			
0300-0400	WYFR, Oakland, California	5950	9680		
0310-0330	Red Cross Bcasting, Switzerland	6135	9725	9885	12035
		[2-2-88 and 2-5-88 only]			
0310-0330	Vatican Radio, Vatican City	6150			
0313-0400	Radio France Int'l, Paris	6055	7135	7175	9800
		11995			
0315-0330	BBC, London, England	3955	5975	6005	6105
		6120	6155	6175	6195
		7125	7160	7185	7210
		7325	9410	9515	9600
		9660	9915	11955	15380
0330-0340	Radio France Int'l, Paris	3965	6055	6175	7135
		7175	9550	9790	9800
		11995			
0300-0355	Radio Finland, Helsinki	9635	11945		
0330-0400	BBC, London, England	3955	5975	6105	6175
		6195	6120	7185	9410
		9570	11955		
0330-0400	Radio Tanzania, Dar es Salaam	9684			
0330-0400	Radio Sweden Int'l, Stockholm	11705			
0330-0400	United Arab Emirates Radio	11940	15435	17890	
0335-0340	All India Radio, New Delhi	3905	4860	9610	11830
		11870	11890	15305	
0340-0350 T-S	Voice of Greece, Athens	7430	9395	9420	
0345-0400	Radio New Zealand, Wellington	15150	17705		
0350-0400	Radio Yerevan, Armenia, USSR	11790	11890	13645	
0350-0400	RAI, Rome, Italy	9710	11905	15330	

0400 UTC [11:00 PM EST/8:00 PM PST]

0400-0405	Radio Uganda, Kampala	4976	5026		
0400-0410	Radio Thailand, Bangkok	9655	11905		
0400-0410	RAI, Rome, Italy	9710	11905	15330	
0400-0415 W,A	Radio Budapest, Hungary	6025	6110	9520	9585
		9835	11910		
0400-0420 T-S	Radio Zambia, Lusaka	3345	6165		
0400-0425	Radio Netherland, Hilversum	7210	9850		
0400-0430	La Voz Evangelica, Honduras	4820			
0400-0430 M	Radio Norway Int'l, Oslo	9530	9630		
0400-0430	Radio RSA, South Africa	4990	7295	9580	11900
0400-0430	SLBC, Colombo, Sri Lanka	6005	9720	15425	
0400-0430	Radio Sofia, Bulgaria	4980			
0400-0430	Radio Tanzania, Dar es Salaam	9684			
0400-0430	Swiss Radio Int'l, Berne	6135	9725	9885	12035
0400-0430	Trans World Radio, Bonaire	9535			
0400-0450	Radio Havana Cuba	5965	6035	6115	6140
0400-0450	Radio Pyongyang, North Korea	15160	15180		
0400-0450	Voice of Turkey, Ankara	9445	17760		
0400-0455	Radio Beijing, PR China	9645	11980		
0400-0455	RAE, Buenos Aires, Argentina	9690	11710		
0400-0500	(US) Armed Forces Radio and TV	6030	11730		
0400-0500	CBC Northern Quebec Service	6195			
0400-0500	CBN, St. John's, Newfoundland	6160			
0400-0500	CBU, Vancouver, British Colombia	6160			
0400-0500	CFCF, Montreal, Quebec	6005			
0400-0500	CFCN, Calgary, Alberta	6030			
0400-0500	CHNS, Halifax, Nova Scotia	6130			
0400-0500	CKWX, Vancouver, British Colombia	6080			
0400-0500	CFRB, Toronto, Ontario	6070			
0400-0500	HCJB, Quito, Ecuador	6230	9720	11775	
0400-0500	(US) Far East Network, Tokyo	3910			
0400-0500	FEBC, Manila, Philippines	11850			
0400-0500	KUSW, Salt Lake City, Utah	9755			
0400-0500	Radio Australia, Melbourne	15160	15320	17715	17795
0400-0500	Radio Moscow, USSR	4890	5940	6000	7150
		7165	12050		
0400-0500	Radio New Zealand, Wellington	15150	17705		
0400-0500	Radio Sofia, Bulgaria	7115	7215	7280	9595
		11735			
0400-0500	SBC Radio One, Singapore	5010	5052	11940	
0400-0500	Spanish Foreign Radio, Madrid	6125			
0400-0500	United Nations Radio (?)	4820			
0400-0500	Voice of America, Washington	5995	6035	7280	9525
		9575	11835		
0400-0500	Voice of Kenya, Nairobi	6045			
0400-0500	WHRI, Noblesville, Indiana	7400			
0400-0500 M-A	WMLK, Bethel, Pennsylvania	9455			
0400-0500	WRNO, New Orleans, Louisiana	6185			
0400-0500	WYFR, Oakland, California	5950	7355	9680	
0425-0440	RAI, Rome, Italy .	6165	7275		
0430-0455	Radio Austria Int'l, Vienna	6000	6075	11805	
0430-0500	Deutsche Welle, West Germany	6065	7150	7225	9565
		9765			
0430-0500	Radio Berlin Int'l, E. Germany	6080	9560		
0430-0500	Radio Tirana, Albania	9480	11835		
0430-0500 S,M	Trans World Radio, Bonaire	9535			
0430-0500	Trans World Radio, Swaziland	3205	7205		
0430-0500	Voice of Nigeria, Lagos	7255			
0440-0450	Radio France Int'l, Paris	4890	5990	6055	6175
		7135	7175	7280	9550
		9790	9800	11700	
0445-0500	Radio Berlin Int'l, E. Germany	5965	9620	11920	
0450-0500	Radio Havana Cuba	5965	6035	6090	6115

0500 UTC [12:00 PM EST/9:00 PM PST]

0500-0510	Radio Lesotho, Maseru	4800			
0500-0510 M-A	Radio Zambia, Lusaka	3345	6165		
0500-0515	Deutsche Welle, West Germany	6065	7150	7225	9565
		9765			
0500-0515	Kol Israel, Jerusalem	7355	7410	9385	9435
		9460	11655	11700	17615
0500-0515	Radio Berlin Int'l, E. Germany	6080	9560		
0500-0515 ?	Radio Garoua, Cameroon	5010			
0500-0515	Vatican Radio, Vatican City	11725	15190		
0500-0530	Deutsche Welle, West Germany	5960	6120	6130	9635
0500-0530	Radio Berlin Int'l, E. Germany	5965	9620	11920	
0500-0530 M	Radio Norway Int'l, Oslo	6015	9620		
0500-0530 S,M	Trans World Radio, Bonaire	9535			
0500-0530	Trans World Radio, Swaziland	3205	5055	7210	
0500-0600	CBC Northern Quebec Service	6160			
0500-0600	CBU, Vancouver, British Colombia	6160			
0500-0600	CFCF, Montreal, Quebec	6005			
0500-0600	CFCN, Calgary, Alberta	6030			
0500-0600	CHNS, Halifax, Nova Scotia	6130			
0500-0600	CKWX, Vancouver, British Colombia	6080			
0500-0600	CFRB, Toronto, Ontario	6070			
0500-0600	(US) Far East Network, Tokyo	3910			
0500-0600	FEBC, Manila, Philippines	11850			
0500-0600	HCJB, Quito, Ecuador	6230	9870	11775	
0500-0600	KUSW, Salt Lake City, Utah	11680			
0500-0600	Radio Cameroon, Yaounde	4850			
0500-0600	Radio Havana Cuba	5965	6035	6090	6115
0500-0600	Radio Japan, Tokyo	5990	15235	17810	
0500-0600	Radio Kuwait	15345			
0500-0600	Radio New Zealand, Wellington	15150	17705		
0500-0600	Radio Thailand, Bangkok	9655	11905		
0500-0600 S	Radio Zambia, Lusaka	11880			
0500-0600	SBC Radio One, Singapore	5010	5052	11940	
0500-0600	Spanish Foreign Radio, Madrid	6125			
0500-0600 S	Swaziland Commercial Radio	6155	9705		
0500-0600	Voice of Kenya, Nairobi	6045			
0500-0600	Voice of Nigeria, Lagos	7255	15120	15185	
0500-0600 M-A	WMLK, Bethel, Pennsylvania	9455			
0500-0600	WYFR, Oakland, California	5950			
0510-0520	Radio Botswana, Gaborone	3356	4820	7255	
0530-0545	BBC, London, England*	3990	6050	6140	7210
		9750			
0530-0555	Radio Bucharest, Romania	9640	11840	11940	15340
		15380	17720		

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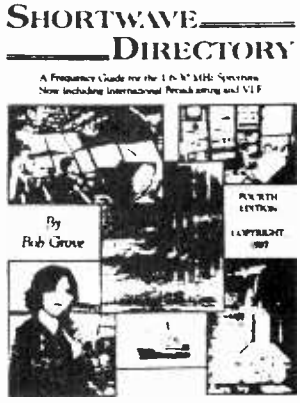

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frequency SECTION

0530-0555		Radio Finland, Helsinki	6120	9605	11755	
0530-0600		Radio Netherland, Hilversum	6165	9715		
0530-0600		Trans World Radio, Swaziland	5055	7210		
0530-0600		UAE RAdio, United Arab Emirates	15435	17775	21700	
0555-0600		Voice of Malaysia, Kuala Lumpur	6175	9750	15295	

0600 UTC [1:00 AM EST/10:00 PM PST]

0600-0615		Radio Ghana, Accra	3366	4915		
0600-0615	M-A	Radio Zambia, Lusaka	6165	7235		
0600-0620		Vatican Radio, Vatican City	6185	9645		
0600-0625		Radio Netherlands, Hilversum	6165	9715		
0600-0630		Laotian National Radio	7113			
0600-0630		Radio New Zealand, Wellington	15150	17705		
0600-0630		Trans World Radio, Swaziland	5055	6070	7210	
0600-0630		Voice of Kenya, Nairobi	6045			
0600-0645		HCJB, Quito, Ecuador	6205	6230	9870	11775
0600-0645	S	Radio Cameroon, Yaounde	4850			
0600-0650		Radio Pyongyang, North Korea	9530	15160	15180	
0600-0700		CBU, Vancouver, British Colombia	6160			
0600-0700		CFCF, Montreal, Quebec	6005			
0600-0700		CFCN, Calgary, Alberta	6030			
0600-0700		CHNS, Halifax, Nova Scotia	6130			
0600-0700		CKWX, Vancouver, British Colombia	6080			
0600-0700		CFRB, Toronto, Ontario	6070			
0600-0700		(US) Far East Network, Tokyo	3910			
0600-0700	F	FEBA, Mahe, Seychelles	17855			
0600-0700		King of Hope, South Lebanon	6215			
0600-0700		KUSW, Salt Lake City, Utah	6135			
0600-0700		Radio Havana Cuba	9505			
0600-0700		Radio Korea, Seoul, South Korea	6060	7275	9570	
0600-0700		Radio Kuwait	15345			
0600-0700	A,S	Radio Thailand, Bangkok	9655	11905		
0600-0700	S	Radio Zambia, Lusaka	11880			
0600-0700		SBC Radio One, Singapore	5010	5052	11940	
0600-0700		Voice of Asia, Taiwan	7285			
0600-0700		Voice of Malaysia, Kuala Lumpur	6175	9750	15295	
0600-0700		Voice of Nigaria, Lagos	15185			
0600-0700	M-A	WMLK, Bethel, Pennsyvlania	9455			
0600-0700		WYFR, Oakland, California	5950	6065	7355	
			9852.5			
0615-0630	M-F	Radio Canada Int'l, Montreal	6050	6140	7155	9740
			9760	11840	15235	
0615-0630		Radio Korea, Seoul, South Korea	13670			
0615-0630	M-A	Vatican Radio, Vatican City	15190	17730		
0615-0700		Deutsche Welle, West Germany	9610	9700	11765	15185
0630-0655		Radio Austria Int'l, Vienna	6000	6155	15410	
0630-0655		Radio Netherland, Hilversum	9895	11930		
0630-0700		Radio Polonia, Warsaw, Poland	6135	7270	15120	
0630-0700		Radio RSA, South Africa	7295	15125	17780	17825
0630-0700		Radio Tirana, Albania	7205	9500		
0630-0700		Swiss Radio Int'l, Berne	12030	15430	17570	
0630-0700		Trans World Radio, Swaziland	5055	6070	7210	9725
0630-0700	A,S	Voice of Kenya, Nairobi	7270			
0645-0700		BBC, London, England*	6150	7260	11945	
0645-0700		HCJB, Quito, Ecuador	6130	9745	11925	
0645-0700		Radio Berlin Int'l, E. Germany	15240	17880	21465	21540
0645-0700		Radio Bucharest, Romania	11940	15250	15335	17790
			17805	21665		
0645-0700	M-F	Radio Canada Int'l, Montreal	6050	6140	7155	9740
			9760	11840	15235	
0645-0700		Radio Ghana, Accra	6130			
0650-0656		Radio Chile, Santiago (?)	7205			

0700 UTC [2:00 AM EST/11:00 PM PST]

0700

0700-0710		Radio Bucharest, Romania	11940	15250	15335	17790
			17805	21665		
0700-0710		Radio Sierra Leone, Freetown	5980			
0700-0715		Radio Ghana (HS), Freetown	3366	4915		
0700-0730		Burma Bcasting Service, Rangoon	9730			
0700-0730		Radio Berlin Int'l, E. Germany	15240	17880	21465	21540
0700-0730	S	Radio Zambia, Lusaka	11880			
0700-0745		Radio Berlin Int'l, E. Germany	5965	11810		
0700-0745		WYFR, Oakland, California	6065	7355	9852.5	
0700-0750		Radio Pyongyang, North Korea	13750	15340		
0700-0800		BBC, London, England	7180			
0700-0800		CBU, Vancouver, British Colombia	6130			
0700-0800		CFCF, Montreal, Quebec	6005			
0700-0800		CFCN, Calgary, Alberta	6030			
0700-0800		CHNS, Halifax, Nova Scotia	6130			
0700-0800		CKWX, Vancouver, British Colombia	6080			
0700-0800		CFRB, Toronto, Ontario	6070			
0700-0800		ELWA, Monrovia, Liberia	11830			
0700-0800		(US) Far East Network, Tokyo	3910			
0700-0800		HCJB, Quito, Ecuador	6130	6205	9745	9860
			11835	11925		
0700-0800		King of Hope, South Lebanon	6215			
0700-0800		KUSW, Salt Lake City, Utah	6135			
0700-0800		Radio Ghana, Accra	6130			
0700-0800		Radio Havana Cuba	9505			
0700-0800		Radio Japan, Tokyo	5990	15195	15235	17810
			21695			
0700-0800		Radio Kuwait	15345			
0700-0800	A,S	Radio Thailand, Bangkok	9655	11905		
0700-0800		Trans World Radio, Swaziland	6070	9725		
0700-0800		Voice of Free China, Taiwan	5985			
0700-0800	A,S	Voice of Kenya, Nairobi	7270			
0700-0800		Voice of Malaysia, Kuala Lumpur	6175	9750	15295	
0700-0800		Voice of Nigeria, Lagos	15120	15185		
0700-0800		WYFR, Oakland, California	11580			
0715-0730	M-A	Vatican Radio, Vatican City	11725	15190		
0715-0800	S	FEBA, Mahe, Seychelles	15325	17785		
0720-0730	M-A	Vatican Radio, Vatican City	6248	9645	11740	
0725-0800		Trans World Radio, Monte Carlo	7105			
0730-0800		ABC, Alice Springs, Australia	2310	[ML]		
0730-0800		ABC, Katherine, Australia	2485			
0730-0800		ABC, Tennant Creek, Australia	2325	[ML]		
0730-0735		All India Radio, New Delhi	5990	6010	6020	7110
			7205	9610	9675	11850
			11935	15235	15250	17705
0730-0745		BBC, London, England*	3975	6010	7230	9915
0730-0755		Radio Finland, Helsinki	6120	9560	11755	
0730-0800		Radio Netherland, Hilversum	9630	9715		
0730-0800		Radio Prague, Czechoslovakia	11685	17840	21705	
0730-0800		Radio Sofia, Bulgaria	9700	11720		
0730-0800		Swiss Radio Int'l, Berne	3985	6165	9535	
0740-0757		Red Cross Broadcasting Service	9560	9885	17830	21695
			(2-1, 2-4, and 2-9-88 only)			
0745-0800		Radio Prague, Czechoslovakia	6055	7345	9505	

0800 UTC [3:00 AM EST/12:00 PM PST]

0800-0815	M-A	Radio Zambia, Lusaka	6165	7235		
0800-0825	M-F	BRT, Brussels, Belgium	5910	17600		
0800-0825		Radio Netherland, Hilversum	9630	9715		
0800-0825		Voice of Malaysia, Kuala Lumpur	6175	9750	15295	
0800-0830		HCJB, Quito, Ecuador	9860	11835		
0800-0830		Radio Bangladesh, Dhaka	12030	15525		
0800-0830		Radio Tirana, Albania	9500	11835		
0800-0835	S	FEBA, Mahe, Seychelles	15325,	17785		
0800-0835		Trans World Radio, Swaziland	6070	9725		
0800-0850		Radio Pyongyang, North Korea	9530	11830	15160	15180
0800-0900		ABC, Alice Springs, Australia	2310	[ML]		
0800-0900		ABC, Katherine, Australia	2485			
0800-0900		ABC, Tennant Creek, Australia	2325	[ML]		
0800-0900		CBN, St. John's, Newfoundland	6160			
0800-0900		CBU, Vancouver, British Colombia	6160			
0800-0900		CFCF, Montreal, Quebec	6005			
0800-0900		CFCN, Calgary, Alberta	6030			
0800-0900		CHNS, Halifax, Nova Scotia	6130			
0800-0900		CKWX, Vancouver, British Colombia	6080			
0800-0900		CFRB, Toronto, Ontario	6070			
0800-0900		(US) Far East Network, Tokyo	3910			

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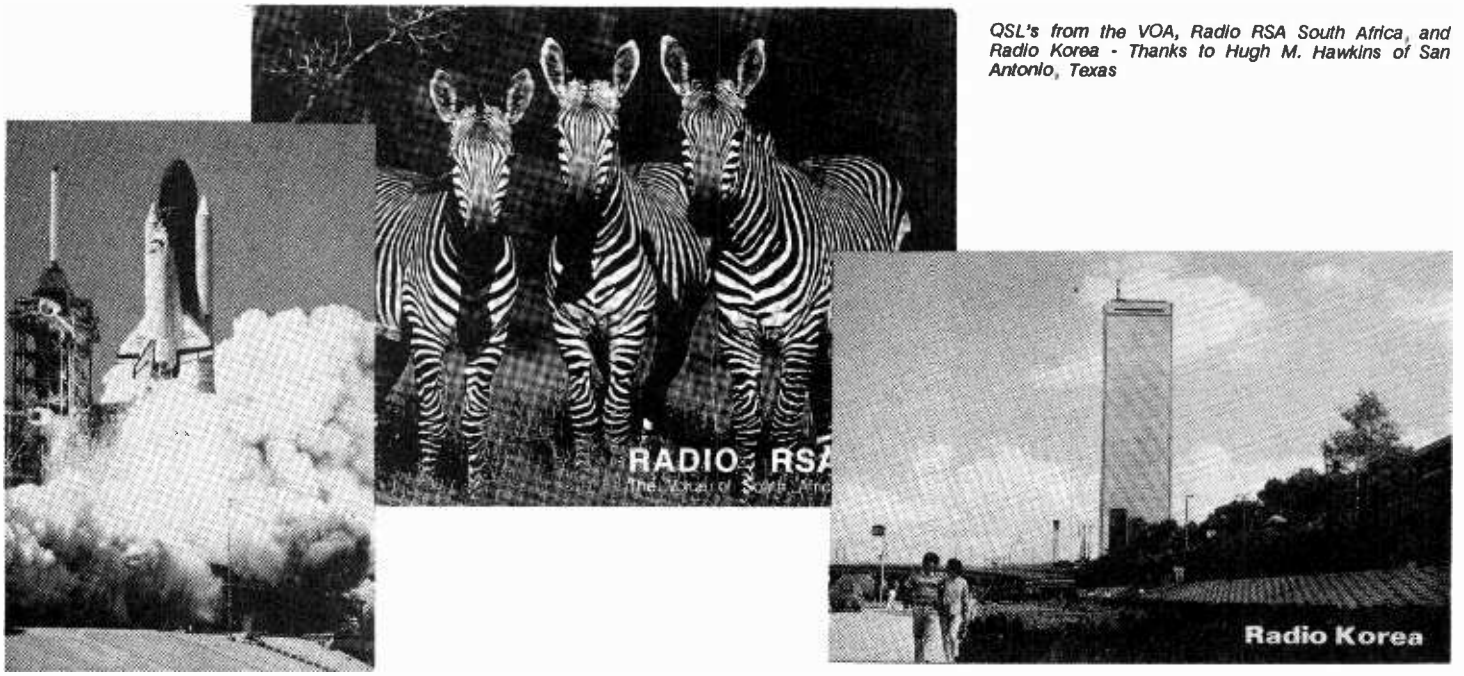
0800-0900		HCJB, Quito, Ecuador	6130	9745	11925		
0800-0900		King of Hope, South Lebanon	6215				
0800-0900		KNLS, Anchor Point, Alaska	6150				
0800-0900		KUSW, Salt Lake City, Utah	6135				
0800-0900		SBC Radio One, Singapore	5010	5052	11940		
0800-0900		Trans World Radio, Monte Carlo	7105				
0800-0900		Voice of Indonesia, Jakarta	11790	15105			
0800-0900	A,S	Voice of Kenya, Nairobi	7270				
0800-0900		Voice of Nigeria, Lagos	7255	15185			
0800-0900		WYFR, Oakland, California	11580				
0805-0900		KTWR, Agana, Guam	11805				
0815-0830	S	Radio Austria Int'l, Vienna	6155	11915	15410	15415	
0815-0830		Radio Korea, Seoul, South Korea	9570				
0815-0845	M-F	Voice of America, Washington DC	7175	9575	9750	11710	
			11915	15600	17715	21500	
			[ML]				
0815-0900	A,S	Radio Berlin Int'l, E. Germany	6040	7185	9730	21465	
			21540				
0830-0840		All India Radio, New Delhi	5960	5990	6010	6020	
			6050	6065	6100	6140	
			7110	7140	7160	7250	
			7280	7295	9610	11850	
			15235	15250	17705		
0830-0855		Radio Austria Int'l, Vienna	6155	11915	15410	15415	
0830-0855	M-A	Radio Netherland, Hilversum	9630				
0830-0900	S	Bhutan Bcasting Service, Thimpu	6035				
0830-0900		FEBC, Manila, Philippines	11850	15350			
0830-0900		Radio Beijing, China	9700	11755	15440		
0830-0900		Radio Netherland, Hilversum	21486				
0830-0900		Radio Prague, Czechoslovakia	11685	17840	21705		
0830-0900		Swiss Radio Int'l, Berne	9560	9885	17830	21695	
0830-0900		Voice of Nigeria, Lagos	15120				
0840-0850	M-A	Voice of Greece, Athens	9855	15630			
0845-0900		Radio Prague, Czechoslovakia	6055	7345	9505		
0850-0900		All India Radio, New Delhi	5960	5990	6010	6020	
			6050	6065	6100	6140	
			7110	7140	7150	7160	
			7250	7280	7295	9610	
			11850	15235	15250	17705	

0900 UTC [4:00 AM EST/1:00 AM PST]

0900-0905		Africa No. 1, Gabon	7200	15200			
0900-0910		All India Radio, New Delhi	5960	5990	6010	6020	
			6050	6065	6100	6140	
			7110	7140	7150	7160	
			7250	7280	7295	9610	
			11850	15235	15250	17705	
0900-0910		Voice of Lebanon, Beirut	6548				
0900-0930		FEBC, Manila, Philippines	11850	15350			
0900-0930		KTWR, Agana, Guam	11805				
0900-0930		Radio Beijing, China	9700	11755	15440		
0900-0930		Radio Netherland, Hilversum	21485				
0900-0930	A,S	Radio Prague, Czechoslavkia	11685	17840	21705		
0900-0950		Deutsche Well, West Germany	6160	17780	21650	21680	
0900-1000		ABC, Alice Springs, Australia	2310	[ML]			
0900-1000		ABC, Katherine, Australia	2485				
0900-1000		ABC, Tennant Creek, Australia	2325	[ML]			
0900-1000	S	Adventist World Radio, Portugal	9670				
0900-1000		CFCF, Montreal, Quebec	6005				
0900-1000		CFCN, Calgary, Alberta	6030				
0900-1000		CHNS, Halifax, Nova Scotia	6130				
0900-1000		CKWX, Vancouver, British Colombia	6080				
0900-1000		CFRB, Toronto, Ontario	6070				
0900-1000		(US) Far East Network, Tokyo	3910				
0900-1000		King of Hope, South Lebanon	6215				
0900-1000		KNLS, Anchor Point, Alaska	6150				
0900-1000		KUSW, Salt Lake City, Utah	6135				
0900-1000		Radio Afghanistan, Kabul	4450	6085	15435	17720	
0900-1000		Radio Japan, Tokyo	11840	15235	17810		
0900-1000	S	Radio Prague, Czechoslovakia	6055	7345	9505	[ML]	
0900-1000		Radio Tanzania, Dar es Salaam	7165				
0900-1000		SBC Radio One, Singapore	5010	5052	11940		
0900-1000		Trans World Radio, Monte Carlo	7105				
0900-1000		Voice of Kenya, Nairobi	7270				
0900-1000		Voice of Nigeria, Lagos	7255	15120	15185		
0915-0950	M-A	Radio Ulan Bator, Mongolia	9615	12015			



QSL's from the VOA, Radio RSA South Africa, and Radio Korea - Thanks to Hugh M. Hawkins of San Antonio, Texas

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0930-0935		All India Radio, New Delhi	5960	5990	6010	6020	
			6050	6065	6100	6140	
			7110	7140	7160	7250	
			7280	7295	9610	11850	
			15235	15250	17705		
0930-0940	M-F	Radio Canada Int'l, Montreal	5960	9755			
0930-0945		BBC, London, England*	9725	11955			
0930-0955		Radio Finland, Helsinki	6120	15245	17860		
0930-1000		CBN, St. John's, Newfoundland	6160				
0930-1000		KTWR, Agana, Guam	11805				
0930-1000		Radio Beijing, China	9700	11755	15440		
0930-1000		Radio New Zealand, Wellington	9540	11780			
0930-1000		Radio Sweden Int'l, Stockholm	9630	15390			
0945-1000		BBC, London, England*	5995	7180	9725	11955	
0945-1000		Radio Berlin Int'l, E. Germany	21540				
0945-1000	M-A	Radio Prague, Czechoslovakia	6055	7345	9505		

1000 UTC [5:00 AM EST/2:00 AM PST]

1000-1025	M-F	BRT, Brussels, Belgium	5510	17595			
1000-1030		Deutsche Welle, West Germany	7225	9735	17765	21600	
1000-1030		HCJB, Quito, Ecuador	6130	9745	11925		
1000-1030		KUSW, Salt Lake City, Utah	6135				
1000-1030		Radio Afghanistan, Kabul	4450	6085	15435	17720	
1000-1030		Radio Beijing, China	9700	11755	15440		
1000-1030		Radio Berlin Int'l, E. Germany	21540				
1000-1030	S	Radio Norway Int'l, Oslo	9590	15180	15235	17780	
1000-1030		Radio Tanzania, Dar es Salaam	7165				
1000-1030		Swiss Radio Int'l, Berne	9560	9885	17830	21695	
1000-1030		Voice of Ethiopia, Addis Ababa	9560				
1000-1030		Voice of Vietnam, Hanoi	9840	12020			
1000-1055	A	Trans World Radio, Monte Carlo	7105				
1000-1100		ABC, Alice Springs, Australia	2310	[ML]			
1000-1100		ABC, Katherine, Australia	2485				
1000-1100		ABC, Tennant Creek, Australia	2325	[ML]			
1000-1100		All India Radio, New Delhi	11860	11920	15130	15335	
			17387	117875			
1000-1100		CBN, St. John's, Newfoundland	6160				
1000-1100		CFCF, Montreal, Quebec	6005				
1000-1100		CFCN, Calgary, Alberta	6030				
1000-1100		CHNS, Halifax, Nova Scotia	6130				
1000-1100		CKWX, Vancouver, British Colombia	6080				
1000-1100		CFRB, Toronto, Ontario	6070				
1000-1100		(US) Far East Network, Tokyo	3910				
1000-1100		KNLS, Anchor Point, Alaska	6150				
1000-1100		KTWR, Agana, Guam	11805				
1000-1100		Radio New Zealand, Wellington	9540	11780			
1000-1100	S	Radio Prague, Czechoslovakia	6055	7345	9505	[ML]	
1000-1100		SBC Radio One, Singapore	5010	5052	11940		
1000-1100		Voice of Kenya, Nairobi	7270				
1000-1100		Voice of Nigeria, Lagos	7255	15120			
1005-1010		Radio Pakistan, Islamabad	15606	17660			
1030-1040		Voice of Asia, Taiwan	5980				
1030-1055		Radio Budapest, Hungary	9835	11910	17710	17780	
			21525				
1030-1100		HCJB, Quito, Ecuador	6130	11925			
1030-1100		KUSW, Salt Lake City, Utah	15225				
1030-1100		Radio Netherlands, Hilversum	6020	9650			
1030-1100	A,S	Radio Tanzania, Dar es Salaam	7165				
1030-1100		SLBC, Colombo, Sri Lanka	11835	15120	17850	[ML]	
1030-1100		UAE Radio, United Arab Emirates	15435	17865	21605		
1040-1050	M-A	Voice of Greece, Athens	11645	15630			
1040-1057		Red Cross Broadcasting Service	9885	11935	15570	17830	
			(2-1, 2-4, 2-29-88 only)				
1045-1055	M-A	Radio Bucharest, Romania	9690	11940	15405		
1045-1100	M-A	Radio Prague, Czechoslovakia	6055	7345	9505		
1055-1100	S	Trans World Radio, Monte Carlo	7105				

1100 UTC [6:00 AM EST/3:00 AM PST]

1100-1105		Radio Pakistan, Islamabad	6090	7290			
1100-1115		Radio New Zealand, Wellington	9540	11780			
1100-1120		Radio Pakistan, Islamabad	15606	17760			
1100-1125		Radio Netherland, Hilversum	6020	9650			
1100-1130		HCJB, Quito, Ecuador	6130	11925			
1100-1130		Kol Israel, Jerusalem	9385	11700	15485	15640	
			15650	17635	17685	21625	
1100-1130	TES	Radio Caroline, Offshore, Europe	5955				
1100-1130		Radio Japan, Tokyo	5990	6120	7210	17810	
1100-1130		Radio Mozambique, Maputo	9525	11818	11835		
1100-1130		Radio Sweden Int'l, Stockholm	6065	9630	21690		
1100-1130		Red Cross Broadcasting Service	7210	(2-28-88 only)			
1100-1130		SLBC, Colombo, Sri Lanka	11835	15120	17850	[ML]	
1100-1130		Swiss Radio Int'l, Berne	9885	11935	15570	17830	
1100-1130		Voice of Vietnam, Hanoi	7430	9732			
1100-1150		Radio Pyongyang, North Korea	6576	9600	11735		
1100-1155		Radio Beijing, China	9665				
1100-1200		ABC, Alice Springs, Australia	2310	[ML]			
1100-1200		ABC, Katherine, Australia	2485				
1100-1200		ABC, Tennant Creek, Australia	2325	[ML]			
1100-1200		(US) Armed Forces Radio and TV	6030	6125	15430		
1100-1200		CBN, St. John's, Newfoundland	6160				
1100-1200		CFCF, Montreal, Quebec	6005				
1100-1200		CFCN, Calgary, Alberta	6030				
1100-1200		CHNS, Halifax, Nova Scotia	6130				
1100-1200		CKWX, Vancouver, British Colombia	6080				
1100-1200		CFRB, Toronto, Ontario	6070				
1100-1200		(US) Far East Network, Tokyo	3910				
1100-1200		Radio Australia, Melbourne	5995	6060	6080	7215	
			9580	9710			
1100-1200		Radio Korea, Seoul, South Korea	15575				
1100-1200		Radio Moscow, USSR	6000	11670	11900	13790	
			15225	15475			
1100-1200		Radio RSA, South Africa	9750	15390	21590		
1100-1200	A,S	Radio Tanzania, Dar es Salaam	7165				
1100-1200	S	Radio Zambia, Lusaka	11880	[IRR]			
1100-1200		Voice of America, Washington	5975	6160	9590		
1100-1200		Voice of Asia, Taiwan	5980	7445			
1100-1200		Voice of Kenya, Nairobi	7270				
1100-1200		Voice of Nigeria, Lagos	7255	15120			
1100-1200		WHRI, Noblesville, Indiana	5995				
1100-1200		WYFR, Oakland, California	5950				
1110-1120	M-F	Radio Botswana, Gaborone	4820	5955	7255		
1115-1125		Radio France Int'l, Paris	6175	9790	9805	11670	
			11700	11845	15155	15195	
			15300	15315	15435	17620	
			17850	21620			
1115-1130		Radio Korea, Seoul, South Korea	7275	11740			
1115-1130		Vatican Radio, Vatican City	11840	21485			
1115-1145		Radio Nepal, Kathmandu	5005				
1115-1200		Trans World Radio, Bonaire	11815				
1115-1200		Voice of Islamic Republic Iran	11790				
1130-1200		Deutsche Welle, West Germany	15410	17765	17800	21600	
1130-1200		HCJB, Quito, Ecuador	11740				
1130-1200		Radio Japan, Tokyo	5990	6120	7210		
1130-1200		Radio Netherland, Hilversum	5995	9715	15560	17575	
			17605	21480			
1130-1200		Radio Thailand, Bangkok	9655	11905			
1130-1200		Radio Tirana, Albania	9480	11855			
1135-1140		All India Radio, New Delhi	6065	7110	9610	9675	
			11850	15320			
1140-1145	M-A	Vatican Radio, Vatican City	6248	9645	11740		
1145-1200		BBC, London, England*	5995	7180			
1145-1200		Radio Prague, Czechoslovakia	6055	7345	9505		
1150-1200	M-F	Radio Budapest, Hungary	9585	9835	11910	15160	
			15220				

1200 UTC [7:00 AM EST/4:00 AM PST]

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1200 UTC [7:00 AM EST/4:00 AM PST]

1200-1215		BBC, London, England*	3915	6065	7275		
1200-1215		Vatican Radio, Vatican City	15190	17865			
1200-1215		Voice of Kampuchea, Phnom-Penh	9693	11938			
1200-1220		Radio Bucharest, Romania	17720	21665			
1200-1220	M-F	Radio Budapest, Hungary	9585	9835	11910	15160	
			15220				
1200-1225	M-F	Radio Finland, Helsinki	11945	15400			
1200-1225		Radio Polonia, Warsaw, Poland	6095	7285			
1200-1230		HCJB, Quito, Ecuador	6075				
1200-1230	S	Radio Austria Int'l, Vienna	6155	9685	11915	15320	
1200-1230		Radio Netherland, Hilversum	5995	9715	15560	17575	
			17605	21480			
1200-1230	S	Radio Norway Int'l, Oslo	15310				
1200-1230		Radio Somalia, Mogadishu	6095				
1200-1230		Radio Tashkent, Uzbek, USSR	5945	7275	9540	9600	
			11785				
1200-1230		Radio Thailand, Bangkok	9655	11905			
1200-1230	S	Radio Zambia, Lusaka	11880	[IRR]			
1200-1235	M-A	Radio Ulan Bator, Mongolia	9615	12015			
1200-1250		Radio Pyongyang, North Korea	9600	9555	11735		
1200-1255		Radio Beijing, China	7335	9530	9635	9665	
			9770	11600	11715	11755	
1200-1300		ABC, Alice Springs, Australia	2310	[ML]			
1200-1300		ABC, Katherine, Australia	2485				
1200-1300		ABC, Tennant Creek, Australia	2325	[ML]			
1200-1300	S	Adventist World Radio, Africa	17890				
1200-1300		(US) Armed Forces Radio and TV	6030	6125	15430		
1200-1300		CBN, St. John's, Newfoundland	6160				
1200-1300		CFCF, Montreal, Quebec	6005				
1200-1300		CFCN, Calgary, Alberta	6030				
1200-1300		CHNS, Halifax, Nova Scotia	6130				
1200-1300		CKWX, Vancouver, British Colombia	6080				
1200-1300		CFRB, Toronto, Ontario	6070				
1200-1300		(US) Far East Network, Tokyo	3910				
1200-1300		HCJB, Quito, Ecuador	11740	15115	17890		
1200-1300		KUSW, Salt Lake City, Utah	15225				
1200-1300		Radio Australia, Melbourne	5995	6060	6080	7205	
			7215	9580	9710	9770	
1200-1300		Radio Moscow, USSR	6000	11670	11900	13790	
			15140	15150	15225	15420	
			15460	15475	15490	15540	
			15585	15595	17655		
1200-1300		Radio RSA, South Africa	21590				
1200-1300	A,S	Radio Tanzania, Dar es Salaam	7165				
1200-1300		SBC Radio One, Singapore	5010	5052	11940		
1200-1300		Trans World Radio, Bonaire	11815				
1200-1300		Trans World Radio, Sri Lanka	11920				
1200-1300		Voice of America, Washington	11715				
1200-1300		Voice of Kenya, Nairobi	7270				
1200-1300		Voice of Nigeria, Lagos	7255	15120			
1200-1300		WHRI, Noblesville, Indiana	5995	11715			
1200-1300		WYFR, Oakland, California	5950	6185			
1215-1300		Radio Berlin Int'l, E. Germany	15445	17880	21465	21540	
1215-1300		Radio Cairo, Egypt	17675				
1230-1235		All India Radio, New Delhi	3905	4800	4920	7280	
			9565	9615	11620	11735	
			15120				
1230-1245		Radio Korea, Seoul, South Korea	7275	11740			
1230-1255		Radio Austria Int'l, Vienna	6155	9685	11915	15320	
1230-1300		BBC, London, England*	6125	7255	6195	9635	
			9660	11780	12040	15270	
			15390	15435	17695		
1230-1300		Radio Bangladesh, Dhaka	11750	15525			
1230-1300		Radio Sweden Int'l, Stockholm	9565	15430			
1245-1255		Radio France Int'l, Paris	9805	11670	11845	15155	
			15195	15300	15315	15365	
			21620	21645			
1245-1300		Radio Berlin Int'l, E. Germany	9665	11705	11785	15170	
			15240				

1300 UTC [8:00 AM EST/5:00 AM PST]

1300-1325		Radio Bucharest, Romania	9690	11940	16405	17720
1300-1330		Radio Berlin Int'l, E. Germany	9665	11705	11785	15170
			15240			
1300-1330		Radio Cairo, Egypt	17675			

A slightly different view of Radio Korea in a QSL from Donald Michael Choleva, KOH8US, of Euclid, Ohio.

1300-1330		Radio Finland, Helsinki	11945	15400			
1300-1330		Radio Ghana, Accra	4915	7295			
1300-1330	S	Radio Norway Int'l, Oslo	6035	9590	15195	15310	
			25730				
1300-1330		Swiss Radio Int'l, Berne	6165	9535	12030		
1300-1330		Trans World Radio, Sri Lanka	11920				
1300-1330		Voice of Kenya, Nairobi	7270				
1300-1332	A,S	Trans World Radio, Bonaire	11815				
1300-1350		Radio Pyongyang, North Korea	9325	9345			
1300-1355		Radio Beijing, China	7335	9530	11600	11755	
1300-1400		ABC, Alice Springs, Australia	2310	[ML]			
1300-1400		ABC, Katherine, Australia	2485				
1300-1400		ABC, Tennant Creek, Australia	2325	[ML]			
1300-1400		(US) Armed Forces Radio and TV	6125	15330	15430		
1300-1400		CBN, St. John's, Newfoundland	6160				
1300-1400		CBU, Vancouver, British Colombia	6160				
1300-1400		CFCF, Montreal, Quebec	6005				
1300-1400		CFCN, Calgary, Alberta	6030				
1300-1400		CHNS, Halifax, Nova Scotia	6130				
1300-1400		CKWX, Vancouver, British Colombia	6080				
1300-1400		CFRB, Toronto, Ontario	6070				
1300-1400	S	ELWA, Monrovia, Liberia	11830				
1300-1400		(US) Far East Network, Tokyo	3910				
1300-1400		FEBC, Manila, Philippines	11850				
1300-1400		HCJB, Quito, Ecuador	11740	15115	17890		
1300-1400		KUSW, Salt Lake City, Utah	15225				
1300-1400		Radio Australia, Melbourne	5995	6060	6080	7205	
			9580				
1300-1400	M-F	Radio Canada Int'l, Montreal	9625	11855	17820		
1300-1400		Radio Jordan, Amman	9560				
1300-1400		Radio Moscow, USSR	9820	11670	11900	13790	
			15225	15440	15475	15585	
			15595	17655	17820		
1300-1400		Radio RSA, South Africa	9750	15125	17810	21590	
1300-1400	A,S	Radio Tanzania, Dar es Salaam	7165				
1300-1400		SBC Radio One, Singapore	5010	5052	11940		
1300-1400		Voice of Nigeria, Lagos	7255	15120			
1300-1400		WHRI, Noblesville, Indiana	9455	11790			
1300-1400		WYFR, Oakland, California	5950	6175	15170	13695	
1302-1400		WYFR, Oakland, California	15055				
1305-1315		Radio France Int'l, Paris	6175	9790	9805	11670	
			11845	15155	15195	15300	
			15315	15365	17620	17720	
			17850	21645			
1310-1327		Red Cross Broadcasting Service	11695	11955	15135	15570	
			17830	21695			
			(2-1, 2-4, 2-29-88 only)				

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1315-1325		Voice of Lebanon, Beirut	6548				
1330-1355	M-A	BRT, Brussels, Belgium	15590	17600			
1330-1400		All India Radio, New Delhi	9545	11810	15335		
1330-1400	M-A	Bhutan Bcasting Service, Thimpu	6035				
1330-1400		Laotian National Radio	7113				
1330-1400		Radio Berlin Int'l, E. Germany	17880	21465	21540		
1330-1400		Radio Tashkent, Uzbek, USSR	5945	7275	9540	9600	
			11785				
1330-1400		Swiss Radio Int'l, Berne	11695	11955	15135	15570	
			17830	21695			
1330-1400		UAE Radio, United Arab Emirates	15435	17865	21605		
1330-1400		Voice of Kenya, Nairobi	6100				
1330-1400		Voice of Turkey, Ankara	15255				
1330-1400		Voice of Vietnam, Hanoi	9840	12020			
1332-1400	A	Trans World Radio, Bonaire	11815				
1345-1400		Radio Korea, Seoul, South Korea	6135	7275	11740	15575	

1400 UTC [9:00 AM EST/6:00 AM PST]

1400-1405	A	Trans World Radio, Bonaire	11815				
1400-1415		Radio Berlin Int'l, E. Germany	17880	21465	21540		
1400-1425		Radio Austria Int'l, Vienna	9665				
1400-1425		Radio Finland, Helsinki	11945	15400			
1400-1427		Voice of Nigeria, Lagos	15120				
1400-1430		ABC, Alice Springs, Australia	2310	[ML]			
1400-1430		ABC, Tennant Creek, Australia	2325	[ML]			
1400-1430	S	Radio Norway Int'l, Oslo	9530	15305	15305	15310	
1400-1430		Radio Peace and Progress, USSR	7440	9790	11835	15470	
1400-1430		Radio Polonia, Warsaw, Poland	6095	7285			
1400-1430		Radio Sweden Int'l, Stockholm	9695	15345			
1400-1430		Radio Tirana, Albania	9500	11985			
1400-1430		Voice of Ethiopia, Addis Ababa	9550	11710			
1400-1430		Voice of Republic of Iran	15085				
1400-1450		Radio Pyongyang, North Korea	6576	11735			
1400-1455		Radio Beijing, China	11600	15165			
1400-1500		ABC, Katherine, Australia	2485				
1400-1500		Adventist World Radio, Italy	7275				
1400-1500		All India Radio, New Delhi	9545	11810	15335		
1400-1500		(US) Armed Forces Radio and TV	6125	15330	15430		
1400-1500		CBN, St. John's, Newfoundland	6160				
1400-1500	M-A	CBU, Vancouver, British Colombia	6160				
1400-1500		CFCF, Montreal, Quebec	6005				
1400-1500		CFCN, Calgary, Alberta	6030				
1400-1500		CHNS, Halifax, Nova Scotia	6130				
1400-1500		CKWX, Vancouver, British Colombia	6080				
1400-1500		CFRB, Toronto, Ontario	6070				
1400-1500	S	ELWA, Monrovia, Liberia	11830				
1400-1500		(US) Far East Network, Tokyo	3910				
1400-1500		FEBC, Manila, Philippines	9670	11850			
1400-1500		HCJB, Quito, Ecuador	11740	15115	17890		
1400-1500		KUSW, Salt Lake City, Utah	15225				
1400-1500		Radio Australia, Melbourne	5995	9580			
1400-1500	S	Radio Canada Int'l, Montreal	9625	11720	11955	15440	
			17820				
1400-1500		Radio Japan, Tokyo	5990	7210	9695	11815	
1400-1500		Radio Jordan, Amman	9560				
1400-1500		Radio Korea, Seoul, South Korea	9570	9750	15575		
1400-1500		Radio Moscow, USSR	11670	11840	13790	15225	
			15475	15540	15595	17655	
			17820				
1400-1500		Radio RSA, South Africa	21590				
1400-1500	A,S	Radio Tanzania, Dar es Salaam	7165				
1400-1500		SBC Radio One, Singapore	5010	5052	11940		
1400-1500		Voice of Kenya, Nairobi	6100				
1400-1500		Voice of Nigeria, Lagos	7255				
1400-1500		WHRI, Noblesville, Indiana	9455	11790			
1400-1500		WYFR, Oakland, California	5950	6175	15170	13695	
			15055	15170	15375		
1415-1420		Radio Nepal, Kathmandu	3230	5005			
1425-1500	S	Radio Austria Int'l, Vienna	9665				
1425-1500	S	Radio Finland, Helsinki	11945	15400			
1430-1500	F	ABC, Alice Springs, Australia	2310	[ML]			
1430-1500	F	ABC, Tennant Creek, Australia	2325	[ML]			
1430-1500		Burma Broadcasting Service	5985				
1430-1500		King of Hope, Southern Lebanon	6280				
1430-1500		KTWR, Agana, Guam	9780				
1430-1500		Radio Netherland, Hilversum	5955	11735	13770	15560	
			17575				
1430-1500		Radio Prague, Czechoslovakia	9605	11685	13715	15110	
			15155	17705	21505		
1445-1500	M-A	Radio Ulan Bator, Mongolia	9575	15305			
1445-1500		Vatican Radio, Vatican City	6248	7250	9645	11740	
			11960	15090	17870		

1500 UTC [15:00 AM EST/7:00 AM PST]

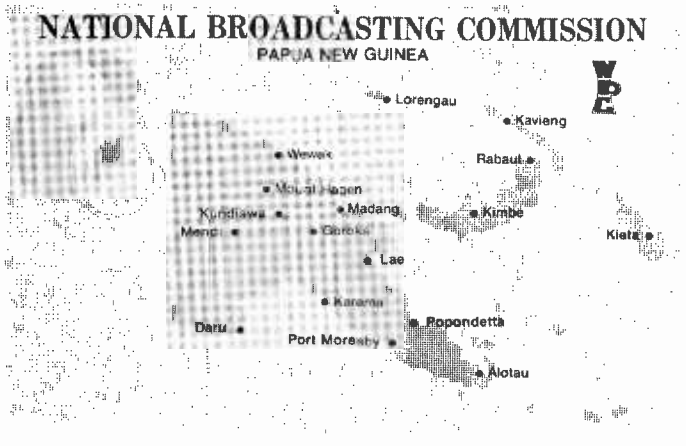
1500-1502		WYFR, Oakland, California	15055				
1500-1505		Africa No. 1, Gabon	7200	15200			
1500-1510		Vatican Radio, Vatican City	11960	15090	17870		
1500-1515		FEBA, Mahe, Seychelles	15325				
1500-1520		Radio Ulan Bator, Mongolia	9575	15305			
1500-1525		Radio Bucharest, Romania	9510	9690	11775	11940	
			15250	15335			
1500-1525		Radio Netherland, Hilversum	5955	11735	13770	15560	
			17575				
1500-1530	A,S	Radio Tanzania, Dar es Salaam	7165				
1500-1530		Radio Veritas Asia, Philippines	9770	15215			
1500-1545		WYFR, Oakland, California	5950	6175	13695	15170	
			15375	17612			
1500-1550		Deutsche Welle, West Germany	7225	9735	17765	21600	
1500-1550		KTWR, Agana, Guam	9780				
1500-1550		Radio Pyongyang, North Korea	7290	9325	9640	9977	
1500-1555		Radio Beijing, China	11600	15165			
1500-1600	F	ABC, Alice Springs, Australia	2310	[ML]			
1530-1600	F	ABC, Tennant Creek, Australia	2325	[ML]			
1500-1600		(US) Armed Forces Radio and TV	9700	15330	15430		
1500-1600		AWR, Alajuela, Costa Rica	15460				
1500-1600		Burma Broadcasting Service	5985				
1500-1600		CBC Norihern Quebec Service	9625	11720			
1500-1600		CBN, St. John's, Newfoundland	6160				
1500-1600		CBU, Vancouver, British Colombia	6160				
1500-1600		CFCF, Montreal, Quebec	6005				
1500-1600		CFCN, Calgary, Alberta	6030				
1500-1600		CHNS, Halifax, Nova Scotia	6130				
1500-1600		CKWX, Vancouver, British Colombia	6080				
1500-1600		CFRB, Toronto, Ontario	6070				
1500-1600	S	ELWA, Monrovia, Liberia	11830				
1500-1600		(US) Far East Network, Tokyo	3910				
1500-1600		FEBC, Manila, Philippines	9670				
1500-1600		HCJB, Quito, Ecuador	11740	15115	17890		
1500-1600		King of Hope, Southern Lebanon	6280				
1500-1600		KSDA, Agat, Guam	11980				
1500-1600		KUSW, Salt Lake City, Utah	15225				
1500-1600		KYOI, Saipan	11900				
1500-1600		Radio Australia, Melbourne	9580				
1500-1600	S	Radio Canada Int'l, Montreal	9625	11720	11955	15440	
			17820				
1500-1600		Radio Japan, Tokyo	5990	7210	11815	21700	
1500-1600		Radio Jordan, Amman	9560				
1500-1600		Radio Moscow, USSR	11670	11840	11900	13790	
			15475	15585			
1500-1600		Radio RSA, South Africa	15125	17810	21590		
1500-1600		SBC Radio One, Singapore	5010	5052	11940		
1500-1600		Voice of America, Washington	15205				
1500-1600		Voice of Ethiopia, Addis Ababa	7165	9560			
1500-1600		Voice of Indonesia, Jakarta	11790	15150			
1500-1600		Voice of Kenya, Nairobi	6100				
1500-1600		Voice of Nigeria, Lagos	7255	11770			
1500-1600		WHRI, Noblesville, Indiana	15105	21640			
1500-1600	S	WRNO, New Orleans, Louisiana	11965				
1500-1600		WYFR, Oakland, California	13695	15170	15375	17612	
1505-1530		Radio Finland, Helsinki	11850	15185			
1515-1600		FEBA, Mahe, Seychelles	11865	15325			
1515-1525	T,F	Radio Budapest, Hungary	6110	9585	9835	11910	
			15160				
1515-1600		Radio Berlin Int'l, E. Germany	15240	17880			
1530-1545		All India Radio, New Delhi	3905	3925	4860	6160	
			7160	7412	9545	9950	
1530-1555		Radio Austria Int'l, Vienna	6155	9610	11915		
1530-1555	M-A	Radio Budapest, Hungary	9585	9835	11910	15160	
			15220				
1530-1600		Radio Prague, Czechoslovakia	6055	7345	9605	11665	
			11685	11990	15110	13715	
			17705	21505			
1530-1600		Radio Sofia, Bulgaria	7245	9560	11735	15310	
1530-1600		Radio Tanzania, Dar es Salaam	9684				
1530-1600		Radio Tirana, Albania	9480	11835			
1530-1600		Radio Yugoslavia, Belgrade	7240	15240	15415		
1530-1600		Swiss Radio Int'l, Berne	9885	15430	17830	13685	
1530-1600		Voice of Asia, Taiwan	5980	7445			
1530-1600		Voice of Nigeria, Lagos	15120				

frequency SECTION

1540-1550	M-A	Voice of Greece, Athens	9855	11645	15630	
1545-1600		Radio Berlin Int'l, E. Germany	11785	15170	15255	
1545-1600		Radio Canada Int'l, Montreal	9555	11915	11935	15315
			15325	17820		
1545-1600		Radio Korea, Seoul, South Korea	7275	9870		
1545-1600		Vatican Radio, Vatican City	11810	15120	17730	
1550-1600	H-S	KTWR, Agana, Guam	9780			

1600 UTC [11:00 AM EST/8:00 AM PST]

1600-1605	H-A	KTWR, Agana, Guam	9780			
1600-1610		FEBA, Mahe, Seychelles	11865	15325		
1600-1610		Radio Lesotho, Maseru	4800			
1600-1610		SBC Radio One, Singapore	5010	5052	11940	
1600-1625		Radio Prague, Czechoslovakia	6055	7345	9605	11665
			11685	11990	15110	13715
			15110	17705	21505	
1600-1630		ELWA, Monrovia, Liberia	11830			
1600-1630		Radio Berlin Int'l, E. Germany	11785	15170	15255	
1600-1630	S	Radio Norway Int'l, Oslo	5990	9660	11850	15310
1600-1630		Radio Pakistan, Islamabad	7365	9465	9785	11615
			11625	15125		
1600-1630		Radio Polonia, Warsaw, Poland	6135	9540		
1600-1630	M-F	Radio Portugal, Lisbon	15245			
1600-1630		Radio Sofia, Bulgaria	7245	9560	11735	15310
1600-1630		Radio Sweden Int'l, Stockholm	6065	11855		
1600-1630		SLBC, Colombo, Sri Lanka	6075	9720		
1600-1630		Trans World Radio, Swaziland	5055	9525		
1600-1630		Voice of Asia, Taiwan	5980	7445		
1600-1630		Voice of Vietnam, Hanoi	9840	12020		
1600-1645		Radio Nacional Angola, Luanda	7245	9535	11955	
1600-1645		UAE Radio, United Arab Emirates	11730	15320	17865	
1600-1655		Radio Beijing, China	7295	9570	11715	15130
1600-1700	F	ABC, Alice Springs, Australia	2310 [ML]			
1600-1700	F	ABC, Tennant Creek, Australia	2325 [ML]			
1600-1700		(US) Armed Forces Radio and TV	15330	15430		
1600-1700		AWR, Alajuela, Costa Rica	15460			
1600-1700		CBC Northern Quebec Service	9625	11720		
1600-1700		CBN, St. John's, Newfoundland	6160			
1600-1700		CBU, Vancouver, British Colombia	6160			
1600-1700		CFCF, Montreal, Quebec	6005			
1600-1700		CFCN, Calgary, Alberta	6030			
1600-1700		CHNS, Halifax, Nova Scotia	6130			
1600-1700		CKWX, Vancouver, British Colombia	6080			
1600-1700		CFRB, Toronto, Ontario	6070			
1600-1700		(US) Far East Network, Tokyo	3910			
1600-1700		HCJB, Quito, Ecuador	11740	15115	17890	
1600-1700		KUSW, Salt Lake City, Utah	15225			
1600-1700		Radio Beijing, China	15130			
1600-1700		Radio Canada Int'l, Montreal	9625	11720	11955	15440
			17820			
1600-1700		Radio France Int'l, Paris	6175	9860	11700	11705
			11995	15315		
1600-1700		Radio Jordan, Amman	9560			
1600-1700		Radio Korea, Seoul, South Korea	5975	9870		



1600-1700		Radio Malawi, Blantyre	3380	5995		
1600-1700		Radio Moscow, USSR	7115	7150	9565	11670
			11840			
1600-1700		Radio Riyadh, Saudi Arabia	9705	9720		
1600-1700		Radio Tanzania, Dar es Salaam	9684			
1600-1700		Radio Zambia, Lusaka	9580			
1600-1700		Voice of America, Washington	15205	15410	15445	15580
			15600	17785	17800	17870
1600-1700		Voice of Kenya, Nairobi	6100			
1600-1700		Voice of Nigeria, Lagos	7255	15120		
1600-1700		WHRI, Noblesville, Indiana	15105	21640		
1600-1700		WRNO, New Orleans, Louisiana	15420			
1600-1700		WYFR, Oakland, California	11580	13695	15170	15440
			15566	17612	17750	17845
1602-1700		WINB, Red Lion, Pennsylvania	15295			
1610-1615	M-A	Vatican Radio, Vatican City	6248	7250	9645	11740
1610-1620	M-F	Radio Botswana, Gaborone	3356	4820		
1610-1625	M-F	FEBA, Agana, Guam	15325			
1610-1650		Deutsche Welle, West Germany	9585	9745	11785	15105
			15510			
1615-1700		Radio Berlin Int'l, E. Germany	6115	7295	9730	
1630-1645		Trans World Radio, Swaziland	5055	7285	9525	
1630-1655	M-A	BRT, Brussels, Belgium	15510	17595		
1630-1700	M-A	ELWA, Monrovia, Liberia	11830			
1630-1700		Radio Netherland, Hilversum	6020	15570		
1630-1700		Radio Peace and Progress, USSR	7260	9470	9490	9515
			9760	9860	11980	
1630-1700		Radio Polonia, Warsaw, Poland	7125	9525	11840	
1630-1700		SLBC, Colombo, Sri Lanka	6075			
1630-1700		Swaziland Commercial Radio	6155			
1630-1700		Voice of Africa, Egypt	15255			
1645-1700		BBC, London, England*	6195	7180	9605	
1645-1700		Radio Bujumbura, Burundi	3300			
1645-1700		Trans World Radio, Swaziland	7285	9525		

1700 UTC [12:00 PM EST/9:00 AM PST]

1700-1705		Radio Uganda, Kampala	4976	5026		
1700-1725		Radio Budapest, Hungary	6110	9585	9835	11910
			15160			
1700-1725		Radio Netherland, Hilversum	6020	15570		
1700-1730		Radio Japan, Tokyo	5990	11815		
1700-1730	S	Radio Norway Int'l, Oslo	9655	11850		
1700-1730		Red Cross Broadcasting Service	7210	(2-1 & 2-29-88 only)		
1700-1750		Radio Pyongyang, North Korea	7290	9325	9640	9977
1700-1755		Radio Beijing, China	7295	9570		
1700-1800	F	ABC, Alice Springs, Australia	2310 [ML]			
1700-1800		ABC, Tennant Creek, Australia	2325 [ML]			

QSLs to be proud of -- Radio New Zealand, and Papua New Guinea -- caught by Bob Doyle of Shelton, Connecticut.

frequency SECTION

1800-1900		CFCF, Montreal, Quebec	6005			
1800-1900		CFCN, Calgary, Alberia	6030			
1800-1900		CHNS, Halifax, Nova Scotia	6130			
1800-1900		CKWX, Vancouver, British Colombia	6080			
1800-1900		CFRB, Toronto, Ontario	6070			
1800-1900		(US) Far East Network, Tokyo	3910			
1800-1900	A,S	KCBI, Dallas, Texas	11735			
1800-1900		KNLS, Anchor Point, Alaska	7355			
1800-1900		Radio Jamahiriya, Libya	15450			
1800-1900		Radio Korea, Seoul, South Korea	15575			
1800-1900		Radio Kuwait, Kuwait	11665			
1800-1900	M-F	Radio Malabo, Equatorial Guinea	9553	[ML]		
1800-1900		Radio Moscow, USSR	7115	7150	7195	9565
			11840			
1800-1900		Radio New Zealand, Wellington	11780	15150		
1800-1900		Radio Riyadh, Saudi Arabia	9705	9720		
1800-1900		Radio Tanzania, Dar es Salaam	9684			
1800-1900		Radio Zambia, Lusaka	9580			
1800-1900	A,S	Swaziland Commercial Radio	6155			
1800-1900		Voice of America, Washington	9700	9760	11760	15410
			15445	15580	15600	17785
			17800	17870	21485	
1800-1900		Voice of Kenya, Nairobi	6100			
1800-1900		Voice of Nigeria, Lagos	11770	15120		
1800-1900		WHRI, Noblesville, Indiana	13760	15105		
1800-1900		WINB, Red Lion, Pennsylvania	15295			
1800-1900	S-F	WMLK, Bethel, Pennsylvania	9455			
1800-1900		WRNO, New Orleans, Louisiana	15420			
1800-1900		WYFR, Oakland, California	11380	11580	13695	15170
			15566	17612	17845	
1805-1830	A,S	Radio Austria Int'l, Vienna	5945	6155	11825	12015
1815-1825		Voice of Lebanon, Beirut	6548			
1815-1900		Radio Bangladesh, Dhaka	6240	7505		
1815-1900		Radio Berlin Int'l, E. Germany	9665	15145	15255	
1830-1855		Radio Austria Int'l, Vienna	5945	6155	11825	12015
1830-1855		BRT, Brussels, Belgium	5910	9860		
1800-1855		Radio Polonia, Warsaw, Poland	5995	6135	7125	7285
			9525	11840		
1800-1830	S	Radio Bamako, Mali	4835	5995		
1830-1900		KUSW, Salt Lake City, Utah	17715			
1830-1900	A,S	Radio Canada Int'l, Montreal	15260	17820		
1830-1900		Radio Havana Cuba	9670			
1830-1900	MWF	Radio Mozambique, Maputo	3265	4855	9618	
1830-1900		Radio Netherland, Hilversum	6020	15180	17605	21685
1830-1900		Radio Sofia, Bulgaria	7245	9560	11735	15310
1830-1900		Radio Sweden Int'l, Stockholm	11845			
1830-1900		Radio Tirana, Albania	7120	9480		
1830-1900		Radio Yugoslavia, Belgrade	5980	6100	7240	11735
1830-1900		Spanish Foreign Radio, Madrid	7275	9765	11840	15375
1830-1900		Swiss Radio Int'l, Berne	9885	11955		
1840-1850	M-A	Voice of Greece, Athens	11645	12045	15630	
1840-1900		Radio Senegal, Dakar	4950			
1845-1900		All India Radio, New Delhi	7412	11620		
1845-1900		BBC, London, England*	6070			
1845-1900		Radio Ghana, Accra	6130			
1855-1900		Africa No. 1, Gabon	4830	15475		

1900 UTC [2:00 PM EST/11:00 AM PST]

1900-1915		Radio Bangladesh, Dhaka	6240	7505		
1900-1915		Radio Tanzania, Dar es Salaam	9684			
1900-1925		Radio Netherland, Hilversum	6020	15180	17605	21685
1900-1930	F	ABC, Alice Springs, Australia	2310	[ML]		
1900-1930	F	ABC, Tennant Creek, Australia	2325	[ML]		
1900-1930		Radio Afghanistan, Kabul	4760	6020	9635	
1900-1930		Radio Canada Int'l, Montreal	15260	17820		
1900-1930		Radio Japan, Tokyo	9505			
1900-1930		Radio Kiev, Ukraine, USSR	6010	6090	6165	7170
1900-1930	S	Radio Norway Int'l, Oslo	9590			
1900-1930	M-F	Radio Portugal, Lisbon	11870	15250		
1900-1930		Radio Sofia, Bulgaria	7245	9560	11735	15310
1900-1930		Spanish Foreign Radio, Madrid	7275	9765	11840	15375
1900-1930		Voice of Vietnam, Hanoi	9840	12020		
1900-1955		Radio Beijing, China	6860	9470		
1900-2000		All India Radio, New Delhi	7412	11620	11935	15360
1900-2000		(US) Armed Forces Radio and TV	15330	15430		
1900-2000		CBC Northern Quebec Service	9625	11720		
1900-2000		CBN, St. John's, Newfoundland	6160			
1900-2000		CBU, Vancouver, British Colombia	6160			
1900-2000		CFCF, Montreal, Quebec	6005			
1900-2000		CFCN, Calgary, Alberia	6030			
1900-2000		CHNS, Halifax, Nova Scotia	6130			
1900-2000		CKWX, Vancouver, British Colombia	6080			
1900-2000		CFRB, Toronto, Ontario	6070			
1900-2000		(US) Far East Network, Tokyo	3910			
1900-2000		HCJB, Quito, Ecuador	11790	15270	17790	
1900-2000	A,S	KCBI, Dallas, Texas	11735			
1900-2000		KNLS, Anchor Point, Alaska	7355			
1900-2000		KUSW, Salt Lake City, Utah	17715			
1900-2000		Radio Algiers, Algeria	9509	9685	15215	17745
1900-2000		Radio Ghana, Accra	6130			
1900-2000		Radio Havana Cuba	9670			
1900-2000		Radio Kuwait, Kuwait	11665			
1900-2000	M-F	Radio Malabo, Equatorial Guinea	9553	[ML]		
1900-2000		Radio Moscow, USSR	7115	7150	7195	9565
			9865	11840		
1900-2000		Radio New Zealand, Wellington	11780	15150		
1900-2000		Radio Prague, Czechoslovakia	5930	7345		
1900-2000		Radio Riyadh, Saudi Arabia	9705	9720		
1900-2000		Radio Zambia, Lusaka	9580			
1900-2000	A,S	Swaziland Commercial Radio	6155			
1900-2000		Trans World Radio Swaziland	3205			
1900-2000		Voice of America, Washington	9700	9760	11760	15410
			15445	15580	15600	17785
			17800	17870	21485	
1900-2000		Voice of Ethiopia, Addis Ababa	9595			
1900-2000		Voice of Kenya, Nairobi	6100			
1900-2000		Voice of Nigeria, Lagos	7255	11770		
1900-2000		WINB, Red Lion, Pennsylvania	15295			
1900-2000	S-F	WMLK, Bethel, Pennsylvania	9455			
1900-2000		WYFR, Oakland, California	11830	11580	13695	15170
			17612			
1910-1920		Radio Botswana, Gaborone	3356	4820		
1915-2000		Radio Berlin Int'l, E. Germany	6080	6115		
1920-1930	M-A	Voice of Greece, Athens	7430	9425	11645	
1930-2000		ABC, Katherine, Australia	2485			
1930-1955		Radio Finland, Helsinki	6120	9530	11755	
1930-2000		Radio Beijing, China	6955	7480	9440	
1930-2000		Radio Bucharest, Romania	5990	6105	7145	7195
1930-2000	M-F	Radio Canada Int'l, Montreal	5995	7235	11945	15325
			17875			
1930-2000		Radio Sofia, Bulgaria	6070	7155	9700	
1930-2000		Voice of Republic of Iran	9022	9770		
1935-1955		RAI, Rome, Italy	7275	7290	9575	
1940-2000	M-A	Radio Ulan Bator, Mongolia	9575	11790		
1945-2000		All India Radio, New Delhi	9755	11860		
1945-2000		Radio Berlin Int'l, E. Germany	9665	11920	15255	

2000 UTC [3:00 PM EST/12:00 PM PST]

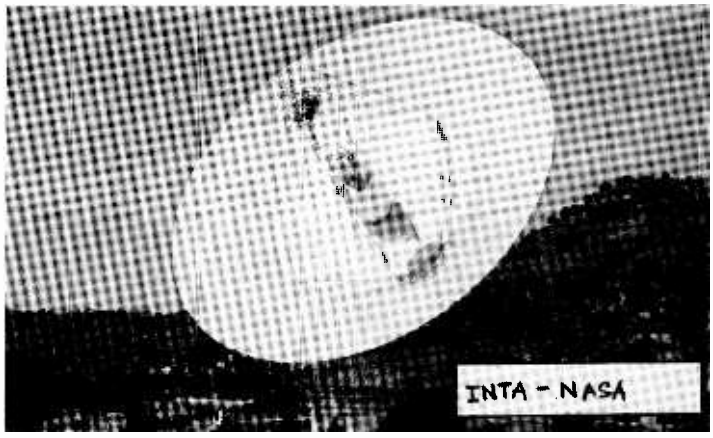
2000-2005		Radio Zambia, Lusaka	3345	6165		
2000-2005	M-A	Vatican Radio, Vatican City	6190	6248	7250	9625
			9645	11700	15120	
2000-2010	A	Radio Zambia, Lusaka	3345	6165		
2000-2010		Voice of Kenya, Nairobi	6100			
2000-2015		Radio New Zealand, Wellington	11780	15150		
2000-2015		Radio Togo, Lome	3220	5047		
2000-2015		Radio Ulan Bator, Mongolia	9575	11790		
2000-2015		Trans World Radio, Swaziland	3205			
2000-2025		Radio Beijing, China	6955	7480	9440	
2000-2025		Radio Bucharest, Romania	5990	6105	7145	7195
2000-2030		KNLS, Anchor Point, Alaska	7355			
2000-2030		Kol Israel, Jerusalem	7355	7460	9010	9435
			9815	9855	11655	11700
2000-2030		Radio Berlin Int'l, E. Germany	9665	11920	15255	
2000-2030		Radio Ghana, Nairobi	3366	4915		
2000-2030		Radio Polonia, Warsaw, Poland	7125	7145	9525	
2000-2030		Radio Yugoslavia, Belgrade	5980	7240	9620	
2000-2030		Swaziland Commercial Radio	6155			
2000-2030		Voice of Nigeria, Lagos	7255			
2000-2030		Voice of Republic of Iran	9022	9770		
2000-2045		All India Radio, New Delhi	7412	9755	9910	11620
			11860			
2000-2045		WYFR, Oakland, California	9455	11830	13695	15566
			17612	17845		
2000-2050		Radio Pyongyang, North Korea	6576	9345	9640	9977
2000-2100	M-A	ABC, Alice Springs, Australia	2310	[ML]		
2000-2100		ABC, Katherine, Australia	2485			
2000-2100	M-A	ABC, Tennant Creek, Australia	2325	[ML]		
2000-2100		CBN, St. John's, Newfoundland	6160			
2000-2100		CBU, Vancouver, British Colombia	6160			

frequency SECTION

2000-2100		CFCF, Montreal, Quebec	6005			
2000-2100		CFCN, Calgary, Alberta	6030			
2000-2100		CHNS, Halifax, Nova Scotia	6130			
2000-2100		CKWX, Vancouver, British Colombia	6080			
2000-2100		CFRB, Toronto, Ontario	6070			
2000-2100		(US) Far East Network, Tokyo	3910			
2000-2100		Radio Kuwait, Kuwait	11665			
2000-2100		King of Hope, Southern Lebanon	6280			
2000-2100		KUSW, Salt Lake City, Utah	17715			
2000-2100	M-F	Radio Malabo, Equatorial Guinea	9553			
2000-2100		Radio Riyadh, Saudi Arabia	9705	9720		
2000-2100		Radio Zambia, Lusaka	9580			
2000-2100		Voice of Nigeria, Lagos	11770			
2003-2100		WINB, Red Lion, Pennsylvania	15185			
2005-2100		Radio Damascus, Syria	9950	11625		
2010-2100	A,S	Voice of Kenya, Nairobi	6100			
2015-2100		ELWA, Monrovia, Liberia	11830			
2015-2100		Radio Cairo, Egypt	9670			
2025-2045		RAI, Rome, Italy	7235	9575	9710	
2030-2055		Radio Polonia, Warsaw, Poland	6095	7285		
2030-2100		Radio Beijing, China	6955	7480	9440	9745
			11790			
2030-2100		Radio Korea, Seoul, South Korea	6480	7550	15575	
2030-2100		Radio Netherland, Hilversum	9540	9715	9895	11740
2030-2100	M-F	Radio Portugal, Lisbon	7155	9740		
2030-2100		Radio Tirana, Albania	9480	11835		
2030-2100		Voice of Africa, Cairo, Egypt	15375			
2030-2100		Voice of Vietnam, Hanoi	9840	12020		
2030-2100		Spanish Foreign Radio, Madrid	7275	9765		
2040-2100		Radio Havana Cuba	15230	15300		
2045-2100		All India Radio, New Delhi	7412	9550	9910	11620
			11715			
2045-2100		IBRA Radio, Malta	5980	6110		
2045-2100		Radio Korea, Seoul, South Korea	5975			
2045-2100		Vatican Radio, Vatican City	9625	11700	11760	15120
2045-2100		WYFR, Oakland, California	11830	13695	15566	17612
			17845			
2050-2100		Vatican Radio, Vatican City	6190	7250	9645	

2100 UTC [4:00 PM EST/1:00 PM PST]

2100-2105		Radio Damascus, Syria	9950	11625		
2100-2105		Radio Zambia, Lusaka	3345	6165		
2100-2110		Vatican Radio, Vatican City	6190	7250	9645	
2100-2110	A,S	Voice of Kenya, Nairobi	6100			
2100-2115		IBRA Radio, Malta	5980	6110		
2100-2125		Radio Austria Int'l, Vienna	5945	6155	7205	9655
2100-2125		Radio Beijing, China	6955	7480	9440	9745
			11790			
2100-2125		Radio Bucharest, Romania	5990	6105	7145	7195
2100-2125		Radio Budapest, Hungary	6110	7220	9585	9835
			11910			
2100-2125		Radio Netherland, Hilversum	9540	9715	9895	11740
2100-2130		Radio Canada Int'l, Montreal	5995	7130	11945	15325
2100-2130		Radio Japan, Tokyo	5965	7140	7280	17835
2100-2130		Radio Korea, Seoul, South Korea	6480	7550	15575	
2100-2130		Radio Sweden Int'l, Stockholm	6065	9700		
2100-2130		Spanish Foreign Radio, Madrid	7275	9765		
2100-2130		Swiss Radio Int'l, Berne	9885	12035	15570	
2100-2135		ELWA, Monrovia, Liberia	11830			
2100-2140		Radio Havana Cuba	15230	15300	15340	
2100-2145		Radio Cairo, Egypt	9670			
2100-2145		WYFR, Oakland, California	9852	11905	13695	15170
			17612	17845		
2100-2150		Deutsche Welle, West Germany	7130	9765		
2100-2150		Voice of Turkey, Ankara	7215			
2100-2155		Radio Beijing, China	6860	9470		
2100-2200	M-A	ABC, Alice Springs, Australia	2310	[ML]		
2100-2200		ABC, Katherine, Australia	2485			
2100-2200	M-A	ABC, Tennant Creek, Australia	2325	[ML]		
2100-2200		All India Radio, New Delhi	9550	9910	11715	
2100-2200		(US) Armed Forces Radio and TV	15330	15345	15430	
2100-2200		CBC Northern Quebec Service	9625	11720		
2100-2200		CBN, St. John's, Newfoundland	6160			
2100-2200		CBU, Vancouver, British Colombia	6160			
2100-2200		CFCF, Montreal, Quebec	6005			
2100-2200		CFCN, Calgary, Alberta	6030			
2100-2200		CHNS, Halifax, Nova Scotia	6130			
2100-2200		CKWX, Vancouver, British Colombia	6080			
2100-2200		CFRB, Toronto, Ontario	6070			



This isn't a broadcasting station - it's subscriber Henry Moreno's QSL card - from Guipuzcoa, Spain!

2100-2200		(US) Far East Network, Tokyo	3910			
2100-2200		King of Hope, Southern Lebanon	6280			
2100-2200		KSDA, Agat, Guam	11965			
2100-2200		KUSW, Salt Lake City, Utah	17715			
2100-2200	M-A	KVOH, Rancho Simi, California	17775			
2100-2200		Radio Baghdad, Iraq	9875			
2100-2200	A,S	Radio Malabo, Equatorial Guinea	9552.5			
2100-2200		Radio Moscow, USSR	5905	5915	5945	5915
			7150	7195	11840	
2100-2200		Radio RSA, South Africa	7295	9580	11900	
2100-2200	A,S	Radio Zambia, Lusaka	9580			
2100-2200		Voice of Africa, Cairo, Egypt	15375			
2100-2200		Voice of America, Washington	6040	6045	9700	11760
			15410	15445	15580	17800
			17785			
2100-2200		Voice of Nigeria, Lagos	15120			
2100-2200		WHRI, Noblesville, Indiana	9770	17830		
2100-2200		WINB, Red Lion, Pennsylvania	15185			
2100-2200		WRNO, New Orleans, Louisiana	15420			
2110-2200		Radio Damascus, Syria	9950	11625		
2125-2155	S	Radio Austria Int'l, Vienna	5945	6155	7205	9655
2125-2200	A,S	Radio Canada Int'l, Montreal	5995	7130	11945	15325
2130-2145		BBC, London, England*	5965	7160		
2130-2200		BBC, London, England*	6030	7230	9635	
2130-2200		HCJB, Quito, Ecuador	11790	15270	17790	
2130-2200		Radio Canada Int'l, Montreal	5995	11880	11945	15150
			15325	17820		
2130-2200		Radio Sofia, Bulgaria	6070	7115	7155	
2135-2150	S-F	ELWA, Monrovia, Liberia	11830			
2145-2200		Radio Berlin Int'l, E. Germany	5965	6125		
2145-2200		WYFR, Oakland, California	11830	13695	17612	17845
2150-2200	M-F	ELWA, Monrovia, Liberia	11830			

2200 UTC [5:00 PM EST/2:00 PM PST]

2200-2205	M-F	ELWA, Monrovia, Liberia	3993	11830		
2200-2210		Radio Damascus, Syria	9950	11625		
2200-2210		Radio Sierra Leone, Freetown	5980			
2200-2215	M-A	ABC, Alice Springs, Australia	2310	[ML]		
2200-2215	M-A	ABC, Tennant Creek, Australia	2325	[ML]		
2200-2215		BBC, London, England*	5965	7160		
2200-2215	M-F	Voice of America, Washington	9640	11740	15160	17730
2200-2225		BRT, Brussels, Belgium	5910			
2200-2225		Radio Finland, Helsinki	6120	9670		
2200-2225		RAI, Rome, Italy	5990	9710	11800	
2200-2225		Vatican Radio, Vatican City	6015	9615	11830	
2200-2230		ABC, Katherine, Australia	2485			
2200-2230		All India Radio, New Delhi	9550	9910	11715	
2200-2230		CBC Northern Quebec Service	9625	11720		
2200-2230	S	KGEI, San Francisco, California	15280			
2200-2230		Radio Berlin Int'l, E. Germany	15965	6125		
2200-2230	S	Radio Norway Int'l, Oslo	9625	9605		
2200-2230		Radio Prague, Czechoslovakia	6055			
2200-2245		WINB, Red Lion, Pennsylvania	15185			

frequency SECTION

2200-2245		WYFR, Oakland, California	5950	11830	13695	17612
			17845			
2200-2250		Radio Baghdad, Iraq	9875			
2200-2255		RAE, Buenos Aires, Argnetina	6060	9690	11710	
2200-2300		CBN, St. John's, Newfoundland	6160			
2200-2300		CBU, Vancouver, British Colombia	6160			
2200-2300		CFCF, Montreal, Quebec	6005			
2200-2300		CFCN, Calgary, Alberta	6030			
2200-2300		CHNS, Halifax, Nova Scotia	6130			
2200-2300		CKWX, Vancouver, British Colombia	6080			
2200-2300		CFRB, Toronto, Ontario	6070			
2200-2300		(US) Far East Network, Tokyo	3910			
2200-2300		King of Hope, Southern Lebanon	6280			
2200-2300	M-A	KVOH, Rancho Simi, California	17775			
2200-2300		Radio Australia, Melbourne	15320			
2200-2300	M-F	Radio Canada Int'l, Montreal	9760	11945		
2200-2300		Radio Havana Cuba	6165			
2200-2300		Radio Moscow, USSR	5915	5945	6045	6200
			7115	7195	7310	9710
			12050	13665	15455	
2200-2300		SBC Radio One, Singapore	5010	5052	11940	
2200-2300		Voice of Free China, Taiwan	7355	9955	11805	15370
2200-2300		WHRI, Noblesville, Indiana	9770	17830		
2200-2300		WRNO, New Orleans, Louisiana	13760			
2215-2230		BBC, London, England*	11820	15390		
2215-2230		Radio Yugoslavia, Belgrade	5980	7240	9620	
2230-2300	A,S	CBC Northern Quebec Service	9625	11720		
2230-2300		Kol Israel, Jerusalem	7355	7462	9010	9435
			9815	9845	11655	
2230-2300		Radio Beijing, China	3985	6165		
2230-2300		Radio Jamahiriya, Libya	7245	11815		
2230-2300		Radio Mediterran, Malta	6110			
2230-2300		Radio Polonia, Warsaw, Poland	5995	6135	7125	7270
2230-2300		Radio Sofia, Bulgaria	6070	11720		
2230-2300		Radio Tirana, Albania	7215	9480		
2230-2300		Radio Vilnius, Lithuania, USSR	6100			
2230-2300		Swiss Radio Int'l, Berne	6190			
2230-2300		Voice of Vietnam, Hanoi	9840	12020		
2245-2300		All India Radio, New Delhi	6055	7215	9535	9910
			11715	11745		
2245-2300		Radio Ghana, Accra	3366	4915		
2245-2300		Radio New Zealand, Wellington	15150	17705		
2245-2300		WYFR, Oakland, California	5950	17612		
2248-2300		WINB, Red Lion, Pennsylvania	15145			

2300 UTC [6:00 PM EST/3:00 PM PST]

2300-2330		Radio Canada Int'l, Montreal	9755	11730		
2300-2330		Radio Mediterran, Malta	6110			
2300-2330		Radio Sofia, Bulgaria	6070	11720		
2300-2330		Radio Sweden Int'l, Stockholm	6045	9695	11705	
2300-2330		Radio Vilnius, Lithuania, USSR	6200	7165	11790	11890
			13645	15180		
2300-2345		Radio Berlin Int'l, E. Germany	5965	6070	6125	6165
			7295			
2300-2345		WINB, Red Lion, Pennsylvania	15145			
2300-2350		Radio Pyongyang, North Korea	11735	13650		
2300-2350		Voice of Turkey, Ankara	7135	7160	9445	17760
2300-0000		All India Radio, New Delhi	6055	7215	9535	9910
			11715	11745		
2300-0000		(US) Armed Forces Radio and TV	6030	15345		
2300-0000		CBC Northern Quebec Service	9625	11720		
2300-0000		CBN, St. John's, Newfoundland	6160			
2300-0000		CBU, Vancouver, British Colombia	6160			
2300-0000		CFCF, Montreal, Quebec	6005			
2300-0000		CFCN, Calgary, Alberta	6030			
2300-0000		CHNS, Halifax, Nova Scotia	6130			
2300-0000		CKWX, Vancouver, British Colombia	6080			
2300-0000		CFRB, Toronto, Ontario	6070			
2300-0000		(US) Far East Network, Tokyo	3910			
2300-0000	M-A	KVOH, Rancho Simi, California	17775			
2300-0000		Radio Australia, Melbourne	15320			
2300-0000		Radio Jamahiriya, Libya	11815			
2300-0000		Radio Japan, Tokyo	7280	11800	15195	15280
			15300			
2300-0000		Radio Moscow, USSR	5915	5940	6045	7115
			7215	7310	12050	15425
			13665			
2300-0000		Radio New Zealand, Wellington	15150	17705		
2300-0000		Radio Thailand, Bangkok	9655	11905		
2300-0000		WHRI, Noblesville, Indiana	9770	11770		
2300-0000		WRNO, New Orleans, Louisiana	13760			
2300-0000		WYFR, Oakland, California	9660	9680	15170	17612
2315-2330		BBC, London, England*	11820	15390		
2320-2325	M-A	Radio Prague, Czechoslovakia	6055	9630		
2330-0000		Radio Tirana, Albania	6200	7065	9762	
2330-0000		Voice of Vietnam, Hanoi	9840	12020		
2335-2345	M-A	Voice of Greece, Athens	9395	11645		
2345-0000		BBC, London, England*	3915	6080	7180	9580
2345-0000		Radio Korea, Seoul, South Korea	7275	9640	15375	15575
2348-0000		WINB, Red Lion, Pennsylvania	15145			

VOA On the Air

All times UTC; Frequencies in kHz; Asterisk (*) indicates medium wave

AMERICAS

SUNDAY	MONDAY-FRIDAY	SATURDAY
(0000-0100) 11695; **(0000-0200)** 6130, 9455, 11740; **(0000-0300)** 5995, 9650, 9775, 9815, 11580, 15205		
0000 News	**0000 News**	**0000 News**
0010 Encounter	0010 Newsline	0010 Closeup
0030 Studio One	0030 Special English News & Features	0030 Special English News & Features
0100 News	**0100 News**	**0100 News**
0110 New Horizons	0110 Report to the Americas	0110 Communications World
0130 Spotlight	**0200 News**	0130 Weekend Magazine
0200 News	0210 Focus	**0200 News**
0210 Critic's Choice	0230 Magazine Show	0210 American Viewpoints
0230 Issues in the News	**0300 News**	0230 Press Conference, U.S.A.
0300 News	0310 Music, U.S.A. (Jazz)	**0300 News**
0310 The Concert Hall	0355 News Summary	0310 Music, U.S.A. (Jazz)
0355 News Summary		0355 News Summary

American Viewpoints A provocative magazine or newspaper article is discussed pro and con by experts.

Concert Hall Music and interviews with America's great artists and conductors.

Communications World A look at the people, technologies, economics, and politics involved in modern telecommunications.

Country Music, U.S.A. Currently popular tunes with a generous sprinkling of old favorites. On Friday broadcasts of Music, U.S.A.

Critic's Choice News from the world of the arts.

Encounter A discussion program presenting opinions on the issues facing America and the world.

Focus The major figures and issues that shape contemporary life are examined, featuring interviews from authorities on opposing sides.

Issues in the News Members of the Washington press corps discuss current topics.

Magazine Show Features about culture, science, sports, medicine, and the arts in America.

Music, U.S.A. (Standards) Classics of American popular music. On Sunday and Monday broadcasts of Music, U.S.A.

Music, U.S.A. (Jazz) Willis Conover looks at jazz of yesterday and today, in the U.S. and abroad.

New Horizons The world of science, medicine, and technology.

News Reports Ten minutes of worldwide and special regional news on the hour.

Newsline News, correspondent reports, interviews, and opinion.

Now Music, U.S.A. Rock and soul music from old favorites to the latest hits with profiles on the stars. On Tuesday, Wednesday, and Thursday broadcasts of Music, U.S.A.

Press Conference, U.S.A. American and international correspondents ask questions of newsmakers in VOA's studios.

Special English Feature programs include *This Is America, Space and Man, The Making of a Nation, American Stories, American Mosaic,* and *Words and Their Stories.*

Studio One Dramatized, semi-dramatized, and narrative documentaries. Subjects range from personality profiles to reviews of historic events.

VOA Morning. Sports, science, business, music, and features about America.

Weekend Magazine A look at the people and places of the United States, featuring music, conversations with correspondents, and talks about the arts.

World Report News, interviews, correspondent reports, and opinion.

Morning Newsline News, correspondent reports, and opinions.

REGIONAL PROGRAMS

Africa in Print Reviews of books, periodicals, and discussion of issues of interest to Africa.

African Panorama News, correspondent reports, and backgrounders.

Asia Report News, correspondent reports, interviews, and opinion.

Daybreak Africa Correspondent reports, news features, and backgrounders.

Caribbean Report News, correspondent reports, and opinion.

Music Time in Africa Music of Africa from both traditional and modern artists.

Nightline Africa News, correspondent reports, backgrounders, and features on world and African issues.

Report to the Americas News, correspondent reports, interviews, and opinion.

Spotlight In-depth examination of issues of interest in the Americas.

VOA-Europe Popular music, news, and features broadcast to Western Europe.

Voices of Africa Actual voices and views of African opinion-makers from throughout the continent.

AFRICA

SUNDAY	MONDAY-FRIDAY	SATURDAY
East, Central, Southern **(0300-0430)** 11835; **(0300-0500)** 9550; **(0300-0600)** 6035, 7280, 9575; **(0500-0600)** 9540; *Central* **(0300-0430)** 3390; *Southern* **(0300-0430)** 621*; *West* **(0600-0700)** 3990, 6035, 6080, 6125, 7280, 9530, 9540, 9550, 11915.		
	0300 News	**0300 News**
	0310 Daybreak Africa	0310 VOA Morning
0400 News	**0400 News**	**0400 News**
0410 VOA Morning	0410 Morning Newsline	0410 VOA Morning
0500 News	0430 VOA Morning	**0500 News**
0510 VOA Morning	**0500 News**	0510 VOA Morning
0600 News	0510 Morning Newsline	**0600 News**
0610 VOA Morning	0530 VOA Morning	0610 VOA Morning
	0600 News	
	0610 Daybreak Africa	
West **(1600-2200)** 15410, 15580, 17785, 17800; **(1900-2200)** 9620; *East* **(1600-1900)** 9575, 11920; *East/Central* **(1600-2100)** 17870; **(1600-2200)** 15445; *West Central* **(1600-2200)** 7195; **(1800-2200)** 21485; *West/Southern* **(1900-2200)** 6045; *Southern* **(1600-1830)** 15600; **(1730-2200)** 621*.		
1600 News	**1600 News**	**1600 News**
1610 Nightline Africa	1610 Nightline Africa	1610 Nightline Africa
1700 News	**1700 News**	**1700 News**
1710 Voices of Africa	1710 African Panorama	1710 Africa in Print
1730 Music Time in Africa	1730 Music, U.S.A.	1730 Sound of Soul
1800 News	**1800 News**	**1800 News**
1810 Encounter	1810 Focus	1810 American Viewpoints
1830 Special English News & Features	1830 Special English News & Features	1830 Special English News & Features
1900 News	**1900 News**	**1900 News**
1910 Africa in Print	1910 African Panorama	1910 Voices of Africa
1930 Music Time in Africa	1930 Sound of Soul	1930 Press Conference, U.S.A.
2000 News	**2000 News**	**2000 News**
2010 Nightline Africa	2010 Nightline Africa	2010 Nightline Africa
2100 News	**2100 News**	**2100 News**
2110 New Horizons	2110 World Report	2110 Communications World
2130 Studio One		2130 Weekend Magazine

CARIBBEAN

SUNDAY	MONDAY-FRIDAY	SATURDAY
(0000-0200) 930*, 1580*, 6130, 9455.		
0000 News	**0000 News**	**0000 News**
0010 Encounter	0010 Caribbean Report	0010 Closeup
0030 Studio One	0030 Music, U.S.A.	0030 Press Conference, U.S.A.
0100 News	**0100 News**	**0100 News**
0110 New Horizons	0110 Report to the Americas	0110 Communications World
0130 Issues in the News		0130 Weekend Magazine
(1000-1200) 1580*, 5975, 6160, 9700.		
1000 News	**1000 News**	**1000 News**
1010 VOA Morning	1010 Focus	1010 VOA Morning
1100 News	1030 VOA Morning	**1100 News**
1110 Critic's Choice	**1100 News**	1110 American Viewpoints
1130 Spotlight	1110 Newsline	1130 Music, U.S.A.

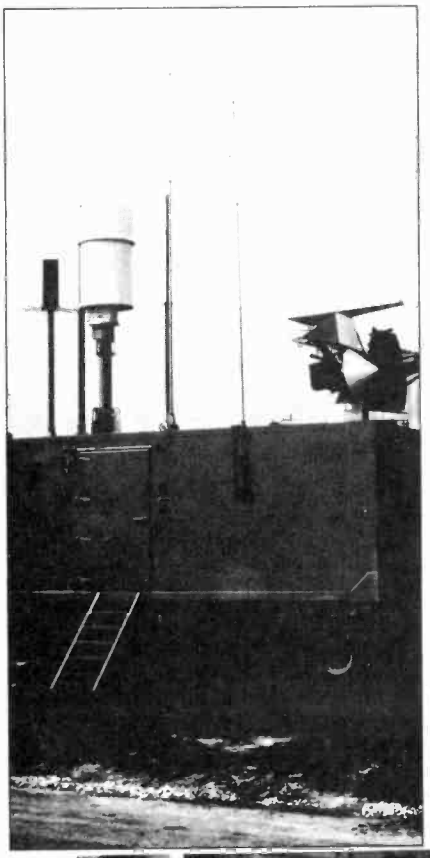
EUROPE AND NORTH AFRICA

SUNDAY	MONDAY-FRIDAY	SATURDAY
Europe **(0300-0700)** 6040, 7200; **(0400-0430** and **0500-0700)** 792*; **(0400-0700)** 5995, 7170; **(0430-0500)** 1197*; **(0430-0500 and 0630-0700)** 3980; **(0500-0545 and 0615-0700)** 6060; **(0600-0700)** 7325. *North Africa* **(0500-0700)** 7170; **(0600-0700)** 6095, 11805.		
0300 News 0310 VOA Morning **0400 News** 0410 VOA Morning **0500 News** 0510 VOA Morning **0600 News** 0610 VOA Morning	**0300 News** 0310 Newsline 0330 VOA Morning **0400 News** 0410 Newsline 0430 VOA Morning **0500 News** 0510 Newsline 0530 VOA Morning **0600 News** 0610 Newsline 0630 VOA Morning	**0300 News** 0310 VOA Morning **0400 News** 0410 VOA Morning **0500 News** 0510 VOA Morning **0600 News** 0610 VOA Morning
Europe **(1700-1730)** 1197*, 3980; **(1700-1800 and 1930-2000)** 792*; **(1700-2200)** 6040, 9760, 11760; **(1930-2000)** 792*; *North Africa* **(1700-2100)** 11760; **(1830-2200)** 9760.		
1700 News 1710 Critic's Choice 1730 Issues in the News **1800 News** 1810 Encounter 1830 Special English News & Features **1900 News** 1910 Sunday Report 1930 Music, U.S.A. (Standards) **2000 News** 2010 The Concert Hall 2055 Editorial **2100 News** 2110 New Horizons 2130 Studio One	**1700 News** 1710 Newsline 1730 Music, U.S.A. **1800 News** 1810 Focus 1830 Special English News & Features **1900 News** 1910 Newsline 1930 Magazine Show **2000 News** 2010 Music, U.S.A. (Jazz) 2055 Editorial **2100 News** 2110 World Report	**1700 News** 1710 Communications World 1730 Weekend Magazine **1800 News** 1810 Closeup 1830 Special English News & Features **1900 News** 1910 American Viewpoints 1930 Press Conference, U.S.A. **2000 News** 2010 Music, U.S.A. (Jazz) 2055 Editorial **2100 News** 2110 Communications World 2130 Weekend Magazine

MIDDLE EAST *(partial listing)*

SUNDAY	MONDAY-FRIDAY	SATURDAY
(0300-0330 and **0600-0700)** 1260*; **(0300-0600)** 7200, 9740; **(0500-0600)** 9670, 11925, 15205; **(0600-0700)** 5965, 7325, 15195.		
0300 News 0310 VOA Morning **0400 News** 0410 VOA Morning **0500 News** 0510 VOA Morning **0600 News** 0610 VOA Morning	**0300 News** 0310 Morning Newsline 0330 VOA Morning **0400 News** 0410 Morning Newsline 0430 VOA Morning **0500 News** 0510 Morning Newsline 0530 VOA Morning **0600 News** 0610 Morning Newsline 0630 VOA Morning	**0300 News** 0310 VOA Morning **0400 News** 0410 VOA Morning **0500 News** 0510 VOA Morning **0600 News** 0610 VOA Morning

Tracsvan Stymies Enemy Comms



"In practice, it is extremely difficult to get all the NATO nations to participate in a single project."

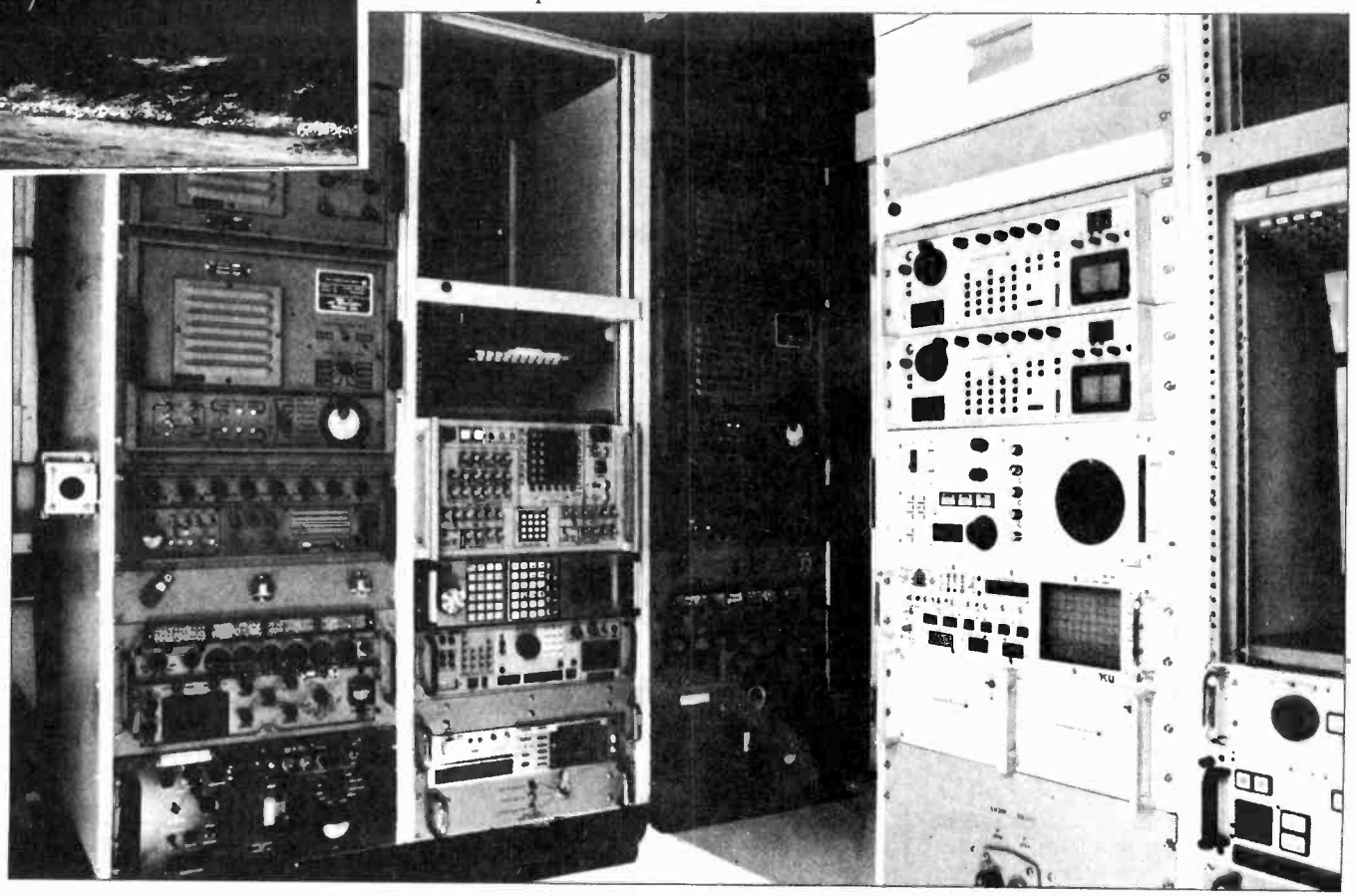
This quote from Robert Komer, Under Secretary for Defense Policy during the Carter administration, keynotes the initiative which created a Multi-Service Electronics Warfare Support Group (NEWSG) to expand the capability of the NATO alliance.

The Fleet Electronic Warfare Support Group (FEWSG), first visualized in 1968, now maintains an impressive array of electronic warfare hardware, including high power jamming transmitters, aircraft pods, wide-coverage receivers, and highly-flexible simulators.

The British specified the development of three Transportable Radar and Communications Simulator Vans (TRACSVANs), the prime contracting of which was granted to Sperry Corporation. Each TRACSVAN comprises a simulator van, a mobilizer (set of wheels) and a diesel generator.

Major subsystems of the creation include a radar simulator, radar jammer, radio direction finder/tracker, communications and electronic countermeasures (ECM), and a computer controlled monitoring system.

Normal communications are conducted via redundant pairs of transceivers for HF, VHF and UHF; a surveillance receiver allows continuous coverage of the 10 kHz-500 Mhz spectrum. Jamming is accomodated by various modes: AM and FM noise, five audio tones with squarewave or sawtooth modulation, or random Morse code. *(Courtesy Signal and Newsbriefs magazines.)*



Inside and outside views of TRACSVAN

Mobile Data Terminals

"ZAP....Z-A-A-A-P". The raucus sound is familiar to scanner listeners in larger cities nationwide. It is the exchange of data between fixed and mobile terminals of public service agencies. But can they be monitored on standard equipment?

This is a question that we have asked our readers for years; as yet, no one has reported being successful. Perhaps the reason is that the protocol is non-standard, a proprietary system developed by a specific manufacturer and never intended to be compatible with existing modes.

Shown here is an example of just such a device, the KDT 480 mobile data terminal from Motorola. The brilliant, 20-square-inch CRT display is capable of showing 12 lines, 40 characters each, plus two additional lines of status information, in bright sunlight.

The terminal supports the full 96 character ASCII character set plus 32 additional characters to allow graphic displays such as maps and diagrams. Up to 3000 characters of a message may be stored in RAM.

Portables, Too

Motorola also markets the KDT-800 portable data terminal which transmits and receives 4800 bps data in the 800 MHz band. Its I/O port is capable of 300 to 9600 bps; it features 32k ROM (expandable to 160k bytes) and 24k RAM (expandable to 80k bytes).

And Even a Vehicle Location System

Keeping a vigilant watch on a large fleet of police vehicles is a complex task for a dispatcher. The Motorola Automatic Vehicle Location system (AVL) makes the job a little easier.

Using the Coast Guard's 100 kHz LORAN-C (Long Range Aid to Navigation) as a stable marker beacon, fix accuracies within 1/8 mile are possible 95% of the time. Sequential, routine polling of vehicles may be increased to once every two minutes when necessary to keep tabs on hot spots.

An officer in an emergency situation can press a button and the five closest cars will be alerted immediately for backup, even if their vehicles and radios are turned off. If an officer leaves his vehicle for a longer period than expected, the dispatcher is signalled by an audible alarm and highlighted display on the terminal.

Lawrence Magne

Editor-in-Chief
Passport to World Band Radio

Generic Engineering

The Sangean ATS-803 and Radio Shack DX-440

Most of the time, a given model of a radio is unique. You don't see it except under the label of the manufacturer, and that's that. But there are exceptions, like the Marc II we reported on in the December issue of *Monitoring Times.*

Manufacturers such as these sometimes sell more world band radios under other firms' names than under their own. The reason for this is simple. Just because a manufacturer knows how to make radios doesn't necessarily mean that they know how to sell them to thew public. Team up a manufacturer with a firm that has better marketing and distribution channels, and a marriage of convenience can result.

The Taiwanese firm of Sangean is familiar to many shortwave listeners as the producer of a small line of world band portables. What's interesting is that it also manufactures for other firms. Not just one other firm, mind you, but any number of firms ranging from Sears to Emerson to Radio Shack.

The evolution of a receiver - Sometimes cooperation between manufacturer and dealer results in a better receiver; sometimes worse. In the case of the Sangean ATS-803 it has resulted in a much improved radio!

To add to the confusion, these manufacturers sometimes alter models for their clients. For example, the Tandy/Radio Shack DX-360 is nothing more than a woefully stripped-down version of the manufacturer's set, the Silver XF1900. So these radios are not necessarily peas in a pod with different labels stuck on them. Some are worse than the manufacturer's original radio. Some are better.

The original version ATS-803, for example, which is a midsize portable and Sangean's top-of-the-line, -- was rather unselective. What this means is that interference from adjacent stations had a greater-than-desirable tendency to disrupt reception of the station you were trying to hear.

Improvements From EEB

Electronic Equipment Bank, which used to distribute the '803, poked about the set's innards and discovered something interesting. Hidden inside was a second and much more selective bandwidth filter. That filter was well suited to reception of world band broadcasts, but for some unaccountable reason, Sangean had rigged it up so that it only switched in when the scanner was in use.

So EEB's technicians came up with a switch to allow the listener to choose between the usual wide filter and the almost-secret narrow filter. But prying open cabinets and working with delicate circuitry for large numbers of sets became a growing headache. So EEB asked Sangean if they could

custom-produce the '803 for them with the switchable bandwidth filtering already included. Sangean agreed and another new version of the ATS-803 -- called the "EEB 2020," was born.

Enhanced Performance

The '2020 is pretty straightforward to operate, given that it has keypad tuning, a conventional tuning knob, plus programmable channel memories for favorite stations.

It's obviously a real improvement over the original '803. With the '2020, if the station you're listening to is out in the clear, you can open up the bandwidth for maximum fidelity -- the same result that you'd get with the original '803. With the '2020, however, if there is interference from nearby channels, you can switch in the narrow filter to clean things up.

Improved bandwidth filtering doesn't make the Sangean into a communications receiver. But considering that the '2020 sold in the US for $179.95, it was a pretty darned good buy for the newcomer or for a second set to take on trips or out in the backyard. The only other world band radio in the same cost/performance league would have been Magnavox's D2935 portable... had they ever put it on sale in North America as they promised.

More Upgraded Versions

EEB's pioneering efforts are beginning to be show up elsewhere now. Last August, Radio Shack introduced its model DX-440 portable, which is essentially the '2020 with a number of *additional* circuit changes mandated by Radio Shack. Radio Shack's DX-440 sells for $199.95.

In the meantime, the original Sangean ATS-803 itself was superseded in December by an improved version selling for $10-15 or so more. This version is all but identical to the DX-440 and very similar to the EEB-2020.

The Demise of EEB-2020

If all of this has you a little confused, relax. Things are beginning to settle down. With all these improved versions of the '803 available, the need for a distinct EEB 2020 diminished. So EEB sold the last of its '2020's back in December. Replacing the '2020 will be -- you guessed it -- the same, improved version of the '803 that most of the other dealers carry -- at about $10 more than the '2020.

And so ends the tale of a heads-up dealer, who, rather than the manufacturer, brought about important engineering improvements in a world band radio. And we're all the beneficiaries of EEB's efforts. Now, at last, there's a world-class world band receiver available for under $200. ■

You can hear Larry Magne's equipment reviews 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. Additionally, Passport's Don Jensen and Tony Jones can be heard the third Saturday night each month.

In the US, RDI White Papers are carried by various dealers, including Electronic Equipment Bank, Imprime and Universal Shortwave. A free catalogue of the latest editions of all available RDI White Papers, which cover -- warts and all -- the most advanced communications receivers, portables 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.

Uniden BC100XLT Handheld Scanner

With the announcement by Regency that it is dropping out of the consumer electronics market, Uniden will undoubtedly increase its domination of the scanner marketplace. At this writing, Uniden is considering buying Regency's consumer division. A decision is due shortly.

Recent delays by Uniden to introduce such new products as the BC200XLT plus their announcement that they would be disabling cellular reception in all future products have alarmed many Uniden customers.

The newest product to reach the user is the BC100XLT, a 100-memory-channel hand-held which will probably replace the venerable BC100XL. Bearcat's BC-100 was the first hand-held programmable scanner ever produced and its generations have set the standard for most of this decade.

Appearances

Uniden has finally abandoned the substantial aluminum enclosure provided with previous models of the 100 series, substituting instead a well-made plastic case resembling that of the competitive Regency HX1500.

The new scanner measures 2-3/4"W x 7-1/2"H x 1-1/4"D and weighs just over one pound, including carrying case.

Specifications

The BC-100XLT is a departure from the earlier BC-100 series, looking more like a tall BC-70XLT; fortunately, there the resemblance ends. 100 memory channels, available sequentially or in ten banks of ten channels each, cover the frequencies 29-54, 118-136, 136-174, and 406-512 MHz.

Features include 15-channels-per-second scan speed, 25-frequencies-per-second search speed, well-lighted LCD display, automatic weather channel search, up/down search step, and individual channel lockout and delay.

A priority command selects the first channel of each bank, allowing up to ten priority channels depending upon the number of banks activated.

Selectivity is stated as -55 dB @ +/- 25 kHz, but no -6 dB figure is given to reveal shape factor of the filter(s). Audio output power of 480 mW provides ample volume for most applications, although the gain control will be turned nearly full on for some noisy environments; still, integrity of the sound remains high.

Sensitivity of our evaluation unit was on par with its predecessor, the BC-100XL. Uniden's published sensitivity figures are 0.4 uV for the 29-54 and 136-174 MHz ranges; 0.8 uV for 118-136 MHz (AM); and 0.5 uV for 406-512 MHz. These figures seem credible and respectable judging from our listening test.

The battery is a detachable module which holds its charge for at least 8 hours of average, low-volume listening. It may be charged from the AC adaptor (provided) or from any source of 12 VDC, and the radio may be operated from those sources as well while charging.

An AC wall adaptor, flex whip, earphone, rechargeable battery pack, and heavy-duty leatherette holster are provided along with an instruction sheet. Warranty is one year.

The average selling price of the BC100XLT is $219.95 from *MT* advertisers, but could increase if there is further devaluation of the American dollar in the Japanese market. ■

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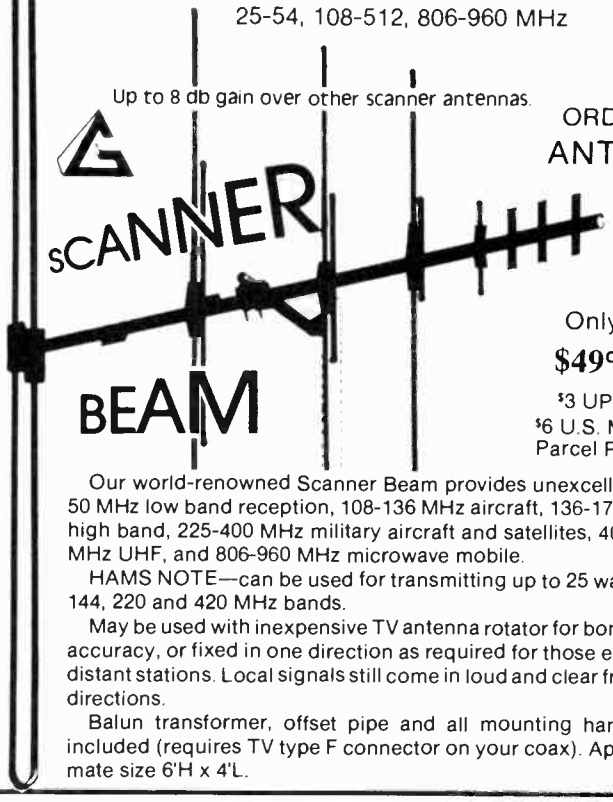

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HAMS NOTE—can be used for transmitting up to 25 watts on 144, 220 and 420 MHz bands.

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.

Grove's Outdoor Scanner Antenna System

1. Start with our OMNI or SCANNER BEAM

See ads on this page for our top-quality, low-cost antennas—the all-band, all direction OMNI Ant-5, and the world-renowned SCANNER BEAM Ant-1B directional antenna.

2. Then add our Wideband Preamp, 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!

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What you need to order:

OMNI (Ant-5B) *OR*	**$19** (plus $2 UPS; $4 U.S. Mail P.P.; $6 Canada Air P.P.
Scanner Beam (Ant-1B)	**$49** (plus $3 UPS; $6 U.S. Mail P.P.; $9 Canada Air P.P.
PRE-3 Power Ant III	**$39** (plus $1.50 UPS; $3 U.S. Mail P.P.; $4 Canada Air P.P.
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)

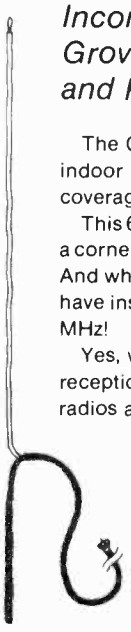
Grove's Indoor Scanner Antenna System

Incorporating the Grove Hidden Antenna and Power Ant III

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. P.P., $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)

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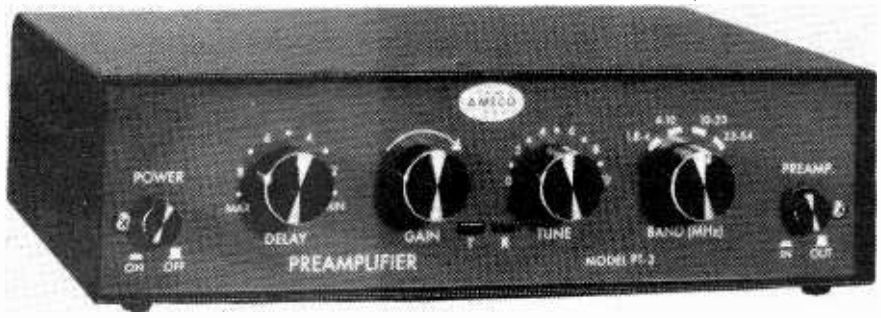


The Ameco PT-2 preamplifier has long been the industry standard; now Ameco introduces the PT-3.

Ameco PT-3 Preamplifier

The name Ameco has been respected among members of the amateur radio fraternity for decades. Recently, the Ameco code tapes were mentioned in the pages of *MT*. For many years, their PT-2 preamplifier was a standard in the industry. Now, the PT-3 has been introduced.

The Ameco PT-3 is continuously tunable from 1.8-54 MHz; it has a built-in transceive capability allowing it to bypass itself during transmissions of up to 350 watts of power. Offering up to 26 dB of gain with a dual-gate, low-noise FET amplifier, the PT-3 requires 12 VDC power.

Housed in an attractive metal cabinet, the PT-3 has a gain control, transceive delay control, bandswitch, tuning dial, preamp bypass switch, power switch, and transmit/receive status lights. It is designed for a nominal 50 ohm line.

(PT-3 transceiver/receiver preamplifier, $109.95; P-12T AC power supply, $8.95. Catalog available from Ameco Equipment Co., 220 E. Jericho Turnpike, Mineola, NY 11501)

Midland Gold Power Max CB

While we rarely venture into CB products, this release from Midland International (Consumer Communications Division, 1690 North Topping, Kansas City, MO 64120) is exceptional enough to deserve mention.

Intended as a special limited edition transceiver for 1988 to celebrate the 30th anniversary of citizens band radio, the model 77-250G has 24K gold plated knobs; special gold lettering and accents are found on both the radio and the microphone. The black, high-tech face features high intensity amber readouts.

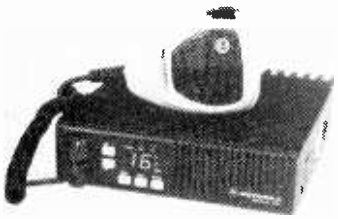
Not all of the glamour is glitz, however; the Gold Power Max offers high level modulation, a tuned-gate MOSFET amplifier for low noise and high sensitivity, a dual conversion receiver with both crystal and ceramic filters for excellent adjacent channel selectivity, switchable audio noise limiter (ANL), and a switchable dynamic noise filter for ignition noise supprssion.

A seven-stage, multicolored meter registers signal strength, RF power, modulation level, and standing wave ratio (SWR); instant channel 9 and 19 access is provided; and a slide-in/slide-out mount allows 30 degree horizontal and vertical movement. Suggested retail is $279.95.

Midland's limited edition Gold Power Max model -- a collector's item and more!

New Compact Radios from Motorola

The Motorola Communications Sector (1301 E. Algonquin Rd., Schaumburg, IL 60196) has announced a new line of MaxTrac professional mobile radios. Available in 136-162, 146-174, 449-470, and 800 MHz versions, the mobiles are offered with 2, 6, or 16 channel capacity (20 for the 800 MHz version).



New from Motorola: upper left, Motorola's MaxTrac 100 and 300 mobile radios; left, MaxTrac 800 MHz series trunked mobile radios.

1988 Hamtronics Catalog

($1 U.S. first class, $2 overseas; from Hamtronics, Inc., 65-F Moul Rd., Hilton, NY 14468-9535)

Whether you are a licensed ham or an active listener--or both--there is bound to be something of interest in the new Hamtronics catalog. Specialized for years in kits and factory wired receivers and converters, Hamtronics' new 36 page catalog now has an FM receiver for 902-928 MHz, a 137 MHz weather satellite receiver, 9600 baud packet linking system, and many other products as well.

Aero/Marine Beacon Guide Updater

by Ken Stryker (14 pages, 8-1/2" x 11", $4 from the author at 2856-G West Touhy Ave., Chicago, IL 60645)

For those low frequency addicts who enjoy logging stations below the 550 kHz band, Ken Stryker's beacon guide has provided an excellent source of station identifications for years. His new updater allows owners of the full guide to bring their listing up to date.

For those who don't have the full volume, a special combination price of $12.50 brings both the full listing and the new updater.

Government Radio Systems -- California Fifth edition

by Robert Kelty (360 pages, 8-1/2" x 11", perfect bound, drilled for looseleaf binder. $12 postpaid from Mobile Radio Resources, 2661 Carol Drive, San JHose, CA 95125)

Now in its fifth edition, Kelty's directory remains a leading reference for city, county, state, and federal government agencies throughout California. Because many federal agencies share nationwide allocations, many listings have wide-area applicability.

Listings include police and fire, interagency common, medcomm, state executive branch (Attorney General, corrections, conservation and agriculture, education, etc.), and federal executive agencies (Agriculture, Commerce, Justice, Treasury, Interior, Transportation, Labor, State, Energy) and many more.

Kelty's publication is the only one which includes exhaustive system details such as channelization plans, input/output repeater pairing, tone squelch frequencies, and unit designators where available.

Frequency ranges are 30-50 MHz low band, 72-76 MHz midband, 151-174 MHz high band, 406-512 MHz UHF, and 806-960 MHz microwave mobile. Even if you're not a Californian, this work is an excellent reference for studying bandplanning. ■

Kenneth Vito Zichi

3018 Moyer Road
Williamston, MI 48895-9566

So You Want to QSL?

"You write to radio stations, and they send you back a 'post card' proving that you heard them?" These are words (usually spoken in a baffled tone of voice) that challenge a radio hobbyist's skills at explaining foreign concepts!

Although the idea of QSLs strikes most non-hobbyists as unusual, the cards are a modern relic of a tradition that dates back to the beginnings of radio broadcasting and amateur operating. This month's column looks at both the QSL's history and how you can improve your luck if collecting such items tickles your fancy.

If you are relatively new to radio as a hobby, you may not be familiar with reception reports and QSL cards. So perhaps a bit of introduction is in order. A QSL is a card sent by a radio station verifying that a listener heard a specific transmission.

Shortwave, AM, FM and many Amateur and utility stations will all verify reports that provide information proving a listener heard the transmission (generally consisting of a recitation of program details, the time, date and frequency of the station). Many hobbyists seek to collect as many of these cards as possible in the same way other people collect stamps or coins. The difference is that money alone is not enough to amass an impressive collection of QSLs. Skill plays a part as well.

History

In the early days, radio amateurs were primarily interested in increasing their contact range as much as possible - distance was everything. Without some tangible evidence, however, proof of contact was impossible. Someone, whose name is unrecorded, hit upon the idea of exchanging a card or letter verifying the contact.

These so called QSL cards are still actively exchanged by amateurs, and listeners also may obtain Ham QSLs by requesting them from the operator directly or through one of the Ham QSL bureaus. QSL, by the way, is the Q code abbreviation meaning "I am acknowledging receipt (of a message), and thus was applied to an acknowledgement of reception *card* as well.

In the 20's and 30's when broadcasting was just becoming popular, listeners also wanted to be able to prove to disbelieving neighbors and friends that they had heard station XYZ. Early in the 1920's, something known as the "verified reception stamp" was developed, primarily by the Ekko company, as a way of collecting proof of reception for broadcast stations.

Stations throughout North America, and to a lesser extent, other areas of the world, would provide listeners with a stamp to paste into their collection books upon receipt of proof of reception. (Basically, the listeners had to send in a reception report on a special form along with a dime for return postage and handling.) Many stations, in addition, or as an alternative to the stamps, produced verification cards, similar to amateurs' QSL cards. These would then be provided to the listener writing a report.

All of this begs the question, why would a station care to send out a QSL stamp or card anyhow? Simply put, from the station's perspective, it was a bonus to be able to show advertisers they really did have listeners! In the days before ratings, direct mail was the only easy way to do this. Station engineers also appreciated the information on how the signal was "getting out" in order to judge how they were doing their job.

As you can see, despite the fact that so few casual listeners have heard of them, QSLs in one form or another actually pre-date broadcasting. Early broadcast stations started to use QSLs early on as a public relations measure to attract listeners, and continue to do so today, albeit for different reasons.

QSLing Today

QSLing today is a bit different than it was in the 1920's, but many of the basics remain the same. Most standard broadcast stations are not overly concerned with attracting a large audience from outside their primary target area, do not care to learn how reception quality in distant areas is, and thus do not promote QSLing. Ratings are a more reliable way to determine listener shares, and are universally used to set advertising rates.

Primarily as a tradition, and also as a public relations measure, however, most local broadcasters continue to provide a verification cards to listeners who write with a reception report and a request.

Although there is a dedicated core of hobbyists primarily interested in Medium Wave (what most people refer to as "AM") Broadcast DX and who regularly attempt to QSL those stations, most activity in this area is by listeners monitoring the shortwave bands.

The reason QSLs remain a major part of shortwave monitoring is, first of all, that broadcast stations do not have the luxury of ratings to determine listener share. Further, they *are* concerned with reaching distant audiences, and signal quality reports are more valuable in those circumstances than when a station is only interested in a local audience. For the same reasons MW broadcast stations started QSLing in the 1920's, shortwave broadcast stations continue it today.

Stations (both MW and SW) continue to QSL as a public relations measure, and a polite request along with a useful reception report is the best way to get a verification.

Hints and Kinks

As a minimum, a reception report should contain the time, date and frequency of station (in units the station staff will understand). Some indication of program details and a description of the equipment used is also desirable. Let's look at each of these items in more detail.

The frequency of a station should be listed in either kilohertz or megahertz and should be as accurate as possible. If the station is announcing one frequency and you note they are on another, you should point out the discrepancy, and list both frequencies. The time and date should be in units the station personnel will understand.

Generally it is OK to use a 24 hour clock rather than AM or PM, but if the station is not aimed at listeners outside the national borders of the country it is best to state the time of reception in the local time of the station, and not UTC or GMT. Remember - the date changes at midnight in the time

you are using for the report not at midnight in any other time zone! Thus all domestic broadcasters, whether on SW or MW, should receive reports that list the time in the local time of the station.

The description of equipment should be something more than just model numbers. It is more helpful to the station if a report indicates that your receiving equipment is a digital read-out portable or a 10 tube communications receiver, or whatever.

Lastly, programme details should be comprehensive enough to prove you heard the station, but need not be a word-for-word transcription of the broadcast. Song titles, the subject of news items and products advertised are all good things to note. If you can keep a running tabulation of the time when various announcements were aired (accurate to one half minute is fine) it will help the station is verifying the report.

As indicated above, the primary tools in successful QSLing are accurate reception reports, and a polite request. Depending on the type of station, however, there are other items that may be helpful.

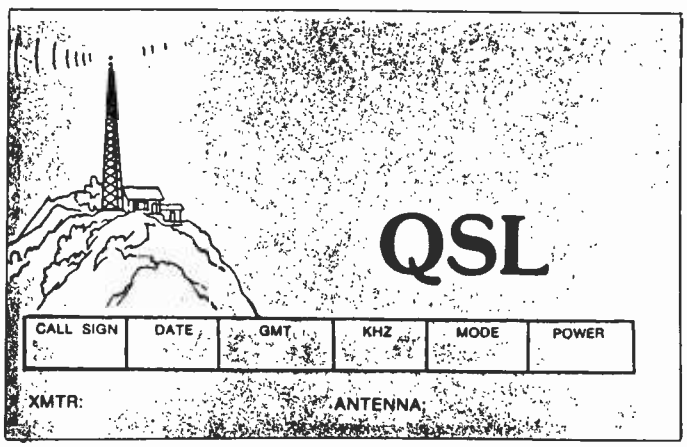
Special Considerations:

If the report is to a large governmental station like Radio Netherlands or Radio Moscow, a report in English (or the language of the broadcast) and a request for the verification card is perfectly adequate. Other types of stations will require additional consideration.

Smaller stations, such as Radio New Zealand or commercial or religious stations such as WABC, or HCJB, require postage with the reception report as a matter of courtesy. Again, a report in English or the language of the broadcast is usually acceptable for such stations, although with domestic stations (both MW and SW) you should report only in the language of the broadcast or the primary language of the country of the station.

Information in addition to the basics listed above is acceptable, and at times, desirable. Such information makes a report much more interesting to the person answering mail for the station, and especially with smaller broadcasters and utility stations, such interest can spell the difference between a report that is placed in the circular file, and one that is answered.

For stations unaccustomed to sending verfication reports, it is helpful to enclose a prepared form card (PFC) for them to fill in the blanks.



Creativity plays a big role here. Additional information such as something about the economy and history of your area, or including a small souvenir like cancelled postage stamps of interest to a foreign collector, are just two ideas on how to make a report more interesting.

Another technique that is especially helpful in verifying utility stations is including a "prepared form card" with a report. A PFC is essentially a fill-in-the-blank QSL card that the reporter makes and includes with his report. The station personnel can then complete and sign the card, and return it to the listener.

Most broadcast and amateur stations maintain a stock of their own cards, so this unnecessary with those types of reports, but obviously, a utility station is primarily interested in point-to-point transmissions and do not generally stock cards.

For more details where to send reports for specific stations, a reference such as the latest edition of the *World Radio TV Handbook* (about $19.95 and a "must have" book for anyone interested in SW broadcast listening) is useful.

For a very detailed look at how to verify difficult stations, and a more comprehensive treatment of the techniques of successful reporting than I have had room for here, check out Gerry Dexter's work, *Secrets of Successful QSLing"* ($9.95). Both are available from Imprime.

■

Radio Shack Batteries and the BC100XL

If you have attempted to replace the AA nicad cells in your Bearcat BC100XL with Radio Shack units, you may notice that the bottom cover ("battery door") for the battery compartment bulges due to the extra length on the new cells. If you are a stalwart do-it-yourselfer, Ron Smith of Birmingham, Alabama, has a cure.

The procedure is simple, but requires a little care: Using a sharp blade, pry out the old metal strip on the battery cover, cutting away any excess plastic to leave a clean surface; replace it with a thin, flat strip of brass shim stock of the same dimensions. It may be held permanently in place by instant-setting glue.

If you goof up the project, you can obtain a new battery door from Uniden: Order #GHZ 316568Z and enclose $5 which includes shipping from Uniden/Bearcat Parts Dept., 6345 Castleway Court, Indianapolis, IN 46250.

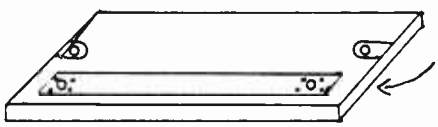
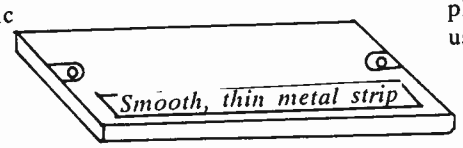


Fig. 1
Pry loose tab with X-acto or similar

Fig. 2
Remove any excess plastic to get a smooth surface. Then instant-glue a thin metal strip in as shown.



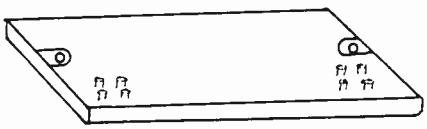


Fig. 3
Cut off pins with X-acto and proceed as before.

A Mobile Mounting Bracket for the PRO2004

Sure, it's a big scanner; but if you want 300 memory channels and wide frequency coverage, it's a good choice. But what if you want to use the Realistic PRO2004 in the car? How do you mount it under the dash?

John Wilson, W4UFF, of Prince George, Virginia, was faced with just that problem recently and came up with an answer using a convenient universal mounting bracket for autosound applications.

The procedure requires drilling holes into the scanner cabinet and may void your warranty. In any case, proceed very carefully to avoid damaging internal components.

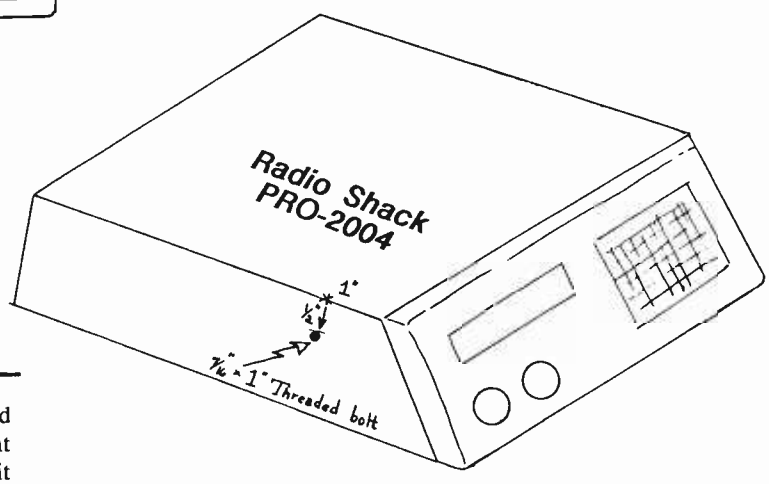
1. Measure 1" back from the top-edge interface with the front bezel (see illustration); then measure 1/2" down from this point and mark it. Repeat for the other side.

2. Slowly and carefully drill a 1/8" hole through each of your two marks, penetrating both the cabinet and the chassis. Repeat using a 1/4" drill bit. Remove the cabinet and brush out any metal turnings.

3. File or ream the hole slightly so that a 7/16" long, threaded, steel bolt will seat in the hole and then, using a socket wrench, use the bolt to tap a thread in the new hole. Needless to say, a tap and die set would help here!

4. With the cabinet still off the scanner, enlarge the two cabinet holes but not the chassis holes) slightly with the next size drill bit. You may wish to make the cabinet holes 1/2" diameter to accommodate two half-inch washers as shims between the mounting bracket and the radio.

5. Reassemble the cabinet on the radio and mount the scanner in place with a universal U-bracket assembly. Fiber washers may be used as shims for tightening to prevent scratching the cabinet.



Button the Beep on the Regency HX1200

One of the blights inflicted upon scanner owners is the obnoxious "beep" which accompanies each key depression on some models. Often, the annoying noise can be heard for considerable distances, a distinct disadvantage when the listener wants to remain inconspicuous in a crowd.

David Cook of Oklahoma City has discovered a simple way to disable the tone on his Regency HX1200; he suspects that a similar fix could be applied to the previous HX1000 and even the present HX1500.

1. Remove the battery door, battery and rubber dust plug from the charger jack.

2. Remove the four black screws from the back of the case, the two silver screws in the bottom of the battery compartment and the two silver screws below the top of the scanner (just above the brass hex spacers).

3. Grasp the front of the case near the speaker and pull it carefully away from the chassis; set it aside.

4. Locate the white connector at the top of the audio board just behind the speaker location and find the 220,000 ohm resistor at the right edge of the connector. Cut one lead midway along its length, leaving enough wire to resolder at a later time to restore the tone if desired.

5. Reassemble the scanner case and test it before installing all the screws.

New Cards for the Old Opti-scan

Remember the Opti-Scan? This early scanner was a forerunner of the present generation of programmable, synthesized scanners. An optically-encoded card was placed in a slot, telling the synthesizer what frequency combinations were sought by the user. Unfortunately, while there may still be a few Opti-Scans around there probably aren't any cards.

Alan Aaronson of Yonkers, New York, shares a suggestion with Opti-Scan owners who need additional frequency cards. Using an ordinary photocopy machine, make several copies of an original card face. Glue these copies to thin cardboard for rigidity, resembling an original Opti-Scan program card.

A conventional hole punch or ticket punch can be used to make any hole pattern in the new cards as necessary, just as peeling tape off the windows in the original cards would have done. The holes may be any shape, just large enough to let the light through.

Nice idea, Alan, and thanks for sharing it with *Monitoring Times* readers!

A Junkbox 800 MHz Converter for Scanners

Mike Miskell, VE3HRT, of Ontario writes to remind us that the October, 1987, issue of *73* magazine (p.40-41) carries an interesting article on utilizing a surplus UHF-TV tuner for monitoring the 800 MHz band on a conventional scanner.

The technique is quite simple, although a regulated power supply must be constructed for frequency control of the varactor tuning in the UHF module. Output of the UHF tuner is in the 44 MHz range, so virtually any scanner may be used for the mainframe.

If your local library doesn't have a subscription to *73*, nor do you know any local hams whom you could ask for a loaner of that issue, try sending $3 to *73* magazine, c/o Becky Niemela, 70 Route 202 North, Peterborough, NH 03458-1194, and request a reprint of the article. ■

W. Clem Small, KR6A, CET

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The Spice of Life

How many times have you been listening to a really interesting program on shortwave only to have the signal fade away to nothing? Fading can be a problem not only on shortwave but also on the VHF and UHF bands. Armed with a little knowledge and a bit of specialized equipment, much of the effects of fading can be eliminated and perfect copy restored. Let's take a look at some ways of successfully attacking the fading problem.

The Diverse Nature of Radio Waves

Shortwave signals generally reach our receiving antennas via reflections from the ionosphere. Much of the time the ionosphere is fairly stable: not shifting in concentration, height, or texture too rapidly. Thus, once a signal is tuned in, it can usually be listened to for a reasonable length of time -- say fifteen minutes to an hour or longer. Then conditions in the ionosphere shift and the signal's path changes so greatly that it misses our antenna and its sound begins to fade away.

Interestingly enough, if we have a second antenna erected only a few wavelengths away from the first one, the signal which just faded out on our first antenna may now be booming in at very readable levels at the site of the second antenna!

Techniques of using more than one antenna and selecting the one with the strongest signal is one way of fighting fading. These techniques are the basis of what is known as "diversity reception." And, although this discussion has emphasized fading in the HF, or shortwave bands, the diversity approaches discussed below are also useful in overcoming the effects of fading on other bands, including the VHF and UHF bands.

Dual Diversity

One approach to diversity reception is to keep your hand on the antenna switch and simply switch antennas when the signal from one fades out. This isn't too easy and you may end up spending most of your time switching instead of listening. Another approach to the problem is to simply have two receivers, each connected to a separate antenna. Tune them to the same frequency and both play simultaneously.

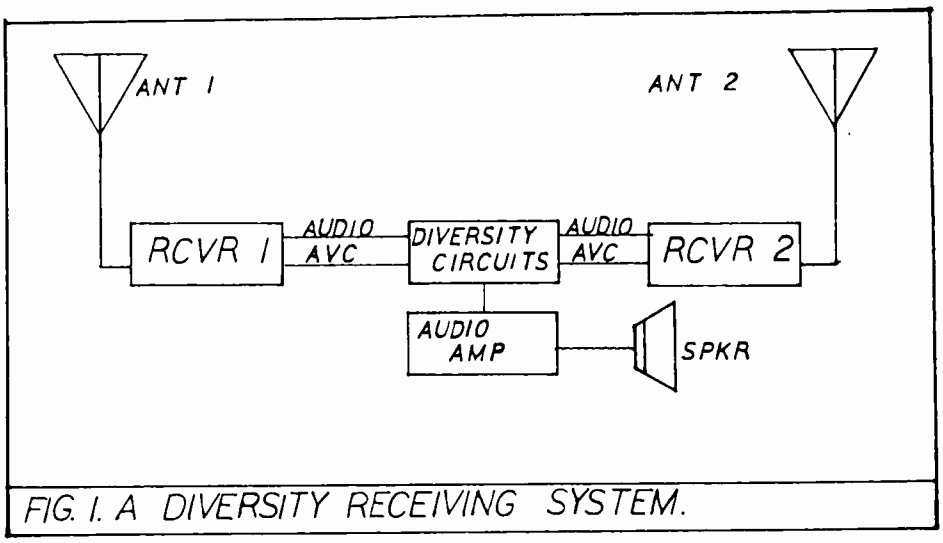

FIG. 1. A DIVERSITY RECEIVING SYSTEM.

Much more convenient and effective is an approach which utilizes a diversity circuit that "listens" to both of the receivers electronically. This circuit, by monitoring the automatic volume control (AVC) line, continually compares the two signals. In this way, it selects the audio from the stronger of the two signals. (See Fig 1.)

Diverse Types of Diversity

Actually, there are several approaches to diversity reception. The approach discussed thus far is based on sufficiently separating the antennas in order to give you two chances of catching the signal as it varies imposition from time to time. It's called "space diversity".

Depending on who you talk to, you'll hear that you should separate your antennas from 1/2 up to 10 wavelengths. I tend to doubt that the 1/2 wavelength is sufficient separation to maintain good diversity reception. A better minimum separation might be three wavelengths.

For most of us, erecting two antennas separated by three wavelengths distance would require more real estate than we have at our disposal. At least on the shortwave bands this would be true. But don't give up yet, there is an approach to diversity reception which takes up less space, called "polarization diversity."

With polarization diversity, we capitalize on the fact that a signal may fade due to a shift in its polarization, even if it is still present in good strength at the antenna site. Antennas respond best to signals which are polarized in the same manner as the antenna itself. Thus, if a vertical antenna is receiving a moderate-strength vertically polarized signal, you will have good reception. If that signal shifts to a horizontal polarization, however, reception may degrade so that the signal is unreadable.

Shifts in the ionosphere can cause such changes in polarization. When it happens, the signal will fade. If you have two antennas at your site -- one horizontally polarized and one vertically polarized -- then dual-diversity can be used to good effect.

If fading is your problem, then diversity reception just may provide the solution.

Frequency Diversity

Many shortwave broadcasting stations transmit their programming simultaneously on more than one frequency. This allows us to use yet another approach to diversity reception. Here, you'll also need two receivers but this time only one antenna. And that one antenna can be coupled to both receivers.

Tune both receivers to the same station but each to a different frequency. As the signal on one frequency fades, it is quite likely that the signal on the second frequency will be at useable strength. This approach is commonly called "frequency diversity".

Time Changes Everything

There is one more approach which should be mentioned in a discussion of diversity. This is known as "time diversity." It's quite useful in increasing the reliability of information-interchange by radio transmission under difficult conditions.

In time diversity, information is repeated by the transmitter in order to give the receiving system more than one chance to reproduce it. Ham operators use time diversity routinely when they have trouble copying a signal: they just ask the other operator to "say words twice."

In shortwave broadcasting, transmitting the same program at various times of the day can be thought of as a means of facilitating time diversity reception. For a more sophisticated example, those readers familiar with the AMTOR or SITOR versions of radioteletype will recognize the FEC, or "forward error correcting" mode in those systems as another application of time diversity reception.

So, if fading is a significant problem in your communications, you might consider investigating the various approaches to diversity reception.

RADIO RIDDLES

Last Month: We asked if you knew what a "hypodermic antenna" is and urged you to look over the column for clues as to its identity. Did you find it? If not, look back to figure 1F in last month's column and notice the "sleeve antenna." This antenna, with its long slim, needle-like quarterwave top element extending from the tube-shaped quarterwave element below, has the appearance of a giant hypodermic needle and syringe. Thus it is sometimes called the "hypodermic antenna." Ouch!

This Month: Some antennas have a kind of "built-in" automatic diversity effect. What sorts of antennas might have this effect, and why? Tune-in next month for the answer to that one.

■

Federal Highway Broadcasting System

In 1985 the FHWA began deployment of an HF radio system interlinking regional and field offices nationwide. The purpose of the network is to coordinate mass relocation in times of national emergency, either natural disaster or armed aggression.

The synthesized transceivers, built by Sunair, are capable of 100 or 1000 watts of power and are used with dipole antennas. Dovetron RTTY terminals are also used. Using upper sideband voice as the dominant mode, 110 and 300 baud ASCII (850 Hz shift) is also used for data transfer.

Practice drills are held quarterly (March, June, September, and December), usually on Wednesday and Thursday of the week during normal business hours, and may involve participation from other agencies as well such as the Federal Aviation Administration (FAA) and the Office of Emergency Transportation (OET).

A bureau of the Department of Transportation, FHWA frequency assignments are distributed to ten regions and administered by the United States Coast Guard, also a DOT agency.

All FHWA members share call signs with a WWJ prefix such as WWJ45 Chicago, Illinois; WWJ65 Raleigh, NC; and WWJ82 Lincoln, NE. Frequencies of 9197 and 10891 kHz are two of perhaps dozens of channels assigned for communications.

Information on this new network is understandably sketchy; we would appreciate additional details on frequencies, call signs and locations from our readers.

Terry Staudt, LPE, W0WUZ

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Loveland, CO 80537

EH?

Like millions of people around the world, I'm hard of hearing. There's a whole bunch of easy things you can do to hold off the purchase of a hearing aid for as long as possible. The most obvious is headsets. Less obvious but just about as simple, is a little bit of electronic 'surgery' on a table radio.

I'll tell you everything there is to do and the whole thing will cost you next to nothing. The truth is, the electronics industry has a treasure trove of 'built in' solutions. They were never intended for this purpose, but they work just fine.

As I've pointed out on a few occasions, the "tone" control on a radio is a treble cutter that gives the illusion of bass, no more, no less. If you snip a wire from either of the outer lugs, the treble or high frequency component is increased by 10 dB or better. (See Fig. 1.) This is an improvement of some 8 to 10 times and obviously, the bass doesn't suffer. That's determined strictly by the size and weight of the speaker.

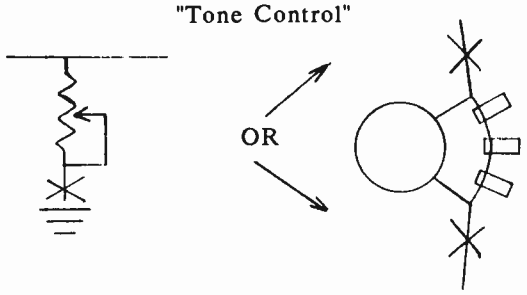
Replace the Speaker!

This is also a clue if you have a radio you really love but the bass isn't much. Remove the speaker and take it to Radio Shack for correct sizing and get one with the biggest magnet that will fit in the mounting area. You'll be thrilled with the result.

While you don't want a "whizzer" cone for shortwave, a speaker with this feature is a great replacement for a person with hearing difficulty. They'll bless you for doing it! And Lordy, we're talking a 20 minute job here, not repairing a nuclear submarine.

Figure 1

"Tone Control"



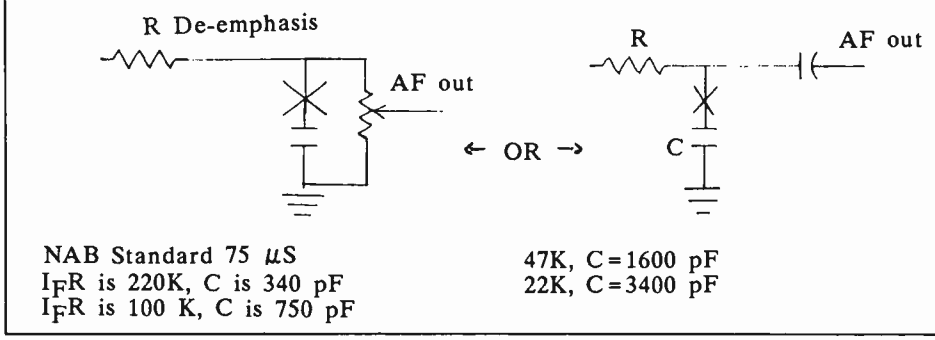
Another slick little thing you can acquire at Radio Shack (Hey, I don't own any Tandy stock, but they have some good stuff) is the #40-1380 piezo tweeter. This can be hooked across any speaker in the world with nothing more than a piece of 2 conductor wire. There are no external circuits whatsoever.

I personally use four of these -- two in my car and two on my stereo. At $12.95, they can make a bat cry. No kidding! They also come in a neat black and silver case that looks good anywhere.

Salt vs Paper

A piezo unit, like radio crystal in effect, works on the vibration of Rochelle salts and isn't paper dependent (although it is mounted within a paper diaphragm). It's free to do its own thing without the restraint of slow paper motion and that is to reproduce high audio frequencies at a faithful level without distortion. This doesn't cover all the speaker options. It just gets you thinking about it.

Figure 2



NAB Standard 75 μS
I_FR is 220K, C is 340 pF
I_FR is 100 K, C is 750 pF

47K, C=1600 pF
22K, C=3400 pF

FM radio speaker options: FM radio uses a system known as pre-emphasis and de-emphasis. This is necessary because the energy of a violin or flute can't compare with a bass drum. Consequently the station "jacks up" the highs, which could otherwise be mixed with noise.

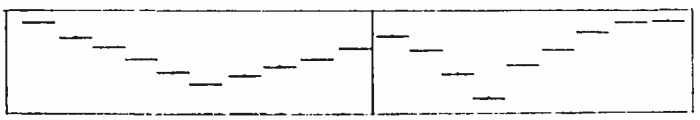
If you think the arrangement is reversed at the receiver, you've got it. A typical de-emphasis circuit is shown in Fig. 2. What is necessary is to first have a *Sams Photofact* or owners copy of the schematic. A *Sams* can be obtained at any radio/TV parts house. Then go for the throat and cut a capacitor.

Big deal? Wait until you hear it - it'll shatter glass. Visitors in my home listening to my Pioneer SX-550 often say, "how can you stand it?" To me it sounds perfectly normal. Ah, the crosses we bear. I have a 40 dB roll-off at 4 kHz. 75 at 10 kHz. No record, but not a bad average in hearing loss.

Same for TV

Don't get me wrong. I've adjusted the situation to where it's no problem! This is the whole point. You *can* do something about it. And yes, since TV sound is FM, they do the same sneaky thing and the solution is exactly the same. Look for the audio

Figure 3



Graphic Equalizer

detector on the schematic and compare it with Fig 2. It's essentially the same.

For heavens sake, before you do any of these 'fixes', unplug the unit and study it over a cup of coffee. Nothing stronger until after you're finished! Then you can enjoy it without having to see if you're in the next day's obituaries.

How about a Graphic Equalizer? Wonderful. I don't use a Radio Shack unit, but a Lassen Peak Ge-206PK that I got from MCM in Ohio. The slide 'pots' are slowly going, but I manage. Too much Oriental stir-fry cooking. The thing of it is, these can not be connected in series with a speaker! You must have a tape in/out capability or equivalent. Then the "Tape Monitor" switch takes control.

Every manual states that these need to be initially set at "0". This gives you a range of +/- 12 dB. Not a whole lot if you have a hearing problem or a room full of overstuffed furniture.

A Big, Fat 24 dB

If you start with all the controls fully down, however, you have a big, fat 24 dB to play with. Nearly half a million to one. Figure 3 shows a typical setting for enhancing audio perception. If you get one with a screen and a pink noise generator, it may be set for the room and tilted toward the high end. Otherwise, a test record, such as the Soundcraftsman ITR-3292 or similar can get you there. You can always just play with it until it sounds right.

I really hope this inexpensive, simple instruction manual can help you or a loved one. The experts in the field don't seem to know one whit about it, except to sell hearing aids.

I still sometimes slur my speech -- i.e., I lif in Luflan -- but that ear piece is still a long way off.

Enjoy. Any questions will get my attention with an S.A.S.E.

■

Build a Crystal Filter

Better Selectivity for Vintage Receivers

by Ike Kerschner

Despite the availability of new, hi-tech receivers, lots of people still enjoy the more vintage models. There are, however, some drawbacks to using a tube-type radio. The most frequent complaint is lack of selectivity.

A simple crystal filter can do a lot to improve the selectivity problem of a receiver that does not incorporate a selectivity filter of some type in its design. The circuit can be added to any set with a 455 kHz i.f.. The entire project can be installed installed inside the set -- there's no need for clumsy, external boxes.

In all, there are only five components to this filter. They are C1 and C2, which are 47 pf ceramic or mica capacitors, C3, which is a 10 pf midget variable capacitor, R1, a 470K (470,000 ohm) 1/2 watt resistor and X1, a 455 KHz crystal. All of these should be available from just about any place that handles electronic components. By the way, most crystals require a socket of some kind, so be sure to purchase one that will fit. A 455 kHz crystal can be obtained through surplus distributors or from Jan Crystals, 2341 Crystal Drive, Fort Meyers, Florida 33906-6017. Tell them that *Monitoring Times* sent you.

How it Works

Capacitors C1, C2, C# and the capacitance of the crystal holder form a capacitance bridge. C3 is adjusted to equal the capacitance of the crystal holder so that the bridge is balanced and the circuit has no output.

If a frequency equal to the series resonant frequency is applied to the input of the bridge, there will be an output. Signals of its frequency will be passed on to the i.f. amplifier easily.

The crystal exhibits a very high Q, consequently the passband of the filter will be only a few hundred Hertz wide. And that's how it improves the selectivity of your receiver.

Installation

Start installation by locating the first i.f. transformer of your set, breaking the lead going to the input of the amplifier (tube or transistor). Solder one side of C1 and one side of the crystal to the lead from the transformer. Now solder the junction of the other side of the crystal and C3 and R1 to the input of the i.f. amplifier.

Break the wire that connects the other side of the first i.f. transformer and the AVC circuit. Solder the junction of C2 and C3 to the transformer lead. Solder the free end of R1 to the AVC side of the broken lead. Now ground the free ends of C1 and C2. That's all there is to it!

Adjusting the Filter

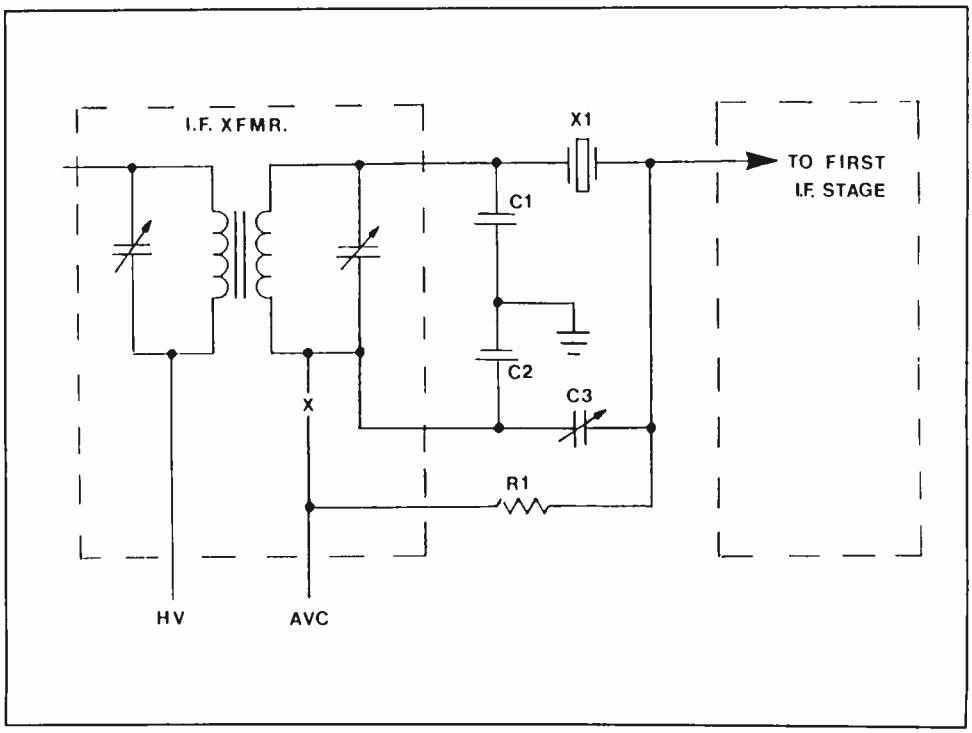
Set C3 about 75% open, now tune in a steady signal. (A broadcast station is fine for this.) Keep the input level low (just audible) with the receiver's RF gain control.

Adjust the IF transformers for maximum output.

Now adjust C3 for maximum selectivity and touch up the transformers again. The filter will reduce the overall gain of the receiver somewhat, but it should not be serious unless the gain of the receiver was already poor to begin with. To be sure, the resulting improvement in selectivity should more than warrant this small effort!

If you want to be able to remove the circuit from operation, just bend the corner of one of capacitor C3's rotor plates so it shorts when fully closed.

■



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ASK BOB

Bob Grove, WA4PYQ

Questions sent to MT are answered in this column as space permits. If you prefer an answer by return mail, you must include a self-addressed, stamped envelope.

Q. *Can you list suppliers of military radios and batteries? (David Mathis, Pinckneyville, IL)*

A. By military, I assume you mean surplus. Try Fair Radio Sales, PO Box 1105, Lima, OH 45802; Slep Electronics, PO Box 100, Otto, NC 28763; and Davilyn Corporation, 13406 Saticoy St., North Hollywood, CA 91605-3475. Others advertise in ham magazines like *CQ, 73, Ham Radio*, and *QST*.

Q. *Where can I obtain a modulator which will increase the modulation on my CB 200 watt linear amplifier by 200% or more? (R.E., Sutter, CA)*

A. Any modulation above 100% severely distorts the audio output of an AM transmitter, producing "splatter" interference to other users on adjacent frequencies and is prohibited by law, as is your 200 watt amplifier.

Q. *What is the "educational band" (2.5-2.69 GHz) and how can I receive it? (Dan Birkner, Spokane, WA)*

A. Intended for instructional TV (ITV), this band is provided by the FCC for schools to interlink special programs of educational value for classes to watch or participate in via television circuits, many with two-way capability. A special converter and antenna would necessary to receive the programming, equipment similar to that sold for multipoint distribution systems (MDS), a subscriber TV system found in many cities.

Q. *After watching the movie, "Top Gun", I began to wonder what frequency ranges are used by military aircraft during their maneuvers? (S. E. Zyla, Omaha, NE)*

A. The vast majority of air-to-air and air-to-ground communications among combat aircraft are conducted in the 225-400 MHz range, AM mode, 100 kHz channel spacing. Additionally, a small amount of VHF AM activity is heard in the 138-144 MHz range as well as some wideband FM in the 30-50 MHz lowband spectrum. Rarely, even some HF (3-30 Mhz) USB transmissions may be heard.

Q. *Why does my Realistic PRO-2004 seem low in sensitivity when compared to other scanners? (Jeff Krauss, Rockville, MD)*

A. An extraordinary scanner with 300 memory channels and wide frequency coverage, the PRO2004, built for Radio Shack by GRE of Tokyo, has notably poor sensitivity. It performs extremely well in high signal level areas like major cities, virtually immune to intermod and images, but when used in rural areas, a preamplifier and outside antenna are recommended.

Interestingly enough, the PRO-2004's major competitor, Regency's TS-2 TurboScan, has just the opposite problem: Although extremely sensitive, the TS-2 suffers from strong signal overload in metropolitan areas, revealing numerous intermod and image products on channels where no signal should be heard.

Q. *What is "slope tuning?" (Dan Birkner, Spokane, WA)*

A. Slope tuning, sometimes called "delta demodulation," is a method of receiving FM signals on an AM receiver. The procedure is quite simple: detune slightly up or down from the exact center of the carrier frequency until the audio becomes intelligible.

Basically, what you are doing is finding a portion of the FM signal "envelope" which the AM detector recognizes as amplitude, rather than frequency, modulation.

Q. *I had a 150 foot wire antenna connected to my Panasonic RF3100 shortwave portable and was plagued by AM broadcast band interference throughout the radio's range. I replaced the radio with an ICOM R71A and, although the problem was almost eliminated, I still occasionally hear the AM broadcasters on shortwave. How come? (K. David Kammler, Ridgecrest, CA)*

A. While the Panasonic was quite sensitive, it overloads easily (poor dynamic range), causing spurious signal products to be generated which could be heard at several points on the tuning dial. The ICOM is vastly improved and, if you still hear them, there could be several explanations.

If you hear the phantom signals on whole-number multiples of their actual frequencies (for example, you might hear a 1400 kHz broadcaster weakly on 2800 and/or 4200 kHz), then it is probably a harmonic actually radiated by the transmitter; they are allowed a minor amount of harmonic radiation.

If you hear a composite of two stations mixing their music and/or voices on the phantom frequency, you are hearing intermod (intermodulation), an overload condition which produces bogus product frequencies blending the programming of each original station.

The simplest way to eliminate these aggravating interference problems is to use a passive preselector (not a preamplifier) between the antenna and the receiver. The Grove TUN-3 MiniTuner has an excellent track record for this application; other frequency-selective tuners may be available from *MT* advertisers.

Q. *Where can I get equipment to add to my scanner so that paging tones will activate the squelch circuit? (Dan Birkner, Spokane, WA)*

A. At the present time, only the Uniden BC600XLT (and future BC950XLT) are equipped for tone squelch option, and that is only of the subaudible (CTCSS), not two-tone, variety. While many companies manufacture tone decoders, they are all subcircuits which require installation into the radio, rather than simple converters which can be added on.

Are readers interested in add-on tone

decoders for scanners? If so, which type? Let us know--perhaps it would be a good future product!

Q. How can I decide which filter options to order with my shortwave receiver? (Adele Amsden, Brunswick, OH)

A. First, consider which modes are most important to you. Are you an international broadcasting DXer? Consider a 4-6 kHz narrow AM filter (no narrower than 3.8 kHz minimum). Is SSB utility hunting your preference? 2.0-2.4 kHz narrow SSB filters are a good choice (no narrower than 1.8 kHz). CW listeners will find a 300-500 Hz filter less fatiguing than a 100-200 kHz filter which "rings". Finally, most RTTY requirements are easily satisfied by a 1 kHz filter.

Check to see what the characteristics are for the filter(s) which come with your radio; make sure that each filter is specified by two figures, usually the -6 and -60 dB attenuation points. Ideally, their ratio should be as close to 1 as possible. 2:1 is common (and usually quite acceptable); 3:1 is often stock in less discriminating receivers.

Q. Are there any S meters available for scanners? (Michael Hasel, Mechanicsville, MD)

A. No. The scanner market is tightly competitive and the addition of an analog S meter would add at least $10 to the resale price. Most scanners, however, have circuitry already in place which could easily support such a readout device.

The trick is to find the correct line: the automatic gain control (AGC) circuitry which exhibits a minor voltage change proportional to signal strength. This is normally part of the intermediate frequency (IF) amplifier/detector chip.

Depending upon the level of that voltage and the degree of voltage swing, a simple 0-1 milliammeter may be placed in series with a metering line made available for that purpose, or else the output drives a balanced bridge circuit with the meter in one leg.

Q. Where can I get information on Subsidiary Carrier Authorization (SCA) equipment and FM stations who use it? (Dan Birkner, Spokane, WA)

A. The best directory of stations is the *FM Atlas and Station Directory* by Bruce Elving ($8.95, *FM Atlas*, Adolph, MN 55701-0024). Dr. Elving also has a catalog of SCA equipment which you may wish to request. Be sure to include an SASE.

Q. With the value of the yen increasing and the dollar decreasing, how long will it take before we see this reflected in the price of radios? (Iden Rogers, Riverside, CA)

A. Probably by the time you read this. We have been told by at least one leading Japanese manufacturer to expect substantial increases in cost. Hopefully, the pendulum will swing to the advantage of American manufacturers, encouraging them to become once again competitive with import products.

Q. What is "narrowband technology" (ACSB)? (Dan Birkner, Spokane, WA)

A. Normal two-way voice communications in the VHF and UHF land mobile services occupies approximately 10-15 kilohertz of spectrum; single sideband, in contrast, occupies only about 3 kilohertz. This may be further reduced by compressing the audio range by special processors, then expanding the audio range by a suitably equipped receiver.

Amplitude compandered sideband (ACSB), then, is a technique of compressing the voice signals into the smallest bandwidth possible, commensurate with acceptable intelligibility, and transmitting it in SSB mode.

Q. Are there any out-of-band modifications for the Fox BMP10/60 scanner? (David Hale, Mountain Home, AR)

A. No.

MAILBAG

MAILBAG
continued from page 2

Incensed Against Censorship

[December's editorial regarding "Cellular Censorship" raised a flurry of response -- we hope it stirs you up, too!]

Thank you for the editorial about the possible coming cellular censorship. I will again write to my congressman and my two state senators. Keep bringing our attention to these important items. We, the radio listening minority of this country, need people like you to wake us up now and then.

Michael Wallace
Lakehead, California

•

I am in complete agreement with your December editorial on "Cellular Censorship." This and the ECPA, not to mention the proposed loosening of standards in Part 15 of the FCC rules, are nothing short of frightening. What is equally scary is that we seem to powerless to do anything to stop these things. The TVRO people are well organized and, I suspect, have the bucks to wage a winning campaign. While ANARC did an admirable job in testifying against ECPA we are just too little, too weak to make very much of a dent.

We need bigger guns and more money to wage campaigns against this kind of nonsense but I don't see it happening. From bits and pieces I've heard over the years all of the various contingents that would have to be part of such a super organization can't agree on very much and often don't even like each other very much. I suspect the individual listener feels his letter just isn't going to make any difference and thus doesn't bother to write to his congressman. Congress is often such a joke, I really can't blame people.

ECPA and other such things also have the potential to be a detriment to pocketbooks of those who should be forming a super organization and fighting for themselves and on behalf of shortwave and scanner monitors. Perhaps a future *MT* editorial might call for ideas and suggestions?

Gerry Dexter
Lake Geneva, WI

•

"From the Publisher," *MT* December 1987, is right on the money. But without a better lobbying base, the CTIA will continue to roll over our rights. And that's why the time has come for all *MT* readers and other monitoring enthusiasts to start lobbying the people we really have some control over: the scanner makers. We have some effect on congress but we have a much greater effect on the people who make and sell the products the CTIA wants removed from store shelves. They *must* be forced to take a stand!!

The proposal is this: If manufacturer X wants to roll over for the CTIA, scanner and other radio owners from all over should let that company know we won't buy their products. And retailers like Grove Enterprises, Scanner World, etc., could stop selling them, or at least downplay the company's products in ads and magazines. *MT should also publish an ECPA watch-list...with each scanner manufacturer's stand on the ECPA and what, if anything, that company is doing to get rid of this anti-liberty, anti-competition, anti-American law.* Americans spend millions of dollars on scanners each year and the competition is growing...if we start voting with our pocketbooks and wallets, we might get a little further.

The ECPA certainly is not in our best interests. But is that enough for the manufacturers? Sadly, the answer is NO! So we must make them understand that what's bad for us is bad for them. And maybe then the electronic trade associations they belong to will take up the fight...and counter the CTIA. Grove Enterprises and the highly respected *Monitoring Times* can certainly play a key role in leading this charge. I HOPE YOU WILL.

Larry Barr
Merrick, New York

•

Just a brief comment on your "From the Publisher" item in the December issue of *Monitoring Times*.

Near the closing line of the article you state, "Did you write? Apparently not..." Until that point I was with you, but there I had to stop.

Having written members of Congress (both state and federal level) many times over many years, I have come to realize one thing: if there isn't a BIG union or UNIFIED coalition (i.e., vested interest group - usually with a registered lobbyist) behind a cause, there have been rare instances when the "cause" was (verbally) supported upfront by the member of Congress involved.

As a brief example, even with the large size of the military, we exert little influential power as demonstrated by our inability to obtain wages equivalent to like job descriptions in the civilian sector. Additionally, by law, we are prohibited from belonging to a union and not that long ago, we finally were able to get "lobbyists" in Congress. So, what does all of this have to do with our hobby?

Until such time that Congress understands our hobby, the number of hobbyists involved (i.e., do we have member size that can effect a change at the polls when [s]he comes up for reelection), and a reliable source of information when needed, I seriously doubt our letters will have much impact.

As an example, letters I write which deal with topics associated with the National Rifle Association of which I am a Life Member elicit a more positive/supportive attitude (whether real or not) and as best I can recall, there is *always* a reply. Not so with letters on other subjects.

Yes, I wrote letters regarding the ECPA. Being military, I wrote the Senators and my Representative from California (where I am a resident); also, the same for the Senators and Representative of this area of Pennsylvania. The results? Both Representatives responded. Senators? Only Alan Cranston responded, and his response as best I can recall was vague; didn't support either side .. I think that's called "diplomacy"?

With most vested interest groups, there is substantial financial support. What type of financial support does our hobby have? If we don't have the $$, then we had best have effective coordination in our letter writing campaigns.

Mike Hardester
N. Versailles, Pennsylvania

•

Well, first came the ECPA, which took away our freedom to monitor any and all radio transmissions beamed around, above, through, or nearby us that the CTIA saw "unfit" for the average hobby monitor to hear or listen to. Of course, with that came all the "bull" about how there would be no restrictions on monitoring "other" types of radio signals except those specifically stated in the "act" itself..and, of course, very few people worried about this law's enforceability due to its vague and poorly-stated contents. All of us who own scanners and monitoring equipment felt stunned, but not totally "defeated" at that point in time.

Now along comes the cellular industry with all their megabucks...still gloating over

victory number 1, and wanting to *totally* outlaw anything that even receives cellular allocations within the frequency spectrum (namely those in the 800 MHz range). With the pressure they applied to ramroad the ECPA into law, the next step of getting the FCC to refuse to certify *any* receiving equipment or scanners capable of cellular reception is a very real, dangerous possibility.

If this comes to pass, then the local police departments, fire departments, wrecker companies, plumbers, and pizza delivery companies who use two-way radio could possibly declare *their* frequencies "private," and soon anyone who even owned a scanner would share the "criminal status" of those who own cellular-coverage scanners, etc. Also, this would have the convenient (to those entities) side-effect of making scanners a thing of the past (by law, this time)!

Yes, this is a bit dramatic, but we also didn't believe "they" (spelled "monopolistic big-bucks industry) would get the ECPA to pass, either.

I, for one, am going to write, complain, and send letters to anyone and everyone I can think of to prevent this type of ridiculous and antiquated thought from becoming law. I strongly suggest that if you value your hobby, *you* do so also! In the meantime I am going to purchase and "stockpile" several more 800 MHz-capable scanners "just in case."

...The long-term effects may also be disastrous. One-by-one, other users of the radio spectrum could have *their* frequencies declared "private," and soon scanner might be limited to reception of the various National Weather Service frequencies ... if scanners even exist then! Yes, maybe this is speculative and a bit "far-fetched," but that's what we all thought about the ECPA before it became law.

On the eighth day, God created they cellular telephone monopoly, who raised their mighty hand and smote those who owneth scanners and receivers...

...But remember David and Goliath. We all have to be "Davids" and bring down the giant! Please write, phone, anything ... but be heard by those who represent us. This time, the threat is *very real*!.

Larry Wiland
Youngstown, Ohio

"Floating Lockout"

I have been reading with some humor the furor over a "floating lockout" loss on the Realistic Pro-2004. In actuality I'm sure any Pro-2004 will produce this phenomenon. What is actually happening is that you cannot lockout all 30 frequencies in a particular band. There is really no need to, since if you want to lockout all 30 frequencies all you need do is lockout the band you wish to with the "band switch." The floating effect comes from locking out 29 memories then arriving at the 30th which will apparently fail to lockout. Whichever the 30th memory you try to lockout it just will not. But if you remove the lockout from any other memory in the same band the previous "floating lockout" will work.

On the Kenwood R-2000 article: I owned two R-2000's for 2-3 years; I have since sold them and graduated to NRD-525's. However, while I used these radios, I noticed that as they aged the frequency readout changed. When the radios were purchased the readout was 300 to 400 hertz low. After nine months of very heavy usage the readout was nearly perfect.

My theory is that Kenwood intentionally sets these radios low at the factory knowing that they will eventually "break in" and the readout will be correct. If you therefore change the readout as it describes in the article you will be constantly doing the procedure in order to keep up with the changing components in the radio.

I guess that's OK if you wish to do it; but I think the factory's approach is better -- that is, of course, if my theory is correct?

What about an article on the new U.S. Government computerized scanning HF transceivers? They apparently transmit a computerized sound to test propagation and then automatically choose the best frequency for a conversation at the time?

R. Kemp
L.H.P., Florida

MT Accolades

I am a neophyte SW listener with a Panasonic RF-B300. I am also a solitary listener, for I have no friends of similar interest. Nor am I a ham or radio technician. So *Monitoring Times*, which I have enjoyed for almost a year now, has meant a good deal to me. I can't recall how I first learned of it - subscribed to it - but I'm glad I did. From it I have derived practially all my knowledge of one world of SW radio. Every issue has been a treat.

I commend you for the "Getting Started" section by Kenneth Zichi and hope you'll give us more articles helpful to the rank amateur such as I am.

I'd also like to learn more about receivers in non-technical terms. I'm thinking I should upgrade my receiver and I read all your advertisements but my comprehension of the technical terms is very limited and I'm in a quandary as to which way to go.

I haven't written a letter like this before but your excellent publication has been, in a sense, my sole companion as an SW listener. Hence, I am constrained to express to you my appreciation.

Whitman Daniels
New Smyrna Beach, FL

•

You have a wonderful publication that seems to be very receptive to the participation and/or ideas of the subscribers. It is very informative, open and very friendly like a very large DX club bulletin. I think that this openness and sensitivity is a good characteristic and it is good for bringing in fresh and different aspects and ideas from both professional writers and anyone interested in radio as a hobby and/or profession.

Mark S. Fosella
Mamaroneck, NY

Shrouded Opinions

We have continued to receive a number of good letters expressing opinions on the Shroud of Turin article (Dec. 87). It is clear that the consensus of opinion is that MT should confine its scope to radio-related subjects.

We wish to thank all who responded, and assure you that, should we hear of the results of the carbon dating, we will publish the end of the story!

Teaser of the Month

One of the most common--and unquestioned--terms is "squelch". We all know what that is; a squelch circuit mutes a receiver between signal transmissions so that we don't have to listen to the annoying background static or other interference.

The question that no one seems to agree on, however, is, "When is a squelch 'open' and when is it 'closed'"? Is a squelch "closed" when you can hear the sound or when the sound is muted? Then, when we "open" it, do we let sound out or deaden it?

Perhaps one of our readers will provide the answer.

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Wanted: Any ZENITH TRANS-OCEANIC transistor model in good condition. Junker for parts OK. Harold Herp, 6615 Michele Ct., Huntingtown, MD 20639 [301] 855-7071.

For sale: BEARCAT 300 scanner - $150.00 mint condition in original box. C. Wolgel, 305 East 86th Street, New York, NY 10028. Call between 9:30-11:30 PM E.S.T. [212] 534-5045.

For Sale: DRAKE SPR-4 receiver with manual $300.00 with 100 kHz crystal calibrator mint condition, 37 crystals. U.S. Postal Money Order only, free UPS. Harold Josselyn, 620 Grove Ave., Zanesville, Ohio 43701.

Info wanted: I would like frequency information used at the MCGHEE-TYSON Air National Guard Base (Knoxville, Tennessee) by these units: the 134th Air Refueling Group, 110th/119th TAC Control Flights, and the 228th Combat Communications Squadron. Have Knox area and Tennessee civil and other frequencies to swap/exchange. Write Steve Galyon, POD 22790, Knoxville, Tennessee 37933. Thanks! (Will pay for postage and Xerox costs.)

PRC-10 ARMY transceiver; I bought new, with power supply, accessories, and manual. Trade for handheld scanner with Air, or SSB CB, or best offer. T.F. Marcotte, 116 Fernway, Duson, LA 70529.

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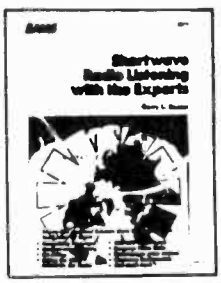

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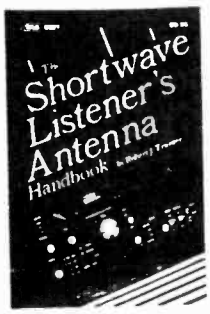

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