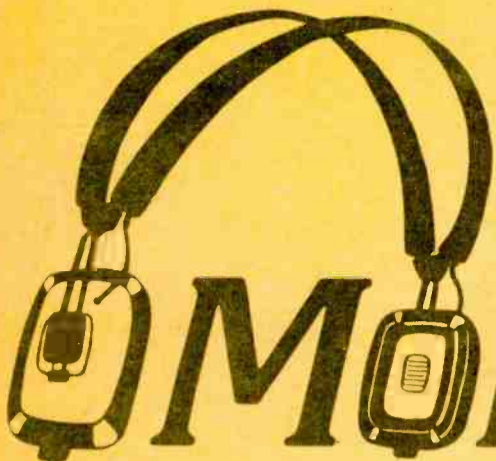


Second Class Postage Paid



MONITORING TIMES

A Publication Of
Grove Enterprises, Inc.

Inside This Issue:

- Magne Reviews the New Heathkit/Zenith SW-7800
- DXing the 'New Countries'
- Radio Beijing Turns 40!
- A Radio Buff's Christmas Wish List



ABOVE: Greenpeace activist is muddied by discharge of lead mine during protest.

RIGHT: The MV Greenpeace arrives at the Bay of Whales, Antarctica, to promote that continent as a "World Park."

The Airways of GREENPEACE



DXing Mall

Preparing for Possible Terrorist Attack

***** 3 DIGIT PRE *****
 GOODMAN, DAVID J. 0188
 31870 HIRAM TRAIL
 CHAGRIN FALLS OH 44022-



"They said it Couldn't Happen Here"

Security

Top Quality!

Discount Prices!

Shop Grove for Your

'Affordable Portable'

The Ticket to Worldwide Shortwave Reception When You are 'On the Go'

Sangean ATS-803



Just look at these features:

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

Clearly, the Most Feature-Packed, High Performance Portable Under \$200

Order RCV4

Former nationally advertised price:

~~\$199~~

Grove price:

\$179

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

Sony ICF-PRO80:

Wide-Frequency-Coverage Portable

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 2 3/4" 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 (3 1/2" x 7" x 2") and lightweight (1 1/2 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 AC wall adaptor.



Available Jan 1988

Order RCV3

Suggested retail:

~~\$499~~

Grove price only

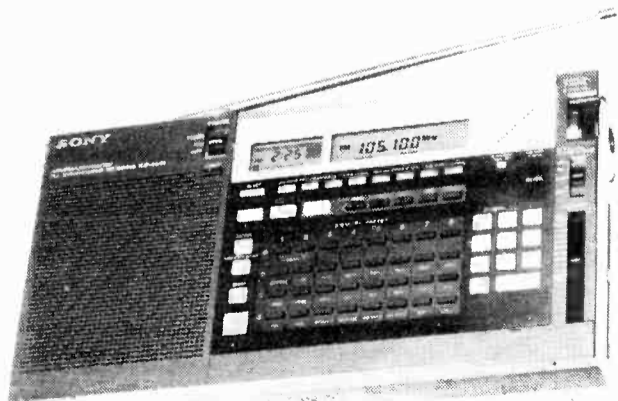
\$329

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

SONY ICF-2010

"Best buy in a quality shortwave portable"

—Bob Grove



Yes, Sony has finally brought out 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.

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 besides!

Manufacturer's Suggested Retail

~~\$429⁹⁵~~

Grove discount price:

\$310⁰⁰

\$5 UPS Shipping
\$10 U.S. Mail Parcel Post
Canadians: \$15 Air Parcel Post

Grove Enterprises

140 Dog Branch Road
Brasstown, N.C. 28902

MC and Visa Orders Only,
Call 1-800-438-8155



MONITORING TIMES

All correspondence concerning editorial content, submittals of newsclippings, inquiries regarding writing, advertising or subscriptions should be directed to *Monitoring Times*, P.O. Box 98, Brasstown, NC 28902. Readers are encouraged to correspond directly with MT columnists where possible.

Published by:
Grove Enterprises, Inc.
Publisher:
Bob Grove, WA4PYQ
Editor:
Larry Miller
Production Manager
Rachel Baughn
Subscriptions:
Mitzi Barrett
Advertising and Dealerships
Judy Grove

From the Publisher:

On the Origin of Brasstown

A number of our readers have expressed interest in Brasstown, headquarters of *Monitoring Times* and Grove Enterprises, with questions ranging from, "How did it get its name?" to "Where the h--- is Brasstown?" to "Why in the world did you move there?"

The name is derived from the Cherokee Indian word "Itse-yi" ("new green place") and was confused in translation with another word, "Untasai-yi", which means "brass".

Brasstown is a quiet, rural farming community, high in the western Appalachian Mountains of North Carolina, sharing the Blue Ridge and Smokey Mountain ranges, and located in the Nantahala National Forest on the westernmost tip of the Tarheel State between Georgia and Tennessee.

Original settlers were mostly of British extraction, following the removal of the Cherokee Indians. Family names like Anderson, Brown, Byers, Caldwell, Cantrell, Carringer, Cook, Dyer, Green, Laney, Ledford, Payne, Rogers, Scroggs, Tipton, and Wilson monopolize the Brasstown section of the telephone directory (which isn't very big).

Local place names are particularly colorful: Brasstown is near Hanging Dog, Shooting Creek, Smackass Gap, Granny Squirrel, Chunky Gal, Greasy Creek, and a myriad others whose origins have been lost to obscurity.

Grove Enterprises and *Monitoring Times* are housed in a two-story frame building on Dog Branch Road (officially Jenkins' Branch, but not recognized as that since an old lady at the head of the street called it Dog Branch years ago because of the preponderance of canines on the road. Yes, they're still here and we have two collies!).

My wife, Judy, and son, Bill, and I moved here from Ft. Lauderdale, Florida, after tiring of neighbors' fighting, drugs, skyrocketing crime, artificial environments, blurring lifestyles, water shortages, and the burglary of our home.

Our home is on a quiet stream adjoining hundreds of acres of timberland with rolling hills and valleys. Our neighbors are unpretentious and kind. We can walk anywhere, anytime, without fear for our safety.

As I sit here composing this reflective piece, looking out my window at expanses of trees and grass, I fear for the future of places like this, an oasis in a desert of exploitation. Mountains and valleys are being shaved of their cover, built over with fast-food housing for other escapees by insensitive, opportunistic land developers.

In the meantime, I have found my Shangrila and have added years to a much happier life.

On the Cover: A penguin and the photographer observe each other during the Portman Bay Action; another Greenpeace activist reports in by radio after single-handedly plugging a mining operation waste pipe (Photos courtesy of Greenpeace). (Inset: The Christmas rush is on...and security is tightened at the malls in preparation for "Black Friday"--photo by Bob Kay, "Scanning" column editor)

Inside this Issue

- The Airways of Greenpeace** 4
Gutsy Greenpeace has made news all over the world for their environmental "actions." Extensive users of the radio spectrum, you've got to be good to tune in their exciting adventures. By Jock Elliott.
- A Radio Buff's Christmas Wish List** 6
Christmas--In a twist on the spirit of the season, MT says that it's far more blessed to receive than to give. When you see MT's wish list, you'll see why!

- Interview:**
- Radio Beijing Turns Forty!** 8
Radio Beijing recently celebrated its 40th anniversary. From its humble beginnings in a cave to the 38 languages services of today, Radio Beijing is in shortwave to stay.

- Here Come the New Countries** 10
Think you've got the world of shortwave licked? You may -- for the moment. But things change fast in the HF broadcasting world. Enrique Albaladejo looks at future challenges.

- Low Band Skip is Back!** 12
Military exercises on the Nicaraguan border. Highway patrols from hundreds - even thousands - of miles away. Low band skip is back and the listening is good! Chuck Robertson tells you how.

- Time and Freq Standard Stations** 42
This authoritative list provides a worldwide look at one of the most reliable indications of propagation conditions.

- Military Operations Areas** 44
Are you getting buzzed by low-flying jets that seem to come out of the blue? They don't; check this list to find their home base.

DEPARTMENTS

- Radio Roundup: Broadcasting** 14
- Radio Roundup: Communications** 18
- High Seas** - James Hay 22
- Shortwave Directory Excerpts** 23
- Scanning** - Bob Kay 24
- The Federal File** - Dave Jones 25
- Utility Intrigue** - Don Schimmel 26
- Signals From Space** - L. Van Horn 28
- Reading RTTY** - Jack Albert 29
- On the Ham Bands** - Ike Kerschner 30
- Domestic Broadcasting** - Paul Swearingen 32
- Outer Limits** - John Santosuosso 34
Havana Moon
- Frequency Section** 35
- "Ask Bob"** - Bob Grove 58
- Mailbag** 60
- Stock Exchange** 62

TOOLS FOR LISTENING

- Magne Tests...** - Larry Magne 45
Heathkit/Zenith SW-7800
- Behind the Dials** 46
Terminator; BC-600XLT
Realistic PRO-38; Ameco IF Filters
- What's New?** 50
- Getting Started** 52
- Helpful Hints** 53
- Antenna Topics** - Clem Small 54
- Technical Topics** - Terry Staudt 55
- Experimenters Workshop** 56
FRG-7700 Memory Expansion;
MW Antenna Booster; Notch Filter

MONITORING TIMES (ISSN 0889-5341) is published monthly for \$16 per year by Grove Enterprises, Inc., PO Box 98, Brasstown, NC 28902 (ph. 1-704-837-9200). Second class postage paid at Brasstown, NC, and additional mailing offices. POSTMASTER: Send address changes to MONITORING TIMES, PO BOX 98, BRASSTOWN, NC 28902.

The Airways of

GREENPEACE

by Jock Elliott



(Photos courtesy Greenpeace)

It is an arresting scene: a young man, soaked in mining waste, contacts his fellow activists by radio after singlehandedly plugging a pipe draining into the Mediterranean. The image is arresting, but typical of an extraordinary organization called Greenpeace.

Greenpeace is a non-profit environmental and peace activist group that is dedicated to a couple of simple ideals:

- All species, including man, deserve protection.
- All species need a green and peaceful planet to enjoy.

Greenpeace activists believe these ideals can be achieved through nonviolent, direct confrontation. Equipped with nothing more than their own bodies, a two-way radio, and perhaps an inflatable boat, they bear witness and call the world's attention to the slaughter of animals; to the chemical poisoning of the earth, air, and water; and to the manufacture and testing of nuclear weapons.

Beginning with opposition to nuclear weapons testing on Amchita Island 15 years ago, Greenpeace has conducted actions around the globe. Some examples:

- Newfoundland, and Canada -- 1976 -- 1985-- Greenpeace repeatedly confronts sealers in a effort to end this commercial slaughter.
- Lavallette, New Jersey -- 1985 -- Greenpeace activists plug the discharge pipe of a major industrial polluter; company officials are subsequently indicted by a grand jury.

- Leningrad, USSR -- 1982 -- The Greenpeace ship *Sirius* enters Leningrad harbor to protest Soviet nuclear testing.

- Nevada -- 1986 -- Campaigners enter a bomb site and postpone a nuclear test.

- Spain -- 1979-1983 -- Activists confront nuclear waste dumping in the North Atlantic by the British vessel *Gem*.

- Vardo, Norway -- 1986 -- The Greenpeace vessel *Moby Dick* confronts illegal whalers.

- Rongelap, The Marshall Islands -- 1985 -- The *Rainbow Warrior* relocates victims of nuclear testing.

- Antarctica -- 1986 -- An expedition is launched to promote World War Park status and halt minerals exploitation.

In virtually, all of these actions, radio communications played a key role. Dick Dillman, N6VS, is the National Campaign Communications Coordinator for Greenpeace and a member of the Greenpeace Board of Directors. With operations in 17 countries and 6 ships on various bodies of water, there is a lot of activity to coordinate. Dillman joined Greenpeace in 1977. "I was a ham, and interested in Greenpeace activities, so I called to ask how they coordinate their radio communications. 'Our what?' they said. I knew right away they needed me."

One of Dillman's first projects was to set up communications in San Francisco for 1977 campaign to protest whaling. Greenpeace began using commercial maritime frequencies to communicate with the vessels *James Bay* and *Ohana Kai* that were confronting Russian whalers.

The Soviets, of course, were interested in disrupting Greenpeace operations as much as possible, and they hit upon an unusual and effective jamming technique.

"We were on the air when suddenly we were interrupted by this unearthly laughter. It was really pretty spooky," Dillman says. "The laughter was very broad spectrum and quite effective in messing us up. Later we concluded that it must have been a joke shop laugh box. To avoid the jamming, we invented code designations for different channels and skipped from one to another."

Later in the campaign, a situation occurred which was much more serious. Unknown to anyone, the fiberglass whip antenna on the *Ohana Kai's* commercial marine radio had developed a leak, and it filled with water. The next time the radio was keyed up, the finals in the transmitter literally blew up.

What followed reads like one of the corollaries of Murphy's Law (if something can go wrong, it will, and it will happen at the worst possible time in the worst possible place). The steering gear on the *Ohana Kai* was locked, the gyro compass was out, and a storm was bearing down on her. It was a

very bad time to lose the main radio. Fortunately, the vessel was also equipped with a ham transceiver and antenna.

The problem was that Dillman did not have a ham transceiver at his communication headquarters in San Francisco. "I called a ham radio outlet nearby and asked if they had used transceivers for sale. The man on the phone said, 'No, but there's a guy here right now trying to sell me one.'

I said if he would drive to my place, I'd buy the radio. When he arrived, I threw some money at him, ran up the stairs, and got on the air with the *Ohana Kai*."

That ham transceiver served very well on a number of occasions, and Greenpeace still has it, but it is rarely used anymore. That's because Greenpeace communications have shifted away from HF to satellite communications for ships at sea and UHF communications for land actions. Even though he loves working HF, Dillman moved communications to other frequencies in the interest of greater reliability.

"Most of the Greenpeace vessels are now equipped with INMARSAT earth (L-band) which enable voice messages, telex, and even still pictures to be sent back and forth as easily as using your home phone," Dillman says, "At first, I had to talk people into trying the satellites, but once they saw how well it worked, they were convinced."

For land-based operations, a stable of ICOM A-16 UHF handtalkies are the preferred means of communication. For example, recently Greenpeace activists climbed the outside of the State Capital in Albany, New York, and hung a banner from the building to protest the pollution of the Niagara river. To support that action, Dillman supplied handtalkies and arranged for the use of a local commercial repeater to aid communications.

Greenpeace also has its own repeater for times when others are not available. If you hear of a Greenpeace action in your area, fire up your scanner in the UHF frequencies and start hunting. You just might be able to hear them in action.

For diehard HF DX enthusiasts, there is still one regular target left: Greenpeace's antarctic base maintains regular RTTY (SITOR) communications with New Zealand on the 8 MHz commercial marine frequencies. Dillman thinks that anyone who can copy their Antarctic base is a superb DXer.

A fundraising ad on the back of the Greenpeace quarterly magazine sums up Greenpeace operations. It says:

"For one dollar, this woman will dodge harpoons, defy men with clubs, and dive into toxic waste."

It's not only good advertising copy; it's true. And when a Greenpeace activist bears witness to activities that threaten life on earth, chances are she will have a radio in her hand. ■

EXTRA! EXTRA! READ ALL ABOUT IT!

GREENPEACE INVADES RUSSIA!

The information below is a copy of the traffic from the Rainbow Warrior during the Greenpeace "invasion" of the USSR, which occurred on July 18, 1983. It is in the form of telexes which Dillman relayed to the various Greenpeace offices around the world. The transcript begins the day before the invasion and ends on July 23, the day the Russians returned our people.

Radio conditions during the action were abysmal. No commercial stations could be contacted on HF from the Bering Seas. As a result, all traffic was therefore sent via Morse code on the 14 MC/S amateur band. The operator aboard the ship was Lloyd Anderson/N6BML. Dick Dillman, N6VS, was the shore operator. The captain of the Rainbow Warrior was Peter Willcox.



(VCR,USA)
RAINBOW WARRIOR WAS CONTACTED AT 0900PDT 7/17. POSITION AT THE TIME OF CONTACT WAS NOME. A ZODIAC WAS DUMPED IN THE SURF AND DEPARTURE HAS BEEN DELAYED BY RECOVERY EFFORTS. THERE WERE NO INJURIES. -DILLMAN-

VANCOUVER GP
THE GREENPEACE BOAT RAINBOW WARRIOR DEPARTED NOME, ALASKA AT 5AM JULY 17PDT. THE ESTIMATED RUNNING TIME TO SOVIET TERRITORIAL WATERS IS 15 HOURS. AT A MEETING PRIOR TO DEPARTURE, THE CREW REAFFIRMED THEIR INTENTIONS OF ENTERING SOVIET TERRITORIAL SPACE IN ORDER TO DEMONSTRATE OPPOSITION TO THE USSR'S OBJECTION TO THE 1986 IWC PHASE OUT OF ALL COMMERCIAL WHALING. THE STORM WHICH HAS BEEN HITTING THE AREA, THE SOVIET UNION AND ALASKA FOR THE LAST SEVERAL DAYS HAS PARTIALLY ABATED, CREW MORALE IS HIGH AND EVERYONE IS FULLY PREPARED FOR WHATEVER MAY HAPPEN WHEN THE BOAT REACHES ITS DESTINATION.

CUNNINGHS
THE NEXT SCHEDULED CONTACT WITH RAINBOW WARRIOR IS 2200PDT 7/17.

PRIORITY
(VCR, USA, INT)
RAINBOW WARRIOR WAS CONTACTED AT 0830PDT 7/18. RADIO OFFICER ANDERSON ADVISED THAT THEY WERE OFF THE WHALING STATION AT LORENO, SIBERIA, AND THAT SIX GREENPEACERS HAVE BEEN ARRESTED BY SOVIET AUTHORITIES AFTER GOING ASHORE AT THE STATION. THEY ARE IN CONTACT WITH THE COMMANDER OF THE STATION BUT THERE HAS BEEN AN ADVISORY ON THE DISPOSITION OF OUR PERSONNEL. IT WAS OBSERVED THAT THE STATION IS SET UP TO RAISE FUR BEARING ANIMALS AS WELL AS PROCESS WHALES.

A CONTINUOUS RADIO WATCH IS BEING MAINTAINED FOR FURTHER TRANSMISSIONS. ANY NEW INFORMATION WILL BE FORWARDED IMMEDIATELY. -DILLMAN-

PRIORITY
(VCR,USA,INT)
THE GREENPEACE PERSONNEL SEIZED ON SHORE AT LORENO ARE PAT HERON, NANCY FOOTE, BARBARA HIGGINS, DAVID REINHART, CHRIS COOK AND ROM PRECIOUS. THE RAINBOW WARRIOR WILL REMAIN ON SCENE UNTIL THE SITUATION WITH THOSE ASHORE IS RESOLVED. -DILLMAN-

PRIORITY
(VCR,USA,INT)
RAINBOW WARRIOR WAS CONTACTED AT 1018PDT 7/18. RADIO OFFICER ANDERSON ADVISED THAT OUR PEOPLE WERE SEEN BEING TAKEN AWAY BY THE SOVIET MILITARY. THE RAINBOW WARRIOR THEN BEGAN TO DEPART THE AREA. THEY WERE HARRASSED BY A SOVIET HELICOPTER WHICH FIRED TWO GREEN FLARES ACROSS THEIR BOW AND DROPPED A NOTE ORDERING THEM TO STOP IMMEDIATELY AND RETURN TO THE WHALING STATION. THIS ORDER WAS IGNORED AND THE BOAT IS PRESENTLY UNDERWAY TO NOME TO DROP OFF FILM. THEY HOPE TO RETURN TO THE WHALING STATION AS SOON AS THE FILM DROP OFF IS COMPLETED. POSITION AT TIME OF CONTACT WAS 65N 171W. -DILLMAN-

PRIORITY
(VCR,USA,INT)
RAINBOW WARRIOR WAS CONTACTED AT 1120PDT 7/18. THE FOLLOWING TRAFFIC WAS COPIED AT THE TIMES INDICATED.

(1121) VESSEL IN INTERCEPT COURSE ETA 10 MINUTES. NO IDENTIFICATION YET, WE ARE STILL INSIDE 12 MILE LIMIT.

(1130) WE HAVE 2 MINUTES TO GO TO THE 12 MILE LIMIT. HELICOPTER APPEARS TO HAVE SPOTTED ZODIAC.

(1144) APPROACHING VESSEL LAYING OFF R/W 3 MILES HAS LAUNCHED 2 SPEED BOATS AND 2 HELICOPTERS IN PURSUIT OF ZODIAC. WE ARE NOW OUTSIDE OF 12 MILE LIMIT. PLEASE STANDBY FOR NEXT EXCITING INSTALLMENT.

(1200) ATTEMPTING ZODIAC LOCATION/RECOVERY IN HEAVY PATCHY FOG. HELICOPTER HARRASSMENT CONTINUES.

A CONTINUOUS RADIO WATCH IS BEING MAINTAINED. A CLANDESTINE TRANSMITTER HAS BEEN INSTALLED ABOARD R/W FOR COMMUNICATION IN THE EVENT OF SEIZURE. ANY NEW INFORMATION WILL BE IMMEDIATELY FORWARDED. -DILLMAN-

PRIORITY
(VCR,USA,INT)
RAINBOW WARRIOR WAS CONTACTED AT 1234PDT 7/18. POSITION AT TIME OF CONTACT WAS 65.05N 170.45W. RADIO OFFICER ANDERSON ADVISED THAT BEFORE THE FOG CLOSED IN THEY SAW A SOVIET HELICOPTER HOVERING OVER THE ZODIAC CONTAINING JIM HENRY AND THE FILM. WHEN THE FOG CLEARED, THEY SAW HENRY BEING PICKED UP FROM THE WATER BY THE HELICOPTER. THE ZODIAC WITH THE FILM STILL ABOARD WAS RECOVERED BY THE RAINBOW WARRIOR. HENRY'S CONDITION IS UNKNOWN. AT THE TIME OF CONTACT THERE WAS ONE SHIP ONE MILE OFF THE BOW AND TWO SHIPS SEVEN MILES ASTERN OF THE RAINBOW WARRIOR. THEY ARE PROCEEDING TO NOME. ETA WILL BE PROVIDED WHEN AVAILABLE.

AT 1331PDT LLOYD ADVISED THAT A RUSSIAN WARSHIP DEMANDED BY RADIO THAT THEY STOP IMMEDIATELY. RAINBOW WARRIOR ADVISED THAT THEY WERE UNABLE TO STOP AT THIS TIME. WHEN ASKED WHAT THEIR INTENTIONS WERE, LLOYD REPLIED "NOME (sic) UNLESS FIRED UPON." STAY TUNED -DILLMAN-

PRIORITY

(VCR,USA,INT)

CONTINUOUS CONTACT HAS BEEN MAINTAINED WITH RAINBOW WARRIOR SINCE THE LAST REPORT. THE FOLLOWING EVENTS HAVE OCCURRED SINCE THEN. THE TIME REFERENCES IN PARENTHESES ARE IN PDT FOR 7/18. STATEMENTS ARE THOSE OF RADIO OFFICER ANDERSON TRANSMITTED IN MORSE CODE. -DILLMAN-

(1340) CLOSEST PURSUIT VESSEL, A MERCHANT VESSEL, IS 500 YARDS ASTERN AND HAS ANNOUNCED IT WILL ATTEMPT TO STOP US.

(1354) ENGAGED IN VERY CLOSE MANEUVERING WITH MERCHANT SHIP NOW.

(1358) VERY VERY CLOSE MANEUVERING NOW. GETTING QUITE HAIRY. THEY'RE PLAYING CHICKEN WITH US.

(1410) LAST PASS WAS LESS THAN 20 FEET AWAY GOING FULL TILT. PETER'S BOAT HANDLING IS BRILLIANT.

(1415) PETER REQUESTS US COAST GUARD BE ADVISED OF OUR SITUATION WITH RUSSIANS AND PROVIDE AIR COVER IF POSSIBLE. (THIS REQUEST WAS RELAYED TO COAST GUARD AND TURNED DOWN.) -DILLMAN-

(1440) BUZZED BY HELICOPTER AGAIN. WARSHIP IS CLOSING. MERCHANT VESSEL IS DEPARTING.

(1507) RUSSIAN WARSHIP ONE MILE ASTERN HAS ANNOUNCED INTENTION TO STOP US AND PLACE PERSONNEL ABOARD. RUSSIANS ACKNOWLEDGE WE ARE IN INTERNATIONAL WATERS. PETER ADVISED THEM WE WON'T STOP.

(1525) CINDY THE MEDICAL TECHNICIAN ADVISES THAT BRUCE HAS A BROKEN LEG AND WILL REQUIRE MEDICAL EVAC.

(1600) WARSHIP HAS TURNED AWAY. WE WILL BRING BRUCE TO NOME FOR TREATMENT. PLEASE ADVISE COAST GUARD.

(VCR,USA,INT)

A CALL WAS RECEIVED FROM RAINBOW VIA THE NOME MARINE OPERATOR AT 0030PDT 7/19. THE ETA NOME IS 0300PDT 7/19. LOUIS BARRETO WILL HAND CARRY THE FILM TO SEATTLE ON THE FIRST AVAILABLE FLIGHT. A LOT OF GOOD ACTION FOOTAGE WAS SHOT INCLUDING BRUCE'S SWAN DIVE FROM THE R/W INTO THE ZODIAC THAT JIM HENRY WAS IN, WHICH WAS CIRCLING UNDER POWER. THIS HEROIC EFFORT WAS THE CAUSE OF BRUCE'S BROKEN LEG. LLOYD ONCE AGAIN DESCRIBED PETER'S HANDLING OF THE BOAT DURING THE CHASE AS BRILLIANT AND UNBELIEVABLE. NO DECISION HAS BEEN MADE ON THE NEXT PHASE OF THE CAMPAIGN BUT THEY DO NOT PLAN TO IMMEDIATELY RETURN TO RUSSIAN WATERS. -DILLMAN-

(VCR,USA,INT)

CONTINUOUS CONTACT HAS BEEN MAINTAINED WITH THE RAINBOW WARRIOR SINCE THE LAST REPORT. AT 2342PDT THE RUSSIAN VESSELS WERE SIGHTED AND AT 0015PDT 7/23 A ZODIAC WITH DAN AND RICK DAWSON CAME ALONGSIDE THE RUSSIAN VESSEL WITH OUR PEOPLE ABOARD. CHRIS COOK REPORTED TO HAVE SAID "THEY'RE NICE. THERE'S NO REASON FOR US TO BE UPTIGHT." THE RUSSIANS ASKED THE GREENPEACERS IN THE ZODIAC TO RETURN TO THE RAINBOW WARRIOR FOR MR. RASMUSEN, THE MAYOR OF NOME, SO THE HE COULD PARTICIPATE IN THE TRANSFER ABOARD THE RUSSIAN VESSEL. AT THIS TIME (0125PDT) THE TRANSFER HAS NOT OCCURRED. WORD OF THE TRANSFER WILL BE TRANSMITTED IMMEDIATELY. *DILLMAN-

AT 0129PDT WORD WAS RECEIVED THAT OUR PERSONNEL WERE BEGINNING TO COME OFF THE RUSSIAN VESSEL. STAY TUNED. -DILLMAN-

PRIORITY

(VCR,USA,INT)

HUZZAH!!!!!!!

AT 0200PDT 7/23, RADIO OFFICER ANDERSON ADVISED THAT ALL OUR FRIENDS WERE SAFELY BACK ABOARD THE RAINBOW WARRIOR! LLOYD ALSO ADVISES THAT MOST OF OUR GEAR APPEARS TO HAVE BEEN RETURNED. FURTHER DETAILS WILL HAVE TO WAIT UNTIL THE MEDIA COMPLETE THEIR FRENZY OF CALLS FROM THE BOAT. THE NEXT SCHEDULED CONTACT WITH THE BOAT BY GREENPEACE RADIO WILL BE BETWEEN 2100PDT AND 2300PDT 7/23. THIS WAS GREAT! LET'S DO IT AGAIN SOON! -DILLMAN-

BEST REGARDS,
DICK DILLMAN/N6VS

1311 EST

MGMCOMP MGH

A radio buff's

Christmas

I have to admit to feeling a little strange about writing a letter to you, Santa. After all, I'm thirty-two years old, have a wife and two kids, a mortgage, car payments, and more bills than the paycheck comes near to paying.

Maybe that's why I'm writing, Santa. You see, I'm desperate. I'm hooked. Yes, St. Nick, I'm ready to admit that I'm a radio addict. I listen to radios. I write about radios. I mean, I'm in love with radio.

I found out about the depth of my illness a couple of weeks ago when my wife, Soni, asked me to turn off the radio and say good night to the kids. Honest to God, Santa, that was a surprise. I didn't know I had kids! But who can blame me for a little oversight like that?

You see, I've been pretty busy over the past six years, chasing down Radio San Miguel, Bolivia on 3320.4. Boy, has that been a tough one. Let me tell you. Radio San Miguel is a 500 watter from Riberalta that broadcast in Spanish from 2200 UTC fade-in until 0200 sign off and again from 1000 UTC until 1645 fade out. I hear it's also on occasionally from 0230 until 0300 but I haven't... Santa? Santa! Wake up!

OK. Maybe you're right, Santa. Maybe I should get into something beside shortwave listening for a while. Maybe a change would be good.

Wait. I've got an idea! You know, **Gordon West** has a 21 day course for getting my novice ham license. It has code tapes, a 112 page book, band chart, FCC forms, sample tests and a hotline for student questions. It's just \$19.95 plus \$2.50 postage and handling from Gordon West Radio School, 2414 College Drive Dept MT, Costa Mesa, California 92626 [714]549-5000. And guess what, Santa! It comes with \$70.00 in equipment certificates from manufacturers like ICOM, Kenwood, and Yaesu.

Speaking of **ICOM**, it sure would be nice to find one of their R71A general coverage receivers under the tree! The R71A is recognized around the world as a quality receiver with superior performance. It's versatile, includes 100 db dynamic range, adjustable noise blanker, selectable AGC, and dial or keyboard frequency selection. Man, there's nothing you can't hear with one of these babies. This is top drawer stuff. And its suggested retail price is just \$949.00 -- a mere pittance for a man of your means, if you get my drift, Santa. Several *Monitoring Times* advertisers carry it.

And if you're up to it, perhaps you might even consider tossing in a *Seeker* from **AF Systems**. The Seeker, in case you haven't heard, is a complete system for controlling the R71A/E with your Commodore C-64, C-64C or C-128 computer. One of its seven modes allows you to schedule the unattended recording of up to one hundred transmissions -- all you have to do is select the day, start and end time, reception mode, a description, and up to four frequencies to test for the best signal. Other modes give you access to literally hundreds of other frequencies.

The complete system, including sample frequencies, broadcast schedules, hardware, software, and all cables is only \$219.00 plus shipping and handling. But *MT* readers like yourself can clip this out and purchase the system for a discount. If you'd like -- and I'm just suggesting, Santa -- you might want to write for more information to AF Systems, P.O. Box 9145-X, Waukegan, Illinois, 60079-9145 [312]623-4744.

As you probably know, Santa, a receiver is only as good as the antenna you attach to it. What? You say that you didn't know that? Oh, yeah. It's true. That's why I'd also like a **Grove** Flexible Indoor antenna.

Few products in the Grove catalogue have captured so much attention as this hidden antenna system. It's designed for apartment dwellers or anyone who can't put up an outside antenna. And after my tower fell down last year and crushed Mr. Hayworth's new Porsche, you can easily imagine why the hidden antenna appeals to me.

It's available in various configurations for scanners, shortwave receivers, or both. It can make the difference between marginal reception and "armchair" copy! And the basic system is only \$50.00! Just a suggestion, St. Nick -- write to Grove Enterprises at Box 98 Dept MT, Brasstown, North Carolina, 28902 [704]837-9200.

Another suggestion might be an **MFJ-1024** outdoor active antenna! It's a two-piece 54" whip that eliminates outside long wire antennas and actually outperforms longwires hundreds of feet long.

It covers everything from 50 kHz to 30 MHz -- just the place I like to hang out -- and all frequencies from VLF through lower VHF, long wave, medium wave, broadcast and shortwave bands. It comes

Grove
Hidden Antenna

Hamtronics
CVR-806 converter

Gilfer
Carrying Case

AF Systems
Seeker

Gerry Dexter
Language Lab

Jabco
Voicegate

Alden Electronics
Weather Chart Kit

Infotech M-800
from Universal

complete with a 50 foot coax cable and can be put up in no time at all! It's just \$129.95 plus shipping from P.O. Box 494 Dept MT, Mississippi State, MS 39762 [800]647-1800.

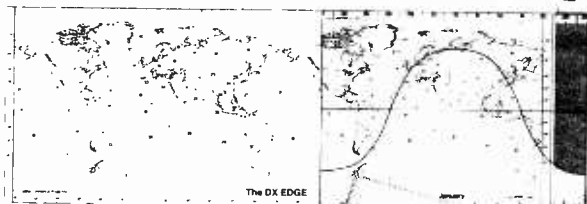
Of course, pulling in all that signal is bound to increase the noise as well. **JABCO's** new Voicegate would do just the trick with an audio gated squelch, two independent tunable notch filters, one tunable bandpass filter, an audio amplifier and a dynamic audio expansion system. It'll even automatically activate and de-activate my cassette recorder for times when I'm not home--great for you on Christmas eve, huh?

The Voicegate comes with connectors and patch cord; all I'd need is 18 Vac @ 500 ma and an 8 ohm speaker (which you could also pick up at Jabco). A free brochure is available for an SASE, or a 30-minute demo cassette for \$3.50 (credited toward purchase), or you can just pick it up for \$109.95 from Jabco Electronics, R.1 Box 386 Dept MT, Alexandria, IN 46001.

And now that we've put together a pretty nifty receiving package, let's tack on a little pizzazz. **Alden Electronics** has a professional quality facsimile Weather Chart kit for hobbyists like me. It's an easy-to-assemble kit that, when connected to a stable receiver like the R71A

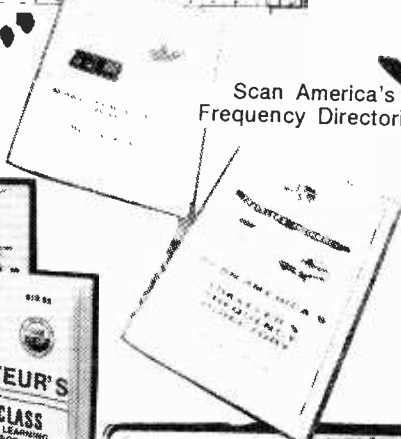
Wish List

MFJ-1024
Active Antenna



DX Edge
from Imprime

Scan America's
Frequency Directories



Gordon West
Radio School



Azimuth
WT-80 World Time Clock



ICOM R-71A

and suitable antenna, can receive weather charts, satellite pictures and oceanographic data from over 50 transmitter sites around the world. Now wouldn't that be a kick! And it's only \$1,000.00!

You can get more details by sending a letter from the North Pole to Alden Electronics, Dept MT, Washington Street, Westborough, MA 01581 [617]366-8851.

Over at **Universal**, Fred Osterman's got a pretty neat gizmo called the INFOTECH M-800. Fred says that once you've got one of these, you can actually "see" the world. You can receive and print pictures using your shortwave radio. See FAX weather maps, press photos, marine information, military charts, satellite photos and more! Write to him at 1280 Aida Drive, Dept MT, Reynoldsburg, Ohio 43068 [614]866-4267 for more information. Fred says you'll really like it.

I've got some other great gift ideas too. Why not take a look at the -- what? You say you've got to be going? Your sleigh is due over Southeast Asia in an hour? Well, what's the problem? If you had the new Azimuth WT-80 World Time, 24 hour clock, you wouldn't have to worry about time. I mean really, Santa. You're going to get an ulcer, or something.

The **Azimuth** clock displays local time plus 24 cities/zones around the world. Set London for GMT/Universal time push the switch and see the local time in 24 other cities around the world on a sharp, LED display. Long life AAA batteries are included and if you order now, you can save \$10.00! It's just \$19.95 plus \$1.95 shipping and handling from Azimuth Clock, 11030 Santa Monica Blvd, Suite 100-A Dept MT, Los Angeles, CA 90025 [213]473-1332 (Call collect for a credit card order).

Accessories! Now there's another great idea! Radios without the knowledge to make the best of it is equipment wasted, that's what I always say. I mean, suppose that you did bring me the ICOM R71A. It'd sure be nice if I got a DX Edge. Lemme tell you how it works.

Turns out that DXers have known for years that their chance of getting those hard to hear stations is when their location is in sunset and the location of the station is in sunrise. Or vice versa. It's called "greyline" DXing.

But calculating just when this occurs has never been easy -- until now. With the DX Edge, you can find the perfect time to try for any station at any time of the year. DX Edge puts this information at your fingertips in an easy-to-use 11 inch plastic slide rule device. You can get it from **Imprime** for just \$19.95 plus \$1.95 UPS shipping from P.O. Box 241 Dept MT, Radnor Station, Radnor, PA 19087 [800]323-1776 ext.126 -- Limited quantities, so hurry, Santa.

And how about a **Hamtronics** CVR-806 converter? Boy, that would be nice! If you don't want to spring for one of those new general-coverage receivers, I could still tune in those new 800 MHz land mobile frequencies (only the legal ones, of course!). A converter for your scanner would do just the trick, and you can get one from Hamtronics, 65-K Moul Road, Dept MT, Hilton, NY 14468-9535 [716]392-9430.

A couple of good books might also round things out nicely. How about a copy of Tom Kneitel's new 6th edition "**Top Secret**" Registry of U.S. Government Radio Frequencies. It's now 192 pages, and covers everything -- I'm talking about 120,000 listings -- from 25 to 470 MHz. There's FBI, DEA, CIA, NSA, Customs, Secret Service, Border Patrol, Immigration, ATF, Santa's cordless phone frequencies (just kidding, Santa!), ATF, Treasury, Marshals, Federal Prisons, National Forests and more!

It's just \$17.95 plus \$2.00 for mailing from **CRB Research**, Box A56 Dept MT, Commack, NY 11725. And rumor has it that if you mention **MT**, you'll get a special list of several hundred "action" frequencies.

The **Midwest Federal Frequency Directory (MFFD)** might also be a nice idea. It is an 80 page directory organized in three ways: by frequency, by call letters, and by major agencies. And it provides coverage of federal radio operations in seven states -- Illinois, Indiana, Kentucky, Michigan, Ohio, Pennsylvania, and West Virginia. It is packed with up-to-date information, including some stuff never published before! You can pick up a copy of MFFD for \$8.00 from **Scan America**, 430 Garner Drive, Suffield, OH 44260.

I hear, too, that QSL collectors are improving their totals with the four editions of **Language Lab**. It's the foreign language reporting guide by **Gerry L. Dexter**. They're available in English to Spanish, English to Portuguese, English to French and English to Indonesian. Each has over 800 sentences, phrases and key words to let even the dumbest among us look like Charles Berlitz. Each is \$12.95 plus \$1.00 shipping from P.O. Box 493 Dept MT, Lake Geneva, Wisconsin 53147.

Phew! Now suppose, just suppose -- and I certainly don't want to appear greedy or anything -- you were to bring me all of the things on my list. Well, I'm going to need something to carry them around in. After all, my good man, you can't expect me to be seen walking around the street with a furry red sack of radios slung over my back!

So why don't you get me one of those nice carrying cases from **Gilfer Shortwave**? I can take my portable radio and accessories along with me in one of these waterproof wonders. A small one is only \$29.95; the large size just \$32.95 plus \$4.00 shipping. That's from Gilfer, Box 239M, Park Ridge, New Jersey, 07656 [201]391-7887.

Well, Santa. I guess that's it. I hope I've not been too greedy or anything. After all, I have been a very good boy this past year!

Be sure to mention **Monitoring Times'** Christmas Wish List when you order and support your **MT** advertisers!

The Voice of China:

Radio Beijing Turns Forty!

by Li Li

"I regard the voice of Radio Beijing as the voice of the Chinese people, as it offers us a chance to learn about this strange nation." This is an excerpt from a letter written by Manfred Steinauer, an Austrian listener to Radio Beijing. The occasion was a special program called "Radio Beijing and Me," which celebrated the 40th anniversary of the station back on September 11.

Radio Beijing and Me

"Radio Beijing and Me" was first aired in March of this year and has drawn some 40,000 letters from more than 40 countries. Each sings the praises of Radio Beijing's 38 language services, warmly expressing their friendly feelings for the Chinese people and the station. At the same time, they express their congratulations on the 40th anniversary of the station's founding.

The founding of Radio Beijing took place at 20:40 on the evening of September 11, 1947. It was then that the Xinhau Broadcasting Station in northern China's Taihang Mountains launched its English program. Located in a cave, it transmitted over a renovated transmitter taken from a captured Kuomintang aircraft. With only a few hundred watts of power, few heard the short, 20 minute broadcasts. The situation did not change until 1949, when New China was born and the external broadcasting station moved to the capital, Beijing.

Growth of External Broadcasts

The Chinese government attached great importance to shortwave broadcasting from the start. In terms of capital investment destined for broadcasting during the First Five Year Plan (1953-1957), 50 percent went to external broadcasting compared with 30 percent for stations in the various provinces, municipalities, and autonomous regions and 20 percent to the central broadcasting station.

In 1959, China built two powerful transmitters -- then considered to be first class units -- and began broadcasting to the whole world. Air time was extended to 40 hours a day, using 16 languages and a staff of 300. By 1965, the station was receiving some 286,000 letters a year.

Boredom and the Cultural Revolution

Growth in the audience for Beijing's External Broadcasting ground to a halt during China's chaotic "cultural revolution" (1966-1976). Radio Beijing became a parody of propaganda. Programs were dry and news items long and crammed with political jargon. Feature programs were few and far between. And although the programs were broadcast in 38 different languages, the station averaged only 20,000 letters a year during this time -- a drop of some 260,000 pieces compared to '65.

After ten years of the cultural revolution, major changes came to China -- and to Radio Beijing's programs. According to *Beijing Review*, the "fine traditions of seeking truth from facts was restored and boring preaching made way for rich feature programs." Closer contacts were maintained with the audience. In the first half of this year, the station received more than 75,000 letters.

Aerial Bridge

Radio Beijing is the only external broadcasting service in China. The presentation of news and information about the country is objective and authentic -- designed to foster audience understanding and improved relations between listeners and the Chinese people.

In order to give a detailed, overall impression of China which goes beyond mere news and commentary, Radio Beijing has added regular feature programs in various languages. In the English department, the number has doubled to twenty, and includes "Economic Horizons," "Culture in China," "The



Happy Birthday, Radio Beijing!

Cooking Show," and "Learn to Speak Chinese."

The Japanese department has seven special programs on music alone. Others include "Friendship Saloon" (Italian), "Kaleidoscope" (Romanian), "Women and Children" (Urdu), and "China in the Eyes of the Turkish People" (Turkish). All language departments have their own listeners' letterbox programs.

These programs show the real China to the audience. For foreign listeners, the Chinese external broadcast services are an "aerial bridge" linking China with the rest of the world.

Voice of China

Apart from accurately presenting

China to the world, Radio Beijing also offers timely reports on major international events and represents the official view of the Chinese government on world affairs. Although the cold-war rhetoric of the 1960s is gone, it continues to take a firm stance on some issues, most notably "hegemony" -- attacking in 1983 the US's "hegemonic stand" in withdrawing from the United Nations Educational, Scientific, and Cultural Organization (UNESCO).

That report, says *Beijing Review*, "was welcomed by many listeners." The station proudly quotes a letter from a Tanzanian listener who said, "There are only a few countries which dare to openly denounce the rule of hegemonic powers. China is one of them."

NEW!

**BEARCAT
BC600XLT**



Order SCN8

\$224.95 plus \$5 UPS

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

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

100 memory channels may be scanned sequentially or in *five 10-channel banks*. Controls are backlighted for night use. And look at these switch-activated, plug-in options never available for a scanner before:

SIGNAL BOOSTING PREAMPLIFIER for weak signal locations; simply plug into the radio and forget it. May be switched in or out of circuit.

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.

Preamplifier option, order ACC95 \$25; CTCSS squelch decoder, order ACC96 \$60; On/off switch, order ACC97 \$8.95.

ORDER TODAY TOLL-FREE 1-800-438-8155 MASTERCARD, VISA OR COD
GROVE ENTERPRISES, INC.
140 Dog Branch Road, Brasstown, NC 28902
704-837-9200

HUGE

70 PAGE

SHORTWAVE CATALOG

SEE WHAT'S NEW IN . . .

- COMMUNICATIONS RECEIVERS
- PORTABLE SHORTWAVE RADIOS
- ANTENNAS & SUPPLIES
- RADIOTELETYPE EQUIPMENT
- FACSIMILE (FAX) EQUIPMENT
- COMMUNICATIONS BOOKS
- PARTS & ACCESSORIES



UNIVERSAL SHORTWAVE RADIO
1280 Aida Drive
Reynoldsburg, Ohio 43068
Phone 614-866-4267

SEND \$1.00 (OR 3 IRCs)
REFUNDABLE

But China can also put on a caring face. In 1985, when Africa was hit by a prolonged period of drought, Radio Beijing recorded its own version of the west's "We are the World," calling it "Stretch Our Hands of Help to the African People." Radio Beijing followed the broadcast of the recording with reports of many touching stories of generosity and concern by the Chinese people -- medical workers attending patients free of charge; artists selling their paintings to solicit donations, martial arts troupes giving benefit performances, and monks praying collectively for the African famine victims.

Response to Listeners

In another story, Radio Beijing relates how a 23 year old disabled Moroccan girl named Medekor Amina wrote to the station in despair. She was worried and pessimistic about her future. Having listened to Radio Beijing's Arabic programs however, she had come to know something of China and wrote to the station. In her letter she requested information about the manufacture and embroidery of Chinese clothes so that she might learn a new way to make a living.

The staff of the Arabic department responded immediately, telling her about Zhang Haidi, a disabled Chinese girl who had overcome her handicaps. They also mailed her three dress making books in Arabic.

The staff of Radio Beijing estimates that, over the past 40 years, they have received more than 2.8 million letters from listeners. Virtually all, say the Chinese with no small amount of pride, were "answered either with detailed explanations, frank expressions of opinion or warm-hearted greetings."

The staff of Radio Beijing estimates that, over the past 40 years, they have received more than 2.8 million letters from listeners. Virtually all, say the Chinese with no small amount of pride, were "answered either with detailed explanations, frank expressions of opinion or warm-hearted greetings."

From its post-war beginnings in a cave, through several Five Year Plans and the Cultural Revolution to today's modern China, Radio Beijing has always been the voice of its times and its people.

Official's Comments

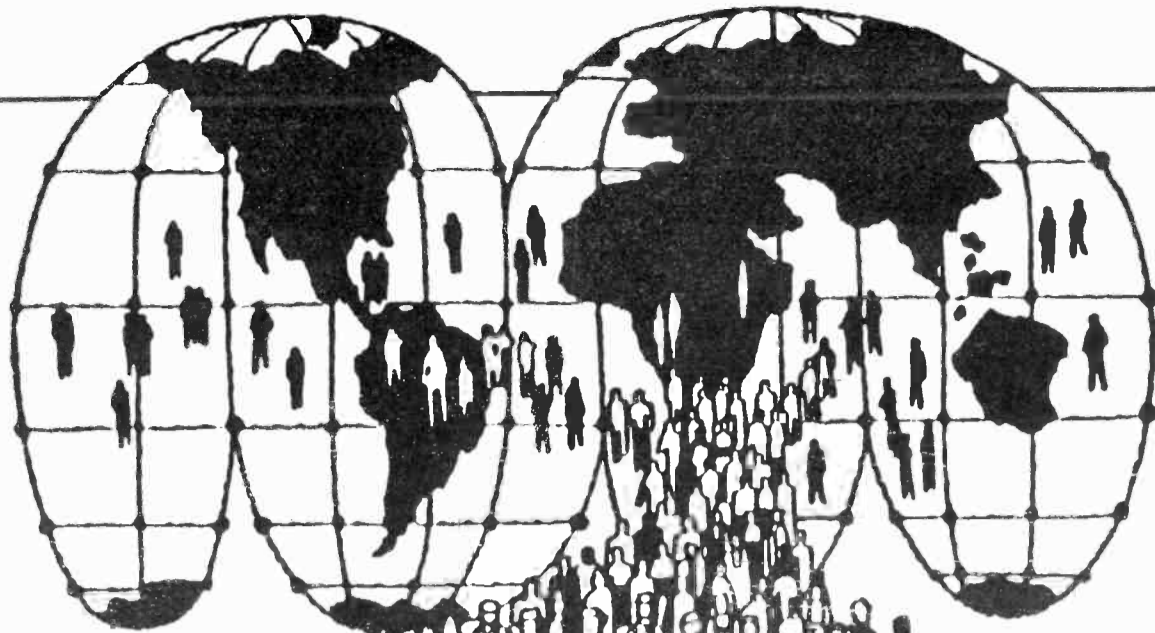
Liu Xiliang, a 1950s graduate of the Spanish Department of the Beijing Foreign Languages Institute is Radio Beijing's acting director. Described as "alert and efficient," Liu concentrates his efforts on the station's future development.

Getting the Signal Out

Liu sees Radio Beijing's biggest weakness as its limited transmission capability. And, as listeners on North America's east coast well know, it is difficult to hear the station. The

government plans, however, to remedy the situation by building a larger transmitting station -- although the government admits that it will be some time before the project is completed. In the meantime, the station is adopting a series of remedial measures, such as swapping transmitter time with other stations (an agreement with the Swiss gets under way the first of this month) and buying time on others.

In all, it's apparent that China believes in shortwave. It is also apparent from its mammoth efforts, that it desperately wants the world to believe them.



by Enrique Albaladejo



Here Come the New Countries

We DX'ers have a "country" fixation. The process of logging or confirming a new one represents the best in DX doings, especially when your pockets are already bulging with nations you've nabbed. Then the pickings are few; when finding a new country is about as rare as spotting a condor in New York City.

To those whose logs contain but 50 or 75 countries, the supply of new worlds yet to conquer may seem well nigh inexhaustible. It seems as if there's enough to last a lifetime, and then some. But if you stick with the hunt seriously you won't be the first DX'er to wake up one day to

discover there's very little left in the way of new countries to log. And DX'ers who reach that stage of the game and who focused most or all of their attentions only on logging new countries, have been known to lose all interest in DX'ing once they've run out of places to chase.

Fortunately, we can rarely log them all. There are always a couple like Tristan da Cunha (*Passport to World Band Radio* lists Tristan's schedule as Sunday's from 1000-1200, Monday through Friday from 1600-1700, and Monday, Wednesday and Friday from 1945 to 2200 UTC on 3290 kHz!) which seem forever out of reach.

But even if it were possible to log all of the countries on whatever country list you go by, you could never completely rest on your laurels. New countries keep showing up -- which, of course, is all to the good. As DX'ers we find ourselves almost always in the challenging situation where someone new has come on the air within the past six months and/or with one or more promised to us down the road.

Sometimes - about once every half a generation - we are totally astonished to find a new country suddenly appear on shortwave, the station not having seen fit to advise the zillions

of DX'ers in its potential audience that it had such plans. The most recent such instance was WSZO in the Marshall Islands which had all of DX-dom dancing with delight when it suddenly appeared on the air last spring.

There was also a recent case in which people were hearing a station in a new country and didn't even know it! Radio Mediu'n's transmitter at Nador, Morocco, was later discovered to be inside an area which used to be Spanish Morocco.

If you go by the country list of the North American Shortwave Associa-

tion then presto - you had a new country without even trying for it. Like a bug under a rock, it was there but unnoticed.

Country hunters can take heart. The next few years may very well see quite a parade of new countries taking up shortwave broadcasting activity.

Some of these places aren't really countries, of course. Not by any political definition you can name. But they are or are likely to be considered as "radio countries" by one or more of the scoring systems (read "country lists") currently available. So, as was noted just above, there's quite a bit of activity and potential activity promised, rumored or in actual fact coming up or down the calendar. Here's a preview :

Aruba - One of the so-called "A-B-C" islands in the Netherlands Antilles, Aruba is in the process of breaking away and going out on its own. So it seems likely that country counters will be able to split it off into separate status on any list as well. The medium wave religious broadcaster on the island, Radio Victoria, has been given a 100 kilowatt shortwave transmitter by the Far East Broadcasting Company. It thus seems quite certain that Aruba may be one of the first in this new crop of radio countries to come on the air. With 100 kW from its Caribbean location it's also likely to be quite an easy station to log.

Curacao - If Radio Earth is ever able to put into practice its plans to eliminate the middlemen and go on the air with its own transmitter from here, then all three of the islands will be on shortwave (Bonaire is the old timer with the Radio Netherlands relay as well as Trans World Radio). The key word is "if". And, "if" not, then the project has, at the least, got the government thinking in terms of shortwave broadcasting, and that might have paved the way for someone else, who knows?

Puerto Rico - The island that could one day be our 51st state is definitely destined for the higher frequencies. And with gusto. Indeed, the island may sink into the Caribbean under the weight of all the 500 kilowatt transmitters the Voice of America plans to put on the air. We can't answer when as we have not seen a VOA timetable but don't

be surprised if it isn't. Either way, when these fellas do get on, you'll know!

Grenada - There are many DX'ers out there who can show you a QSL card from the Windward Islands Broadcasting Service from back when that's what the station there was called. There are some who can show you QSL's from Radio Free Grenada, though in that guise the station was much less free with its QSL cards. The U.S. invasion/rescue put an end to all broadcasting by Radio Grenada, though it has long since returned to medium wave and FM. Shortwave? The manager says he'd like to do that in a couple of years, after current operations are fully organized, consolidated and running smoothly. Certainly there are no promises. Certainly letters of encouragement would help.

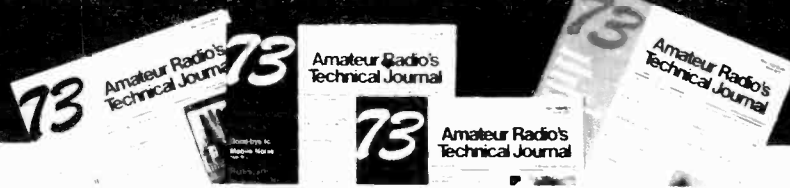
Tonga - Pacific area broadcasting was in the doldrums for more than 20 years. We lost the Gilbert and Ellice Islands. We lost Fiji and nearly New Zealand. And there wasn't much there to begin with! Now things are turning around and seem close even to surpassing the activity levels of the good old days.

A religious broadcaster in New Zealand - Radio Rhema - has been given the go ahead by the Kingdom of Tonga to build an AM-FM-shortwave station and this should be on the air sometime during 1988. It will probably operate in the 60 and/or 49 meter bands and should be nicely positioned, challenge-wise. No snap but far from impossible.

Micronesia - The Federated States of Micronesia announced plans for a shortwave broadcasting facility a year or more ago but there's been no further word on development.

Brunei - The Sultan could afford \$10 million in change to provide aid to the Nicaraguan contras, yet his shortwave broadcast station went off the air a number of years ago. Now there are reports that Brunei's broadcasts will be resumed, with new and more powerful transmitters. Again, we have no time frame, no idea of when this might happen. When Radio Brunei was active it operated in the 41 and 60 meter bands.

MONITOR



Do it yourself and save. Why pay for someone else to have all the fun? 73: *Amateur Radio's Technical Journal* publishes more easy-to-build construction projects than any other ham magazine. Every issue is packed with simple articles that will put your soldering iron to work.

Stay informed with the latest ham news. 73's monthly columns give you the facts you need:

73 International—learn about foreign contests, reciprocal licensing laws, and how hams operate in other parts of the world.

New Products—find out about the latest state-of-the-art equipment.

Reviews—comparison-shop from home and save money.

DX—get DXpedition updates, profiles of famous hams, and tips for beginners.

Never Say Die—publisher Wayne Green's bold editorials are sure to give you something to talk about.

Subscribe to 73 today. A full year (12 issues) is only \$19.97. You'll save nearly \$10.00 off the regular newsstand price. Just fill out the coupon, or call (toll free) 1-(800)-258-5473 and charge it.

Order 73—ham radio never sounded so good.

YES! I want to monitor 73. Send me 12 issues for \$19.97.

Check/MO MC Visa Amex Bill me

Card # _____ Exp. Date _____

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

Canada & Mexico \$22.97/1 year only, U.S. funds drawn on US bank.

Foreign surface \$39.97/1 year only, U.S. funds drawn on U.S. bank.

Foreign airmail, please inquire.

Please allow 6-8 weeks for delivery.

736RMT

73: *Amateur Radio's Technical Journal*, PO Box 931, Farmingdale NY 11737

Goa - Back when the Portuguese held sway over this little enclave on India's western coast Emissor da Goa was an active shortwave broadcaster. When the Indians moved in and took over they put the transmitter off the air and Goa left the list of active shortwave countries. On paper, at least, the Indian government has seemingly endless projects aimed at extending the reach of All India Radio. One such involves placing a shortwave transmitter in the area which was once Goa. The announcement was made some 18 months ago and there's been no further word.

Andaman Islands - Out in the Indian Ocean, these islands belong to India but are much closer to Burma than India. The distance factor may be a telling one when it comes to these islands "making it" as a radio country. New Delhi has announced plans for a ten kilowatt shortwave transmitter here, in order to improve AIR's coverage of the islands.

Reunion - Also in the Indian Ocean, Reunion is another "once was" - a formerly active shortwave broadcasting country. Just recently Radio France International announced plans to build a relay station on Reunion so the island should return to the ranks of the active, albeit as host to a relay rather than programming of its own.

So that is an even ten new countries which we may be hearing on the bands over the next few years. Even if they don't all make it the chances seem pretty good on at least seven. And there's always the DX'ers eternal optimism to keep us going in between. Maybe Bahrain will decide not to be the odd man out in the gulf anymore and start broadcasting on shortwave. Perhaps the other newly merging Pacific nations will want an effective means of reaching citizens living on far flung dots. What about Andorra, Bermuda, Martinique, Panama, Trinidad, Jamaica? Would the BBC put a high power shortwave in Scotland do you think?

Low Band Skip is Back!

by Chuck Robertson

One source of low band skip commonly heard is RFI rebroadcast over Conservation channels -- a rusty TV tower? a spliced guy wire? perhaps a heterodyne signal? -- Whatever, it renders the channel useless when the skip comes in.



Propagation

The ionosphere is important to radio monitors because it can refract back to earth radio waves which hit it. As a result, these signals -- called *skywave* -- can often be heard considerable distances from the originating transmitter. Ultraviolet light is the "gas" of skywave signals. Insufficient UV and they just don't make the long hop.

The level of ionization depends on solar activity. And solar activity is dependent on the time of day, season of the year, your listening location, and the level of sunspot activity, which occurs in a series of 11 year cycles. Fortunately, solar cycle 22 has entered with a roar.

What will you hear?

In the so-called low bands (30-50 MHz), the airwaves will be filled with the sounds of Spanish two-way communications from Central America and Canada. Listeners will be able to hear Latin American military operations; listeners on the east coast transmissions from the California Highway Patrol (CHiPS). Other state highway patrols and police agencies will be similarly affected. US Army exercises from proving grounds and ranges will also be audible and signals traveling 2 to 3 thousand miles and more -- when things get really hot -- will occur on an almost daily basis.

Already, things are heating up, as evidenced from these entries into the log book. All military catches are wideband FM (WBFM). All civilian catches are narrowband FM (NBFM). Exceptions are noted. 29.80, 29.95, 31.30, 32.02, 32.40, 36.00, 36.19, 38.00,

42.00 MHz Soviet Military, Time Domain (TD) Scrambling and Clear Voice.

The Russians are in Cuba. Russian language communications are logged regularly at my QTH in southern Illinois. The channels listed above are usually off frequency a few kHz. Most times it's impossible to clearly hear both sides of the conversation without slight retuning.

The Year at a Glance

I'll leave you with a few propagation tips. Look for E_s skip any time of the day or night on frequencies across the 30 to 50MHz band. Skip distances vary from 500Mhz. Search the 30MHz portion of the band first, then scan upwards to find how high the MUH is. Skip distances are over 2000 miles, with multi-hop extending the range. During periods of low to moderate solar activity, afternoon hours seem to be best for F₂ catches.

November and December should see many band openings. January is the quietest month of the year for VHF skip; however, if a major solar flare should occur in this month, look for intercontinental openings to Europe and Asia with skip distances over 9000 miles!

February and March are fantastic -- I receive some of my best foreign skip during this period. April is a pivotal month gradually tapering off in May, June, July, and August. Late August, September, and October are a mixed bag with infrequent band openings. That's it! Now get out there and DX!

Low Band Skip Loggings

- 29.805, 29.850 Whistlers, radiotelephones (Mexico?)
 29.90 US Military mobile, base and telemetry; low power.
 29.995 Spanish, two males "Guatemala"; "Vamos!" NBFM.
 30.00 "Straight Jacket Control, Straight Jacket Mobile", US Military, NBFM; stockade operations?
 30.00 "Chemical Base", US Military.
 30.00 "Tiger Base" US Military.
 36.55 North Carolina military personnel heard informing a Canadian mobile phone user he was on a US military frequency!
 30.10
 30.15, 30.35, 30.80, 31.00 Time domain scrambling and clear voice; Spanish military, Central America. Afternoon hours are the best time to hunt for skip from Central and South America and the Caribbean.
 30.475 Security Service (Guatemala?)
 30.96, 31.00, 31.04 New York City taxi services (Spanish language)
 30.15, 31.35, 32.05, 32.35, 32.40, 34.40, 34.80, 36.05, 37.00 ASCII-type data burst (preamble) followed by digital scrambling. The scrambling sounds like a distorted guard tone. This is one of the loudest forms of scrambling I've ever heard! Military personnel say they are "going digital" before switching on the scramblers. I suspect that this may be "KY"-type US military scrambling.
 30.15 Repeater. Los Alamos Proving Grounds, New Mexico, NBFM; Base is "3600" and security personnel use numbers like "3603." Other IDs include "Noble Roman," "Coronado Field" (Albuquerque) and "Cundiyo and Dulce" (towns near Los Alamos). Star Wars technology is developed in Los Alamos.
 30.20 US military "Bad Man 3"
 30.20/30.40 Semiduplex, US Military. Voice multiplexing (MUX)
 Multiplexing is a wideband technique utilizing sub-bands on either side of the carrier frequency -- something like the SCA systems that accompany FM broadcast stations. Since the signals are not directly on the carrier frequency, they sound like single sideband. Use of a BFO will not clarify the signal.
 The frequencies 30.20 and 30.40 were used semi-duplex. There were also tones on 30.31, 30.35 and 30.39.
 30.00, 32.20 Aircraft, Ft. Campbell, KY. "Screaming Eagle"
 30.20, 32.15, 36.05, 42.00, 48.75 DES scrambling, US Government. DES is composed of a short high-pitched data burst (preamble) followed by what sounds like static. The "static" is the digitized audio arranged a near-random pattern.
 30.25 US Mil Aircraft
 30.40 "Windjammer Control," "Windjammer Mobile" (US military)
 30.50, 31.10 "Silo 5"; apparently missile silos.
 30.55 "Control del Campo" Spanish military.
 30.565 Intermittent tones; this is a developmental frequency, used for testing new radio techniques or equipment. Location seems to be the East Coast (Statustronics, Farmingdale, NY?)
 30.58 Nonstop signaling (tone varies from high to low pitch every two seconds). Heard along with Canadian paging stations.
 30.60 "Skyking" aircraft and ground stations (US military)
 30.60 "Birdman to Faithful" (US military)
 30.75 "Charlie Uno" (Spanish military, Central America)
 30.76 Bus service, New York City, Amplitude Modulation (AM)! Spanish with English accent.
 30.80, 31.10, 31.50, 31.60, 31.80, 32.00 & 33.10 WBFM West German military (Bundeswehr) mock battles with tank-to-tank (panzer) and tank-to-helicopter combat in a desert location. A European reader states that the West Germans have a base at Pueblo, Colorado. Here are some of the tactical call signs and ID's:

- Rock Rim ---- name of war games operation
- Magpie ---- tactical
- Smilie ---- tactical
- Panzer Charlie ---- Tank C
- Hierleitung ---- Range Control
- 31.10 New York Transit Authority (buses); base and vehicles use Amplitude Modulation (AM)! NBFM channels include: 31.02,31.06,-31.08,31.12 and 31.14 Rptr-out, 30.90Rptr-in.
- 31.23 New York taxi service (bootlegged frequency), Spanish language.
- 31.35 "Red Leg Operations" US Mil.
- 31.35, 3268, 32.82
Paging, Argentina.
- 31.38 Time domain scrambling: I suspect Canadian fishing vessel operating on a bootlegged frequency and located on Canada's east coast and waterways.
- 31.40 Louisiana truck drivers; "Gonna' stop and get some snake oil."
- 31.75 US Corp of Engineers, Panama: this is a very active channel during the F2 skip season! Aircraft, mobiles and bases heard conducting maintenance on the Panama Canal and its reservoirs include: "Guabala Air" (tower); "Ft. Sherman" (Panama); Go Go Solo (town near Panama Canal); "LSE Site" (work site); "Rio Indio" (Madden Lake area); "Army 292" (helicopter); "Ft Gulick" (Panama); "Station 99", Corps site".
- 31.48 Panama Canal communications. The Gulf Fleet Marine Corporation vessels give regular reports to Harvey, Louisiana!
- 31.84 Base, 31.85 Mobile
US business on east coast: "Colonial Chevrolet"
- 31.94 Canadian fishing vessels on bootlegged frequency; speech inversion scrambling.
- 32.00 Honduran Military, Spanish language, "Campo Palmerola" (Palmerola AFB, Honduras); "Pito Solo".
- 32.05 "Ram Base," "Ram Control," "Ram 89" (US military)
- 32.16 (repeater) Schools and schoolbuses in the Monotick, Warkworth, Merricville area, Ontario, Canada NBFM
- 32.20 US military vehicle, Texas
- 32.37 US government, NBFM "Unit K" Keep your eye on this one!
- 32.40 "Desk Top Control," "Desk Top Remote" (US Military)
- 32.55 Time domain scrambling; no clear voice heard, but it was obviously Spanish language.
- 32.65 "Yoda", "Lone Star", "Joshua" US Mil; sounds like Star Wars!
- 33.00 Ft. Knox, Kentucky.
- 33.00 New York taxi service on bootlegged frequency in Spanish.
- 33.10 "Iron Flint Operations". US Navy
- 33.14 Several US businesses have been repeated over this high powered Canadian repeater.
- 33.20,33.55,38.45
"Gulf 6, Gulf 7", US Navy
- 33.35 Recurring tone. Possibly a data line on standby with tone signal constantly coming up every second just to reassure the circuit that it is operational.
- 33.35 DES scrambling.
- 33.44 Canadian mobile telephone, full-duplex.
- 34.00 Time domain scrambling (Spanish military)
- 34.30 Dutch military, English language; Base is probably on the east coast. Can anyone identify and locate this operation?
- 34.45 Radio frequency interference (RFI). So what makes this noise of interest? Well, it seems year after year the signal is rebroadcast over the US National Conservation repeaters on 34.83 out, 34.43 in! My local National Wildlife Refuge virtually gives up using their radios when this grinding skip comes in.
The RFI signal slowly drifts in frequency and will not access the repeaters if too far from the input, 34.43MHz.
Here are some of the conservation stations using repeaters on 34.83 out, 34.43 in.
KIE617 Orsino, FI
KIE645 Savana, GA
KIE641 Cambridge, MD
KIE639 Harrisburg, PA
KIE638 Richmond, VA
- 34.55 "Hovermaster", hovercraft. Probably US military.
- 34.55 US Mil. convoy near Dunn, NC.
- 34.65 Flight evaluation tests, US military.
- 34.80 "Farley liaison", "Impact area"; aircraft and range control, US military.
- 34.85 Paging;, NBFM, "Atlanta". Possibly Department of Human and Health Services, Atlanta, GA.

Gordon West's 21 DAY NOVICE



\$19.⁹⁵

Plus \$2.⁵⁰
Postage and
Handling



**CODE TAPES • 112 PAGE BOOK • BANDS CHART • ALL FCC FORMS
SAMPLE TESTS • HOTLINE • PLUS MORE!**

STEREO THEORY TAPES COULD BE SUBSTITUTED FOR THE BOOK FOR THE VISUALLY IMPAIRED. PLEASE ASK US

- Free ICOM \$20 equipment certificate when you receive call letters.
- Ham radio equipment "Wish Books".
- ARRL membership forms. • Free CQ Magazine coupon
- Hotline for student questions. • Dealer distributor list
- School pen. • Course completion certificate.

GORDON WEST RADIO SCHOOL

2414 College Drive • Costa Mesa, CA 92626 • (714) 549-5000

- 34.90, 34.99 ASCII tone bursts lasting about one second.
- 35.00 New York City taxi (bootlegged frequency), Spanish language. Check 32.00 and 34.98 for more NYC taxis.
- 35.00 "Wilcox Radio; Heath Radio; Eagle Base; Security Center", US military; maybe Arizona.
- 35.00 US military, Panama, possibly Medevac operations for Army Corps of Engineers.
- 35.04 Canadian fishing vessels on bootlegged frequency. East Coast
- 35.85 US military mobile unit at training center
- 40.01, 40.03;
repeater 40.31, 40.33
Bureau of Indian Affairs communications between schools and busds on the Indian reservations in New Mexico and Arizona. Here are a few callsigns hea over the repeaters:
Shiprock, KOJ566
Toadlena, KOP552
Alamo, KOP528
Tuba City, KOJ567
Ft Defiance, KOJ570
- 40.20 Telemetry, regularly heard,
- 40.48 Four digit numbers read by a professional announcer, NBFM. The numbers contained fractions (i.e., 48401/2)
- 40.59 Paging, NBFM (US Govt)
- 40.95 Continuous data flow
- 41.00 Aircraft near Albany, NY.
- 41.10 (repeater) US business and paging skip is occasionally rebroadcast over this Spanish repeater.
- 41.35 (repeater) Security, Department of Human and Health Services, Atlanta, Ga. NBFM
- 41.55 "Gulf Fleet 1"; US Navy
- 41.95 Kirtland AFB, Albuquerque, NM. Tower and aircraft.
- 42.50 "VCX516" Ontario Humane Society, Thunder Bay.
- 43.65 (repeater) Colon Fire Dept., Colon, Panama. This repeater sometimes rebroadcasts US business skip (NBFM) and US military skip (WBFM!) The repeater is NBFM.
- 45.44 Time domain scrambling, Spanish military. Cuba (and possibly Nicaragua)
- 46.90 (repeater) US business skip is rebroadcast over this Spanish repeater.
- 49.15 Radiotelephone, Spanish
- 49.35 Canadian business, "Cherry Creek"
- 49.40,
- 49.725 Radiotelephone, full-duplex Spanish
- 49.76 Canada Hydro line operations, "Hightower"
- 49.80 Radiotelephone, British West Indies (probably Bahamas), full-duplex, NBFM.

November is a time when, in many parts of the U.S., winter truly comes upon us. That same wind that long ago whipped the leaves from the trees now drives most of us inside and closer to the radio.

At about the same time, in places far, far away, broadcasters seem to go absolutely mad. In the engineering departments of stations all over the globe, a creeping, insidious disease, takes hold of their minds. The disease: **frequency roulette**. First the times change in Europe. Then a few frequencies. Then the U.S. time changes. Then more frequency changes. At about this time, everyone thinks that someone else is on the frequency they've chosen so everyone changes again. And again. And again. And by the time everyone in this audio demolition derby settles down, it's time to change frequencies for the spring.

This exercise invariably leaves listeners dazed and confused. It's no wonder shortwave listeners are so dedicated. They have to be!

A Once-in-a-lifetime Catch! Anyone who had their radio on during mid-October probably noticed the absence of regular programs from Kol Israel. The reason, it turns out, is that workers for the Israeli Broadcasting Authority (IBA) went on strike.

Anyone lucky enough to be tuned to Kol Israel's usual 13750 frequency during this time found something very special. Instead of strike-related filler programming, they found a once-in-a-lifetime DX catch -- Galei Zahal, the Israeli Defense Forces station.

Galei Zahal is a special Hebrew language station for the armed forces. It broadcasts over AM and FM in Israel and is the second of only two organizations allowed to broadcast under Israeli law. (The first being the Israeli Broadcasting Authority [IBA].)

Galei Zahal is known to have a few shortwave transmitters of their own but these units are almost never used and are only, at least report, some 50 to 100 watts in the 2 and 3 MHz region. They are probably simple field packs and have never been heard in the United States. Inside sources say that they are not even audible in Israel -- on the rare occurrences when they are used.

In a reportedly rare instance of cooperation between the two organizations, Galei Zahal apparently received permission to broadcast over the IBA transmitters. The result is the signal now being heard.

It might be worth mentioning that Galei Zahal usually picks up the Reshet Bet (B) home service for seven minutes or so of news at the top of the hour, but naturally, you won't hear that during the strike as it comes from the IBA.

Ironically, due to the strike, the fact is that aside from newspapers, the only source of decent news in Hebrew currently available to the public in Israel comes from Jordanian TV!

How long will Galei Zahal be audible? The answer is unknown. Could be until the strike is settled, and no one knows when that will occur. Or it could become a permanent fixture -- although that's doubtful. In any case, I hope it's still on by the time you read this! Good luck!

We've got some more DX news for you and we'll turn the stage over to Kannon Shanmugam, who'll be filling in for me for a couple of months.

Introducing Kannon Shanmugam - Kannon Shanmugam is one of shortwave's rising new stars. He's a great DXer who really knows how to make a radio stand up and sing. Here's some information he's compiled to help you get the most out of your time behind the dials.

Belgium: Here's the schedule for Belgische Radio en Televisie, BRT, in Brussels. These English transmissions can be heard through March 5, 1988. All schedules in this section are set up by time, followed by schedule (S=Sunday, M=Monday, T=Tuesday, W=Wednesday, H=Thursday, F=Friday, A=Saturday; no code indicates daily), frequency and, where available, target area.

0300-0055	5910, 9925	[Americas]
0800-0825 M-F	5910, 17600	[Australiasia]
1000-1025 M-F	5510, 17610	[Africa]
1330-1355 M-A	5590, 17600	[North America, S.E. Asia]
1630-1655 M-A	5510, 17610	[Africa]
1830-1855	6035, 9860	[Europe]
2200-2225	5910, 6035	[Europe, North America]

Burma: The new Burmese Army Station is now using new 6570 kHz at 1030-1330. Sarath Weerakoon speculates that the transmitter may be a new 10 kilowatt model. In any case, it has been logged by a number of U.S. DXers, including *Monitoring Times'* own loggings editor, Gayle Van Horn.

Canada: The other shoe has dropped in the Canada-Japan transmitter swap. Radio Japan has been rebroadcasting its programs over Radio Canada's facility in Sackville for some time; now Canada will get the use of Japan's facilities. And although this would seem to mean that Canada could at last satisfy its lust for reaching the Pacific region, a report from Canada says the languages will be (one hour in) Russian, and (half hours each in) English, French, Japanese and Ukrainian. Two frequencies will be used and the first programs hit the airwaves at the first of the year.

Costa Rica: As reported in the last issue of *Monitoring Times*, Radio for Peace, TIRFP, has been noted by various sources on 7380 kHz, between 0000 and 0300 UTC.

Radio Lira International is planning a second transmitter. They now use 15460 kHz with 5 kilowatts of power. (WOR)

Dominican Republic: Radio Discovery continues to have problems with the erratic power supply in Santo Domingo and has been off the air recently. But the biggest reason for the absence of the station is that it is now in the process of moving into the government radio and TV building, from where it will relay the programs of Radio Television Dominicana on shortwave from 0900-0500 UTC on 15045.

In addition, you can now hear the Radio Discovery program, "This is Santo Domingo" in English at 2000 and 0000 UTC and its Spanish counterpart, "Estoy es Santo Domingo" at 1900 and 2300 UTC. Look for the voice of Jeff White, now in Santo Domingo overseeing the transfer of the facility and an increase in power.

Ecuador: A slight change in HCJB's evening schedule to North America: at 0035-0070, the old 9870 kHz has been replaced by 9875 kHz.

Finland: Trouble continues with Radio Finland's new transmitter site at Pori. In an effort to straighten this out a bit, they've added extra frequencies and dropped secondary targets. Here is their new, revamped and renovated schedule:

0430-0455	6120*	11715, 11755	[Europe and North America]
0630-0655	6120,	9560, 11755	[Europe]
0700-0725	A 6120*	15245, 15305	[Europe]
0830-0855	6120*	15245, 15305	[Europe, Australia, East Asia]
1100-1125	M-F 11945,	15400	[North America]
1200-1225	M-A 11945,	15400	[North America]
1300-1325	M-A 11945,	15400	[North America]
1300-1400	S 11945,	15400	[North America]
1400-1425	15185,	15305	[Middle East, Africa]
1830-1855	6120*	9610* 11755*	[Europe]
2100-2125	6120*	15305, 15400	[Europe, South America]

* = *omni directional beam*.

So, how are Radio Finland broadcasts being heard at your place? Radio Finland would like to know. Call them. It's toll free. 1-800-221-9539. (SCDX)

France: Radio France International continues its incredible commitment to shortwave. Further expansion of their facilities is planned. They should have a new relay station on the air from somewhere in South Asia by next year -- Thailand seems to be the frontrunner here. Also, a relay at Reunion is schedule to light up by 1990 with two 500 kilowatt transmitters. The service area for the site will be the Middle East and East Africa.

Meanwhile, RFI is now on the air 24 hours a day in French and broadcasts in an additional 12 languages. English is at 0200, 0330, 0415, 1110, and 1600 UTC. Try also for their bilingual (French and English) DJ program from 0300-0500 UTC for eastern North America.

Gabon: Swiss Radio International has changed the frequency of its relay via Africa Number One in Gabon. 11920 kHz is now used for the program at 2210 UTC. The non-English transmission is beamed to South America. (WOR)

Grenada: Richard D'Angelo of Pennsylvania reports having received a letter from Radio Free Grenada saying that the station should be back on shortwave within the next two years. RFG left the airwaves during the American invasion and formerly occupied the frequency now used by Radio Discovery -- 15045 kHz. Look for Jeff White, Radio Discovery's owner, to conduct his own invasion of Grenada if they try to reclaim their frequency. (with WOR)

Hong Kong: Here you go, QSL hounds! Here's the schedule for the BBC's new Hong Kong relay station:

0400-0815	11775, 15280	1500-1615	5995, 7160
0815-0900	7180, 11775	2245-2330	5965, 15435
0900-0945	5995, 7180	2330-0030	11820, 15435
1300-1445	5995, 7160		

India: All India Radio's new external service transmitter site at Bangalore is almost completed. The facility will reportedly run 500 kw. (RNMN)

Italy: RAI's Arabic service broadcasts from transmitters on Sicily each day (except Sundays) from 1330-1345 and 1430-1445 on 6060 and 9515 kHz. If the programs in Arabic are as awful as the ones in English, we could see peace in the Middle East very shortly -- the programs will put everyone to asleep. (with RCI)

Jamaica: The Jamaican Government has dissolved the Jamaican Broadcasting Corporation (JBC) and public radio will soon be underway -- in more ways than one. Shares of stock in the new venture, it seems, will be sold to the general public. The change also opens the possibility of having shortwave from the island as well, although the idea remains in the realm of speculation at this time. (with WOR)

Lebanon: The Voice of Lebanon is on the air 24 hours a day on 6550 kHz. News in English airs at 0900, 1315, and 1815 UTC. This is a very, very tough one to hear -- near impossible. (WBI)

Lesotho: The BBC has installed a new 100 kw transmitter at its Lesotho relay site. Listen for testing to begin way down on 3340 kHz from 1500 to 2130 UTV. (RNMN)

Madagascar: Radio Madagaskara is audible at 1930-2100 on 3288 kHz. The frequency is variable, wandering as far away as 3287.6. Look also on 4960 kHz from 1430 to 1600, with a switch to 2495 kHz in the middle of the broadcast. (RCI)

Netherlands Antilles: Aruba will soon be on shortwave. Yes, it's another new country. And yes, Don Jensen predicated it in the last issue of Monitoring Times! Look for an FEBC-donated 100 kw transmitter named Radio Victoria to sign on with religious and cultural programs.

KGEI will soon begin to broadcast to Southern Europe and Africa in English.

Nicaragua: Whatever happened to Sandinista shortwave? It's a question that all of America has been asking. The answer is, they've been busy getting a new transmitter on the air. And now, you, too, can hear the Voice of Nicaragua on new 6100 kHz from 0000-0700 UTC with one hour English broadcasts at 0000, 0300, and 0600 UTC. The domestic service, in Spanish, is on 6105 kHz, along with occasional English. (WBI)

Nigeria: Nigeria. Land of turmoil and poverty. A long time ago we ran an article entitled, "Nigerian shortwave stations. Catch Them Before they're Gone." Well, a lot are off the air -- four on the 49 meter band and one on 41 meters. However, there are a few left and you might want to try and hear them: Look for regionals from Kaduna (4770 and 6090), Ibadan (6050), and Enugu (6025). (RNMN)

Papua New Guinea: Broadcasts in Pidgin English are quite an experience -- a mixture of strange terms, interesting accents, and, well, it just sounds great. Get a taste of this strange language by tuning in Radio East Sepik at 1050 or so UTC. The frequency is 3335 kHz and you'll hear not only Pidgin but island vocals and even a splash of American pop music. (with Wayne Thomas, ASWLC)

Seychelles: FEBA radio can be heard in Farsi -- the language those people are yelling in the background during those on-the-spot reports from Iran. The time is 0300-0330 UTC and the frequency is 11869 kHz. There's also an English-language "DX Postbag" program at 0732 UTC. (RCI)

Surinam: Just in time for lunch time listening at the office! Pull that tuna salad sandwich out of the desk, push back your chair, kick off your shoes and punch up 17755 kHz. And enjoy. You're listening to the sounds of Radio Surinam International, broadcasting in English on Thursdays via Brazilian transmitters, from 1730-1755 UTC. Never again does lunch have to be boring.

Thailand: If you're in the right place at the right time, you can hear the Thai national program on 4830 and 6070 kHz from 0000-0100 and from 1100 until the 1600 UTC sign off. This program is not the same as Radio Thailand. (RNMN)

Turkey: Here is the rather short schedule for the Voice of Turkey in Ankara. These English broadcasts a valid, says VOT, through December 31.

0300-0400	9560, 17760 [E. North America, S.E. Asia]
1230-1300	15260 [South Asia]
2000-2100	7215 [Europe]
2200-2300	7135, 9505, 9560, 17760

USSR: Ever get a Radio Moscow schedule in the mail? Ever notice that they always left you guessing as to where they were on the dial? For example, RM would print a frequency as 6.18, leaving you guessing if that last, missing number was a zero or a five. Well, *glasnost* has come to Radio Moscow schedules.

Take for example this, most recent version, good through March 5, 1988...

To Eastern North America

2300-0000	5915, 5940, 6045, 6115, 7115, 7150, 7215, 7310, 11770, 12050, 13665, 15425, 15455, 17700.
0000-0100	5915, 5940, 6000, 6045, 6115, 7115, 7150, 7215, 7310, 11770, 12050, 13665, 15425, 15455, 17700
0100-0200	5915, 5940, 6000, 6045, 6070, 6115, 7115, 7150, 7215, 7310, 9580, 11770, 12010, 12050, 13665, 15455
0200-0300	5915, 5940, 6000, 6045, 6070, 6115, 7115, 7150, 7210, 7215, 7310, 9580, 11770, 12010, 12050, 13665
0300-0400	5915, 5940, 6000, 6045, 6070, 6095, 7115, 7150, 7260, 7310, 9580, 11770, 12010, 12050

To Western North America

0400-0500	6095, 6150, 6190, 7260, 7290, 11790, 12010, 12050
0500-0600	6095, 6150, 6190, 7260, 7290, 7345, 11790
0600-0700	5905, 6095, 6150, 6190, 7290, 7345
0700-0800	5905, 6150, 6290, 7290, 7345

Can global peace be far away?

The Soviets have added three new 45 minute weekend programs as well: Nikolai Kurnakov's "From Moscow with Jazz" (Saturdays), "Talk it Over" (Sundays), and Tankred (Tankred? Red Tank?) Golyenpolsky's "Conversations" (Sundays). "Talk it Over," alternates with "Conversations."

U.S.: Many U.S. stations seems to have dropped that strange, 9852.5 frequency. Seems it was getting clobbered by interference.

Yugoslavia: Anyone heard Yugoslavia's two new 500 kw transmitters yet? They're supposed to be in use for their 1730 and 1900 UTC broadcasts on 5980 and 6100 kHz.

International Waters: Look for long-time British pirate on 6338 kHz. It's testing on shortwave right now. (RNMN)

And that's enough tips for this time. Let's see how you're doing by opening the floor to Ms. Gayle Van Horn and the talented readers of America's favorite monitoring magazine, *Monitoring Times*...

RADIO ROUNDUP: Broadcast Loggings

- 0012 UTC on 9600**
PORTUGAL: R. Renensenca. Portuguese. Interval signal heard under R. Moscow. Too bad Moscow covers it! (B. Mac Gibbons, Gresham, OR) Thanks for the log, Bruce! - ed.
- 0040 UTC on 3250**
HONDURAS: R. Luz y Vida. Spanish. Lengthy local news and announcements. 'Easy-listening' music and 0100 ID.
- 0042 UTC on 18710 USB**
PITCAIRN ISLAND: Not a shortwave log but interesting station to try for as they are regularly in touch with Wellington, New Zealand. (B. MacGibbons, Grsham, OR) - let's hear it for exotic DX Bruce! - ed.
- 0045 UTC On 11880**
SPAIN: Spanish Foreign R. Report and interesting views on the New World Ballet of Caracas, Venez, and visiting Spain. (R. Fraser, Cohasset, MA) - first time contributor - welcome, Bob! - ed.
- 0057 UTC on 3370**
GUATEMALA: R. Tezulutlan. Spanish. Very weak instrumental marimba music Tezulutlan ID @ 0100 into news reeporting format.
- 0100 UTC on 9575**
ITALY: R.A.I. Usual news including Italian monies invested in Spain and shoe exports news. (R. Fraser, Cohasset, MA)
- 0100 UTC on 9435**
ISRAEL: KOL. News on Journalist Charles Glass escape in Lebanon. (T. Jones, Memphis, TN) - welcome to Radio Roundup, Tony - ed.
- 0105 UTC on 3360**
ECUADOR: R. Federacion. Spanish. Latin pop vocals, local time check, singing ads into more pops.
- 0115 UTC on 3395**
ECUADOR: R. Zaracay. Spanish. Zaracay promo and local ad. Newscast on mostly local times.
- 0130 UTC on 6005**
ASCENSION ISLANDS: BBC. Play of the Week program on Sir Arthur Canon Doyle. Some interference. (T. Jones, Memphis TN)
- 0135 UTC on 4845**
BRAZIL: R. Nac'l-Manaus. Portuguese. Popular Brazilian pops with music titles, and Nac'l ID.
- 0140 UTC on 15170**
TAHITI: R. Tahiti. French/Tahitian. Pro style music in English and French. Very strong signal! (L.W. Lee, Richmond, KY) - sounds like a great DXpedition, Loy! - ed.
- 0200 UTC on 9475**
EGYPT: R. Cairo. Program on ancient Egyptian land areas. Usual noisy signal. (T. Jones, Memphis TN)
- 0200 UTC on 17795**
AUSTRALIA: R. Australia. Aussie theme music, international news and feature on India with text and sitar music.
- 0200 UTC on 6025**
DOMINICAN REP.: R. Amanecer. Spanish. New religious station heard for several nights past 0200. Check 1570 MW for address in WRTH. (J.Tuchscherer, Neenah, WI.) - thanks for the tip John! - ed
- 0201 UTC on 11745**
BRAZIL: R. Bras. Text on new hydroelectric dam project and national news of Brazil. (T. Linz, New Orleans, LA.) - welcome to MT, Thomas - ed
- 0220 UTC on 4785**
COLOMBIA: Ecos del Combeima. Spanish. Bolero sounding Colombian folk. Break at 0230 for an ID with local lbague news announcements.
- 0220 UTC on 11785**
BRAZIL: R. Guaiba. Portuguese. Rapid Brazillian pops, local IDs with phone #. More talk on Porto Alegre. (T. Linz, New Orleans, LA)
- 0235 UTC on 4790**
PERU: R. Atlantida. Spanish. Several Atlantida IDs, time checks and quite nice Peruvian flute music.
- 0245 UTC on 5889**
CLANDESTINE: R. Liberacion. Spanish. Political rhetoric condemning Nicaragua. Spanish 'ranchero' music. News on El Salvador president. ID and speeches. On past usual 305 sign-off.
- 0307 UTC on 4960**
MADAGASCAR: R. Madagasikara. Malagasy. Native African music and talk from female. ID @ 0312. Horn instrument introduces new program features.
- 0330 UTC on 7475**
TUNISIA: R. Tunis. Arabic. Sign-on NA and station ID, brief comments before Qu'ran. Arabic music at 0345. Parallel 7310 fair.
- 0350 UTC on 7430**
GREECE: VOICE OF GREECE. Male singer singing Greek folk music. (L.W. Lee, Richmond, KY)
- 0405 UTC on 3211**
MOZAMBIQUE: R. Mocambique. Portuguese. Very poor-signal as male announcer barely audible. African music and feature by lady. Parallel 4864 just as bad tonight.
- 0415 UTC on 9800**
FRENCH GUIANA: R. France Int'l. News of unstable Persian Gulf situation. (T. Jones, Memphis, TN)
- 0417 UTC on 4910**
ZAMBIA: R. Zambia Vern. African hilife music, Zambia ID @ 0420, fanfare and talk from two announcers.
- 0425 UTC on 4880**
SOUTH AFRICA: R. Five. Music from Elton John and Michael Jackson. "10 minutes to 7" time check and "When Smokey Sings" song.
- 0431 UTC on 5015**
CLANDESTINE: R. Truth. Bird interval signal, ID, trumpets fanfare and talks about Namibia. Bird i.s. and sign-off @ 0500.
- 0457 UTC on 4904**
CHAD: R. Nat'l Tchadienne. French/English. NA and children's chorus at sign-on. ID, cock crow and "good morning, wake up, - let's go" (in English) Morning chat and news format.
- 0500 UTC on 4830**
GABON: Africa #1 French. ID by female announcer followed by jazzy Afro music. (T. JOnes, Memphis, TN)
- 0526 UTC on 5047**
TOGO: R. Togo. French. Chime melody interval signal, NA and sign-on ID. French and English classical music followed.
- 0531 UTC on 5020**
NIGER: LV. Du Sahel. French. Chorus NA, flute interval signal, and "good morning ladies and gentleman" into Qu'ran recitations.
- 0550 UTC on 17780**
MARIANA ISLANDS-Saipan: KYOI Saipan. 'Canned' station promotional as "All Hits KYOI" with rock music. (R. Pearson, St. Augustine, FL)
- 0605 UTC on 4915**
GHANA: GBC. National news of Ghana, rural development news and native African music.
- 0611 UTC on 9540**
NEW ZEALAND: R. New Zealand. Local weather forecast, UTC time check into instrumental classics.
- 0615 UTC on 7172**
ANGOLA: Er do Lobito (T). Unknown. African music with native 'chanting' and drums. Very poor signal. All music program. Log submitted as tentative. (R. Pearson, St. Augustine, FL)
- 0630 UTC on 4845**
MAURITANIA: ORT de Mauritanie. Arabic. Guitar interval signal and ID into Qu'ran recitations. (B. Mac Gibbons, Gresham, OR)
- 0637 UTC on 6046**
COLOMBIA: R. Melodia. Spanis. Good clear signal for Latin music and IDs at 0650 and 0701. (B. Mac Gibbons, Gresham, OR)
- 0658 UTC on 9545**
SOLOMON ISLANDS: S.I.B.C. 'Island' music, SIBC Id with freq schedule DJ with music dedications and English pop selections.
- 0705 UTC on 7105**
MONACO: TWR. Christian contemporary music and interview on religious education in the U.K.
- 0715 UTC on 6090**
LIBERIA: ELBC. Ad for Cherry coke and into Liberian National Police Report at 0717. (B. Mac Gibbons, Gresham, OR)
- 0803 UTC on 6000**
BRAZIL: R. Guaiba. Portuguese. News covering Rio. "Radio Guaiba" into music program.
- 0805 UTC on 6010**
BRAZIL: R. Inconfidencia. Portuguese. Station ID with 'canned' promo. local time check and phone-in talk.
- 0810 UTC on 6040**
BRAZIL: R. Clube Paranaense. Portuguese. Local time, "Clube" ID, pop music and ballads.
- 0819 UTC on 6020**
BRAZIL: Gaucha. Portuguese. Enthusiastic announcer with , "bom dia de Radio Gaucha" (good morning from Radio Gaucha) and morning news with weather temps.
- 0820 UTC on 6170**
COLOMBIA: LV de la Selva. Spanish Cumbia Colombia folk styles, ID as, "esta es la voz de la Selva de Caqueta" and time check. R. Cultura Brazil underneath signal.
- 0830 UTC on 6090**
BRAZIL: R. Bandeirantes. Portuguese. "bom dia de Sao Paulo", ID, music dedications into Brazilian pops.
- 0920 UTC on 4996**
PERU: R. Andina. Spanish Peruvian folk styles and local ads. Continued beautiful flute music.
- 0929 UTC on 4945**
BOLIVIA: R. Illimani. Aymara/Quecha. Station ID and news covering Bolivia. Bolivian folk with flutes and radio drama. - Illimani recently reactivated on 4945 to 0359 sign-off with NA. - ed. (thanks for the tip John T.)
- 0945 UTC on 4805**
BRAZIL: R. Dif. do Amazonas. Music of pops and ballads. Amazonas promo, and time checks.

Send your loggings to Gayle Van Horn, 160 Lester Drive, Orange Park, Florida 32073 USA. All loggings are of English broadcasts unless otherwise noted. Logs without contributor name are the editor's loggings.

- 0946 UTC 9775/11505
CHINA: CPBA-2 Chinese music with children singing. Time pips @ 1000 with ID. Don't believe I've ever heard 9775 before. (B. Mac Gibbons, Gresham, OR) - nice log, Bruce.
- 0950 UTC on 6135
BRAZIL: R. Aparecida. Portuguese. Ballads and DJ chit-chat on phone, ID and Brazilian pops.
- 0955 UTC on 4875
BRAZIL: R. Nac'l - Boa Vista. Portuguese. Severe HET on frequency, but news, 'easy-listening' and Nac'l promos making it!
- 1000 UTC on 4780
VENEZUELA: LV de Carabobo. Spanish Sign-on with national anthem, ID @ 1002 Ads and lots of talk on city Valencia. (B. Mac Gibbons, Gresham, OR)
- 1010 UTC on 5050
ECUADOR: R. Jesus Gran Poder. Spanish. Morning religious devotionals with choral and organ hymns.
- 1035 UTC on 6070
CANADA: CFRX Toronto. News headlines, area forecast and temps, morning traffic report and Merrill Lynch ad.
- 1055 UTC on 6150
COSTA RICA: R. Impacto. Spanish. Public service announcements, NA @ 1100 and "buenos dias Costa Rica". ID and news of Central America.
- 1100 UTC and 5975
COLOMBIA: R. Macarena, Spanish. Promo for Macarena newscast, ID and time tones with bank ad and Latin pop music.
- 1200 UTC on 11650
CHINA R. Beijing. National news of China and South Asia followed by industrial report of China.
- 1230 UTC on 11775
ANTIGUA: BBC relay. "The Valley of Fear", Part 1 a Sherlock Holmes adventure. (R. Fraser, Cohasset, MA)
- 1240 UTC on 15320
AUSTRIA: R. Austria Int'l. "S.W. Panorama" - Part 3 of "IDs of the 1960s". (R. Fraser, Cohasset, MA)
- 1315 UTC on 15305
NORWAY: R. Norway Int'l. Report and interview on Norway's film industry and annual film festival. (R. Fraser, Cohasset, MA)
- 1358 UTC on 11820
SRI LANKA: TWR Announcer with, "this is TWR" and Hindu/Urdu schedule. "This new frequency. (B. Mac Gibbons, Gresham, OR)
- 1400 UTC on 15400
FINLAND: R. Finland. Signing off with an ID. No national anthem noted. Parallel 15305/15185 good. (J. Kline, Santa Monica, CA) - thanks for the logs, James! - ed
- 1429 UTC on 9720
SRI LANKA: SLBC. Religious message and ID @ 1430 followed by more of the same. (B. Mac Gibbons, Gresham, OR)
- 1443 UTC on 9840
GUAM: KTWR Just caught the ID before the end of program transmission @ 1459. (J. Kline, Santa Monica, CA)
- 1456 UTC on 7115
SWAZILAND: TWR Interval signal and English ID into Malagasy programming @ 1500. (B. Mac Gibbons, Gresham, OR)
- 1535 UTC on 9545
INDIA: AIR Newscast to 1545 Parallel 10335 poor signal. (B. Mac Gibbons, Gresham, OR)
- 1600 UTC on 15295
USA: WINB. Program of, "International Freedom Alert" on Soviet presence and threat to Southern Africa. (D. Mc Cants, Trussville, AL) welcome to MT, Donald! - ed
- 1630 UTC on 11875
USA WYFR Program on Science, Scripture, and Salvation" on Christian evangelism. (D. Mc Cants, Trussville, AL)
- 1751 UTC on 11875
AUSTRALIA: ABC Perth, Pop songs by lady DJ. Station is now 24 hours as mentioned on "Talkback". (B. Mac Gibbons, Gresham, OR)
- 2006 UTC on 15020
SYRIA R. Damascus. Program features with Radio Damascus ID Parallel 12085 poor. (J. Kline, Santa Monica, Ca)
- 2030 UTC on 9715
MADAGASCAR: R. Nederland relay. Tome Meyer's wonderful "Happy Station" program (R. Fraser, Choasset, MA))
- 2035 UTC on 9510
ALGERIA: R. Algeria French/Span. Radio Algeria with news briefs into classical and Arabic music styles. (S. Zackery, Lake Charles LA)
- 2120 UTC on 11705
USA WRNO Elvis music medley from the 60's with local ads.
- 2220 UTC on 15330
MOROCCO RTV Marocaine. Arabic. Very weak signal with arabic singing under AFRTS. 15105 weak also. (T. Linz, New Orleans, La)



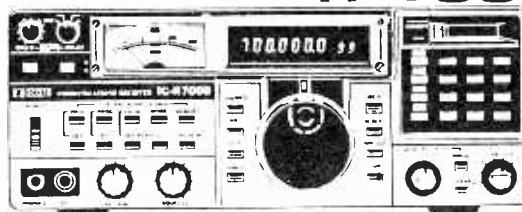
GALAXY ELECTRONICS

BOX 1202—67 EBER AVE., AKRON, OHIO 44309

(216) 376-2402



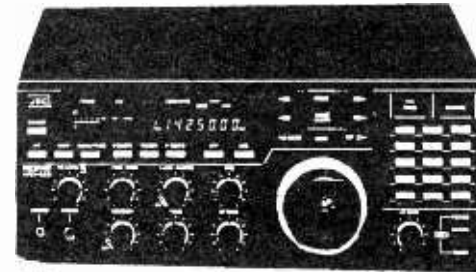
R-7000



****NEW ICOM R-7000 SCANNING RECEIVER** Its the BEST -**

25-2,000mhz continuous coverage receiver on the market today!! FEATURES: 99 Memorys, Modes Of AM/FM/SSB, Priority, 5 Tuning Speeds, Noise Blanker, S-Meter, 7 Digit Fluorescent Display, Dial Lock, Keyboard Entry Or Manual Tuning, Lithium Memory Battery Back-Up, Narrow/Wide Filter Selection, Dimmer, Adjustable Speed For Scan And Delay Functions, Plus MUCH, MUCH MORE!! - YOUR DISCOUNT PRICE ONLY \$959.95

****NEW NRD-525 SHORTWAVE SCANNING RECEIVER** WHAT A MACHINE!!** FEATURES: 200 Memorys, Covers 0.09 To 34mhz, Has Direct Keyboard Frequency Entry Or Manual Tuning, Has RIT/Tuning Control, RF Gain, BFO Control, Modes of AM/FM/RTTY/USB/LSB/CW/FAX, Pass Band Shift, Notch Control, Clock/Timer, Dimmer, 7 Digit Frequency Display, Scan, Sweep, Run, AGC, Attenuator, Noise Blanker, S-Meter, Pause Level, Monitor Switch, Dial Lock, Multiple Selectable Bandwidths AND MUCH MORE!! MANY OPTIONS ALSO AVAILABLE!! - YOUR DISCOUNT PRICE ONLY \$1,174. RS-232 Interface \$129...RTTY Unit \$139; VHF/UHF Converter(114-174 & 425-445 mhz) \$349; NVA-88 Speaker \$59...1000hz Filter \$129.



JRC Japan Radio Co., Ltd.

SHORTWAVE RADIO

NRD-525 09-34 mhz, 200 Memorys, Scans, Ultimate!	1,169.00
ICOM ICR-71/A 100khz 30mhz, 32 Memorys, Scans	799.95
KENWOOD	
R-5000 100khz-30mhz, Digital, 100 Memorys	729.00
R-2000 150khz 30mhz, Digital, 10 Memorys, Scans	575.00
SONY ICF-2010 150khz 30mhz, 76-108, 116 136mhz	319.00
SONY ICF-2002 150khz-30mhz, Memorys, Scans	234.95
SONY ICF-PRO-80 150khz 216mhz, 40 Memorys, Fantastic!	339.00
BEARCAT DX-1000 10khz 30mhz, 10 Memorys	449.00
PANASONIC	
RFB-300 1.6 30mhz, AM/USB/LSB/CW, Digital	289.00
RFB-600 1.6 30mhz, AM/USB/LSB/CW, Memorys, Digital	549.00
RF-3100 1.6 30mhz, 31 Bands, AM/FM/USB/LSB/CW	389.00
YAESU FRG-8800 150khz-30mhz, Scans, Memorys	639.00
INFO-TECH M-6000 Multi-Mode RTTY Code Receiver	849.00
SONY AN-1 Indoor Active Shortwave Antenna	79.95
ICOM AH-7000 25-1,500mhz Antenna	89.00
MFJ-959 Antenna Tuner, Pre-Amp, Dual Ant Outlets	89.99
MFJ-1040 Pre-Selector, Pre-Amp, Multi Antennas	99.95
FREE UPS SHIPPING & INSURANCE TO 48 STATES	
COMPLETE 31 PAGE 1988 PICTURE CATALOG W/SPECS \$1.00	
FREE FULL BENCH TESTING	FREE

POLICE/FIRE SCANNERS

REGENCY	
TS-2 75ch, 29 54, 118 175, 406 512, 806-999mhz	349.00
TS-1 35ch, 29 54, 118 175, 406 512, AM/FM	255.00
MX-3000 30ch, 30 50, 138 174, 406 512, AGDC	199.00
Z-60 50ch, 30 50, 88-108, 118 174, 406 512, AM/FM	169.00
Z-45 45ch, 30 50, 118 174, 406 512, AM/FM	155.00
R-1090 45ch, 30 50, 144 174, 406 512mhz	155.00
R-1080 30ch, 30 50, 138 174, 406 512mhz	149.00
R-1075 15ch, 30 50, 138 174, 406 512mhz	129.00
HX-1500 55ch, 29 54, 118 174, 406 512mhz	219.00
BEARCAT/UNIDEN	
BC-800XLT 40ch, 29 54, 118 174, 406 512, 806 912	299.00
BC-200XLT NEW!! Call for Price	CALL
BC-580XLT NEW!! Call for Price	249.00
BC-210XLT 20ch, 29 54, 118 174, 406 512mhz	225.00
BC-580XLT 16ch, 30-50, 118 174, 406 512mhz	275.00
BC-300 50ch, 30 50, 118 136, 421-512mhz	188.00
BC-100XL 16ch, 30-50, 118 174, 406 512mhz	178.00
BC-70XLT 20ch, 29-54, 138 174, 406 512mhz	178.00
ICOM R-7000 99ch, 25-2,000mhz, FM/AM/SSB	959.00
FREE SHIPPING/INSURANCE TO 48...1988 CATALOG...\$1.00	
USED GEAR, SPECIALS, CLOSOUTS, ETC...SEND ONE-10\$ASE-	
FREE FULL BENCH TESTING	FREE

Cordless Phones • CB Radios • Radar Detectors • Frequency Directories
True Discount Prices & Free UPS Shipping To 48 States Picture Catalog \$1.00 Refundable.



- 2233 UTC on 4900
GUINEA: R. National Vern. 1 hour conversation from two males, African hlife music at 2333. Into French @ 2337 with African pops. Guitar interval signal, ID, National Anthem, and 0001 sign-off.
- 2240 UTC on 9940
CLANDESTINE; La Voz de CID. Spanish. Latin music to 2300 followed by newscast and what sounded like a radio play. (P. Farris, Albany, NY) another new contributor - welcome, Peter! - ed
- 2250 UTC on 4990
NIGERIA: R. Nigeria-Lagos. Jazz music program, ID with schedule @ 2300 National news of Nigeria.
- 2253 UTC on 4870
BENIN ORTV Du Benin. French CLock chimes, ID as "Radio du Benin" music from Beverly Hills Cop I. Closing ID, "good bye friends", NA and 2300 sign-off
- 2302 UTC on 4835
MALI: RTV Mалиenne. French. Terrific African music, "ici Bamako" ID, Afro French pops, interval signal, martial NA and 0001 sign-off.
- 2310 UTC on French 4850
CAMEROON: R. Cameroon-Yaounde. French. Male and female with conversation, French vocals and FAX interference.
- 2310 UTC on 4850
BURKINA FASO: RTV Burkina. French. African pop music by DJ. Cclosing comments balafon interval signal, ID, NA, and sign-off @ 0000.
- 2315 UTC on 14802 USB
KIRIBATI R. Kiribati. (T) Kiribati. Fast pop music amid excessive noise. Male announcer heard as signal peaks. Log tentative.
- 2315 UTC on 4910
HONDURAS: LV de la Mosquitia. Englis/Spanish. Old-time religious music with program notes. Fading as religious text begins in Spanish.
- 2320 UTC on 4940
COITE D' IVOIRE RTV Ivorienne. French Music from B.B. King, Madonna, and Janet Jackson's 'Control' hit. DJ really enjoying himself as he sings along! Closing ID, choral NA, and 0001 sign-off.
- 2335 UTC on 4825
BRAZIL: R. Educ. Branganca. Portuguese. Very rapid commentary of soccer game. Occasional breaks for talk and ads.

Next year's release of a model **BC1000XLT Scanner** from **Uniden** will be somewhat less ambitious than originally proposed. Hopes for a tuning dial, S meter and a few other advanced features faded when the manufacturer found out what the costs would be.

The scanner market is tightly competitive and the depressed value of the dollar has done its part to discourage American importers. Still, the message from the consumer regarding the desire for wide frequency coverage has been heard and many new models will reflect that trend.

On Thursday, September 17, 1987, the Federal Communications Commission (FCC) adopted **new rulemaking on Part 15 of the Rules and Regulations** regarding incidental radiation devices. As proposed, a complete overhaul would discard specific design restrictions on devices, leaving only the emission control regulation.

The new rewrite would not only open up the market for unlicensed radio devices for home use such as wireless links between computers and keyboards, VCRs to TVs, and so forth, but would seem to eliminate the prospect that radios could be forbidden by law from receiving certain frequency ranges. *(Thanks to Bob Horvitz for this news note)*

Scanner Listeners near the Persian Gulf are hearing warships challenge civilians. Commercial aircraft and vessels are battling it out over the airwaves with military vessels as tensions continue to mount. Most commonly heard are queries concerning cargo and warnings regarding restricted lanes.

Occasional harrassment, catcalls and obscene transmissions punctuate the maritime and aircraft frequencies, making routine communications difficult at best. *(Clippings sent by Bill Black, Washington, DC; Don Schimmel, Vienna, VA)*

Karl Holt of Delhi, New York, still enjoys listening to the old tube-type sets like his Hallicrafters Sky Champion (bottom left) and S-38D (bottom center). Considerably more recent are his Radio Shack multiband portable and Panasonic RF-B300 (bottom right).



Don't throw away those old books and radios! From time to time we receive donated publications from our readers who no longer wish to keep early radio books and equipment manuals.

Please don't discard them. If you can't find a local recipient and wish to donate them, send them to MT; we'll see that they get a good home!

The same plea extends to early radio equipment, especially prewar receivers. The rapid advance of high-tech electronics has created a groundswell of nostalgia and collectors of old radios abound. Even incomplete or damaged radios have their place among a few dedicated individuals, either for parts to restore other pieces or to be restored themselves.

Conservationists are still opposing the Air Force with the result that **the construction of several military communications towers has been postponed** in Rhode Island, Massachusetts and Maine. Legal action is pending against the government, brought about by Boston-based Conservation Law Foundation.

The proposed sites would be part of a \$1 billion nationwide network of 127 300-foot towers, separated by 200-300 miles and an additional 228 two-way radio stations, comprising the low frequency Ground Wave Emergency Network (GWEN).

Defense Department officials hold that the system is a vital backup to communications which would be disrupted during nuclear attack; opponents disagree, citing invitation of attack to small towns, environmental impact of each 11 acre installation, and prolonged nuclear war. *(Report from Dave Alpert, NY, NY)*

We've all seen satellite weather maps on the evening news, and we've heard about special subscription programming superimposed on SCA-equipped FM broadcast stations, but now in some areas **satellite weather maps are being transmitted by FM broadcast stations.**

Radair, of San Antonio, Texas, is marketing a new receiving system, primarily for airline cockpit use, which shows National Weather Service weather radar images in full color and in real time. The images can be displayed on the aircraft's local radar display or even a portable or pocket TV.

Joystick control allows choice of locale to zoom in on; the display can be "uncluttered", permitting areas of heavy precipitation to be shown. Historical information from previous sweeps is also stored, allowing progressive weather front or storm sequences to be displayed. *(Clipping from Dave Alpert, NY, NY)*

Interested in some serious HF DXing? The Australian Department of Sciences now has a highly refined, low cost **frequency and propagation prediction service.** For only \$20 including postage anywhere in the world, hams and SWLs may subscribe to one year's worth of monthly custom propagation charts, up to 18 circuits between any two points on the globe.

An informative manual accompanies the service, illustrating the principles of radio wave propagation and explaining the symbols used on the charts. For more information or to subscribe to the service, write to IPS Radio and Space Services, PO Box 702, Darlinghurst, NSW 2010. *(Sample sent in by Jeff Bell, Rivervale, Western Australia)*

How many people really listen to shortwave? In our October column we reported an estimate by the Electronic Industries Association (EIA) that roughly one-third of the American population listens to shortwave based on a dazzling 450 million radios.

Worldband radio expert Larry Magne strongly disagrees. His article in the *Wall Street Journal* (October 1, 1987) estimates that a far

more conservative 4% of the American population, some 10 million citizens, share our shortwave hobby.

Magne suggests that the EIA report probably depended upon a highly erroneous guesstimate made some years ago which was based on a Department of Commerce account of the number of "multi-band radios" in the country.

Since the multiband radio category includes scanners, weather radios, TV sound receivers, shortwave receivers, and anything else that isn't a garden variety AM/FM set, the reason for the exaggerated estimate becomes clear.

Police agencies around the country are discovering that **the cellular telephone frequencies are a haven for organized crime.** A recent report in Newsweek magazine quotes KeKalb County (Atlanta), Georgia, police spokesman Gary Williams: "Cellular phones are the worst thing to happen to law enforcement since Miranda."

Dope dealers use cellular phones constantly; as a car passes from one cell (repeater site) to another, the frequency changes making continual surveillance nearly impossible. Law enforcement technologists think that it is only a matter of time--and money--before the good guys have electronic equipment to track the bad guys.

Captain Midnight: Part Two could well be the title of the most recent satellite piracy episode. On Sunday night, September 6, at 9:55 PM EST, Playboy Channel viewers were interrupted while watching the movie "Three Daughters" by the message, "Repent your sins. Keep the Sabbath Holy " (or, "Repent, the end is near"--we have had two different reports of the message).

The legitimate uplink station reports that it was transmitting full power at the time, indicating that the overriding uplink must have used substantial power to accomplish its nefarious task.

The FCC is actively investigating, but are not as optimistic about catching the intruder as they were with the John McDougall (Captain Midnight) caper of April 1986 because they have no tape of the ten-second illicit transmission to analyze. Furthermore, it is suspected that the transmission came from a transportable earth station, making location hard to determine.

For those of us who really enjoy DXing obscure parts of the world, treating ourselves to elusive catches not heard in some years, **happy days are here again.** Scientists have confirmed that we have passed the sunspot minimum and are well up the ascending path to a 1989-1992 maximum for sunspot cycle 22.

The bottom line of all of this is that shortwave monitoring will get better and better over the next several years, with distant signals getting stronger and more reliable. This will also result in amateur and other two-way users of the HF spectrum experiencing longer paths of communications with attendant interference from distant stations.

The FCC has granted a two year extension to Airphone to prove the viability of its air-to-ground commercial telephone service. Sixteen airlines are presently utilizing the experimental system on a total of 500 aircraft. Calls cost \$7.50 for the first three minutes and may be made from a cordless phone at the passenger's seat, soon to be replaced by telephones mounted on the seats' backs.

Frequency ranges assigned to the air-to-ground telephone service are 849-851 MHz (aircraft) and 894-896 (ground), changed from their previous allocation which had a potential for interfering with studio-to-transmitter (STL) broadcast links.

Zimbabwe (formerly Rhodesia) residents are finding out that they must **step lightly to avoid radio and TV interference.** Apparently, shoes made from the hides of certain cattle and elephants from draught areas contain semiconductor junctions of aluminum salts due to the unusual grass diets of the animals. When the wearer walks on carpeting, static electricity produces considerable radio frequency interference!

The phenomenon was reportedly first noticed by a man dancing in his living room to the music heard over an FM station; each time he took a step, he rhythmically interfered with his radio reception!

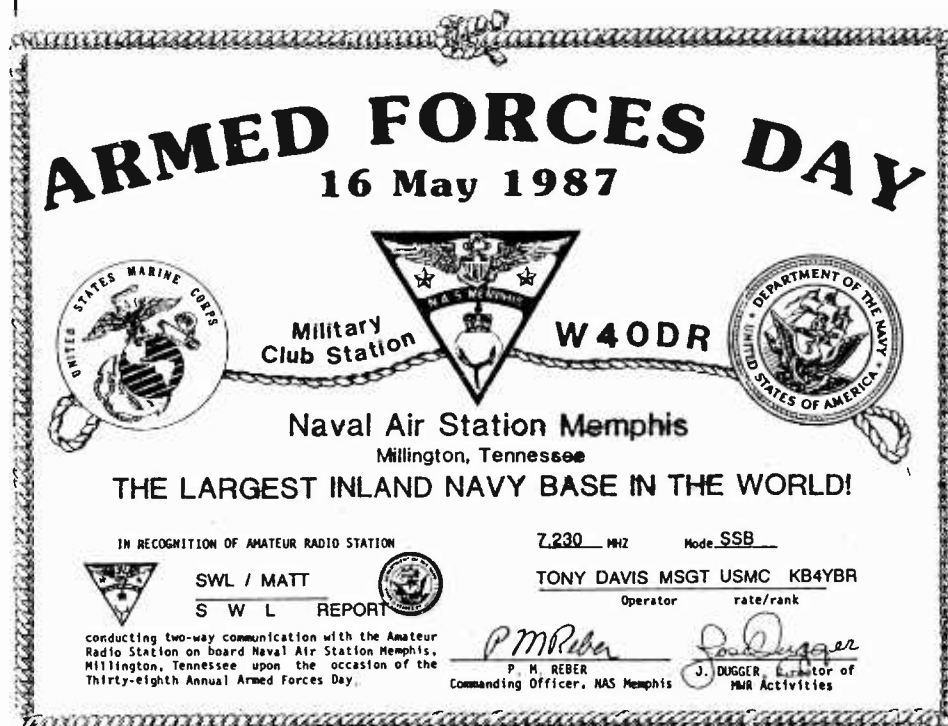
The shoe manufacturers acknowledge the problem and are exchanging the radio-active shoes with more docile pairs.

(Last four items from Fred Maia's W5YL Report)

In an effort to increase their revenues, the state of **California will now collect taxes from mail order sales to its residents.** Designed to cash in on TV home shopping services and major mail order firms, only those companies shipping to California with tax liability exceeding \$50,000 per month will be affected.

The California Assembly Bill AB 229 was introduced January 12, 1987, and signed into law scarcely eight months later on September 8, 1987 after receiving a 65-7 vote in June. The California Board of Equalization estimates that the measure will increase revenues from mail order by \$96 million annually; additional unknown revenues from home TV shopping should be substantial.

Matt Haston of Tennessee sent "Utility Intrigue's" Don Schimmel a copy of the attractive certificate he received for his **participation in Armed Forces Day** last spring. You, too, could have one of these on your wall! Thanks, Matt.



Dayton Public Safety Communications -

A Model for the Nation

by Anthony Cono

"The most advanced radio system in use nationally and perhaps internationally" - This is the way that Dayton, Ohio's, new radio system has been described.

Motorola radio was contracted to install the trunked radio and a computer aided dispatch/management information system (CAD/MIS). On June 28, 1987, the city of Dayton began operations on this new system.

The vehicular radios can be programmed as mobile telephones by programming an access code on the radio keypad. Another option this system has is to rebroadcast non-800 MHz frequencies on their trunked system. Dayton fire dispatch can receive the Ohio mutual aid net on 154.28 MHz and rebroadcast it on the trunked system.

All police, fire and rescue vehicles are equipped with the CAD/MIS terminals, referred to as "KDTs." The police department uses them for dispatching along with voice, on-scene and in-service dispositions, records checks, and car-to-car communications.

The fire department is using theirs for dispatching along with voice, car-to-car communications and unlimited information on handling hazardous materials (HAZMAT).

All KDTs, portable and mobiles have an emergency to be used for officer/firefighter-down calls or any

other in-trouble calls that the officer/firefighter cannot audibly call for help.

At the beginning of each shift all police officers advise dispatch of their crew number, cruiser number and radio number. All fire and rescue radios are assigned to a specific vehicle rather than specific personnel.

When an emergency button is activated the dispatch terminal will lock up and display the crew and radio in distress. The only way to reset the alarm is to turn the radio off for ten seconds.

All police, fire and rescue radios have eight channels and each channel has a choice of five frequencies (expandable to ten). This type of system is difficult but not impossible to monitor: Don't use the "delay" function on your scanner but push the "scan" button to keep up with a specific conversation.

With a trunked system, one frequency is designated as a "control" frequency; it is changed daily between 0001 hours and 0015 hours. You will have to lock out this data channel because its buzz will stop your scan sequence.

With the implementation of this new nine-million-dollar system, Dayton has taken public safety into the twenty-first century and enhanced officer safety.

Frequencies and Dispatch Signals

WCNA303

856/811.2125	857/812.2125	858/813.2125	859/914.2125
860/815.2125	856/811.2375	857/812.2375	859/814.2375
860/815.2375			

Dayton is currently using the ".2125" frequencies; the ".2375" frequencies are reserved for future expansion.

Police Radio Channel Allocations:

- 1-A West dispatch districts 3+5
- 2-B Records
- 3-C East dispatch districts 1+2
- 4-D Citywide car to car
- 5-E Detectives
- 6-F Detectives
- 7-G Special events
- 8-H Tactical/Administration

400 Call given number
Code A Channel closed for emergency traffic

Tone Emergency run
E crew Evidence technicians
GTA Grand theft auto
PI Personal injury accident
PD Property damage accident
ABV Abandoned vehicle
OR Owners request for tow truck
DIF Death in family

Fire Radio Channel Allocations:

- 1-A Dispatch
- 2-B Subfleet Bravo
- 3-C Subfleet Charlie
- 4-D Subfleet Delta
- 5-E Subfleet Echo
- 6-F EMS
- 7-G EMS to Fire
- 8-H Mutual Aid

Unit Numbers:

- 001 Administration
- 100 1st district cars NE
- 200 2nd district cars SE
- 300 3rd district cars SW
- 400 Detectives
- 500 5th district cars NW
- 600 Traffic light repair crews
- 620 Detectives
- 700 Detectives
- 800 CBD cars
- 900 Detectives
- F Festival squad
- P Parking control squad
- S Tactical response team
- T Motorcycle squad
- W Walking squad
- X Traffic service and accident investigation cars
- HNT Hostage negotiations team
- BDU Bomb disposal unit

Note: Subfleet channels are primarily used as fire ground

Signals and Codes:

- 11 Lunch
- 12 Not available for dispatch
- 20 No problem, officer is OK
- 99 Officer in trouble
- 200 In service/On duty
- 201 In service, no report
- 202 In service, report made
- 203 In service, unfounded
- 204 In service, unable to locate
- 300 Out of service/Off duty
- 301 On the scene



West Coast Monitoring

CALIFORNIA

*contributed by
Andrew Munoz, Sr.
Modesto, Cal.*

San Joaquin County
155.4 Ambulance to hosp F-1
155.34 Ambulance to hosp F-2
463.0 Paramedics
453.65 Ch. #1 Net A
453.375 Ch. #2 Net B
463.325 Ch. #3 Net C;Co. Jail
155.025 Stockton
154.07 Ch #1 coordination
154.13 Ch #2 dispatch
154.755 Sheriff Ch#1 (in:155.61)
155.79 Sheriff Ch#2 information
460.125 Sheriff Tac 1
460.35 Sheriff Tac 2

Escalon
155.925
154.13 F-1
159.15 F-1

Lodi
155.28 Community Hospital
155.205 Ambulance Co.
155.265 Unified School District
154.04 Public Works
154.01 Fire
154.785 Police

Manteca
47.78 Ch#1 Irrigation District
48.44 Ch#2 Irrigation District
155.025 Public Works
453.65 Public Works
155.295 School district buses
155.54 School district mainten-
ance
152.45 Taxi
155.985 Telephone Continental
Co.
150.845 Tow Service Vern's
153.95 Ch#1
154.75 Ch#1
158.835 Ch#2

Ripon
155.925
155.37 F-1

Stockton
41.8 Air National Guard
120.3 Airport tower
155.16 Ambulance Delta
452.575 Calif State Auto Assoc
47.9 Calif Water Comp
39.02 Calif Youth Authority
47.1 Cal/Trans
455.65 News TV Ch 13
160.26 Attchison-Topeka-Santa
Fe F-3
160.65 Attchison-Topeka-Santa
Fe Yard
161.55 Southern Pacific
160.38 Union Pacific
453.925 Security Day-night
152.39 Yellow Cab
451.35 Telephone Maintenance
162.0 Telephone marine opera-
tor

464.65 Telephone mobile
operator
464.625 Tow Service Jack's
151.745 Univrsity of Pacific
173.375 News (TV)
48.1 Water Control
453.7 Government
153.92 Public Works
464.625 School district
453.225 Transit District-Metro-
460.525 Ch#1
460.575 Ch#2
453.15 Ch#3
460.4 Ch#1
460.25 Ch#2 Traffic
46.025 Old
46.54 Old

Port of Stockton
154.83 Police
158.745

Tracy
47.84 Irrigation District
155.895 Public Works
154.31 F-1
155.37 Ch #1

LAS VEGAS, NEVADA

*Contributed by
Todd Shideler*

As of July '86, the Las Vegas Police changed their frequencies, which also cover Clark County.

Ch	Freq	Use
1	159.150	Wants/warrants/ detectives nights
2	159.090	South Patrol
3	158.970	Car-car/Stakeouts
4	158.745	NE/Downtown patrol
5	159.210	Supervisors/Tactical
6	159.030	West patrol
7	158.790	Rural units (Laughlin, etc)/Detective days
8	156.210	Car-car/Detectives/ Special events
9	154.890	Special events
10	154.830	SWAT/Narcotics/Vice
12	155.910	Narcotics/Internal Affairs (simplex)
	453.925	DA Office
	153.800	County jail (simplex)
	158.925	Marshalls/court security

Notes:
Ch.5 can be scrambled DVP
Ch.8 called Ch.12 by patrol
Ch.10 called "B" channel by SWAT
and is called Ch.9 by Vice
Ch.7 used by units outside city
including Indian Springs, Mt.
Charleston, Jean, Mohave, Laughlin,
etc.

MISCELLANEOUS

*Contributed by
Michael Leary
Seattle, Washington*

6.680 Honolulu weather
6.754 Edmonton military
6.507 USCG Guam weather
13.115 USCG Guam weather
0°N-50°N, 110°E-180°E
15.032 McClellan weather
13.272 New York Radio Av
weather
14.489 MARS phone patch
12.629 Numbers, Spanish
8.766 Honolulu Sea weather
6.579 New York ATC
11.273 Edmonton military

11.240 McClellan weather
6.650 Panama ATC?
6.226 Numbers in Spanish AM
on top of Spanish
numbers in USB
11.183 Scott working MAC
70019
13.283 Honolulu weather
13.307 ? ATC
8.893 Cambridge Bay to 414
?ATL
13.284 Honolulu weather
8.779 Scrambled USN
6.706 Trenton/Edmonton
military
11.118 Calmlake to Phosphate
11.283 Dispatch to United 803;
descend to warm up fuel
14.776 Phospate with phone-
patch

"YOUR EYES TO THE WORLD" M-800 FACSIMILE UNIT



At last an affordable facsimile system that opens the exciting world of shortwave and satellite facsimile reception!

- Worldwide press and wire photos.
- Prints all speeds and IOC's, AM/FM in black and white or 16 gray shades.
- Weather maps and charts.
- Uses inexpensive Epson™-type dot matrix printers.
- All marine weather services.
- Military & government FAX
- Prints on inexpensive plain paper.



FREE

**"HOW TO RECEIVE FACSIMILE (FAX)
ON YOUR SHORTWAVE RADIO"**

Send SASE now for your free copy!

M-800 Facsimile Converter
Introductory price \$499 (+ S&H)

Printer not included.

UNIVERSAL SHORTWAVE RADIO
1280 Aida Drive
Reynoldsburg, Ohio 43068
Toll Free: 1 800 431-3939

Canadian Coast Guard Frequencies

In the July column we took a look at the internal workings of Canadian Coast Guard Radio Stations. As a form of follow up, this month's column offers a listing of the Coast Guard stations in the Province of Quebec on VHF. The stations can also be found on MF and low frequency telegraphy. Remember that the callsign used is that for the main station rather than that for the transmitter being used, therefore callsign VCF is used rather than VES for the Grosses-Roches transmitter for Mont Joli Coast Guard Radio.

As you can see from the list below the areas served by a small number of stations has been vastly increased through the use of the remote transmitter sites. With the decline in shipping in the past five years, many manned stations have been converted over to remote control.

As always your comments are welcome to the address at top. Until next time, good listening. ■

156.300	VBJ	Quebec CG Radio	Riviere du Loup, P.Q.
156.300	VBQ 30	Quebec CG Radio	Cap-Est, P.Q.
156.300	VCF	Mont Joli CG Radio	Mont Joli, P.Q.
156.300	VES	Mont Joli CG Radio	Grosses-Roches, P.Q.
156.300	VEU	Sept Iles CG Radio	Mont-Louis, P.Q.
156.300	VFN	Montreal CG Radio	Mont St. Bruno, P.Q.
156.300	XLI 423	Ste-Anne de Bellevue CG	Ste-Anne de Bellevue, P.Q.
156.300	XML 382	Valleyfield CG Station	Valleyfield, P.Q.
156.300	XML 383	Pointe Claire CG Station	Pointe Claire, P.Q.
156.300	XML 384	Pointe aux Trembles CG	Pointe aux Trembles, P.Q.
156.300	XML 385	Ste-Anne CG Station	Ste-Anne, P.Q.
156.300	XML 386	Chambly CG Station	Chambly, P.Q.
156.450	VBQ 30	Quebec CG Radio	Cap-Est, P.Q.
156.450	VFN	Montreal CG Radio	Mont SS-Bruno, P.Q.
156.450	XLI 423	Ste-Anne de Bellevue CG	Ste-Anne de Bellevue, P.Q.
156.450	XML 382	Valleyfield CG	Valleyfield, P.Q.
156.450	XML 383	Pointe Claire CG Station	Pointe Claire, P.Q.
156.450	XML 384	Pointe aux Trembles CG	Pointe aux Trembles, P.Q.
156.450	XML 385	Ste-Anne CG Station	Ste-Anne, P.Q.
156.450	XML 386	Chambly CG Station	Chambly, P.Q.
156.450	XML 387	Ile au Noix CG	St-Paul, Ile au Noix, P.Q.
156.500	XLI 423	Ste-Anne de Bellevue CG	Ste-Anne de Bellevue, P.Q.
156.550	VBJ	Quebec CG Radio	Riviere du Loup, P.Q.
156.550	VCC	Quebec CG Radio	Lauzon, P.Q.
156.550	XML 382	Valleyfield CG	Valleyfield, P.Q.
156.550	XML 382	Pointe Claire CG	Pointe Claire, P.Q.
156.550	XML 384	Pointe aux Trembles CG	Pointe aux Trembles, P.Q.
156.550	XML 385	Ste-Anne CG	Ste-Anne, P.Q.
156.550	XML 386	Chambly CG	Chambly, P.Q.
156.550	XML 387	Ile au Noix CG	St-Paul, Ile au Noix, P.Q.
156.600	VCK	Sept Iles CG Radio	Sent Iles, P.Q.
156.650	XLI 423	Ste-Anne de Bellevue CG	Ste-Anne de Bellevue, P.Q.
156.650	XML 382	Valleyfield CG	Valleyfield, P.Q.
156.650	XML 383	Pointe Claire CG	Pointe Claire, P.Q.
156.650	XML 384	Pointe aux Trembles CG	Pointe Claire, P.Q.
156.650	XML 385	Ste-Anne CG	Ste-Anne, P.Q.
156.650	XML 386	Chambly Coast Station	Chambly, P.Q.
156.650	XML 387	Ile au Noix CG	St-Paul, Ile au Noix, P.Q.
156.700	VBJ	Quebec CG Radio	Riviere du Loup, P.Q.
156.700	VCF	Mont Joli CG Radio	Mont Joli, P.Q.
156.700	VES	Mont Joli CG Radio	Grosses-Roches, P.Q.
156.700	VEU	Sept Iles CG Radio	Mont-Louis, P.Q.
156.700	XLI 423	Ste-Anne de Bellevue CG	Ste-Anne de Bellevue, P.Q.
156.700	XML 382	Valleyfield CG	Valleyfield, P.Q.
156.700	XML 383	Pointe Claire CG	Pointe Claire, P.Q.
156.700	XML 384	Pointe aux Trembles CG	Pointe aux Trembles, P.Q.
156.700	XML 385	Ste-Anne CG	Ste-Anne, P.Q.
156.700	XML 386	Chambly CG	Chambly, P.Q.
156.800	VBJ	Quebec CG Radio	Trois Rivieres, P.Q.
156.800	VBQ 22	Sept Iles CG Radio	Natashquan, P.Q.
156.800	VBQ 30	Quebec CG Radio	Cap-Est, P.Q.
156.800	VBS	Riviere au Renard CG Rad	Newport, P.Q.
156.800	VCC	Quebec CG Radio	Lauzon, P.Q.
156.800	VCC	Quebec CG Radio	Montmagny, P.Q.
156.800	VCC	Quebec CG Radio	Mont Belair, P.Q.
156.800	VCF	Mont Joli CG Radio	Mont Joli, P.Q.
156.800	VCG	Riviere au Renard CG Rad	Riviere au Renard, P.Q.
156.800	VCJ 3	Quebec CG Radio	Sacre-Coeur, P.Q.
156.800	VCJ 4	Quebec CG Radio	Cap-Est, P.Q.
156.800	VCK	Sept Iles CG Radio	Sept Iles, P.Q.
156.800	VCN	Grindstone CG Radio	Cap aux Meules, P.Q.
156.800	VES	Mont Joli CG Radio	Grosses-Roches, P.Q.

156.800	VEU	Sept Iles CG Radio	Mont-Louis, P.Q.
156.800	VFN	Montreal CG Radio	Mont St-Bruno, P.Q.
156.800	VFN	Montreal CG Radio	Montreal, P.Q.
156.800	VFN	Montreal CG Radio	Rigaud, P.Q.
156.800	XLI 423	Ste-Anne de Bellevue CG	Ste-Anne de Bellevue, P.Q.
156.800	XML 382	Valleyfield CG	Valleyfield, P.Q.
156.800	XML 383	Pointe Claire CG	Pointe Claire, P.Q.
156.800	XML 384	Pointe aux Trembles CG	Pointe aux Trembles, P.Q.
156.800	XML 385	Ste-Anne CG	Ste-Anne, P.Q.
156.800	XML 386	Chambly CG	Chambly, P.Q.
156.800	XML 387	Ile au Noix CG	St-Paul, Ile au Noix, P.Q.
156.950	VBJ	Quebec CG Radio	Riviere du Loup, P.Q.
156.950	VBQ 22	Sept Iles CG Radio	Natashquan, P.Q.
156.950	VBQ 30	Quebec CG Radio	Cap-Est, P.Q.
156.950	VBS	Riviere au Renard CG Rad	Newport, P.Q.
156.950	VCC	Quebec CG Radio	Mont Belair, P.Q.
156.950	VCF	Mont Joli CG Radio	Mont Joli, P.Q.
156.950	VES	Mont Joli CG Radio	Grosses-Roches, P.Q.
156.950	VEU	Sept Iles CG Radio	Mont-Louis, P.Q.
156.950	VFN	Montreal CG Radio	Montreal, P.Q.
156.950	VFN	Montreal CG Radio	Rigaud, P.Q.
156.950	XLI 423	Ste-Anne de Bellevue CG	Ste-Anne de Bellevue, P.Q.
156.950	XML 382	Valleyfield CG	Valleyfield, P.Q.
156.950	XML 383	Pointe Claire CG	Pointe Claire, P.Q.
156.950	XML 384	Pointe aux Trembles CG	Pointe aux Trembles, P.Q.
156.950	XML 385	Ste-Anne CG	Ste-Anne, P.Q.
156.950	XML 386	Chambly CG	Chambly, P.Q.
156.950	XML 387	Ile au Noix CG	St-Paul, Ile au Noix, P.Q.
157.100	VBJ	Quebec CG Radio	Riviere du Loup, P.Q.
161.650	VCG	Quebec CG Radio	Lauzon, P.Q.
161.650	VCG	Riviere au Renard CG Rad	Riviere au Renard, P.Q.
161.650	VCK	Sept Iles CG Radio	Sept Iles, P.Q.
161.650	VCN	Grindstone CG Radio	Cap aux Meules, P.Q.
161.650	VES	Mont Joli CG Radio	Grosses-Roches, P.Q.
161.650	VFN	Montreal CG Radio	Montreal, P.Q.
161.650	VFN	Montreal CG Radio	Mont St-Bruno, P.Q.
161.775	VBK	Montreal CG Radio	Trois Rivieres, P.Q.
161.775	VBQ 22	Sept Iles CG Radio	Natashquan, P.Q.
161.775	VBS	Riviere au Renard CG Rad	Newport, P.Q.
161.775	VCC	Quebec CG Radio	Montmagny, P.Q.
161.775	VCF	Mont Joli CG Radio	Mont Joli, P.Q.
161.775	VCJ 3	Quebec CG Radio	Sacre-Coeur, P.Q.
161.775	VEU	Sept Iles CG Radio	Mont-Louis, P.Q.
161.775	VFN	Montreal CG Radio	Rigaud, P.Q.
161.800	VBK	Montreal CG Radio	Trois Rivieres, P.Q.
161.800	VBQ 22	Sept Iles CG Radio	Natashquan, P.Q.
161.800	VBS	Riviere au Renard CG Rad	Newport, P.Q.
161.800	VCC	Quebec CG Radio	Lauzon, P.Q.
161.800	VCC	Quebec CG Radio	Quebec, P.Q.
161.800	VCF	Mont Joli CG Radio	Mont Joli, P.Q.
161.800	VCG	Riviere au Renard CG Rad	Riviere au Renard, P.Q.
161.800	VCJ 4	Quebec CG Radio	Cap-Est, P.Q.
161.800	VCK	Sept Iles CG Radio	Sept Iles, P.Q.
161.800	VES	Mont Joli CG Radio	Grosses-Roches, P.Q.
161.800	VEU	Sept Iles CG Radio	Mont-Louis, P.Q.
161.800	VFN	Montreal CG Radio	Rigaud, P.Q.
161.800	VFN	Montreal CG Radio	Rigaud, P.Q.
161.800	VFN	Montreal CG Radio	Rigaud, P.Q.
161.850	VFN	Montreal CG Radio	Rigaud, P.Q.
161.875	VFN	Montreal CG Radio	Rigaud, P.Q.
161.900	VBK	Montreal CG Radio	Trois Rivieres, P.Q.
161.900	VBQ 22	Sept Iles CG Radio	Natashquan, P.Q.
161.900	VBS	Riviere au Renard CG Rad	Newport, P.Q.
161.900	VCC	Quebec CG Radio	Lauzon, P.Q.
161.900	VCC	Quebec CG Radio	Montmagny, P.Q.
161.900	VCF	Mont Joli CG Radio	Mont Joli, P.Q.
161.900	VCG	Riviere au Renard CG Rad	Riviere au Renard, P.Q.
161.900	VCJ 3	Quebec CG Radio	Sacre-Coeur, P.Q.
161.900	VCK	Sept Iles CG Radio	Sept Iles, P.Q.
161.900	VCK 2	Sept Iles CG Radio	Mingan, P.Q.
161.900	VCN	Grindstone CG Radio	Cap aux Meules, P.Q.
161.900	VES	Mont Joli CG Radio	Grosses-Roches, P.Q.
161.900	VEU	Sept Iles CG Radio	Mont-Louis, P.Q.
161.900	VFN	Montreal CG Radio	Montreal, P.Q.
161.900	VFN	Montreal CG Radio	Rigaud, P.Q.
161.900	VFN	Montreal CG Radio	Mont St-Bruno, P.Q.
161.900	VFN	Montreal CG Radio	Montreal, P.Q.
161.900	VFN	Montreal CG Radio	Rigaud, P.Q.
161.950	VBS	Riviere au Renard CG Rad	Newport, P.Q.
161.950	VCC	Quebec CG Radio	Montmagny, P.Q.
161.950	VEU	Sept Iles CG Radio	Mont-Louis, P.Q.
162.025	VCC	Quebec CG Radio	Lauzon, P.Q.
162.025	VFN	Montreal CG Radio	Montreal, P.Q.
162.025	VFN	Montreal CG Radio	Mont St-Bruno, P.Q.

The International Q-Code

To expedite traffic handling via Morse code, network operators have devised a system of "Q codes" which have specific meanings. The

following abbreviated list will provide the listener with insight as to the meaning of signals copied during CW net operations.

QNA Answer in prearranged order.	QRN Are you troubled by static? (1)No (5)Extreme.
QNB All net stations copy.	QRO Shall I increase transmitter power?
QND Net is directed.	QRP Shall I decrease transmitter power?
QNE Entire net stand by.	QRQ Shall I send faster?
QNF Net is not controlled.	QRR Are you ready for automatic operation?
QNG Take over as net control station.	QRRR EMERGENCY (Amateur only)
QNH Your net frequency is high.	QRS Shall I send more slowly?
QNI Net stations report in.	QRT Shall I stop sending?
QNJ Can you copy?	QRU Have you anything for me?
QNK Transmit messages.	QRV Are you ready?
QNL Your net frequency is low.	QRW Shall I inform...that you are calling him?
QNM You are interfering; stand by.	QRX When will you call me again?
QNN Net control station is...	QRY When is my turn?
QNO Station is leaving the net.	QRZ Who is calling me?
QNP Unable to copy.	QSA What is my signal strength?
QNQ Move frequency to finish traffic.	QSB Are my signals fading?
QNS Following stations are in the net:...	QSK Can you hear me if I break in on your transmission?
QNT Request permission to leave the net.	QSL Can you acknowledge receipt?
QNU The net has traffic for you.	QSM Shall I repeat the last telegram?
QNV Establish contact on this frequency.	QSN Did you hear me?
QNW How do I route messages?	QSO Can you communicate with...?
QNX You are excused from the net.	QSP Will you relay?
QNY Shift to another frequency to clear traffic.	QSR Shall I repeat the call?
QNZ Zero beat your signal with mine.	QSS What frequency will you use?
QRA What is the name of your station?	QSU Shall I send on this frequency?
QRE What is your estimated time of arrival?	QSV Shall I send a series of Vs for adjustment?
QRG Will you tell me the exact frequency?	QSW Will you send on this frequency?
QRH Does my frequency vary?	QSX Will you listen?
QRI How is the tone of my transmission? (1)Good, (3)Bad	QSY Shall I change frequency?
QRK What is the intelligibility of my signals? (1)Bad, (5)Excellent.	QSZ Shall I send each word or group more than once?
QRL Are you busy?	QTA Shall I cancel telegram number...?
QRM Is my transmission being interfered with? (1)No, (5)Extreme.	QTB Do you agree with my counting of words?
	QST General call to all amateurs.

NEW! **ADVANCED** tm
SEEKER



SEEKER™ The complete system which makes your Commodore computer and ICOM R-71 a sophisticated monitoring station. EASY to use . . . UNEQUALED in performance.

A FEW OF SEEKER'S FEATURES

<p>NEW "VCR-like" multiple program recording. You choose day, time, and frequencies.</p> <p>STORES, DESCRIBES, PRINTS, AND SCANS hundreds of frequencies.</p> <p>SELECTS the strongest signal when you store alternate frequencies.</p>	<p>INSTANTLY DISPLAYS broadcaster time and frequency schedules.</p> <p>UNATTENDED recorder control in six scanning modes.</p> <p>ADVANCED FEATURES explained in our FREE literature!</p>
--	---

AF SYSTEMS
Post Office Box 9145-E
Waukegan, Illinois 60079-9145
United States of America

Send for FREE literature or include \$15 (refunded on purchase) for demo disk and Owner's Manual, to . . .

CW Prosigns

While Q signals expedite handling on CW networks, certain dot-dash groupings called prosigns are handy for signalling information quickly to

operators. A bar over the letters indicates that there is no space between the letters; they are sent as a single dot-dash group.

<u>AA</u> Unknown Station	CL Closing Station
<u>AA</u> All After	COL Collate
<u>AB</u> All Before	CQ General Call to All Stations
<u>AR</u> End of transmission	CS Callsigns
<u>AS</u> Short Wait	DE From
<u>AR</u> Long Wait	E East
B More to Follow	EEEE Error
BK Break	ETA Estimated Time of Arrival
BN Between	F Do Not Answer
<u>BT</u> Long Break	FM From
C Correct; Yes	G Repeat Back
CFM Confirm	

GA Go Ahead	R Received
GR Group Count	<u>REF</u> Reference
II Separative Sign	<u>RPT</u> Repeat
J Verify with Originator and Repeat	<u>RQ</u> Request
<u>K</u> Invitation to Transmit	S South
<u>KA</u> Starting Signal	<u>SIG</u> Signature
M Deferred	<u>SK</u> End
MSG Message	<u>SLT</u> Radiomarine Letter
N Negative; No	<u>STC</u> Service Telegram
N North	<u>T</u> Station Called: Transmit to all Addressees
<u>NIL</u> I have nothing to send	<u>TD</u> Action Address
<u>NR</u> Number	<u>TU</u> Thank You
<u>NW</u> Now	<u>TXT</u> Text
<u>NX</u> Notice to Mariners	W West
O Operational Immediate	<u>WA</u> Word After
OL Ocean Letter	<u>WB</u> Word Before
P Private radiotelegram	<u>EX</u> Weather Report
P Priority	Y Emergency
PBL Preamble	Z Flash
PSE Please	

Black Friday

Black Friday. The name sounds ominous, like an day commemorating a terrorist attack or a mudslide that wipes out a village of 10,000 people. But it isn't. Ironically, "Black Friday" is the name merchants give to the start of the Christmas holiday season -- the day after Thanksgiving -- and all it means is that their stores begin to show a profit and operate in the "black" on this day.

For the scanner buff, Black Friday is a special day, too. As if triggered by some deeply hidden biological buzzer, all of America seems to go collectively crazy. There are traffic jams, accidents, robberies, shoplifting and violent arguments over parking spots. Want to join in the fun, but avoid the crowds? Then use your scanner to do a little "frequency shopping." Our first stop: department stores. Best of all, you don't have to live next to a shopping complex to catch all the action.

Scanning Security

Sure, all of the big department stores like Sears, J.C. Penny's and Montgomery Ward all have their own security forces. But what most people don't know is that *all* department stores, regardless of size, are required by their insurance companies to have security personnel. Dressed in uniform or plain clothes, these private guards walk the floors looking for shoplifters and other undesirables.

Vern Davis, manager for J.C. in the Northeastern U.S., explains that security is used primarily as a deterrent to store theft. "We can't totally stop the shoplifting or vehicle theft," he says, "but we can try to make stealing less attractive and hope the thieves will move to an easier target."

According to Davis, making a store less desirable to thieves is a costly project. Maintaining a complete complement of TV monitors, personnel, vehicles and communications gear can cost a store over one hundred thousand dollars a year.

Nonetheless, when Black Friday rolls around this year, those costly anti-theft systems will be challenged. Tune in the action with your scanner and discover



Large malls will often use "high tech" security devices to not only monitor the inside of the complex, but the outside area as well.

where your local thieves prefer to do their holiday shopping.

Monitoring the Mini-City

Another stop on our holiday scanner tour allows us to monitor over 150 stores, all at one time. The place: shopping malls. Covering an area of approximately 4 acres, providing parking for over 10,000 cars and handling more than 20,000 shoppers per day, your local mall is actually a city within a city.

One mall supervisor who asked not to be identified agrees. "We have gardens, water falls, grocery stores, pharmacies, spas, restaurants, doctors, dentists, travel agents and even theatres." So when fire starts, or a fight breaks out, it will impact on the entire mall, very quickly.

"Starting on Black Friday and continuing through the holidays," he added, "People pack themselves in here shoulder to shoulder. God help us if an emergency arises and the shoppers start to panic. Heck, even Disney World will close the gates when attendance gets too high. But malls just keep packing them in."

Private Security Guards

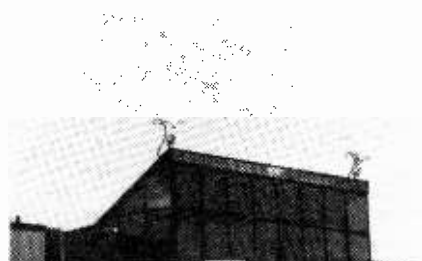
Malls do have private security guards that are hired from a security agency. The agency name is usually on the shoulder patch of the uniform. Once the name of the agency is known, a quick look through a local scanner directory will probably provide an operating frequency.

Uniforms without shoulder patches may indicate that the guards are employed directly by the mall. It is also interesting to note that many of the stores operating within a mall will retain their own private security guards. These frequencies will differ from mall security frequencies. Again, consult your local scanner publications or contact a local scanner club for frequency usage in your area.

Tricks of the Trade

Another way to obtain frequencies is to take your hand held scanner and a

The first hour after a mall closes, security teams will do a walk-through. Some of the hottest radio action may occur at this time.



frequency counter to the mall. Find a cozy seat, plug a set of head phones into your portable and start searching. One of my favorite tricks, as described by Dave Beauvais (Aug MT), is to stand next to a security guard while he is talking on a hand-held. It is an easy and proven way to find those hidden frequencies.

Many of the larger malls also have a security base with a control operator. Internal security uses hand held units and often identify by first name. Mobile units operate in parking areas and usually report as "mobile 1," "mobile 2," and so forth.

Noting the type of antenna that is on the patrol vehicle may provide a clue as to what area of the VHF-UHF spectrum is being utilized. Here is a simple rule to remember. The longer the antenna, the lower the frequency. The smaller the antenna, the higher the frequency. Patrol cars on 500 MHz have short antennas. Vehicles on the low band have a tall antenna. Get the idea?

As with any rule of thumb, there are exceptions. Base or center loaded antennas utilize "coils" that compensate for antenna height. Some manufacturers are actually disguising their antennas, making visual band detection nearly impossible. Here are some additional antenna specifications that may help:

VHF Low
30-50MHz - 60" to 100" antenna or 35" w/5" coil on bottom.

VHF High
150-174MHz - 18" antenna or 40" w/3" coil on bottom

UHF
450-512MHz - 6" antenna or 32" w/3" coil on bottom.

800 MHz
Cellular - 3" antenna or 18" w/coil in center.

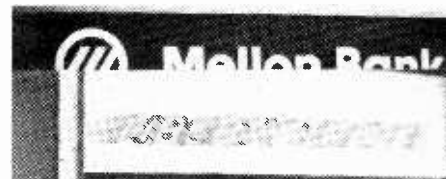
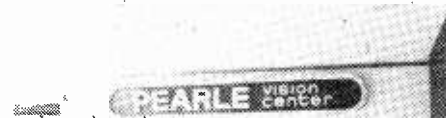
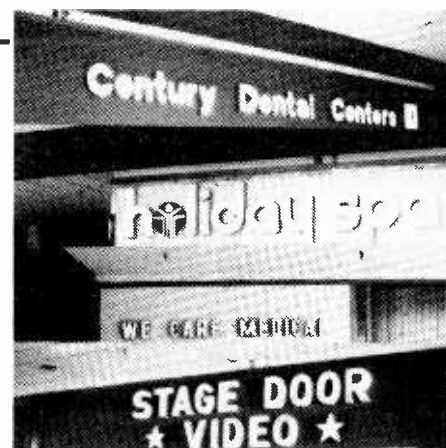
Lastly, if you're still without specific frequencies to monitor, search the following ranges:

151.00 - 152.00	462.00 - 463.00
154.00 - 155.00	463.00 - 464.00
157.00 - 158.00	464.00 - 465.00
461.00 - 462.00	

Monitor the Action: Don't Become a Part of It

Remember, too, that if you do decide to take your valuable scanner equipment to the mall during the holidays, don't forget your common sense. Remember, not only are the shoppers out in full force, but so are the thieves. Put your hand held down for a second and it might be the last time you'll ever see it. The idea is to monitor the action, not become a part of it.

Malls will hold daily special events during the holiday season. These



A city in miniature, where a city's problems may be concentrated under one roof!

shows draw large crowds and place an additional burden on security. If your mall is featuring live bands, chorus groups or talent celebrities, check the security frequencies for increased activity.

If mall security decides to take an interest in your actions, maintain a professional attitude. Keep in mind that many of the security guards are moonlighting police officers. If questioned, be honest and to the point. Security will usually write you off as some sort of "radio nut."

Monitor the police district that surrounds your mall. Special details may be assigned to deter pickpockets and shoplifters. Traffic police will also be increased and portable operations will be at their peak.

When the department stores and malls close down for the evening, don't close down your listening post. In fact, some of the best action may occur within the first hour after closing.

After the doors are locked, security will do a walk through. Each member of the security team is assigned a specific area to search. Radio traffic will remain constant, as the teams look for hidden robbers. Some stores and malls use specially trained police dogs for the same purpose. The dogs may even be allowed to roam the complex through the night. The following morning, about an hour before opening, the animals are removed by a special handler.

The malls of tomorrow will be larger and may even offer apartment rentals. As more people start to take residence in malls, actual miniature cities will develop. While living in one on Black Friday may not appeal to everyone, scanning the action will certainly be exciting. But hurry, the increased radio traffic won't last forever. When Black Friday arrives, there will only be 27 scanning days before Christmas! ■

DXing the Pacific Firestorm

Recent fires in the Pacific Northwest region of the United States have destroyed thousands of acres. It is land that will be barren for years. The process, however, is totally natural. Most of the fires were started by Mother Nature herself: lightning. A few more fires were, of course, caused by arson or carelessly flicked cigarette, but regardless of the cause, the blazes were fought and eventually controlled.

The people who accomplished this herculean task? The USDA. Yes, the United States Department of Agriculture. The USDA has many responsibilities and one of them is protecting our national forests and lands from fire.

I was in northern California during September and I was able to monitor the fire fighting operations directly and examine the equipment used in aircraft operations. The data is presented by a numeric frequency order as utilization of many frequencies were not unique to a given forest or fire operation area. As a basis for my frequency search list I utilized the *Government Radio Systems* frequency directory from Mobile Radio Resources of San Jose, California.

Of all the frequencies listed, the Forest Net (FN) channels contained the most radio traffic. It was here that logistics and coordination were based for most, if not all operations concerned with the fire fighting operations. The forest nets often dispatched the initial units to possible fires or newly confirmed fires. Logistics ranging from fire crew rotations to meals for the crew to the evacuation of injured personnel were monitored. All the FN channels could also be operated in a simplex mode referred to as CH 1. The Fire Camp Service Nets were utilized to coordinate maintenance of fire fighting equipment and other related activities.

The dispatching of aircraft such as air tankers -- both chemical and water -- and helicopters) were monitored on either the USDA North Zone Dispatch channel or on 168.625 USDA aircraft channel (also 415.550 UHF link). Once an air unit was dispatched it could be found operating on most any frequency utilized at a given site.

170.000 was a common air-to-ground frequency. Air tankers also conducted communications in the VHF aircraft band on several frequencies; they were heard on 122.925 working fire zones as well as communicating with their bases. The aircraft-to-aircraft frequency of 122.975 provided some interesting observations between pilots.

The UHF frequencies in general repeated the Forest Net channel at each given location and also administration net traffic was heard. The UHF frequencies are fixed links between the various USDA stations (ranger offices and headquarter buildings), but more often than not the links were received when the receiver was dead silent on the respective VHF channel. The links are directional in nature using fixed direction yagi antennas; however, the high mountain antenna locations provided somewhat omni-directional coverage.

The UHF link frequencies listed are the link from the repeater location to the USDA stations. The station to repeater link frequency is exactly four megahertz lower than the listed frequency. Each national forest location used several different UHF link frequencies, with most being between 415.225 and 415.575.

No traffic was monitored on frequencies listed as Boise Cache for either USDA or BLM (Bureau of Land Management, U.S. Department of the Interior) operations.

Beale Air Force Base

Beale AFB is the U.S. Base for SR-71 and U-2 strategic reconnaissance aircraft. It is located near Marysville, California, approximately forty miles northeast of Sacramento.

The 9th SRW (Strategic Reconnaissance Wing) located at Beale provided invaluable assistance to the forest fighting efforts in the state of California with one A U-2R plying a six hour training mission on September 3.

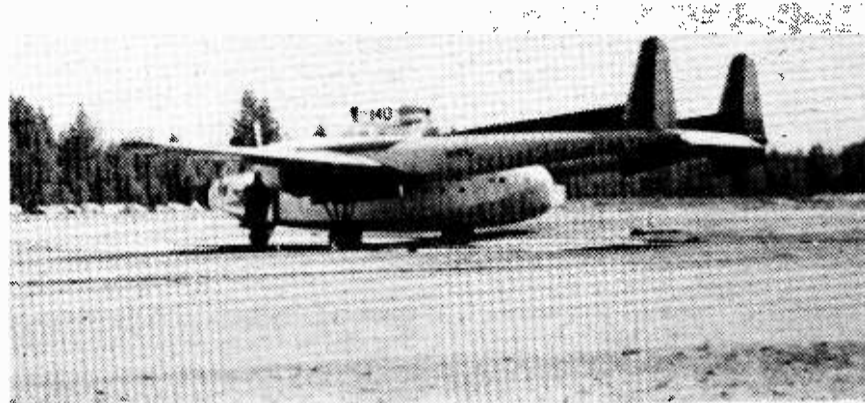
The U-2R surveyed more than 64,000 square miles concentrating on remote forest areas and current fire

zones. The survey produced more than 6,500 feet of exposed film from the mission. The final result was that three previously undetected fires in northern California were found and fire fighting field units were dispatched - all within twenty-four hours of CDFs request for assistance from Beale AFB.

The flight operations can be monitored on SAC command post (CP) frequency of 311.000 (channel 9 nationwide for SAC units) and on the SAC alternate CP frequency of

321.000 (channel 11 nationwide for SAC units).

The next Federal File column will complete the look at Beale AFB and the 9th SRW operations and present the radio operations of the U.S. Postal Service. A correction to Federal File column in last issue - the twenty channels listed for UHF AC operations were for Loring AFB (Limestone, Maine). Last, but certainly not least, thank you to all the contributors of data to this column. ■



USDA air-tanker based at Chester, CA (aircraft based on a C-113); ID "Air-Tac 140"

FIRE FIGHTING FREQUENCIES

122.850	NW	AIR-TAC 2, AC-AC
122.900	NW	AIR-TAC 3, AC to base fields
122.925	NW	AIR tanker base, operations
122.975	RW	AC operations, AC-AC
123.050	NW	Heliport Control
166.5875R	RW	USDA North Zone Fire Dispatch; WX Reports
168.100R	NW	USDA Command Ch 2 Fire Fighting Operations
168.175R	THNF	Fire Net CH 4
168.200	TNF	USDA TAC 2, On scene working fire
168.625	RW	USDA Air Operations
168.700R	NW	USDA Command CH 1 Fire Fighting; Maintenance
168.775R	THNF	Forest Net CH 2
169.175R	TNF	Forest Net CH 2
170.000	RW	Air-to-Ground Channel (NBFM)
170.550R	PNF	Forest Net CH 2
171.500R	THNF	Fire Camp Service Net CH 2
171.525R	ENF	Forest Net CH 2
171.550R	MNF	Fire Unit Dispatch (initial)
171.700R	MNF	Fire Camp Service Net CH 2
172.225R	LNF	Forest Net CH 2
172.425R	TNF	BLM CH 2
415.225R	RW	Varies (refer to text)
415.275R	MNF	HQ, Fire Unit Dispatching
415.300R	MNF	Dispatch to AC
415.325R	RW	Varies
415.350R	RW	Varies
415.425R	MNF	RD operations
415.475R	PNF	Administration
415.525R	PNF	Administration
415.550R	NW	USDA Air Dispatch (repeats 168.025 & 168.050)
415.575R	LNF	RD Operations
417.650R	MNF	Repeats Forest CH 2
419.650R	TNF	Logistic radio traffic

Key:

AC	Aircraft	CH	Channel	LNF	Lassen
MNF	Mendocino NF	NBFM	Narrow Band FM	R	National Forest
NW	Nationwide	PNF	Plumas NF	R	Repeater
RD	Ranger District	RW	Region Wide	TAC	Tactical
THNF	Tahoe NF	TNF	Trinity NF	WX	Weather



UHF link at Coming Ranger Station, Mendocino National Forest

Shaking Out the Mailbag

Calling all low frequency buffs! Marine Radio Station WMH (Baltimore, Maryland) can use your help.

According to the Longwave Club of America, officials at WMH are looking for reception reports on with reception reports of their 428 and 500 kHz transmissions. Hours of operation are from 1100 to 2300 UTC daily, with a CW traffic list at 30-35 minutes past each hour on 500 kHz followed by an immediate QSY to 428 kHz.

Your reception report should include standard information plus an indication of degree of fading and any interference noted. If possible, try to identify the interfering station.

The station guarantees that they'll reply on the same day that your reception report is received. But be sure to include a self-addressed, stamped envelope with your report. Their address:

WMH Marine Radio Station
Dundalk Marine Terminal
2700 Brooning Highway
Baltimore, MD 21222

Military Dictionaries?

Here's another call for help. Say that you're tuning about the dial and happen upon a military maneuver in Costa Rica. Reception is good, but you just can't seem to make your way through the jargon of foreign military phrases and abbreviations. Where to tune?

As I recall, there were some dictionaries of military terminology in various languages available in French, Spanish, Portuguese and Russian. There may have been a few more in other languages. If anyone has knowledge of a source for these publications which were in the "TM" (Army Training Manual) series, please let me know and I will list the details in a future column. I believe they date back to WWI days.

Think About it!

Take the matter of the "Fairness Doctrine." It has required Radio and TV stations to carry conflicting views on important public issues. Now comes word that the FCC plans to abolish the practice. And a number of congressmen are up in arms. I find this both interesting and confusing. Here's an example of why:

In the case of the Fairness Doctrine, Senator Ernest F. Hollings, (D-SC) went on the record as saying that "the American people own the airwaves." Yet not too awfully long ago, the Electronic Communications Privacy Act made the cellular phone portion of the radio spectrum off limits to the shortwave listener. Are we not also part of the "American People?"

It is difficult to understand how Congress can make such a 180 degree turn on what amounts to the same issue.

Federal Emergency Management Agency

Monitoring Times reader Dave White of Maine raised some points about FEMA communications in a recent letter. As a result, I must admit to an error in identifying the FEMA intercept I made in May 1987 on 3379 kHz. The transmitter was not WGY912, it was WGY908.

In addition to the 10870 kHz frequency reported for WGY912 by Dave, my references show 4780 (night). 16201 and 18744 kHz also assigned to that station. For a more detailed look at FEMA, including listings of frequencies and station locations, I refer readers to the new edition of the *Grove Shortwave Directory*, due out later this fall.

Quiet U's and K's

I've also been asked how come 'U' and 'K' single letter stations are so quiet these days. The reference is to two of the many single-letter beacons that have been the subject of so many articles -- most recently in the July 1987 *MT* -- and even more speculation. My observation is that if the assumptions made in the article are in fact correct, then perhaps the locations served by the two beacons have had a very dry August and that might explain the beacon drought.

Straaaaange Station

W.J. Battles of New Hampshire writes to say that "I have found a strange new station operating on 5689 USB sending data and using voice communications with callsigns MOBILE ONE and VERONA LAB TWO. They also used a tactical call of RED LEADER as well as callsign AF3FBF (I believe)."

I could not locate any information regarding these callsigns. Perhaps a reader can identify this station?

Interesting Net

A reader from Oklahoma signing as "Delta Tango" indicates that he (or she?) has been following "an interesting (and bizarre) net on 4373 kHz USB (also rarely on 5210 and 5710 kHz) that spends a great deal of time looking for 'clean alligator playground.'"

I have also copied this net several times. My impression is that the stations were making reference to a specific operations area when they talked about going to "alligator playground."

The exchanges between operators include questions regarding "Interrogation" which may refer to Radar and Electronic Countermeasures. Use of the term "Papa Uniform" seems to mean a specific location or position given in what appears to be grid system coordinates.

Two aircraft, X-ray Alfa Alfa and X-ray Alfa Bravo were also noted as being part of the operation.

During my most recent intercept of the net, control station Two Whiskey came up on the net and said "HOLD ALL PLAYERS." My guess is that these communications are in connection with US Navy training exercises involving ships that are tracking aircraft.

Special interest items

3479 kHz 030154Z CW

I believe this net replaced one formerly operating on 3463.6 kHz with not only the frequency changed but an apparent complete callsign change as well with control now using callsign MOA. O/SS are; ALZ, BWU, CAN, CDH, FNE, GND, IDA, ION, JPO, LFB, MON, NEO, PFO, RSF, SOL (possibly the net collective call), ULP and XKL. There may be others also that I have not as yet heard. Some of these stations are very weakly received at the *Utility Intrigue* monitoring site so I am not absolutely sure I have copied all of the callsigns correctly. Note that the letter "N" in GND and MON is the Spanish NYEH, sent in Morse as MW.

Some of the transmitters sound like little peanut whistles and they drift badly perhaps indicating battery operation or a low powered generator that is not running smoothly.

A typical message heading looks like this:

PBL NR 00181603 GR 30 QTR NR 2055 NR 15 8 87 NR 901 BT (Text of 5-characters per group) BT

The characters appearing in the texts include all the letters from A-Z, Spanish Nyeh, and the figures 2, 3, and 8. Messages are all exactly 30 groups in length. At times traffic flow is very heavy but possibly due to QRM, QRN, weak signals, the passing of traffic can be extremely slow with many repetitions of groups.

At this time I have not come up with a positive identification but I suspect the sponsoring government may be Cuba.

13377.8 kHz 132223Z CW

It took me a moment to realize I was listening to Morse code by voice. Station "A" (quite loud) was sending 5L groups by saying dits and dahs for the characters. The receiving station ("B") was on CW and very weak. Upon completion of the message "B" sent NOTE BT BEHULETEGNUM YSSERA BT." "A" came up on CW and after an exchange of the QSL, QRU, and QRX 2030, "B" sent QTC ALEHWEY with "A" answering NIL NIL GIN HULETEGNA QETTE BT RT RT whereupon "A" shifted to voice and again sent brief chatter by oral Morse code.

The next day at 1942Z I heard FTK DE ADL. There may also have been one other station present because I thought I heard FTK called by WSR but just one time. ADL was the strong station and FTK was the weaker station. When contact was established ADL sent: LANITE YISEMAH TTEWAT BE 0500 INDITIGTTA DBILEHAL BLINDLY QSL BT.

MAY 1987 LOGGINGS

KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
2742	080010	USB/YL-EE with 5L grps, ltrs sent in phonetics
3195	040122	CW/5L grps, vy weak sig, hand sent
4000	190337	CW/5L grps, slow, auto sent
4313	080204	CW/French Naval Freq/French PT & 5L tfc
4372.4	080148	USB/2WC, 1FO, K5Q/poss tng exercise
4507.1	120009	CW/00 DE 28, 22 DE 28/poss Soviet acty
4645.5	080124	CW/Cipher tfc but ltrs sent in string, not possible determine grp length
4680	130223	CW/841 841 841/5F grps
5425	150432	CW/KWT99 DE KRH50 (US Emb London) QSY 10733
6225.8	122309	CW/5L (cut ntrs), auto sent
6230	200715	CW/Spanish PT msgs/appear be military of official govt in nature
6243.7	121253	CW/WIO DE DEL (unid)/believed be associated with nets sending tfc with ltrs, Spanish Nyeh, plus 2, 3, 8
6298	020849	CW/5L grps, hand sent, very weak sigs
6518.2	112359	USB/Two OM/SS in cryptic conversation, towards end of contact one said he was not going to mess with any bad girls, instead he was going to church, ha ha
6675	160411	CW/5F grps, auto sent, cuts zero as T
6783.4	122316	USB/YL-EE with 3-2F grps
6785	221012	CW/5L grps (cut ntrs) auto sent. Also hrd cut ntr tfc on freq 16 Aug 0408Z
6789	200731	CW/Spanish PT tfc, military texts
6840	122318	AM/YL-EE with 3-2F grps. Diff msg frm that on 6783.4 kHz
7590.3	182354	CW/5L grps, pauses after every 10 grps
7905	182210	CW/SLB "K", rpts every 4 secs
13377.7	201729	CW/RGW AUW (cut ntr callup)/foll by 5L (cut ntrs) grps
13380	132227	CW/KNY32 (Bulgarian Emb, Wash DC) calls LZG7 (MFA, Sofia, Bulgaria)/PSE QSY 16256/shifts to RTTY 75-170, Bulgarian PT tfc/QSW 14728 & shifts that freq
13380.1	301925	CW-AM/Tuning xmtr then YL-EE sending 641 641 641 00000
13416.8	132019	RTTY 50-425/Romanized Korean text
13463	171445	CW/5L grps (cut ntrs)/auto sent, slow
13635.7	061449	CW/Two SLB's here: "C" & n "P"
13636.6	021315	CW/SLB "F"
13862.5	051630	CW/Hand sent cut ntrs, AU34567DNT for 1-0
13906.8	141530	Buzz pulses foll by blips with bubbly sound/Sequence not same each time and duration of signals varies
14375.1	201856	RTTY 50-425/msg from MINREX Habana to Cuban Emb Algeria
14461	201852	CW/5F grps, sent very fast
14506.9	131528	RTTY 50-170/DE D4B (Sal, Cape Verde) RY
14638.3	131532	CW/OMZ DE 7L1 (MFA Prague fm Czech Emb, Havana, Cuba)
14704.8	032014	CW/5L grps (cut ntrs), hand sent, very sloppy fist
14763.9	161508	CW/5L grps, auto sent, pause after 10 grps, band RTTY QRM on top of CW stn
14848.2	141524	RTTY/Pss PICCOLO transmission
19683	021351	CW/Tone on for 2 secs, off for 2 secs, sequence repeats over and over
19855	021401	CW/Timing pips at one second intervals.

Grove's Indoor SWL Antenna

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.

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!



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

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

What you need to order:

ANT-6 Hidden Antenna
PRE-3 Power Ant III
ACC-20 AC adaptor
ACC-60 receiver cable

\$8.95 (free shipping)
\$39 (plus \$1⁰⁰ UPS, \$3 U.S. Parcel Post, \$4 Canada)
\$9.95 (free shipping with PRE-3)
\$7.50 (you specify connector or receiver model; one for each receiver)

Full instructions included.



POWER ANT III

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.

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

TUN-3 Minituner **\$49** (plus \$1⁰⁰ 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)



MINITUNER

CALL TODAY – TOLL FREE

VISA, MC OR C.O.D. 1-800-438-8155

SEND CHECK OR MONEY ORDER TO:

15 DAY RETURN POLICY FULL REFUND

GROVE ENTERPRISES
P.O. Box 98
Brasstown, N.C. 28902
Phone 704-837-9200



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.

Voyager Celebrates Ten Years of Exploration

With one of its two spacecraft enroute to distant Neptune and the other exploring the outer solar system, the Voyager mission celebrated the 10th anniversary of its launch on August 20, 1987.

During those ten years, Voyagers 1 and 2 have contributed immensely to knowledge of the solar system. Both have logged billions of miles over the past decade; executing flybys of the giant planets Jupiter, Saturn and Uranus. The two unmanned craft have relayed a staggering amount of data on each of the planetary systems, in the process discovering such phenomena as new moons, rings and the first active volcano in space.

Rare Alignment of Planets

The mission was originally conceived in anticipation of a rare alignment of the planets that occurs only once every 170 years. During this alignment, a single spacecraft could visit each of the four planets, using their gravity in a slingshot-like effect.

The Voyagers initially were scheduled only to fly by Jupiter and Saturn, but the initial success of the missions prompted NASA to extend it with flybys of Uranus and Neptune as well.

Voyager 2 was launched August 20, 1977, followed by Voyager 1 on September 5 of that same year. Because of its trajectory, Voyager 1 overtook its twin and arrived first at Jupiter on March 5, 1979. Voyager 1 flew by Saturn on November 12, 1980. Its flight path at that planet then took Voyager 1 up and away from the ecliptic, the plane in which most of the planets orbit the Sun.

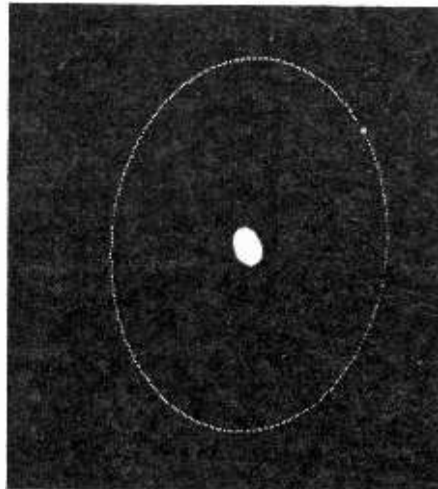
Voyager 2 encountered Jupiter on July 9, 1979 and Saturn on August 25, 1981. It reached Uranus on January 24, 1986.

Mission Highlights

Highlights of the mission at Jupiter include discovery of active volcanoes on Jupiter's moon Io; detailed photos of Jupiter's atmosphere, including the Great Red Spot and the surface of the planet's four major moons; discovery of three new, smaller moons; detection of lightning bolts in Jupiter's upper atmosphere; and discovery of a faint, narrow ring system encircling the planet.

At Saturn, the Voyagers revealed high-resolution details of the planet's new moons and relayed photos of Saturn's larger moons.

During the Uranus flyby, Voyager 2 discovered 10 new moons and



The planet Neptune and its satellite Triton as photographed by Voyager 2 (Triton's orbit is inscribed on the photo) (Courtesy NASA)

offered the first detailed look at the distant planet's ring system. The spacecraft also returned photos of the planet's five largest moons - among them Miranda, which scientists agree exhibits the most bizarre geography of any body yet visited in the solar system.

The Voyager project recently released a photo recorded earlier this year by Voyager 2 of Neptune and its moon Triton. With the spacecraft still 853 million miles away from the planet, Neptune and Triton appear as small dots, comparable to the best photos that can be taken by Earth-based telescopes. Successively better photos are expected during the next two years as the spacecraft closes in on the planet.

3.9 Million Miles and Counting

On the anniversaries of their launches, Voyagers 1 and 2 will have traveled a total of 3.9 billion miles and 3.7 billion miles, respectively. After Voyager 2's encounter with Neptune in August 1989, the two spacecraft will continue out of the solar system in search of the heliopause, the outer boundary of the Sun's energy influence.

Both satellites are 10-sided structures that have a diameter of 3.66 meters and a height of .47 meters. Each of the satellites has a mass of 825 kg. On each satellite's main frame is a high-gain parabolic reflector and they are powered by three radioisotope thermoelectric generators.

Voyager 1 has two radio downlinks:

2295 MHz (telemetry 9.4 or 28.3 watts) and 8415 MHz (telemetry and tracking, at 12 or 21.3 watts). Voyager 2 uses two downlinks of 2296.48 MHz and 8420.43 MHz. Both satellites use 2113 MHz for uplink telecommand.

The Jet Propulsion Laboratory (JPL) manages the Voyager project for the NASA's Office of Space Science and Applications.

Challenger's Replacement

Rockwell International has begun work on a fifth space shuttle orbiter following the award of a \$1.3-billion contract by NASA on August 1, 1987.

Designated OV-105, the new orbiter will restore NASA's shuttle fleet to four vehicles. OV-105 will replace the shuttle Challenger, which was destroyed early last year in the Mission 51L accident that killed seven crewmembers. Delivery of the new orbiter is scheduled for April, 1991.

Under the terms of the contract, Rockwell will fabricate, assemble, test, check out and deliver the orbiter. Using existing structural spares, the new vehicle will feature the latest upgrades and modifications and will incorporate all new technology evolving from the current return-to-flight activities.

Project NASA

June of 1988 is the proposed date for the shuttle Discovery's launch into space, the first post Challenger launch of an American crew. A lot of attention will be focused on this launch. If my mail is any indication, a lot of MT readers plan on being at the Cape with their scanners and shortwave radios.

Signals from Space is starting a new project to help those that want to monitor space shuttle activities when they resume. I am planning a major update of the shuttle program's radio spectrum in an issue just prior to the launch in June. However I need help in observing any changes in the radio frequency usage at the major NASA shuttle sites, hence 'Project NASA'.

You Can Participate

Those individuals who live close to major NASA installations are asked to help in the project. The sites specifically include: Kennedy Space Center, Cape Canaveral AFS, Patrick AFB, White Sands Missile Range, Vandenberg AFB, Edwards AFB, and Johnson Space Center in Houston.

Monitoring information on the aforementioned sites should include: frequencies (active only), usage, designations (if any), and any call-signs/unit identifications noted on each frequency. The spectrum for

this is unlimited. Information on shortwave networks, VHF/UHF networks, military aircraft frequencies, and satellite links are acceptable for this project. All relevant agencies may also be included, such as USAF, USN, local police and fire departments, amateur repeaters carrying shuttle voice, etc.

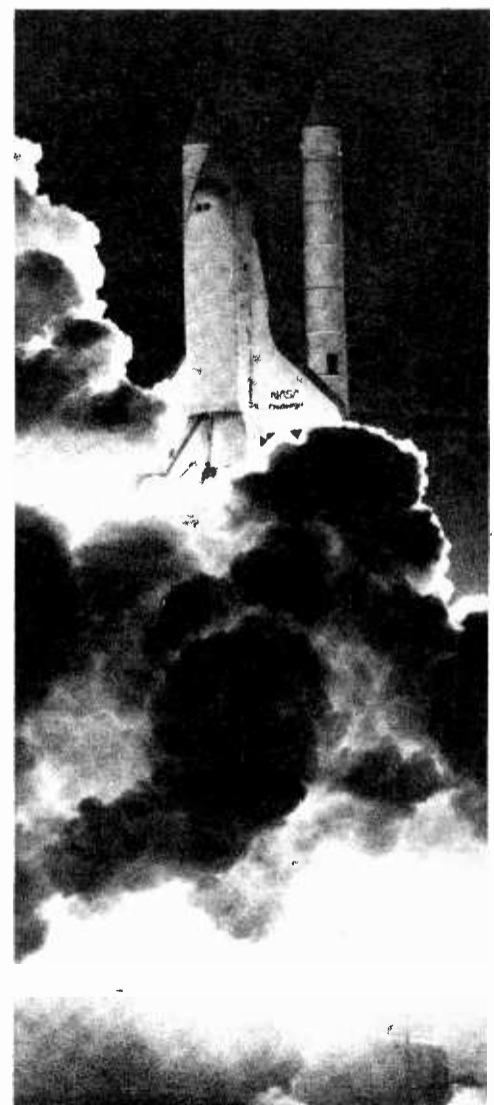
Those contributing to the project will get new information as it is entered in the computer. All participants will also be acknowledged unless they request otherwise.

Send your frequency information to:

Project NASA
160 Lester Drive
Orange Park, FL 32073

Be sure to include your return address to receive new information as it is released. Only contributors to the frequency database will receive updates.

I would like this to be the best update ever done on the shuttle radio networks and I invite our readers to join 'Project NASA' and help MT readers worldwide get ready for the return of America into space in June, 1988. ■



Meet Jack Albert -- RTTY Enthusiast!

Jack Albert thinks RTTY is the most fun you can have sitting down. And he's excited about sharing his 25+ years of RTTY experience with you. Meet Jack in his first MT column.

A Short Autobiography

I started listening to RTTY in the mid-60's during my high school years. In those days I belonged to the school's amateur radio club. It was here that one of the members introduced me to RTTY. We spent hours copying things like the UPI and AP news wire services using a home built, tube-type terminal unit.

In the late 60's I received my draft notice and I was off to war. The Army sent me to the South East Signal Corp Training Center in Ft. Gordon, Georgia. My classmates were sent to Vietnam. I ended up in Korea where I worked as a "Field Radio Repairman." Later I was transferred to Osan Air Force base in central Korea where I maintained two RTTY sites and spent most of my free time listening to the short wave bands and monitoring RTTY. I got back to the states in 1969 and was discharged the following year.

It wasn't until 1973 that I got back into RTTY. Working at Rockwell International Telecommunications, I started building and designing RTTY equipment in my spare time. Today my equipment consist of an ICOM R-71, a Kenwood 830 and a Sony ICF 2010. There are also piles of homebrew audio filters and a RTTY TU, a Commodore 64 computer with the SWL Text Software by AEA; 80 and 40 meter dipole antennas; 6, 2 and 1/14 meter beams and a Triband beam. RTTY equipment has come a long way since that home brew unit back in high school!

Like our everyday life, microprocessors and computers have changed the shortwave listening hobby. By putting a microprocessor in an RTTY terminal unit (TU) computers actually talk to other computers. Commercial communication systems, too, are also getting more complex. Listen to the shortwave bands and

you'll find a cacophony of strange beeps, clicks and noises -- high speed data transfers -- filling the airwaves. Microprocessors are also making encrypted RTTY more popular and cheaper to build.

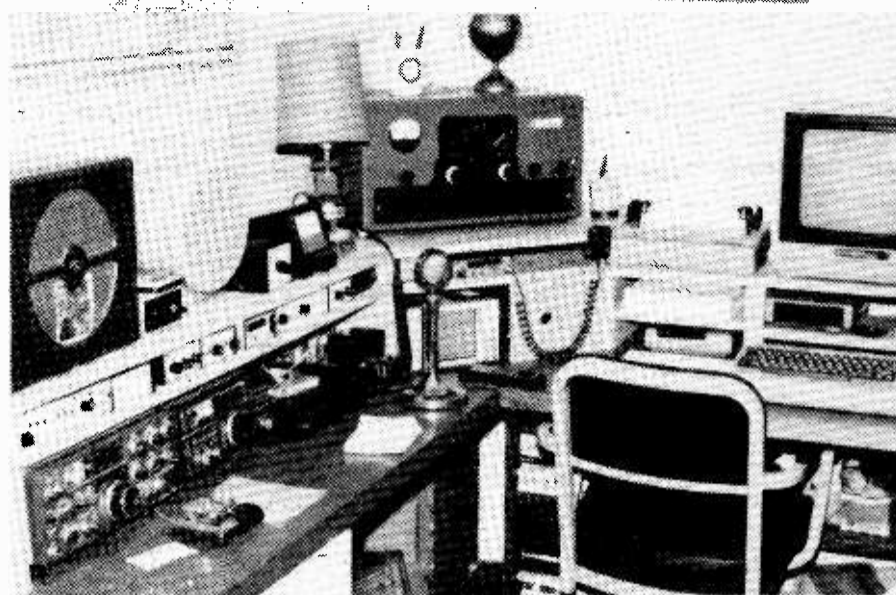
In future issues of *Monitoring Times* I'll try to explain some of these signals and share my experiences as well as the experiences of others. We'll cover all facets of the RTTY hobby from filter construction projects to loggings. You can help by sending in your loggings and any printouts that you may have.

Common Questions

But first, let's take a look at some of the more commonly asked questions about RTTY.

- Where can I find RTTY traffic and what speed are they using?
- How can I tell if the RTTY is encrypted, reversed or what is the baud rate?"
- What am I talking about when I say "encrypted," "reversed," and "baud rate"?"
- Why can't I copy RTTY very well with my \$5,000 "Super Trionic" RTTY terminal unit and my \$50 "PEE WEE 6" receiver?
- Why can't I copy RTTY very well with my \$5,000 "Super Snoop Hyperactive" receiver and my economy model "Cheetum and Howe" mini terminal unit?
- Can you recommend a good receiver or RTTY TU?

I will be happy to answer your questions by mail (if you remember to include a self addressed, stamped envelope). If the question is something I can answer in a future column, you'll find your answer there. I can't promise a product review in every issue because I build most of my RTTY gear but I will try to review any commercial RTTY equipment or software I can get my hands on and report my findings.



Jack Albert's well-equipped monitoring post

Examples of RTTY Copy

Let's take a look at some actual RTTY copy. In figure 1, I took a telex on the 32 meter marine band using the FEC mode. Notice that the print is virtually error free. In figure 2, however, I had obvious difficulty copying an important TELEX from the Coast Guard station NMO to ships traveling to the Mediterranean. Figure 2 is a good example of how an "error free" communications system can be vulnerable to interference on the short wave bands.

The problem was that Coast Guard station NMO was being clobbered by Morse code during fading. And, I couldn't copy the Morse code because it was partially covered by NMO.

Tips and Techniques

You probably would feel that Fig 2 is a poor copy. However I would not have copied anything if I didn't use the proper techniques. In order to pull out anything from this mash of signals, I used the narrow filter (500 Hz) and the Band Pass Tuning on the ICOM R71. I also used the ATC (automatic threshold control) on the

terminal unit.

In future issues I'll show you techniques to pull out RTTY in these and other problem situations. Then you'll find out how to load it into a file and retrieve it to edit the file using a "text editor" in your computer. In short, I'll take you by the hand and show you how you can add some RTTY "pizazz" to your listening hobby.

If you are a Commodore 64 user I will show how to use "GEOS"* to create some very impressive text using the same RTTY files. Because RTTY is vulnerable to errors it is important that you practice "Proof Reading" skills so that you can correct errors. Can you correct the text in Fig 2? Can you find the errors that were caused by the printing of lower case instead of the upper case RTTY characters? I'll show you how.

I look forward to sharing my hobby with you and hope you will find that "Reading RTTY" is one of the most exciting parts of shortwave listening! Until next time! ZCZC

* GEOS is a trademark of Berkeley Softworks

COPIED 8-2-87
0500 UTC
8713.6 KHZ
165 HZ SHIFT
FEC

.BXA 5MPS 5MPS/TOR
7TGY 7TGY 9VRV 9VRV DE WCC WCC WCC
=
HERES SUMMARY OF HURRICANE ADVISORY NR 42
ARLENE 0400GMT SATURDAY
. 0001/22 5- YROIVD
RCA WCC SHIPTLX
TCAGWE KMIA 220338
HURRICANE ARLENE MARINE ADVISORY NUMBER 42
NATIONAL WEATHER SERVICE MIAMI FL
0400Z SAT AUG 22 00IU
HURRICANE CENTER LOCATED NEA 36.0N 43.0W AT 22/0400Z.
POSITION WITHIN 60 MILES BASED ON SATELLITE.
PRESENT MOVEMENT TOWARDS THE NORTH OR 350 DEGREES AT 10 KT.
MAX SUSTAINED WINDS 65 KT WITH GUSTS TO 80 KT.
RADIUS OF 64 KT WINDS 25NE 25SE 25SW 25NW.
RADIUS OF 50 KT WINDS 50NE 50SE 50SW 50NW.
RADIUS OF 34 KT WINDS 200NE 200SE 175SW 175NW.
RADIUS OF 12 FT SEAS OR HIGHER 200NE 200SE 175SW 175NW.

Figure 1

C DE NMO NMO NMO QLH SITDR QIQEPCOPIED 8-2-87
0400 UTC
8178 KHZ
145 HZ SHIFT
FEC

.C SPECIAL WARNING (6) AND THIS PARAGRAPH.
7#4 4-88 8 IA A REBROADCAST OF A SPECIAL WARNING
NO.72 (5070200) AUG 87.
F SPECIAL WARNING NUMBER 2. PERSIAN GULF AND THE STRAIT OF HORMUZ
U.S MARINERS ARE ADVISED TO EXERCISE EXTREME CAUTION WHEN
TRANSITING THE WATERS OF THE
IRIAN GULF, THE STRAIT OF HORMUZ, AND THE GULF NFM.
DUE TO HOSTILITIES BETWEEN
IRAN AND IRAQI MARINERS ARE FURTHER ADVISED TO
AVOID IRANIAN OR IRAQANI PORTS AND WTL WATERS AND TO
REMAIN OUTSIDE THE AERA DELIMITED PSA GRAPH SW AND 3 BELOW
UNTIL FURTHER NOTICE. IRAN HAS STATED THAT
RCIAN COASTAL WATERS ARE WAR ZONES.
AND TRANSPORTADN OF CARGO TO IRAQIAN PORTS IS FORBIDDEN
A GUIDE FOR THE NAVIGATIONAL SAFETY OF MARINERS
IN THE PERSIAN GULF ARE AS FOLLOWS:
IRASITING THE STRAIT OF HORMUZ, MERCHANT SHIPS ARE SAILING
TO NON-IRAAAN PORTS SHOULD PASS 1L U OF AU MUSA ISLAND=
QW MILE SOUTH OF SRREIAND=

Figure 2

The new novice license is attracting would-be "hams" by the thousands. Ike Kerschner reports on what all the excitement is about.

The Novice Class Amateur Radio Bands

We would like to thank Mike Mitchell for his eloquent and informative chronology of the development of amateur radio from its infancy through today's high tech equipment and techniques. We hope to see Mike in future issues writing on special monitoring topics.

Ike Kerschner is well known to MT readers for his ability to introduce the newcomer to the various aspects of radio through his previous column, "Getting Started." This month Ike takes the helm of "On the Ham Bands"; let him know what subjects you would like him to cover -- he'll do a great job!

Each mail brings queries about what to expect from the various frequency bands the Novice class amateur is allowed to operate and what equipment is suitable for the newcomer to amateur radio.

For the next several months we will devote this column to examining the many bands and modes the Novice class amateur has to operate with.

HF Novice Bands

The HF (high frequency) band is the region between 3 and 30 MHz in the electromagnetic spectrum. The holder of a Novice license has four frequency bands within this range to work with; they are 3.7 to 3.75 MHz (or 80 meters), 7.1 to 7.15 MHz (40 meters), 21.1 to 21.2 MHz (15 meters) and 28.1 to 28.5 (10 meters). Each has something of interest to offer the new amateur.

On 80, 40, and 15 meters, the Novice operator is allowed to operate Morse code only. On 10 meters, Morse, radiotelephone and digital techniques are permitted.

Novice operators may also operate on 222.1 to 223.91 MHz (1 1/4 meters), a Very High Frequency (VHF) band, and 1270 to 1295 MHz (23 centimeters), an Ultra High Frequency (UHF) band. On these bands the Novice class licensee can operate all modes allowed his higher

class brethren.

Usually, equipment designed for the HF bands will cover all of the HF bands while VHF and UHF operation require separate equipment. Therefore this month our discussion will be confined to the HF Novice bands.

80 Meters (3.7 to 3.75 MHz)

Eighty meters has always been a popular band with newcomers for several reasons. First, for those who like to build their own equipment 80 is the easiest band of all to get a home brew station to work on. The diligent home builder can assemble a station for this band with easily available parts at very low cost. It is difficult to describe the pleasure of talking to friends thousands of miles away with a rig you have built yourself (try it!).

If building is not your cup of tea it is possible to purchase a decent used transmitter for 80 at very reasonable prices (I have obtained working 80 meter transmitters for less than ten dollars. Add another 50 to 60 bucks for a decent receiver and you are on the air.

Second, while daylight conditions limit useful communications to about 200 miles, nighttime extends ranges to several thousand miles. Often on a

quiet fall or winter evening stations halfway around the globe will be workable.

Third, thousands of new Novices inhabit this band and code speeds are reasonable. This makes 80 a good place to improve your operating skills. In addition, scores of older, more experienced hams like to hang out on the 80 meter Novice band and chew the fat with the newcomers and help them advance in the hobby.

Fourth, moderate power levels of 25 to 50 watts will let you work nearly anything you can hear on this band. Power levels of under ten watts are usable, but I suggest sticking to at least 25 watts to make life easier.

One disadvantage of 80 meters is the length of antenna required. A quarter wave antenna is 64 feet and a half wave is 128 feet. Of course it is not necessary to have a perfect antenna and simple wires or loaded dipoles will do a good job for you. One friend runs his 50 watt transmitter into a 25 foot long wire and has excellent results on 80. So don't be afraid to try short antennas.

While summer static at times limits the usefulness of 80, some contacts can be made every day by the average station. Average being the 25 to 50 watt power level described; good days are more frequent than bad days this band.

The Novice is allowed Morse only on 80.

40 Meters (7.1 to 7.15 Mhz)

Another Morse-only band for the Novice, 40 meters will easily extend your range to 400 + miles during daylight. After dark the Novice portion of this band suffers from heavy interference from SWBC stations, making communication difficult on part of the band. Coast to coast and DX contacts are easy on 40 after sunset.

The same transmitter and receiver you use for 80 will work well on 40. Antennas for 40 are half the size of an 80 meter antenna.

15 Meters (21.1 to 21.2 MHz)

Again Morse only for the Novice, 15 is the super DX band. During the hours of daylight, stations all over the globe can be worked here. Normally this band closes for DX after sunset and only local contacts are possible (during good conditions 15 meters is open 24 hours a day, though).

Again shoot for at least 25 watts on this band and 50 or more is better.

There is a lot of competition for the DX stations that inhabit 15 so it is a good idea to have some experience on 80 or 40 before tackling 21 MHz.

Antennas for 15 are only 22 feet for a half wave dipole, but be advised that horizontal dipoles do not work well on this band. Any vertical antenna mounted as high as possible will do fine on 15. A better choice would be a uni-directional Yagi or Quad antenna.

Equipment for 15 is a bit more sophisticated than your 80/40 meter rig. Transmitters have at least one additional stage and receivers must have good sensitivity, stability and selectivity. Expect to pay more for a rig that will do a good job on 15; say 100 to 150 bucks up for a used unit.

10 Meters (28.1 to 28.5 MHz)

At last a band where the Novice can operate radiotelephone (voice) as well as Morse code or teletype! Phone and teletype privileges on ten meters have attracted thousands of newcomers to amateur radio.

Until the Novice was permitted ten meters, this band closed down after dark during normal conditions; for most purposes it could be said ten was dead after dark. That's no longer the case. Large numbers of Novice operators keep this band hopping around the clock and it is possible to find a contact at anytime on ten meters today.

Like 15 meters, 10 is normally a daytime DX band. During the present portion of the sunspot cycle good daytime openings are rare with only an occasional South American station or a European or two showing up from time to time. However with the number of folks on this band they have plenty of contacts to keep them interested. Contacts of 50 to 500 miles are possible every day.

A station for ten meters that includes the capability of SSB phone operation will cost about \$200.00 up for used gear and from \$400.00 up for new.

Antennas are quite small on ten with a half wave being only 16 feet in length. As with 15, horizontal dipole antennas are not satisfactory and simple vertical antennas will do much better for you. Again the Yagi or quad is the preferred antenna on 10.

Next month we will discuss some of the gear available to the Novice (new and used), and take a look at some simple antennas you can build for the HF bands. ■

Equipment Notes

Three examples of used transmitters available to the Novice interested in operating the HF bands are the Heath DX-20, the Heath DX-40, and the Johnson Ranger. All cover 80 through 10 meters and allow CW operation. The Ranger and DX-40 have AM phone capability but are not legal for Novice use.

Expect to pay from \$5.00 to 30.00 for a DX-20 and up to \$40.00 for the DX-40. A Ranger in good condition will cost up to \$100.00.

Both Heath units use either crystals or an external VFO (Variable Frequency Oscillator). The Ranger has a built-in VFO plus provision to use crystals if you desire.

The prices I mention for 80 and 40 meter gear are approximately what older tube type rigs are selling for. As additional bands are added to the rig you must expect to pay more for a decent unit. The inclusion of SSB phone will at least double the price of any ready-built unit.

Prices for new gear start at about \$350.00 for a suitable ready built Morse only transceiver. An all band SSB/CW rig starts at about \$600.00.

CONVENTION CALENDAR

Date	Location	Club/Contact Person
Nov 7-8	Odessa, TX	West TX ARC/ Otis Brasfield KA5REM 3103 N. Hancock, Odessa, TX 79762
Nov 8	Ft Wayne, IN	Allen Co Am RTC/ Alan Scott N9BAC P.O. Box 278, Hometown, IN 46748
Nov 8	Selden, NY	Radio Central ARC/ Andy Goldman WB2FXN 3 Walton Way, Tanglewood, NY 11727
Nov 14-15	Montgomery, AL	Montgomery ARC/ John McLemore c/o WCOV-TV 1369 Adrian La., Montgomery, AL 36196
Nov 15	Rockford, IL	Ill State Conv/ James Miller W4JR 5581 Einor Ave, Rockford, IL 61108
Nov 20-22	St.Petersbrg,FL	S.Fla Sec Conv/ Frank Ziegler K4EUK. 8316 Stillbrook, Tampa, FL 33615
Nov 21-22	Palm Beach, FL	Palm Bch Rptr Assoc/ Hamfest P.O. Box 461, Lake Worth, FL 33460
Dec 4-6	Apache Jct, AZ	Superstition ARC/ Billy Glaze 7809 E. Javalina, Mesa, AZ 85208
Dec 5	Okeechobee, FL	Okeechobee ARC/ Tim Taylor N4AOU 401 SW Park St., Okeechobee, FL 33474
Dec 5	Banning, CA	Banning Police Dept/ Dennis Paul Decker (714) 849-6966

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.

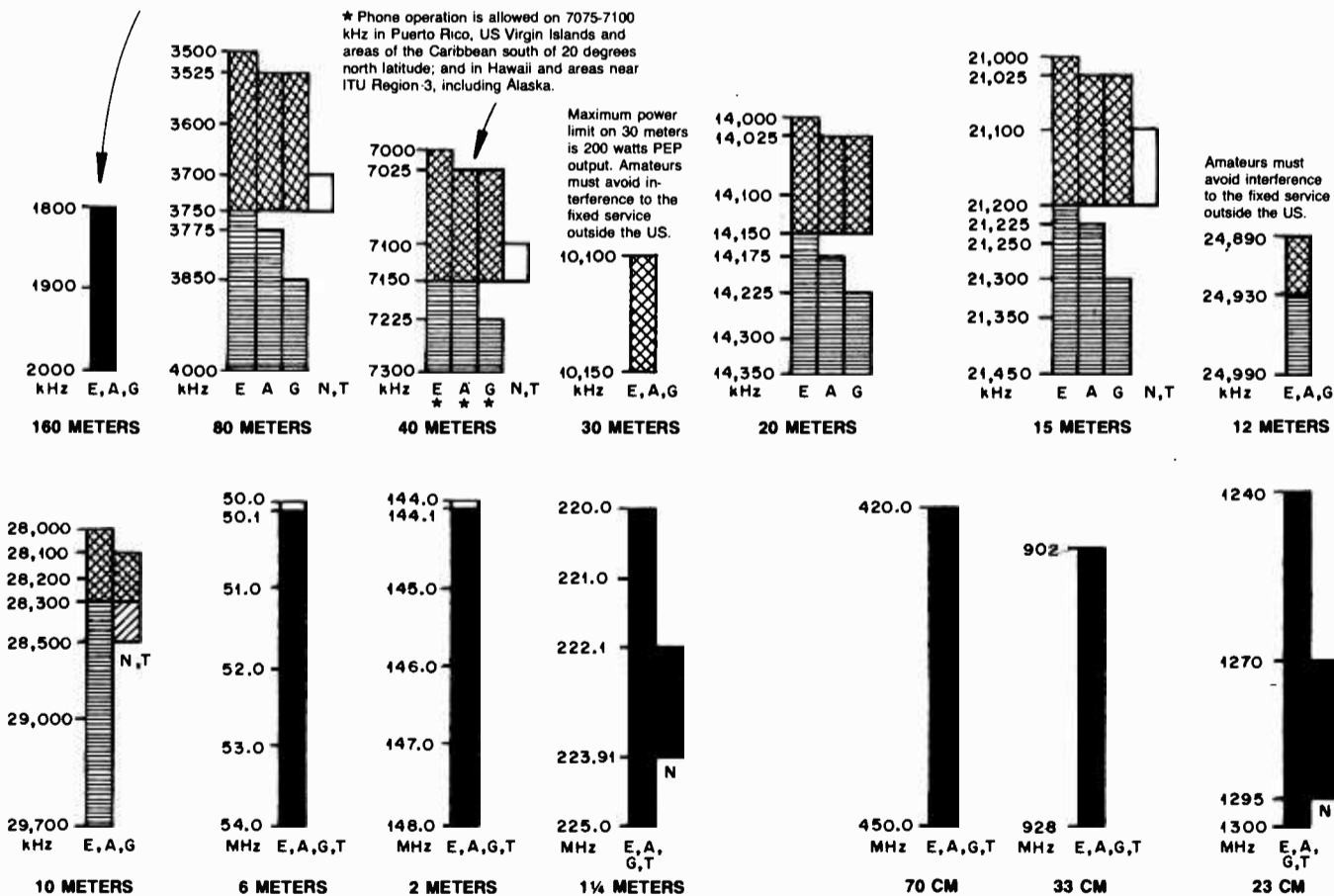
US AMATEUR BANDS

(Courtesy QST magazine)

Amateur stations operating at 1900-2000 kHz must not cause harmful interference to the radiolocation service and are afforded no protection from radiolocation operations;

* Phone operation is allowed on 7075-7100 kHz in Puerto Rico, US Virgin Islands and areas of the Caribbean south of 20 degrees north latitude; and in Hawaii and areas near ITU Region 3, including Alaska.

Maximum power limit on 30 meters is 200 watts PEP output. Amateurs must avoid interference to the fixed service outside the US.



Operators with Technician class licenses and above may operate on all amateur bands above 50 MHz.

5167.5 kHz Alaska emergency use only (SSB only) E, A, G, T, N

KEY

- = CW ONLY
- ▨ = CW AND RTTY
- ▤ = CW, VOICE, SSTV AND FAX
- = CW, VOICE, SSTV, FAX AND RTTY
- ▩ = CW AND SSB
- E = EXTRA
- A = ADVANCED
- G = GENERAL
- T = TECHNICIAN
- N = NOVICE

US AMATEUR POWER LIMITS

At all times, transmitter power should be kept down to that necessary to carry out the desired communications. Power is rated in watts PEP output. Unless otherwise stated, the maximum power output is 1500 W. Power for all license classes is limited to 200 W in the 10,100-10,150 kHz band and in all Novice subbands below 28,100 kHz. In addition, Novices are restricted to 25 W in the 222.1-223.91 MHz subband and 5 W in the 1270-1295 MHz subband.

COMPUTERS

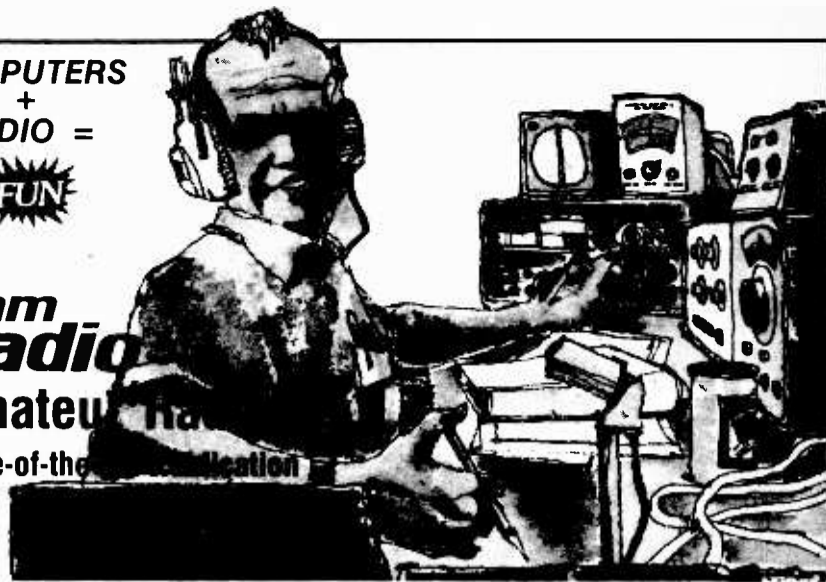
+ RADIO =



ham radio

Amateur Radio

State-of-the-Art



Try a subscription to Ham Radio Magazine for one year for just \$19.95. SAVE \$3 off the regular Ham Radio subscription rate of \$22.95 and \$10 off the newsstand price.

Ham Radio gives you more technical articles and the very best technical articles of the Amateur journals. Transmitters, receivers, antennas, as well as state-of-the-art design theory and practical articles. Ham Radio has got it all! In May there's our annual Antenna Issue — chock full of all kinds of antenna design ideas and projects. November brings the Receiver Issue — the very latest in receiver technology for the Radio Amateur. Many consider these two issues alone worth the price of a year's subscription.

And there's more! Monthly columns by: Joe Carr, K4IPV on the ins and outs of repairing and troubleshooting your radio; Bill Orr, W6SAI on antennas and antenna technology plus a lot more; noted HF/VHF operator and DX'er Joe Reiser, W1JR's world of VHF and UHF technology; and noted government propagation expert Garth Stonehocker, K0RYW on propagation.

There's even more — but you'll have to get a subscription to find out what it is.

Fill out the coupon today and send it in before you miss another issue! Remember — you not only get Amateur Radio's finest magazine, you also SAVE \$3.00 off the regular rate.

Special Trial Subscription
Save \$3.00 off the regular rate of \$22.95/year

JUST \$19.95

Prices US Subscriptions only

Sure I'll give Ham Radio a try. Sign me up for a one year subscription. Just \$19.95 for 12 issues. That's a \$3 savings off the regular rate of \$22.95

Start my New Subscription
 Payment Enclosed Charge to MC VISA

Card Number _____ Expires _____

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

ham radio magazine, Dept. MT, Greenville, NH 03048

Back to Basics and ... Hello, winter DX!

Yes, I've returned to Kansas and to teaching high school journalism and English, as well as to entirely different DX conditions. More about those after I have a chance to DX a little more extensively.

Getting Back to Basics

I think it's time also that we returned to the roots of DXing. You see, I'm one of those iconoclasts who believe that SW, FM, TV, and uter DX are all Johnny-come-latelies in the hobby -- fun, noble, and interesting, but still not as challenging as AM DX. And what could be more challenging than DXing on a receiver which uses no electricity, AC or DC? I'm talking about the crystal set, of course, and decent DX is indeed possible on one. Just ask Ray Cole of Cape Girardeau, MO.

Ray put together a crystal detector last year from designs made by Barfield, Lyon, and Tuggle, adding a 168' longwire 40' high. Using a germanium diode in his set (for that modern touch!), he was able to log stations in Quebec, Cuba, Mexico, Netherlands Antilles, San Antonio, Des Moines, and Denver. All this was on the very first week he tried it out.

Mike Tuggle, who lives in Virginia, has logged some 600 stations over the years using *only* a crystal set! What's more, he's having fun doing it, and that's the important part of the hobby. If you're not having fun, you should take up something else to keep yourself occupied.

Dozens of crystal set designs have been published over the years, but I've decided to include one published in 1923 in the "Pre-phy-lac-tic [toothpaste] Handy Book for Boys". It seems to have been designed to utilize a round oatmeal box, which the Quaker Company has thoughtfully continued to provide.

Other more modern designs are available and have been published quite often in the hobby magazines, but I thought that some of you purists might want to try out one of the earlier designs. Let me know if you decide to build it and what results you get. And don't ask me how it works; a technician I ain't!

No Stereo Standard for U.S.

As of this writing the FCC has not designated a stereo standard for United States AM stations, unlike Australia, Brazil, Canada, and possibly others who have chosen Motorola's C-Quam system. Only slightly over 500 AM stations are currently broadcasting in stereo, with others apparently holding back to see which system will get the nod from the FCC. Very few home, portable, and auto receivers are currently equipped to receive any AM stereo, and I don't know of any auto receiver priced under \$200 which is AM stereo capable. It's no wonder that consumers are barely aware of the existence of AM stereo.

November = Good AM DX

In November, DX activity on AM is on the rise. If you live east of the Mississippi, start checking split frequencies for trans-Atlantic stations just before sunset, and you'll be amazed at the hets you'll be able to hear while the sun is still shining. DX'ers living south and east of Kansas City will have their best chance to start bagging Caribbean and South American stations early in the evening, roughly from sunset to two or three hours later. Those living west of Denver will want to get up early in the morning, around 3:30 am PST, for a shot at trans-Pacific DX. Trans-polar DX such as Kvitsoy, Norway-1314 becomes easier for DXers living in the upper midwest states. And on good nights, anything can happen!

Don't forget daytime DX as a chance to fatten up your DX totals. From now through around Valentine's Day is a good time to listen on quiet frequencies for regional stations whose signals rise above atmospheric noise. Also, if you use a good directional antenna to null out those locals and near locals, you may be surprised at what can be heard behind them. With T-storms at a lull, those faint signals will now be audible.

DXing the Graveyard

Real gluttons for punishment inhabit the graveyard frequencies (1230, 1240, 1340, 1400, and 1490) now for maximum counts on those frequencies. Again, a good directional antenna, especially an amplified box loop, or a phased array, may prove to be your best DX tool. Be prepared to sit on a frequency for an entire evening, though, to be able to gather enough information to verify stations. You may find your best time for DX'ing graveyards after midnight when some stations in smaller markets sign off for the night, leaving the frequency more clear for others to come in. You should be able to pick out at least a half-dozen different GY's on a good night as they rise to the top of the noise.

AM DX Tips

I've noted one local off the air in Topeka - WREN-1250 but I haven't had the time to find out just why. Southwestern DX'ers who hear hard rock on 550 just before CST signoff time are almost certainly listening to KFRM-550, which simulcasts KICT, Wichita. Look for new stations on clear frequencies, according to NRC's Jerry Starr, in 1040 from Flemington, NJ (4700/1000 day.night watta, directional antenna) and Delmar, NY (5000/1000 directional) (maybe the Cuban powerhouse will clear off 1040 by then); and on 1160 from Fieldale, VA at 5000/250 directional).

TV DX

Don't forget to scan the UHF TV frequencies for new low-power stations which pop on unannounced. I've noted one locally on 21 rebroadcasting the TBN, originating from 40 in Orange county, CA. Ironically, the first time I tuned by I caught a personality praying for an end to the technical difficulties which apparently had kept the station off the air.

E Skip

December is usually the month when for some reason E-skip returns for a short time to low-band VHF TV channels, but remember that last year an incredible tropo opening occurred right after Thanksgiving, with a duct enhancing station signals for over a thousand miles. Check conditions several times a day if you are able.

I'd like to present a few FM and TV changes ... but unfortunately they're still boxed up somewhere in my spare room, or I think they are. Perhaps I'll find them by the next deadline (oops, my deadline list is missing, too). Isn't moving fun? '73 until next time!

6 PRO-PHY-LAC-TIC HANDY BOOK FOR BOYS

HOW TO MAKE A GOOD RADIOPHONE RECEIVER

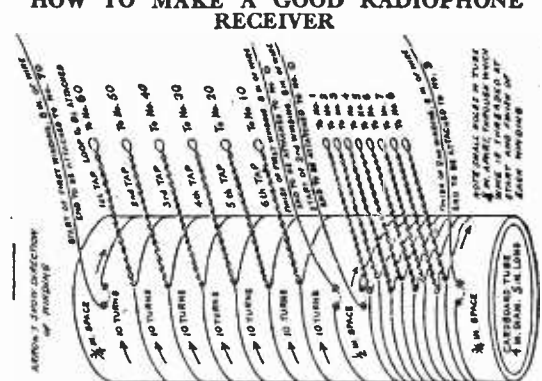


FIG. 1
METHOD OF WINDING TUNING-COIL
AND INSTRUCTIONS FOR CONNECTING TO RECEIVER

The panel-design Receiver here described will enable you to hear radiophone programs broadcasted from a distance of 15 or 20 miles, and will also pick up wireless telegraph messages from local amateur stations. It is small, compact and handsome in appearance, and very convenient to operate because the Detector is placed in center to afford ease of adjustment and the Switches are located below in such position that left hand controls coarser Tappings while finer Tappings are controlled by right hand. Considering its trivial cost it cannot be excelled for efficiency and has the advantage of practical test, by having been actually built and operated with perfect success by hundreds of boys, as well as older people.

The Tuning Coil (Fig. 1)
Punch two small holes in Cardboard Tube 1/4 in. from one end and 1/4 in. apart. Use 1/4 lb. Spool No. 22, double cotton covered Magnet Wire, and thread end through holes, as shown in diagram. With spool in right hand wind on 10 turns lying close together side by side. At start of eleventh turn hold wire tight against Tube with left thumb while with right hand you draw out about 5 in. of wire and bend it back upon itself to your left thumb, then with thumb and finger of right hand twist this long loop of wire until it has only a small loop at end. (See diagram.) This is called a Tap. Proceed to wind on 10 more turns from spool and Tap again, and so on until you come to the end of seventeenth turn, as illustrated, where you punch two holes, 1/4 in. apart. Then cut off wire, leaving about 8 in. and thread through holes. This finishes First Winding. Leave 1/4 in. space on Tube, then punch two holes 1/4 in. apart, and start second winding exactly as you did the first. On this Second Winding make a Tap at every turn. At end of ninth turn punch two holes, 1/4 in. apart. Cut wire as before and thread through holes to finish Second Winding. If all these turns have been wound properly, close together, 1/4 in. space will be left at end of Tube. The Tube is much shorter in proportion to diameter than shown in diagram, which is elongated to show principle clearly. Scrape cotton covering, or insulation from small loop of each Tap, and Coil is ready to be connected to Receiver Panel.

The Receiver Panel (Fig. 2)
Front Panel Board is 6 in. square and 1/4 in. thick. Base Board is 6 x 8 in. and 1/4 in. thick. Sandpaper both boards smooth and apply thin coat of varnish all over, and allow to dry thoroughly. Never use putty on any part of apparatus; it would spoil sensitivity.

Description of Parts: S-1 and S-2 are inexpensive Switches you can buy. Each should have shaft 3-16 in. diam. Nos. 1 to 9 and 10 to 70

A Clean Tooth Never Decays

7 PRO-PHY-LAC-TIC HANDY BOOK FOR BOYS

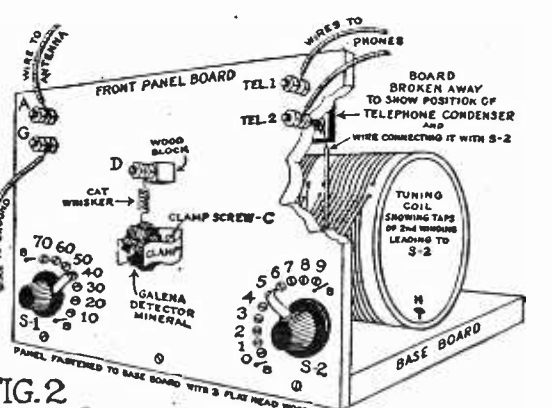


FIG. 2
PARTS AND CONSTRUCTION OF
PANEL-DESIGN RECEIVER

are Round-head brass Machine Screws, 6-32 in. Shaft by 5-8 in. long with hexagon brass Nut for each. C is same. A and G are same with 2 Nuts each. Tel. 1 and Tel. 2 are same, but 1/4 in. long, with 2 Nuts each. D is same but 1 in. long, with 2 Nuts. All these Machine Screws serve as Binding Posts for wire connections.

The Detector is formed of 3 parts. Above, a Wood Block about 1/2 in. square by 1/4 in. thick, drilled to take Screw D. Below, a Clamp made by bending piece of spring brass about 1/2 in. wide by 2 1/2 in. long drilled at center to take Clamp Screw C. Between these is the Cat-Whisker Spring, made by coiling small piece of fine phosphor-bronze or brass wire around a lead pencil. Top end of Cat-Whisker is bent around Screw D between Nuts, and lower end just touches Galena Detector Mineral (sometimes called Crystal), which is held in place by pressure of Clamp. Never handle or touch Mineral with bare fingers, because that would cause it to lose sensitiveness.

Held in place by Screws Tel. 1 and Tel. 2 at back of board is a Telephone Condenser, Capacity 0.002 microfarad. The distance apart for holes for Screws Tel. 1 and Tel. 2 is governed by distance between 2 eyelets of Condenser, through which Screws must pass.

In spacing Screws in arcs, for Switch-Points around Switches S-1 and S-2, their distance from shaft of Switch is governed by length of Switch-arm, and distance between Screws must be just sufficient for Nuts to turn without corners touching. Set these Screws so that "bites" in screw-heads will be at right-angles to path of Switch-arm as it moves across them, otherwise Switch is liable to catch. At end of each arc of Switch-point Screws drive a 1/2 in. brass bead (B-B-B in diagram) to prevent Switch-arm turning too far in either direction, thus loosing contact.

Drill all holes, and assemble all parts on Panel before screwing the latter to Base Board.

Wiring the Receiver: First connect loops of all Taps on Tuning Coil under Switch-point Nuts on back side of Panel, according to numbers specified on Fig. 1. Next, revolve Tube gently as it rests on Base Board to straighten Taps, and nail Tube to Base Board with 2 short, flat-headed nails, one at each end like N in Fig. 2. Then carry start and finish wires of both Windings, to their respective numbers; cut away insulation of each wire and connect, after which cut off ends of wires that may be left over. This completes connections of Tuning Coil.

Now, also at back side of Panel, and using same kind of Magnet wire as on Coil, connect Screw A with shaft of S-1. With another piece of wire connect Screw A with Screw D. With another wire connect Clamp-Screw C with Screw Tel. 1 underneath top eyelet of Condenser. With another wire connect Screw Tel. 2 underneath bottom

A Clean Tooth Never Decays

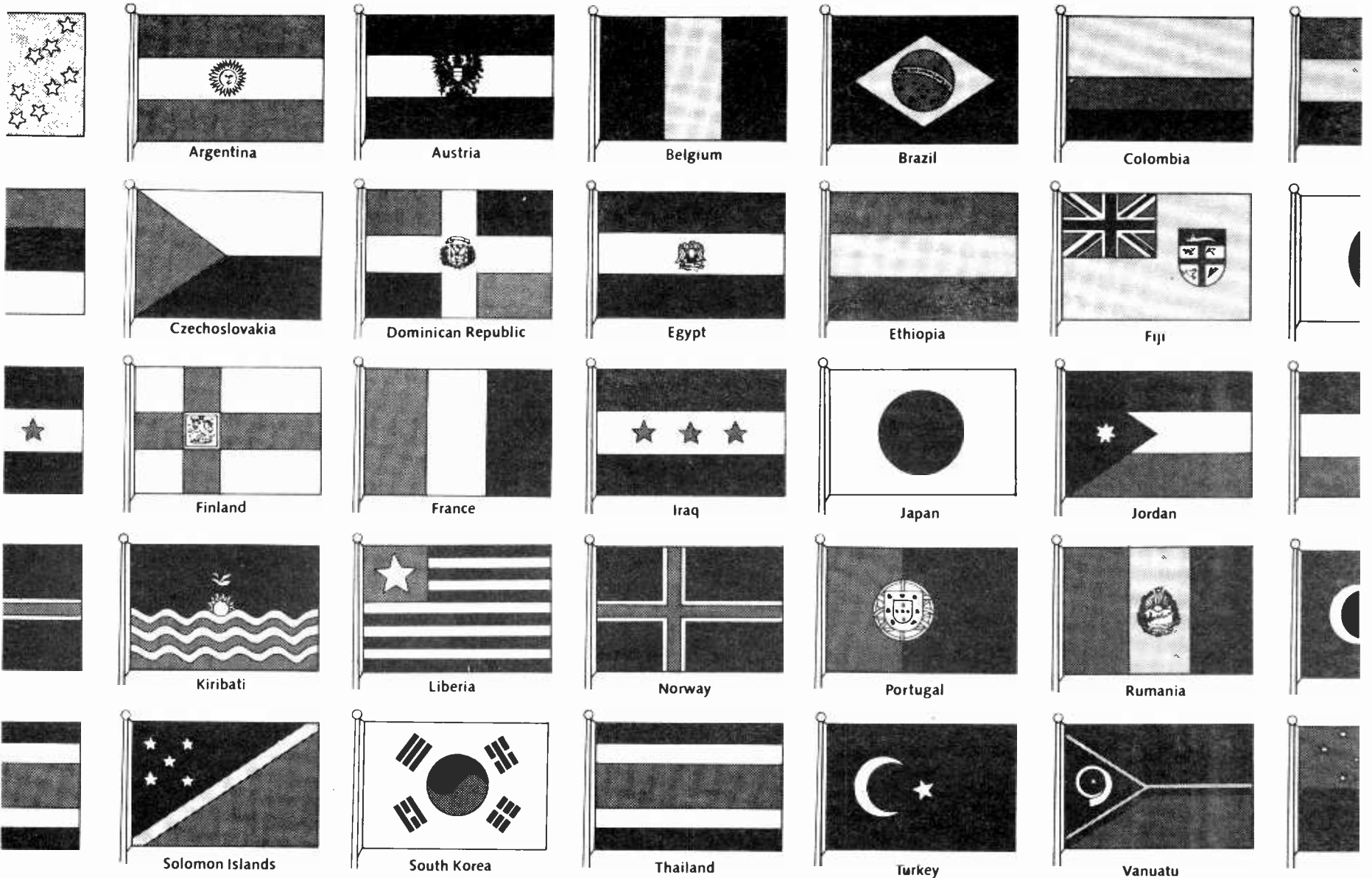
8 PRO-PHY-LAC-TIC HANDY BOOK FOR BOYS

eyelet of Condenser, with shaft of S-2. With another wire connect shaft of S-2 with Screw G (None of these wires is shown in either diagram except a part of one of them where board is broken away in Fig. 2.) This completes wiring of Receiver.

The Antenna
A single, bare copper wire, 75 to 100 ft. long, supported by the ends at a height of 30 or 40 ft. above ground, and insulated from its supports at both ends by porcelain cleats, forms an Antenna. This is connected by an insulated wire with Screw A, as shown in Fig. 2. A bare wire connects Screw G (Fig. 2) with a waterpipe in the house, or with any other suitable "Ground." Two insulated wires connect Screws Tel. 1 and Tel. 2 (Fig. 2) with Telephone Receiver, or Head-Piece, which can be bought at very moderate cost.

To Operate
See that all your wire connections are in tight contact. Then adjust Cat-Whisker to rest lightly upon Galena Detector Mineral. This adjustment is made by shifting lower end of Cat-Whisker from place to place on Mineral by pushing it with point of lead pencil. Do not touch with fingers. When a sensitive spot is located your Telephone Receiver will give forth sounds, either signals or "crackles of static." If a signal is heard, either telephone or telegraph, you proceed to "tune-in" by revolving S-1 and S-2, back and forth, to find "wave length" that will give you clearest response. After a little practice you will come to know the various wave-lengths of different sending stations within your range, and by remembering numbers you can find them very quickly by adjusting your Switches to correspond.

No license is required to operate a radio set of this kind, but it will be necessary to protect your Antenna with an approved type of Lightning Arrestor to conform with insurance regulations of National Board of Fire Underwriters.



With a Sony World Band Radio, each country clearly has its own voice.

Sony presents synchronous detection circuitry so you can enjoy clear connections with less interference.

Synchronous detection circuitry is a tiny mechanism with global proportions. It locks onto the frequency you've chosen and travels with it, letting you clearly hear one country at a time, with less interference all of the time. Which means if you happen to be listening to Ping-Pong from Peking, São Paulo soccer shouldn't break in.

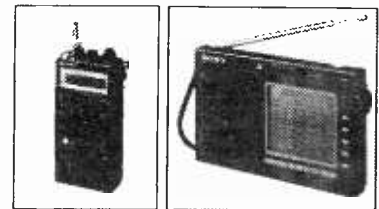
Inventing the transistor radio was just the beginning.

Thirty years ago, Sony put the world on its ear with the very first transistor radio. In 1967, Sony unveiled the world's first integrated circuit radio, and then made history again with the shortwave transistor. Ever since then, Sony has been fine-tuning world band radios with world-famous technological advancements.

Sony is the world leader that can put the whole world at your fingertips.

Only Sony has the kind of technology that lets you clearly listen to over 100 languages in 160 countries.

Sony World Band Radio® units around the



world are clearly receiving air, marine, longwave and shortwave bands, with synchronous detection circuitry, quartz tuning and automatic search and scan.

When it comes to globe-trotting, you'll find any of our five World Band Radio units handier than a passport.

And you'll also find that you understand what's being said around the world more clearly than ever before.

World Band Radio. SONY.
THE ONE AND ONLY.

Radio New York International

On August 27 all charges were dropped against those responsible for Radio New York International. The station received national attention in July because of its broadcasts from international waters near New York City. Although the FCC vowed to prosecute "to the full extent of the law" if the station returned to the air, chief engineer Alan Weiner made good on his intention to resume broadcasting.

Unanswered Questions

Although RNI's legal battles are over at least for now, the case has raised several disturbing issues. Why was New York's *Village Voice* reporter R. L. Smith not permitted to show his press credentials and why was he arrested along with the RNI staff? Why did the FCC deliberately destroy, rather than simply confiscate RNI's transmitting equipment before the case went to court and any guilt established?

According to our reader John Demmitt, the FCC also seized reception reports and other mail sent to RNI. Since the FCC ultimately asked that the charges be dropped, was the confiscation of mail simply an attempt to intimidate listeners of pirate broadcasts? Finally we might note that in the 1950's some VOA broadcasts were regularly made from the "U.S.S. Courier," stationed in international waters in the Mediterranean.

Does that make the United States government a pirate?

Several of our readers were able to log RNI. Minnesota's Mace Twigg heard them on both 1620 and 6240 kHz. He reports a friend in Louisiana logged them on 1620. New Jersey's Tom Lemaire heard their final broadcast on July 27 on both 1620 and 6240 but was unable to receive their 103.1 FM signal. New York's Cathy Turner also heard them on 1620 and 6240 but could not receive the FM transmission. In addition to RNI, Cathy has recent loggings of Radio North Coast International on 7448 and unidentified pirates on 7415 and 7463.

Cuba

The radio war continues. John Demmitt writes to tell us that September 2 (EDT) Cuba once again fired up the 300 kW transmitter on 1040 kHz, drowning out WHO Des Moines at his central Pennsylvania location. He also noticed stations on 1160 dropping carrier in mid-sentence, perhaps a result of the FCC taking field measurements.

Demmitt says a July 22 Radio Taino broadcast on 1160 was cancelled after the State Department threatened Cuba with a military strike if the broadcast took place. Interestingly enough nothing was said about 1040.

Guatemala

If you are fortunate enough to log that relatively new anti-Guatemalan government clandestine on 6950 UTC Saturdays at 0015, you might be able to verify your reception via NISGUA, 1314 14th Street, NW, Washington, DC 20005. This organization, Network for Solidarity with the People of Guatemala, has been verifying some reports, although it is not actually responsible for the broadcasts. English reports are fine, but enclosing a prepared card would be a good idea.

Nicaragua

Reporting in the by-invitation-only newsletter *DX South Florida*, Terry Krueger notes a new anti-Sandinista clandestine, Radio Liberacion Onda Corta, on 5890 kHz. The station appears to sign on at about 0145 UTC, and its programming is not parallel with that of Radio Liberacion on 1520. At present it is not clear whether this station is intended to replace existing Contra shortwave efforts or is a new addition.

Radio Caroline

For those on the East Coast an excellent DX challenge as we approach the winter season is to try to log Radio Caroline. It broadcasts on 963 kHz, and with less power on 558. Caroline transmits from the "S.S. Ross Revenge" off the Southeast coast of England. On rare occasions it has been heard in North America.

While I was in England several months ago, I found it quite easy to monitor Caroline's transmissions, although it is technically illegal to listen to them. The 558 service is a popular pops and rock format running approximately from 6:00 a.m. to midnight British time. Dutch language Radio Monique, with pops and rock, occupies 963 until 6:00 p.m. when it is replaced with "Viewpoint 963", which airs religious programming (mostly American) until 9:15 or 9:30 p.m.

In talking with people in both England and the Netherlands I was told that both Radio Caroline and Radio Monique have wide followings. However, Caroline appears to have trouble raising advertising revenue, except for its religious programming. About the only advertising heard is for the Canadian lottery. Atari and several other prominent companies advertise on Monique which seems to have a far greater number of advertisers.

The other offshore pirate, Laser 576, is off the air, perhaps permanently. According to the British government and others this is the result of financial difficulties. However, the station claims it is due to renovation of its ship, which is being done in France.

Thanks to England's David Duck-Worth, Scott McClellan, and New York's Dave Alpert for information on the offshore pirates. And now...

NUMBERS STUFF

Welcome to the Havana Moon segment of "The Outer Limits." S.M. of Humberside, England, bought a copy of *Uno, Dos, Cuatro* and was kind enough to forward revealing "German numbers" information.

S.M. says the "German numbers" station that I have reported on 3820 kHz utilizes the following frequencies and times: 3215 kHz at 1800, 1900, 2000, and 2100 UTC. On 3280 kHz (with same traffic as 3215 kHz) at 2000, 2100, 2200 and 2300 UTC. And on 5820 kHz at 1200 and 1300 UTC. Also on 6450 kHz at 0800 and 0900 UTC.

A Florida monitor from Boca Raton says the 3820 kHz transmission at 2200 UTC is often in excess of S9! Could this be a relay transmission from Havana, S.M.?

S.M. also states that--in the manner of their "Spanish numbers" kin(?)--"German Numbers" stations repeat traffic for days, weeks and even months at a time. Some traffic is years old.

Perhaps *all* "numbers" stations are "kindred spirits," S.M.!

According to S.M., the "Gypsy Music Station" is *Rumanian!* This station can be heard on 5425 kHz at 2000, 2100, 2200, and 2300 UTC and 6825 at 1800 and 2300 UTC. Note that 6825 and 5425 kHz are *active* "Spanish numbers" frequencies!"

The usual format for this "Gypsy Music" station: tune, repeat tune, "OM" with "Terminat," tune, repeat tune. "Terminat," etc. with carrier off in 12 or 13 minutes. Traffic seldom heard.

Thanks for the report. Let's hear more from you and your colleagues in England.

Ever notice that "numbers" stations reveal while they conceal and conceal while they reveal! Think about it!

K.C. of Maryland writes that shortly before 0400 UTC on 21 July he monitored an extremely strong carrier on 7021.7 kHz. At 0400 a series of numbers were transmitted in Morse and repeated over and over for several minutes. The code, according to K.C., was perfectly sent therefore machine or computer generated.

This Maryland contributor says that after "introduction," random number groups were transmitted and repeated. Carrier was continuous--that is--*did not* turn on and off in time to the Morse transmission. Transmission ended 0424 UTC.

K.C. says that he is not certain that the carrier was from the same transmitter as the Morse. He says that the "fading pattern" would suggest that two transmitters were used! Maybe these guys have had lessons from the 5-digit Spanish crowd, K.C.! This was the loudest signal K.C. he had ever heard on the amateur bands. The signal peaked at more than plus 50 and faded to a low of plus 20!

K.C. is of the opinion the effect of this ORM was to obliterate *all legitimate traffic* on or about the frequency in use.

Yes, K.C. this transmission was illegal! But for the ARRL to take the matter to the FCC is another story! I seem to remember someone from the ARRL once saying that they (the ARRL) had never had any "numbers" interference complaints!

And the "spectrum police," our very own FCC (according to a spokesperson), says the FCC has never had a "numbers" complaint!

Consider this an official complaint, FCC!

K.C. wonders if this transmission was in any way related to the Cuban medium wave incident of the same night. Dr. Santosuosso has previously reported on this matter.

Reading List

"Spycatcher" by Peter Wright (Viking). Thatcher and MI-5 (the British of the FBI) are worried. Thatcher's government moved to halt publications and won a controversial ruling by England's highest court banning newspapers from reporting the contents of "Spycatcher!"

Be sure to obtain *Guide to Utility Stations* by J. Klingenfuss.

Noticias

Next issue: Revealing -- and possibly *never before published* -- "German number" information!

Watch for future announcements of another far more revealing *Uno, Dos, Cuatro* project. Work progresses!

Don't miss one action packed minute of "The Fourth Protocol" (Lorimar). Pay particular attention to the Radio Moscow transmission. You do remember Radio Free Granada's obituaries, don't you?

Wanted

Al Smith, Vivian H., Fred Lehman, Tammy Bakker, Kevin O'Connell, John Blair, Bill Neill, R.L. Slattery, Bob Homuth, Michele Schute, Bob Russ, Mary Minard and Bruce M. All were once readers and contributors. Some even acquired *Uno, Dos, Cuatro*. It would be nice to hear from you again!

"Buena Suerte Amigos."

frequency SECTION

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.

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.

All frequencies in this list have been heard by one or more Monitoring Times monitors during the previous month.

0000 UTC [8:00 PM EDT/5:00 PM PDT]

0000-0025	Kol Israel.....	7465, 9435
		9855
0000-0030	BBC, England.....	5975, 6005
		6120, 6175
		7325, 9410
		9515, 9590
		9915, 11955
0000-0030	Radio Canada International..	5960, 9755
0000-0045	Radio Berlin International..	6080, 9730
0000-0045	Radio New Zealand Int'l....	17705
0000-0045	WYFR, Florida.....	11885
0000-0100	Armed Forces Radio and TV..	6030, 15345
0000-0100	CBC Northern Quebec Svc....	6195, 9625
0000-0100	CFCX, Montreal, Canada.....	6005
0000-0100	CFRX, Toronto, Canada.....	6070
0000-0100	CFVP, Calgary, Canada.....	6030
0000-0100	CHNX, Halifax, Canada.....	6130
0000-0100	CKFX, Vancouver, Canada....	6080
0000-0100	KVOH, California.....	17775
0000-0100	Radio Australia.....	15320, 15395
		15140, 17795
0000-0100	Radio Baghdad, Iraq.....	11705
0000-0100	Radio Beijing, China.....	15445
0000-0100	Radio Havana Cuba.....	6090
0000-0100	Radio Moscow.....	5940, 6000
		6170, 7115
		7135, 7150
		7290, 7400
		12050, 13605
0000-0100	Radio Moscow World Serv....	17685
0000-0100	Radio Sofia Bulgaria.....	9700
0000-0100	Spanish Foreign Radio, Spain	9630, 11880
0000-0100	Voice of America.....	5995, 6130
		9455, 9775
		9815, 11580
		11695, 11740
		15205
0000-0100	WCSN, Boston, MA.....	9765
0000-0100	WHRI, Indiana.....	11770
0000-0100	WRNO Worldwide.....	7355
0030-0100	BBC, England.....	5975, 6005
		6120, 6175
		7325, 9515
		9590, 9915
0030-0100	HCJB, Ecuador.....	9875, 11775
		11910, 15155
0030-0100	Radio Belize.....	3285
0030-0100	Radio Kiev, Ukrain SSR.....	7260, 7205
		7185, 11790
		13645, 15180
0030-0100 S,M	Radio Canada International	5960, 9755
0030-0100 T-A	Radio Portugal.....	9680
0045-0100	Radio Berlin International..	6080
0050-0100	Vatican Radio.....	6105, 9605
		11780

0100 UTC [9:00 PM EDT/6:00 PM PDT]

0100-0115	Vatican Radio.....	6150, 9605
0100-0120	RAI, Italy.....	6010, 9575
0100-0124	Kol Israel.....	7465, 9435
		9855
0100-0130	HCJB, Ecuador.....	9875, 11775
		11910, 15155
0100-0130	Radio Canada International	9535, 11845
		11940
0100-0150	Deutsche Welle, West Germany	6040, 6085
		6145, 9545
		9565
0100-0200	Armed Forces Radio and TV..	6030, 15345
0100-0200	BBC, England.....	5975, 6005
		6120, 6175
		7325, 9515
		9590, 9915
0100-0200	CBC Northern Quebec Svc....	6195, 9625
0100-0200	CFCX, Montreal, Canada.....	6005
0100-0200	CFRX, Toronto, Canada.....	6070
0100-0200	CFVP, Calgary, Canada.....	6030
0100-0200	CHNX, Halifax, Canada.....	6130
0100-0200	CKFX, Vancouver, Canada....	6080
0100-0200 T-A	KVOH, California.....	9495
0100-0200	Radio Australia.....	15160, 15320
		15395, 17715
		17750, 17795
0100-0200	Radio Canada International	5960
0100-0200	Radio Havana Cuba.....	6090
0100-0200	Radio Moscow.....	5940, 6000
		6070, 6170
		7115, 7135
		7150, 7290
		7400, 9530
		12050, 13605
		15245, 15425
0100-0200	Radio Moscow World Service	17685, 17880
0100-0200	Radio Prague, Czechoslovakia	5930, 6055
		7345
0100-0200	Spanish Foreign Radio, Spain	9630, 11880
0100-0200	Voice of America.....	5995, 6130
		7205, 9455
		9650, 9775
		9815, 11580
		11740, 15205
0100-0200	WCSN, Boston, Mass.....	9765
0100-0200	WHRI, Indiana.....	9850
0100-0200	WRNO Worldwide.....	7355
0100-0200	WYFR, Florida.....	9555
0115-0200	Radio Berlin International..	6080
0130-0140	Voice of Greece.....	7430, 9395
		9420
0130-0200	HCJB, Ecuador.....	9875, 11775
		15155
0130-0200	Radio Austria International.	9550

0200 UTC [10:00 PM EDT/7:00 PM PDT]

0200-0210	Radio France Int'l.....	5950, 6055
		9790
0200-0230	BBC, England.....	5975, 6005
		6120, 6175
		7325, 9515
		9590, 9915
0200-0230	Kol Israel.....	7465, 9435
		9855
0200-0230	Radio Budapest, Hungary....	6025
0200-0230	Swiss Radio International...	5965, 6135
		9725, 9885
0200-0250	Deutsche Welle, W. Germany..	7285
0200-0256	Radio RSA, South Africa....	6010, 9615

The MT Monitoring Team

Joe Hanlon, PA

Rich Foerster, NE

Greg Jordan, NC

0200-0300	Armed Forces Radio and TV...	6030, 15345
0200-0300	CBC Northern Quebec Service.	6195, 9625
0200-0300	HCJB, Ecuador.....	6205, 9875
		11775
0200-0300 T-A	KVOH, California.....	9495
0200-0300	Radio Australia.....	17795
0200-0300	Radio Bras, Brazil.....	11745
0200-0300	Radio Bucharest, Romania....	5990, 6155
0200-0300	Radio Cairo, Egypt.....	9475, 9675
0200-0300	Radio Havana Cuba.....	6090
0200-0300	Radio Moscow, U.S.S.R.....	5940, 6000
		6070, 6170
		7115, 7150
		7290, 7400
		12050, 13605
		15425
0200-0300	RAE, Argentina.....	9690, 11710
0200-0300	Voice of America.....	5995, 6130
		9455, 9815
		9650, 9775
0200-0300	Voice of Free China, Taiwan.	5985
0200-0300	WCSN, Boston, Mass.....	9815
0200-0300	WHRI, Indiana.....	9850
0200-0300	WRNO Worldwide.....	7355
0200-0300	WYFR, Florida.....	9555, 9680
0215-0300	Radio Berlin International..	6080

0300 UTC [11:00 PM EDT/8:00 PM PDT]

0300-0310	CBC Northern Quebec Service.	6195, 9625
0300-0315 W,A	Radio Budapest.....	6025
0300-0325	Radio Netherland.....	6020, 6165
		9590, 11730
0300-0330	BBC, England.....	5975, 6005
		6120, 6175
		7325, 9515
		9600, 9915
0300-0330	Radio Cairo, Egypt.....	9475, 9675
0300-0330	Radio Kiev, Ukrain SSR.....	7260, 7185
0300-0345	Radio Berlin International..	9560, 9620
0300-0350	Deutsche Welle, West Germany	6010, 6045
		9700
0300-0400	Armed Forces Radio and TV...	6030
0300-0400	CFCX, Montreal, Canada.....	6005
0300-0400	CFRX, Toronto, Canada.....	6070
0300-0400	CFVP, Calgary, Canada.....	6030
0300-0400	CHNX, Halifax, Canada.....	6130
0300-0400	CKFX, Vancouver, Canada....	6080
0300-0400	HCJB, Ecuador.....	6205, 9875
		11775
0300-0400 T-A	KVOH, California.....	9495
0300-0400	Radio Havana Cuba.....	6090
0300-0400	Radio Japan.....	5960
0300-0400	Radio Moscow.....	5940, 6000
		6070, 6170
		7115, 7150
		7165, 7290
		7400
0300-0400	Radio Prague, Czechoslovakia	5980, 7345
0300-0400	Trans World Radio, Bonaire..	9535
0300-0400	Voice of America.....	6035, 7280
		9550, 9575
0300-0400	Voice of Free China, Taiwan.	5985
0300-0400	WCSN, Boston, Mass.....	9815
0300-0400	WRNO Worldwide.....	7355
0313-0400	Radio France International..	6055, 7135
		7175, 9790
		9800
0330-0400	BBC, England.....	5975
0352-0358	Radio Yerevan, Armenian SSR	11790, 13645
		15180

frequency SECTION

0400 UTC [12:00 PM EDT/9:00 PM PDT]	
0400-0430	BBC, London, England..... 5975, 6175 6195, 9410
0400-0430	Swiss Radio International... 6135
0400-0430	Trans World Radio, Bonaire.. 9535
0400-0500	Armed Forces Radio and TV... 6030
0400-0500	CBC Northern Quebec Service. 6195, 9625
0400-0500	CFCX, Montreal, Canada..... 6005
0400-0500	CFRX, Toronto, Canada..... 6070
0400-0500	CFVP, Calgary, Canada..... 6030
0400-0500	CHNX, Halifax, Canada..... 6130
0400-0500	CKFX, Vancouver, Canada..... 6080
0400-0500	HCJB, Ecuador..... 6205, 9875 11775
0400-0500	Radio Havana Cuba..... 6035, 6090
0400-0500	Radio Moscow World Service. 6000, 7150 7185, 9490
0400-0500	Radio New Zealand..... 11780 15180
0400-0500	Radio Sofia Bulgaria..... 7115
0400-0500	RAE, Argentina..... 9690
0400-0500	Voice of America..... 5995, 6035 7280, 9550
0400-0500	Voice of Turkey..... 9575 9560
0400-0500	WCSN, Boston, Mass..... 9465
0400-0500	WHRI, Indiana..... 7400
0400-0500	WRNO Worldwide..... 6185
0400-0500	WYFR, Florida..... 7355
0430-0500	BBC, London, England..... 5975, 6195 9510, 9600

0500 UTC [1:00 AM EDT/10:00 PM PDT]	
0500-0510	CBC Northern Quebec Service 6195
0500-0530	BBC, London..... 5975 6005, 6155 6190, 7160 9510, 9600
0500-0530 S,M	Trans World Radio, Bonaire.. 9535
0500-0550	Deutsche Welle..... 5960, 6130
0500-0600	CFCX, Montreal, Canada..... 6005
0500-0600	CFRX, Toronto, Canada..... 6070
0500-0600	CFVP, Calgary, Canada..... 6030
0500-0600	CHNX, Halifax, Canada..... 6130
0500-0600	CKFX, Vancouver, Canada..... 6080
0500-0600	HCJB, Quito, Ecuador..... 6205, 9875 11775
0500-0600	Radio Havana Cuba..... 6035, 6090 9655
0500-0600	Radio Moscow..... 5905, 7150 7185
0500-0600	Spanish Foreign Radio..... 6125
0500-0600	Voice of America..... 5995, 6030 7280
0500-0600	WCSN, Boston, Mass..... 9465
0500-0600	WHRI, Indiana..... 7400
0500-0600 S	WRNO Worldwide..... 6185
0500-0600	WYFR, Florida..... 11580

0600 UTC [2:00 AM EST/11:00 PM PST]	
0600-0645	WYFR, Florida..... 6065, 7355 9660, 9680
0600-0700	BBC, London..... 5975, 7150 9410, 9600
0600-0700	CFCX, Montreal, Canada..... 6005
0600-0700	CFRX, Toronto, Canada..... 6070
0600-0700	CFVP, Calgary, Canada..... 6030
0600-0700	CKFX, Vancouver, Canada..... 6080
0600-0700	CHNX, Halifax, Canada..... 6130
0600-0700	HCJB, Quito, Ecuador..... 6205, 9845 9875, 11775

0600-0700	Voice of America..... 6035, 6080 6090, 6125 7325, 9530 9540, 9550
0600-0700	WHRI, Indiana..... 6100, 7400
0600-0700 S	WRNO Worldwide..... 6185
0615-0630	Radio Canada International.. 6140
0630-0700	Radio Tirana..... 9500
0645-0700	Radio Canada Intrnationa.... 6140

0700 UTC [3:00 AM EDT/12:00 AM PDT]	
0700-0730	BBC, London..... 5975, 6195 7120, 7150 7185, 9410 9600, 9640
0700-0730	Radio Australia..... 11860
0700-0800	HCJB, Ecuador..... 5995, 9655 6130, 9745 9845, 11925
0700-0800	Radio Moscow..... 11835 7290
0700-0800	Voice of Free China..... 5985
0700-0800	WCSN, Boston, Mass..... 7365
0700-0800	WHRI, Indiana..... 6100, 7400
0700-0800 S	WRNO Worldwide..... 6185
0700-0800	WSZO, Marsall Island..... 4940
0700-0800	WYFR, Florida..... 6065, 7355 9660, 9680 11580

0800 UTC [4:00 AM EDT/1:00 AM PDT]	
0800-0825 M-F	BRT, Belgium..... 9880
0800-0825	Radio Netherlands..... 9630, 9715
0800-0830	HCJB, Quito, Ecuador..... 6130, 9745 9845, 11835
0800-0835 S	FEBA, Seychelles..... 11925
0800-0900	BBC, London..... 15115 7150, 9410 9600, 9640
0800-0900	Radio Australia..... 11860, 12095 5995, 6080 9580, 9655
0800-0900	RTE Portugal..... 11720 9670
0830-0900	HCJB, Quito, Ecuador..... 6130, 9745 11925
0830-0900	Swiss Radio International... 9560, 9885 11905, 15570

0900 UTC [5:00 AM EDT/2:00 AM PDT]	
0900-0915	BBC, London..... 9410, 11860 12095, 15070 15400, 17790
0900-0925	Radio Netherlands..... 17575, 21485
0900-0930	Radio Australia..... 9580, 9655 9710, 11720
0900-1000	AFRTS..... 6030
0900-1000	Deutsche Welle..... 9720
0900-1000	HCJB, Quito, Ecuador..... 6130, 9745 11925
0915-1000	BBC, London..... 11750
0930-1000	Radio Australia..... 9580, 9655 9710

1000 UTC [6:00 AM EDT/3:00 AM PDT]	
1000-1030	Radio Australia..... 9580, 9770
1000-1100	ABC, Perth, Australia..... 9610
1000-1100	AFRTS..... 6030, 9530 9700
1000-1100	BBC, London..... 9750, 9760 12095
1000-1100	CFRX, Toronto, Canada..... 6070
1000-1100	HCJB, Quito, Ecuador..... 6130
1030-1100	Radio Australia..... 9580, 9770
1030-1100	Radio Netherland..... 6020, 9650

1100 UTC [7:00 AM EDT/4:00 AM PDT]	
1100-1125	Radio France Int'l, Paris.. 9790, 11670 11690, 11845 15365, 17720
1100-1125	Radio Netherland..... 6020, 9650
1100-1130	HCJB, Ecuador..... 6130, 11925
1100-1130	Radio Australia..... 5995, 6080 7215, 9580 9710, 9770 11705, 11800
1100-1130	Radio Japan General Service. 6120
1100-1130	Voice of America..... 9760
1100-1200	ABC, Perth, Australia..... 9610
1100-1200	AFRTS..... 6030, 9700
1100-1200	BBC, London..... 5965, 6195 9510, 11775 12095
1100-1200	CFCX, Montreal, Canada..... 6005
1100-1200	CFRX, Toronto, Canada..... 6070
1100-1200	CFVP, Calgary, Canada..... 6030
1100-1200	CHNX, Halifax, Canada..... 6130
1100-1200	CKFX, Vancouver, Canada..... 6080
1100-1200	KYOI, Saipan..... 11900
1100-1200	Radio Beijing..... 11855
1100-1200	Radio Moscow..... 13755, 15225 15375
1115-1200	TWR, Bonaire..... 11815
1130-1200	HCJB, Quito, Ecuador..... 11740
1130-1200	Radio Australia..... 5995, 6060 6080, 7215 9580, 9710
1145-1200	Radio Berlin Intl..... 15240

1200 UTC [8:00 AM EDT/5:00 AM PDT]	
1200-1215 M-A	Vatican Radio..... 17865, 21485
1200-1225	Radio Netherland..... 15560, 17605
1200-1230	Radio Australia..... 5995, 6060 6080, 7205 7215, 9580 9710, 9770
1200-1230	Radio Berlin Intl..... 15240
1200-1230	Radio Tashkent..... 7325
1200-1242	Trans World Radio Bonaire.. 11815
1200-1300	ABC, Wanneroo, Australia... 9610
1200-1300	AFRTS..... 6030, 6125 9700, 15430
1200-1300	BBC, London..... 6195, 9510 11775, 12095 15070, 17705 17790
1200-1300	CFCX, Montreal, Canada..... 6005
1200-1300	CFRX, Toronto, Canada..... 6070
1200-1300	CFVP, Calgary, Canada..... 6030
1200-1300	CHNX, Halifax, Canada..... 6130
1200-1300	CKFX, Vancouver, Canada..... 6080
1200-1300	HCJB, Quito, Ecuador..... 11740, 15115 17890



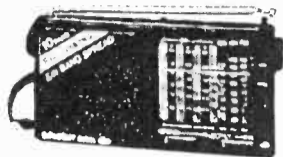
SHORTWAVE HEADQUARTERS

Our 17th Year! Order Toll Free 800-368-3270
EEB—The Nation's Leading SWL Supplier



SMALL PORTABLES

DIPLOMAT 4950 \$99.95 VALUE
INTRODUCTORY PRICE
\$69.95
\$4.00 UPS



The perfect radio for the person on the go!

- Medium wave AM 550-1670 kHz.
- FM 88 to 108 with stereo head set out.
- Shortwave 2.3 to 5 MHz continuous 120, 90, 75 and 60 meter bands (not covered by Sony ICF 4910) and 49, 41, 31, 25, 19, 16 and 13 meter band each expanded for easy tuning.

"AC Adapter Optional \$9.95 (SPA4.5)"



SONY ICF-4920
\$99.95
+ \$4.00 UPS
LIST \$129.95!

- FM & AM
- Seven Short Wave Bands!
- FREE earphone, carrying case & shortwave guide.
- OPTIONAL AC Adapter AC-39 \$14.94

SANGEAN ATS-801
\$99.95
+ \$4.00 UPS
LIST \$199.95



- SW 5.8-15.5 MHz FM 88-108 MHz
- LW 155-281 MW530-1620 kHz
- 25 Program Memories
- Digital Frequency & Clock Readout
- Manual or Autotone
- Same Weight and Size as SONY ICF 2002
- Free 100 Page SWL Book

Optional A.C. Adapter SPA-6 \$9.95

DXers Dream
TOSHIBA RP-F11

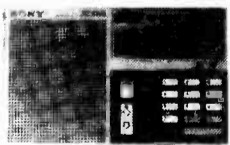


- Covers all International & Tropical Bands
 - S Meter, Safety Off Lock
- SAVE \$40.00 SALE \$79.95**
"One of the finest receivers available under \$130.00"
List \$129.95 \$4.00 UPS
Optional AC wall adapter TAC 64 \$11.95

SONY ICF 2003 \$4.00 UPS

- Ultimate compact HiTech at an affordable price
- 25% size of famous SONY ICF 2001, SONY's best seller
- 150 kHz - 30 MHz
- AM, FM
- Memories
- Keyboard entry
- Scan
- 24 hour clock

Sale Price **\$239.95** A.C. Adapter SPA6...\$9.95



DATA BASE INTERNATIONAL
1987 Edition \$9.95

- Up-to-date Picture of SW Broadcasting.
- Frequency by Frequency, Hour by Hour.
- Station Name, Location, Frequency, Time, Language, Target Area, Power.
- Innovative Computer Display. Makes Easy Reading of Complex Information.
- In-depth Equipment Review.



NOW while supplies last \$9.95 + \$1.95 UPS

LARGER PORTABLES

EEB 2020
NEWEST HIGH TECH RECEIVER
\$299.95 VALUE
INTRODUCTORY PRICED
\$179.95 \$6.00 UPS



- High stability for good CW-SSB-RTTY reception.
- AM button allows full coverage of 150 kHz to 30 MHz.
- FM button allows full coverage of 88-108 MHz.
- Multimode AM-FM-CW-SSB allow full coverage of commercial traffic, Amateur, aircraft, ship at sea, & more!
- 9 programmable memories.
- Same size & weight as SONY ICF 2010.

FREE AC Adapter & Radio Stand
Mention this AD (\$24.90 value)

FREE ONE YEAR WARRANTY!

SONY ICF 2010

- 150 kHz to 30 MHz, AM, CW, SSB
- 76 MHz to 108 MHz FM
- 116 MHz to 136 MHz AM Air Band
- 32 Programmable Memories
- 4 Event Timer
- Synchronous Detector
- Wide/Narrow Bandwidth

\$6.00 UPS

FREE RADIO STAND (\$9.95 value)



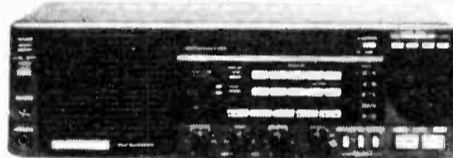
IN STOCK!

"This is one of the finest receivers available today under \$500."

A.C. Adapter Included **Sale Price \$329.95**

DESK TOP RADIOS

R-2000 KENWOOD
\$499.95
\$8.00 UPS



Kenwood offers a communication receiver to suit your listening pleasure. It covers the full spectrum: Long, Medium, and Shortwave. AM-CW-SSB-FM Wide-Narrow Selectivity, Noise Blanker, and more.

VHF Converter (VC-10).....\$149.95

YAESU FRG-8800
\$619.95
+ \$8.00 UPS
150 KHZ-30 MHz



- CAT computer compatible
- 12 memories—scan—RIT
- Keyboard frequency entry
- Dual 24 hour clock timer recorder control
- Optional FRV8800 VHF converter 118-174 MHz \$119
- All mode AM-SSB-CW-FM
- Green LCD display
- 150 KHz to 30 MHz

KENWOOD R-5000



\$749.95
\$8.00 UPS

All-Band All-Mode Receiver Covers
100 kHz-30 MHz (108-174 MHz with VC-20 option)

- 100 Memory Channels
- Direct Keyboard Frequency Entry
- Programmable Scanning (Center-Stop Tuning)
- Computer Control Option
- Built-In Power Supply
- Many More Options Available.

Special Introductory Price...\$749.95
VC-20 Option...\$169.95
Service manual order: SMR5000 price: \$25.00

DESK TOP CONT.

ICOM R71A **\$799.00**



- 100 kHz to 30 MHz
- Keyboard entry
- 32 programmable memories
- SSB-CW-AM-RTTY (FM optional)
- Wide dynamic range
- Digital PLL
- Memory scan
- Band pass & notch tuning
- Computer control via MEC 71A & C64
- See ICOM's ads for more details

ICOM Options Free installation when purchased with your R71A from EEB

- CK-70: DC Kit for 13.8 VDC operation
- CR-64: High stability oscillator
- CR-70: DC kit for VDC operation
- EX309: Computer interface connector
- EX310: Voice synthesizer
- FL32A: CW narrow filter (500 Hz)
- FL44A: Crystal filter (2.4 KHz)
- FL63A: CW narrower filter (250 Hz)
- RC-11: Infrared remote control

Service Manual SMR71A \$25.00 + \$4.00 UPS

EEB HP Options

R71 (HP) High Performance. EEB has the reputation of excellence when it comes to R71A modifications. Many of our modifications are proprietary and not offered by any other source. EEB now offers a package deal including our most popular option—known as the R71(HP) High Performance and includes the following:

- 24 hour bench test.
 - Narrow filter (choice of 3, see below). Replaces stock ceramic SSB filter. Improved selectivity and shape factor.
 - Front end upgrade—improves dynamic range (plus) preamp enabled below 1600 KHz.
 - 4 KHz filter replaces stock. 6 KHz wide filter—improves AM selectivity.
 - Audio output modification—increases audio output; reduces distortion.
 - AGC time constant changed to better suit SW listening.
 - Spike protection added.
 - RFI line filter.
 - Installation of ICOM options purchased with your R71A HP.
 - Final alignment and overall checkout.
 - Free extended 6 month warranty.
- | | |
|--|-----------|
| R71HP (MF) Mechanical Filter | add \$200 |
| R71HP (XF) 8 Pole, 2.4 KHz xtal filter | add \$250 |
| R71HP (XFS) Super 2.1 KHz filter | add \$300 |

NRD-525 General Coverage Receiver

- 90 kHz to 34 MHz
- Options for 34-60 MHz, 114-174 MHz and 423-456 MHz
- 200 Memory Channels
- 2 Clocks/Timer To Control Radio & Extra Equipment (tape recorder)
- Computer Interface Option.



\$8.00
Sale Price UPS
\$1179.00

IBS WHITE PAPER

Larry Magne - a name you can trust - 'speaks out' with detailed test reports. Know the facts before you buy!

- RD2: ICOM ICR71A
- RD3: KENWOOD R5000
- RD4: HOW TO Interpret Specifications
- RD5: JAPAN RADIO NRD 525
- RD6: YAESU FRG8800
- RD7: LOWE HF125
- RD8: SWL ANTENNAS
- RD9: SONY ICF2010

\$12.00 FOR 3 + \$1.95 POST



frequency SECTION

1200-1200	Radio Moscow.....	9600, 13680, 13710, 13755, 15155, 15225, 15375, 15560, 17645, 17820	
1200-1300	WHRI, Indiana.....	5995, 11790	
1200-1300	WYFR, USA.....	9680	
1200-1256	Radio Beijing.....	9645, 9665, 11855	
1230-1300	Radio Austria International	15320	

1300 UTC [9:00 AM EDT/6:00 AM PDT]

1300-1330	BBC, London.....	6195, 9510, 11775, 12095, 15070, 17705, 17780, 17790, 18080, 21970	
1300-1330	Radio Australia.....	5995, 6060, 7205, 9580	
1300-1330	Radio Finland.....	15400, 11945	
1300-1330 S	Radio Norway International.	15310	
1300-1337 A-S	TWR, Bonaire.....	11815	
1330-1355 S	Radio Finland.....	11945, 15400	
1300-1400	ABC Waneroo, Australia.....	9610	
1300-1400	AFRTS.....	9700, 15430	
1300-1400	CFCX, Montreal, Canada.....	6005	
1300-1400	CFRX, Toronto, Canada.....	6070	
1300-1400	CFVP, Calgary, Canada.....	6030	
1300-1400	CHNX, Halifax, Canada.....	6130	
1300-1400	CKFX, Vancouver, Canada.....	6080	
1300-1400	CKZU, Vancouver, Canada.....	6160	
1300-1400	HCJB, Quito, Ecuador.....	11740, 15115, 17890	
1300-1400 S	Radio Canada Int'l.....	9625, 11855, 15440, 17820	
1300-1400	Radio Korea.....	15575	
1300-1400	Radio Moscow.....	11840, 13755, 15375	
1300-1400	Radio RSA, South Africa....	21590	
1300-1400	WHRI, Indianapolis.....	11790	
1300-1400	WYFR, USA.....	9680	
1330-1400	BBC, London.....	12095, 15070	
1330-1355 M-A	BRT, Belgium.....	15590	
1330-1400	Radio Australia.....	9580	
1330-1400	Radio Berlin International.	17880	
1330-1400	Swiss Radio International..	15570, 17830	
1330-1400	U.A.E. Radio.....	15435, 17865, 21605	

1400 UTC [10:00 AM EDT/7:00 AM PDT]

1400-1415	Radio Berlin International	17880	
1400-1430	Radio Australia.....	9580	
1400-1430	Radio Finland.....	11945, 15400	
1400-1430 S	Radio Norway International.	15245, 15310	
1400-1430	R.Stn Peace & Progress USSR	15470	
1400-1430	Radio Sweden International.	15345	
1400-1500	ABC Perth, Australia.....	9610	
1400-1500	AFRTS.....	9700, 15330, 15430	
1400-1500 A,S	BBC, London.....	9510, 11775	
1400-1500	BBC, London.....	12095, 15070, 17790	
1400-1500	CBC Northern Quebec Service.	9625, 11720	
1400-1500	CFCX, Montreal, Canada.....	6005	
1400-1500	CFRX, Toronto, Canada.....	6070	
1400-1500	CFVP, Calgary, Canada.....	6030	
1400-1500	CHNX, Halifax, Canada.....	6130	
1400-1500	CKFX, Vancouver, Canada.....	6080	
1400-1500	HCJB, Quito, Ecuador.....	11740, 15115, 17890	
1400-1500 S	Radio Canada International.	9625, 11720, 11955, 15440	
1400-1500	Radio Moscow.....	11840, 13680, 13755, 15225, 15320, 15375, 15470, 15475, 15530, 15545, 17820	
1400-1500	Radio RSA, South Africa....	17825, 21590	
1400-1500	WHRI, Indiana.....	11790	

1400-1500	WYFR, USA.....	9680, 11830	
1430-1500 S	Radio Finland.....	11945, 15400	
1430-1500	Radio Netherland.....	11735, 13770, 15560	

1500 UTC [11:00 AM EDT/8:00 AM PDT]

1500-1530	HCJB, Quito, Ecuador.....	11740, 15115, 17890	
1500-1530	Radio Netherland.....	13770	
1500-1550	Deutsche Welle.....	21600	
1500-1556	Radio RSA, South Africa....	17825, 21590	
1500-1600	AFRTS.....	9700, 15330, 15430	
1500-1600	BBC, London.....	11750, 12095, 15070, 15400, 15420	
1500-1600 A,S	BBC, London.....	11775, 15260	
1500-1600	CBC Northern Quebec Service.	9625, 11720	
1500-1600	CFCX, Montreal, Canada.....	6005	
1500-1600	CFRX, Toronto, Canada.....	6070	
1500-1600	CFVP, Calgary, Canada.....	6030	
1500-1600	CKFX, Vancouver, Canada.....	6080	
1500-1600	CHNX, Halifax, Canada.....	6130	
1500-1600	Radio Australia.....	9580	
1500-1600 S	Radio Canada International.	9625, 11720, 11955, 15440	
1500-1600	Radio Japan General Service	21700	
1500-1600	Radio Moscow.....	11840, 13680, 13755, 15375, 15420, 15475, 15545	
1500-1600	Voice of America.....	15205	
1500-1600	WYFR, Florida.....	9680, 15375	
1515-1600	Radio Berlin International	15240	
1530-1600	Radio Yugoslavia.....	15240	
1530-1600	Swiss Radio International..	15430, 17830	

1600 UTC [12:00 PM EDT/9:00 AM PDT]

1600-1630	Radio Sweden Int'l.....	15235	
1600-1640	UAE Radio.....	11730, 15320	
1600-1700	AFRTS.....	15330, 15430	
1600-1700	BBC, London.....	11775, 12095, 15070, 15260, 15400	
1600-1700	CFCX, Montreal, Canada.....	6005	
1600-1700	CHNX, Halifax, Canada.....	6130	
1600-1700	CFRX, Toronto, Canada.....	6070	
1600-1700	CFVP, Calgary, Canada.....	6030	
1600-1700	CKFX, Vancouver, Canada.....	6080	
1600-1700	Radio France International.	11705, 17620	
1600-1700	Radio Moscow.....	9765, 11840, 13755, 15205	
1600-1700	Voice of America.....	15410, 15580, 15600, 17785, 17800, 17870	
1600-1700	WHRI, Indiana.....	15105	
1600-1700	WRNO Worldwide.....	11965	
1600-1700	WYFR, Florida.....	11830	
1630-1700	Radio Netherland.....	13700, 15570	

1700 UTC [1:00 PM EDT/10:00 AM PDT]

1700-1730	Radio Netherlands.....	13700, 15570	
1700-1730 S	Radio Norway International.	15310	
1700-1730	Swiss Radio International..	9535	
1700-1745	BBC, England.....	9410, 11775, 12095, 15070, 15260, 15400	
1700-1800	AFRTS.....	15330, 15430, 17880	
1700-1800	CBC, N. Quebec, Canada....	9625	
1700-1800	CFCX, Montreal, Canada.....	6005	
1700-1800	CFRX, Toronto, Canada.....	6070	
1700-1800	CFVP, Calgary, Canada.....	6030	
1700-1800	CHNX, Halifax, Canada.....	6130	

1700-1800	CKFX, Vancouver, Canada....	6080	
1700-1800	CKZU, Vancouver, Canada....	6160	
1700-1800	Radio Moscow.....	9490, 9625, 9765, 9880, 11840, 13755, 15410, 15445, 15580, 15600, 17785, 17800, 17870	
1700-1800	Voice of America.....	15410, 15445, 15580, 15600, 17785, 17800, 17870	
1700-1800	WCSN, Massachusetts.....	15225	
1700-1800	WHRI, Indiana.....	15105	
1700-1800	WRNO Worldwide.....	11965	
1700-1800	WYFR, Florida.....	11580, 11830	
1745-1800	BBC, London.....	9410, 12095, 15070, 15400	

1800 UTC [2:00 PM EDT/11:00 AM PDT]

1800-1830	Radio Canada International	17820	
1800-1830	Radio Prague, Czechoslovakia	9725	
1800-1900	AFRTS.....	15330, 15430	
1800-1900	BBC, London.....	9410, 12095, 15070, 15400	
1800-1900	CBC, N. Quebec Service....	9625, 11720	
1800-1900	CFCX, Montreal, Canada.....	6005	
1800-1900	CFRX, Toronto, Canada.....	6070	
1800-1900	CFVP, Calgary, Canada.....	6030	
1800-1900	CKFX, Vancouver, Canada....	6080	
1800-1900	CKZU, Vancouver.....	6160	
1800-1900	Radio Moscow.....	9625, 9765, 9825, 9880, 11840	
1800-1900	Radio Kuwait.....	11665	
1800-1900	Voice of America.....	11760, 15410, 15580, 15600, 17785, 17800, 17870	
1800-1900	WCSN, Boston, Mass.....	21515	
1800-1900	WMLK, Bethel, PA.....	9455	
1800-1900	WRNO Worldwide.....	15420	
1800-1900	WYFR.....	11580, 11830	
1830-1900	Swiss Radio International..	9885	
1830-1900 A,S	Radio Canada International	17820	
1830-1900	Radio Netherlands.....	9540, 17605, 21685	
1830-1900	Spanish Foreign Radio.....	15375	
1830-1900	Radio Havana Cuba.....	11795	

1900 UTC [3:00 PM EDT/12:00 PM PDT]

1900-1925	Radio Netherland.....	9540, 17605, 21685	
1900-1930	Spanish Foreign Radio.....	15375	
1900-2000	AFRTS.....	15330, 15430	
1900-2000	BBC, London.....	9410, 9515, 15070	
1900-2000	CBC Northern Quebec Serv....	9625, 11720	
1900-2000	CFCX, Montreal, Canada.....	6005	
1900-2000	CFRX, Toronto, Canada.....	6070	
1900-2000	CFVP, Calgary, Canada.....	6030	
1900-2000	CKFX, Vancouver, Canada....	6080	
1900-2000	CKZU, Vancouver, Canada....	6160	
1900-2000	HCJB, Ecuador.....	17790	
1900-2000	Radio Havana Cuba.....	11795	
1900-2000	Radio Kuwait.....	11665	
1900-2000	Radio Moscow.....	9720, 9765, 9825, 11840	
1900-1957	Radio Prague, Czechoslovakia	15155	
1900-2000	Voice of America.....	9760, 11760, 15410, 15445, 15580, 17785, 17800, 17870	
1900-2000	WCSN, Boston, Mass.....	21515	
1900-2000	WMLK, Bethel, PA.....	9455	
1900-2000	WRNO Worldwide.....	15420	
1900-2000	WYFR, Okeechobee, Florida..	11830	
1930-2000	Radio Bucharest, Romania....	9690, 11940	
1930-1955	Radio Finland.....	11755	
1930-2000	Radio Sofia Bulgaria.....	9700, 11720	
1935-1955	RAI, Italy.....	9710	
1945-2000	Radio Berlin International	15170	
1950-2000	Vatican Radio.....	7250, 9645	

frequency SECTION

2000 UTC [4:00 PM EDT/1:00 PM PDT]

2000-2030	Kil Israel.....	9435, 11610
2000-2030	Radio Berlin International	15170
2000-2025	Radio Bucharest, Romania...	9690, 11940
2000-2030	Radio Budapest, Hungary.....	9835, 11910
2000-2030 M-F	Radio Canada International.	5995, 7235 11945, 15325
2000-2030 S	Radio Norway International..	9655, 15225
2000-2100	AFRTS.....	15430
2000-2100	BBC, London.....	6175, 9410 12095, 15070 15260
2000-2100	CBC Northern Quebec Svc.....	9625, 11720
2000-2100	CFCX, Montreal, Canada.....	6005
2000-2100	CFRX, Toronto, Canada.....	6070
2000-2100	CFVP, Calgary, Canada.....	6030
2000-2100	CHNX, Halifax, Canada.....	6130
2000-2100	CKFX, Vancouver, Canada.....	6080
2000-2100	CKZV, Canada.....	6160
2000-2100	Radio Moscow.....	9720, 9765 9825, 11840
2000-2100	Voice of America.....	9700, 9760 11760, 15410 15445, 15580 17800, 17785 17870
2000-2199	WCSN, Boston, Mass.....	11695
2000-2100	WRNO, Worldwide.....	15420
2000-2100	WYFR, Okeechobee, Florida..	9850, 11830 21525
2005-2100	Radio Damascus Syria.....	11625, 12085
2015-2100	Radio Cairo, Egypt.....	9670
2030-2100	Radio Netherland.....	9540, 9715 9895, 11740 13700

2100 UTC [5:00 PM EDT/2:00 PM PDT]

2100-2115	Radio Cairo, Egypt.....	9670
2100-2125 S-F	CBC Northern Quebec Service.	9625, 11720
2100-2125	Radio Netherland.....	9540, 9715 9895, 11740 13700
2100-2130	Radio Budapest, Hungary.....	9835, 11910
2100-2130 M-F	Radio Canada Int'l.....	5995, 7130 11945, 15325 17820, 17875

2100-2130	Swiss Radio Int'l.....	9885, 12035 15570
2100-2150	Voice of Turkey.....	7215
2100-2156	Radio RSA.....	9585, 11900
2100-2200	AFRTS.....	15330, 15345 15430
2100-2200	BBC, London.....	6005, 6175 6195, 7325 9410, 12095 15070, 15260
2100-2200	CFCX, Montreal, Canada.....	6005
2100-2200	CFRX, Toronto, Canada.....	6070
2100-2200	CFVP, Calgary, Canada.....	6030
2100-2200	CHNX, Halifax, Canada.....	6130
2100-2200	CKFX, Vancouver, Canada.....	6080
2100-2200	KVOH, California.....	17775
2100-2200v	Radio Jamahiriya, Libya.....	7235
2100-2200	Radio Moscow.....	7105, 7115 7400, 9735 9765, 11840
2100-2200	Voice of America.....	6045, 9760 11760, 15220 15410, 15445 15580, 17720 17785, 17800 17870
2100-2200	WCSN, Boston, Mass.....	11695
2100-2200	WHRI, Indiana.....	9770
2100-2200	WRNO, Louisiana.....	15420
2100-2200	WYFR, Okeechobee, Florida..	9850, 11830 15375
2105-2200	Radio Damascus, Syria.....	11625
2130-2200 T,F	BBC Falklands Service.....	9915
2130-2200 S-F	CBC Northern Quebec Service	9625, 11720
2130-2200	HCJB, Quito, Ecuador.....	15270, 17790
2130-2200	Radio Canada International.	5995, 7130 11945, 15325 17820, 17875 7115, 9700
2130-2200	Radio Sofia, Bulgaria.....	7115, 9700
2145-2200	Radio Berlin International	6125

2300 UTC [7:00 PM EDT/4:00 PM PDT]

2300-2330	BBC, London.....	5975, 6005 6120, 6175 6195, 7325 9410, 9590 9915, 9515 12095
2300-2330	Radio Canada International..	9755, 11730
2300-2330	Radio Korea, South.....	15575

2300-2330	Radio Sweden International..	9695, 11705
2300-2330	Radio Vilnius.....	7260, 7185 13645, 15180 11790
2300-2330	WRNO, Louisiana.....	9495
2300-2345	Radio Berlin International..	6125, 11750
2300-0000	AFRTS.....	6030, 15345
2300-0000 A,S	CBC Northern Québec Service.	6195, 9625
2300-0000	CFCX, Montreal, Canada.....	6005
2300-0000	CFRX, Toronto, Canada.....	6070
2300-0000	CFVP, Calgary, Canada.....	6030
2300-0000	CHNX, Halifax, Canada.....	6130
2300-0000	CKFX, Vancouver, Canada.....	6080
2300-0000	CKZU, Vancouver.....	6160
2300-0000	KVOH, California.....	17775
2300-0000	Radio Australia.....	17795
2300-0000	Radio Japan.....	11800
2300-0000	Radio Moscow, U.S.S.R.....	6170, 7115 7135, 7400 12050
2300-0000	Radio Moscow World Service	17685, 17850
2300-0000	Voice of Turkey.....	9560
2300-0000	WCSN, Boston, Mass.....	9465
2300-0000	WHRI, Indiana.....	11770
2300-0000	WYFR, Florida.....	11580, 15440
2330-0000	BBC, London.....	5975, 6005 6120, 6175 7325, 9410 9515, 9590 9915, 12095
2330-0000	WRNO Worldwide.....	7355

2200 UTC [6:00 PM EDT/3:00 PM PDT]

2200-2215 M-F	Voice of America.....	9640, 11740 15120
2200-2225	BRT, Belgium.....	9675
2205-2225	Vatican Radio.....	6015, 9615
2200-2225	RAI, Italy.....	5990, 9710
2200-2230	All India Radio.....	9910, 11620
2200-2230	CBC Northern Quebec Service	9625, 11720
2200-2230	Radio Berlin Int'l.....	6125
2200-2230	Radio Canada International..	5960, 9755
2200-2230	WRNO Worldwide.....	11705
2200-2300	AFRTS.....	6030, 15345 15430
2200-2300	BBC, London.....	5975, 6005 6120, 6175 6180, 7325 9410, 9515 9590, 9915 12095, 15070
2200-2300	CFCX, Montreal, Canada.....	6005
2200-2300	CFRX, Toronto, Canada.....	6070
2200-2300	CFVP, Calgary, Canada.....	6030
2200-2300	CHNX, Halifax, Canada.....	6130
2200-2300	CKFX, Vancouver, Canada.....	6080
2200-2300	CKZU, Vancouver.....	6160
2200-2300	KVOH, California.....	17775
2200-2300	Radio Australia.....	15160, 15240 15320, 15395 17795
2200-2300	Radio Baghdad.....	9875
2200-2300 M-F	Radio Canada International	11960, 15325
2200-2300	Radio Moscow.....	6170, 7105 7115, 7135 7160, 7260 7400, 9490 9710
2200-2300	Voice of America.....	11760, 15220 15290, 17720
2200-2300	Voice of Free China, Taiwan	9455, 9955 11900
2200-2300	WCSN, Boston, Mass.....	9465
2200-2300	WHRI, Indiana.....	9770
2200-2300	WYFR, Florida.....	11830, 15375
2215-2230	Radio Yugoslavia.....	7240, 9620
2230-2300 A,S	CBC Northern Quebec Service.	9625, 11720
2230-2300	Kof Israel.....	7465, 9010 9435, 11610
2230-2300	Radio Korea, South.....	15575
2230-2300	Radio Sofia.....	9700, 11720
2230-2300	WRNO Worldwide.....	9495
2245-2300	GBC1 Ghana.....	3366, 4915

Support Your MT Advertisers

THEY DESERVE IT!

Did you know that without the aid of advertising copy your subscription costs would be a lot higher? Think about it next time you need to order that book or receiver or accessory. Their advertisement is a vote of confidence that MT readers are active radio monitors ...

Your order from them is your vote of thanks!

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, 118-174, 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 won't 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

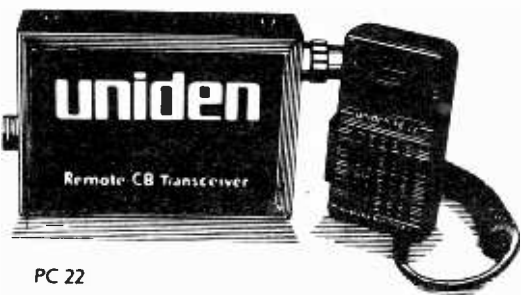
List price \$259.95/CE price \$139.95/SPECIAL
7-Band, 45 Channel • No-crystal scanner
Bands: 30-50, 118-136, 144-174, 440-512 MHz.
The Regency Z45 is very similar to the Z60 model listed above however it does not have the commercial FM broadcast band. The Z45, now at a special price from Communications 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: 29-54, 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. RDO01-1 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 listening 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 SH 88-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 9 1/4" x 4 1/2" x 12 1/2."

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! BC 70XLT-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 Intelligence, 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
USAK-RA 3/4" hole mount VHF ant. w/ 17' cable.... \$35.95
Add \$3.00 shipping for all accessories ordered at the same time.
Add \$12.00 shipping per shortwave receiver.
Add \$7.00 shipping per radio and \$3.00 per antenna.

BUY WITH CONFIDENCE

To get the fastest delivery from CE of any scanner, send or phone your order directly to our Scanner Distribution Center™. Michigan residents please add 4% sales tax or supply your tax I.D. number. Written purchase orders are accepted from approved government agencies and most well rated firms at a 10% surcharge for net 10 billing. All sales are subject to availability, acceptance and verification. All sales on accessories are final. Prices, terms and specifications are subject to change without notice. All prices are in U.S. dollars. Out of stock items will be placed on backorder automatically unless CE is instructed differently. A \$5.00 additional handling fee will be charged for all orders with a merchandise total under \$50.00. Shipments are F.O.B. Ann Arbor, Michigan. No COD's. Most products that we sell have a manufacturer's warranty. Free copies of warranties on these products are available prior to purchase by writing to CE. Non-certified checks require bank clearance. Not responsible for typographical errors.

Mail orders to: Communications Electronics™, Box 1045, Ann Arbor, Michigan 48106 U.S.A. Add \$7.00 per scanner for R.P.S./U.P.S. ground shipping and handling in the continental U.S.A. For Canada, Puerto Rico, Hawaii, Alaska, or APO/FPO delivery, shipping charges are three times continental U.S. rates. If you have a Discover, Visa or Master Card, you may call and place a credit card order. Order toll-free in the U.S. Dial 800-USA-SCAN. In Canada, order toll-free by calling 800-221-3475. FTCC Telex any-time, dial 825333. If you are outside the U.S. or in Michigan dial 313-973-8888. Order today.

Scanner Distribution Center™ and CE logos are trademarks of Communications Electronics Inc.
† Bearcat is a registered trademark of Uniden Corporation.
‡ Regency and Turbo Scan are registered trademarks of Regency Electronics Inc. AD #080187-RA

Copyright © 1987 Communications Electronics Inc.

For credit card orders call
1-800-USA-SCAN

**COMMUNICATIONS
ELECTRONICS INC.**

Consumer Products Division

P.O. Box 1045 □ Ann Arbor, Michigan 48106-1045 U.S.A.
Call 800-USA-SCAN or outside U.S.A. 313-973-8888

Time and Frequency Standard Stations Worldwide

To the shortwave listener, WWV (Fort Collins, Colorado), WWVH (Kauai, Hawaii) and CHU (Ottawa, Ontario) have become synonymous with time and frequency calibration. But unknown to the majority of listeners, dozens of similar stations may be heard with favorable propagation from all points of the globe.

This month *MT* takes a look at all of these stations whose primary

purpose is to provide standard frequency and/or time reference for its users, most often military and government interests. It is additionally useful for the listener as a propagation indicator for reception quality from different parts of the earth.

The list below is compiled from the July 1986 edition of the U.S. Army MARS Field Manual FM 11-490-7.

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the Time Signals
BSF	Taiwan Rep. of China	5000	Between min 00-05, 10-15, 20-25, 30-35, 40-45, 50-55 from 0100-0900	Second pulses of 5 ms duration. Minute marker is pulse of 300 ms duration. During 29th and 59th min., Morse code and Chinese voice announcement of time. Second markers for DUT1 are pulses of 100 ms.
CHU	Ottawa Canada +45°18' +75°45'	3330 7335 14670	continuous	Second pulses of 300 cycles of a 1 kHz modulation. Minute pulses are 0.5 s long. A bilingual (Fr.-Eng.) announcement of time is made each minute. DUT1: CCIR code by split pulses
DAM	Elmshorn Germany, F.R. +53°46' - 9°40'	8638.5 16980.4 4625 8638.5 6475.5 12763.5	11 h 55 m to 12 h 6 m 23 h 55 m to 24 h 6 m from 21 Sept. to 20 March 23 h 55 m to 24 h 6 m from 21 March to 20 Sept.	New international system, then Second pulses from minutes 0.5 to 6.0 (Minute pulses prolonged). A1 type. DUT1: CCIR code by doubling after Minute pulses 1 to 5
DAN	Osterloog Germany, F.R. +53°38' - 7°12'	2614	11 h 55 m to 12 h 6 m 23 h 55 m to 24 h 6 m	As DAM (see above)
DAO	Kiel Germany, F.R. +54°26' -10° 8'	2775	11 h 55 m to 12 h 6 m 23 h 55 m to 24 h 6 m	As DAM (see above)
DCF77	Mainflingen Germany, F.R. +50° 1' - 9° 0'	77.5	continuous, except second Tuesday of every month from 4 h to 8 h	The Second marks are reduction to 1/4 of the carrier's amplitude of 0.1 s duration; the reference point is the beginning of the pulse modulation. The second 59 marker is omitted. DUT1: CCIR code by lengthening to 0.2 s
DGI	Granicburg Germ. Dem. Rep. +52°48' -13°24'	185	5 h 59 m 30 s to 6 h 00 m 11 h 59 m 30 s to 12 h 00 m 17 h 59 m 30 s to 18 h 00 m	A2 type Second pulses of 0.1 s duration for seconds 30-40, 45-50, 55-60. The last pulse is prolonged.
DIZ	Nauert Germ. Dem. Rep. +52°39' -12°55'	4525	continuous except from 8 h 15 m to 9 h 45 m for maintenance if necessary	A1 type Second pulses of 0.1 s duration. Minute pulses prolonged to 0.5 s. Hour pulses marked by prolonged pulses for seconds 58, 59, 60. DUT1: CCIR code by double pulse.
RFM	Chèvannes France +45°32' +2°27'	2580	continuous from 8 h to 16 h 25 except Saturday and Sunday	Second pulses of 5 cycles of 1 kHz modulation. Minute pulses prolonged to 0.5 s. DUT1: CCIR code by lengthening to 0.1 s.
FTA91	Saint-Andre-de-Corcy France +45°55' - 4°55'	91.15	at 8 h, 9 h, 9 h 30 m, 13 h, 20 h, 21 h, 22 h 30 m.	A1 type Second pulses during the 5 minutes preceding the indicated times. Minute pulses are prolonged. DUT1: in Morse code.
FTH42 FTK77 FTN87	Pontoise France +40° 4' - 2° 7'	7428 10775 13873	at 9 h and 21 h at 8 h and 20 h at 9 h 30 m, 13 h, 22 h, 30 m.	A1 type Second pulses during the 5 minutes preceding the indicated times. Minute pulses are prolonged. DUT1: in Morse code.

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the Time Signals
GBR	Rugby United Kingdom +52°22' + 1°11'	16	at 3 h, 9 h, 15 h, 21 h	A1 type Second pulses during the 5 minutes preceding the indicated times. DUT1: CCIR code by double pulse
HBG	Prangins Switzerland +46°24' - 6°15'	75	Continuous	Interruption of the carrier at the beginning of each second, during 100 ms. The minutes are identified by a double pulse, the hours by a triple pulse. No transmission of DUT1.
IAM	Rome Italy +41°52' -12°27'	5000	10 m every 15 m from 7 h 30 m to 8 h 30 m and from 13 h to 14 h except Saturday afternoon and Sunday Advanced by 1-hour in summer.	Second pulses of 5 cycles of 1 kHz modulation. Minute pulses of 20 cycles (Announcements and 1 kHz modulation, 5 m before the emission of time signals).
IBF	Torino Italy +45° 2' - 7°42'	5000	During 15 m preceding 7 h, 9 h, 10 h, 11 h, 12 h, 13 h, 14 h, 15 h, 16 h, 17 h, 18 h. Advanced by 1-hour in summer.	Second pulses of 5 cycles of 1 kHz modulation. These pulses are repeated 7 times at the minute. Voice announcement at the beginning and end of each emission. DUT1: CCIR code by double pulse.
JG2AE	Koganei Japan +35°42' -139°31'	8000	from 20 h 59 m to 10 h 59 m.	Second pulses of 1600 Hz modulation. Minute pulses are preceded by a 600 Hz modulation. DUT1: CCIR code by lengthening
JG2AS	Chiba Japan + 35°38' -140° 4'	40	from 23 h 30 m to 8 h (exc. Sunday) and from 8 h to 23 h 30 on Monday. Interruptions during communications.	A1 type Second pulses of 0.5 sec. duration. Second 59 is omitted. No DUT1 code.
JJY	Koganei Japan + 35°42' -139°31'	2500 5000 10000 15000	continuous, except interruptions between minutes 25 and 34.	Second pulses of 8 cycles of 1600 Hz modulation. Minute pulses are preceded by a 600 Hz modulation. DUT1: CCIR code by lengthening
LOL1	Buenos-Aires Argentina -34°37' +58°21'	5000 10000 10000	11 h to 12 h, 14 h to 15 h, 17 h to 18 h, 20 h to 21 h, 23 h to 24 h	Second pulses of 5 cycles of 1000 Hz modulation. Second 59 is omitted. Announcement of hours and minutes every 5 minutes, followed by 3 m of 1000 Hz and 440 Hz modulation. DUT1: CCIR code by lengthening
LOL2 LOL3	Buenos-Aires Argentina -34°37' +58°21'	8030 17180	1 h, 13 h, 21 h	A1 Second pulses during the 5 minutes preceding the indicated times. Minute pulses are prolonged. DUT1: CCIR code by lengthening
LQB9 LQC20	Planta Gral Pacheco Argentina -34°26' +58°37'	8167.5 17551.5	22 h 5 m, 23 h 50 m 10 h 5 m, 11 h 50 m	A1 Second pulses during the 5 minutes preceding the indicated times. Second 59 is omitted, second 60 is prolonged. After the emission, OK is transmitted if the emission is correct, NV if not correct. DUT1: CCIR code by omission of second markers.
MSF	Rugby United Kingdom +52°22' + 1°11'	60	continuous except for an interruption for maintenance from 10 h 0 m to 14 h 0 m on the first Tuesday in each month.	Interruptions of the carrier of 100 ms for the Second pulses, of 500 ms for the minute pulses. The signal is given by the beginning of the interruption. DUT1: CCIR code by double pulse
MSF	Rugby United Kingdom +52°22' + 1°11'	2500 5000 10000	between minutes 0 and 5, 10 and 15, 20 and 25, 30 and 35, 40 and 45, 50 and 55	Second pulses of 5 cycles of 1 kHz modulation. Minute pulses are prolonged. DUT1: CCIR code by double pulse
NBA	Balboa USA + 9° 3' +79°39'	24 147.85 5448.5 11080 17697.5	Every even hour except 24 h and during Monday maintenance (12 h to 18 h) 5 h, 11 h, 17 h, 23 h	Experimental FSK Second pulses on 24 kHz. CW Second pulses during the 5 minutes preceding the indicated times on the American Code time format. DUT1: by Morse Code, each minute between seconds 56 and 59.
NIT	Yosami Japan + 34°58' -137° 1'	17.4	to be determined	To be determined.
NPG	San Francisco USA + 38° 6' +122°16'	3268 6428.5 9277.5 12966	6 h, 12 h, 18 h, 24 h	CW Second pulses during 5 minutes preceding the indicated times on the American Code time format DUT1: by Morse Code, each minute between seconds 56 and 59.

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the Time Signals
NPM	Honolulu USA + 21°25' +158° 9'	4525 9050 13655 16457.5 22593	6 h, 12 h, 18 h, 24 h	CW Second pulses during 5 minutes preceding the indicated times on the American Code time format. DUT1: by Morse Code, each minute between seconds 56 and 59.
NPN	Guam USA + 13°27' -144°43'	4955 8150 13380 15925 21760	6 h, 12 h, 18 h, 24 h	CW Second pulses during 5 minutes preceding the indicated times on the American Code time format. DUT1: by Morse Code, each minute between seconds 56 and 59.
NSS	Annapolis USA +38°59' +76°27'	21.4 88 5870 8090 12135 16180 20225 25590	5 h, 11 h, 17 h, 23 h (on Tuesday 17 h the frequency 185 kHz replaces 88 kHz) 17 h, 23 h	Experimental FSK Second pulses on 21.4 kHz when transmissions resume (CW Second pulses during 5 minutes preceding the indicated times on the American Code time format. DUT1: by Morse Code, each minute between seconds 56 and 59.
NWC	Exmouth Australia - 21°49' -114° 9'	22.3	Keyed from 28 to 30 minutes after every other even hour beginning 0 h UT	Experimental FSK Second pulses during the indicated times on the American Code time format. DUT1: by Morse Code, between seconds 56 and 58.
OLB5	Podebrady Czechoslovakia +50° 9' -15° 8'	3170	continuous except from 5 h to 11 h on the first Wednesday of every month	A1 type. Second pulses. No transmission of DUT1
OMA	Liblice Czechoslovakia +50° 4' -14°53'	50 2500	continuous except from 5 h to 11 h on the first Wednesday of every month between minutes 5 and 15, 25 and 30, 35 and 40, 50 and 60 of every hour except from 5 h to 11 h on the first Wednesday of every month	Interruption of the carrier of 100 ms at the beginning of every second, of 500 ms at the beginning of every minute. The precise time is given by the beginning of the interruption. Pulses of 5 cycles of 1 kHz modulation (prolonged for the minutes). The first pulse of the 5th minute is prolonged to 500 cycles. No transmission of DUT1.
PPE	Rio de Janeiro Brazil -22°54' +43°13'	8721	0 h 30 m, 11 h 30 m, 13 h 30 m, 19 h 30 m, 20 h 30 m, 23 h 30 m	Second ticks, of A1 type, during the 5 minutes preceding the indicated hours. The minute ticks are longer. DUT1: CCIR Code by double pulse
PPR	Rio de Janeiro Brazil -22°59' +43°11'	435 8634 13105 17194.4	01 h 30 m, 14 h 30 m, 21 h 30 m	Second ticks, A1 type, during the 5 minutes preceding the indicated hours. The minute ticks are longer
RAT	Moscow USSR +55°19' -38°41'	2500 5000	between minutes 30 and 35, 41 and 45, 50 and 60 from 17 h 50 m to 24 h between minutes 30 and 35, 41 and 45, 50 and 60 from 1 h 30 m to 17 h	Second pulses* at the beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1 by Morse Code each hour between minutes 11 and 12.
RBU	Moscow USSR +55°19' -38°41'	66-2/3	between minutes 0 and 5 from 0 h to 22 h 5 m	A1 type. Second pulses*. The pulses at beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1: by Morse Code each hour between minutes 6 and 7.
RCH	Tashkent USSR +41°19' -69°15'	2500	between minutes 15 and 20, 25 and 30, 35 and 40, 45 and 50 from 0 h to 3 h 50 m from 5 h 35 m to 9 h 30 m from 10 h 15 m to 13 h 30 m from 14 h 15 m to 24 h	Second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1: by Morse Code each hour between minutes 51 and 52.
RID	Irkutsk USSR + 52°46' -103°39'	5004 10004	between minutes 5 and 10, 15 and 20, 25 and 30, 51 and 60 from 0 h to 1 h 10 m from 13 h 51 m to 24 h between minutes 5 and 10, 15 and 20, 25 and 30, 51 and 60 from 1 h 51 m to 13 h 10 m	Second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1: by Morse Code each hour between minutes 31 and 32.
RIM	Tashkent USSR +41°19' -69°15'	5000 10000	between minutes 15 and 20, 25 and 30, 35 and 40, 45 and 50 from 0 h to 1 h 30 m from 2 h 15 m to 3 h 50 m from 18 h 15 m to 24 h between minutes 15 and 20, 25 and 30, 35 and 40, 45 and 50 from 5 h 35 m to 9 h 30 m from 10 h 15 m to 13 h 30 m from 14 h 15 m to 17 h 30 m	Second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1: by Morse Code each hour between minutes 51 and 52.

Station	Location Latitude Longitude	Frequency (kHz)	Schedule (UT)	Form of the Time Signals
RKM	Irkutsk USSR + 52°46' -103°39'	10004 15004	between minutes 5 and 10, 15 and 20, 25 and 30, 51 and 60 from 0 h to 1 h 10 m, from 13 h 51 m to 24 h between minutes 5 and 10, 15 and 20, 25 and 30, 51 and 60 from 1 h 51 m to 13 h 10 m	Second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1: by Morse Code each hour between minutes 31 and 32.
RTA	Novosibirsk USSR +55°04' -82°58'	4996 9996 14996	between minutes 5 and 10, 15 and 20, 25 and 29, 35 and 39 from 0 h to 1 h 29 m from 18 h 5 m to 24 h between minutes 5 and 10, 15 and 20, 25 and 29, 35 and 39 from 3 h 5 m to 4 h 39 m from 14 h 5 m to 17 h 29 m between minutes 5 and 10, 15 and 20, 25 and 29, 35 and 39 from 5 h 35 m to 9 h 29 m from 10 h 5 m to 13 h 29 m	Second pulses*. The pulses at the beginning of the minute are prolonged. DUT1 + dUT1: by Morse Code each hour between minutes 45 and 46.
RWM	Moscow USSR +55°19' -38°41'	10000 15000	between minutes 30 and 35, 41 and 45, 50 and 60 from 1 h 30 m to 3 h from 17 h 50 m to 24 h between minutes 30 and 35, 41 and 45, 50 and 60 from 3 h 50 m to 17 h	Second pulses*. The pulses at the beginning of the minute are prolonged to 0.5 s. DUT1 + dUT1 by Morse Code each hour between minutes 11 and 12.
RTZ	Irkutsk USSR + 52°18' -104°18'	50	between minutes 0 and 5 from 0 h to 22 h 5 m	A1 type second pulses*. The pulses at the beginning of the minute are prolonged. DUT1 + dUT1: by Morse Code each hour between minutes 6 and 7.
VNG	Lyndhurst Australia - 38° 3' -145°16'	4500 7500 12000	9 h 45 m to 21 h 30 m continuous except 22 h 30 m to 22 h 45 m 21 h 45 m to 9 h 30 m	Seconds markers of 50 cycles of 1 kHz modulation; 5 cycles only for Seconds markers 55 to 58; Seconds marker 59 is omitted; 500 cycles for Minute markers. During the 5th, 10th, 15th, etc., minutes, 5 cycles for Seconds markers 50 to 58. Identification by voice announcement during 15th, 30th, 45th, and 60th minutes. DUT1: CCIR code by 45 cycles of 900 Hz modulation immediately following the normal Seconds markers.
WWV	Fort-Collins USA + 40°41' +105° 2'	2500 5000 10000 15000 20000 25000	continuous	Pulses of 5 cycles of 1 kHz modulation. 59th and 29th second pulse omitted. Hour is identified by 0.8 second long, 1500 Hz tone. Beginning of each minute identified by 0.8 second long, 1000 Hz tone. DUT1: CCIR code by double pulse. Additional information on corrections.
WWVB	Fort-Collins USA + 40°40' +105° 3'	60	continuous	Second pulses given by reduction of the amplitude of the carrier. Coded announcement of the date and time and of the correction to obtain UT1. No CCIR code.
WWVH	Kauai USA + 21°59' +159°46'	2500 5000 10000 15000 20000	continuous	Pulses of 6 cycles of 1200 Hz modulation. 59th and 29th seconds pulse omitted. Hour identified by 0.8 second long 1500 Hz tone. Beginning of each minute identified by 0.8 second long, 1200 Hz tone. DUT1: CCIR code by double pulse. Additional information on UT1 corrections.
YVTO	Caracas Venezuela +10°30' +66°56'	6100	12 h to 20 h 0 h 30 m to 1 h 30 m	Second pulses of 1 kHz modulation with 0.1 s duration. The minute is identified by a 800 Hz tone and a 0.5 s duration. Between seconds 52 and 57 of each minute, voice announcement of hour, minute, and second.
ZUO	Olifantsfontein South Africa -25°58' -28°14'	2500 5000 100000	18 h to 4 h continuous continuous	Pulses of 5 cycles of 1 kHz modulation. Second 0 is prolonged. DUT1: CCIR code by lengthening

OTHER TIME SIGNALS: BPV, XSG, Shanghai, China, P.R., Latitude: +31° 12', Longitude: -121° 26'. Characteristics and schedule not known.

*The information about the value and the sign of the DUT1 + dUT1 difference is transmitted after each minute signal by the marking of the corresponding second signals by additional impulses. In addition, it is transmitted in Morse Code as indicated.

Military Operations Areas

It is a quiet afternoon as you sit in front of your radio. Suddenly, the thunderous roar of an overhead military jet fighter rocks you back into reality. You have just been buzzed by a routine practice flight originating from a nearby military air base.

As hazardous as you might suspect such flights are, they are carefully programmed by the mission commander and filed with civilian aeronautical authorities. The zone of flight is called a military operations area (MOA).

Here at MT headquarters, we are in the Snowbird MOA, assaulted on a routine basis by jet fighters dispatched from Shaw Air Force Base (SC) and Dobbins Air Force Base (GA). Presented below is a complete listing of MOAs nationwide. You will find yours there.

MOA NAME	LOCATION
ABEL	MCAS Yuma, AZ
ADA EAST/WEST	McConnell AFB, KS
ANCHOR BAY	NAS Alameda, CA
ANNE	Barksdale AFB, LA
AUSTIN 1, 2	NAS Fallon, NV
AVON-North-South-East	MacDill AFB, FL
BAGDAD 1	Luke AFB, AZ
BAKER	George AFB, CA
BASINGER	MacDill AFB, FL
BEAK A,B & C	Holloman AFB, NM
BEAUFORT 1, 2 & 3	MCAS Beaufort, SC
BEAVER	Duluth Intl Arpt, MN
BENNING	Fort Benning, GA
BIG BEAR	Griffiss AFB, NY
BIRMINGHAM 1, 2	Birmingham Muni, AL
BISON	McConnell AFB, KS
BOONE	Des Moines, IA
BRADY	Bergstrom AFB, TX
BRISTOL	Twentynine Palms, Co
BRONSON	Grand Forks AFB, ND
BROWNWOOD 1 & 2	NAS Dallas, TX
BRUNEAU 1 & 2	Mt Home AFB, ID
BRUSH CREEK	Rickenbacker ANGB, OH
BULLDOG A, B & D	Show AFB, SC
CALVERTON 1 & 2	Bethpage, NY
CAMDEN RIDGE	Dannelly Field, AL
CAMPBELL 1 & 2	Fort Campbell, KY
CHASE 1, 2 & 3	NAS Chase Field, TX
CHINA	McClellan AFB, CA
CHINOOK A & B	Whidbey Island, WA
CHIPPEWA	Battle Creek, MI
COCOA	Patrick AFB, FL
COLLINS	Phelps Collins ANGB, MI
COLUMBUS 1, 2, 3 & 4	Columbus AFB, MS

MOA NAME	LOCATION	MOA NAME	LOCATION	MOA NAME	LOCATION
COMPLEX	Edwards AFB, CA	JONES	Barksdale AFB, LA	ROBERTS	NAS Lemoore, CA
CONDOR 1, 2	Pease AFB, NH	JUNIPER A & B	McChord AFB, WA	ROBY	Dyess AFB, TX
CROWNPOINT	Kirtland AFB, NM	KANE	NAS Miramar, CA	ROOSEVELT	Whidbey Island, WA
CRYSTAL	Kelly AFB, TX	KINGSVILLE 1 & 2	NAS Kingsville, TX	ROSE HILL	Jacksonville, FL
DEEPWOODS	Bangor, ME	KIOWA	Fort Indiantown Gap, PA	RUBY 1	Tucson, AZ
DELMAR	Patuxent River NAS, MD	KIT CARSON A & B	Buckley ANGB, CO	RUCKER A,B & C	Ft Rucker, AL
DEMO 1, 2 & 3	Quantico MCAF, VA	LADY	Barksdale AFB, LA	SADDLE A & B	Boise, ID
DESERT	Nellis AFB, NV	LAKE ANDES	Siaux City, IA	SALEM	Lambert Field, MO
DESOTO	NAS New Orleans, LA	LAKE PLACID	MacDill AFB, FL	SAYLOR	Mt Home AFB, ID
DEVILS LAKE	McChord AFB, WA	LAUGHLIN 1, 2 & 3	Laughlin AFB, TX	SAYLOR 4	Mt Home AFB, ID
DRUM 1 & 2	Hancock Field, NY	LAVETA	Buckley ANGB, CO	SELLS Low, 1	Luke AFB, AZ
DUKE	University Park, PA	LINCOLN	Lincoln, NE	SEVIER A & B	Hill AFB, UT
EAGLE 1, 2 & 3	Eielson AFB, AK	LIVE OAK	NAS Cecil Field, FL	SEYMOUR JOHNSON ECHO	Seymour-Johnson AFB, NC
EDGEMONT	Ellsworth AFB, SD	LORING	McChord AFB, WA	SHEEP CREEK 1 & 2	Mt Home AFB, ID
EGLIN A, B, C, D, E & F	Eglin AFB, FL	LUCIN A, B & C	Hill AFB, UT	SHEPPARD 1, 2, 3, 4 & 5	Sheppard AFB, TX
EUREKA	McConnell AFB, KS	MARIAN	Patrick AFB, FL	SHILO	Patrick AFB, FL
EVERS	Langley AFB, VA	MAXWELL 1, 2, 3, 4, 5, 6	Mather AFB, CA	SHIRLEY 1	NAS Memphis, TN
FAGUS	Blytheville AFB, AR	MERAMAC	Lambert Field, MO	SMOKY	McConnell AFB, KS
FALCON 1 & 3	Griffiss AFB, NY	MERIDIAN 1 EAST & WEST	NAS Meridian, MS	SNAKE 1	Mt Home AFB, ID
FALLS 1	Volk Field, WI	MINNOW	Milwaukee, WI	SNAKE 2	Mt Home AFB, ID
FARMVILLE	Langley AFB, VA	MISTY 1, 2 & 3	Griffiss AFB, NY	SNOOPY	Duluth Intl Arpt, MN
FLAGLER	Buckley ANGB, CO	MOODY 1, 2A, 2B & 3	Moody AFB, GA	SNOWBIRD 1	Dobbins AFB, GA
FOOTHILL 1 & 2	NAS Lemoore, CA	MORENCI	Tucson, AZ	SNOWBIRD 2	Shaw AFB, SC
FORT BRAGG NORTH A & B	Fort Bragg, NC	NAKNEK 1 & 2	Elmendorf AFB, AK	STONY A & B	Elmendorf AFB, AK
FORT BRAGG SOUTH A & B	Fort Bragg, NC	NEW RAYMER A & B	Greely, CO (TAC)	STUMPY POINT	NAS Oceana, VA
FORT STEWART A, B1, B2 & C	Fort Stewart, GA	OKANOGAN	Whidbey Island, WA	SUNDANCE	Twentynine Palms, CA
FREMONT	Buckley ANGB, CO	OLYMPIC A & B	Whidbey Island, WA	SUNNY	Luke AFB, AZ
FUZZY	Tucson, AZ	O'NEILL	Lincoln, NE	SUSITNA	Elmendorf AFB, AK
GABBS NORTH, SOUTH	NAS Fallon, NV	ONTONAGON	Griffiss AFB, NY	SYRACUSE 1, 2, 3 & 4	Hancock Field, NY
GALENA	Elmendorf AFB, AK	OWYHEE	Mt Home AFB, ID	TALON	Holloman AFB, NM
GAMECOCK A, B, C & D	Myrtle Beach AFB, SC	PALATKA 1, 2 & 3	NAS Jacksonville, FL	TEXON 1	Bergstrom AFB, TX
GAMECOCK I	Shaw AFB, SC	PAMLICO A & B	NAS Oceana, VA	TIGER NORTH, SOUTH	McChord AFB, WA
GAMECOCK J	Shaw AFB, SC	PARADISE	Mt Home AFB, ID	TILFORD	Ellsworth AFB, SD
GANDY	Hill AFB, UT	PECK	Selfridge ANGB, MI	TOMBSTONE A, B & C	Davis-Monthan AFB, AZ
GATOR LOW	NAS Cecil Field, FL	PECOS EAST HIGH & LOW, WEST HIGH & LOW, SOUTH HIGH & LOW	Cannon AFB, NM	TRACY 1 & 2	McConnell AFB, KS
GLADDEN 1	Luke AFB, AZ	PENSACOLA NORTH, SOUTH	NAS Pensacola, FL	TRUMAN A, B & C	Richards-Gebaur AFB, MO
GOOSE	Kingsley Fld, OR	PICKETT 1, 2, 3	Byrd IAP, VA	TURTLE	MCAS Yuma, AZ
GUNTERSVILLE	Dobbins AFB, GA	PINE HILL EAST & WEST	NAS Meridian, MS	TWELVE MILE	Ft. Wayne, IN
HATTERAS F	MCAS Cherry Point, NC	PINON CANYON	Fort Carson, CO	TYNDALL A	Tyndall AFB, FL
HAYS	Mc Chord AFB, WA	POWERS	Minot AFB, ND	TYNDALL B, C, D, E, F & G	Tyndall AFB, FL
HIAWATHA	K.I. Sawyer, MI	QUAIL	MCAS Yuma, AZ	VALENTINE	Holloman AFB, NM
HILLTOP	Fort Wayne, IN	QUICK THRUST E, F, G, H, I, J, L, M & N	Shaw AFB, SC	VANCE 1A & 1B	Vance AFB, OK
HOG 1,2 & 3	Fort Smith, AR	RAINIER 1, 2 & 3	Ft Lewis, WA	VOLK, EAST A & B, WEST A, B & C	Volk Field, WI
HOLLIS	Sheppard AFB, TX	RALPH	Phelps Collins ANGB, MI	WAITTS	Fairchild AFB, WA
HOOD	Fort Hood, TX	RANCH	NAS Fallon, NV	WASHITA	Sheppard AFB, TX
HOTROCK 1,2 & 3	England AFB, LA	RANDOLPH 1A,1B,1C,2A,2B	Randolph AFB, TX	WHITMORE 1, 2 & 3	Beale AFB, CA
HOWARD EAST	Springfield, IL	RAPPA 1 & 2	NAS Patuxent River, MD	WILLIAMS 1, 2, 3 & 4	Williams AFB, AZ
HOWARD WEST	Springfield, IL	RED HILLS	Terre Haute, IN	WILLIAMS 3A	Davis-Monthan AFB, AZ
HUMMER 1, 2, 3, 4, 5, 6 & 7	Mather AFB, CA	REESE 1, 2, 3, 4 & 5	Reese AFB, TX	WILLISTON	McChord AFB, WA
HUNTER	NAS Lemoore, CA	RENO	Reno Int'l, NV	YANKEE ONE	Bradley IAP, CT
HURON	Phelps Collins ANGB, MI	RESERVE	Tucson, AZ	YANKEE TWO	Bradley Intl, CT
INDIA 1,2,3	England AFB, LA	RIVERS	Tinker AFB, OK	YUKON 1 & 2	Eielson AFB, AK
JENA 1, 2	England AFB, LA				

Heathkit/Zenith SW-7800 Receiver

In the September issue of *Monitoring Times*, reader Izak Luchinsky indicated that he would be interested in finding out more about Heath products. As good fortune would have it, at *Passport to World Band Radio* -- the new name for *Radio Database International* -- we have had the opportunity to test a number of Heath's SW-7800 general coverage receivers.

Heath Corporation Grows and Evolves Over The Years

It was shortly after World War II that the Heath Company, a small firm from rural Michigan, began designing and selling inexpensive electronics kits. While other American firms were all but driven out of the shortwave market by more efficient Japanese and other overseas firms, the little U.S. operation on the snowy side of Lake Michigan grew and prospered. Kit making had caught on, and the rest is history.

As the Heath Company grew, it passed through various corporate hands. It was acquired briefly by Daystrom, then for many years it was owned by the prestigious oil service/electronics firm of Schlumberger, Ltd. In recent years, it has been part of the Zenith Corporation, itself well known to veteran shortwave listeners for its hefty tube-type "Transoceanic" shortwave portables of yore.

New Receiver Available Only in Kit Form

In 1984, Heath broadened its line to include the SW-7800, a general coverage -- 150 kHz to 30 MHz -- tabletop receiver with digital frequency readout. The design is fairly modern, but it breaks no technological ground. And it was available only in kit form -- a plus for creative hobbyists who enjoy wiling away the hours with soldering guns. In this regard, Heath's traditionally well-written instructions and supportive technical staff are a real plus. After all, assembling a '7800 isn't a snap. It takes a good 50 hours or so!

Straightforward Controls

The '7800's digital readout -- to the nearest kilohertz -- is displayed by five red LEDs. Tuning is controlled by two knobs: one for megahertz, the other, kilohertz. A mode switch allows you to choose among AM, lower and upper sideband, plus CW (for code reception). The front panel also includes an analog signal-strength meter, a slow/fast automatic gain control switch and variable attenuator. There also is a single-step attenuator switch behind the set to supplement the front panel control.

While certainly not a portable -- it has no provision for internal

batteries -- the '7800 can be operated from an external 12-16V dc power supply, as well as normal ac house current. And, even though it's a tabletop, it comes with a built-in telescoping antenna. Most tabletops don't.

Two Selectivity Positions Really More Like One

Two selectivity positions, controlled by the mode switch, are marked on the set's front panel. Normally this would indicate that the receiver has two bandwidth filters in the intermediate frequency (IF) stage. Alas, this is not the case with the '7800. It has only one IF bandwidth filter -- albeit a decent 5.5 kHz "wide" choice. The "narrow" position, however, is nothing more than an audio filter which gets involved in interference cleanup only in the very late stages of the reception process. As audio filters go, the device works well enough. But it just can't clean up interference quite as well as would a good second IF filter.

Original Version Poor

In late 1984 we tested our first sample of the '7800. Its performance was grossly deficient. To begin with, the receiver overloaded badly. In addition, the set produced an assortment of strange whistles and spurious noises. As if this weren't enough, the digital frequency counter ran amok from about 20 MHz on up. Once you tuned above that point, you literally had no idea of what frequency was being received!

Drifting was also a serious problem. As the set warmed up, the frequency changed as much as 10 kHz in two hours, and 4 kHz more afterwards. That's three channels in all -- something like tuning a TV to channel 2 and a few hours later finding it's drifted to channel 5! This sort of performance was just not acceptable.

The '7800's performance was so bad, in fact, that -- incredulous -- we checked with colleagues at an amateur radio testing facility who were evaluating another sample. Their tests showed the same problems as ours.

Some Improvements

Once Heath became aware of these problems -- God only knows how



Spend 50 hours putting together Heath's general coverage shortwave receiver kit and you'll probably have a good time. But you won't have a good radio.

they could have overlooked them in the first place -- they decided that some design modifications would be in order. We have tested the resulting revised version, which came on the market in 1986, and have found that, indeed, some improvements had been made.

To begin with, the revised '7800 has slightly improved dynamic range and blocking. This, at the cost of reduced sensitivity, has made overloading somewhat less of a problem. More importantly, the drifting in the original version has been tamed to a more respectable, albeit mediocre, 3 kHz during the first hour of use. The frequency counter now performs satisfactorily up to about 29 MHz -- nearly the top of the set's range -- before failing to count properly.

...But Still No Cigar

Whistles and other spurious signals, unfortunately, still plague the set. The varying pitch of the whistles normally would suggest poor image rejection, but lab tests show the SW-7800's image rejection to be excellent. Although our lab could not isolate the cause, the most likely culprit appears to be the noisy frequency synthesizer -- alone or in concert with the set's IF. Single-sideband reception continues to be difficult -- and exalted-carrier selectable-sideband (ECSS) all but impossible -- thanks to both the frequency instability and the lack of a narrow IF bandwidth filter. Additionally, the product detector distorts -- a relatively minor point of concern only when tuning in the SSB/ECSS modes.

Unusually Low Price

The Heath Company (Benton Harbor MI 49022 USA) has priced the SW-7800 at \$349.95 in the US, although a reduced price of \$299.95 has been reported recently. This makes it far and away the cheapest tabletop world band receiver available new on the market today. Anything better costs nearly twice as much.

Price then is the '7800's high card. With the yen up and some portables selling for over \$300, the '7800 occupies an obvious niche -- especially if kits are your special passion. But the hard truth is that it sells for about what the Sony ICF-2010 goes for after discounting. In the just-released 1988 *Passport to World Band Radio*, the '2010 is rated as being very good, while the '7800 is rated as being only fair.

The fact is that Heath has never really understood shortwave listening. Even going back a quarter century, its shortwave receivers have been dreary performers. One model -- designed some years back for the ham market that Heath knows so well -- was the sole exception.

Today, the shortwave listening market is divided between lower-cost portables and higher-cost tabletop models. Trying to swim upstream with a low-cost, low-performance tabletop simply hasn't succeeded. Tabletops are perceived as high-performance items, and the '7800 is anything but. ■

You can hear Larry Magne's equipment reviews, along with reports from Passport to World Band Radio's Don Jensen and Tony Jones, the first Saturday night each month over Radio Canada International's "SWL Digest" at 8:10 PM Eastern Time on 5960 and 9755 kHz. Larry's "What's New in Equipment" is also featured over "SWL Digest" various other Saturdays throughout the month.

In the US, RDI White Papers are carried by Electronic Equipment Bank, Imprime and Universal Shortwave. A free catalogue of the latest editions of all available RDI White Papers, including those covering the best in communications receivers and antennas, may be obtained by sending a self-addressed stamped envelope to Publications Information, Radio Database International, Box 300, Penn's Park PA 18943 USA.

"Terminator"

A Winner for the Serious, Computer-Equipped DXer

by Arch Wicks W6SWZ

You may have seen one in an airport lobby, or in a travel agency. A framed map of the world, backlighted, and with a dark band slowly moving across the face of the earth. The dark band represents darkness, and its edge is the demarcation between it and daylight.

On many occasions I have marvelled at the ingenuity of one of these presentations, inasmuch as they operate in real-time--obviously linked to an electrical clock. Once, I went as far as tracking down a manufacturer, and was shocked to find that one would cost me over \$300.

Real Savings!

Now, however, I have overcome that problem and for one-tenth of that amount, I have my own. It operates on my PC-compatible computer. And best of all, it offers more features than an of the standard electro-mechanical displays I used to admire.

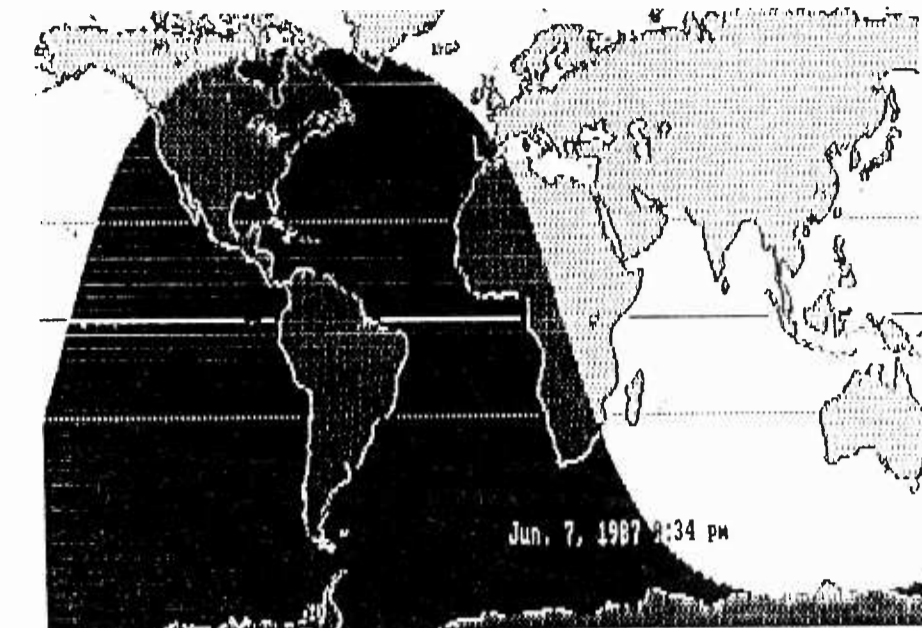
The solution was an unassuming program produced by Trillium, called "Terminator" and is named for the "termination" between daylight and darkness. The correct astronomical name for this zone is "terminator," but it is also sometimes called the "twilight zone" or "grayline."

Sounds interesting. But what does something like this have to do with communications monitoring? And the answer is "lots" -- especially when all of the program features are considered. Let's look at some background material, and then review these features.

DXer's Delight

As you probably know, darkness and daylight has a definite effect on the height of the ionosphere that surrounds Earth. At night, the D and E layers of the ionosphere disappear, and the F1 and F2 layers combine to form a single layer. In turn, the height of the ionosphere affects the propagation of radio frequency energy over a large portion of the wavelength spectrum, starting approximately with frequencies 30 MHz and lower. This is, of course, why distant stations may be heard in the broadcast band (540-1650 kHz) at night -- ones which can not even be faintly heard during the day.

At the same time, other higher frequency signals (e.g. 20 MHz), will disappear entirely during darkness. During daylight, these same



frequencies will allow reception of signals from halfway around the earth. Because of the great many effects that the sun has on the ionosphere and its various layers, anyone into DXing would be well advised to study the subject further, as there are other factors -- such as sunspots for instance -- involved in night/day propagation.

Grayline DXing

There are some particularly interesting phenomena that develop at sunrise and sunset. One of these is "grayline propagation." As this area has neither full daylight nor full darkness (which accounts for its other name: "twilight zone"), and is changing rapidly with the rotation of the earth, the effect on the ionosphere is strictly defined and predictable. It may well provide some exceptionally good DX not only along the longitudinal axis, but particularly in the situation where the listening station is in the sunset grayline and the other location is in the sunrise zone (or vice versa).

A excellent example of this presented itself to me on the date and a little before the time shown on the Figure. I consulted the *Terminator* and noted the possibility of DX from Europe on 14 MHz. A brief listen soon confirmed this, with several stations in England and the continent coming in at from S6 to S8. I soon contacted another amateur station in Poland, and had a brief but pleasant contact with good signals both ways from my location in California.

Another glance at the grayline showed that there could be some results expected from the South Pacific, and sure enough I was soon in contact with a station in New Zealand for a nice chat. Grayline DXing sure looks good to me!

Using Terminator

The program displays a map (see figure), which shows the terminator quite clearly. By entering the date and time when you start up your computer, *Terminator* automatically compensates for Daylight Savings (and European Summer) Time, if they are in effect, as it loads.

All operations are extremely simple. Merely typing TERMINAT loads and starts the program, which displays a world map. Obviously, this will tie up the computer for any other use if you continuously display the map. However, an easy option allows you to dismiss the program but retain it in memory for instant recall at any time.

As a ham, that is how I keep *Terminator* on call; I use the computer for logging, but leave *Terminator* in memory for immediate reference to the daylight/darkness display, and for several of the other useful features.

Other Functions

One function key will call up short menu of other features. One of these choices is "Display Selected Cities." With this, the monitor will show the current time in up to 24 cities worldwide -- very handy when monitoring DX stations. The city names and locations are clearly marked on the map, together with the terminator. In addition, your local date and time are also function key controlled, and may be toggled off and on as desired.

Another good feature that can be switched in shows all of the world's time zones. Therefore, if you know the general location of some place that you are listening to but which is not entered as one of the 24 locations, you can easily deter-

mine the time there. If you want to permanently change or add other locations, such as "Moose Jaw" or some place having a fractional time difference, a custom change or addition can be made.

If you would like to see what is ahead as far as when or where darkness (or daylight) will occur, you may toggle in a "high-speed" mode which advances the clock at a rate determined by pressing the "+" or "-" keys on your computer. This speeds up the intervals between screen refreshing, along with the intervals representing two minutes to up to one week for every second of real time.

For instance, if I wanted to know if it would be completely dark in India six hours from now, I could speed up the display until it reached the time desired.

Second Map Display

One other map display is available. This shows the lines of latitude and longitude. Any of the maps available can always show city times simultaneously; however, with too much information displayed at one time the display tends to be cluttered and confusing.

An interesting aspect of the whole display is that not only is the terminator changing constantly as the sun moves across the face of the earth, but it also changes position with the seasons. It may be observed that total darkness (or constant daylight) envelopes the Arctic (or Antarctic) regions 24 hours a day depending upon the ecliptic and the solstices of the sun.

The width of the terminator (or twilight) is not shown, as a few hundred miles is too small an area to represent. As the actual position of the terminator is a sunrise and sunset by local time, it should be quite adequate for any spotting purposes in pursuing grayline DX.

Astronomy

There are several features in *Terminator* that do not have a monitoring or communications reference--at least not directly. These may be of interest to anyone who has astronomy as a hobby, and will only be briefly mentioned here.

A marker on the screen, which indicates the position on the earth's surface when the sun is directly overhead at noon Solar Times, may be toggled on and off. The declination of the sun will be quite evident as it moves between the Summer and Winter Solstices. (The Equator, and the Tropics of Capricorn and Cancer are always visible on the map.)

Also, for astronomy buffs, the analepsis of the sun (if you don't know what that is, then you aren't one), may be observed in rapid motion by using *Terminator* in week-at-a-time mode.

Evaluation

There are no major problems in the operation of *Terminator*. The instructions are complete, informative, and well-written. A minor deficiency is a reduction in resolution, or quality of the display, when using either the Time Zone map or the Latitude and Longitude map; not seriously so, but noticeable.

Although the times shown are all in the civilian (a.m.-p.m.) method, I would like to have seen an option to display the 24-hour Universal Coordinated Time (UTC) system.

For esthetic reasons I would like to see less distortion of the map display. This distortion may not occur with all computers, however, and may be due to the pixel configuration of my "compatible" unit, which may also have a different aspect ratio than that for which the program was designed.

A color display would also be a nice touch--particularly if the water area could be shown in blue.

Nonetheless, the program is a winner, and should be useful for the purposes stated. The price is right, and is well worth the \$30.00 total cost (includes shipping, taxes, etc.)

Available from TRILLIUM, 3770 Highland Ave, Suite 208 Dept.MT, Manhattan Beach, CA 90266



when pressed and legends are bold and easy to read. The LCD display is backlighted yellow-orange, making night viewing a snap.

The usual array of Bearcat functions is present: search, individual channel lockout, channel one priority*, search hold, and individual channel delay. Rear apron jacks are provided for external speaker, tape recorder audio, 12 volt power, and external antenna (Motorola plug).

Accessories provided with the unit include an AC power adaptor, plug-

in whip antenna, mobile mounting kit, and full instructions.

Installing the options: A signal-boosting preamplifier, a CTCSS (subaudible) tone-squelch decoder and a switch panel are available for →

*A preliminary specification erroneously stated that the BC600XLT had five priority channels; this error was carried into the October *MT* Grove Enterprises advertisement. We regret the error.

Bearcat BC600XLT Scanner

A high performance, ultra compact scanner is always good news. More, this little unit doesn't compromise features. Boasting a frequency coverage of 29-54 MHz low band FM, 118-136 MHz civilian aircraft AM, 136-174 MHz high band FM, and 406-512 MHz UHF FM, the new Bearcat has pre-programmed service

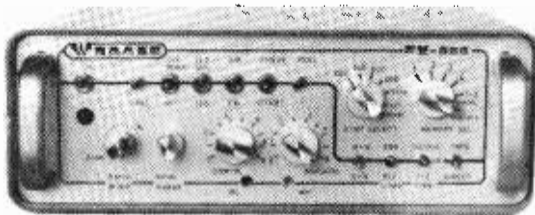
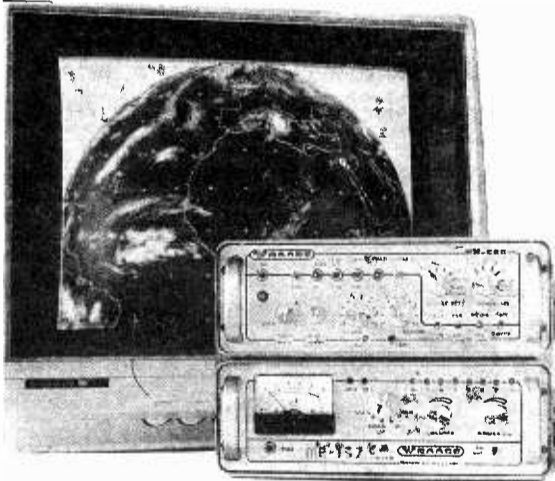
search for police, Fire/EMT, marine, aircraft, and weather just like its all-time favorite, but much larger, predecessor, the BC300.

A whopping 100 channel memory may be scanned sequentially or divided into five 20-channel banks; rubberized keys have good "feel"

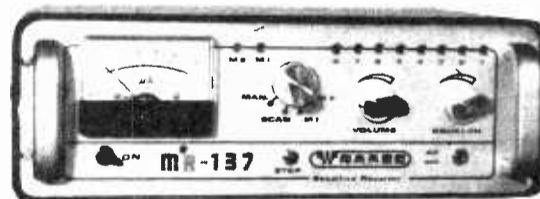
APT ASSOCIATES Proudly Present

Order now for the holidays
WRAASE VIDEO FAX SYSTEM

Protect yourself from costly weather attacks.
View real time wx imagery live from orbital spacecraft.



FX-666 \$1585



MR-137 \$868

VHF Preamp - \$68.00

We carry hard copy printers such as the DL19W and 9271 18-inch chart recorders



DL-19W \$850.00
Factory reconditioned
APT modified



9271 \$1995.00
Rebuilt and reconditioned
\$1200 - Working condition

Applied Digital Research Star Track II

Stand-alone satellite tracking system for orbital satellites, will track up to 12 satellites, will steer all Kenpro, CDE, or other cross-Yagi rotors. \$435.00

APT ASSOCIATES

Tiros/Goes Weather Systems
Installation - Sales - Consulting
2685 Ellenbrook Drive
Rancho Cordova, CA 95670
(916) 364-1572

Ask about our extended warranty and installation plans -- We go anywhere.

BC-600XLT cont'd from p.47

the BC600XLT. Installation takes about 15 minutes and requires removing the radio from its cabinet with a Phillips screwdriver; no soldering is necessary.

With the tone-squelch decoder installed and switched on by the optional switch, any of the 38 CTCSS tones may be programmed by the scanner keypad into any combination of channels. When engaged, only those channels will be scanned; when switched off, all channels are scanned.

There is a distinct improvement in weak signal strength when the optional preamplifier is switched on. We would suggest its use in suburban or rural areas, or anywhere average signals levels are low such as when the plug-in whip is used or in open-road mobile operation.

When operating on a desk, a tilt-down bracket is engaged, allowing the 600 to face upward, optimizing the audio as well as the viewing angle of the display and controls.

So how does this new entry perform? Does it live up to its expectations? Let's find out.

A simple test

We connected the 600 to an external antenna and compared it with a BC210XLT. Scan rate was fast and sensitivity was excellent, obviously

meeting the published specifications. Audio was pleasing from the bottom-mounted speaker; the 2.5 watt audio amplifier is loud enough for any mobile application. Styling is attractive, functions are easy to access and straightforward.

In a field test using the BC600XLT in a metropolitan environment, image rejection and intermod immunity were both above average, an improvement over previous Bearcat models.

Are there any bad points?

There is no operating manual, merely a large, folded sheet which must be cut up to return the warranty registration; the volume control has no indexing mark to show its setting; an audible "tick" can be heard during the scanning sequence in a quiet room; two AA-size memory backup batteries are required (even without them the radio will retain memory during brief power outages).

Accepting these petty criticisms, the scanner is an exceptional value. Clearly, an exciting new generation of scanners is emerging from Uniden; the BC600XLT is the pacesetter.

(BC600XLT, \$224.95 plus \$5 shipping from Grove Enterprises; preamplifier, \$25; CTCSS decoder, \$60; switch (required for either option), \$8.95. Installation fee at time of order, \$10.

Realistic PRO-38 Scanner

If you sense something familiar-looking about the new Realistic PRO-38 hand-held scanner, it isn't just your imagination. Made for Tandy by Uniden, the new programmable is an upgrade of the Bearcat BC50XL scanner.

Substantial improvements, however, have gone into the Tandy version. Even the cabinet is attractively metallic-accented, replacing the bland brown box of its Bearcat predecessor. More important, however, is what has happened inside the box.

The user may choose between conventional AA replaceable cells or nicads for power; a small switch in the battery compartment selects the option. With a full charge, the nicads will operate the radio for a full day without the premature "beep-beep" low battery signal which was so annoying on the BC50XL.

A new microprocessor controls the internal circuitry on the PRO-38, but the remainder of the radio's functions are the same as the former Bearcat: ten memory channels with individual channel lockout, three second scan delay, keypad lock switch, review button to check frequency entry, LCD channel display, earphone jack, and BNC-fitted flex antenna.

Audio is strong and clear, sensitivity is certainly equal to other scanners,



and an internal voltage regulator allows charging or operation from an external 12 volt DC source. Scan rate is typically 12 channels per second. Frequency range is 29-54, 136-174 and 406-512 MHz, FM mode.

After a day's listening, we would rate the new PRO-38 an excellent value for an introductory level scanner.

(PRO-38, \$124.95 plus \$3 shipping from Grove Enterprises; \$139.95 plus local sales tax at Radio Shack outlets)

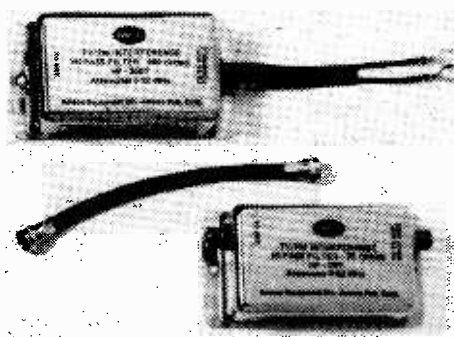
Ameco Interference Filters

The name AMECO has been associated with amateur radio equipment and accessories for decades. At one time the company had low-cost receivers and transmitters as well as license study guides (the guides are still very much alive).

AMECO was sold to Aerotron in the early 1970s, but reacquired a few years later. They are once again making a thrust into the amateur radio market with their accessories.

Most recently, AMECO has released a high pass filter available in two configurations: The HP-75T (equipped with type F connectors for coaxial lines) and the HP-300T (for screw-terminal twin-lead attachment). With R.L. Drake no longer making TVI filters, the AMECO device stands alone on the market.

The filter is designed to attach between the TV set and the incoming signal line and is intended to pass signals above 52 MHz (TV channel 2 begins at 54 MHz). The sharp rolloff of the filter exhibits 70 dB attenuation at 50 MHz, only two megahertz below its cutoff frequency.



When do you need one?

Unless your TV is connected to a cable distribution system, you probably suffer interference of one kind or another at some time on some channels. If the interference is due to signal overload coming in the antenna line at frequencies below 50 MHz, the AMECO filter should offer relief. Thus, it is also applicable to FM broadcast receivers and VCRs as well.

Low frequency interference sources which may be reduced by the filter

include those from amateur SSB/CW transmitters, CB radios, low-band (30-50 Mhz) two-way radio equipment, and some appliances.

A peek inside

The enclosure is all metal, housing nine shielded sections composed of 25 elements, thus accounting for the impressive rolloff characteristic below 52 MHz. A short length of coax with male F connectors on each end comes with the version HP-75T to allow interconnection of the device with an existing line.

Since many of us use preamplifiers ("boosters") with our VHF/UHF receiving equipment, it is worth mentioning that any filter--including this one--should be placed between the antenna and the amplifying device. This reduces the possibility of strong signal overload affecting the preamp.

What won't it do?

If the interference is actually being generated on the frequencies to which you are tuned, no filter will help since a filter which would

reduce the interference would also reduce the desired signal level. If the interference is coming in through the power line rather than the antenna, the filter won't help; fortunately, this is rarely the case.

There is no substitute for a good ground and appropriate shielding on transmitting equipment. If the transmitter is located near the TV set which is experiencing interference, the direct radiation will be unaffected by the installation of an antenna line filter. Remember, TV sets are enclosed by plastic or wood, not metal which could act as an effective shield.

When proper precautions are taken against direct RF radiation or signals being generated on frequencies above 50 MHz, and equipment operating below 50 MHz is causing interference, then it's time to employ an effective high pass filter like the AMECO.

(AMECO HP-75T or HP-300T filter, \$12.95 plus \$2 shipping from AMECO Publishing Corp., 220 E. Jericho Turnpike, Mineola, NY 11501)

ORDER DESK HOURS (Eastern):
MONDAY-FRIDAY 10 A.M. to 5 P.M.
SATURDAY 10 A.M. to 4 P.M.
 Technical and VA orders call (703) 938-3350

Electronic Equipment Bank
 516 Mill Street N.E., Vienna, VA 22180
 Telephone (703) 938-3350

STORE HOURS (Eastern):
 Same as Order Desk Hours
 Closed Mondays
 Thursday 10 A.M. to 9 P.M.

Electronic Equipment Bank—Order Toll Free 800-368-3270

VHF - UHF

SCANNERS CONT.

NEW FROM EEB

YAESU FRG9600

60-905 MHz



Service manual
 order: SM9600
 price: \$25.00
\$499.95

A premium VHF/UHF scanning + \$7.00 UPS
 communications receiver.

- You won't miss any local action with continuous coverage from 60 to 905 MHz.
- You have more operating modes to listen in on: upper or lower sideband—CW, AM wide or narrow, and FM wide or narrow.
- Plus there's much more, including a 24-hour clock, multiplexed output, LCD readout, signal strength graph, and an AC power adapter.

OPTIONS: FIF-232C for RS232 compatible computers; \$69.95. VU-9600 for tuning in TV stations with your 9600 and video monitor, \$25.00.
 99 memories.

ICOM R-7000
\$949.00

+ \$10.00 UPS



Commercial Receiver
 VHF-UHF 25-2000 MHz

Service manual
 order: SMICR7000
 price: \$25.00

- 25-2000 MHz coverage
- Precise frequency entry via keyboard
- 96 programmable memories
- Scan-memory-mode-select memory-frequency
- 5 tuning speeds: 1, 1.0, 5, 10, 12.5, 25 KHz
- Narrow/wide filter selection
- Memory back-up • Noise blanker
- "S" meter or center meter for FM
- AM & FM wide, FM narrow. SSB, CW

EEB HP OPTIONS

- Front end upgrade improves sensitivity.
- Audio mod for better volume, less distortion.
- Spike protection on AC line.
- 24 hour bench test, Final alignment & overall checkout. Numbers 1 through 4 above for \$200.00
- Power Supply mod: A completely new power supply reduces the heat buildup & lowers the noise floor for longer component life and increased sensitivity. **Price is \$150.00.**
- Multiplex output mod for SCA and Subcarrier Analysis. **Price: \$50.00**

SCANNERS

RADIO SHACK!

PRO 31A

Handheld 10 channels, \$189.95 + \$4.00 UPS

PRO 32A

Handheld 200 Channels, \$289.95 + \$4.00 UPS

PRO 2021

Tabletop/Mobile 200 Channels,
 \$279.95 + \$6.00 UPS

PRO 2004

Tabletop 300 Channels, \$379.95 + \$6.00 UPS

SPECIAL SALE LIMITED QUANTITIES

J.I.L. SX-200

- 26-88, 108-180, 380-512 MHz
- 16 Memory Channels
- Table/Mobile • 13.8 VDC
- Dual Scan Speed • AM, FM
- Metal case • DX Local switch

\$199.95 + \$6.00 UPS

SX-400

- 26 - 520 MHz
- 20 Memories
- Converters for up 1.4 GHz - call

\$599.95
 \$4.00 UPS

AR2002 SCANNER

- 25 MHz to 550 MHz & 800 MHz to 1300 MHz
- FM (wide & narrow) and AM
- LED "S" meter • Scanning
- Optional RS232 socket on rear!
- Professional class performance

\$449.95 \$6.00 UPS

RTTY-CW-FAX

RTTY - CW - AMTOR

SPECIAL SALE

WHILE SUPPLIES LAST!

AEA CP-1 Computer Patch

As Low As:

\$215.00!!



*Copy Morse Code, 5-99 wpm, RTTY, Ascii, Amtor. All you need is a stable Receiver, a computer, a CP-1 & the Software. Choose one of our package Deals for best price break. CP-1 Interface and software for the following: C64/C128 \$269.00 IBM PC \$229.00 APPLE II, IIe \$215.00 + \$4.00 UPS. **AC Adapter is included**

AMECO Tunable Pre Amp-Antenna



- Matches Most Any Antenna
- Improves Gain and Noise Figure
- 9V Battery PWR (not included)
- AC Adapter Optional (\$9.95) (Order - P9T)

- 200 kHz-30 MHz
- Preselector
- Indoor Active Antenna

\$74.95 + \$4.00 UPS

ANTENNAS

EAVESDROPPER SALE

\$59.95 + \$4.00 UPS

- Balanced trapped Dipole
- Maximum performance, Minimum local noise
- All SW Bands 60-11 meters
- Only 43 feet long - 100 ft. feed line
- Complete - Everything you need.

MFJ 1024 \$119.95 + \$5.00 UPS

A.C. Adapter \$9.95

- Outdoor active antenna
- Performs as well as units costing \$180.00
- WRTVH rates it high

ICOM AH7000

\$89.95 + \$4.00 UPS

Discone Antenna for ICR7000/others w/type 'N' antenna connector. 25-1300 MHz!

50' of Lo-Loss Coax Cable Included.

D-130 ANTENNA

\$79.95 + \$4.00 UPS

Same as above but with PL-259 connector.

50' of Coax Cable Included.

**ALL NEW FROM SONY!
 WORLD BAND RADIO
 THE NEW ICF-7700**



- 15 Bands-12 SW, MW, LW & FM
- 15 Station memory presets
- LCD Frequency readout
- Built in clock & sleep timer
- 4 1/2" x 7 1/2" x 1 1/4"
- Earphone, carrying case, SWL book included.
- AC-D4L Optional AC Adaptor \$21.95

\$249.95 + \$4.00 UPS

**DON'T LET ITS SMALL
 SIZE FOOL YOU! A FULL
 FEATURED RADIO THAT WILL
 FIT IN YOUR POCKET. THE
 ULTIMATE IN PORTABILITY!**

SONY ICF—PRO80

\$349.95

+ \$4.00 UPS



**SONY CALLS THIS RADIO THE 'PRO80' &
 HERE'S WHY:**

- Covers 150 kHz to 216 MHz!! (with supplied converter)
- AM, FM, (wide & narrow); SSB • 40 Station Memories!
- Memory scan, Program scan, Limit scan, up/down manual scan and priority scan! • Automatic and manual squelch!
- Handheld radio 3 1/2" x 7 1/4" x 2" and weighs 1 lb. 7 oz.
- Rechargeable battery Pak (opt) • Comes with telescopic antenna, shoulder belt, carrying case, wave book, frequency converter and BNC adaptor.

PANASONIC RFB60

Compact multi-band radio

\$249.00

\$4.00 UPS

- PLL synthesized receiver
- 6-way tuning system
- Clock/Timer with Sleep
- LCD Readout

DATONG ACTIVE ANTENNA

- Constant sensitivity from 200 kHz to 30 MHz.
- No need for tuners or antenna matchers.
- Compact and unobtrusive, only 10 feet long!
- Optional DC supply (model MPU) available - call

INTRODUCTORY PRICE

ONLY \$129.95 + \$4 UPS

**SIGNAL DISPLAY UNIT!
 FOR THE ICR7000 & OTHERS**

\$1295.00

+ \$8.00 UPS



SPECIFICATIONS FOR THE SM1071

- Frequency range 10.2 to 11.2 MHz
- Sensitivity: 0.5uV min discernable signal
- Gain control range: 70 dB min.
- 2.5" x 2.0" Screen
- Log range: approx 60 dB
- 50 ohm nominal input impedance
- Size is 6" x 4" x 10.5
- Log range is approx 60 dB



- We ship world-wide
- Shipping charges not included
- Prices & specifications subject to change without notice

10 miles west of Washington, D.C.

Sorry—No COD's

10-5 Tues., Wed., Fri. 10-9 Thursday

10-4 Saturday Closed Sunday and Monday



ELECTRONIC EQUIPMENT BANK

516 Mill Street, N.E.

Vienna, VA 22180

Order Toll Free: 800-368-3270

Technical and VA Orders (703) 938-3350



Passport to World Band Radio (Radio Database International)

by Larry Magne and Tony Jones (400 pages, 7" x 10", perfect bound; \$14.95 plus \$2 shipping from Grove Enterprises; available also from other MT advertisers)

Highly polished and eminently authoritative, this 1988 edition lives up to its title. Regardless of your worldwide broadcast listening preference, *Passport's* colorful and definitive text comprise an indispensable goldmine of up-to-date information.

Introductory chapters by a variety of well-known shortwave experts provide valuable listening tips from around the globe. A comprehensive, illustrated buyer's guide tells you in no uncertain terms which radios represent the best values and which to stay away from.

Finally--and foremost--the frequency section, a logically-arranged directory of world broadcasters heard between 2 and 22 MHz. Listed by frequency and cross-referenced by time, country, language, and transmitter power, accurate details at your fingertips assure your success when you switch on your receiver.



Queensland Frequency Register - 1986 edition

by Richard Barrett (244 pages, 8-1/4" x 5-3/4", looseleaf binder; price and availability from ESG, PO Box 280, Hahndorf 5245, South Australia)

While Australian recipients of *Monitoring Times* are a distinct minority, scanner enthusiasts in the "land down under" will appreciate the work that went into assembling this professionally-printed scanner directory.

Concentrating on the 35-520 MHz portion of the spectrum, Barnett's listings include transmitter (and receiver where different) frequency, call sign, user, and location. Major licensees are industrial, government, police and fire, marine, airlines and airports, public utilities, conservation, and businesses.

North American listeners would be interested in the similar bandplan used in Australia as compared to the U.S. and Canada. Australian monitors and retailers would do well to contact ESG for details on obtaining this well-assembled VHF frequency directory.

Station Address List

by Ravindranath G. Sewdien (44 pages, 6" x 8", staple bound; for ordering information write to the author in care of the Suriname DX Club International, Bechaniestraat 58, Paramaribo, Suriname)

This concise directory of addresses for international broadcast listeners is cleverly arranged by frequency. If you are listening, say, to the Zambia Broadcasting Services on 6165 kHz, merely look up that frequency, find R Zambia, and the mailing address follows.

Containing some 2000 listings, the booklet is a handy desk-side reference for the QSL hound.

National Contest Journal

published by the American Radio Relay League (31 pages, 5-1/4" x 8-1/2", staple bound; bimonthly magazine. \$10 per year from NCJ Circulation, ARRL 225 Main Street, Newington, CT 06111)

If you are a ham interested in contesting as a competitive sport, the new NCJ will keep you up to date. Featuring articles of aid to contesters (antennas, switching, techniques and tips, etc.), as well as contest details. NCJ is definitely for the indefatigable contesteer!

LA DXing

by Takayuki Inoue Nozaki and Tetsuya Hirahara; 4th edition (1987) (293 pages, 6" x 8", paperbound; \$18 in U.S. funds or 23 IRCs airmail, \$12 or 16 IRCs seairmail from Takayuki Inoue, c/o R. Nuevo Mundo, 18-11 Fujimi-cho, Hachioji-shi, Tokyo 192, Japan)

Review by Gayle Van Horn

Rarely does a book come along that gives every serious Latin DXer something to cheer about; such is the case, however, with Nuevo Mundo's *LA DXing*. Latin listeners will delight in this expanded edition with its improved chapter layout, photo reproduction and quality printing.

The first chapter covers a by-frequency listing of station schedules for Central and South America with notations for active and inactive stations. An additional 65 pages of IDs, sign-on and promotional text in Spanish for Central and South America, Mexico and clandestine stations are included.

New to this edition is an in-depth profile of Mexican broadcasters with studio photos. Full-page DX maps including city and state divisions are provided for Belize, Guatemala, El Salvador, Honduras, Costa Rica, Ecuador, Mexico, and Brazil.

The largest chapter of "LA" is Colombia--a 72-page goldmine profiling 22 stations. Other chapters include a by-country listing of verifications signers, a peek inside Paraguayan radio stations and a look

at the seldom featured country, Suriname.

There are also guest features by noted SWL DXers Christian Zettle and Jerry Berg. LA DXing is for every diehard Latin DXer, an informative book which is a welcome addition to my bookshelf.

Security Industry Buyers Guide

(1140 pages, 8-1/2" x 11", perfect bound; \$90 from Bell Atlantic, 1-800-237-4915 nationwide, 1-800-262-2046 Maryland)

This giant compendium is a sourcebook for security related products and services, more than 4500 listings in all. Researched and published cooperatively by the American Society for Industrial Security (ASIS) and Bell Atlantic.

The directory is divided into six main sections: a cross-referenced index, turnkey systems, single-function products, consultants and engineers, service companies, and company names.

W1FB'S Antenna Notebook

by Doug DeMaw (130 pages, 8-12" x 11", perfect bound; \$8.00 from the American Radio Relay League, 225 Main Street, Newington, CT 06111)

Doug DeMaw, W1FB, is well known in amateur radio circles for his technical talents, both as former Technical Manager of the ARRL lab as well as for his numerous articles and books on radio-related topics.

Doug's personal choice in experimenting would appear to be antennas. This latest publication is a case in point; it is an excellent essay on practical antenna designs and considerations for HF (1.8-30 MHz) interests.

Written primarily for the ham with transmitting considerations in mind, the practical theory and construction lend themselves to the SWL as well. Dipoles, arrays, verticals, trap antennas, beams, loops - they're all here and discussed in conversational style with an absolute minimum of theory.

A separate chapter on receiving antennas concentrates primarily on applications in the 160-80 meter bands, but the notes are useful for higher frequency assignments as well.

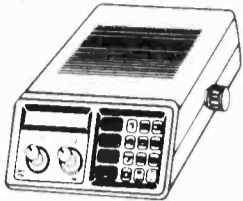
The book is well illustrated and includes examples of tuners, power measurement, a noise bridge, and other test techniques. Very informative, and the price is right. ■

"The Largest Dealer of Scanners in the World"



SCANNER WORLD, USA®

10 New Scotland Ave., Albany, NY 12208 518/436-9606



SPECIAL
Regency
MX-3000

Special \$169.99
(\$7.00 shipping)

30 CHANNELS—MOBILE/BASE —SCANNER WORLD EXCLUSIVE—

Features include simple programming of the following frequency ranges: 30-50 MHz, 144-174 MHz, 440-512 MHz. Digital display, priority, search, lockout, delay, dim control, top mounted speaker, one year factory warranty. Includes AC & DC cords, mobile mounting bracket, telescopic antenna. All for only \$169.99 plus \$7.00 shipping (optional extended warranty: 3 years \$39.99; 2 years \$29.99.) MX3000 Service Manual \$5.00.

Regency® Z30 30 Channel Automatic Programmable Scanner

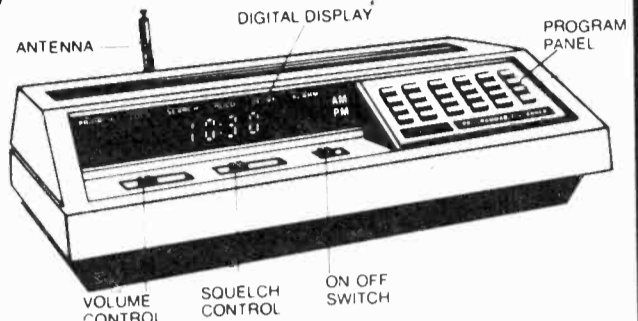
Scanner World Special

\$129.99

(plus \$5.50 shipping each)

Optional Accessories:

Cigarette Lighter Plug RGMPC . \$4.95
Z Mobile Bracket — Special . . . \$5.99



The Regency Z30 is a compact, programmable 30 channel, multi band, FM monitor receiver for use at home or on the road. It is double conversion, super heterodyne used to receive the narrow band FM communications in the amateur, public safety and business bands: 30-50, 144-174, and 440-512 MHz. Size 10 3/4" W x 2 7/8" H x 8 3/8" D.

Sophisticated microprocess-controlled circuitry eliminates the need for crystals, instead, the frequency for each channel is programmed through the numbered keyboard similar to the one used on a telephone. A "beep" acknowledges contact each time a key is touched. The Z30 scans approximately 15 channels per second.

Any combination of two to thirty channels can be scanned automatically, or the unit can be set on manual for continuous monitoring of any one channel. In addition, the search function locates unknown frequencies within a band.

Other features include scan delay, priority and a bright/dim switch to control the brightness of the 9-digit Vacuum-Fluorescent display. The Z30 can be operated on either 120 VAC or 12 VDC. Includes one year warranty from Regency Electronics (optional 3 yr extended warranty only \$39.99, gives you a total of 4 yrs complete warranty or 2 yr extended warranty only \$29.99, gives you a total of 3 yrs complete warranty.) Z-30 Service Manual \$5.00.

Cobra SR-15

\$219.99 (\$7.00 shipping)



100 channel pocket sized hand-held scanner (6" H x 2 3/4" W), no crystal, portable scanner, 29-54 MHz, 118-174 MHz, 406-512 MHz, bank scanning, backlit LCD display, automatic search, lockout, scan delay, priority, key lock, plus much more. Includes rubber antenna, rechargeable Ni-Cad battery pack, AC adapter charger, earphone, and carry case. optional cigarette lighter adapter #15MPC \$12.99.

BEARCAT 100XL Hand-Held Programmable	194.99	(7.00)
REGENCY INF-1 Informant Scanner	\$249.99	(7.00)
BEARCAT 70XL Programmable Hand-Held	169.99	(6.00)
BEARCAT 50XL Programmable Hand-Held	119.99	(5.00)
AD100U AC Adapter/Charger for 50 XL	12.95	(.)
BP55 Ni-Cad Battery Pack for 50XL	13.99	(.)
CA50 Carry Case for 50XL	11.99	(.)
PS001 Cigarette Lighter Adapter for 50XL/100XL	12.95	(.)
BEARCAT 140 AC Programmable Scanner	94.99	(5.00)
BEARCAT 145XL AC Programmable Scanner	99.99	(5.00)
BEARCAT 175XL AC Digital Scanner	159.99	(5.00)
BEARCAT 100XL Digital Hand-held	194.99	(7.00)
BEARCAT Weather Alert	39.99	(4.00)
BEARCAT 210XL AC/DC Digital Scanner	199.99	(7.00)
BEARCAT 800 XLT AC/DC Digital Scanner	299.99	(7.00)
REGENCY R1075 AC Digital Scanner	94.99	(6.00)
REGENCY MA-257 Cigarette cord for HX1000/1200	16.99	(.)
REGENCY MA-917 Ni-cad Battery for HX1000/1200	24.99	(.)
REGENCY HX-CASE Hvy Leath. case for HX1000/1200	19.99	(.)
REGENCY MA-549 Drop in charger for HX1000/1200	89.99	(5.00)
REGENCY MX-3000 AC/DC Digital Scanner	169.99	(7.00)
REGENCY HX-2200 Digital Hand-Held Scanner	172.99	(7.00)
REGENCY Z-30 AC/DC Digital Scanner	129.99	(5.00)
REGENCY Z-60 AC/DC Digital Scanner	149.99	(7.00)
Mobile Mounting Bracket for Z Scanners	5.99	(.)
REGENCY ACT-R-1 AC/DC Cryst. Single Channel	75.99	(4.00)
REGENCY RH-256B High Band Transceiver	359.99	(7.75)
REGENCY UC 102 Hi-VHF Hand Transceiver	119.99	(5.50)
REGENCY RH-600B High Band Transceiver	429.99	(7.75)
REGENCY R806 AC/DC Crystal Scanner	79.99	(5.00)
COBRA SR12 Digital Hand-Held Scanner	199.99	(6.50)
COBRA SR10 Digital Hand-Held Scanner	129.99	(6.00)
COBRA SR900 AC/DC Digital Scanner	109.99	(5.00)
COBRA SR925 AC/DC Digital Scanner	164.99	(6.00)
Book "Top Secret Registry of Gov't Frequency"	12.95	(3.00)
Book "Covert Intelligence, Electronic Eavesdropping"	8.95	(.)
Book "Betty Bearcat Frequency Directory"	14.95	(.)
Book "Rail Scan Directory"	7.95	(.)
Book "Air Scan Directory"	12.95	(.)
RCD MRP-1 Single Channel Hand-Held	38.99	(3.00)
FANON M8HLU DC Crystal Scanner	89.99	(5.00)
FANON PSK-1 AC Adapted for M8HLU	12.99	(.)
FOX BMP-1060 AC/DC Digital Scanner	129.99	(5.50)
FOX Mounting Bracket for BMP-1060	9.99	(.)
ANT-1 Magnet Mount Mobile Scanner Antenna	29.99	(3.00)
ANT-6 Base Scanner Antenna w/50' cable	29.99	(3.00)

Regency® HX2200

\$172.99

(Plus \$7.00 shipping each)

Digital Programmable 20 Channel Hand-Held Scanner with raised button keyboard for easy programming of the following frequency ranges: 118-136 MHz, 138-174 MHz, 406-512 MHz, 800-950 MHz (NOTE: This is the only hand-held portable scanner which will receive the 800-950 MHz range plus high band, air, and UHF). Features include priority, scan delay, memory backup, dual scan speed, channel lockout, jacks for external antenna and earphone, 90 day factory warranty, keyboard lockswitch, sidelit liquid crystal display for night use, program AM or FM mode, search or scan, size is 3" x 7" x 1 1/2". Complete HX2200 package includes Ni-Cad rechargeable batteries, wall charger adapter, protective carry case, and rubber antenna. All for the low price of only \$172.99 plus \$7.00 shipping each. (Optional extended warranty: 3 years \$39.99, or 2 years \$29.99)



SCANNER WORLD EXCLUSIVE



Bearcat
BC-600 XLT

\$224.99 (\$7.00 shipping)

Digital Programmable 100 Channel Scanner

BC-600 XLT covers the following frequencies: 29-54 MHz, 118-174 MHz, 406-512 MHz. Features compact size of 6-5 16" W x 1-5 8" H x 7-3 8" D. scan delay, priority, memory backup, channel lockout, bank scanning, key lock, AC/DC power cords, telescopic antenna, mounting bracket supplied, one year factory warranty, search, direct channel access, track tuning service search including pre-programmed frequencies by pushing a single button for police fire/emergency, aircraft, weather, and marine services. Plus exclusive optional features never available on any scanner before. First is an RF receive amplifier for boosting weak signals for only \$24.99 plus a CTCSS tone board is available for only \$59.99 to make this the number one scanner available in the USA. Optional cigarette lighter plug #600MPC \$4.99

REGENCY HX1500

Digital programmable 55 channel hand-held scanner. Frequency coverage 29-54 MHz, 118-174 MHz, 406-420 MHz, 440-512 MHz. Covers Public Service bands plus aircraft, trains, marine, plus many others. Has priority, search, lockout, scan, banks, sealed rubber keyboard, 90 day factory warranty. Includes flexible rubber antenna, belt clip and earphone.

\$224.99 (Plus \$7.00 Shipping each)

Optional Accessories Available for HX-1500: Call For Price.

REGENCY RH-256 B PROGRAMMABLE TRANSCEIVER

RH-256B Transceiver, 16 channel 12 VDC 2-way Radio fully programmable in transmit and receive mode. Includes built-in CTCSS tones for encode/decode, time-out timer, scan delay, 25 watts transmit power, priority, plus more. Frequency spread as shipped 152-158 MHz. Package includes mobile mike, bracket, mobile antenna, and all cables and instructions for installation. **Special package deal only: \$359.99 (7.75 shipping)**
(2 year extended warranty \$49.99 - 3 year \$69.99)

ORDERING INFORMATION

Call (518) 436-9606 to place orders by phone or mail orders to **Scanner World**, 10 New Scotland Ave., Albany, NY 12208. Orders will be shipped same day received by United Parcel Service. **Scanner World** accepts VISA, MasterCard (COD shipments by United Parcel will be for cash or certified checks only). Mail orders with personal or business checks will be held 4 weeks for bank clearance. Orders with cashiers checks or money orders shipped same day received. Prices, specifications and terms subject to change without prior notice. If items are out of stock we will backorder and notify you of delivery date. All shipments are F.O.B. **Scanner World** warehouse in Albany, NY. We are not responsible for typographical errors. All merchandise carries full manufacturers warranty. Bid Proposals and Purchase orders accepted from Government agencies. Free full line catalogue available upon request. No minimum order. New York State Residents add 7% sales tax.

SHIPPING CHARGES

(* Add \$) per scanner, and \$3.00* for all accessories ordered at same time. C.O.D. shipments will be charged an additional \$3.00 per package. Full insurance is included in shipping charges. All orders are shipped by United Parcel Service. Shipping charges are for continental USA only. Outside of continental USA, ask for shipping charge per scanner.

Scanner World, USA®
10 New Scotland Ave., Albany, NY 12208

(518) 436-9606

Most orders Shipped Same Day Received!

Scanner World, USA • Albany, New York 12208 • (518) 436-9606

Scanner World, USA • 10 New Scotland Ave. • Albany, New York 12208 • (518) 436-9606

Starting at the Beginning



Shortwave - Radio's window on the world

Try to remember back to the first time you turned on a shortwave radio. For most people, the thing that immediately comes to mind is the unbelievable thrill of hearing radio stations from tens of thousands of miles away. Most of us can even, to this day, remember the name of that first station. And most of us still get a little tingle of excitement when we think about it. That feeling stays with us. What's harder to remember is the confusion.

It doesn't take long after we've heard that first station to realize that we are indeed in a strange land. Weird terms like *UTC*, "*S*" units, *propagation*, *wavelength* and *meter bands* whiz past our heads like bullets on a battlefield. Each and every concept is literally dizzying!

For some people, the experience ends there. Overwhelmed, they run for cover, diving back into the safety of their local AM and FM radio foxhole -- never to poke their heads into the line of fire again. For these timid souls, the door to an entire world of fun, knowledge and excitement, is closed.

Missing the Thrill

These people won't ever have the thrill of tuning into a government radio station during a bloody coup d'etat and hearing messages designed to calm the local population. "All residents are advised to remain in their houses until further notice," it might say. "There is no reason for panic. The New People's Provisional Government is now in control of all army barracks, federal buildings and...."

They won't have the chance to tune in a marine distress channel to hear the S.O.S. of a Liberian oil tanker under fire in the Persian Gulf. Or

gain that incredible insight into world affairs that listening to news bulletins from around the world provides.

And what non-shortwave listener has ever had the opportunity to pick up the telephone and talk live, on the air, to the Queen of England, the U.S. Secretary of Defense or the head of Red Cross famine relief efforts in Ethiopia?

All these things are possible for the person who takes the time and who makes the effort to *learn* about shortwave radio.

Getting By

Sure, cynics will say, you don't need to know about solar flux levels and grayline DXing to hear shortwave. With today's high technology, they chide, a person only needs to know how to flip the "on" switch of their radio and spin the tuning dial to hear the world. And sure enough, that's true -- to a point. But in order to get the *most* out of your shortwave radio, you need to know more than the difference between "on" and "off." It's kind of like saying that in order to drive a car from New York to California, all you have to know is how to work the ignition.

The same holds true with shortwave. There are, as Harry Helms says in his *Shortwave Listening Handbook*, "Many things that happen to a radio signal in the interval (measured in millionths of a second) between when it leaves a transmitter and when it is received by you." Exactly what happens to that signal, how, when and why, is the cause of much frustration. And frustration is shortwave listening's greatest killer.

Killer Frustration

Take, for example, a first-time reader of *Monitoring Times*. He or she is going to leaf through the pages of this magazine and see some pretty exciting stuff. Maybe they'll read that someone has heard the Burmese Army Station on its new frequency of 6570 kHz. Burma! Wow! And they even have an army!

The reader sits down at noon time, perhaps during lunch, and dials it up. And all they hear is static. Their first idea is to question the integrity of the person who said that they heard it. The second is to curse the editor -- that darned fool! The third is to wonder if, perhaps, maybe their radio isn't good enough. And the fourth is usually to give up, disgusted.

If only they had more information. Fella! You just aren't going to hear a

station on that frequency, at that time, operating from that part of the world. It is just about as likely as your getting struck by lightning on your birthday as you cash in your winning four million dollar lottery ticket.

You Need Info

What you need is information. Basic information. A good, fairly reliable rule of thumb. And here's one of them. Frequencies below 10,000 kHz are best heard at night; frequencies above 10,000 kHz are best heard during the day. Those in the middle of the range can be heard both during the day and at night. So while you may get hit by lightning on your birthday as you cash in that winning lottery ticket on 6570 kHz at high noon, the odds are not good.

Too, a \$1,000 communications receiver isn't going to get you those rare stations. What a \$1,000 communications receiver *does* get you is the proper *tools* to work with. But if you don't know how to use those tools, then a \$1,000.00 radio is not a whole heck of a lot better than a \$100.00 radio. The fact is that not a small portion of the so-called "experts" in this field use radios most of the rest of us would be embarrassed to admit owning. They just know how to use them well.

An antenna. That's the answer! If I could just attach a three mile-long piece of wire to my Sony ICF-2010, then I'd hear those faint ones. Wrong again. Put a big antenna on something like a '2010 and you'll hear stations all right. It'll be like putting a copy of the frequency section of *Passport to World Band Radio* in a blender. You'll probably hear all kinds of stuff all over the dial, none of them where they're supposed to be -- including your local AM stations in the middle of the shortwave bands. However, put that same antenna on a radio that's built to handle it and the results can be stupendous.

And What's That?

And what's all this stuff I hear about "utility" stations? Just what are all those beeping and whirring noises I hear between the broadcasts stations? Do I have to buy a soldering iron to listen to shortwave? Will I be any less of a human being if I don't collect QSL cards? Why are so many shortwave listeners also hams? And just who the heck is Tom Meyer and why do shortwave listeners like him so much?

Each month, we'll try to take you on a trip to a different part of the communications monitoring hobby.

Sometimes we'll take a particular topic and beat it to death. Sometimes we'll answer your letters. And sometimes we'll invite experts in various fields to be guest writers for this column.

Whatever the case, it is our goal to get you started -- and started right. And as always, your input it always welcome. Address your questions or comments to "Getting Started," c/o Monitoring Times, P.O. Box 98, Brasstown, NC 28902. Personal replies are not always possible, but we'll try to answer as many as possible within these pages. ■

Basic Terms for the Communications Monitor

Shortwave. Formally, the range of frequencies between 1600 and 30,000 kHz (1.6-30 MHz). Often used, inaccurately, by the general public to describe "ham" or amateur radio.

World Band Radio. A new, more modern and descriptive name for shortwave radio. Used variously to describe the entire range of shortwave frequencies and to describe those portions of the shortwave spectrum on which international and domestic broadcast stations are found.

Shortwave Listener (Abbreviated: "SWL"). A person who listens to transmissions, of various types, on the "shortwave" portion of the radio spectrum. The term can also be used to denote a person who listens to shortwave broadcasts for the content of the programs (as one would listen to local radio).

Utilities and Utilities Listener (Both abbreviated "Utes"). Two-way communications and those who like to listen to them.

World Band Listener. See "Shortwave Listener."

DX (Pronounced: DEE ecks). An old telegraph abbreviation for "distance." Refers to unusual and hard-to-hear stations.

DXer (Pronounced: dee ECKS er). A person who seeks out of the ordinary stations. The term is used to indicate a person who monitors various communications, including but not limited to, shortwave, AM, FM, and TV, for the expressed purpose of hearing as many different and unusual stations as possible. The actual content of the transmissions is often of little or no concern to the DXer. However, a DXer may also be a shortwave listener and vice versa.

Shortwave Radio. A colloquialism generally used to denote any radio that can tune to any portion of the shortwave frequency range. A shortwave radio may also receive AM, FM, etc.

World Band Radio. See "Shortwave Radio."

Communications Receiver. A radio designed to receive signals in more than one portion of the frequency spectrum, usually shortwave plus AM and often long wave (150 to 540 kHz). This name is usually applied to higher-priced models and often only to the larger table-top models as opposed to portables.

HELPFUL HINTS

Worldwide Time Table

Confused by time zones? Rene Borde of Sunnyvale, California, shares with fellow MT readers this month his neat scheme to keep track of worldwide time. Centered on Easter Standard Time, the chart below is easily converted to your time zone by adding an hour or so.

To use the chart, simply look up the country of interest and add the number of hours shown (or subtract if a negative is shown). It's that simple. Thanks, Rene, for a helpful time saver!

Icom R70 "Buzz" Cure

My Icom ICR-70 developed a low level electrical buzz. I noticed that when operating it on a metal picnic table, a mechanical hum had also developed in it. Tightening up the two screws that held the transformer in place to the chassis seems to have cured the problem. (David Woo)

PRO32 Scan Speed Increase Revisited

In our October column we reported Tom McElvy's discovery that the scan rate of the Radio Shack PRO-32 handheld scanner could be increased by replacing a resistor. A call from another reader, Frank Loyke, revealed that there are some side effects of the operation.

First, although the resistor value was correctly identified by value (39k ohms), but not by callout; it should be R50, not R51. Secondly, after the modification, the user can no longer lock out channel banks 1, 4, 7, or 10; it may be possible that individual channels within those banks might still be laboriously locked out one at a time, however.

Thus, while the scan rate is approximately doubled by the exercise, there is a negative tradeoff which must be considered before proceeding with the modification.

We appreciate these hints from Tom and Frank and invite other readers with helpful hints for better reception to send in their tips to share with other MT readers.

Country	EST Time
Algeria	6
American Samoa	-6
Andorra	6
Argentina	2
Aruba	1
Ascension Island	5
Australia	15
Austria	6
Bahrain	8
Bangladesh	11
Belgium	6
Belize	-1
Benin	6
Bolivia	1
Brazil	2
Brunei	13
Bulgaria	7
Cameroon	6
Chile	1
China, People's Rep. of	13
Colombia	0
Costa Rica	-1
Cyprus	7
Czechoslovakia	6
Denmark	6
Ecuador	0
Egypt	7
El Salvador	-1
Ethiopia	8
Fiji	17
Finland	7
France	6
French Antilles	1
French Guiana	2
French Polynesia	-5
Gabon	6
Gambia	5
German Dem. Rep	6
Germany, Fed. Rep. of	6
Gibraltar	6
Greece	7
Guadeloupe	1
Guam	15
Guantanamo Bay (U.S. Naval Base)	0
Guatemala	-1
Guyana	2
Haiti	0
Honduras	-1
Hong Kong	13
Hungary	6
Iceland	5
India	10½
Indonesia	12
Iran	8½
Ireland	5
Israel	7
Italy	6
Ivory Coast	5
Japan	14
Jordan	7
Kenya	8
Korea, Rep. of	14
Kuwait	8

Caribbean/Atlantic		
1	Anquilla, British Virgin Islands, Union Island	
	Antigua, Barbados, Bequia, Dominica, Montserrat, Mustique, Nevis, Palm Island, St. Kitts, St. Lucia, St. Vincent, Trinidad, Tobago	
0	Bahamas	
1	Bermuda	
0	Cayman Islands, Dominican Republic	
0	Jamaica	

Country	EST Time
Lesotho	7
Liberia	5
Libya	7
Liechtenstein	6
Luxembourg	6
Macao	13
Malawi	7
Malaysia	13
Monaco	6
Morocco	5
Namibia	7
Netherlands	6
Netherlands Antilles	1
New Caledonia	16
New Zealand	17
Nicaragua	-1
Nigeria	6
Norway	6
Oman	9
Pakistan	10
Panama	0
Papua New Guinea	15
Paraguay	1
Peru	0
Philippines	13
Poland	6
Portugal	5
Qatar	9
Romania	7
Saipan	15
San Marino	6
Saudi Arabia	8
Senegal	5
Singapore	13
South Africa	7
Spain	6
Sri Lanka	10½
St. Pierre and Miquelon	2
Suriname	1½
Swaziland	7
Sweden	6
Switzerland	6
Taiwan	13

Tanzania	8
Thailand	12
Togo	5
Tunisia	6
Turkey	8
Uganda	8
United Arab Emirates	9
United Kingdom	5
Uruguay	2
Vatican City	6
Venezuela	1
Yemen Arab Republic	8
Yugoslavia	6
Zaire	6
Zambia	7
Zimbabwe	7



Wideband Preamp 10-1000 Mhz

Dual GasFet low noise preamplifier for HF, UHF or VHF systems. Just perfect for the R-7000. Excellent for Spec Analyzers, Scanners, etc. Gain 20 Db +/- 1 DB, -3 Db at 2 & 1100 Mhz. 1 Db compression of >10 Dbm. Intercept points >45 Dbm. New shipped price of only \$124.95. Pa. residents please add 6% state tax.



R-7000 Widespan Panadaptor

Panadaptor especially designed for the R-7000 receiver. For use with a standard scope. Variable span width from 1 to 10 Mhz. Uncover unknown elusive signals. Complete with all cables, & 90 day warranty. \$349.95 Shipped. Pa. res. add 6%.

GTI Electronics

RD 1 BOX 272
Leighton, Pa. 18235
717-386-4032

NEW!



Sequel just \$12.95 (+\$2 UPS)

If you liked the original, you'll love the Rainer Lichte sequel! Another fact-filled book of reviews. Not a computer printout - a real book. 14 reviews in all. Grundig Satellit 400; 650; Icom R-7000, Kenwood R-5000, Panasonic RF-B60m, JRC NRD-525 and more - all new.

The Original "Radio Receiver, Chance or Choice," Plus "MORE Radio Receiver, Chance or Choice" - together 320 pp. All real-life specifications are exactly comparable between books. Only \$19.95 + \$3.00 UPS

Better Radio/TV Reception by Ashok Nalawalla

Non-technical explanation of radio/TV reception emphasizing shortwave. Explains Long Wave, Medium Wave, all types of antennas, satellites. Definitions from amplitude to zulu 8½ x 11, 129 pp. \$14.95 + \$2.00 UPS

Utility Address Book by Wilhelm Herbst

"139 pages of pure joy for (utility) DX fan" Pop Comm Review says. Contains 3200 addresses around the world.

6 x 9, 139 pp. \$12.95 + \$2.00 UPS

GILFER SHORTWAVE

52 Park Ave., Park Ridge, NJ 07656
Phone Orders 201/391-7887 8 AM - 11 PM

Antenna Matching: An introduction

If we take our communications seriously -- and many of us do -- we will naturally notice factors which seem to be important in producing good contacts when conditions are difficult. Sooner or later, most seasoned operators come to the conclusion that the effectiveness of a radio station's antenna system one of the most important factors to consider when operating under less than optimum conditions.

But acquiring a good antenna and mounting it high and in the clear is not necessarily enough to insure good communications. For instance, it is quite possible to have a high gain antenna which performs poorly due to inefficient matching of the antenna to its feedline, or of the feedline to the rig (transmitter, transceiver, or receiver, see fig. one). Obviously then, an appreciation of the importance of matching is a prerequisite for setting up a good good radio system. So this month we'll consider just what matching does for us, and some ways in which it is accomplished.

Got a Match, Buddy?

Just what is matching, anyway? For our purposes, we can answer this question by saying that matching is that situation in which the electrical characteristics of two circuits are such that the most efficient transfer of power possible can take place from one circuit to the other. The circuits that we will consider matching to one another will be your antenna, your feedlines, and the antenna input/output circuit of your receiver or transmitter.

The electrical characteristics referred to in the above paragraph are the impedance of the feedpoint on the antenna, the impedance of the transmission line, and the impedance of the antenna circuit within the radio receiver or transmitter. Nicely enough, we don't actually have to understand impedance in order to understand matching. We just have to accept the idea that power transfer is optimum when each of two circuits connected together have the same value of impedance.

Thus, when the impedance of a feedline, such as RG-58 (52 ohms impedance), is approximately the same as the impedance of the feedpoint of some antenna (like the approximately 50 ohms feedpoint on a drooping-radial groundplane antenna) there can be an optimum transfer of power between these two circuits (feedline and antenna).

So, when you are receiving a signal, matching your antenna to your feedline allows you to get maximum signal transfer from your antenna into your feedline. And matching your feedline to your receiver's antenna input circuit lets you get the maximum amount of that signal from your feedline on into your receiver. When trans-

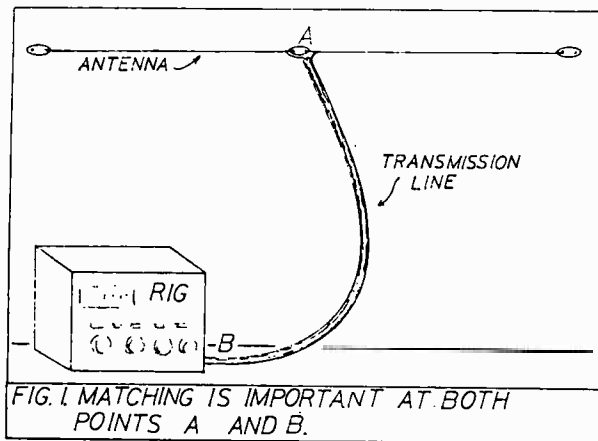


FIG. 1. MATCHING IS IMPORTANT AT BOTH POINTS A AND B.

mitting, matching lets you get maximum signal transfer what received power we have on down the line into our receiver (or our transmitter's power on out to our antenna) the better job of communicating we can do.

The Best Things in Life are Free

Sometimes matching between an antenna and feedline is taken care of for us "automatically". That is popular feedline impedances are available that are the appropriate value to match the impedance of some popular antennas. The example of the groundplane and RG-58, given above, an "automatic match". Again, RG-59 coaxial cable has an impedance of about 75 ohms, which is a good "automatic" match for the 75-or-so ohm impedance of the center feedpoint of a halfwave dipole antenna. TV twin-lead transmission line has an impedance of about 300 ohms, which matches the approximately 300 ohm feedpoint impedance of a folded-dipole very nicely.

But the feed point impedance on many antennas, particularly beams, often cannot be matched by standard feedlines. In such situations we must do something so that we have a reasonably close match of the impedances involved.

Techniques for Changing Impedances

There are a number of techniques at our disposal for changing the impedance of the feedpoint of an antenna, or of the antenna input/output circuit of a receiver/transmitter. Changes in antenna input or output circuit are usually accomplished by use of antenna-circuit tuning controls on the rig itself. To change the impedance of the feedpoint of an antenna, perhaps the simplest way to do this is to change the point on the antenna at which the feedline is attached.

A good example and discussion of this technique appeared in Caron's article on the Windom antenna in the August 1987 issue of *Monitoring Times*. Caron pointed out that the impedance of a halfwave dipole varies

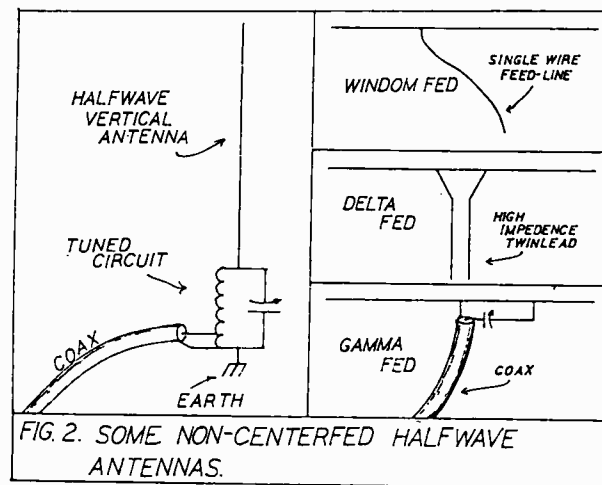


FIG. 2. SOME NON-CENTERFED HALF-WAVE ANTENNAS.

from very low value at its center to a very high value either end. Thus we can efficiently center-feed this antenna with low impedance source, or end-feed it with a high impedance source. Points intermediate between the center and either end yield intermediate values of feedpoint impedance.

The halfwave vertical antenna of figure 2A shows a high impedance end-fed system. The impedance encouraged in connecting to this coil varies from very low at the grounded end, to very high at the top end. Notice that one end of the antenna (high impedance) is attached to a high impedance point on the coil. The coaxial feedline (low impedance) is attached to a low impedance on the coil.

Therefore there is efficient transfer power between the antenna and the tuned circuit. Power will pass efficiently through the tuned-circuit between the antenna and feedline because both antenna and feedline are each matched to their appropriate impedance.

Figure 2B shows the circuits of some other antenna systems which allow matching to various transmission-line impedance values by tapping into a halfwave dipole antenna at points other than at its center.

A Baluns of Power!

Radio frequency transformers can be used to match non-equal impedances. The tuned-circuit in the end feed example of figure 2A is actually an autotransformer. There is another type of RF transformer, known as a "balun" which finds frequent application in matching non-equal impedances. For example, a balun transformer with a 4-to-1 matching ratio can be used to match a 300-ohm transmission line and the 75-ohm center feedpoint on a halfwave dipole ($300/75=4/1$).

The Old Standby

The example of matching with which many of are most familiar is the so-called "antenna tuner." An antenna tuner is an electrical circuit which connects between an antenna feedline and the rig with which it is used (this would be at point B in figure

one). The circuit of the tuner is such that it presents an appropriate impedance level to both the feedline (actually the whole antenna system) and to the rig. Despite what its name implies, the "antenna tuner" doesn't tune the antenna to the feedline at point A, but we can usually live with that if we've used appropriate feedline.

Going Further

There is, of course, much more to matching than we can discuss in this column. What I've covered here is only an introduction. If you'd like to check out more on antenna-feedline-rig matching, check over some of the following references: *The Easy Way* by J. M. Haerle is a very practical book, one of the best you can find; *The Radio Amateur's Antenna Hand Book*, Orr and Cowan, is a good practical introduction to antennas.

The *ARRL Antenna Book* (American Radio Relay League) and *High Frequency Antennas for all Occasions* (Radio Society of Great Britain) are both more technically oriented than the first two, but contain much practical information as well.

RADIO RIDDLES

Last Month's Radio Riddle asked: "What is a balun, and what does it do?" Part of the answer has been given above. One fact, not mentioned above, is that a balun can be used to link balanced lines (like TV twin-lead) to unbalanced lines (like coax), while still preserving electrical balance to ground on the balanced line. The word "bal-un" is derived from the BALUnced-to-UNbalanced function of these useful devices.

This Month's Radio Riddle: In radio communications we have occasion to use transmission lines, delay lines, halyard lines, Lecher lines, load lines, and gray lines. Which of these lines is a phenomenon associated with radio wave propagation, and how does a knowledge of it help us to improve our HF communications? Get a line on the answer to this riddle by reading next month's column. Til then, Peace, DX, 73

Terry Staudt, LPE, W0WUZ

716 N. Roosevelt
Loveland, CO 80537



A Small Tale - Starring the Heath HW-9

In a departure from the usual, I'm going to chat a bit with you all and skip the boxes and diagrams that usually fill this space in the magazine. I'm going to talk to you about ham radio.

Just about all of the folks here at *Monitoring Times* are ham radio operators. We run an amateur column and we all try to "salt the mine" just a touch in our columns. We enjoy ham radio and hope we can get some of you interested in giving transmitting a try.

At last count, the amateur population was hitting a median age of fifty (Yours truly is just a couple of years away) and climbing. This is due primarily to the fact that most older amateurs don't give a damn about putting forth any efforts to win converts.

When I got my license back in 1954, there were two hams in town. And one hated kids -- wouldn't give me the time of day (I was 14). The other one was amiable enough to give me my novice test *just once*. Happily, I aced it.

Today, the amateur population in my neck of the woods is over a hundred. And they don't all work for the electronics industry. Some are nurses, landscapers, and salesmen. Simply put, you don't need a Ph.D. in nuclear physics to get you ham license. Not by any stretch of the imagination. What all of these people have in common is the shared thrill of communicating with other people across the country and around the world.

Now, to the case in point.

Out with the Old ...

In the summer of 1986, a retired, inactive ham visited my home and got the requested demonstration of my radio set up. Well, being something of a perfectionist, my Yaesu FT-101ZD (modified, of course), Dentron MLA-1200 linear amplifier and assorted other goodies were working like the Budweiser wagon team. And this really got him enthused.

In a little while, after knocking off about 15 different countries and learning how they make fermented coconut milk in Pago Pago, he said "what would you want for all this?" I tossed out an outrageous figure, as usual, and after lighting up a cigarette, was astonished to see him writing out a check! If you want a "Chicken today, feathers tomorrow" life, try writing and consulting!

I took the check and helped him out with everything, along with extremely mixed feelings, to say the least. All I had left in the way of amateur gear was some assorted wire.

The cash helped me tough it out until May of this year when I received a little windfall. I'd been wanting to get back on the air but with moving from Evergreen to Loveland and all, it was out of the question. Now I had the chance.

My options were to either purchase someone else's problem that looked like it had been kicked off a bridge or get something new. Full of enthusiasm, I opted for the latter.

... And in with the New

With a fixed sum of money and a little guilt, I decided to start from scratch. I got a Heath HW-9. This is a little QRP (low power 5 watt) rig for CW (code) only. It did have a list of relatively sophisticated features, however. Among them were a crystal filter, an extensive IC circuit, and variable audio selectivity which in the present state of the art works as well as a crystal filter alone.

This unit was covered extensively in the June and August issues of *73* magazine so I wanted to add my personal comments for those who want to get their feet wet with this fine little piece of gear.

Working Out the Bugs

It is a little difficult to construct. I can't recommend it as a first project by any means. I also found that the vernier drive slipped because of a little catch in the variable capacitor. I already knew that from the *73* magazine review. In any case, they make

those things like aspirin tablets so they can't check every one!

I was also disappointed, but not surprised, by the almost total lack of background noise on 15, 12, and 10 meters. The sensitivity was there to be sure, but at the ragged edge. The HW-9 has no RF (radio frequency amplifier) stage, which really isn't necessary under 30 MHz as extraneous noise masks out just about everything anyway.

Anyway, being intimately acquainted with the 3N211 -- the best dual gate MOSFET for under 50 MHz work, I replaced Q107 (and MFE-131) with it and wasn't a bit surprised as background noise was apparent when switching between a dummy load (a 50 ohm resistor) and the antenna. Q107 is the first mixer in the HW-9.

A little correspondence with Matt Adrian, senior technical service supervisor at Heath, got the problem resolved post-haste. Matt's the kind of guy I like to have working with me -- he's knowledgeable and he cares.

There was also a spur (miscellaneous frequencies) on 15 meters that was cured with a new #Q402 (#417-293) that's yours for the asking. Matt states that this will be a new revision, so you got it here first.

Otherwise, with *dedicated* antennas (resonant for the band in question), I find I can work everything I can hear with no problem at all. (5 watts is just *one* "S" unit below 100 after all is said and done.)

For a small amount of cash outlay, you can join the fun -- *and it really is!* If you have a good receiver, a QRP transmitter can be constructed for about \$20.00, less power supply. The *ARRL Handbook* and Bill Orr's publications have a wealth of extremely simple and well-described circuits that may be built from Radio Shack parts. So, if you're tired of listening to *owl up da pis* (sic) *livink pebble uf da wort*, try talking to someone in Iowa or England. It sure is a welcome change of pace. ■

IDEAL CHRISTMAS GIFT! ORDER TODAY!

SETH THOMAS 24-HOUR STUDIO CLOCK

For that professional touch

Nothing lends an air of authority in a radio station like the clock on the studio wall. It is traditional, recognizable, functional, and now, with a modern precision quartz movement, accurate to 1/2 second per day.

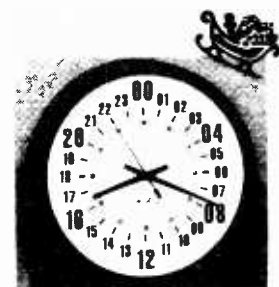
This studio clock from Grove Enterprises is a professional 13" Seth Thomas, featuring a 24-hour movement with bold, black numerals and a red sweep-second hand.

A convenient set knob allows precise set-up at installation; add an inexpensive alkaline AA cell (not included) and you have at least a year of unattended, accurate time--even during power outages.

Order CLK1 MASTERCARD, VISA, COD CALL
TOLL-FREE 1-800-438-8155

Retail \$34.95 Only \$29.95
plus \$3 UPS, \$6 US Parcel Post,
Canadians \$9 Air Parcel Post.

GROVE ENTERPRISES, INC.
140 Dog Branch Road, Brasstown, NC 28902
704-837-9200



An advanced project for the experienced experimenter ...

72 Channel Yaesu FRG-7700 Memory Expansion

by Don Moman
Shortwave Horizons
6815-12 Ave.
Edmonton, Alberta
CANADA T6K 3J6

The FRG-7700 with the 12 channel memory option installed can easily be rewired to allow 72 channel operation. A total of 256 channels are available; however, a suitable switching arrangement that is convenient to use and implement is difficult to find.

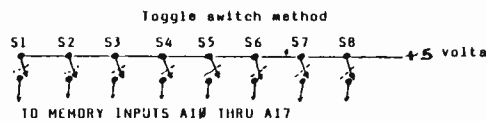
Basics

Refer to diagram PB-2175 (FRG-7700 Memory Unit) and main FRG-7700 diagram. Components Q30-35 are the memory elements. Each IC has eight leads labeled A10 through A17 that are used to address a certain memory location or channel. These pins are brought out to connector J02 / P34 and finally to the 12 position memory select switch S5a and S5b.

Since we have eight lines, each of which can be in one of two conditions (high or low), we have a total of 2 to the 8th power or 256 combinations available. If we were to install eight SPST toggle switches as shown

below, we could access all 256 memory locations.

This method is inconvenient to use as one can easily see that scanning all the memories would be a chore - flicking eight toggle switches and keeping track of them would be a real hassle! Also, there is no way to mount them neatly in the existing front panel space.



A Better Way

In most applications, the front panel ATT (attenuator) control on the 7700 serves very little purpose and can easily be eliminated. In its place we will install a six position *memory bank select* switch which will allow us to retain the original 12 position *memory channel select* switch but give us a total of 72 memory channels.

Rewiring the Memory Channel Switch

Some major disassembly is required. The ATT and MEM CH switches must be removed -- this can only be done by removing all the knobs and the front panel. The ATT pot is left in the normal MAX setting end tied back to a convenient spot in the set where it isn't touching anything. The control may be reinstalled should you ever wish to.

The leads on the MEM CH switch are called A0 through A7 on the schematic and you should verify which color is which! They are not all color coded properly! Rewire, following accompanying diagram and steps below.

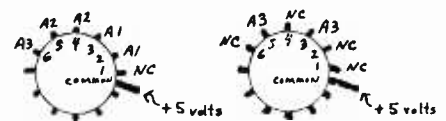
Adding the Memory Bank Select Switch

The first obvious step is to locate a usable switch! It should be a six position, two pole rotary switch capable of mounting in a 1/4 inch hole. Most

switches mount in a 3/8" hole. The panel hole in the 7700 is metric (approx. 5/16") so, unless you wish to enlarge the hole, find a 1/4" switch or order one from Yaesu or from Shortwave Horizons.

I will be attempting to stock the original MEM CH switch from Yaesu for this purpose. It's compact, fits right and blends right in -- even the knob fits in. It is a 12 position two pole switch but you will only need to use the first six positions. If you can find a good use for the other six let us know!

Whichever switch you find, it should be wired as follows (NC = no connection!):



The +5 volts comes via the 6" wire you added to the original switch. There is enough slack in A1, A2 and A3 (when the wire bundle is freed) to

Unusual MW Antenna Booster

Portable AM broadcast band portables are often limited by their tiny internal loop antennas. Efficiently wound around a ferrite rod core, the antenna coils still occupy a very small volume and intercept only small signal voltages.

It is possible, of course, to open up the radio and adapt it to accept a long wire antenna, improving its signal pickup; but wouldn't it be more convenient to utilize some external means to capture more signal voltage?

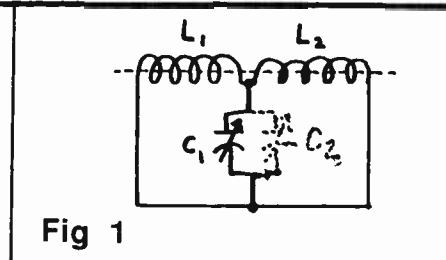
A trick used for decades by medium wave DX enthusiasts is to employ a passive external loop which concentrates the radio field, coupling it inductively to the internal loop antenna rather than requiring a direct connection. Tuned to resonance at the desired frequency, the contrivance becomes a giant RF transformer, improving signal voltages dramatically.

A novel approach to this method was

sent in by reader Malcolm Nichols of Franklin, Tennessee (see figure 1); his design is based on an unusual method developed by the U.S. Army Signal Corps many years ago. The original version was housed in a metal trough which acted as a Faraday shield, assuring that the antenna would be sharply directional in its response.

Malcolm wound his coils on a ferrite rod he obtained from Mouser Electronics (2401 Highway 287 North, Mansfield, TX 76063; part number 542-FR-500-7.50, \$15.56) using 20 gauge, double-silk-covered wire acquired from Fair Radio Sales (PO Box 1105, Lima, OH 45802). Any similar-gauge insulated wire should work.

The variable capacitor is rated for at least 365 pF maximum; Malcolm used a dual 410 pF unit with an external switch to engage the second section if required to tune the lower frequencies. Mouser has a usable tuning capacitor, part number 524-

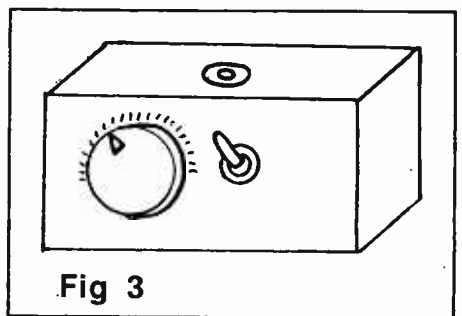
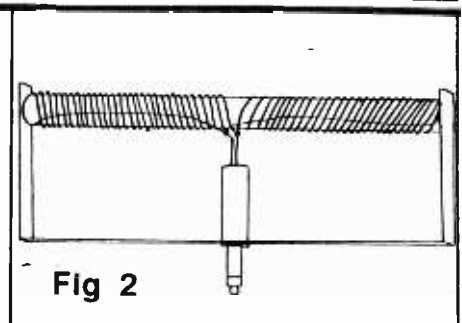


A1-227, for \$10.95. Similar capacitors may be salvaged from old tube-type radios--check a local repair shop; you might get lucky and find a ferrite rod antenna as well!

The coils consist of 53 turns on one and 51 turns on the other to prevent their inductances from cancelling and to provide a balanced loop with constant capacitive reactance along the windings, according to Malcolm.

It is important that the two windings are opposite in phase, so start winding from the middle on each coil as shown in figure 2, going over and then behind the rod on the first turn in each case.

The two far ends of the windings are brought back and connected together as one lead into the phone plug; the common center of the two windings is the other lead. The windings may be taped in place on the ferrite rod or glued if the ferrite has no paraffin coating.



The mounting bracket is made of wood or plastic; metal would distort the pattern and change the inductance. The rod assembly is mounted on a phone plug which, in turn, is inserted into a matching jack mounted on the top of a convenient utility box and connected to the variable capacitor mounted in the same box as shown in figure 3.

To use the tuner, simply bring the portable radio close to the loop and tune the variable capacitor for maximum signal. The loop may be rotated to favor a particular direction or null out interference. ■

reroute these wires over to the new switch.

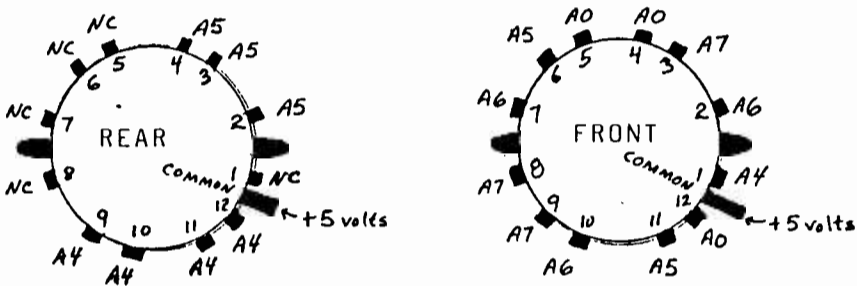
This completes all the modification steps, and upon putting it all back together you should have 72 channels to play with, instead of just 12!

If you are unable or don't wish to perform the modification for the 72 channel memory on your FRG-7700, Shortwave Horizons will modify your set for you. Contact us for further details. ■

Rewiring Diagram

- (1) REMOVE: A3 (red) A2 (orange) and A1 (yellow) from front deck, lugs 2,3,&4
- (2) ADD :A7 (gray) to #2; A6 (violet) to #3; and A0 (green) to #4
- (3) ADD :A5 (blue) to 2,3&4 on rear deck
- (4) ADD :6" wire to +5 volts (common of each deck) to be used for new switch

This completes rewiring of the original MEM CH switch. The switch should match the following rear view of switch wafers, as installed, KEYWAY down (front and rear wafers separated for clarity).



Notch Filter for Interference

A recent letter from Jim Coyle of Johnson City, New York, is typical of many we receive here at *MT* headquarters. Jim is troubled by a strong NOAA weather transmitter located just a few miles away. Signals are so strong that he frequently hears the weather forecasts no matter where he tunes his scanner. Is there a simple cure?

Advising Jim to move is one possibility, but we suspect that it may not be the most practical. He needs technical help now.

Several years ago Grove Enterprises designed their popular Scanner Filter, a tunable notch filter which was connected between an antenna and a scanner. The device could be tuned to remove a single interfering signal between roughly 80 and 220 MHz.

As successful as the product was, component costs rose dramatically and it was discontinued. Fortunately, Grove is actively working on an improved version, the FTR-4, which should be ready in a few months.

The new version is almost entirely automatic; connected between the antenna and the scanner it will pass frequencies of interest to scanner

listeners while selectively removing annoying strong-signal interference. But in the meantime, what is Jim-- and others like him-- to do?

What Jim needs is a sharp-selectivity notch filter adjusted to 162.5 MHz. A simple one-pole (single resonant circuit) filter, properly designed, can knock down a signal by as much as 40 dB.

Such a notch filter can be made out of a five-inch piece of coax as shown in figure one. Solder a 2-18 pF (approximate) trimmer capacitor between the center conductor and shield at one end and install a Motorola plug (Radio Shack 274-711) on the other.

If soldering a Motorola plug onto a piece of coaxial cable sounds abhorrent to you, purchase the Radio Shack 12-1312 automotive extension cable and snip off the Motorola plug and five inches of cable. The trimmer may then be soldered across the cut.

If you can't find the trimmer, you may use a Radio Shack 272-1340 (6-50 pF) with a tiny fixed capacitor of approximately 22-47 pF soldered in series with the stator lug. Keep the leads as short as possible.

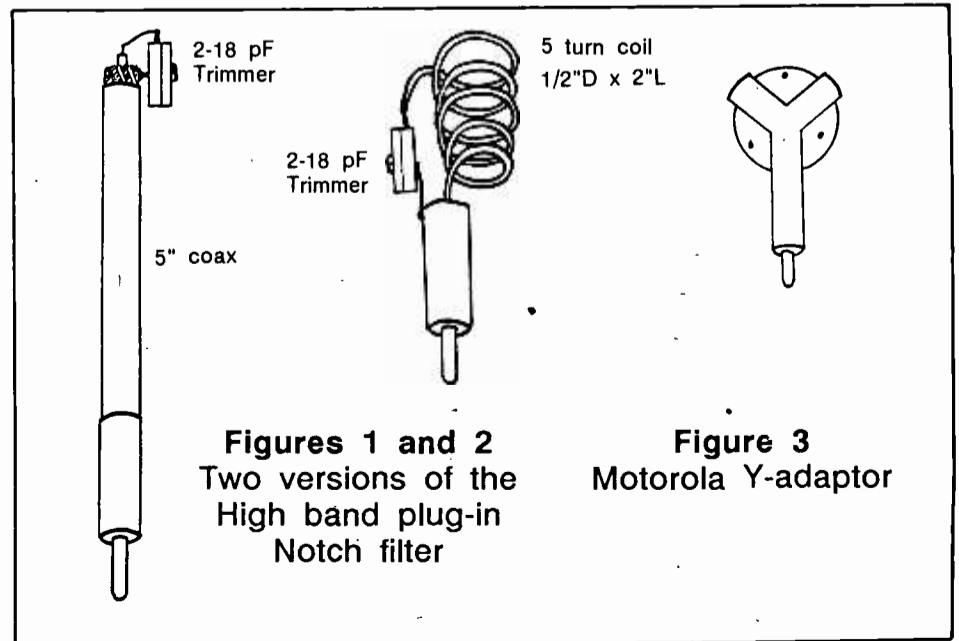
Alternatively to the coax, wind five turns of stiff, insulated hookup wire around a half-inch form; remove it from the form and stretch it to two inches. Insert one end into the Motorola plug and solder it; the other end is connected to one lug (stator) on the trimmer and the other lug (rotor) is soldered to the rear of the plug shell.

If the problem occurs with the screw-in whip attached, simply plug the notch filter into the external antenna jack; if an outside antenna is in use, plug the filter and the antenna cable into a Y-adaptor (Radio Shack 12-

1313), then the adaptor into the external antenna jack.

With the interfering frequency tuned in, adjust the trimmer slowly until the signal drops sharply, then tune in desired signal frequencies to make sure that they are still clearly receivable.

Similar notch filters can be made for a variety of applications and frequencies. FM and TV broadcasters, aircraft images on the police band, mobile telephone pilot tones--all wreak havoc with scanner listeners. All can be cured with a notch filter like those described above. ■



Figures 1 and 2
Two versions of the
High band plug-in
Notch filter

Figure 3
Motorola Y-adaptor

MIL-SPEC COMMUNICATIONS CO.

SPECIAL SALE! HF RECEIVERS

WORLD-FAMOUS BRAND NAME

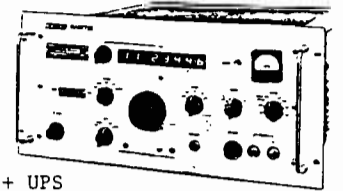
A SPECIAL PURCHASE OF FACTORY-SURPLUS PROFESSIONAL GRADE H-F RECEIVERS PROVIDES A ONCE-IN-A LIFETIME OPPORTUNITY TO UPGRADE YOUR SHACK WITH A TRULY PROFESSIONAL HF RECEIVER. LIMITED SUPPLY

RA-6778C - Digital Receiver
15 kHz - 30 MHz continuous.
Digital readout to 10 Hz with
1 part in 10⁷ stability.
AM-FM-SSB detectors. Filters
include 200,500,1000,3240, and
8000 Hz bandwidths. Keyboard
entry; 16 memory channels



\$ 2595.00 + UPS

RA-6772E - Digital Receiver
1.0 to 30.0 MHz. AM-FM-SSB
Stability 1 part in 10⁶. Display
reads to 10 Hz. Same filters as
above except no 500 Hz bandwidth.



\$ 1995.00 + UPS

BOTH RECEIVERS: Sensitivity on AM of 2.5 uV at 8 kHz BW 10dB/N
Third order intercept point in excess of +35 dBm. Both units
feature die-cast chassis, and superb shielding. Until you see
a truly professional unit, you won't appreciate the quality.
Designed for years of continuous use. Made for a NATO military.
A US Government export license is required for foreign orders.

Send \$ 3.00 for descriptive brochures; \$ 20.00 for a copy of the
operations manual, or \$ 65.00 for a repro service manual.
Credited against purchase. Each unit tested prior to shipment.

MIL-SPEC COMMUNICATIONS CO.
P.O. Box 461
Wakefield, Rhode Island
02880

WE SPECIALIZE IN MIL-SPEC
RECEIVERS, NEW AND USED.
PHONE: 401 783 7106

Q. How can I connect an external antenna to my Regency HX2200 handheld scanner? (Jim Larocque, Phoenix, AZ)

A. Some scanners don't make it easy, and the threaded hole on your HX2200 is a fine example. A variety of adaptors are available from Centurion International, PO Box 82846, Lincoln, NE 68501-2846. Write to them for pricing, describing your unit and connector you desire.

Q. Will the Grove Hidden Antenna System give me better 800 MHz reception on my BC800XLT than the whip on my scanner? (Marcus Ard, Georgetown, SC)

A. Probably, but the Hidden Antenna works best up to about 500 MHz. Since your Bearcat has a separate input for the 800 MHz band, try the following experiment in devising your own antenna length for use with the Grove preamp that comes with the Hidden Antenna System.

Select a piece of coaxial cable long enough to reach where you want to suspend the indoor antenna. Install an F connector on the end which attaches to the preamp; trim back about 4 inches of the black jacket on the far end in order to expose the braid. Peel back the braid, separating it from the insulated center conductor.

Now pull the braid in one direction and the center conductor in the other, forcing it to shape itself into a short vertical dipole. With the scanner listening to an active 800 MHz frequency and the Hidden Antenna System plugged in and working with the homebrew antenna, move the vertical dipole around for best reception and attach it permanently at that spot.

Q. I have a restricted space for an antenna. If I mount the Grove Scanner Beam horizontally instead of vertically, will the performance be degraded significantly? (Peter Dougan, Sarnia, ONT)

A. In an ideal environment (high above ground, no reflecting surfaces, flat terrain) you would probably lose some 30 dB of signal by changing the mismatching polarization. In the city with its considerable signal reflections it's impossible to predict. Chances are there would still be some loss, though not as profound as if the antenna were in the clear.

Q. What states outlaw mobile scanners? (William Doherty, Madison, FL)

A. At last count Indiana, Kentucky, Michigan, Minnesota, New Jersey, New York, North Dakota, and South Dakota all have prohibitions against mobile monitoring of police calls. There are various exemptions, usually for law enforcement personnel and licensed amateur radio operators.

Q. When I key in frequencies like 167.52 and 165.387 on my scanner the numbers show, but when I attempt to enter them, another frequency will show. How come? (Rod Plyler, Lancaster, SC)

A. The FCC has different channelization plans for different bands. For example, assignable frequencies in the domestic high band (150.8-162 MHz) are separated by 15 kHz, while those of federal government high band (162-174 MHz) are separated by 25 kHz. To make things even more complicated, channel "splintering" is authorized--167.175 is followed by 167.2125 MHz.

Following all of these changes would be quite a task for a scanner's microprocessor. Some manufacturers compromise by using average increments, saving the expense of an extra digit on the frequency display as well.

When you enter 167.2125 MHz, the display may read 167.215 or 167.210; since the bandwidth of a typical scanner FM signal is about 15 kHz, the 2.5 kHz off-center frequency will never be noticed.

Q. Are there any handheld scanners that have continuous 30-512 MHz

frequency coverage? (Patrick D. Shediak, Andrews AFB, MD)

A. No, and as best as we can determine, none is planned in the near future.

Q. What advantage would there be in using two Grove TUN-3 MiniTuners instead of one between my outdoor antenna and my shortwave receiver?

A. Absolutely none, either in series or parallel; we just tried it! This question arrived in the mail just as we were preparing to experiment with noise-cancelling concepts using two preselectors connected out of phase on one antenna. That didn't work, either!

Q. What is the difference between synchronous detection and exalted carrier single sideband? (R. S. Badessa, Canton, MA)

A. The prime advantage of single sideband is that it occupies less spectrum space than AM, thus causing and receiving less interference. Single sideband signals, unlike AM broadcast signals, are devoid of a carrier; the receiver must be switched to SSB mode which generates its own carrier, thus restoring normal sound when properly fine-tuned.

If we attempt to use an SSB detector on an AM signal which already has a carrier present, the two carriers, if not perfectly aligned, will produce an objectionable "beat note" or "heterodyne" which severely distorts reception.

Exalted carrier single sideband is a tuning technique in which the listener attempts to adjust the receiver as closely as possible to the original carrier frequency to avoid the distortion.

In synchronous detection the receiver samples the original transmitted carrier and automatically locks its own self-generated carrier perfectly in phase, removing the objectionable distortion and requiring no further adjustments.

Q. When will digital filters be available for general coverage receivers? (Bill Tomkiw, Oakland, CA)

A. They are already available for special purpose receivers, but since our present consumer radios come from Japanese manufacturers who are legend for copying one another, it is unlikely that we will see true digital RF or IF processing in the near future. Rest assured, however, that if one of those offshore manufacturers should break with tradition and put out an innovative product, the others will quickly follow.

Q. What is the difference in distance between whip and outdoor antenna?

What distance can I expect to hear with the attachable whip on my scanner as compared to a good outdoor antenna? (Allen Merrett, St. John's, NFLD)

A. On the average, you should have reliable coverage of 10-20 miles on the attachable whip and at least 50-75 miles on a good outdoor antenna, assuming flat terrain and a clear view of the horizon.

Q. Can a scanner preamplifier be used as a TV or FM broadcast signal booster as well?

A. Absolutely. Check the manufacturer's literature to make sure it will cover the same frequency range that you require (54-216 MHz for channels 2-13, 512-806 MHz for UHF, 88-108 MHz for FM).

While preamplifiers are great for fringe area reception in the deep suburbs or out in the country, they are discouraged for metropolitan dwellers. Nearby strong transmitters can saturate their transistors and produce severe interference from the overload, including desensitization--an actual reduction in signals after the "booster" is added.

Your important newspaper . . . FULL DISCLOSURE

Information You Need to Know

If you don't already subscribe to Full Disclosure, then read some of the information below. It's information you may have missed from other sources:

- ✓ **Legal Advisor Update.** Written for police departments. When can the police search your car? What if the VIN isn't visible from outside? Can they stop you, if you're merely acting suspiciously? Many issues involving your rights are discussed in this column. Can you afford not to be up to date on your rights?
- ✓ **Privacy.** Local traffic stops are part of a federal surveillance web. Do you have to let the government in to look around? How do you deal with government forms, should you fill them out? How easy is it to tap your phone, or find out if it's tapped? All of this and more has been covered in Full Disclosure.
- ✓ **Computers & Technology.** What computers does the FBI have to keep track of you with? What are their plans for using artificial intelligence? High-tech spying: is the data in your computer safe? A \$250,000 fine and 2 years in jail just for listening to the wrong radio station! Full Disclosure keeps an eye on technology for you.
- ✓ **Members of Congress...** do they represent you or the executive branch? Full Disclosure exposed a situation where a Congressman was being loyal to the FBI, not his constituents.
- ✓ **The Government Against People Commentaries.** Each issue of Full Disclosure brings you the GAP Commentaries, by Lynn Johnston, which address issues of the government working against the people. Some of the subjects covered include: Preventative Detention, State Religion, and Justice Of Control.

It is this type of impressive coverage that leads many to make comments like these:

- "Full Disclosure is dedicated to making the operations of government open to all, by judicious use of the power of the press." - **Factsheet Five**
- "I just received a copy of Full Disclosure and, after reviewing it, I find it to be an excellent periodical. It is professionally edited and printed and covers topics which are not covered by others..." - **Lowell Becraft, Attorney, Huntsville, Alabama**
- "This is a type of publication that is especially needed. Full Disclosure publishes research on government agencies' illegal and immoral (often highly secret) actions against its citizens..." - **Sound Choice Magazine**

- "Excellent newspaper." **Bob Banner, Editor, Critique Magazine**
- "I just received a sample issue of Full Disclosure, and was very impressed with your style and content. I was especially impressed by your book listings." - **R.H., Clayton, North Carolina.**

SUBSCRIBE TODAY AND SAVE!

You need to subscribe to Full Disclosure today. Special offer for Monitoring Times readers: Prepaid subscriptions are only \$15 for twelve issues, a savings of over 15% from the cover price of \$18.

NO RISK TRIAL SUBSCRIPTION

Call or write for a no risk trial subscription to Full Disclosure. If you're not entirely satisfied after receiving your first issue, just write cancel on the bill. The first issue is yours to keep free of charge.

MONITORING TIMES READER SPECIAL

As a special offer for Monitoring Times readers, Full Disclosure is offering a special 10% discount on all book orders with your paid subscription. You can either order directly from this ad, or you will be sent a complete book catalog and 10% discount certificate. Limit one per customer.

BOOKS FROM FULL DISCLOSURE

#1030 - **PRIVACY - How To Get It. How To Enjoy It.**
By Bill Kaysing

Big Brother and his underlings have nearly succeeded in completely undermining our constitutional right to lead private lives. But Privacy tells how to secure and maintain a private world of your own, much to the chagrin of the taxman, mailman, lawman and collection man. This very special knowledge will allow you to keep secret your bank records, address and phone number, possessions, tax information, credit background, education and employment records, even your true identity. The author knows what he's talking about-- even his best friends aren't sure who he is or where he lives! This 1985 edition will have Big Brother cringing. 128pp. \$18.95

#1022 - **D.E.A. NARCOTICS INVESTIGATOR'S MANUAL**

An exact reprint of the same manual used by the Drug Enforcement Administration to train its narcotics investigators.

CALL TOLL FREE
1-800-832-4372 Ext. 103 NOW!

(in Michigan (313) 747-7027)

Visa and Mastercard Accepted

Law officers and attorneys especially can benefit from the wealth of technical information found in this book and nowhere else. This extremely hard-to-find volume details every possible angle involved with drug law enforcement. Learn all about interviews and interrogations, case preparation, testifying in court, informants, surveillance operations, undercover operations, entrapment, penetration techniques, search operations, raids, clandestine laboratories, raid and surveillance equipment, and much more. The sections on use of informants and preparation for court testimony are especially enlightening, making the D.E.A. Investigator's Manual a worthy addition to any police or legal library. 270pp. \$49.95

#1025 - **TOP SECRET: A CLANDESTINE OPERATOR'S GLOSSARY OF TERMS**

By Bob Burton

Spy dust, HUMINT, cryptography, COSMIC TOP SECRET -- learn the meaning of these and over 800 more terms of international espionage. Available to the public for the first time, this A to Z of spy jargon includes all the most up-to-date terminology related not just to the CIA but to unconventional warfare and special ops, codes and ciphers, security and the intelligence community in general.

Every intelligence service around the world will make this must reading for their operatives. Here is your key to understanding the literature of the spy world as well as contemporary world events. Appendices cover additional relevant info on intelligence. 136pp. \$10.00

BOOK ORDERING INFORMATION

Add \$1.50 postage and handling to book orders. Allow 4-6 weeks for delivery. Minimum COD order \$25. We have a large selection of books on Privacy, Electronic Surveillance, The FBI, DEA, IRS, CIA, and other topics. Send \$1 for a complete catalog.

MONEY BACK GUARANTEE

Full Disclosure guarantees your satisfaction. If at any time you're not satisfied we will refund your subscription for all unmailed issues. We also offer a ten day return privilege on books.

Full Disclosure
527 E. Liberty #204-F
Ann Arbor, Michigan 48104

Q. What is the difference in range between base and hand-held scanners? Is there much difference in sensitivity and thus, listening range, between hand-held and base/mobile scanners? (Allen Merrett, St. John's, NFLD)

A. None whatsoever. Circuitry is virtually identical, albeit miniature, in the hand-held scanner when compared to the larger desktop and mobile units.

Q. What frequencies are used for wildlife tracking? (R. Gamache, Westfield, MA)

A. Wildlife agencies are experiencing growing numbers of illegal poaching incidents in which the hunter uses radio direction finding to home in on radio-tagged animals, often directly to a lair where the hibernating animal is slain. For this reason, officials are understandably reluctant to pub-

lish frequencies used for wildlife telemetry.

If you are in a game management area or near a wildlife refuge, you may hear tell-tale beacons and beeps from low power (10 milliwatt) collars and tags in the 40.66-40.70, 164.4-164.7, 166.7-167.3, and 216-220 MHz bands.

Q. Will covering the inside cabinet of a scanner with aluminum foil reduce lockup when both scanners are connected to the same antenna via a Y-connector, or if they are side by side using their own whips? (John Mahoney, Pawtucket, RI)

A. Scanner lockup, characterized by mutual interference from two adjacent scanners which causes the scanning sequence to stop on certain channels as though a signal is being received, occurs when products of the oscillator frequency of one scanner coincide with receive frequencies of another.

Properly applied and grounded to the chassis (make sure that none of the foil touches electronic components or bare wiring), aluminum foil will inhibit oscillator circuit radiation outward through a non-metallic cabinet; however, it will do nothing for the radiation from the antenna circuitry.

Isolation between scanners is required, utilizing splitters or, better yet, separate antennas. On very strong signal channels, lockup may be reduced by entering the frequency 5 kHz high on one scanner and 5 kHz low on the other. For example, if when 154.875 is being received on one scanner it stops the other, enter 154.870 on the first scanner and add 5 kHz to the frequency entered on the other.

Q. What DX club should I join? (Barry Rader, Fostoria, OH)

A. I'm afraid that must be a personal choice, as in choosing a car or a receiver. There are dozens of DX clubs, both here and abroad, with various

strengths, weaknesses and specialties. For a list of clubs and their specifics, send \$.50 in mint stamps with your request to the ANARC Publications Manager, P.O. Box 462, Northfield, MN 55057.

Q. Why do I hear 130 MHz aircraft signals on my scanner when listening to the 152 MHz band? (Randy Hudson, Albemarle, NC)

A. All modern superheterodyne receivers produce "images"-- repeated signals other than the desirable one to which the listener wants to hear. High quality (more expensive) receivers have circuitry designed to attenuate these phantom signals, but consumer radios generally suffer from compromised performance.

In the case of scanners (depending upon the brand), these images are typically 21.4 MHz (Regency, Fox and Radio Shack) or 21.6-21.7 MHz (Bearcat and Cobra) away from the desired frequency setting, thus accounting for the offset you noticed on your scanner.

**Caveat:
GRE 800 MHz Converter**

In our August issue, an article by Larry Wiland reported why GRE, a Tokyo-based firm best known for their manufacture of Radio Shack scanners, had allegedly discontinued their model 8001 800 MHz scanner converter.

According to Wiland, "a friendly female voice" at GRE's U.S. headquarters in Belmont, California, advised him that pressure from the FCC and some "court battles" had resulted in an agreement between GRE and the FCC which allowed GRE to sell off the remainder of their converters in stock.

We have been notified by Washington correspondent Bob Horvitz that there were substantive errors in the article which needed to be corrected. We quote from his letter:

"There have been no 'court battles' over the application of the Electronic Communications Privacy Act to the sale of any type of electronic device.

"Current regulations provide no basis for the FCC to 'contact' or 'advise' GRE America that under the ECPA they 'could no longer produce or sell' their model '8001 frequency converter, or for the Commission to 'allow' GRE to continue selling the device only on condition that 'a warning label was affixed to each one sold.'

"The FCC Field Operations Bureau has no knowledge of any such burdensome 'compromise' as described in (Wiland's) article. According to Spencer Tall, marketing manager of GRE America, GRE's decision to put a disclaimer in each carton--and not a warning label on the device--was entirely voluntary."

We appreciate Bob Horvitz's incisive reporting and know that the correction will be of interest to our readers.

Program Guide

Thanks for the renewal reminder. *MT* is great, but I miss the old hobby-type program schedules

for the SWLer. By this I mean, where and when is *SWL Digest*, *DX Party Line*, *Swiss SW Merry Go Round*, *Waveguide*, *Sweden Calling DXers*, *Media Network*, etc.? You would not have to include column after column of Radio Beijing; this listing would take up less than 1/4 page.

Ed Janowski
Spicewood, TX

RDF Network?

It would be super if a network of *MT*-SWL types could collaborate, in the cases of sufficiently interesting signals, in a coordinated listening effort.

The hard (read *costly*) part would be the instant callup for signals of opportunity, to pass frequency, mode and details, for cross bearings, signal comparisons... but if all were hams, maybe a RTTY network!

Bill Edwards
Houston, TX

(For years I've dreamed of just such an *RDF* network and it would be licensable to all participants, not just hams. Any interest out there?...Bob)

"New Math" ?

Re *MT* October '87; page 21; "800 MHz in Roanoke"

You list the 800 channels saying that they are spaced 120 kilohertz apart. Maybe my math is not too good, but shouldn't the intervals be 210 kilohertz? Aside from that bit of trivia, I enjoy *Monitoring Times* very much.

Gordon H. Hubbard
Tucson, AZ

(Right on! Our typing transposed the first two digits; 210 kilohertz it is!...Bob)

Avoiding the Scandalous

I want to voice my concern about the Scanning column on page 24 of the October *MT*.

Cordless phones have been covered in *MT* and elsewhere before...*BUT* - to present this topic in a "voyeur" or "deviate" light can only give the anti-scanner crowd (cellular, land mobile, Tandy, et al) some more ready-made ammo.

Much of the piece was, I'm sure, intended to be taken as tongue-in-cheek by Mr. Kay. However, if you quote parts of it out of context, as our foes like to do, it could be very harmful to us. What would you do if you were a state representative or congressman and saw such quotes?

Personally, if I used a Rolodex to keep track of my neighbors, it would be the best-kept "dirty little secret" in town.

Ron Smith WA4JNX
Birmingham, AL

INFORMATION PLEASE

Need service info for the following. I will purchase of pay copy cost. Unicom Electronics Power Supply Model Pc-11R, Tandy 64K Color Computer II Model 26-3127, EMP/GTS Manual Mini Modem Model MM-101 (manufactured by Elec and Eltec Co. Hong Kong), Garrard Turntable Model Lab 95B, Johnson Messenger CB Model 323, Apple IIe Pro System Duo-Disk, Imagewriter, Printer Monitor II, Icom Model 735 Ham Transceiver, Loonam Assoc. Modem Model FM30, Designers for Industry Mutual Conductance Tube Tester Model TV2CU (F.A.A.), Amplifier/Marker Jerrold Model CM-6C (F.A.A.), Signal Generator URM-64A/TS-419, and RCA Video Disc Player Model SGT-250.

Mike Adams, Haney Vo-Tech Center, 3016 Highway 77, Panama City, FL 32405 (904)769-2191.

**Radio Plus Electronics:
What Happened?**

A former advertiser, Radio Plus Electronics of Pensacola, Florida, had been building an excellent reputation for quality service and integrity. Then, several months ago, we began receiving complaints of unanswered correspondence and undelivered merchandise.

We contacted Gerry Thomas, the owner, and reported to our readers his explanation that severe health problems had forced him to cut back on his business and concentrate on recovery.

When complaints from customers continued to cross our desk, we tried to reach Gerry but our correspondence went unanswered and his telephone had been disconnected. Finally, another letter was received this morning.

Conditions have deteriorated rather than improved, according to Gerry, and he has been forced to close Radio Plus Electronics. He has promised that his mountain of unanswered correspondence--along with checks (none of which has been cashed)-- will be returned to senders within the next few weeks.

**Subscribe Today To The
World's Leading Magazine For
Shortwave & Scanner Listeners!**

- International Broadcasting
- Utility Monitoring
- Scanners
- Shortwave and Longwave
- Satellites
- Electronic Projects
- Listening Tips
- Frequency Lists
- Equipment Reviews
- News-breaking Articles
- Feature Articles
- Exclusive Interviews
- Insights by the Experts
- New Products



Each month **MONITORING TIMES**, the first wide-spectrum listener's publication and still the best, brings you 64 giant tabloid pages of late-breaking information on every aspect of monitoring the radio spectrum.

Fast-paced and information-packed, **MONITORING TIMES** consistently scoops the publishing industry.

ORDER YOUR SUBSCRIPTION TODAY before another issue goes by: only \$16 per year (U.S. and Canada), \$23 per year (foreign) or send \$1 for a sample issue (foreign send 2 IRCs).

MONITORING TIMES

P.O. Box 98 Brasstown, N.C. 28902

SELL MT IN YOUR STORE!

MONITORING TIMES DEALERSHIPS ARE AVAILABLE AT A SUBSTANTIAL DISCOUNT. CALL OR WRITE JUDY GROVE AT P.O. BOX 98, BRASSTOWN, NC 28902 OR CALL 704-837-9200.

Itching to Write?

One of the many pleasures of publishing is giving writers an opportunity to hone their talents. This year *MT* has added several new authors with excellent writing ability and we are looking for more.

Are you an experienced listener? Do you feel especially qualified in a particular area of monitoring? Would you enjoy writing an article, sharing your expertise with other serious listeners? Contact *MT* offices now and ask for our writers' guidelines. It's not only fun, but it pays!

YES! I Would Like to Subscribe to MT!

U.S.:

- 1 Year for \$16 (12 issues) 2 Years for \$30 (24 issues) 3 Years for \$44 (SAVE \$4.00!) (36 issues)

Price effective through December 31, 1988

Subscription will start with next issue; current copy \$2 if available

Canada and Mexico:

- 1 Year \$21.00 2 Years \$40.00 3 Years \$58.00

Foreign Subscribers:

- 1 Year \$23.00 2 Years \$44.00 3 Years \$66.00

All foreign subscriptions must be paid by International Money Order in U.S. funds drawn on a U.S. bank with federal transit numbers imprinted on check or Postal Money Order.

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Subscribe for a friend!

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Please send a gift card signed from _____

PAYMENT MUST ACCOMPANY ORDER!

Make checks payable to: **MONITORING TIMES**
140 Dog Branch Road
P.O. Box 98
Brasstown, NC 28902

ARE YOU OVER-ANXIOUS to Receive Your Next MT ?

We are very gratified by the eagerness with which our readers await their new issues of Monitoring Times. However, if you think your December issue is delayed, please don't call us for a replacement issue until the tenth of December! Our staff will be greatly appreciative.

COMMUNICATIONS SATELLITES

GREATLY EXPANDED AND REVISED THIRD EDITION! by Larry Van Horn

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 identification, 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!

Available November 15, 1987!

Only \$14.95

ORDER BOK-15

plus \$2 UPS or bookrate;

8 1/2" x 11"

Canadians \$5 Air Parcel Post

255 pages

GROVE ENTERPRISES, INC.

140 Dog Branch Road, Brasstown, NC 28902

ORDER TOLL-FREE 1-800-438-8155 VISA,
MASTERCARD OR COD

MT frequency monitor Greg Jordan promotes shortwave listening wherever he goes!



STOCK EXCHANGE

NOTE: Monitoring Times assumes no responsibility for misrepresented merchandise.

NON-COMMERCIAL SUBSCRIBER RATES: \$.10 per word; **NON-SUBSCRIBER RATE:** \$.25 per word. All ads must be paid in advance to Monitoring Times. All merchandise must be personal and radio-related. Ads for Stock Exchange must be received 45 days prior to the publication date.

COMMERCIAL RATES: \$30 per two inch ad must accompany ad, payable to Monitoring Times. Send 2-1/4" x 2-1/4" camera-ready copy or send text.

1-Alpha-Delta model DX-SWL shortwave "Sloper" antenna, brand new: \$55 shipping included. John Zidanich (716) 693-5290

Wanted: A GROVE shortwave adapter for the Scanner Aircraft band. This is a discontinued model by Grove and I desperately need replacement. Will buy one or more units. Please send price and information to: Jim Snow, P.O. Box 746, First Street, Darien, GA 31305.

BEARCAT 210-XW, new, under warranty absolute mint, \$145.00 free UPS (803) 723-5061, evenings after 7PM-EDT.

REGENCY Programmable Scanner, excellent condition, 3 months old, \$115.00 (803) 723-5061, evenings after 7PM-EDT.

FEDERAL PA-1000 Electronic Siren (100 watts) with Master Control Module, new speaker, all cables, complete manuals on both, mounting brackets, first \$170.00 takes all. Box 1239, Charleston, SC 29402.

POLICE RADAR UNIT mounts in vehicle using cig. lighter plug for power, all brackets, fittings, operators manual, \$75.00; Box 1239, Charleston, SC 29402.

REGENCY AIRCRAFT SCANNER--compact size for mobile or base, AC or DC, works well, \$45.00 (803) 723-5061 evenings.

Sell: Two R390A Receivers, one excellent, one intermittent. W/Manual. Both \$150.00. KSR-35, ASCII Teletype w/box of paper \$35.00. PRO-2004, excellent condition \$360.00. Will ship PRO-2004, others for pickup only. Dick Palace, 12020 Hunterton St., Upper Marlboro, MD 20772 (301) 249-6729.

For Sale: TEN-TEC RX-325 receiver, very good condition, with manual and power supply. One year old. \$275.00 including shipping. Jim Wright (312) 748-5834.

For Sale: INFO-TECH M600A with parallel printer interface, \$450. Certified check or money order. David Cook, 11649 Shasta Lane, Oklahoma City, OK 73162.

INFOTECH M6000 - Complete with original materials and cables. Low hours and in new condition. \$700 ppd. (313) 234-2866.

INDEX OF ADVERTISERS

AF Systems	23
APT Associates	47
Communications Electronics	41
EEB	37,49
Full Disclosure	59
Galaxy Electronics	17
Gilfer Shortwave	53
Gordon West	13
Grove	2,9,27,55,61
GTI Electronics	53
Ham Radio	31
Icom	64
Imprime	39,63
Mil-Spec Communications	57
Scanner World	51
73 magazine	11
Sony	33
Universal	21,9

For Sale: KENWOOD R-600, all accessories, \$260.00. BEARCAT 220 VHF/UHF/Aircraft 20 channel programmable scanner, \$140.00. Postal Money orders only, no trades. SASE for info. Gary Hahnke, 1211 Capri Isles Blvd. #14, Venice, FL 34292.

Wanted: Used ICOM R7000 receiver in good condition. Tom (201) 467-2128.

For Sale: Mint ICOM R71A, one year old, \$600.00. BEARCAT BC-250 50 channel scanner, \$150.00. JIL SX-100 scanner, needs power switch \$50.00. MICRONTA (Radio Shack #22-121) adjustable dual tracking DX power supply, brand new in box, never used, \$50.00. REALISTIC 8" polypropylene woofers, \$20.00 a pair. Black ROLODEX, looks good on shack table, \$15.00. YAESU YH-55 8 ohm headphones, \$10.00. STEEL-MASTER single drawer 5x8 file cabinet, 16" deep, good for QSL's, \$15.00. Shipping included on all items. Call Barry, (212) 828-0411 9:00 AM-2:00 PM EST.

Wanted: Used UNIDEN XL-100, or similar hand-held scanner. Concerned with function - not appearance. Will pay \$100.00 for yours. Bill Coolbaugh, 1304 Fairlane Drive, Bettendorf, Iowa 52722; include SASE.

For Sale: AR2002 professional monitor receiver with computer capabilities \$425.00 (313) 463-0172 before 3 PM.

HELIAX 7/8 inch, 50 ohm. \$1.00 per foot, plus shipping, "N" connectors for 7/8 and 1/2 Heliacx, \$25.00. 3/8 aluminum tubing, 5 foot lengths, \$2.00 no limit. D. Kerl, Rt 1, Box 175A, Butternut, Wisc. 54514.

For Sale: JAPAN RADIO CORP NRD-515 in excellent condition, with 96-Ch memory. \$800 price includes original box and delivery. Tom Martens, 601 S. Walnut St., Appleton, WI 54911 (414) 739-9820.

BUY,SELL,TRADE - HAM, S.W. AND OTHER ELECTRONIC GEAR ~ TECH. ARTICLES!

THE COMMUNICATION POST

BOX 1771 GRAND FORKS, ND 58206-1771
SEND LARGE SASE FOR SAMPLE COPY
24 ISSUES ONLY \$9.95 PER YEAR

COMMODORE CUSTOM CHIPS or FAST REPAIRS for C64/128 Computer/ Peripherals at low prices (eg. C64-\$39.95 complete). 6510 Chip-\$9.55; 6526-\$9.95; 6567-\$14.75; 6581-\$12.85; 901 ROMS at \$10.95, and many others...

"THE COMMODORE DIAGNOSTICIAN"
A complete diagnostic reference chart for fixing Commodore computers, etc. An absolute must for those who want to fix their own computers and save money and down time. \$6.95 plus postage...HD Power Supply for C64-\$27.95...

Kasara Microsystems, Inc.
33 Murray Hill Drive
Spring Valley, NY 10977
800-642-7634, 800-248-2983

RADIO ASTRONOMY

If you have in mind to do radio astronomy at any level of expertise, we can supply you with technical information and modular equipment to do the work. For a complete brochure send \$2 to:

BOB'S ELECTRONIC SERVICE
7605 DELAND AVE.
FT. PIERCE, FL 33451
PHONE (305) 464-2118

SCANNER / SHORTWAVE

Latest scanner and short-wave books, accessories product info & discount prices on select items. Send for FREE catalog:

Firecom Communications
Post Office Box 61-B
New York, NY 10011
Phone (212) 989-5773

IF YOU BUY, SELL OR COLLECT OLD RADIOS, YOU NEED...

Antique Radio's Largest-Circulation Monthly Magazine



ANTIQUE RADIO CLASSIFIED

Articles - Classifieds - Ads for Parts & Services.
Also: Early TV, Ham Equip., Books, Telegraph, 40's & 50's Radios & more...
Free 20-word ad each month. Don't miss out!
Sample - Free. 6-Month Trial - \$10.
1-Year: \$18 (\$24 by 1st Class). Foreign - Write.
A.R.C., P.O. Box 2-P2, Carlisle, MA 01741

NEW KENWOOD R-5000
(Reg. \$789.00)

plus UHF/MHF VC-20 Option
(Reg. \$189.95)

SAVE \$100.00
on combo at \$878.95.

Limited quantity,
phone immediate.

GILFER SHORTWAVE
(201) 391-7887

YOU AINT HEARD NOTHIN...YET!

Largest selection of scanner frequency guides (federal, military, police, aero, etc.); AM/FM/TV broadcast directories; HF "ute" directories; Books on espionage, covert ops., bugging, wiretapping, surveillance, clandestine radio, & more!
BIG FREE CATALOG!

CRB RESEARCH
P.O. Box 56-MT
Commack NY 11725

ALL STATE ELECTRONICS

3151 Hadley Ave. N.
Oakdale, MN 55109
(612) 777-8632

**Radios
Scanner Repair
Modifications**

Rocky Mountain Shortwave Specialists

NRD 525 • GRUNDIG • KENWOOD • INFO-TECH
SANGEAN • SONY • PANASONIC • YAESU
ICOM • MAGNAVOX and others
OPEN SEVEN DAYS A WEEK
M-F 9:30-5:30 Sat. 9:30-3:00 Sun. 12:00-5:00
Books • Magazines • Antennas
Call For Sale Prices
303-761-7305

Allied Appliance & Radio
4253 S Broadway • Englewood, CO 80110
VISA MASTERCARD



VOICEGATE
MORE than a squelch!
MORE than a filter!
Communications noise reduction.
An SASE gets YOU our FREE brochure or send \$3.50 (credited towards purchase) and we'll include a 30 min. Voicegate demonstration cassette. Hear it before u buy it!
VOICEGATE with patch cord & connectors \$109.95
POWER PACK 18vac at 1 amp 9.95
Indiana residents include 5% tax Shipping/Handling \$4.00
JABCO ELECTRONICS
R1 BOX 386, ALEXANDRIA, IN 46001

NJ-NJ-NJ-NJ-NJ-FINALLY!

A Ham - SWL - CB - Scanner store in NJ
Discount Grant Opening Prices
Top performing radio systems
for any budget
New 10 meter and VHF/UHF rigs
Antenna Specialists, ARRL, Astatic, Azden, B&W, Belden, Bilal, Butternut, Clear Channel, Diawa, Diamond, Kenpro, Kenwood, KLM, Larsen, Mirage, Nye, Santec, Sanyo, THL, Yaesu, Welz & more
Open M-W 11:30-7:30
Th-F 11:30-9, Sat 9-3
Have qualified repair facility
ABARIS SYSTEMS
276 Oriental Place
Lyndhurst, NJ 07071 (201)939-0015

Professional Receivers

Mil-Spec Communications has available a small number of new factory-surplus RACAL receivers. See our display ad in this issue.

Also available is the RACAL RA-6217 solid-state receiver, covering 1-30 MHz with AM-FM-SSB detectors, and 5 bandwidths (200, 1000, 3000, 6000 and 13 kHz) with digital frequency readout. \$1495.00. Complete with repro service manual.

Other prof-grade gear (new/used) is available from time to time. Please call or write.

Mil-Spec Communications
401-783-7106

Imprimé: The World Book Marketplace



All new articles... completely revised listings... 400 pages for 1988.

ONLY \$14.95

Everything you need to explore and enjoy the exciting realm of world band radio. The first part, *How to Tune in the World*, looks at a few of the countries and subjects available. Part two, *1988 Buyer's Guide to World Band Radio*, reports "hands-on" and laboratory tests of the latest models and comparative ratings of just about every major portable or tabletop receiver. Finally, *Worldscan* runs through all the frequencies of the world band spectrum and shows who's broadcasting what, from where, at what times, and in which languages.

Radio Database International

1988 BUYER'S GUIDE TO WORLD BAND RADIOS

PASSPORT TO WORLD BAND RADIO

"... closest thing to TV Guide for world band radios."
—Howard Blumenthal, NEW YORK TIMES

HOW TO TUNE THE SECRET SHORTWAVE SPECTRUM by Harry L. Helms. There are 1100 formal channels on shortwave and an infinite number of spaces in between. And it's here that some of the strangest broadcasts are found—the so-called "numbers" or "spy" stations sending information to agents in foreign countries, government and military communications, clandestine stations and more. helm's takes you into this mysterious world, tells you where these transmissions come from, who controls them and how you can tune it all. 182 pp. 1 lb. \$10.95.

MARITIME RADIO HANDBOOK. A truly unique reference work containing a time order list of all coastal radio stations transmitting traffic lists, weather messages, navigational warnings and ice reports between 4 and 26 MHz. Thousands of transmissions are conveniently organized and this is the first publication of its kind anywhere. An excellent summary of coastal marine radio. 180 pp. 2 lbs. \$12.95.

RADIOTELETYPE PRESS BROADCASTS. A new book containing up-to-date lists that help you tune to new agencies around the world. There are two sections, the first a time-order list for each half hour segment of the 24 hour day. Each half hour lists the agency that will be on the air at that time. The book contains English, French, German, Spanish and other languages broadcasts and covers the entire shortwave spectrum from 3 through 30 MHz. There's lots of photos, logos and illustrations as well as factual information direct from the press agencies themselves. 120 pp. 1 lb. \$12.95.

North American Radio-TV Station Guide—15th Edition • Vane Jones' guide to AM radio and TV in the Americas. \$9.95 (1 lb.)

Radio Database International, 1987 • Last year's edition of this complete frequency guide to the shortwave broadcast bands. \$6.95 (2 lbs.)

RAILSCAN. The largest number of railroad frequencies ever published! Includes over 4,000 frequencies for major railroads, short lines, narrow gauge, tourist lines, museums, accident/emergency frequencies, federal rail agencies. Included is full frequency usage data as well as railroad addresses, uniform alphabetic codes, track mileage and more. Tune in America's backbone—the gutsy world of American-Canadian railscan! 1 lb. \$7.95.

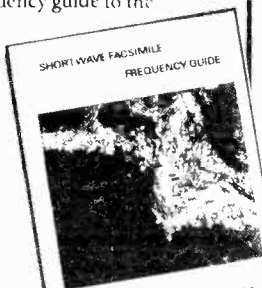
RTTY TODAY: THE MODERN GUIDE TO RADIOTELETYPE. The complete and modern guide to amateur radio teletype. The only up-to-date handbook on RTTY available, which covers all phases of radioteletype. A new book, it answers many of the questions commonly asked about amateur RTTY. Extensive sections cover home computers and RTTY use, the most recently developed RTTY equipment and systems. Fully illustrated with photos, diagrams, RTTY station set-ups and equipment. The latest information on a new generation of RTTY. 112 pp. 1 lbs. \$8.95.

SHORTWAVE FACSIMILE FREQUENCY GUIDE. The first book listing all FAX frequencies for all types of services around the world. Covers from 55 to 27,750 kHz. Lists press, meteo, embassy government, military plus other services. Also contains a cross-reference with FAX stations in country order. Many illustrations and photos. The purpose of the book is two-fold—to help shortwave enthusiasts decide whether the purchase of FAX equipment is "for them" and to help existing FAX enthusiasts get the most out of their equipment. 1 lb. \$14.95.

Maritime Radio Handbook • A unique reference work containing a list of all coastal radio stations transmitting traffic lists, weather, navigation warnings, ice reports and so forth between 4 and 26 MHz. Arranged by time, includes thousands of transmissions in various modes, ranging from Morse to SSB and RTTY. Also includes station call sign, name, country, frequency and type of transmission. Imported from Holland. \$12.95 (2 lbs.)

Radio Station, (The) • An eye-opening guide to how radio stations really work—from an insider's point of view. \$17.95 (2 lbs.)

Latin American DX Guide • Anyone who wants to learn the ins and outs of Latin American broadcasting should take a look at this book. Includes frequencies, profiles of stations, personnel and more. A complete guide to this fascinating and entertaining portion of the shortwave bands. A superb work in English, imported from Japan. \$18.95 (3 lbs.)



RDI White Papers • From the editors of Passport to World Band Radio (formerly RDI), comes a series of exhaustive test reports on some of the most popular shortwave receivers of today: Grundig 650, ICOM R71A, Japan Radio NRD-93, Japan Radio NRD-525, Kenwood R5000, Lowe HF-125, Sony ICF-2010, Ten Tec RX-325, Yaesu FRG-8800, Popular Outdoor Antennas, How to Interpret Receiver Specifications and Lab Tests. If you're going to plunk down \$500 to \$1,000 dollars for one of these radios, you should invest \$4.00 to make sure you're buying the right radio—a very small price to pay for such authoritative insurance. \$4.00 each postpaid. When ordering single RDI White Papers, please remember that there is a \$10.00 minimum for credit card orders on the toll-free line.

U.S. MILITARY COMMUNICATIONS, VOLUMES 1, 2, AND 3. A special, three volume set detailing the U.S. military's extensive useage of the short-wave bands from all parts of the world. 3 lbs. total weight. All three reports just \$38.85.

WORLD RADIO TV HANDBOOK (1987). It's the 41st annual World Radio TV Handbook—an indispensable reference to the shortwave broadcast bands. Over 300 pages, arranged by country, of stations around the world—including stations names, addresses, personnel, schedules, languages, targets, powers and more. 3 lbs. Just \$19.95.

BEGINNER'S GUIDE TO READING SCHEMATICS. Robert Traister's (author of the best-selling *Shortwave Listener's Antenna Handbook*) provides a hands-on guide to understanding and using schematic diagrams—the key to mastering the fundamental concepts needed to design, build, troubleshoot and repair electronic circuits. Never again be intimidated by those unusual drawings in the back of your receiver's owner's manual that until now had all the meaning of a bowl of spaghetti. Know that they mean! Understand your radio from the inside out. 140 pp. 1 lb. \$8.95.

Guide to Utility Stations • If "Passport to World Band Radio" is the 'bible' of the shortwave broadcast bands, this is the bible of everything else you'll hear—from 150 kHz all the way up to 30 MHz. Over 15,083 frequencies in this huge, 475 page English-language book imported from West Germany. Included are frequencies for airplanes, airports and air forces. There are ships at sea, coastal stations and weather radios. Worldwide embassy, business, police, and army stations. Transportation, United Nations, you name it. It's here. 4 lbs. you want to reserve the 1988 edition, which will be shipped in December/January. \$29.95 (3 lbs.)

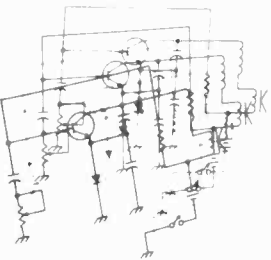
Confidential Frequency List • A complete frequency directory, running from 4000 to 27998 kHz, identifying non-broadcasting stations. Includes military, aeradio, navigation, embassies, maritime, and much more. A nice companion to the Passport to World Band Radio. \$15.95 (2 lbs.)

Complete Shortwave Listener's Handbook—3rd Edition • Hank Bennett's classic guidebook to the radio monitoring hobby. Now updated and revised in an all new third edition. Includes chapters on everything from choosing a receiver to how to DX, station profiles and other things to hear on your radio. \$16.95 (2 lbs.)

How to Repair Old Time Radios • A book for the person looking to turn that old-time radio into a working thing of beauty. A guide to repairing and replacing parts—even obsolete ones—troubleshooting, and more. Written so even the non-technical layman can handle the job. \$8.95 (1 lb.)

International Broadcasting: Limits of the Limitless Medium • Donald Browne's classic look at the history of international radio broadcasting. Includes profiles tracing the history of stations like the Radio Moscow and the BBC, the reason for broadcasting, audiences and much more. All salesmanship aside, every serious shortwave listener should have a copy of this book to enhance their understanding of the shortwave medium. \$36.50 (4 lbs.)

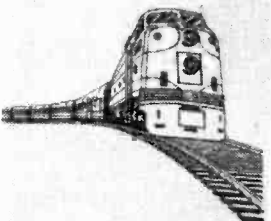
BEGINNER'S GUIDE TO READING SCHEMATICS



BY ROBERT J. TRAISTER

RAIL-SCAN DIRECTORY OF RAILROAD SCANNER FREQUENCIES

BY TOM BENTLEY, N3RAB



The World Book Marketplace
PO Box 241, Radnor Station
Radnor, PA 19087
1-800-323-1776, ext. 126



Mastercard & Visa Welcome!
Min. order \$10.00

Card Number _____
Expiration Date _____
Signature _____

Name _____
Street Address _____
City _____ State _____ Zip _____

DESCRIPTION	WEIGHT	PRICE
Total Cost		
PA Res. add 6% Sales Tax		
Shipping		
Total Enclosed		

Shipping Chart

Lbs	Price	Lbs	Price	Lbs	Price	Lbs	Price
1	1.95	6	3.09	11	4.19	16	5.42
2	2.16	7	3.33	12	4.49	17	5.66
3	2.39	8	3.56	13	4.72	18	5.95
4	2.62	9	3.68	14	4.96	19	6.25
5	2.86	10	4.02	15	5.19	20	6.55

7 DAYS ORDER TOLL-FREE 1-800-323-1776, ext. 126 24 HOURS



ICOM RECEIVERS

The World at Your Fingertips

Only ICOM brings the world into your living room...HF, VHF, UHF, and low band receptions. ICOM is the professional's choice to receive international broadcasts, aircraft, marine, business, emergency services, television, and government bands. Tune in with ICOM's IC-R7000 25-2000MHz* and IC-R71A 0.1-30MHz commercial quality scanning receivers for full spectrum coverage.

Incomparable Frequency Control. Both the IC-R71A and IC-R7000 feature direct frequency access via their front keypad, main tuning dial, optional infrared remote control and/or computer interface adapter. Flexibility of this nature can only be accomplished with an ICOM!

Full Coverage, Maximum Performance. The superb IC-R71A is your front row seat to worldwide SSB, CW, RTTY, AM, and FM (optional) communications and foreign broadcasts in the 100kHz to 30MHz range. It features passband, IF Notch, low noise mixer circuits, and 100dB dynamic range. The pacesetter IC-R7000 receives today's hot areas of

interest, including aircraft, marine, public services, amateur, and satellite transmissions in the 25MHz to 2000MHz* range. It includes all mode operation low noise circuits plus outstanding sensitivity and selectivity. The combined IC-R71A/IC-R7000 pair creates a full radio window to the world!



The IC-R71A is a shortwave listener's delight. Its 32 tunable memories store frequency and mode information, and they are single-button reprogrammable independent of VFO A or VFO B's operations! This HF reception is further enhanced by a dual width and level adjustable noise blanker, panel selectable RF preamp, selectable AGC, four scan modes, and all-mode squelch.

The IC-R7000 is a high band monitor's masterpiece. Its 99 tunable memories are complemented by six scanning modes. It even scans a band and loads memories 80 to 99 with active frequencies without operator assistance! Additional features include selectable scan speed and pause delays, wide/narrow FM reception, and high frequency stability. Many professional services use IC-R7000's as calibration references.

Options. IC-R7000: RC-12 remote control, EX-310 voice synthesizer, CK-70 DC adapter, MB-12 mobile bracket. IC-R71A: RC-11 remote control, EX-310 voice synthesizer, FM module, CK-70 DC adapter, MB-12 mobile bracket, FL-32A 500Hz, FL-63A 250Hz, and FL-44A filters.

See the IC-R7000 and IC-R71A at your local authorized ICOM dealer.

* Specifications of IC-R7000 guaranteed from 25-100MHz and 1260-1300MHz. No coverage from 1000-1025MHz

 **ICOM**
First in Communications

ICOM America, Inc., 2380-116th Ave. N.E., Bellevue, WA 98004 Customer Service Hotline (206) 454-7619
3150 Premier Drive, Suite 126, Irving, TX 75063 / 1777 Phoenix Parkway, Suite 201, Atlanta, GA 30349
ICOM CANADA, A Division of ICOM America, Inc., 3071 - #5 Road Unit 9, Richmond, B.C. V6X 2T4 Canada

All stated specifications are approximate and subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. RCVR3587.