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MONITORING TIMES

Precision Flight



*Air Shows
Thrill
Spectators—
and Scanner
Listeners!*

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The Next Tom Meyer?
(SW Interview). Page 14



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We Yen for a Stronger Dollar

There's no secret about it--the U.S. dollar has plunged in the world market in the face of the Japanese yen. So strongly, in fact, that advertised prices for Japanese-manufactured radios are often obsolete before the publications hit the newsstands.

Such is the case with the ICOM R7000 receivers. Here at Grove Enterprises, our cost has risen over \$200 per receiver in just one month, hardly an incentive to invest in a heavy stock of these new radios. Similar price increases are occurring at Kenwood, Regency and other manufacturing importers.

Even overseas manufacturers are suffering. Hong Kong and Taiwan, tooled up for low cost production, are heavily dependent upon Japanese components. Offshore companies are reeling from the inflated costs, setting these trade ports into a recession.

Many of us recall decades ago how low-cost Japanese goods impacted upon the American marketplace, competing with such vigor that U.S. companies were forced out of the

competition. Names like Hammarlund, National, Hallicrafters, Drake, Johnson, RME, and Gonset, once revered in the communications marketplace, disappeared forever from the shelves of radio suppliers.

Even those few products still manufactured in the U.S. are largely dependent upon imported components to place them in a competitive slot in the world marketplace. Open the cabinet of any consumer radio and read the "Made in..." line on capacitors, transformers, IC's, speakers, controls, and so on.

But has the wheel come full 'round? Is the pattern cyclical and now, with Japanese prices on the world market where U.S. prices were years ago, will American manufacturers start getting a bold, new idea and compete with the Japanese?

There seems to be no end in sight for the escalating yen; perhaps we will start seeing "Made in the USA" on more products in the future.



Bob Grove
Utilities Editor



HAZY, CRAZY DXing

Summer time is traditionally thought of as the "off season" for DXing. Nothing could be further from the truth. Sure, summer storms can make some pretty awesome racket on the radio, making even the powerhouse stations unlistenable. But it's also a time for some really good listening, for taking the radio out on the back porch or, for the more adventurous, heading off into the wilderness for a DXpedition.

As Harold Sellers points out in this month's issue, taking a weekend off with your radio can be an enjoyable and even DX-profitable experience. But even if you choose to do your listening at home, there's nothing quite like the feeling of laying back in the tall grass on a warm summer night and listening to the sounds of Radio Tahiti rolling into your radio from across vast expanses of ocean.

Too, summer's a good time to prepare your externals for the long winter ahead. Take some time to examine your antenna and connections for corrosion and replace what is necessary. Check out your ground as well for a poor ground will not only hamper your listening later, but might increase the damage incurred by a stray lightning bolt during the summer. With the new, sensitive solid state equipment, all it takes is one strike and you'll be staring at one of the most expensive piles of melted plastic and components you've ever owned. Not to mention the chance for a lethal injection of high voltage to your own body!

Summertime is indeed DX time. So take advantage of these hazy, crazy days of summer to increase your listening pleasure both now and in the months to come. And always remember, with shortwave, the world is just a radio away!



Larry Miller
Broadcast Editor

Privacy Act Moves Swiftly Through Senate

If S.2576 passes in its present form, a radio listener may be convicted of a felony, facing a fine of \$10,000 and confinement in a federal prison for a year for innocently tuning into a mobile telephone call or even hearing a remote relay transmission from a broadcast station, the contents of which were intended for broadcast use...Bob Grove

The Communications Privacy Act of 1985, sponsored by and heavily lobbied for by ATT and the telephone industry, is enjoying a rapid course toward ratification. At this writing the bill is in the Senate (S.2575) and a markup could have come as early as mid-July.

MT has provided an in-depth chronology of the progress of this ill-devised bill, encouraging readers to alert their legislators as to their opposition.

We would advise short wave and scanner listeners to phone and write

their senators immediately to inquire as to the status of the bill, encouraging them to oppose the bill in its present form.

Since these prohibited frequencies lie throughout the legally-receivable spectrum, it would be impossible to avoid their accidental interception. Even though the Department of Justice has affirmed that they will not enforce the criminal aspects of the bill where hobby monitors are concerned, an extremely dangerous precedent will be set allowing

(Please turn to p.58)



"Vive la difference!"

The unreasonable restrictions of the Communications Privacy Act inspired John Biro to suggest this political satire cartoon to our MT artist, Betsy Henn.

MONITORING TIMES

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OOPS!

A number of sharp-eyed readers spotted two goofs, one in the June issue (it was mislabeled May), the other in the July frequency section (we left out 0000-0100 UTC listings).

Rest assured; this August issue has been called "August" and the frequency section has 24 hours!



WORLD RADIO NEWS



WORLD R

▶ KVOH to Test (now) in August

KVOH, the long-proposed California-based shortwave service of High Adventure Ministries has announced that it will begin testing during the "mid to end of August." All programs will be in English although some Spanish is proposed. Their latest schedule, from Rancho Simi, California, is as follows:

Until Early September, 1986

0100-0300 UTC on 11930 kHz
0300-0600 UTC on 9852.5 kHz
0600-0800 UTC on 6005 kHz
1400-1700 UTC on 11940 kHz
1700-2200 UTC on 17775 kHz
2200-0100 UTC on 15250 kHz

Early in September, the station will switch to 9525.5 kHz from 0300-0600 UTC. The station's address is P.O. Box 7466, Van Nuys, CA 91409.

▶ Lightning Rips Dish Owner's Home

A freak lightning bolt in Sandy, Oregon, recently blew the top off a tree, charged through a 70-foot-high fir tree and jumped to a satellite TV dish, following the cable into a home where it blew out wall sockets and sheetrock and knocked a resident off her feet. Fortunately, she was uninjured.

A portion of the charge also followed the rain gutters, forcing 3-1/2 inch nails out of the wall and blowing pieces of rock off the front of the house.

While the one home suffered the greatest damage, six additional homes nearby reported damage to TV sets, VCR's and other electrical and electronic appliances.
(Contributed by Gary Rudd, Oregon City, OR)

▶ Twenty-four Hours in Mexico

La Voz de America Latina, XEWW in Mexico City, is operating 24 hours a day and has been widely heard in North America past 1000 UTC on 6155 kHz.

▶ New Japanese Hamsat

By the time you are reading this, a joint Japanese National Space Agency/Nippon Electric Corporation satellite should have been launched from Tanegashima Island (2000 UTC, July 31).

JAS-1 carries two transponders, one voice and the other digital for packet radio communications.

Scanner monitors will experience difficulty in tuning in the voice transmissions between 435.800 and 435.900 MHz because they will be in upper sideband mode. A CW beacon may be heard on 435.795 MHz, while the packet radio downlink may be heard on 435.910 MHz.

▶ Woodpecker Project Update

A recent inquiry from Lou Burkhardt of Los Alamos, New Mexico, prompted a phone call to Robert Horvitz, originator of the "Woodpecker Project" of a year or so ago designed to gather data about the prevalence of the irritating Russian signals.

Bob has been in the process of collating data from monitors who reported listening and logging the over-the-horizon-backscatter-radar

signals commonly referred to as the "Russian Woodpecker" due to the "rat-a-tat" sound of the pulse.

The results of this ambitious undertaking are being shared with the U.S. Department of State for a formal protest at the World Administrative Radio Conference and preliminary findings will be shared with MT readers in the next 60-90 days.

▶ Austrian Shortwave Panorama Moves

The weekly offering of shortwave news from *Radio Austria International* has moved to a more convenient time for North American listeners. Previously heard UTC

Sundays at 0430, it is now on at 0200 instead. No more staying up late to be disappointed -- now you can be disappointed early and get it over with.

▶ Radio Havana Cuba Frequency and Program Schedule

May-September, 1986

North America		Caribbean		Europe, Africa, Middle East			
0000-0600	6100 kHz	2050-2140	11725 kHz	1700-1800	15295 kHz		
0200-0450	6140 kHz	0400-0600	6090 kHz	1830-2000	11795 kHz		
0200-0600	6120 kHz			2200-2300	9590 kHz		
0400-0600	6090 kHz						
0600-0800	9525 kHz						
Monday, Wednesday, Friday		Tuesday, Thursday		Saturday		Sunday	
Newscast		Newscast		Newscast		From Havana	
Commentary		Commentary		Commentary		Promotion	
Cuban Music		Varied Music		Cuban Music			
Life in Cuba		P.O. Box 7026		Cultural Review			
Cuban News		Cuban News		Cuban News			
Cuban Music		Varied Music		Cuban Music		Philately	
Visitors in Cuba		Visitors in Cuba		Visitors in Cuba		Cultural Review	
Cuban Music		Varied Music		Cuban Music		Varied Music	
Spotlight on Latin America		Touring Cuba		P.O. Box 7026			
						-----60 min.	
Newscast		Newscast		Newscast		From Havana	
Commentary		Commentary		Commentary		Promotion	
Sports		Sports		Sports			
Cuban Music		Cuban Music		Cuban Music			
Inside the U.S.		Life in Cuba		Life in Cuba			
Touring Cuba		Touring Cuba		Touring Cuba		Touring Cuba	
Cuban Music		Cuban Music		Cuban Music		Varied Music	
Spotlight on Latin America		Visitors in Cuba		P.O. Box 7026		Inside the U.S.	
Cuban Music		Cuban Music		Cuban Music		Varied Music	
Newscast		Newscast		Newscast		P.O. Box 7026	
Sports		Sports		Sports		Promotion	
Cuban News		Cuban News		Cuban News		The Jazz Place	
Varied Music		Varied Music		Varied Music		Varied Music	
						-----90 min.	
Visitors in Cuba		Spotlight		Visitors in Cuba		Visitors in Cuba	
Varied Music		Varied Music		Varied Music		Varied Music	
P.O. Box 7026		Cultural Review		The March of Science		Philately	
Varied Music		Varied Music		Varied Music		Varied Music	
						-----120 min.	
						Francusico Luna	

RADIO NEWS WORLD RADIO NEWS

▶ More Info on Canada's Plans to Drop U.S. Transmissions

As reported in the July edition of *Monitoring Times*, *Radio Canada International* has formally announced that it will drop its broadcasts to the U.S. effective November 1. In an unprecedented move, this gentle but commanding voice is being toned down, allegedly due to budget cuts (see item on *Radio Japan's* announcement that they will begin using *RCI's* transmitters).

The cancellation was announced by staffers Ian Mc Farland and Bob Cadman who confirmed that the decision will not affect the weekend

transmissions. *Coast to Coast* and *Canada a la Carte* will remain on Saturdays; *Shortwave Listener's Digest* (including "Forum") and *Listener's Mailbag* will continue to be heard on Sundays. Lost in the shuffle will be *RCI Journal*, a program of news, comment, weather, and sports. A new morning transmission will replace the evening one to the US at 1300 to 1400 UTC.

You can register your complaint with *RCI* over the cancellation by writing to Mr. Allan Familiant, Radio Canada International, P.O. Box 6000, Montreal, Canada H3C 3A8.

▶ Cordless Phones Dial Cops --Unassisted!

An interesting phenomenon has developed in which 911 emergency numbers are being dialed randomly by cordless telephones across the country. It appears that some models, when batteries grow weak, pick up electrical pulses from household appliances like microwave ovens, vacuum cleaners and refrigerators, and start dialing 9's and 1's.

At least that's the theory of Joel Healy, Assistant Chief of Communications in Santa Clara County, California. "It's a headache; we get 30 or more calls a month that I call 'phantom dialers'," Healy went on to say. Pacific Bell electronics expert Bud Walker confirmed the problem, adding that complaints are being received nationwide.

▶ Hawaii's Privacy Bill Signed into Law

In spite of impassioned--and reasoned--opposition, the state of Hawaii has enacted an anti-listening bill which, like the pending U.S. Senate Bill 2575, is totally unenforceable.

Signed into law May 30, 1986, by Governor George Ayiyoshi is House Bill 2526-86, "A Bill for an Act Relating to Privacy." Like the new U.S. Senate bill, the Hawaiian bill is

exceedingly vague, reflecting considerable ignorance of the matter by legislators.

Also like the Senate bill, the Hawaiian legislation makes it a felony for an individual to tune in on a radiotelephone conversation accidentally uncovered while using a scanner, invoking a penalty of up to five years in prison and/or a \$5000 fine.

▶ **Beijing**

Montsinery

Radio Japan has announced that an agreement with *Radio Canada International* is imminent. The agreement would allow *Radio Japan* to use one of *RCI's* 250 kW transmitters at Sackville to relay their programs to eastern North America -- an area where Japan is rarely heard, aside from their transmissions over the Gabom Africa relay at 2300 UTC on 9645 kHz). The

Tokyo

= -----
?

agreement raises speculation that *RCI* will be able to use *Radio Japan* transmitters to reach the long-sought after audience in Asia, where they are seldom heard. The relay transmissions from Sackville are expected to begin October 1. No frequencies or times have been announced but look for them in place of *RCI's* North American service.

▶ Washington Feels Frequency Crunch for Public Safety

Officials in Washington, DC, are concerned that more and more users are sharing frequencies used for life-saving efforts such as ambulances, police and fire departments. Although there are no documented deaths caused by delayed communications which could be blamed on the overload, Prince Georges County's fire chief M.H. Estep said, "We are operating on the border each day."

Speaking before the Metropolitan Washington Council of Governments, Estep urged the board to ask the FCC for more channel

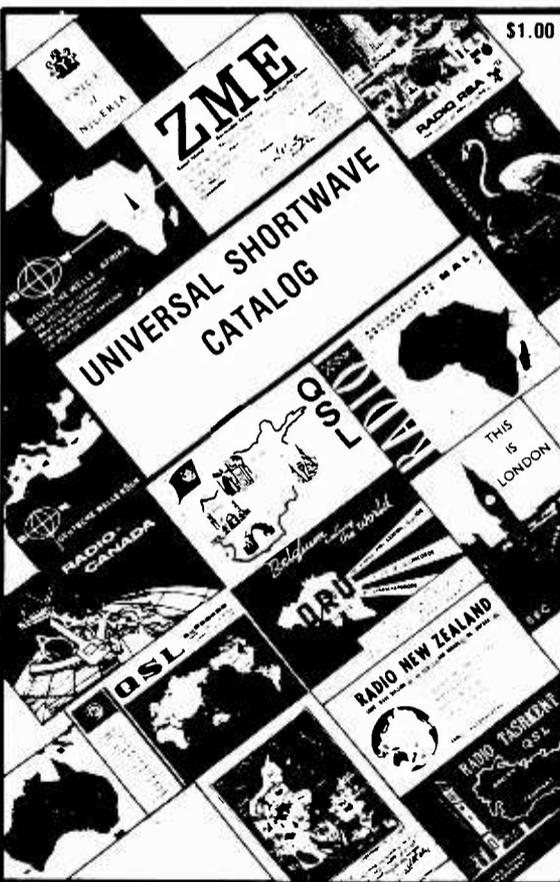
authorizations for public safety communications in the area.

It is expected that our nation's capitol will probably follow the lead of other burgeoning metropolitan areas and move to the 800 MHz band in the future.

Estep drove home his point by emphasizing that the number of lives lost every year due to fire--6000--is equivalent to a monthly collision of two fully-loaded Boeing 747's, and the monetary loss is in the tens of billions of dollars. (Contributed by Bill Black, Washington, DC)

SHORTWAVE CATALOG

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THE THUNDERBIRDS



by Michael Perlman

During a show by the U.S. Air Force Thunderbirds, one barely has time to worry about following the action on a scanner because you are so busy watching the demonstration. The Thunderbirds - or the U.S. Air Force Air Demonstration Squadron - spends about seven months a year giving demonstrations around the country and the world.

It is a show well worth seeing and, because the pilots are so well trained and rehearsed, there is not much radio chatter during the show. The preparations and coordination for a show, however, involve many frequencies found on a standard scanner.

The format of a typical 20-40 minute show is fairly standard. One member of the team serves as narrator and introduces the Thunderbird air show. He is positioned with the Thunderbird ground equipment and personnel who keep in contact with the lead pilot, videotape the show and provide support.

These key personnel are always located in direct, unobstructed line from "show center," a point several hundred yards in front of the audience line at which is placed an object that can be seen from the air. The pilots use this center for their maneuvers. I have seen a fireboat used in Lake Michigan and a school bus parked on a runway at Chanhute AFB.

During the show, the narrator tells which maneuvers are about to be performed. A good location for viewing a show is as close to the ground equipment as possible. What you can't find on your radio you might be able to overhear on ground communications equipment.

There are six F-16 Fighting Falcon aircraft in their distinctive red, white and blue paint scheme (with the stylized "thunderbird" on the underside) used during the show. After the first surprise entry of the six aircraft, they divide up into a group of four (the "diamond") and two solo aircraft. This allows for almost continuous action in front of the audience - while the diamond is regrouping the solo pilots are performing.

During the course of the show, the narrator will briefly cut in the air to air radio (UHF military) so that the audience can hear the lead pilot call for a particular maneuver and the changes during the maneuver.

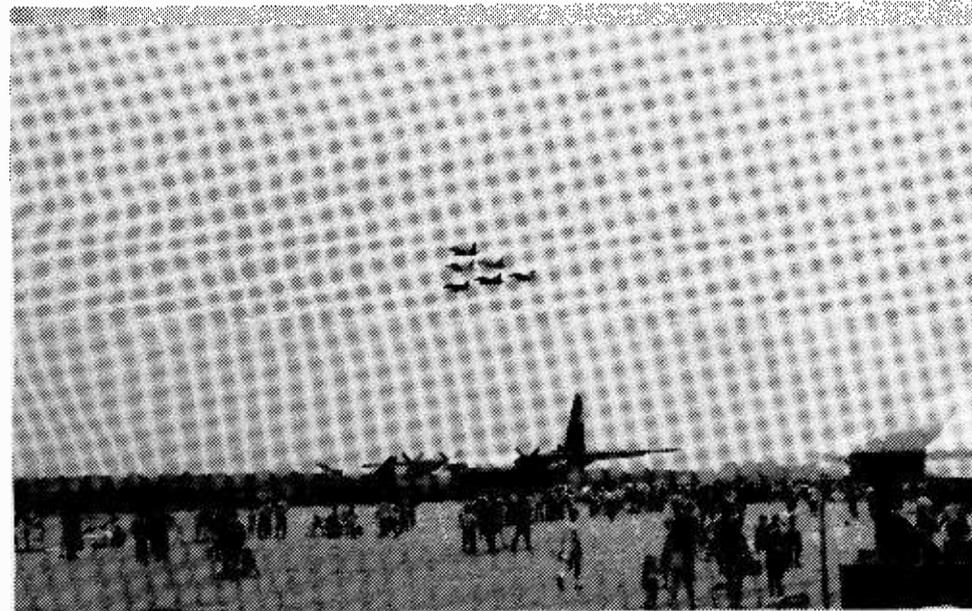
The planes perform a variety of spectacular maneuvers including two solo pilots doing a "crossover" (crossing one over the other at a high speed at a 90° angle), the famous "starburst" where the planes fly straight up and peel off, and inverted flight where one solo flips over and flies "top to top" with the other.

All the maneuvers are performed at minimum distances between the planes (four to six feet between wingtips) and look even smaller. Near the end of the show, the six planes rejoin for final maneuvers and a pass in review.

In addition to the UHF Thunderbird frequencies, local frequencies have a great deal of action. In Chicago where the Thunderbirds perform at the annual Park District Air and Water Show, the standard tower frequencies for O'Hare Airport (118.1 and 120.75 MHz) usually contain advisories to aircraft about the restricted air space, etc. Recently, when the Thunderbirds were based



Spectacular maneuvers yield good monitoring. Photo: Michael Perlman



The show extends to the ground as well as the air. Photo: Bob Grove

Air Shows Thrill Spectators-- --and Scanner Listeners

The roar of jet engines as a flight of precision fighters grazes the viewing stands sends chills up the backs of young and old alike. Whether your fare is the Navy's Blue Angels, Air Force Thunderbirds, Canadian Snowbirds, or Army Golden Knights, these public exhibitions of military maneuvering all utilize radio communications.

The following list of VHF and UHF frequencies have been accumulated over some two years of monitoring various public shows by these famous flying teams. Some frequencies are local to the particular sector; others may be discrete channels abandoned after a program.

In any case, it is relatively sure that at least some of them will be in use next time one of these spectacular teams puts on a show near you. Let us know what you hear!

THUNDERBIRDS

- 66.90
- 114.95
- 118.1
- 120.450 F-16 Stunt coordination
- 123.450 Air show control
- 124.925 Air to air
- 126.2 Tower
- 134.1 Parachutists
- 138.875
- 141.850 Air coordination
- 148.550 Maintenance crews
- 241.4
- 250.85 Team leader command
- 273.5
- 283.5
- 295.7
- 322.3
- 322.6
- 382.9
- 394.0
- 413.025 Ground support crews, pilots in cars on runway

BLUE ANGELS

- 34.35
- 118.1
- 118.2
- 141.560
- 142.0 "Alpha" (pri)
- 143.0 "Bravo" (alt)
- 142.625 (rptr out)
- 142.025 (rptr in)
- 241.4
- 250.8 Solo aircraft
- 251.6
- 275.35 Aircraft
- 360.4
- 384.4
- 391.9 Air coordination
- 395.9 Air coordination

GOLDEN KNIGHTS

- 42.35 (Pri)
- 32.30 (Sec)

SNOWBIRDS

- (1) 275.8
- (2) 295.6
- (3) 310.8
- (4) 227.6
- (5) 243.4
- (6) 240.5
- (7) 378.5
- (8) 266.3
- (9) 294.5
- (10) 322.8
- (11) 245.7
- (12) 316.5
- (13) 344.5
- (14) 356.6
- (15) 236.6
- (16) 283.9
- (17) 363.8
- (18) 289.4
- (19) 245.0
- (20) 239.8

at nearby Glenview Naval Air Station, they were heard getting clearance from Navy tower on 126.2.

Any show or special event is sure to have all the frequencies in the area hopping. In addition to police and other public safety frequencies, there are "special event" frequencies in the air bands as well as search and rescue. Some of these (in the Chicago area) are 122.9, 123.1, 123.3 and 123.5. Check frequencies in your area for similar activities.

With the increasing number of scanners capable of receiving the military 225-400 MHz range, more confirmed reports are appearing (see inset). Reader contributions are encouraged as these frequencies are searched out.

The Thunderbirds perform at open houses at Air Force bases around the country as well as other air shows and festivals. Usually, additional activities or displays are held in conjunction with the Thunderbirds demonstration. These might include ground displays of aircraft where you can climb in and note frequencies on the radios! A visit by the Thunderbirds to your area is sure to fill the airwaves with radio activity and also fill the skies with some fantastic flying.

Air shows often include additional displays such as the Golden Knights. (Photo: U.S. Army)



THE GOLDEN KNIGHTS

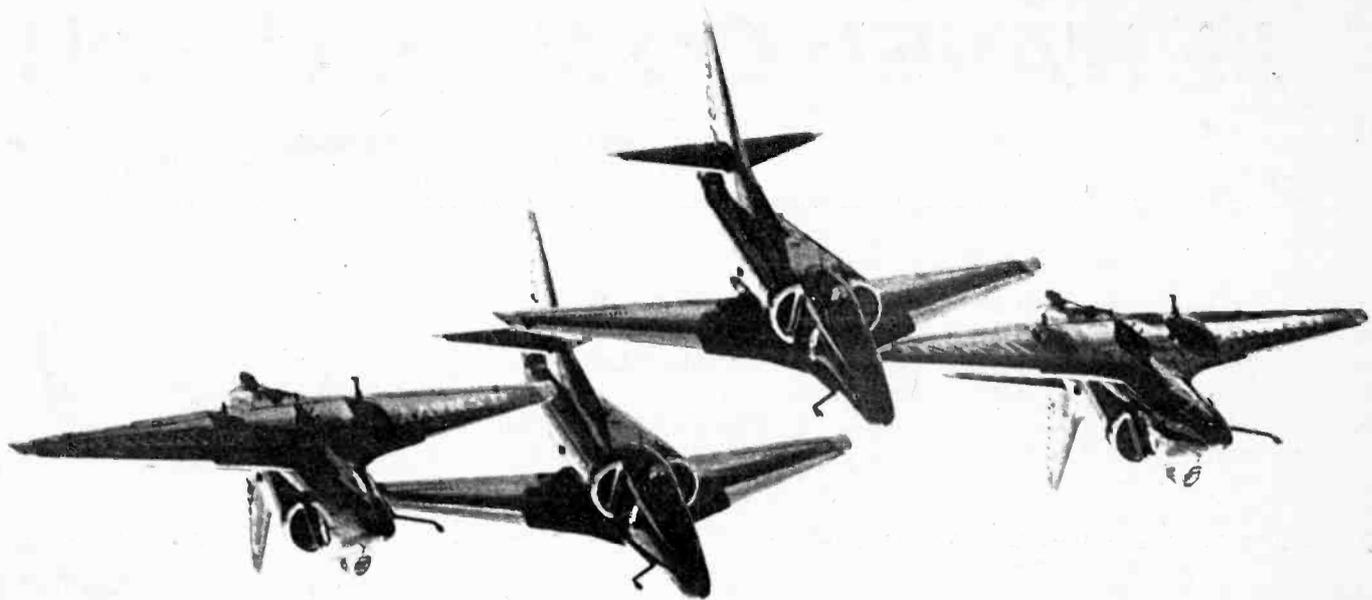
The United States Army Parachute Team is the Army's official aerial demonstration team. These specially selected Airborne soldiers compete in national and international parachute competitions, help develop new parachuting techniques and equipment and, each year, demonstrate their skills before millions of spectators.

The members of the Golden Knights are recognized as the finest precision parachuting team in the

world. The team has won 57 National and eight World Championship titles.

Founded in 1959 at Fort Bragg, North Carolina, the team's 82 members are divided into two demonstration teams, two competition teams, an aviation section, and a headquarters section.

Exiting from the "Caribou" aircraft at 12,500 feet, the Golden Knights have performed more than 4,500 demonstrations throughout all 50 states and in 35 foreign nations.



Upper photo: Flying "top to top"
Lower photo: Refueling demonstration
Photos: USAF

GOOD NEWS



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BEWARE! COWS EAT ANTENNAS!

A Story of Adventure and DXpeditioning

by Harold Sellers

There is a sub-species of DXer known, not by a different name, but rather solely by his or her actions. This strain of hobbyist can be found sitting in a tent or cabin in the wee hours of the morning, hunched over a receiver, wrapped in a sleeping blanket, eyelids hanging heavy, surrounded by the litter of fast-food. From the headphones clamped tightly to his skull, one might hear the joyful and relaxing sounds of Radio Happy Isles in the Soloman Islands or maybe even music from Radio Cook Islands. We are looking at a DXer who is hooked on DXpeditions -- truly an unusual fellow.

Unusual though he might be, he is also dedicated, enthusiastic, knowledgeable -- a student of the DX university. Being on a DXpedition allows one the opportunity to experiment with antennas, study propagational phenomenon, hear weak and rare stations, as well as expose oneself to all that nature has to offer -- both living and otherwise.

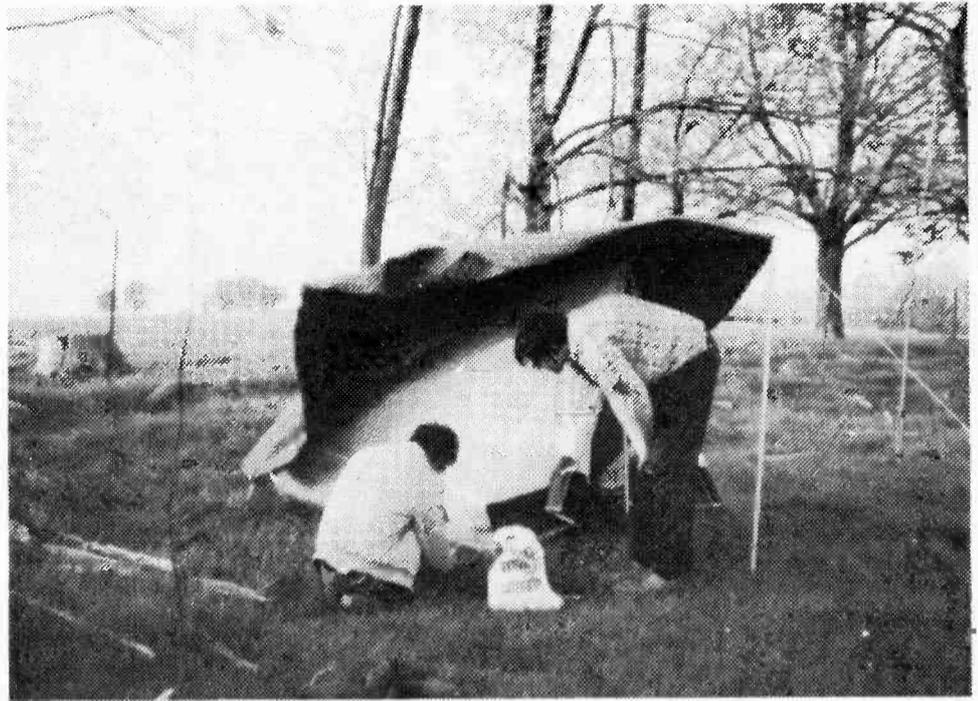
But let's back up for a moment for the benefit of those of you who have not been exposed to DXpeditioning. What is it?

Clearly, it is a combination of "DX" and "expedition." The DXer embarks upon an expedition into the countryside, away from his urban home, to the wide open spaces of field and forest. Taking up temporary residence in a cabin, cottage or tent, the DXer finds himself in an environment where he can erect an antenna as big as a city block -- or bigger! Being this far from civilization and all of its man-made noise and interference, he can receive Tanzania without automobile ignition noise or Bolivia sans

fluorescent lighting. The larger antennas bring in more signal and less noise, putting stations into headphones that have never heard such things before. Imagine -- Papua New Guinea, Vanuatu, Zanzibar, Namibia, Peru, Belize, Indonesia, Bangladesh, Falkland Islands to name just a few!

Stations like these are the prey of the DXpeditioner. But that is only half the fun. Getting there is half the fun -- as they say -- and it is true that much adventure and satisfaction lies in the techniques which the DXpedition fan employs. The science of antenna design and the art of antenna erection are common pursuits. Antenna designs such as Beverage, rhombic, longwire, inverted 60 or 90 meter band dipoles are designs that are uncommon in urban settings but which fit easily into the space found in the great outdoors. The DXer may find that he has to adapt either to too many trees or not enough trees to support his antennas. Stakes must be driven into the ground, ropes thrown over tree-tops, and so on, so that he can get that precious, sensitive wire up where it will encounter those radio signals.

Adventure awaits the DXpeditioner. This writer and fellow enthusiasts from the Ontario DX Association have found that cows like to consume wire antennas. It must be the insulation -- or else they are using it for dental floss. But I swear it's true -- we have actually watched cows in the neighboring field eat the end off a 90 meter dipole! Cows, it seems, also enjoy human company, as we have found out on more than one occasion while unreeling a longwire antenna. The sight of a DXer standing in the middle of a cow pasture brings excitement to the



Dave Clark and Cedric Marshall pitching one of the tents used on our DXpedition.



Ron Hopkins erecting an antenna.



A herd of antenna-munching cows approaches!

herd, whereupon they all immediately charge your way to welcome you and who knows what else. It is hard to run while holding a spool of wire and watching where you step in a pasture at the same time!

Small wildlife can be even more interesting. Let me give you some tips: (1) In the middle of a hot summer day, keep your car windows rolled up while driving through a field. It takes a long time to get all the grasshoppers out of your car. (2) Block all holes in the bottom of your tent; ants can find any route to the food crumbs you will be leaving about. (3) High and windy hilltops are better than low, shady valleys for avoiding mosquitoes and biting flies.

If you have accommodations all set up and a beautiful antenna gracing the landscape, you can now put your receiver into action. But where does one plug in an ICOM R71 when the nearest dwelling is miles away? Ah yes, don't forget the batteries! Our DXpedition team has been through it all. Now we use a portable AC generator and we can not only operate half a dozen receivers but also see one another's unshaven faces by the light of a 40 watt bulb! Ah, luxury!

As I said earlier, the adventure of DXpeditioning is just as much fun as actually hearing the stations you've gone after. Our group of DXpeditioners is hooked on the

Reader Makes contact with Radio Truth

by W.H. Scarbrough

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activity. For over four years we have gone on several weekend trips each year, to a farmer's land an hour drive north of Toronto, near the town of Uxbridge. Each has its own memories, from leaky tents and freezing weather to picking wild mushrooms and so much DX one can hardly sleep. We have a small group that usually goes on these trips -- two or three of us is the average. We are all close friends; something that is a necessity when there might be four bodies, four tables, four receivers and four food boxes in a single tent for four days!

you will have learned some of the ingredients of a successful DXpedition. Be prepared for the weather, the outdoors and cows. Be sure your receiver will operate from whatever the available power source is. Have sufficient antenna wire, rope and supports on hand. Dress appropriately and take steps to keep warm and dry. Be prepared for pests and other intruders. Know what you want to hear and how you will go about logging it. Go with a small number of friends -- close friends. Be comfortable. And have fun -- that's what this hobby of ours is for. △

I hope that from some of the experiences I've related in this article

The reward after a successful DXped

--sleep!



Radio Truth is an enigmatic station broadcasting out of Southern Africa. Little is known about it except that it provides a unique perspective on the news of the region, is anti-Zimbabwe Prime Minister Robert Mugabe and has been thought to be associated with the South African government. MT Reader W.H. Scarbrough heard *Radio Truth*, sent in a reception report, and received the following information on the station in reply.

Radio Truth can be heard with a listenable signal on 5015 kHz on the USB mode at 0430 until 0500 UTC in English. It makes for interesting listening. Another *Radio Truth* (*A Voz da Verdade*) may be heard on 4950 kHz at 0300 UTC in Portuguese.

Radio Truth is believed to be located in Pietersburg, South Africa with an intended audience in neighboring Zimbabwe. Asked specifically what connection existed between *Radio Truth* and *A Voz da Verdade*, the station replied "in due course we hope to be able to furnish you with the technical data in which you have expressed an interest." Neverthe-

less, they did furnish ample information about their broadcasts.

Contrary to the anti-Zimbabwe label attached to the station in last year's *Radio Database International*, *Radio Truth* says that its main purpose is instead to propagate "an alternative point of view" to that put out by the government-controlled media in Zimbabwe. The station's operators claim to be "dedicated Zimbabweans whose loyalty to the country is unquestioned." The organization, it states further, is anti-Communist and dedicated to the principles of democracy.

Radio Truth advises that observations on program content or reception reports can be sent to c/o Mr. Stanley Hatfield, P.O. Box 815, Thayer Avenue, Silversprings, Maryland 20910. Transcripts of the week's broadcasts can be obtained for US\$1.00. [Editor's note: MT's Greg Jordan recently sent a report to *Radio Truth* at the above address and received it returned, marked "Moved-No Forwarding Address."]

SUBCARRIER DETECTOR KIT

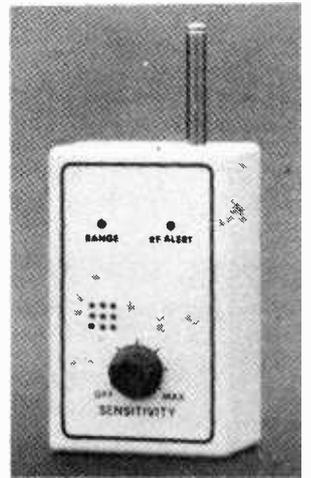
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Texas -- noted for some of the nation's most severe storm systems -- may also make for dramatic monitoring. Here a news photographer recalls his first experience and shares some graphic photos.

TORNADO ALLEY MONITORING

by Steve Douglass

The day starts out muggy and hot--you can feel the heaviness in the air. A day like most June days in west Texas. One of those days when you thank the powers that be for air conditioning!

Later in the afternoon, fluffy white cumulus clouds begin to gather. Hot, humid updrafts begin to stack the clouds forming towering, boiling columns that darken and threaten to blot out the sun.

Most of the time you're oblivious to the atmospherics--until the local weather service issues a tornado watch.

Tornado and severe thunderstorm watches are common occurrences to the people in west Texas; the natives of Amarillo usually take little things like tornado watches for granted--until they become tornado warnings!

I can remember when I first moved here the frightening introduction to Texas weather that welcomed me: a towering, anvil-shaped thunderstorm moved in quickly from the west. The local TV station broke into its programming with a loud warbling tone to get your attention: "Warning! There is a very severe cell moving into the city. A tornado warning is in effect and several funnel clouds and large hail have been reported in this storm," the newscaster announced.

Outside the approaching storm clouds had a very strange green cast and they contorted and twisted into frightening shapes. A scary stillness hung in the air. The atmosphere felt thick and eerie, hinting that at any moment something was going to cut loose.

Then it appeared, a thick white veil reaching from the churning clouds to the ground. Not dark like rain shafts, but a bright reflective moving curtain.



Characterized by their anvil shape, this line of severe storms marches across the Texas Panhandle. Although they sometimes spawn deadly tornados, they are still beautiful nonetheless. Photo by Steve Douglass.

A blast of cold frigid air hit me in the face, signalling what the white mass coming closer was: Hail!...and somewhere imbedded in the hail was a funnel cloud!

The sound of the thousands of tons of ice falling from the sky assaulted my ears. Imagine someone throwing a baseball as hard as he could at a metal garbage can and multiply that sound by a thousand times!

I could see the wall of white was about on me now so I moved inside to take cover. I had barely gotten the door shut when it hit. World War Three could not be as frightening. Grapefruit sized hail pounded the house. I could hear the windows and skylights shattering and feel the whole house vibrating from the beating. I had heard of large hail before but didn't believe the tales until I saw the boulders that were being propelled horizontally through my house!

The pounding ceased as quickly as it had begun...and then I heard it. The

roar of a freight train soaring through the sky! The tornado was aloft, hovering over the southwest corner of the city.

Amarillo was lucky that day. If the tornado had touched down the loss of life would have been great, but the storm moved out fast. No sooner had the hail stopped than I could see the stars to the north. The glowing, ice-blue thunderhead to the south crackled with lightning and moved on its way.

The next day the damage was assessed. Thousands of windows and roofs had been destroyed. One of the strangest sights was the totally leafless trees; all the vegetation had been stripped by the hail. Although the tornado did no damage, the hailstorm more than made up for it, totalling up several million dollars in destruction.

Forewarned is Forearmed

Now, when severe storms threaten the area, I fire up the scanners and stay tuned to the action. Not only do I get advance warning on severe weather heading my way--usually way in advance of any warnings the weather bureau might issue--I also tune into the public safety services.

Because of the threat to the area posed by severe storms every spring, Amarillo and other "Tornado Alley" towns rely on volunteer and public safety organizations to give them advanced warning on any severe storms. In the event that a storm might be potentially dangerous, storm spotters are dispatched to the area threatened. These usually include sheriff and fire department personnel and the local civil defense.

In Amarillo I listen to the local civil defense on 155.145 MHz and 462.700 MHz. I also listen to the Ham Panhandle Severe Weather Net on



Devastation left by the killer tornado in Lubbock, Texas, May 1970. Photo courtesy Amarillo Globe/News.



Classic Panhandle twister roars down a west Texas town's street. Deadly storms like this one make you wonder why the photographer had the nerve to stop and shoot this one. Photo courtesy Amarillo Globe/News.

147.390 MHz. If a tornado should strike a city or town nearby, I will swing my Grove scanner beam in the general direction and listen to the rescue and clean up, Red Cross on 47.42 MHz, the sheriff department and local civil defense.

Another good source of advance information is aviation observations from aircraft (122.650 and 122.000

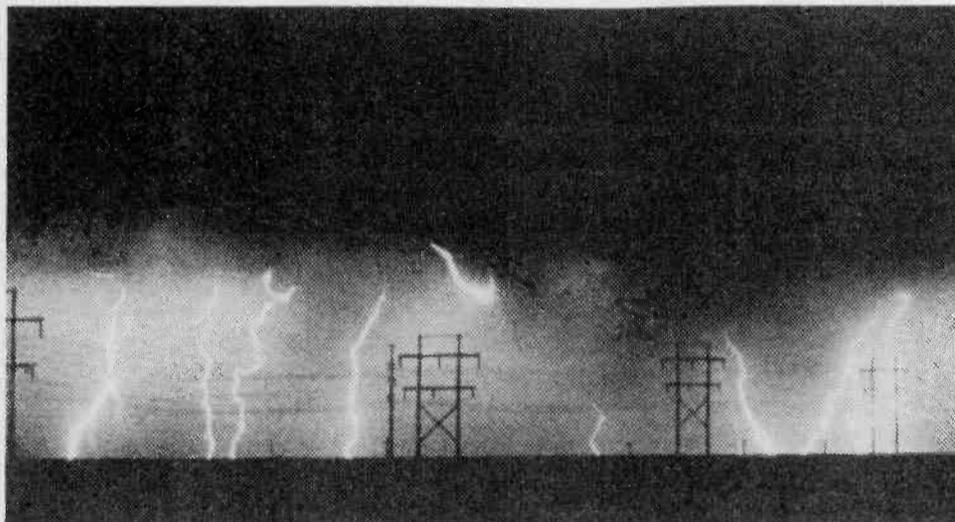
MHz here in Texas). Planes flying into or around storms can give you a good look at a severe cell!

Now that we are in the severe storm season, turn on your scanners and stay tuned for some exciting listening! △

POINTERS FOR MONITORING IN SEVERE WEATHER

There are a few things to keep in mind when preparing your monitoring post for the severe weather systems.

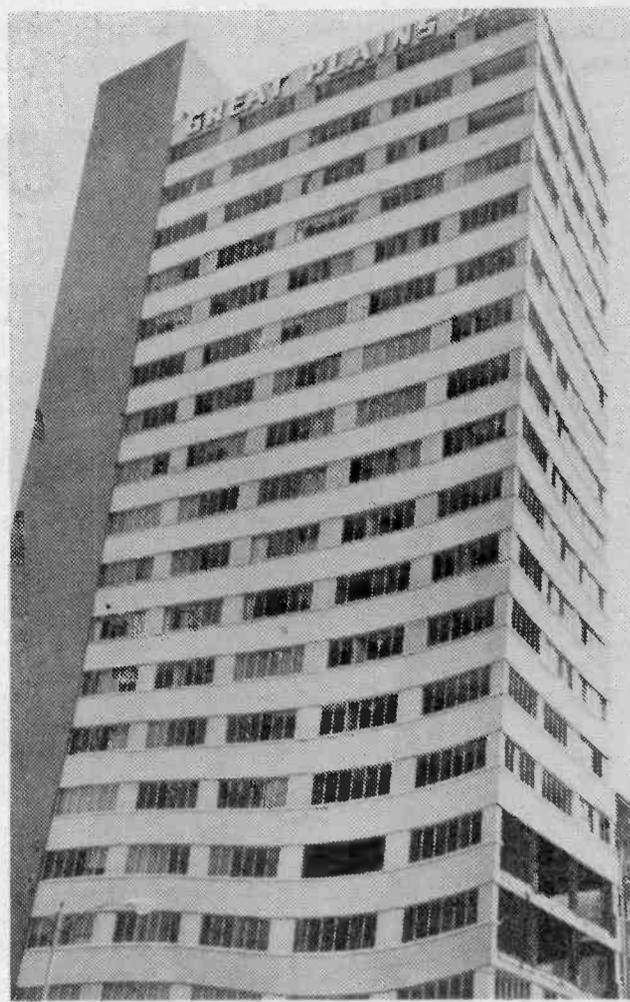
1. **MAKE SURE YOUR EQUIPMENT IS SAFE FROM LIGHTNING STRIKES!** Unplug and ground your roof antenna when the lightning gets too close. It does not have to be a direct strike to destroy you and your gear. When unplugged from your rooftop antenna, make use of the small telescoping whip provided with your scanner for local reception.
2. **IN CASE OF EMERGENCY HAVE AN ALTERNATIVE POWER SUPPLY.** Make sure that you have plenty of batteries to power your rig in case of a power black-out. On my base scanners I keep a 12 volt motorcycle battery charged during the storm months for use as a long-lived power supply. In an emergency you can use the battery in your car.
3. **IT IS ALSO GOOD TO HAVE ON HAND AN EMERGENCY ANTENNA SYSTEM.** Experiment with a home brew antenna in case your antenna system gets destroyed. Information is the hardest thing to get during a disaster such as a tornado.



Vivid lightning displays such as this are a common occurrence in tornado alley. While spectacular to see, they are dangerous to people and equipment. Lightning is attracted to power lines and antenna masts.



Tossed like toys, these aircraft at the Lubbock Municipal Airport in Lubbock, Texas, caught the full brunt of the 1970 twister. In the foreground at the right is a smashed Department of Public Safety helicopter. Photo courtesy Amarillo Globe/News.



Twisted Tower, the Great Plains Life building in Lubbock, Texas. The tornado that devastated this city in 1970 was a twister over a mile wide. The tornado hit the downtown area and the cyclonic winds twisted the skyscraper, which is still standing today as a sort of monument to the storm's awesome strength. Photo courtesy Amarillo Globe/News.



GALAXY ELECTRONICS

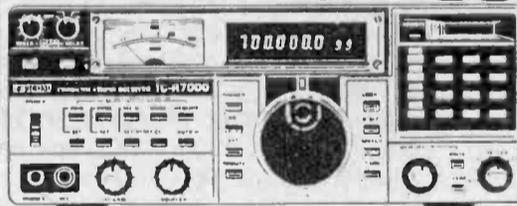
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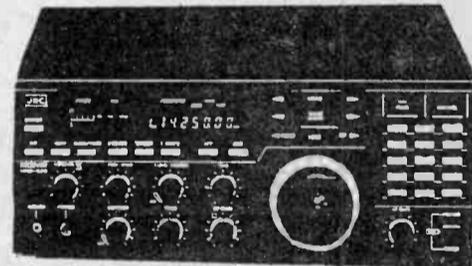
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“SEMI-TOUGH”

Wouldn't it be nice if those electronic wizards who design all the wonderous receivers we use today could make some sort of a gadget that would measure the difficulty of the DX catches we enter into our logs?

It would be sort of a reverse "S" meter, a difficulty meter in which the weak signal, pounded by QRM, would pin the needle, while the powerhouse signal wouldn't register at all! The "D" meter could help us estimate the relative rarity of our catches.

But since the D meter doesn't yet exist, we have to base our judgements on intangibles, largely such things as how often something is heard by our fellow listeners, the power, the condition of the frequency and so forth.

In all of the monitoring areas we pursue, there are easy pickin's and there are once-in-a-lifetime loggings. But in between lies the vast realm of the "semi-tough" stations and countries -- ones that have to be encouraged if not grabbed by the arm and pulled kicking and screaming into the shack.

A reasonably good receiver/antenna combination is hardly necessary to pull in the likes of London, Hilversum, Havana, Montreal, Moscow and Melbourne on the shortwave broadcast bands. They are so strong that your average toaster oven can bring 'em in -- without being plugged in.

At the other end of the scale are the likes of Comoros Islands, Maritius, Zanzibar, Kashmir, and a number of other which take a unique combination of reception variables before there's much chance they'll pop into the headphones. We won't even mention Tristan and Bhutan which are about as close to impossible as you can get.

But the vast middle range on which the imaginary "D" meter registers a "5" is where many shortwave broadcast countries would register if they were heard. They are countries that aren't simple to hear but which aren't extremely difficult, either. They can be logged with the application of some patience and some knowledge of when and where to tune and what to listen for.

Let's look at a dozen of these stations in the semi-tough range. We'll provide you with the information but the persistence has to come from you.



The *Broadcasting Service of the Hashemite Kingdom of Jordan* isn't as easy a catch as its listed 100 kilowatts might suggest. The trouble is that, despite the King's interest in ham radio, Jordan doesn't maintain much more than a regionalized service on shortwave and most of the broadcast times and frequencies simply aren't suitable for reception in the U.S.

The winter months provide the best opportunity to catch this station in Arabic up to 2330 UTC on 7155 and 9530 kHz or at listed 0330 sign on on 7155. There's also English from 1500 to 1730 UTC on 9560 kHz.

The *Voice of the People of Kampuchea* can sometimes be enticed into the shack, but it's pretty tired out from the trip when it arrives. You can catch it in English at 1200 UTC, but only for 15 minutes before it switches to French at 1215 UTC.

QRM is a frequent problem on 11938 kHz where it often gets the squeeze from bigger stations. Check also 9695 in parallel. Neither is strong and reception certainly isn't consistent. Best bet for *VOPK* is on the west coast of North America.

The situation in Lebanon is muddled and hardly a day goes by when it doesn't change radically. Virtually anything you can pick up from Lebanon fits into the category of semi-tough -- and some into the near impossible. Try for the semi-tough *King of Hope* on 6280 kHz from 2000 to 2300 UTC, on 6215 kHz from 0600 to 1000 UTC and 6280 kHz from 1430 to 1600 UTC. The best time is around 0600 UTC.

The *National Radio of Laos* seems to have caught the bug formerly afflicting the *Ghana Broadcasting Corporation*. The disease causes the afflicted radio station's technical facilities to get sick. As a result, *Lao National Radio* tends to be spotty in operation. The foreign service is listed for English on 7029 kHz at 1330 UTC but you might have better luck with 6130 kHz which airs in Laotian from 0900 to 1600 UTC. There are a number of Laotian regionals, too. Savannakhet is on 7385 and Louzng Prabang 6997 (both frequencies are variable) and both occasionally show up in the morning.

Radio Nacional de Sao Tome e Principe is one of those stations which rides high when the African conditions are good -- and when it's on the air. *Radio Nacional* was silent for several years, returning in 1985 and allowing many DXers to scratch it off their "need" list. That was followed by another silent period but

now it's back again. Try for it either its 0500 UTC sign on or 0000 UTC sign off on 4807 kHz, slightly variable. Programs are strictly in Portuguese.

Singapore presents the DXer with a pair of targets. The least exciting is the *BBC Far Eastern* Relay station using a number of frequencies at various times, mostly beamed to Asia. Currently you can try 15310 kHz until 1330 UTC or 7160 kHz from 1330 UTC.

Radio Singapore also uses several frequencies but the most likely to be heard are 5052 and 11940 kHz, both which run 50 kilowatts. Early mornings from 1100 UTC or so should provide the best chance. Programs are mainly in English, Malay and Chinese.

Radio Mogidishu, Somalia needs only one clear frequency...but! Mogadishu logs are tougher at their 0300 sign-on with the *Voice of America* also occupying 7200 kHz at that hour. However, others hear the station to its 2100 UTC sign-off and that's a good possibility, QRM-free for most of the U.S.

Radio Thailand matches Kampuchea on the difficulty scale. 'Taint easy but it isn't impossible, either. Like Kampuchea, Thailand maintains a sort of international service using both the 25 and 31 meter bands, specifically from 1130 to 1230 UTC in English on 9655 and 11905 kHz. Wait long enough and your prospects will improve since both Thailand and the *VOA* are upping their power.

Uruguay is no Argentina or Brazil when it comes to easy shortwave reception. There was a time when the government station, *SODRE*, paid regular calls on 9515 but no more. *SODRE* is still on the air, currently listed for 9620 with 0900 UTC sign-on. The schedule doesn't run into the late afternoon or early evening in the U.S. so there are no opportunities then, save for the occasional special broadcast.

La Radio on 6035 kHz or *Radio Sport/Radio El Espectador* on 6045 kHz are perhaps better targets in Uruguay. It's not certain that either one is consistently active, but a regular search around 0900 to 1000 UTC may turn up either or both eventually.

Now is the best time for hunting the Pacific area stations, including *Radio Vanuatu*. Try 3945 kHz which carries the higher power ten kilowatt transmitter or 7260 with just 2.5 kW.

Deep 'o the night is the time to go on

Destroy Before Reading!

An interesting news clipping was forwarded to us recently by Steve Handler, a former utilities monitor and frequency contributor to our earlier *Short Wave Directory's*.

It would seem, according to the *Wall Street Journal*, that a report on "nuclear decapitation," the destruction of high-level communications during enemy attack, was so highly classified that its author was denied clearance to read it!

Handler suggests a new rubber stamp for classifying this material: DBR -- Destroy Before Reading!

the prowl for this, most likely between 0500 and 1100, with most logs occurring in the 0800 to 1100 UTC time period. Sadly, there's little, if any, English.

Zaire should be the easiest of the lot. Trouble is that *La Voz du Zaire's* international service is inactive more than it's active. There's supposed to be a 100 kW transmitter using 15350 and it should be heard fairly easy in the afternoons, U.S. time, when it is active. *Radio Bukavu*, from the city of the same name, has been showing up lately on 4839 kHz with its 4 kilowatt transmitter. Check for its 0400 UTC sign-on. You might also try *Radio Candip*, the station of the National University of Zaire, on variable 5067 kHz, sometimes heard from 0330 or 0400 sign-on.

The *Zimbabwe Broadcasting Corporation* (a) doesn't overwhelm anybody here with the might of its signals and (b) maintains a schedule which uses higher frequencies in the daytime -- but not high enough to aid reception here. It haunts 90 meters at night from its 0325 sign on (later on weekends), so we have to rely on "good African nights" to log this one. Try also 3306 and 3396 kHz.



There are many other countries and many, many other stations which live in the land of the semi-tough but these twelve are probably representative. Of course, those living in the Western U.S. will have an easier time with some of them and those in the East will do better with still others.

If you're in the happy situation of already having heard them all, good for you! We'll be back in a few months with a list of stations that will definitely pin your difficulty meter!

△

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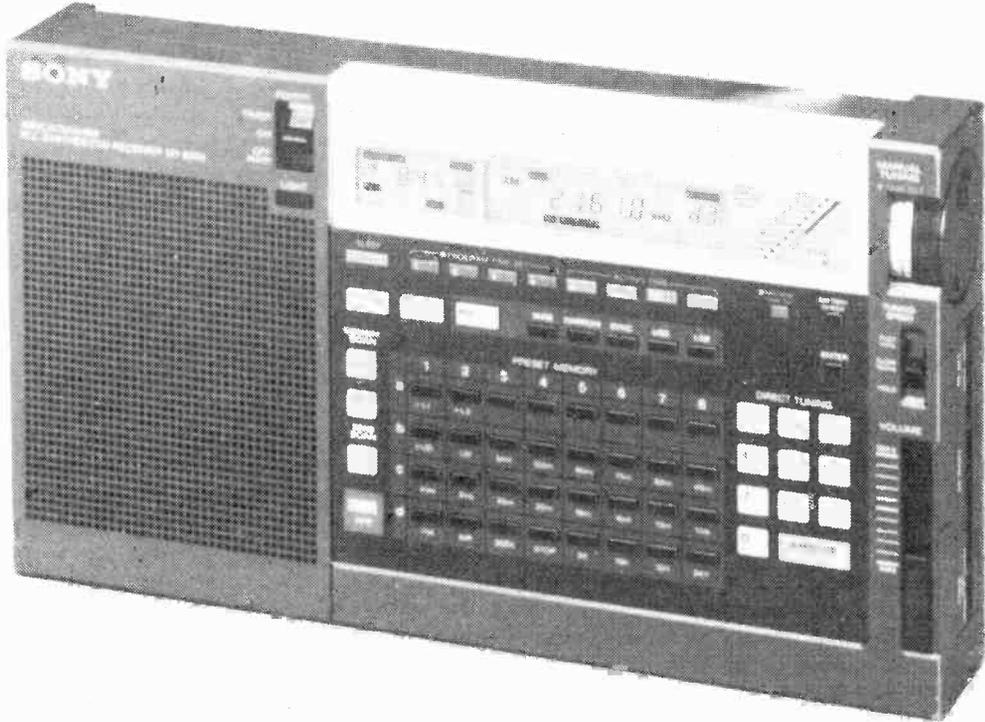
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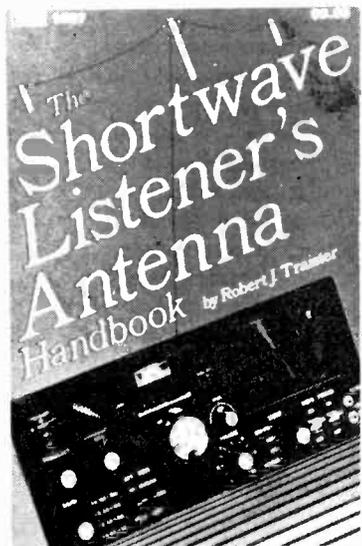
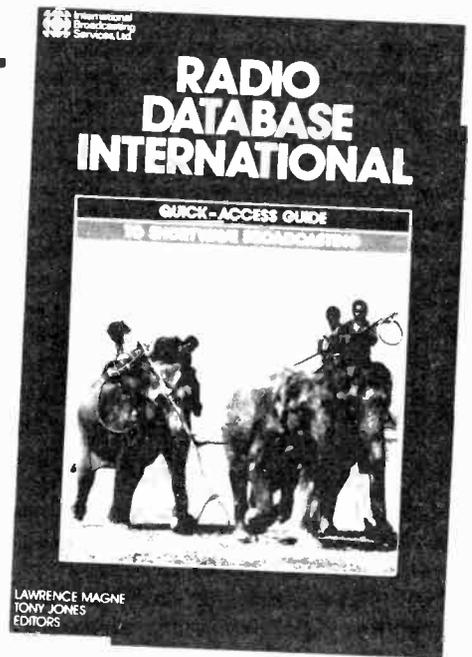


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HCJB's Ken MacHarg: The next Tom Meyer?



If you've never heard the name Ken MacHarg before, chances are you will soon. If you don't know him from his shortwave book, *Tune in the World*, his work with Larry Miller for a number of years on *International Radio* magazine, or his many appearances on *HCJB*, you can now hear him weekly as host of the station's "International Friendship Program," *Saludos Amigos*. Ken MacHarg is one of shortwave's rising stars.

In fact, so popular has his show become that many are calling him "the next Tom Meyer," an allusion to the host of Holland's perennially top-rated Sunday show, *Happy Station*, and a compliment he defers by saying, "Modesty does not allow me to comment."

By all accounts, the 44 year old MacHarg should not be so modest. He is an ordained minister with an enviable stack of academic credentials, is executive director of Kentuckiana Interfaith Community (Louisville, Kentucky's inter-religious ecumenical organization) and a broadcaster of some note who is heard both in the Louisville area (WXVW) and on the shortwave bands. As well, he is a published author (his latest article on shortwave will appear in *South*, the Third World magazine this month). But even more important than all of that is the fact that you can bet the ranch on the fact that you'll never meet a person who doesn't like Ken MacHarg. And it comes through on the air. A common response to MacHarg's on air persona came from a recent writer to *Saludos Amigos* which said, "I've never met you but I consider you to be a good friend." *HCJB* could not have picked a better representative for their station.

MILLER: So what's all this commotion I hear about *Saludos Amigos*. It's not that good, you know.

MACHARG: Yeah, yeah.

MILLER: You're a minister broadcasting on a religious station but it

doesn't show on your program. You don't play the religious angle very heavy. In fact, one time I jokingly wrote you a note asking you to play some off-the-wall rock song and you read it on the air. I couldn't believe it. You answered me on the air.

MACHARG: [Laughter] It's really kind of subtle. In part...

MILLER: Still, there's no Led Zepplin...

MACHARG: Then there's the weirdo letters... No, I believe that the Christian witness on the program should be low-keyed. That's to offer an opportunity to witness to people without beating them over the head and turning them off. With the hopes that they'll come back to the program and over a period of time, if they're searching for some meaning in their life, that they'll find it in the program. It's not a Bible study program. It's a friendship program. The inspirational message, which takes up a couple of minutes on the program along with a Christian song, is really meant to be done on a very experiential, low-key way.

MILLER: Even Tom Meyer is pushing a message on *Radio Netherlands' Happy Station*. He's selling Holland, albeit subtly. And Holland has been doing *Happy Station* since the 1920s.

MACHARG: I've just recorded the 58th edition of the program. I've heard from 37 countries plus Antarctica, Tasmania and Hawaii -- some 265 individuals in the first year.

MILLER: So *Saludos Amigos* has been on just over a year.

MACHARG: Yes.

MILLER: How did you end up getting involved with *HCJB*?

MACHARG: I've listened to *HCJB* for over twenty-five years. And something like twenty years ago when Jim Roberson was a missionary with them, he invited my wife and I

to Ecuador for a summer with the summer missionary program. I was in seminary at the time and was unable to go.

Many years later I wrote an article for a shortwave bulletin and I was contacted by Phill Sandahl at the station and the relationship began to grow. In 1983 I started a weekly series for the DX Party line with Clayton Howard based on my book, *Tune in the World*. And in 1984, I went to Quito for eight weeks where I was a Working Visitor in the English language service doing a variety of things -- working in the news department, doing some fill-in, producing a lot of features for the Passport program. I went back in the summer of '85 to fill in for three people on vacation doing *Morning in the Mountains* and the news.

MILLER: Both of the programs you mention are good examples of *HCJB's* rather unique philosophy and position in the religious radio market. It's not a teaching and preaching station but one with a much more subtle and palatable message.

MACHARG: I think that in general, the Christian missionary stations -- and I'm using that term very specifically -- are different from your average Christian stations in the United States. People don't realize that over half, I believe, of the Christian stations in the United States are commercial operations. All of the Christian stations in the Louisville area are owned by commercial entities in the business of making money. Now the people who work there are often very committed people but the bottom line for the owner is profit.

HCJB, *Trans World Radio*, *FEBC*, *ELWA* and some of the other missionary stations are missionary enterprises. In other words, the bottom line for them is people's lives. The thing at *HCJB* that made it so different than working at stations in the States like the commercial non-religious station that I work for in the Louisville area is that the real criteria for programming was does it fulfill the purpose of the station and can you do a good job? Can you do a quality job? As opposed to will it make money and how can we get away with doing this as cheaply as possible. I think motivation is obviously the prime factor. In terms of reaching the non-Christian people, the type of format that *HCJB* uses -- the *Passport* program, *DX Party Line* -- is more effective than the sermon sandwich, a sermon with a hymn or two on each side.

MILLER: Sure. The one thing I admire about *HCJB*, on a show like John Beck's *DX Party Line*, was that he realized that the reason why I tuned in was for DX information, not

religion. And I didn't mind -- and often found myself thinking about -- the one 30 second religious message he dropped in three-quarters of the way through the program. I especially enjoyed Helen Howard's work in that regard. They don't need to hit you over the head. You really feel that these are caring people.

MACHARG: I agree with you. Domestic radio in the United States is a juke box. It turns out music after music after music. There is little caring about the listeners, only about making money. International radio is a more intimate and personal medium. The programs are designed for people to listen to. They're designed to attract people and to relate to people.

MILLER: Huh? I know shortwave is more intimate for me because whenever I turn it on, everyone else leaves the room...

MACHARG: [Laughter] Now some shortwave stations do a better job of that than others. I personally believe that *HCJB* probably does the best job in terms of being in contact with the listener, reading people's names on the air, responding to every letter that is written, and the *large* number of personal letters that are written to people. John Beck will tell you what a large proportion of his time is spent writing personal replies to people who have written to him.

MILLER: It's not just the fact that the people at *HCJB* will write to you. It's the fact that they will address the topic that you talked about in it.

MACHARG: There are stations that will send you an outdated frequency schedule no matter what you say. When I was writing *Tune in the World*, one station in particular, which shall remain nameless... but it's in Baghdad [laughter]... responded to my request for information about the station with a confirmed QSL card. Guess they didn't quite read the letter. But I have had personal responses from other stations like *Radio Netherlands* and *Radio Australia*. I think that personal touch is nice. *HCJB* does that a lot.

MILLER: You've gotten some good response -- results even -- with *Saludos Amigos* in that respect.



The control room at *HCJB* through which programs like MacHarg's are routed to the world.



MACHARG: A teenager in Jamaica wrote to me and said that his father was deceased, that his mother was an invalid, that there was no income, and he felt that, after a great struggle, the best thing he could do would be to leave his family and relieve some of the financial burden on his mother. So he asked me to announce to the world that he was up for adoption.

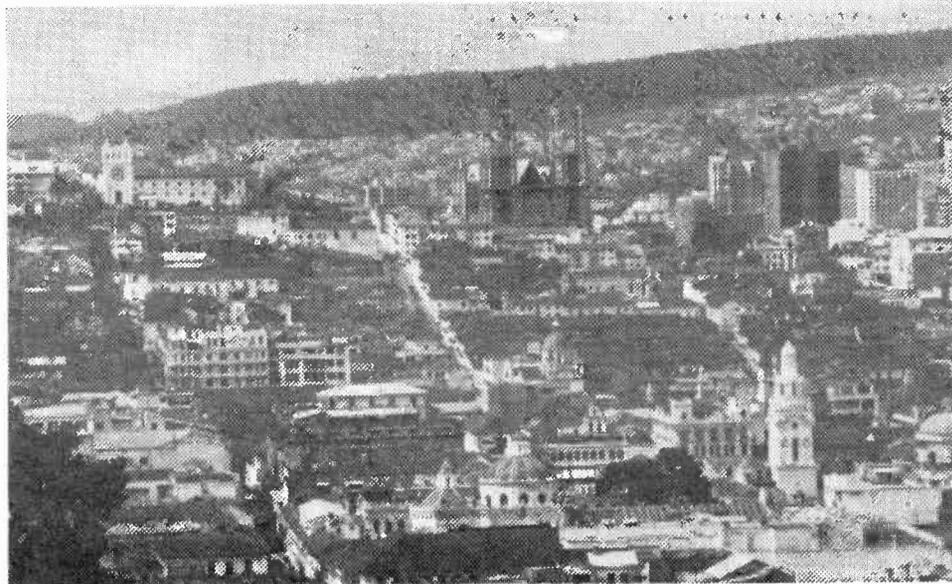
I did not announce to the world that he was up for adoption. But I did read his letter on the air, did talk about his situation and both through a letter to him and responding to him on the air, put him in touch with a Baptist minister friend of mine in Jamaica, the result of which is that he now has a scholarship to the Montego Bay Community College and his brother got a job. That happened strictly through the program *Saludos Amigos*.

I also received a postcard from a Navy pilot stationed at a remote based 300 miles from the South Pole who said that the only other station he could get was *Radio Moscow* and how much the program meant to him because he was homesick. And he said, "by the way, I'm from Louisville" -- I'm from Jeffersonville which is just across the river -- "and you might want to call my dad for me. Well, it turned out that his dad was the Episcopal bishop of Louisville who I've known for eight or nine years. It's kind of a small world.

And there was a guy from New York who wrote in and said that after seventeen years on drugs and alcohol, he had, through the programming of *HCJB*, become a Christian and turned his life around. He is now off of drugs, and starts college at the age of 35 this year.

MILLER: So how does that make you feel?

MACHARG: That's what the name of the game is. That's what the program is all about. You know, you can turn out these programs for ever and ever. But the reward is getting a letter like that. That's kind of exciting. In fact it is exciting! △



↑ The massive hydroelectric plant that generates the power for *HCJB's* powerful signal.

Quito skyline ↓

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Schedule for Saludos Amigos	
South Pacific and Asia	UTC Sunday 0800 on 6130 9745 11925
Europe, Middle East, Africa	UTC Sunday 1900 on 15220 15270 17790
North America	UTC Wednesday 0200 on 6230 9870 UTC Wednesday 0630 on 6230 9870 11910





World Watch
Tom Williamson
506-270 Waterloo Avenue
Guelph, Ontario, CAN N1H 3J5

Well, summer reception conditions are now well and truly with us, including heavy QRN (atmospheric static noise) and, in a small way, some reactivation of the high frequency bands. For instance, 16 meters is now quite a good source of daytime signals and there is an occasional flicker of life from the 13 meter region; none of this of course is up to the "good old days," and we shall have to wait for the sunspot cycle to declare better times!

What with all of the political activity around the world these days, and bearing in mind particularly the South African situation, one might think that the shortwave listener would be a red-hot source of up-to-date news on the situation. Not so. Listeners to *Radio RSA* may be surprised to hear during this "crisis" not what they might expect but rather an enticing tourist program or an account of the many fascinating wildlife areas in the Republic! But not an eye-witness report of Soweto today! The government has tight control on the news at present.

This is the case in a number of different regions as well. So here are some suggestions for some of the better, though limited sources of local news on a continent basis:

AFRICA: Try *Radio France International*, the *VOA Africa Service* and both the *BBC* and the *BBC's Africa Service*.

PACIFIC: *Radio Australia* (far and away the best! You would be surprised to hear how different the news sounds from there with items and events rarely covered by other stations.)

MIDDLE EAST: *Kol Israel*, *Radio Cairo*, *Radio Japan*.

EUROPE: *BBC*, *Deutsche Welle*, *Radio Finland*.

SOUTH AMERICA: *HCB*, *Radio Habana Cuba*, *VOA*.

Of course, from time to time other stations provide excellent coverage of special areas, and much may depend on reliability of reception in your area.

Recent developments

In the last few days it has been noted that the erstwhile "pirate" station *Radio Dublin International* has been coming in well in the 49 meter band, on 6910 kHz to be precise. I'm not sure what the present "official" status of this one is, but it was rumored that the Irish government

would either close it down or make it legal! Anyway, they are still on the air at the time of writing and giving the "country chaser" a chance to log and QSL Ireland, a difficult country on shortwave. About the only other station heard and which used to verify reception reports was the *Aeradio Utility* station!

Another "out of band" 49 meter band station -- that is to say, above 6200 kHz -- is the *Voice of Lebanon* on 6549 kHz, which has been audible in the evenings around 0130 to 0230 UTC. Programming is mainly long periods of easy listening music without any announcements. French language has been heard at 0150 UTC but mostly the few announcements, by a man and woman, have been in Arabic. This station belongs to the Christian Falangist faction of that war-torn country.

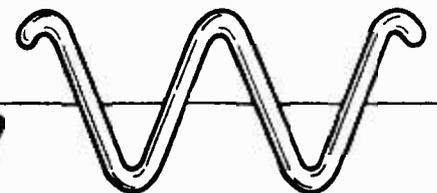
If you understand Spanish, and are interested to know what the home-service Cuban broadcasting is like, try tuning to *Radio Rebelde*, the shortwave station regularly heard on 5025 kHz in the 60 meter tropical band. News, music, and sports events will update you on the local scene and interests, and the station identifies, at least on the hour, with a single note and the words, "Radio Rebelde, La Habana." The station's sound is quite refreshing compared to that of *Radio Habana*.

I wonder if you've noticed that there are quite a few Latin American broadcasters off the air these days? Previously "regular" stations (a doubtful phrase, I agree, since Latins do come and go, but these have been around for a long time), such as *Radio Barquisimeto*, *Radio Lara*, *Radio Universo*, *Radio Continente* -- all in Venezuela -- *Radio Guatapuri*, *Emisora Atlantico*, *Radio Santa Fe*, *Radio Difusora Nacional*, even *Radio Sutatenza* -- all Colombians -- seem to be off the air at present. Perhaps these are simply irregular stations, but the impression is that economics may be taking their toll.

I welcome your comments on this topic and, indeed, on anything else raised in this column. All loggings are welcome and any photostats of unusual verifications/program bulletins from stations.

Please understand that in this column we try to present up-to-date original observations so that if you are kind enough to write to me, please try to keep your information exclusive to this publication.--Until next time, good listening!

RADIO ACTIVITY



Monitoring Times is proud to announce that beginning with the September issue, SPEEDX, one of North America's largest and most popular radio clubs, will begin hosting the Radioactivity section. Editing Radioactivity for SPEEDX will be well-known DXer J. "Speed" Grey. Speed will be bringing all of the expertise and enthusiasm to Radioactivity that SPEEDX is known for.

You can submit your loggings for Radioactivity directly to Speed at 1260 Troon Ct. SE, Grand Rapids, MI 49506-9732.

We look forward to working with SPEEDX on this unique arrangement and hope you will enjoy the results and take the opportunity to consider membership in this fine club. We also thank Tom Williamson for his assistance in providing the editorship for Radioactivity over the last two months.

[Frequency, Station, Time, Frequency, Language, Program Details, Contributor]

ALBANIA: RADIO TIRANA [0015 UTC on 9760 kHz in English] Program of news comment and patriotic historical story of the people's struggle against oppression and achievement of "liberation." Broadcast ended at 0026 with lady announcer saying "goodbye" and march music (sounded like the old Communist song, the *International*). Good signal.

ARGENTINA: RAE [0130 UTC on 9690 kHz in English] Lady announcer with a talk at 0130 UTC. Very poor signal with QRM (unidentified; possibly WHRI?).

AUSTRALIA: RADIO AUSTRALIA [1130 UTC on 9580 kHz in English] Radio Australia continues with reliable signals on 9580 in the morning broadcast from 1130-1230 UTC with *Australia Tonight*, a news and talk program. Also now heard in the evening on 17795 in parallel with 15435 kHz with news commentary at 0215 UTC. Male announcer discussing Prime Minister Fraser and his attitude toward the South African political crisis. Good signal, better on 17 MHz channel.

AUSTRIA: RADIO AUSTRIA INTERNATIONAL [0200 UTC on 6155 kHz in English] Tentative logging of Vienna. Bad QRM.

BRAZIL: RADIO NACIONAL [0200 UTC on 11745 kHz in English] Radio Nacional has a consistently good signal on this channel with its evening broadcast to the Americas in English at 0200 UTC. Also heard earlier on the Manaus station on 11780 kHz in Portuguese for the Amazon region especially (IDs as Radio Nacional Amazonia).

BRAZIL: RADIO PROGRESSO [0340 UTC on 2310 kHz in Portuguese] Probably Radio Progresso, Souza around 0340 UTC in frenetic Portuguese, likely a sporting event; still going at 0435 UTC. Weak in horrendous QRN. (Bob Hill, MA/FRENDX)

BURKINA FASO: RTB: [0558 UTC on 4815 kHz in French] Interval signal at 0558 UTC, ID "Ici Ouagadougou" into music. Very strong. (Tom Laskowski, South Bend, Indiana/ FRENDX)

CENTRAL AFRICAN REPUBLIC: RADIO CENTRAFIQUE [2211 UTC on 5034.4 kHz in French] Afro music, talk by a man and woman, much QRM. (Donald Stidwell, Keflavik, Iceland/ ADXR)

CHINA: CPBS 1 [0930 UTC on 6750 kHz in Chinese] Music program until 0945 UTC. (Ralph Bowden, Mentone, CA/ FRENDX)

CLANDESTINE: RADIO CAIMAN [1335 UTC on 7400 kHz in Spanish] Heard various music selections then male announcer with ID, frequencies, etc. Then commentary on Angola, Afghanistan, Guatemala and other countries. (Thompson, FL/ASWLC)

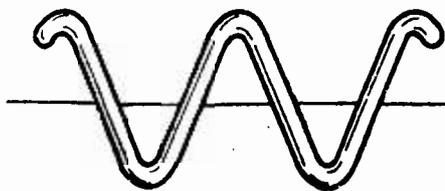
COSTA RICA: RADIO IMPACTO [1101 UTC on 6160 kHz in Spanish] National anthem in progress, greetings, ID, and music. Good signal. (Norman Bobb, Minneapolis, MN/ FRENDX)

COSTA RICA: TIFC [1755 UTC on 6175 kHz in Spanish] Pop music including the theme from M*A*S*H. ID at 1800 UTC, poor signal. (Tom Giella, League City, TX/ FRENDX)

CUBA: RADIO HAVANA CUBA [0020 UTC on 9740 kHz in English] Latin American music with good signal but QRM from Prague.

CZECHOSLOVAKIA: RADIO PRAGUE [0230 UTC on 5930 KHZ in English] Good signal.

EGYPT: RADIO CAIRO [0130 UTC on 9475 and 9675 kHz in Spanish] Radio Cairo heard on these two frequencies with Spanish programming. Lady announcer giving talk of political nature followed by oriental music of the usual type. This was followed by English programming on the same channels at 0200 UTC, the lower frequency giving the better signal.



RADIO ACTIVITY

FRANCE: RADIO FRANCE INTERNATIONAL [1600 UTC on 17620 KHz in English] Broadcast of the program *Paris Calling Africa*. 17620 kHz best signal at this time; Montsinery relay station in French Guiana gives stronger signals later in the day.

GABON: AFRICA NO. ONE [1950 UTC on 15475 kHz in French] Play about chasing and shooting a dog with many sound effects. ID and address of station at 2000 UTC followed by a pop song and news. Very good signal. (Ruth Hesch, New York)

GERMANY, WEST: SUDWEST-FUNK [0358 UTC on 7265 khz in German] Pips, 4-minute talk (possibly news), then pop music program with woman announcer. drowned out by 0427 by VOA sign on. (John Wilkins, Wheat Ridge, CO/ADXR)

GREECE: VOICE OF GREECE [0114 UTC on 7430 kHz] Athens heard with Greek music at 0114 with poor signal.

HONDURAS: LA VOZ EVANGELICA [0220 UTC on 4820 kHz in Spanish. Music and ID at 0230 UTC. (Edward Hamill, Bulingame, CA/ADXR)

HUNGARY: RADIO BUDAPEST [0200 UTC on 9835 kHz in English] Fairly good signal with some QRM.

INDONESIA: RRI CIREBON [1300 UTC on 2390 kHz in Indonesian] Indonesian news by woman at 1300 UTC, National Anthem and ID at 1308 UTC. (Roland Schultze, West Germany/FRENDX)

ISRAEL: KOL ISRAEL [0100 UTC on 9435 kHz in English] Talk about the religious clashes between Orthodox believers and the non-practising Jewish groups. Good signal but some RTTY QRM on this channel, presumed parallel to 5885 and 7410 kHz. The former channel often performs rather poorly.

IVORY COAST: ABIJAN [2240 UTC on 9620 kHz in French] Disco, Hi-life music with boomer signal, many IDs as "Abijan."

JAPAN: RADIO JAPAN [2350 UTC on 9640 kHz in English] English news program announcing as the "overseas Service of NHK." Good signal.

MEXICO: RADIO UNIVERSIDAD DE SONORA [1530 UTC on 6115 kHz in Spanish] ID followed by easy listening music. (Tinsley, CA/ASWLC)

NETHERLANDS: RADIO NETHERLANDS [0230 UTC on 9560 and 6165 kHz in English]. 9590

remains best channel for Holland at 0230 UTC.

NEW CALEDONIA: RFO NOUMEA [1004 UTC on 7170 kHz in French] US pop music in parallel with 3355 kHz. (Dustin Brann, Kansas City, MO/FRENDX)

NEW ZEALAND: RADIO NEW ZEALAND INTERNATIONAL [0555 UTC on 9620 kHz in English] Shore forecasts, sports, rugby scores, EZ listening instrumental music (Brian Alexander, Mechanicsburg, PA/ FRENDX)

NICARAGUA: VOICE OF NICARAGUA [0020 UTC on 6015 kHz in Spanish] Pop music, Latin Vocals, and man announcer identifying as "La Voz de Nicaragua." Fair signal with QRM.

PAPUA NEW GUINEA: RADIO SIMBU [1025 UTC on 3355 kHz in Pidgin] Pop oldies on a piano, jazz violin. (Norman Bobb, Minneapolis, MN/FRENDX)

PIRATE: TNFM [0328 UTC on 7414 kHz in English] Presumed from Canada with oldies rock music, time checks in Pacific time, taking collect calls from anywhere in the world, address in British Colombia. (Lani Petit, IA/ASWLC)

ROMANIA: RADIO BUCHAREST [0200 UTC on 5990 kHz in English] Man announcing news. Poor signal with QRM.

SYRIA: RADIO DAMASCUS [2016 UTC on 12085 kHz in English] Music, female with the news which began and ended with a few bars of "Flight of the Bumble Bee." Time check, Arabic music. Transmission to Europe. Very good signal. (Ruth Hesch, NY)

TURKEY: VOICE OF TURKEY [2221 UTC on 7215 kHz in English] Music, history of a city, music, letterbox program. Transmission to Europe. Fair signal. (Ruth Hesch, NY)

VENEZUELA: RADIO MATURIN [0349 UTC on 5040 kHz] talk by man with ads and ID at 0356 UTC. Good signal. (Tom Giella, League City, TX/FRENDX)

VIETNAM: VOICE OF VIETNAM [1908 UTC on 15010 kHz in English] News with woman, music and ID. (Edward Hamill, Burlingame, CA/ADXR)

YUGOSLAVIA: RADIO YUGOSLAVIA [0000 UTC on 7240 kHz in Spanish] ID then news. Brian Jones, San Antonio, TX/FRENDX)

ZAIRE: LA VOZ DU ZAIRE [1943 UTC on 15245 kHz in French] Music and ID at 2000 UTC. (Edward Hamill, Burlingame, CA/ADXR)

Another Derivation of "Ham"

There must be as many explanations as to the origin of the word "ham" for amateur radio operators as there are hams! *MT* has done several articles on this subject in the past. The latest comes from several ham publications including *Florida Skip*, *Mike and Key*, and *Breakfast Club News*.

In 1908 Albert S. Hyman, Bob Almy and Peggie Murray operated the Harvard Radio Club station using their last names for a call: Hyman-Almy-Murray, later shortened to HY-AL-MU.

Early in 1909, confusion reigned when radio operators also heard the Mexican ship HYALMO on the air, so the three amateur CW operators shortened their call sign even further; thus, "HAM" was born!

In 1911 Albert Hyman selected a controversial Wireless Regulation Bill as a thesis topic, opposing pending legislation which would critically limit amateur radio activity. A committee member, Senator David Walsh, was moved by the impassioned document and invited Hyman to testify before the committee.

The testimony triggered a Senate debate, and the little station, HAM, became a symbolic battle cry for amateur radio supporters who realized that the impending bill would squash the little amateur stations in favor of moneyed commercial broadcast stations who wished to dominate the new medium.

The monicker "ham" has stuck ever since, according to the historical report.



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frequency SECTION

The MT Monitoring Team

West Coast:
Mr. Gunner Danneels, WA
Jim Young, CA

East Coast:
Mr. John Herkimer, NY
Larry Miller, PA

Frequency updates from readers are also welcome and should be sent to:

Larry Miller, Frequency Coordinator
Monitoring Times
P.O. Box 691
Thorndale, PA 19372

All frequencies in this list have been heard by one or more MT monitors during June and early July.

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.

0000 UTC	[8:00 PM EDT/5:00 PM PDT]	0100 UTC	[9:00 PM EDT/6:00 PM PDT]	0200 UTC	[10:00 PM EDT/7:00 PM PDT]
0000-0015	Voice of People of Kampuchea 9693, 11938	0100-0115	All India Radio..... 6035, 7215	0200-0215	Radio Berlin International.. 7125, 9560
0000-0025	Radio Tirana, Albania..... 7065, 9760	0100-0115	Vatican Radio..... 11845	0200-0215	Vatican Radio..... 6145, 7125
0000-0030	BBC, England..... 5975, 6005	0100-0120	RAI, Italy..... 9575, 11800	0200-0225	Kol Israel..... 9435
		0100-0125	BRT, Belgium..... 9830	0200-0225	Radio Netherland..... 6020, 9895
		0100-0125	Kol Israel..... 5885, 7410	0200-0225	Radio Veritas, Philippines.. 15195
		0100-0130	BRT, Belgium..... 9830	0200-0230	BBC, England..... 5975, 6005
		0100-0130	Kol Israel..... 5885, 7410	0200-0230	6120, 6175
		0100-0130	Radio Budapest, Hungary..... 6025, 6110	0200-0230	7325, 9410
		0100-0130	Radio Canada International.. 9520, 9835	0200-0230	9515, 9590
		0100-0130	Radio Canada International.. 11910, 12000	0200-0230	9915, 11750
		0100-0130	Radio Canada International.. 5960, 9755	0200-0230	Burma Broadcasting Corp.... 7185
		0100-0130	Radio Canada International.. 9535, 11845	0200-0230	Radio Austria International.. 6155
		0100-0130	Radio France International.. 11940	0200-0230	Radio Budapest, Hungary..... 6025, 9520
		0100-0130	Radio Japan General Service. 15350	0200-0230	Radio Canada International.. 5960, 9755
		0100-0130	Radio Japan General Service. 7140, 9675	0200-0230	Radio Kiev, Ukrainian SSR... 7175, 13605
		0100-0130	Radio Vientiane, Laos..... 15235, 17810	0200-0230	Radio Korea World..... 7275, 11810
		0100-0145	Radio New Zealand Int'l... 7112v	0200-0230	SLBC, Sri Lanka..... 9720, 15425
		0100-0145	WYFR, Florida..... 15150	0200-0230	Swiss Radio International... 6135, 9725
		0100-0150	Deutsche Welle, West Germany 6065, 9680	0200-0230	9885, 11925
		0100-0200	ABC, Perth, Australia..... 11855	0200-0230	12035
		0100-0200	Armed Forces Radio and TV... 6040, 6085	0200-0230	15145
		0100-0200	Armed Forces Radio and TV... 6145, 9565	0200-0250	WINB, Pennsylvania..... 6035, 7285
		0100-0200	ABC, Perth, Australia..... 11785	0200-0250	Deutsche Welle, W. Germany.. 9650, 9690
		0100-0200	Armed Forces Radio and TV... 15425	0200-0256	11945
		0100-0200	Armed Forces Radio and TV... 6030, 11790	0200-0300	Radio RSA, South Africa..... 5980, 6010
		0100-0200	Armed Forces Radio and TV... 15330, 17765	0200-0300	Armed Forces Radio and TV... 6030, 11790
		0100-0200	Armed Forces Radio and TV... 21570	0200-0300	17765, 21570
		0100-0200	Armed Forces Radio and TV... 5975, 6006	0200-0300 (S)	CBC Northern Quebec Service. 6195
		0100-0200	Armed Forces Radio and TV... 6120, 6175	0200-0300	GBC, Guyana..... 5950
		0100-0200	Armed Forces Radio and TV... 7325, 9515	0200-0300	HCJB, Ecuador..... 6230, 9870
		0100-0200	Armed Forces Radio and TV... 9590, 9755	0200-0300	KCBI, Texas..... 11910
		0100-0200	Armed Forces Radio and TV... 9915, 11750	0200-0300	KVOH, California..... 11930
		0100-0200	CBC Northern Quebec Srvc... 9625	0200-0300	KYOI, Saipan..... 15405
		0100-0200	CFCX, Montreal, Canada..... 6005	0200-0300	Radio Australia..... 15180, 15240
		0100-0200	CFRX, Toronto, Canada..... 6070	0200-0300	15395, 17715
		0100-0200	CFVP, Calgary, Canada..... 6030	0200-0300	17750, 17795
		0100-0200	CHNX, Halifax, Canada..... 6130	0200-0300	Radio Beijing, PR China..... 6015, 9635
		0100-0200	CHNX, Halifax, Canada..... 6080	0200-0300	Radio Belize..... 3285
		0100-0200	CKFX, Vancouver, Canada..... 6080	0200-0300	Radio Bras, Brazil..... 11745
		0100-0200	KCBI, Texas..... 11910	0200-0300	Radio Bucharest, Romania... 5990, 6155
		0100-0200	KVOH, California..... 11930	0200-0300	9510, 9570
		0100-0200	KYOI, Saipan..... 15405	0200-0300	11810, 11940
		0100-0200	Radio Australia..... 15160, 15240	0200-0300	Radio Cairo, Egypt..... 9475, 9675
		0100-0200	Radio Australia..... 15320, 15395	0200-0300	Radio Canada International.. 5960, 9755
		0100-0200	Radio Australia..... 17795	0200-0300	R. Discovery, Dominican Rep. 6245v
		0100-0200	Radio Beijing, China..... 15445	0200-0300	Radio Cairo, Egypt..... 9475, 9675
		0100-0200	Radio Canada International.. 5960	0200-0300	Radio Dublin International.. 6910
		0100-0200	Radio Dublin International.. 6910, 9740	0200-0300	Radio Havana Cuba..... 6100, 6140
		0100-0200	Radio Havana Cuba..... 9865, 11845	0200-0300	Radio Japan..... 11870, 15420
		0100-0200	Radio Moscow..... 12030, 12060	0200-0300	Radio Korea, South..... 11810
		0100-0200	Radio Moscow..... 12050, 13665	0200-0300	Radio Moscow..... 7115, 9600
		0100-0200	Radio Moscow..... 15265, 15425	0200-0300	9765, 11845
		0100-0200	Radio Moscow World Service.. 17590, 17850	0200-0300	12030, 12050
		0100-0200	Radio Moscow World Service.. 7315, 9565	0200-0300	12060, 15265
		0100-0200	Radio Moscow World Service.. 9655, 11845	0200-0300	15415, 15425
		0100-0200	Radio Moscow World Service.. 9650, 11905	0200-0300	17590, 17730
		0100-0200	Radio Moscow World Service.. 12030, 12050	0200-0300	17825, 17850
		0100-0200	Radio Moscow World Service.. 15415, 15425	0200-0300	17860, 17880
		0100-0200	Radio Moscow World Service.. 15515, 17590	0200-0300	Radio Nacional do Brasil... 11745
		0100-0200	Radio Moscow World Service.. 17850	0200-0300	Radio Polonia, Poland..... 6095, 7145
		0100-0200	Radio Moscow World Service.. 7130, 7315	0200-0300	7270, 11815
		0100-0200	Radio Prague, Czechoslovakia 5930, 7345	0200-0300	Radio RSA, South Africa..... 5980, 6010
		0100-0200	Radio Prague, Czechoslovakia 9540, 11990	0200-0300	9615
		0100-0200	Radio Thailand..... 9655, 11905	0200-0300	Radio Thailand..... 9655, 11905
		0100-0200	RAE, Argentina..... 9690, 11710	0200-0300	SBC Radio 1, Singapore.... 11940
		0100-0200	SBC Radio 1, Singapore.... 11940	0200-0300	Sri Lanka Broadcasting Corp. 6005, 9720
		0100-0200	Spanish Foreign Radio, Spain 6055, 9630	0200-0300	15425
		0100-0200	Sri Lanka Broadcasting Corp. 6005, 9720	0200-0300	Voice of America..... 5985, 5995
		0100-0200	Voice of America..... 5995, 6130	0200-0300	6010, 6085
		0100-0200	Voice of America..... 9455, 9650	0200-0300	6130, 9455
		0100-0200	Voice of America..... 9775, 11580	0200-0300	9575, 9775
		0100-0200	Voice of America..... 11680, 11740	0200-0300	11675, 11740
		0100-0200	Voice of America..... 15185, 15205	0200-0300	11680, 15205
		0100-0200	Voice of America..... 15290, 15375	0200-0300	15375, 15420
		0100-0200	Voice of America..... 17740, 17820	0200-0300	7285
		0100-0200	Voice of America..... 11770	0200-0300	Voice of Free China, Taiwan. 5985, 9680
		0100-0200	Voice of America..... 7355	0200-0300	WHRI, Indiana..... 9745
		0100-0200	Voice of America..... 9680, 9715	0200-0300	WINB, Pennsylvania..... 15145
		0100-0200	Voice of America..... 11855, 15170	0200-0300	World Music Radio..... 6910
		0100-0200	Voice of America..... 11855, 15170	0200-0300	WRNO Worldwide..... 7355

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0600-0700	CFRX, Toronto, Canada.....	6070	0700-0800	Radio Japan General Service.	9735, 11955		9635, 9795
0600-0700	CFVP, Calgary, Canada.....	6030			15235, 17810		9810, 11710
0600-0700	CKFX, Vancouver, Canada.....	6080			17855		11815, 11910
0600-0700	CHNX, Halifax, Canada.....	6130	0700-0800	Radio Kuwait.....	9560		12010, 15260
0600-0700	GBC, Accra, Ghana.....	3366	0700-0800	Radio Moscow.....	7290, 17590		15295, 17765
0600-0700	HCJB, Quito, Ecuador.....	6230, 9870			17880		17815, 17850
		11910	0700-0800	Radio Thailand.....	9655, 11905		
0600-0700	King of Hope, Lebanon.....	6280	0700-0800	SBC Radio 1, Singapore.....	5010, 11940	0900 UTC	[5:00 AM EDT/2:00 AM PDT]
0600-0700	TEN KVOH, California.....	6005	0700-0800	Soloman Islands Bcating Svc	5020	0900-0905	Africa Number One, Gabon....
0600-0700	KYOI, Saipan.....	15190	0700-0800	VLM4 Brisbane, Australia....	4920	0900-0915	BBC, London.....
0600-0700	Radio Australia.....	15160, 15240	0700-0800	Voice of America.....	5995, 6035		7200, 15200
		15315, 17715			6080, 6125		9510, 12095
		17750			9550, 9670	0900-0915 (S)	11750, 15070
0600-0700	Radio Havana Cuba.....	9525	0700-0800	Voice of Free China.....	11840		6000, 6155
0600-0700	Radio Moscow.....	9635, 9580	0700-0800	Voice of Malaysia.....	5985	0900-0925	11915
		9755, 11770	0700-0800	Voice of Nigeria.....	6175, 9750	0900-0930	17575, 21485
		11950, 13605			15295		6060, 9580
		13615, 13680	0700-0800	WHRI, Indiana.....	15120, 15185	0900-0930	9670
		15210, 17590		World Music Radio.....	17800	0900-0950	7275
		17730, 17860	0700-0800	WRNO Worldwide.....	9620		9765, 11830
		17835, 17850	0700-0800 (S)	Vatican Radio.....	6910	0900-1000 (S)	13650
0600-0700	Radio Pyongyang, N. Korea..	13650, 13680	0700-0800 (S)	FEBA Radio, Seychelles....	6185	0900-1000	9670
0600-0700	SBC Radio 1, Singapore.....	11940	0715-0730 (M-A)	TWR Monte Carlo.....	11725, 15190	0900-1000	6030, 9530
0600-0700	Soloman Islands Bcating Co.	5020	0715-0800 (S)	All India Radio.....	15120, 17780		9590
0600-0700	VLQ 9, Brisbane, Australia..	9660	0725-0800		7105		11945, 15160
0600-0700	VLW 15, Lyndhurst, Australia	15230	0730-07357		5990, 6010		15185, 15205
0600-0700	VLW 15, Waneroo, Australia.	15425			6020, 6050		15320, 17780
0600-0700	Voice of America.....	3990, 5995			7110, 7250	0900-1000	17800, 21560
		6080, 6095			9610, 11730	0900-1000	11890, 21475
		6125, 9530	0730-0800	BBC, London.....	11850, 11935		6130, 9745
		9550, 9670		KTWR, Guam.....	9410, 9510	0900-1000	11925
0600-0700	Voice of Asia, Taiwan.....	7285	0730-0800	Radio Finland.....	12095, 15070	0900-0100	King of Hope, Lebanon.....
0600-0700	Voice of Malaysia.....	6175, 9750	0730-0800	Radio Netherlands.....	11735, 15115	0900-1000	11850
		15295	0730-0800	Radio Prague.....	6120, 11755	0900-1000	11840
0600-0700	WHRI, Indiana.....	9620	0730-0800		15265		4450, 6085
0600-0700	(S) World Music Radio.....	6910	0730-0800		9630, 9715	0900-1000	9675, 11875
0600-0700	(S) WRNO Worldwide.....	6185			11855, 17840		11955, 15235
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		7355, 7365		[4:00 AM EDT/1:00 AM PDT]		0900-1000	9795, 13645
0615-0630 (M-F)	Radio Canada International..	9455	0800-0805	GBC, Accra, Ghana.....	3366	0900-1000	13655, 13680
		6140, 7155	0800-0825	Radio Netherlands.....	9630, 9715	0900-1000	9600, 11780
		9740, 9760	0800-0825	Voice of Malaysia.....	6175, 9750	0900-1000 (S)	9685v
		11775, 11840			15295		6055, 9505
0615-0630 (M-A)	Vatican Radio.....	15235	0800-0830	Radio Bangladesh.....	11645, 12035	0900-1000	11990
0625-0700	TWR, Monaco.....	15190, 17730	0800-0830	HCJB, Quito, Ecuador.....	6130, 9745	0900-1000	5010, 11940
0630-0655	Radio Netherland.....	7105			9845, 9860		7255, 15120
0630-0700	Radio New Zealand Int'l....	9895, 11930	0800-0830	Voice of Nigeria.....	7255, 15185	0900-1000	15185, 17800
0630-0700	Radio Polonia.....	11780	0800-0845 (S)	FEBA, Seychelles.....	15120, 17795	0900-1000 (S)	7355
		6135, 7270	0800-0855 (M-F)	BRT, Belgium.....	9880, 15515	0910-0930 (A)	6185
		9675	0800-0900	AFAN, Antarctica.....	6012	0915-1000	9880, 15515
0630-0700	Radio RSA, South Africa.....	5980, 7270	0800-0900	AFRTS Far East Network....	11750		9410, 9655
		9585, 11900	0800-0900	BBC, London.....	9410, 9510		12095, 15070
0630-0700	Radio Sofia, Bulgaria.....	9700	0800-0900	CFCX, Montreal, Canada.....	12095, 15070	0930-1000	15400, 17705
0630-0700	Radio Tirana.....	7080, 9500	0800-0900	CFRX, Toronto, Canada.....	6005		21660
0630-0700	Swiss Radio International..	3985, 6165	0800-0900	CFVP, Calgary, Canada.....	6070		9580, 9655
		9535, 9870	0800-0900	CHNX, Halifax, Canada.....	6030	1000 UTC	
0645-0700 (M-F)	HCJB, Quito, Ecuador.....	12030, 15430	0800-0900	CKFX, Vancouver, Canada....	6130	1000-1010	Voice of Kenya.....
0645-0700	Radio Bucharest, Romania..	6205	0800-0900	FEBE, Manila.....	6080	1000-1030	9665
		11940, 15250	0800-0900 (S,A)	GBC, Accra, Ghana.....	11890, 21475		7225, 9735
		15335, 17790	0800-0900	HCJB, Quito, Ecuador.....	3366	1000-1030	17765, 21600
		17805, 21665	0800-0900	King of Hope, Lebanon.....	6130, 9745		11700, 13725
0700 UTC	[3:00 AM EDT/12:00 AM PDT]		0800-0900	KNLS, Anchor Point, Alaska.	6280		15640, 15650
0700-0712	Radio Bucharest, Romania..	11940, 15250	0800-0900	KTWR, Guam.....	11860		17565, 17685
		15335, 17790	0800-0900	KYOI, Saipan.....	11735		17815
		17805, 21665	0800-0900	Radio Australia.....	15190	1000-1030	9580, 9655
0700-0725	Radio Tirana Albania.....	9500, 11985	0800-0900	Radio Earth (via Milan)....	9580, 15395	1000-1030 (S)	9770
0700-0735	Burma Broadcasting Corp....	9730	0800-0900	Radio Korea World News Svc..	17715, 17750		9790, 15175
0700-0730	BBC, London.....	5975, 6175	0800-0900	Radio Kuwait.....	7295		15185, 15230
		7150, 9510	0800-0900 (S)	Radio Prague.....	7275	1000-1030	9560, 11745
		15360			9750	1000-1100	11905, 15570
0700-0730 (A,S)	TWR, Bonaire.....	9535	0800-0900	Radio Pyongyang, N. Korea..	6055, 9505		9840, 12035
0700-0730v	Radio Zambia.....	11880v	0800-0900	Radio Earth Int'l.....	11990		6030, 6125
0700-0735	TWR Swaziland.....	6070	0800-0900	Radio Austria Int'l.....	11830, 13680		9530, 9590
0700-0745	Radio New Zealand Int'l....	11780, 15150	0800-0900	RTE Portugal.....	9670	1000-1100	9700, 11805
0700-0745	WYFR, Florida.....	6065, 7355	0800-0900	SBC Radio 1, Singapore.....	5010, 11940		11705, 11810
		7400, 9455	0800-0900	TWR Monte Carlo.....	7105		15320, 15335
		9852.5	0800-0900 (S)	Voice of Indonesia.....	11790, 15150		17387, 17875
0700-0750	Radio Pyongyang.....	11930, 13750	0800-0900	WHRI, Indiana.....	7355	1000-1100	6195, 9410
		15340		WRNO Worldwide.....	6185		9740, 9760
0700-0800	Armed Forces Radio and TV..	15400	0830-0900	Radio Beijing.....	6000, 6155		11750, 12095
0700-0800	CFCX, Montreal, Canada.....	6005	0830-0900	Radio Prague, Czechoslovakia	11915, 15410		15070, 15280
0700-0800	CFRX, Toronto, Canada.....	6070	0830-0840	All India Radio.....	9700, 11755		11855v
0700-0800	CFVP, Calgary, Canada.....	6030			15440	1000-1100	6005
0700-0800	CHNX, Halifax, Canada.....	6130			11855, 17840	1000-1100	6070
0700-0800	CKFX, Vancouver, Canada....	6080			21705	1000-1100	6030
0700-0800	(A,S) ELWA, Liberia.....	11830			5960, 5970	1000-1100	6130
0700-0800	FEBE, Manila.....	11850, 15350			5990, 6010	1000-1100	6080
0700-0800	GBC, Accra, Ghana.....	3366			6020, 6050	1000-1100	6080
0700-0800	HCJB.....	6130, 9745	0830-0855 (M-A)	Radio Netherlands.....	6100, 7110	1000-1100	3910, 6155
		9860, 9845	0830-0900	HCJB, Quito, Ecuador.....	7125	1000-1100	6130, 11925
		6280			9715	1000-1100	11930
0700-0800	TEN King of Hope, Lebanon.....	6005	0830-0900	Radio Netherlands.....	6130, 9745	1000-1100	17775
0700-0800	KVOH, California.....	9555	0830-0900	Swiss Radio International..	11925	1000-1100	5020
0700-0800	KNLS, Anchor Point, Alaska..	15190			17575, 21485		9600, 9795
0700-0800	KYOI, Saipan.....	4890	0840-0900	Radio Australia.....	9560, 11745		13645, 13665
0700-0800	NBC, Papua New Guinea.....	15395, 17715			11905, 15570		13680, 13705
0700-0800	Radio Australia.....	17750			6045, 6060		15110, 15140
		7295	0847-0852 (A)	R. Pacific Ocean, Vladivost.	9580, 15395		15155, 15225
0700-0800	(S) Radio Earth (via Milano)...	9525			17715, 17750		15265, 15490
0700-0800	Radio Havana Cuba.....	9525			9500, 9620		17625, 17645
							17665, 17775

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1000-1100	Radio New Zealand Int'l.....	9600, 11780	1200-1215	Voice of Islamic Rep. Iran.	15084	1300-1400	CHNX, Halifax, Canada.....	6130
1000-1100 (S)	Radio Prague.....	6055, 9505	1200-1215 (S)	Vatican Radio.....	17840, 21485	1300-1400	CKFX, Vancouver, Canada.....	6080
1000-1100	SBC Radio 1, Singapore.....	11990	1200-1215	Voice of People of Kampuchea	9693, 11938	1300-1400	FEBC, Manila.....	11850
1000-1100	Voice of Nigeria.....	7255, 15120	1200-1215	Radio Finland.....	11945, 15400	1300-1400	GBC, Accra, Ghana.....	7295
1000-1100	WHRI, Indiana.....	7355	1200-1225	Radio Bucharest, Romania....	9530, 11740	1300-1400	HCJB, Quito, Ecuador.....	11740, 15115
1000-1100 (S)	WRNO Worldwide.....	6185	1200-1225	Radio Netherland.....	15345			17890
1005-1010	Radio Pakistan.....	15605, 17660			5955, 9715	1300-1400	KTWR, Guam.....	9870
1030-1040	Voice of Asia, Taiwan.....	5980			15560, 17575	1300-1400	Radio Australia.....	5995, 6060
1030-1100	Radio Austria International.	9625, 12025	1200-1225	Radio Polonia.....	17605, 21480			7205, 9580
1030-1100	Radio Budapest Hungary.....	9835, 11910	1200-1230	Radio Tashkent.....	7325, 9600			9770,
		15160, 15220			9715, 15460			9550, 9730
		17710, 21665	1200-1230	Radio Ulan Bator, Mongolia..	9615, 12015	1300-1400	Radio Beijing.....	11660, 11755
1030-1100	Radio Netherland.....	6020, 9650	1200-1230	Swiss Radio International...	6165, 9535	1300-1400	Radio Canada International.	11955, 17820
1030-1000	Radio New Zealand.....	6100, 9620	1200-1242	Radio Ulan Bator Mongolia..	12030	1300-1400	Radio Moscow.....	9580, 9655
1030-1100	Sri Lanka Broadcasting Corp	11835, 15120	1200-1250	Trans World Radio Bonaire..	11815	1300-1400		9705, 9755
		17850	1200-1300	Radio Pyongyang, N. Korea...	9550			11675, 13615
1030-1100	UAE Radio, Dubai.....	17775, 17865	1200-1300	4VEH, Haiti.....	4930			15490, 17625
		21605, 21700	1200-1300	AFRTS.....	6030, 9700	1300-1400	Radio RSA, South Africa....	15220, 21535
1040-1050	Vatican Radio.....	6250, 9645	1200-1300		15330, 15430	1300-1400	SBC Radio 1, Singapore.....	5010, 11940
		11740			21670	1300-1400	Sri Lanka Broadcasting Corp.	6075, 9720
1040-1050	Voice of Greece.....	15630, 17565			5965, 6195	1300-1400	Voice of Nigeria.....	7255, 15120
1045-1000	Radio Nepal.....	5005, 9590	1200-1300	BBC, London.....	9740, 11750	1300-1400 (S)	WHRI, Indiana.....	11790
1050-1100 (M-F)	Radio Budapest Hungary.....	9585, 9835			12095, 12095	1300-1400	WRNO Worldwide.....	9715
		11910, 15160			15070	1330-1400	All India Radio.....	11810, 15335
		17710			11855v	1330-1400	Laotian National Radio.....	7123v
					6065, 9625	1330-1400	BBC, London.....	9740, 11750
1100 UTC	[7:00 AM EDT/4:00 AM PDT]				6005	1330-1400	Radio Korea World News Svc.	15575
1100-1115	Radio Pakistan.....	15605, 17660	1200-1300	B.S. Kingdom Saudi Arabia..	11855v	1330-1400	Radio Tashkent.....	7325, 9715
1100-1125	Radio Netherland.....	6020, 9650	1200-1300	CBC Northern Quebec Service.	6065, 9625	1330-1400	Swiss Radio International..	15570, 15585
1100-1130	Kol Israel.....	11605,	1200-1300	CFCX, Montreal, Canada.....	6005	1330-1400	U.A.E. Radio.....	11955, 17775
		15560, 15643	1200-1300	CFRX, Toronto, Canada.....	6070	1330-1400		21605, 21695
1100-1130	Radio Australia.....	5995, 6080	1200-1300	CFVP, Calgary, Canada.....	6030	1337-1400 (A)	Voice of Vietnam.....	10040, 15010v
		7215, 9580	1200-1300	CHNX, Halifax, Canada.....	6130	1345-1400	Radio Austria International	11935
		9710, 9770	1200-1300	CKFX, Vancouver, Canada.....	6080		WYFR, Florida.....	15055
1100-1130	Radio Finland.....	11945, 15400	1200-1300	GBC, Accra, Ghana.....	7295		TWR, Bonaire.....	11815
1100-1200	Radio Japan General Service.	9675, 11815	1200-1300	HCJB, Quito, Ecuador.....	11740, 15115		Vatican Radio.....	7250, 9645
1100-1130	Radio Sweden Int'l.....	9630, 15115	1200-1300		17890	1400 UTC		11740
1100-1130	Sri Lanka Broadcasting Corp	11835, 15120	1200-1300	KYOI, Saipan.....	11900	[10:00 AM EDT/7:00 AM PDT]		
		17850	1200-1300	Radio Australia.....	5995, 6045	1400-1415	GBC, Accra, Ghana.....	7295
1100-1130	Swiss Radio International..	11795, 15570	1200-1300	Radio Beijing.....	6060, 6080	1400-1415	U.A.E. Radio, Dubai.....	11955, 17775
1100-1130	Voice of America.....	15585, 17830	1200-1300	Radio Korea World News Svc..	7205, 9580	1400-1430	Radio Australia.....	5995, 6035
		6110, 9760	1200-1300	Radio Moscow.....	9770			6045, 6060
		15160, 15210	1200-1300		9535, 9640	1400-1430	Radio Finland.....	6080, 9580
		15425	1200-1300	Radio Tanzania.....	9820	1400-1430	Radio Japan General Service.	5990, 7140
1100-1130	Voice of Vietnam.....	9840, 12035	1200-1300	RAE, Argentina.....	7275	1400-1430 (S)	Radio Norway International.	9695, 11815
1100-1156	Radio RSA, South Africa....	11900, 15220	1200-1300	SBC Radio 1, Singapore.....	9600, 9795	1400-1430	Radio Poland International.	15245, 15300
		17780	1200-1300	WHRI, Indiana.....	11675	1400-1430	Radio Polonia.....	15310
1100-1200	4VEH, Haiti.....	4930	1200-1300	WRNO Worldwide.....	9685	1400-1430	Radio Sweden International.	6095, 7285
1100-1200	ABC, Brisbane, Australia....	4920	1200-1300 (S)	WYFR, Louisiana.....	15345	1400-1430	Radio Tirana.....	11705, 21570
1100-1200	ABC, Perth, Australia.....	9610	1200-1300	Voice of Nigeria.....	5010, 11940	1400-1430	ARFTS.....	9500, 11985
1100-1200	AFRTS.....	6030, 9590	1210-1300	Radio Cairo.....	5995	1400-1500		9700, 11805
		9700, 11805	1215-1300	Radio Japan Regional Serv..	9715	1400-1500	All India Radio.....	15330, 15430
1100-1200	BBC, London.....	15430	1215-1245	Radio Berlin International.	5985, 11875	1400-1500	BBC, London.....	11810, 15335
		5965, 6195	1215-1300	All India Radio.....	7255, 15120	1400-1500		11750, 12095
		9410, 9510	1230-1235		17675	1400-1500	CBC Northern Quebec Service.	15070, 21660
		9740, 11750			11875, 15235	1400-1500	CFCX, Montreal, Canada.....	9625, 11720
		11775, 12095			21465, 21540	1400-1500	CFRX, Toronto, Canada.....	6005
		15070, 15280			3905, 4800	1400-1500	CFVP, Calgary, Canada.....	6070
1100-1200	B.S. Kingdom Saudi Arabia..	11855v	1230-1300	Radio Austria International.	4920, 7280	1400-1500	CHNX, Halifax, Canada.....	6030
1100-1200	CFCX, Montreal, Canada.....	6005	1230-1300	Radio Bangladesh.....	9565, 9615	1400-1500	CKFX, Vancouver, Canada....	6130
1100-1200	CFRX, Toronto, Canada.....	6070	1230-1300	Radio Polonia.....	6000, 6155	1400-1500	FEBC, Manila.....	6080
1100-1200	CFVP, Calgary, Canada.....	6030	1230-1300	Radio Sweden Int'l.....	11915, 11955	1400-1500	HCJB, Quito, Ecuador.....	9670
1100-1200	CHNX, Halifax, Canada.....	6130	1230-1300	Radio Tirana.....	15525	1400-1500	KVOH, California.....	15115, 17890
1100-1200	CKFX, Vancouver, Canada....	6080	1230-1300	Sri Lanka Broadcasting Corp.	9525, 9675	1400-1500	Radio Beijing.....	11940
1100-1200	Radio Beijing.....	9535	1230-1300		11840, 15120	1400-1500 (S)	Radio Canada International.	11600, 15165
1100-1200	Radio Korea.....	7275, 15575	1230-1300	Voice of Turkey.....	9565, 11940	1400-1500	Radio Korea, South.....	11955, 17820
1100-1200	Radio Moscow.....	9600, 9795	1235-1245	WYFR, Florida.....	9555, 11960	1400-1500		9570, 9750
		11675, 13665	1235-1245	Voice of Greece.....	6075, 9720	1400-1500	Radio Moscow.....	9655, 11710
1100-1200	Radio New Zealand.....	6100, 9600	1255-1300 (M-A)	Radio Ulan Bator Mongolia..	15425	1400-1500		11840, 11850
1100-1200	Radio Pyongyang, N. Korea...	9750, 9977	1255-1330 (A-S)	TWR, Bonaire.....	15255			12005, 12030
1100-1200	SBC Radio 1, Singapore.....	5052, 11940			9680			15100, 15125
1100-1200	Trans World Radio Bonaire..	11815	1300 UTC		11645, 15405			15150, 15330
1100-1200	Voice of Asia, Taiwan.....	5980, 7445			17565			15455, 15475
1100-1200	Voice of Nigeria.....	7255, 15120			7235, 15305			17700, 17875
1100-1200	WHRI, Indiana.....	5995			11815			9585, 15220
1100-1200 (S)	WRNO Worldwide.....	6185						21535
1115-1130	Vatican Radio.....	17840, 21485						5010, 11940
1115-1200	Voice of Islamic Rep. Iran.	15084						6075, 9720
1130-1200	Radio Australia.....	5995, 6060						15425
		6080, 7215						11790
		9580, 9645	1300-1330	Radio Australia.....	9410, 9510	1400-1500 (S)	WRNO Worldwide.....	11965
		9710, 9770	1300-1330	Radio Bucharest, Romania....	9750, 11705	1400-1500	Voice of Nigeria.....	7255, 15120
1130-1200	Radio Netherland.....	11800	1300-1330	Radio Finland.....	11775, 12095	1415-1430	KTWR, Guam.....	9820
		5955, 9715	1300-1330 (S)	Radio Korea.....	15070, 17790	1415-1500 (S,A)	GBC, Accra, Ghana.....	7295
		15560, 17575		Radio Norway International.	7205, 9580		Radio Berlin Int'l.....	11795, 15445
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1130-1200	Radio Thailand.....	9655, 11905	1300-1337 (A-S)	TWR, Bonaire.....	15400, 17800	1430-1445	Vatican Radio.....	11865, 15115
1130-1200	TWR Bonaire.....	11815	1300-1355 (A-S)	BRT, Belgium.....	6040, 15245	1430-1500	Radio Australia.....	5995, 6045
1150-1200 (M-F)	Radio Budapest Hungary.....	6025, 9585	1330-1355 (S)	Radio Finland.....	15310, 17770			6060, 6035
		9835, 11910	1300-1400	4VEH, Haiti.....	11815			6080, 7205
		15160, 17710	1300-1400	AFRTS.....	15590, 17590	1430-1500 (M-A)	Radio Budapest Hungary.....	9580, 9710
					11945, 15400			9835, 11910
1200 UTC	[8:00 AM EDT/5:00 AM PDT]				9700, 15330			15160, 15220
1200-1215	Radio New Zealand.....	6100, 9620	1300-1400	B.S. Kingdom Saudi Arabia..	15430	1430-1500	Radio Korea World News Svc..	17710, 21665
1200-1215 (M-A)	Vatican Radio.....	15190, 17840	1300-1400	CBC Northern Quebec Service	11855v	1430-1500	Radio Netherland.....	7275, 11805
		17865, 21485	1300-1400	CFCX, Montreal, Canada.....	11720			5955, 11735
				CFRX, Toronto, Canada.....	6005			13770, 15560
				CFVP, Calgary, Canada.....	6070	1430-1500	Radio Yugoslavia.....	17575
					6030	1445-1500	Radio Ulan Bator, Mongolia..	9620, 15240
								9615, 12015

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1900-1930	Voice of Vietnam.....	10040, 15010v
1900-2000	4VEH, Haiti.....	4930
1900-2000	AFRTS.....	15330, 15345
1900-2000	All India Radio.....	15430, 17765
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1900-2000	BBC, London.....	7325, 9410
		12095, 15070
1900-2000	B.S. Kingdom Saudi Arabia..	11855v
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
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1900-2000	Radio Australia.....	5995, 6045
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1900-2000	Radio Beijing.....	9860, 11500
1900-2000 (A,S)	Radio Canada International..	7130, 9555
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1900-2000	TEST R. Discovery, Dominican Rep	15045
1900-2000	Radio Kuwait.....	11675
1900-2000	Radio Moscow.....	9580, 12030
		12050, 12070
		13665, 15480
		15500
1900-2000	Radio New Zealand Int'l....	11780, 15150
1900-2000	Voice of America.....	15410, 15580
		17800
1900-2000	Voice of Nigeria.....	7255, 11770
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1900-2000	WRNO Worldwide.....	15420
1900-2000	WYFR.....	11830, 11875
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1910-1920	Radio Botswana.....	3355, 4820
1920-1930	M-A Voice of Greece.....	7430, 9395
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1930-2000	Radio Beijing, China.....	9440, 11515
		11905
1930-2000	Radio Bucharest, Romania....	7145, 9690
		9750, 11940
1930-2000	Radio Finland.....	6120, 11755
1930-2000	Radio Tirana Albania.....	7075, 9500
1930-2000	Voice of Islamic Rep. Iran..	9022, 11930
1940-2000	Radio Ulan Bator Mongolia...	9575, 15305
1950-2000	Vatican Radio.....	6190, 7250
		9645

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

2000-2005	Radio Ghana.....	4915
2000-2005	Radio Ulan Bator Mongolia...	9575, 15305
2000-2010	Vatican Radio.....	6190, 7250
		9645
2000-2010	Voice of Kenya.....	4808
2000-2015 (M-F)	Radio Cotonou, Benin.....	4870
2000-2015	Radio Togo, Lome.....	3220, 5047
2000-2025	Radio Beijing, China.....	9440, 11515
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2000-2025	Radio Bucharest, Romania....	7145, 9690
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2000-2025 (M-H)	Radio Polonia.....	7125, 7145
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2000-2030	Radio Australia.....	6060, 6035
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		9620
2000-2030	Radio Algiers, Algeria.....	9640, 9685
		15160, 15215
		17745
2000-2030	Radio Budapest Hungary.....	6025, 7220
		9585, 9835
		11910, 12000
2000-2030 (M-F)	Radio Canada International..	7130, 9555
		11945, 15325
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2000-2030 (S)	Radio Norway International..	6015, 11865
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2000-2030	Radio Polonia.....	7125, 7145
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2000-2030	Radio Prague, Czechoslovakia	5930, 7345
2000-2030	Voice of Islamic Rep. Iran..	9022, 11930
2000-2030	Voice of Nigeria.....	7255, 11770
2000-2045	All India Radio.....	7160, 9665
		9755, 9910
		11620, 11865
2000-2100	AFRTS.....	11805, 15330
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2000-2100	BBC, London.....	6175, 9410
		11675, 12095
		15070, 15260
2000-2100 (S)	CBC Northern Quebec Service.	9625, 11720
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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 (M-F)	KCBI, Texas.....	11735
2000-2100	King of Hope, Lebanon.....	6280
2000-2100	TEN KVOH, California.....	17775
2000-2100	KYOI, Saipan.....	9670
2000-2100	Radio Kuwait.....	11675
2000-2100	Radio Moscow.....	12030, 12050
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2000-2100	Radio New Zealand.....	11780, 15150
2000-2100	Radio Pyongyang, N. Korea...	6575, 7105
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2000-2100	Radio Zambia.....	9505
2000-2100	Voice of America.....	15410, 15445
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2000-2100	WHRI, Indiana.....	15310
2000-2100 (S,A)	WINB, Red Lion, Penna.....	15185
2000-2100	WRNO Worldwide.....	15420
2000-2100	WYFR, Okeechobee, Florida..	11830, 11875
		15170
2005-2100	Radio Damascus Syria.....	7455, 12085
2010-2100	Radio Havana Cuba.....	17885
2015-2100	ELWA, Liberia.....	11830
2015-2045	RAI, Italy.....	7235, 9575
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2030-2100	Falkland Islands Bcast Svc..	2380 / 3958
2030-2100	IBRA Radio.....	6110
2030-2100	Radio Australia.....	6035, 6045
		6080, 7215
		9580, 9620
2030-2100	Radio Beijing.....	6955, 7480
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2030-2100	Radio Canada International.	15325
2030-2100	Radio Netherland.....	9540, 9715
		9895, 11740
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2030-2100	Radio Tirana, Albania.....	7065
2030-2100	Voice of Africa (Cairo)....	15375

2030-2100	Voice of Nigeria.....	11770
2030-2100	Voice of Vietnam.....	10040, 12020
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2045-2100	All India Radio.....	7160, 9550
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2100-2115	Radio New Zealand Int'l....	11780, 15150
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2100-2130	Radio Japan General Service.	7140, 9675
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2100-2130	Radio Sweden International.	11845, 11955
2100-2140	Radio Havana Cuba.....	17885
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James Vowden and Pam Creighton, newsreaders on the BBC World Service (Photo: BBC)

IN THE NEWSROOM

THE BBC

by Terry Heron, Editor, External Services News

It's just after midnight in the Bush House Newsroom. The night shift of journalists has been on duty for about an hour. Having read the output of the previous shift, they are now preparing themselves for whatever the next eight hours might bring.

The man on the World Service desk is listening through headphones to the bulletin being read from the studio only a few paces away. If a news story suddenly arrives, he can have it in front of the newsreader in seconds. Next to him the Senior Duty Editor is planning rewrites of various stories. Some will have to be shortened to make room for what the

coverage diary tells him is expected, others lengthened to include new information coming in from the bank of teleprinters behind him.

On the European desk an editor is shaping bulletins for translation into European languages and broadcast to breakfast audiences right across the continent. He (or she) will use many of the stories going out hourly in news broadcasts on World Service, plus news of interest only to the target audience.

Other editors are doing similar work on bulletins for the Middle East, Africa, Latin America, South and South-East Asia and the Far East.

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	21525	2300-0000	Falkland Islands Bcast Svc..	2380 / 3958
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	11830	2300-0000	KVOH, California.....	15250
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	9620	2300-0000	Radio Australia.....	15160, 15240
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(S) Radio Mediterran, Malta.....	6110			15235
Radio Nacional Angola.....	7245, 9535	2300-0000	Radio Kiev, Ukrain, USSR....	9665, 9685
Radio Polonia.....	5995, 6135			9800, 11790
	7125, 7270			11875, 13605
Swiss Radio International...	6190	2300-0000	Radio Korea, South.....	15575
All India Radio.....	6035, 7215	2300-0000	Radio Moscow.....	7175, 7400
	9595, 9912			9610, 9720
	11765			9765, 9865
				12030, 12050
				12060, 13665
				15425, 17850
				15478 LSB
				6055, 9630
				11735, 13650
				11720, 15330
				9650, 11905
				6090
				9640, 11740
				15160, 15185
				15290, 17730
				17740
				11775
				9852.5
				6300, 7485
				11830, 11855
				5975, 6120
				6175, 7325
				9590, 9915
				12095
				5960, 9755
				9840, 12035
				9395, 11645
				6080, 9730
				7275

2100-2200	Radio Baghdad, Iraq.....	7170	
2100-2200 (M-F)	Radio Canada International.	11960, 15325	
2100-2200v	Radio Jamahiriya, Libya.....	6155/ 11815	
2100-2200	Radio Moscow.....	5915, 5980	
		6020, 7290	
		7310, 9840	
2100-2200 (M-A)	Radio Nacional Angola.....	9535, 7245	
2100-2200	R. Nacional, Equat. Guinea.	15106v	
2100-2200 (F,A)	Radio Zambia.....	9505	
2100-2200	RTL, Luxembourg.....	6090	
2100-2200	Voice of Africa (Cairo)....	15375	
2100-2200	Voice of America.....	9760, 11760	
		15445, 15580	
2100-2200	Voice of Free China, Taiwan.	9510, 9765	
		11860, 15540	
		17845	
2100-2200	Voice of Nigeria.....	15120	
2100-2200	Voice of Turkey.....	7215	
2100-2200	WHRI, Indiana.....	9770	
2100-2200	WRNO Worldwide.....	11705	
2100-2200	WYFR, Okeechobee, Florida..	11830, 11875	
		15055	
2105-2200	Radio Damascus, Syria.....	9950, 12085	
2115-2145	Radio Cairo.....	9805	
2115-2200	Radio Yugoslavia.....	6100, 7240	
		9620	
2130-2200 (T,F)	BBC Falklands Service.....	9915, 11820	
		12040, 15390	
2130-2200 (S-F)	CBC Northern Quebec Service.	9625, 11720	
2130-2200	HCJB, Quito, Ecuador.....	15270, 17790	
2130-2200	KGEI, San Francisco, CA....	15280	
2130-2200	Kol Israel.....	9009, 9435	
		9815, 9860	
		11960, 12080	
		13725	
2130-2200	Radio Austria International.	5945, 6000	
		9670	
2130-2200	Radio Australia.....	15160, 15395	
		17795	
2130-2200	Radio Canada International.	11945, 15150	
		17820	
2130-2200	Radio Prague.....	6055	
2130-2200	Radio Sofia, Bulgaria.....	11720, 15330	
2130-2200	Radio Vilnius, Lithuania....	6100	
2130-2200	Swiss Radio International...	6190, 9885	
2200 UTC	[6:00 PM EDT/3:00 PM PDT]		
2200-2205	Radio Damascus, Syria.....	9950, 12085	
2200-2207	Voice of America.....	11740, 15160	
		17730, 17775	
2200-2210	Radio Sierra Leone.....	5980	
2200-2225	Radio Tirana Albania.....	7065, 9480	
2200-2225	Radio Yugoslavia.....	6100, 9670	
2200-2225	RAI, Italy.....	9710, 11800	
		15330	
2200-2230	All India Radio.....	7160, 9550	
		9665, 9910	
		11620, 11870	2200-2300
2200-2230 (S-F)	CBC Northern Quebec Service.	9625, 11720	2200-2300
2200-2230	Radio Canada International..	5960, 9755	2200-2300
2200-2230 (S)	Radio Norway International..	9605, 11930	
2200-2230	Radio Vilnius, Lithuania SSR	7165, 7400	
		9800, 11750	2205-2230
		11860, 15100	
2200-2245	Radio Cairo, Egypt.....	9805	2215-2230
2200-2245	WINB, Red Lion, Penna.....	15185	
2200-2250	Radio Jamahiriya, Libya.....	6155	2230-2300
2200-2250	Voice of Turkey.....	7215, 9535	2230-2300
		9560, 17725	
2200-2300	AFRTS.....	11790, 15330	
		15345, 17765	2230-2300
		21570	2230-2300
2200-2300	BBC, London.....	5975, 6175	2230-2300
		7325, 9590	
		9515, 9915	2230-2300
		12095, 15070	2245-2300
2200-2300	CFCX, Montreal, Canada.....	6005	
2200-2300	CFRX, Toronto, Canada.....	6070	
2200-2300	CFVP, Calgary, Canada.....	6030	
2200-2300	CHNX, Halifax, Canada.....	6130	2300 UTC
2200-2300	CKFX, Vancouver, Canada....	6080	
2200-2300	CKZU, Vancouver.....	6160	2300-2330
2200-2300	Falkland Islands Bcast Svc..	2380 / 3958	
2200-2300	KVOH, California.....	15250	
2200-2300	KYOI, Saipan.....	15405	
2200-2300	Radio Australia.....	15160, 15240	
		15320, 15395	2300-2330
		17795	
2200-2300 (M-F)	Radio Canada International..	6170, 7230	2300-2345
		11945, 15325	2300-2330
2200-2300	Radio Havana Cuba.....	11705	2300-0000
2200-2300	Radio Korea.....	6480, 7550	
2200-2300	Radio Moscow.....	7390, 9490	
		9610, 9720	2300-2330
		9820, 9880	2300-2345
		11950, 12030	2300-2350
		12060, 15425	
		15478 LSB	2300-0000
2200-2300	Spanish Foreign Radio.....	5960, 6020	2300-0000
		7105	
2200-2300	Voice of America.....	15185, 15290	
		15415, 15580	2300-0000
		17740, 17820	2300-0000
2200-2300	Voice of Free China, Taiwan.	9955, 15440	2300-0000
		17845	

It's a routine frequently shattered by the arrival of a big story. It could come from one of our 30 foreign correspondents, a message from the BBC's Monitoring Service which listens around the clock to broadcasts by radio stations worldwide, or from the international news agencies.

The US air attack on Libya, the Chernobyl disaster, statements of profound importance from Washington or Moscow -- all require immediate follow-up action to ensure swift, comprehensive and accurate coverage.

If the source is one news agency, we wait until we can get confirmation from another. Facts are checked and re-checked; only then is the story used. We like to be first, but we like even more to be the first to get it right.

If the news is important enough we will not wait until the next bulletin. A brief news summary will be sent to the World Service continuity announcer to be read at the first break between programmes. Translators will be alerted; if one is on the air, a three or four-line summary will be sent to him in the studio.

In the newsroom the World Service desk will be reshaping the next

bulletin, writing new headlines, discussing the content with the newsreader.

The *Radio Newsreel* editor will have scrapped his carefully-laid plans and be talking to foreign correspondents. What can they get on the story, what time can they file? Perhaps a correspondent has to be moved off base to another country; how soon can he get there?

As the night progresses, the news will be rewritten several times as more information becomes available; the shape of the *Newsdesk* programs will be changed more than once -- even when they are on the air -- as correspondents up-date their dispatches.

And so to the end of the shift, when the weary night team hands over to its daytime successors. The operation begins all over again -- an operation which produces some 200 news programs every 24 hours.

Elsewhere, a sub-editor is reading quickly through the first editions of the national papers. His job is to write a five minute *Press Review* beginning with a description of how the papers are treating the news and continuing with a summary of the editorials. And he hasn't much time to do it -- the first edition is due on the air in less than two hours.

Meanwhile, the *Radio Newsreel* team is assembling the 0215 Reel for South Asia and planning the 0400 and 0600 half-hour *Newsdesks*.

They are listened to attentively by huge audiences at every level of society. On one occasion, an African president asked his office to ring the newsroom to complain that we weren't giving enough prominence to a speech he'd made the night before.

Inevitably, there are complaints of bias in our reporting; the deeply committed will perceive political motivation in any story which does not reflect their beliefs.

We have to explain that judgements are based on Anglo-Saxon news values. We are not idealogues here to change the world; only to tell it more about itself. △

BBC News Programs (North American Evenings)

World News (daily)
0000, 0200, 0300, 0400, 0500, 0600, 0700, 0800, 0900, 1100 UTC

Newsdesk (daily)
A half-hour program including World News and dispatches from overseas and UK correspondents. 0400 and 0600. News summary at 0100 UTC.

Radio Newsreel (daily)
News of events as they happen and dispatches from BBC correspondents all over the world. 0015 and 0215 UTC.

Twenty-Four Hours (daily)
Analysis of the main news of the day. 0509 and 0709 UTC.

The World Today (Tuesdays to Saturdays)
Examines thoroughly one topical aspect of the international scene. 0315, 0545, 0915 UTC.

From Our Own Correspondent (Sundays)
BBC correspondents comment on the background to the news. 0315 and 0730 UTC.

Images, Intermod & Bleedover

Most of today's popular short-wave receivers suffer from strong-signal overload and its resultant intermod, bleedover and desensitization, especially when attached to an external antenna.

TIP: To eliminate the interference caused by strong-signal overload, install a passive preselector between your antenna and your Kenwood, Yaesu, Panasonic, Sony, Radio Shack or similar receiver.

Bob Grove's

EQUIP-tips



Tips from the expert on boosting the performance of your listening equipment

The **Grove Minituner III** is a shortwave/longwave performance booster which eliminates intermod, images, phantom signals and other products of strong-signal overload in the 100 kHz through 30 MHz range! Comes equipped with standard coax connectors.

Only \$39 plus \$2 UPS; \$5 U.S. Mail P. P.

Grove Enterprises

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(704) 837-9200 or (MC & Visa only) 1-800-438-8155

Hand-Held Scanner Reception

Today's hand-held programmable scanners are highly sensitive and sophisticated receivers (the Bearcat BC-100XL and the Regency HX-1000/1200 are among a growing number of quality units), but their range is often severely limited by the short "rubber ducky" antennas with which they are supplied.

TIP: To increase the range of your hand-held scanner, install an extendable full-length antenna with a standard BNC base. This simple operation will noticeably increase your receiving distance.

Bob Grove's

EQUIP-tips



Tips from the expert on boosting the performance of your listening equipment

The **Grove ANT-8** is a fully adjustable whip antenna, offering a standard BNC base to fit most programmables. Length is extendable from 7 to 46 inches. Replace that rubber ducky with the ANT-8 and stand back!

Only \$12⁹⁵ plus \$1⁵⁰ Shipping

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New! Heavy-duty Universal Power Supply

A \$15 Value for Only

\$9⁹⁵ Includes free UPS shipping;
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Our new universal AC Adaptor is especially rugged - capable of switching to your choice of 3, 4, 5, 6, 7, 5, 9, or 12 volts DC at a current of 500 milliamps (1/2 amp)! Another switch lets you choose + or - plug polarity. An array of plugs on its interconnect cord assures proper mating to any electronic accessory. Plugs into standard house current (120 VAC, 60 Hz).

Order ACC 20

MOBILE SCANNER POWER ADAPTOR

No messy wiring connections to your car's battery system; just plug into your cigarette lighter accessory and power up your scanner (as well as charge NICAD batteries in your portable) while you drive! Choose the appropriate cable for your scanner.

ACC23 for 12 VDC (center pin positive) Bearcat BC50XL, BC100, BC100XL, BC800XLT, BC145, BC140, BC175 and BC170 **\$9⁹⁵***

ACC19 for 9VDC (center pin negative) Regency HX1000, HX1200, HX1500, Radio Shack PRO 30-31 **\$9⁹⁵***

* free first class shipping

Rechargeable Battery Pack and Charger for your BC50XL

No more short life throwaway replacements! Save time, money and aggravation with this professional Bearcat NICAD power system. Operates from 120 VAC wall outlet.

Order ACC17 **\$25**

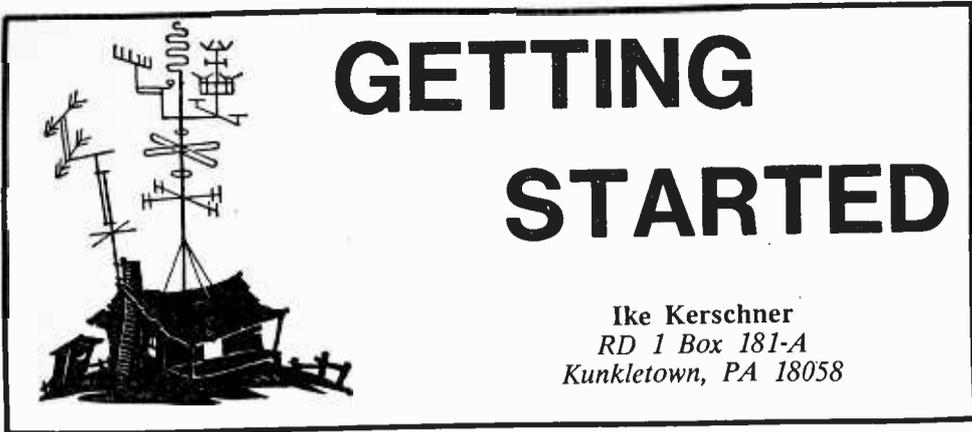
plus \$1⁵⁰ UPS or \$3 U.S. Mail Parcel Post

Professional Drop-in Charger for Regency HX1000, -1200 & -1500

Simply stand your scanner in this heavy duty charger and operate your scanner or charge its batteries from 120 VAC wall outlet.

Order ACC18 **\$92⁵⁰**

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GETTING STARTED

Ike Kerschner
RD 1 Box 181-A
Kunkletown, PA 18058

-- ANTENNAS --

A Nuts and Bolts Approach

After reading Clem Small's "Antenna Talk" column in *Monitoring Times*, you probably have an idea of what kind of antenna you would like to have. It is possible to purchase almost any kind of antenna you want. Prices start at about \$20.00 for antennas like the Grove Skywire and Omni, and can reach hundreds or even thousands of dollars for more elaborate installations.

You can, however, build your own antenna for a fraction of what a commercial antenna could cost. It will perform as well as the store-bought unit and, in some cases, even better!

As you check prices on material you are sure to notice that buying components across the counter to build that dream antenna won't save much money; in fact, store-bought components may cost more than buying the antenna kit.

In order to overcome this problem you will need to resort to a technique called "alternate material substitution"--scrounging! It is simply a matter of knowing what can be substituted for a particular item, or where various components can be obtained at low cost.

Let's take a look at the major parts of an antenna and see what we can substitute for the high priced stuff. It is also important that the material you choose be able to stand up to the severe conditions which most antennas must endure.

The first real antenna that I built was an 80 meter dipole. My weekly allowance was ten cents in those days and insulators cost from ten to twenty-five cents each. Since three insulators were required I was going to be flat broke for three weeks just to purchase the insulators unless I could figure something out.

One of my ham radio friends suggested using wood for the insulators. He told me that if I gave the wood a coat of shellac they would last for years and work fine.

I used three pieces of scrap hardwood flooring about eight

inches long, drilled a hole about one-half inch from each end and coated them with shellac. They cost nothing except for the shellac; you can use varnish or clear lacquer, too. Those wooden insulators lasted nearly six years and came down only when we moved to a new house (it was a swell antenna!).

Today our choice of material for insulators is better than it was forty years ago. Short pieces of PVC pipe and scraps of plastic make dandy insulators. Next time you see a new home being built ask the plumber for plastic scraps; chances are he will give you enough to build a hundred acres of antennas!

Antenna Wire

There are two types of commercial antenna wire commonly available: hard-drawn copper and copper-clad steel. Hard drawn copper is nearly pure copper that has been treated to make it very strong and resist stretching. Copper clad steel is just that--steel wire that has a thin layer of copper to improve the electrical conductivity.

There are several suitable substitutes for commercial antenna wire. The first and easiest to obtain is steel fence wire. Two kinds of fence wire, copper-clad (about half the cost of antenna wire) and galvanized (about one-third the cost of antenna wire) can be purchased by the foot in many hardware or farm stores or by the quarter mile spool.

If you use galvanized wire some care must be taken when soldering it because there is an oily film on the surface. Use sandpaper to clean the area to be soldered.

Fence wire will take all the abuse regular antenna wire will. Galvanized wire has a useful life of three to five years depending on what part of the country you live in. Many radio buffs change antennas every year or two (in quest of the ultimate) though, so this is not a serious drawback.

Theoretically, galvanized wire does not conduct electricity as well as copper, but you will never notice any difference between a copper wire and a steel wire antenna of the same dimensions.

Very often, single conductor wire of the type used in wiring houses is available at reasonable prices at flea markets or hamfests. Buy it whenever you can, for while it is either medium or soft drawn wire, you can turn it into hard drawn wire easily.

Tie one end of it to a solid object (I use a tree) unroll the wire (never uncoil it like stretching a spring!) and grab the other end (wear leather gloves) and stretch the wire 'til it won't stretch any further. You could use a car or garden tractor for this operation, but be careful not to break the wire.

Now you have hard-drawn wire. It will be about two gauges smaller than before it was drawn. Don't worry about the plastic insulation left on the wire--the radio waves won't even know it's there.

Another very good antenna wire that shows up a lot at hamfests is military surplus field telephone wire which consists of two very tough steel wires twisted together.

The wires can be separated if you like. An easy way of doing this is to hook one end to an electric drill and run the drill in the opposite direction from the twist. This is usually more work than it is worth and there is nothing wrong with leaving the wires in a pair and using it as a single wire.

Many other wires are suitable for antennas, just be sure whatever you choose is strong enough to stand up to the worst weather conditions that you normally experience in your area.

Feedline

Coaxial cable is the most popular feedline for antennas and if your antenna is going to be operating at a frequency lower than 30 MHz, use the cheapest cable you can find.

An even cheaper feedline that I have used is lamp cord or "zip cord." This is the common, two-conductor, rubber-covered wire that is found on electrical lamps. It is available at about one third the cost of the least expensive coax, it has an impedance of about 72 ohms and works well for receiving antennas.

300 ohm TV "ribbon" feedline works well if you have a transmatch ("tuner") or use balun coils with a folded dipole type antenna. Even without the matcher, parallel feedline works well for receiving applications.

Note: Do not use inexpensive coax for frequencies above 30 MHz (VHF/UHF); use the best cable you can afford at these frequencies.

That about covers the antenna scrounging lessons for lower frequency antennas. If your interest is in VHF and UHF antennas, look around for an old TV antenna because next issue I will show you how to build a super VHF/UHF signal grabber from it!

Keep those letters and cards coming;
73 - Ike

AM STEREO CORRECTION

In a previous issue (July, 1986, page 39), we erroneously cited the Motorola receiver chip as being contested by Kahn Communications as having spurious emissions in excess of the maximum allowable by the FCC.

In fact, it is the Motorola exciter used in the transmitter which is alleged to be causing AM broadcast band interference. The receiver chip is not at fault and would still be compatible with an improved version of the exciter.

We would like to thank Christopher Kissel of Islip Terrace, NY, for bringing this to our attention.

Monitoring a Black Art?!

Write MT or Ike Kerschner with your questions; monitoring shouldn't be a mystery only for the initiated!

African Emergency Radio System

The civil strife which is presently ripping South Africa has resulted in the installation of an emergency alarm radio system across most of South Africa and Namibia.

MT reader Robert Horvitz sent an article from the Johannesburg *The Star* which discusses the system, "MARNET," which is enforced by the police and South African Defence Force.

The system automatically broadcasts a distress signal at the touch of a button in case a farm or homeowner is under insurgent attack, terrorist threat, major accident, or bush fire.

Specifications for the system were drawn up in conjunction with the South African Telecommunication and Electrical Power Supply Authority and manufactured by Barcom Electronics under a contract to Armscor.

Do you use an ICOM IC-R71A with a Commodore 64 home computer? Then you may benefit from this preview of an SWL software program offered by its designer.

'SEEKER'

Computer Aided Communications Monitoring System

by Allan Franklin

'SEEKER' is scheduled to be available late summer 1986. For more information write to: AF Systems, P.O. Box 9145 Dept. MT, Waukegan, Illinois 60079.

HISTORY

The first developmental system stored information about ten international broadcasters and continuously displayed those which were currently scheduled on a video monitor. That system was a handy tool with much room for improvement.

Two later trends led to the design of a more sophisticated communications receiver control system: Communication receivers became sophisticated (not necessarily better!) in their use of microprocessors, and powerful home computers like the Commodore 64 became available at reasonable prices.

The ICOM IC-R71A was selected because of its ability to be interfaced easily with a computer; additionally, it is equipped with some useful features such as the internal memories.

WHAT IS 'SEEKER'?

'SEEKER' is a computer-aided communications monitoring system with two major components: a logging system which allows you to build and edit your database of communications information; and a hardware and software system which controls an ICOM IC-R71A communications receiver.

WHAT EQUIPMENT IS REQUIRED?

The 'SEEKER' computer aided communications monitoring system requires the following equipment:

1. A Commodore 64 computer, model 1541 disk drive and a video monitor (or TV)
2. An ICOM R-71A communications receiver
3. The ICOM EX-309 interface adapter
4. The 'SEEKER' Computer Aided Communications Monitoring System, which includes:
 - a. The 'SEEKER' hardware interface which attaches to the Commodore 64 computer

Allan Franklin, designer of AF System's 'SEEKER' Computer Aided Communications Monitoring System, is a shortwave listener by hobby and a business computer systems consultant by profession. He feels that people who have little or no computer background will find 'SEEKER' a worthwhile and easy to use system for any listener with an ICOM R71A receiver and a Commodore 64 home computer.



Figure 1 - 'Seeker's' Main Menu

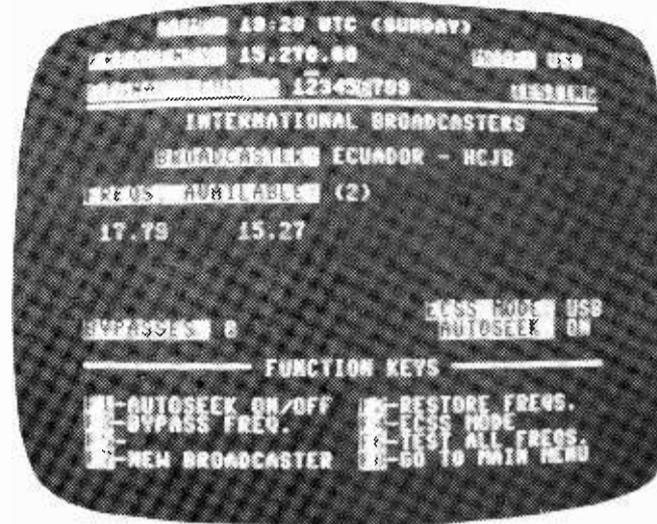


Figure 2 - International Broadcaster Selection Menu

- b. The 'SEEKER' control program software disks
- c. The 'SEEKER-LOG' Communications File Editor

'SEEKER-LOG'

Unlimited amounts of information about frequencies you want to monitor may be stored, including frequency, receiver mode, and a description in diskette files grouped by international broadcaster schedules, aeronautical, RTTY and special frequencies which can include whatever types and groupings of information you want. The program internally contains over 100 additional marine channels and four WWV frequencies.

'SEEKER-LOG' lets you quickly and easily store information from your logs, communications publications (like *Monitoring Times!*) or any of the frequency lists available. Once stored on diskettes you have immediate access.

You can have multiple sets of files based on season of the year, propagation conditions, different groups of countries, or anyway you choose.

HARDWARE AND SOFTWARE

Comparing 'SEEKER' to a 'scanner' would be like comparing a typewriter to a word processing system. Depending upon the mode you select, 'SEEKER' tunes your receiver using the database information, displaying the description you entered on the status screen.

The top portion of the screen (figure 1) displays UTC time and day of week, frequency (to 10 Hz), mode, and the relative signal level as indicated by the reverse video number.

If no communication activity is found, the next frequency in the

database will be sampled automatically. Hundreds of frequencies and descriptions are available at a time.

'AUTOSEEK'

This function measures the relative signal strength regardless of squelch setting and either pauses or continues to the next channel. The signal level at which 'AUTOSEEK' pauses is user-adjustable and is visually displayed on screen (see figure 3) as a bar above the signal level display. 'AUTOSEEK' is easily turned on and off by pressing a function key.

HOW DOES 'SEEKER' WORK?

Over the years I have collected a lot of frequencies I would like to check out regularly. Listeners know the tremendous amount of time required to monitor even a small group of frequencies. SWL's know the problems of keeping up with schedules, especially when they don't arrive until several months after they have gone into effect.

Please turn to p.56

RELEASED TO THE PUBLIC FOR THE VERY FIRST TIME!



Top Secret

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First Edition

Edited by Cathye J. Crozier

This Directory contains the codes, terms and slang words used by most federal agencies involved in surveillance work.

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We welcome short but useful contributions giving listening hints, tips on equipment use, hard-to-find sources, etc.; Let others profit by your hard-won experience!

Direct Channel Access on the R7000

Owners of the new ICOM R7000 VHF/UHF receiver are probably perplexed by the method described in the instruction manual as to selecting a memory channel directly from the keyboard without having to step sequentially through all the memory channels using the rotary switch.

The method is extremely simple: Press the digit(s) on the keyboard for the channel desired and **PRESS** the channel selector knob! That's right; you don't turn the knob, you *press* it!

Regency Keypad Membrane Cover

Many customers complain about how the membrane keypad beings to look on their MX5000, 5500 and 7000 after a few hours of use. It begins to bubble, wrinkle and generally look tacky.

There's a very good reason--one that isn't covered in the Regency manual and one that makes us feel foolish when we learn the facts; If you simply peel off the offensive layer, you will remove only a protective film installed at the factory revealing the true keypad beneath!

PRO-30 POINTERS

by Ken Garber
Windsor, Ontario, CAN

I would like to comment on Chester West's letter in the March MT regarding the Radio Shack PRO-30 and battery use.

It appears that there may be a power consumption problem. I've had my PRO-30 for 18 months and have had no problems with it (except for a recent cabinet repair due to the gravitational pull of the earth!)

The nicad batteries presently in the radio are Radio Shack's and have been in the radio since day one. I have not timed the battery life but I can safely say that it far exceeds Mr. West's one-hour operation. As a matter of practice, knowing that nicads can 'die' suddenly, I always try to use the car adapter when mobile.

After a long portable session the radio is plugged into the AC charger when I return home.

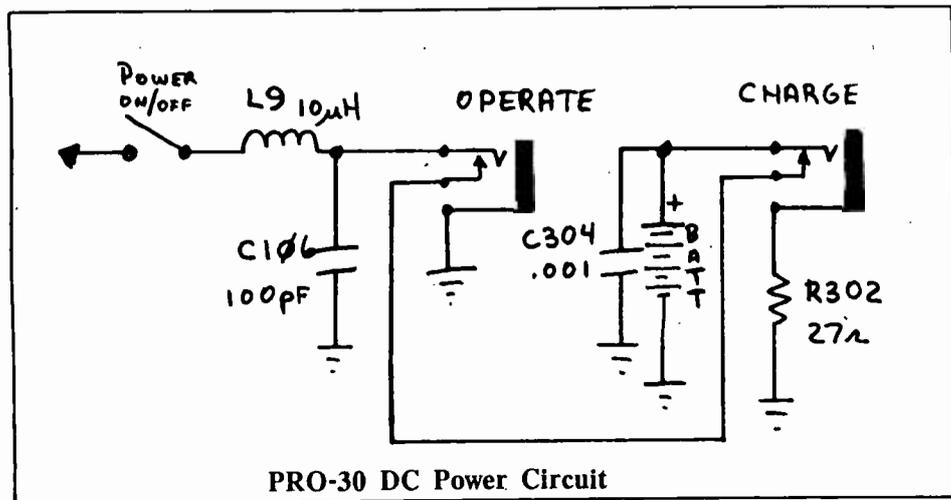
I found that you couldn't monitor something and charge the battery at the same time, but since

the radio has two DC connectors (one to operate; the other to charge), I decided to investigate the possibility of simultaneous operate/charge. The local Radio Shack service centre said it could not be done.

Upon examining the schematic (drawing below), I came to the conclusion that you can operate and charge at the same time by using two AC adapters. I hope that this answers Mr. West's battery concern.

What I don't like about the radio is its lack of audio output. In a noisy car with the volume at maximum, the radio is very difficult to hear and I will sometimes hold the radio to my ear.

As a temporary solution I purchased a cheap pair of "walkman-type" headphones, yanked off one earpiece (for safety and as a backup part), and changed the connector to the standard 2.5mm size. My eventual plan is to piggyback the radio on a RS 12-1869 power booster for better audio penetration.



COMPUTER R.F.I.: Nixing the Noise!

by Allan Franklin

All computers generate electronic "noise" (R.F.I.--Radio Frequency Interference) which disturbs sensitive communications receivers. The solution to the problem is two-fold: Maximize the signals you want to monitor and minimize the signals which cause interference.

Good Antenna and Lead-in...

In order to maximize signals, a good antenna, optimally designed for the frequencies you wish to monitor, is a must. The antenna should be located reasonably high and away from sources of interference such as power lines, house wiring, and television antennas.

Next we need to get the signal to the radio. I use a low-loss, foil-shield coaxial cable similar to the Grove RG-6/U series. This cable has worked much better for me than the typical copper braided shielded coaxial cable.

...and a Good Electrical Ground

Since the earliest days of radio we have been told that for the best reception your equipment must be properly grounded. This is just as true today. A good ground will not only make your equipment safer but will help control noise.

Ideally, two eight-foot pipes separated by at least 10 feet, driven into wet soil, and interconnected by heavy wire, works best. But do the best you can.

Clean Electrical Power

First a warning. Surge/spike suppressors and EMI/RFI filters are a popular item right now. Some of the advertisements exaggerate the usefulness of the devices and may lead the unwary to believe that a simple spike suppressor is a noise filter. We all look for "quick fixes" and the filtered power strips are attractive for this reason.

The power used to run your equipment can be the source of two problems. First, power surges and transient spikes from lightning or heavy appliances turning on and off can cause limited noise, but most important, can damage today's highly sophisticated receivers and computers.

One way to minimize the chance of damage is to use one of the power line surge/spike protectors currently available. These may be multiple outlet strips or a single device which

installs on the end of a power cord. These devices will reduce the likelihood of damage to your equipment but are not designed to control the majority of noise which travels along the power lines.

To control conducted line noise you can install an EMI/RFI filtered outlet strip. While these are generally more expensive than the simpler surge/spike suppressor units, they often contain the surge/spike suppression devices as well. If you decide to buy the more expensive power strip unit, I would recommend looking at the schematic to be sure both spike suppression and EMI/RFI filtering components are in the circuit.

Better Safe than Sorry

It won't do your receiver any good to have the power input protected if the unit is still connected to an outdoor antenna just waiting for a nearby lightning strike! Whenever I am away from my equipment and it is not being used for unattended monitoring, I disconnect any external antennas and completely unplug the radio and other delicate equipment from the AC power outlets.

Proper Cable Routing

Another good way of keeping your receiver as free of noise as possible is to keep the source of the noise away from the receiver and the receiver's cables. Just as the antenna lead-in can act as a receiving antenna, so any cables attached to your computer act as transmitting antennas.

Route the receiver lead-in away from all other cables. Keep the computer power supply, disk drives, printers, other devices, and their cables away from the receiver and the antenna lead-in. Make sure all interconnect cables are shielded. Unplug and turn off any computer peripherals not needed while monitoring.

Experiment

If you identify noise as coming from the computer, try moving cables, reconnecting ground wires, and using different power outlets to minimize the noise. If you have a power filtering unit, connect the receiver to the normal AC outlet and all of the computer equipment to the power filter unit.

In general, you will be more successful in reducing noise if you can put the filtering unit at the source of the noise, not at the receiving device.

420-440 MHz on the HX1200

Unlike their predecessor (the HX1000) the Regency HX1200 and HX1500 do not have continuous 406-512 MHz UHF coverage; both skip the 420-440 MHz amateur portion. Since hams use mostly single sideband mode there anyway, chances are that even with that coverage you wouldn't hear anything.

But borrowing a trick called image reception, that range can be heard simply by adding 42.8 MHz to the desired frequency and entering that higher frequency.

For example, suppose you wish to hear 421.1 MHz; add 42.8 MHz to this desired frequency and you will have 463.9 which you would enter into the scanner. You would then hear 421.1 whenever it becomes active. Naturally, you would also hear transmissions occurring on 463.9 MHz as well.

This anomaly of all superheterodyne circuits allows additional frequencies to be heard, depending upon the intermediate frequency (IF) of the radio.

This is the same characteristic which provides the aggravating interference of aircraft signals commonly heard on the 155 MHz police band. But in the instance given above, we desire to hear the "interference."

We would like to thank MT reader James Marquard for sharing this tip with fellow hobbyists.

Japanese Monument to Edison

by D.K. deNeuf, WA1SPM

In Yawata, Japan, between Kyoto and Osaka there is a monument which was erected in 1934 to Thomas A. Edison bearing his likeness, near a large bamboo grove. It commemorates Edison's death in 1931. The reason for its erection in this location dates back to 1880.

In this period Edison, working on his incandescent lamp, having tried carbonized paper, cotton thread and numerous other materials tested a strip of carbonized bamboo as a filament (It was torn from the binding of a palm-leaf fan).

The bamboo when carbonized proved superior to anything he had previously used to find a material for a filament which would glow sufficiently without being consumed in a short period of time. He tested samples of bamboo from all over the world. He found the bamboo from the grove at Yawata was by far the most efficient.

For the next ten years millions of Edison lamps used bamboo from the Yawata grove, brought in by the bale from Japan. Eventually, of course, Edison developed better

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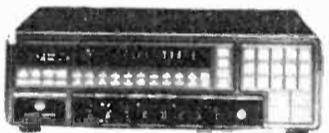
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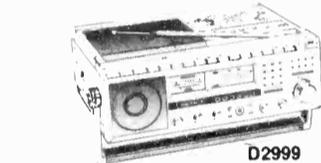
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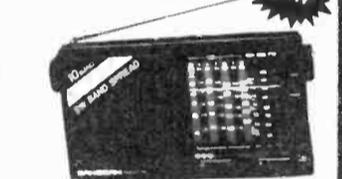


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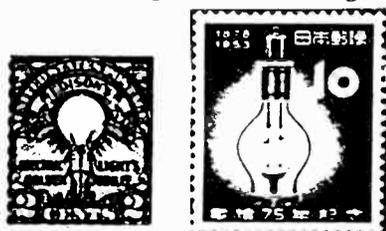
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filament material, but bamboo was used as late as 1898 for certain types of lamps and it was with this material that the incandescent lamp won public acceptance.

The postal authorities of both the United States (in 1929) and Japan (in 1953) issued stamps commemorating the electric light.



False Distress Calls Net Prison Term

Using state-of-the-art radio direction finding (RDF) gear, FCC officials located the perpetrator of more than 15 phony "mayday" distress calls on VHF-FM marine channel 16.

The U.S. Coast Guard search and rescue facility at Gloucester City, New Jersey, reported the fake calls after they began to recognize the voice, which forced the Coast Guard to respond repeatedly to fictitious boat accident scenes, resulting in

wasted manpower, unnecessary costs and taking the efforts away from legitimate rescue work.

The FBI, with assistance from the FCC, drove to the residence of Bruce Humenik of Maple Shade, New Jersey, who was subsequently ordered confined in federal prison awaiting psychiatric examination and now awaits further sentencing which could result in five years imprisonment and a \$250,000 fine.

Signal Propagation and the Ionosphere

...How those short wave signals travel around the globe

PART II (Conclusion)

by Bert Huneault

Frequency is Critical!

The most important element affecting ionospheric propagation is the frequency of the radio waves; if the frequency is too low, excessive absorption by the D layer weakens the signal to such an extent that returning energy gets lost in atmospheric and receiver noise. On the other hand, if the frequency is too high, the radio waves penetrate right through the ionosphere rather than bending back to earth.

Somewhere between these two extremes is the "Maximum Usable Frequency" (MUF); i.e., the highest signal frequency that can be returned to earth. The MUF depends on the time of day, time of year, solar activity, geographic latitude, and the angle of arrival of the radio waves at the ionosphere.

To ensure best quality and lowest noise, HF communications should take advantage of the frequencies just below the MUF (see figure 3).

For simplicity, the E layer and one of the F layers are omitted from figure 3 and an MUF of around 17 or 18 MHz is assumed. In this example, your receiver is tuned to shortwave station WWV (Fort Collins, Colorado), which broadcasts time signals continuously on 2.5, 5, 10, 15 and 20 MHz.

In this daytime scenario, the lower frequency 2.5 and 5 MHz radio signals are absorbed by the D layer; therefore, you cannot hear WWV on those frequencies at your distant QTH. However, 10, 15 and 20 MHz signals penetrate the D layer, suffering little absorption due to their higher frequencies.

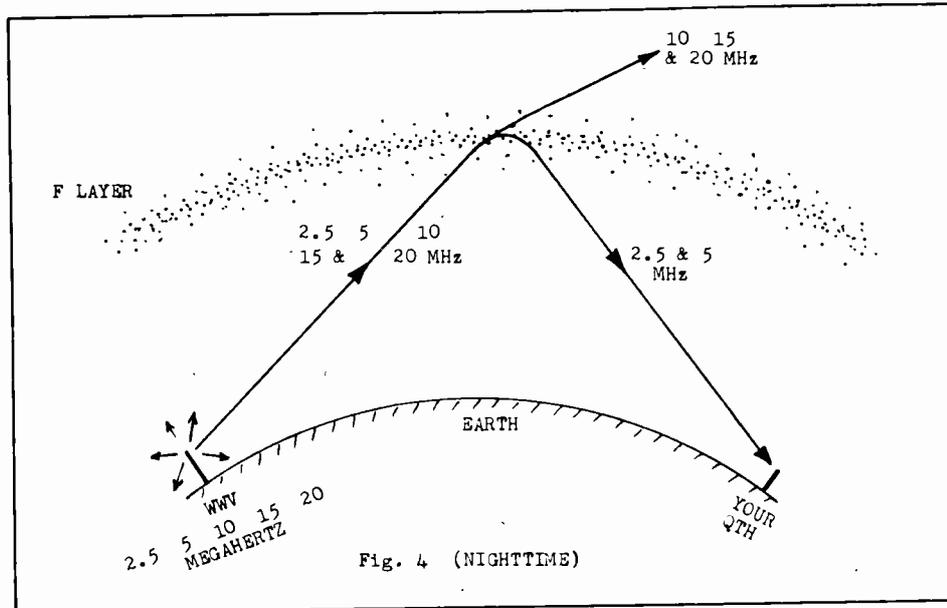
At the F layer, the 10 and 15 MHz

radio waves are bent sufficiently to return to earth, enabling you to enjoy solid reception of WWV on these two frequencies. But when you tune your receiver to 20 MHz, there is no trace of WWV--the 20 MHz waves are "too stiff"; that is, they do not bend sufficiently to return to earth. The higher the frequency, the higher the energy and the greater the ability to pierce the ionosphere.

Nighttime Scenario

Figure 4 shows that the situation is very different in the middle of the night. Note that the D layer has disappeared, allowing all WWV frequencies to reach the F layer; however, during the hours of darkness, ion/electron recombinations have drastically reduced the density of ionization of the F layer, causing a substantial lowering of the MUF.

In this figure 4 scenario, the MUF is assumed to be somewhere between 5 and 10 MHz at that hour of the night, so that WWV's 2.5 and 5 MHz signals are the only ones which can be received at your location.



waves make with the ionosphere. The steeper the angle, the more readily the waves can pass through the ionosphere; the shallower the angle, the more likely the reflection. Figure 3 illustrates the concept.

The skywaves emitted from transmitter T vertically strike the ionosphere at a 90° angle at A. The ionosphere is unable to return the 10 MHz waves back to earth when they strike at such a steep angle. As a result, the radio waves penetrate the ionosphere and continue on into space.

In order to receive the 10 MHz transmission at location R1, the sky waves would have to be bent quite sharply by the ionosphere at B. But because angle B is too steep, the waves do not bend sufficiently to return to earth; thus, they too escape into space.

Receiver R1 is said to be located in the "zone of silence," beyond the range of ground waves from T and short of the nearest distance where sky waves do return to earth (at point R2). The zone of silence is sometimes called the "skip zone," because the sky waves skip right over the head of any SWL located within that zone.

In figure 5, angle C is called the "critical angle." It is the radiation angle for which the ionosphere just manages to produce sufficient bending to send the sky waves back to earth. For any angle shallower than C--for example, D--the ionosphere easily produces sufficient bending to return signals back to earth.

This phenomenon often surprises listeners--receivers R2 and R3, located perhaps one or two thousand miles away from transmitter T, enjoy good signal reception; while receiver R1, only a few hundred miles from T, cannot pick up the transmission at all!

location. The higher frequencies (10, 15 and 20 MHz) are not bent sufficiently and therefore escape into space.

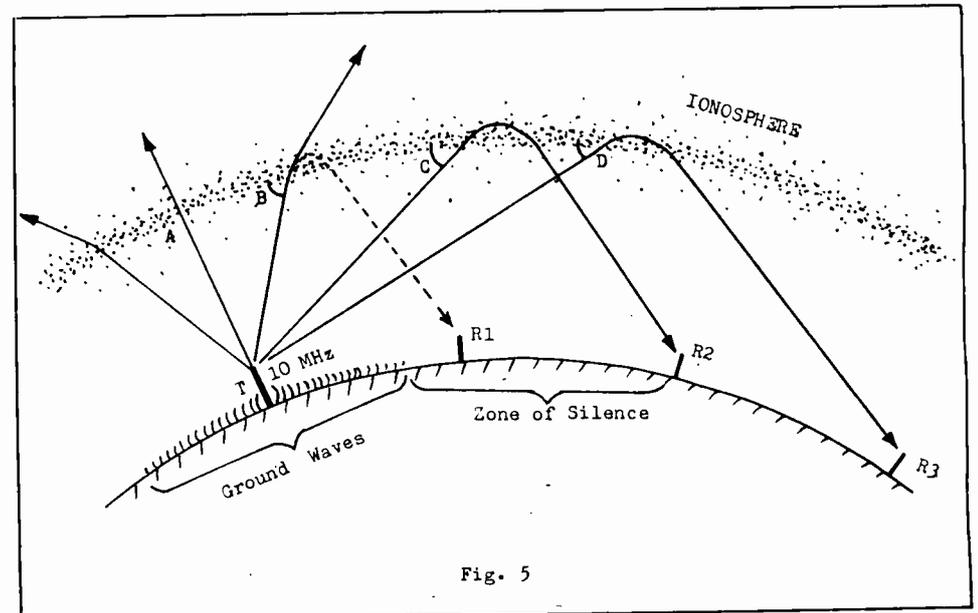
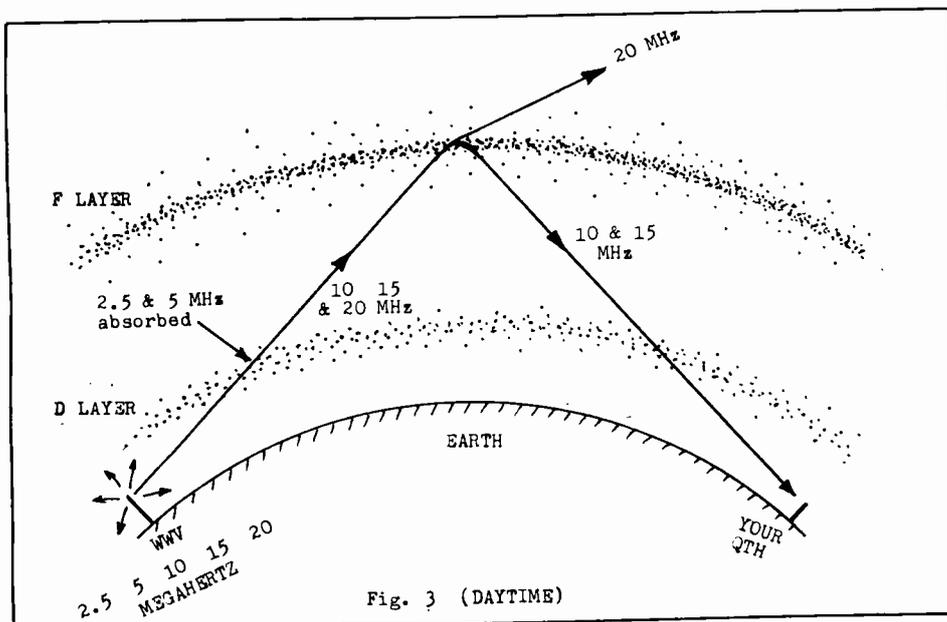
Incidentally, the scenario illustrated in figures 3 and 4 can be used to explain the daytime/nighttime propagation of AM broadcast band signals. During daylight hours, useful reception of these signals occurs only within the range of the stations' ground waves (typically 100 miles or so, depending on frequency and effective radiated power).

Broadcast band frequencies (0.54 to 1.6 MHz) are completely absorbed by the D layer, so that skywaves cannot produce long distance daytime reception. But after sunset, with the D layer out of the way, broadcast band sky waves do reach the F layer and bounce back to earth several hundred or even a few thousand miles away from their source.

Gotta play the Angles!

Another factor of paramount importance is the angle of radiation, or the angle that the incident radio

Just as the MUF depends upon the ionization density of the ionosphere at any given time, so does the critical



angle. Thus, reception at R2 may at times be impossible; at other times, the ionosphere may be so highly ionized that even R1 will receive the 10 MHz transmission.

More Bounce to the Ounce!

So far, we've only illustrated situations wherein the ionosphere produces a single reflection; however, long distance communications often depend on multi-hop propagation as shown in figure 6. The conductivity of the earth's surface and the electrified layers of the ionosphere makes it possible for HF radio waves to skip and bounce their way over oceans and continents, even clear around the world.

Seasonal Variations

The condition of the ionosphere depends not only on the short term daily path of the sun, but also on longer term seasonal variations in the sun's latitude. For example, in June the sun is about 23° north of the equator, and therefore well up in the sky at high noon for SWLs in the northern hemisphere. But in December, when the sun is approximately over latitude 23° south, it is much lower in the sky and the ionospheric density is much lower as well.

For example, your favorite station might come in best around 15 MHz in the summertime, but reception might be better at 11 or even 9 MHz during the winter.

Ol' Sol Does Its Thing!

A periodic change called the "sunspot cycle" exerts a profound influence on shortwave propagation. Averaging about 11 years in duration, the sunspot cycle refers to variations in solar activity--the number of sunspots and solar flares. Sunspots are stormy areas on the sun's surface which produce large amounts of ultraviolet radiation; thus exerting a considerable influence on D, E and F layer ionization.

Solar flares often erupt in the vicinity of large sunspots, and thus occur quite frequently during years of high sunspot numbers. Solar flares are sudden, violent explosions which result in enormous amounts of matter and radiation being ejected from the surface of the sun, including electrons, protons, X-rays, ultraviolet radiation, cosmic rays, and radio noise.

The radiation, traveling at the speed of light, reaches the earth's ionosphere about eight minutes after a flare occurs, whereas the slower charged particles (electrons and protons), traveling at speeds of about 1000 miles per second, reach the ionosphere some 24 hours later.

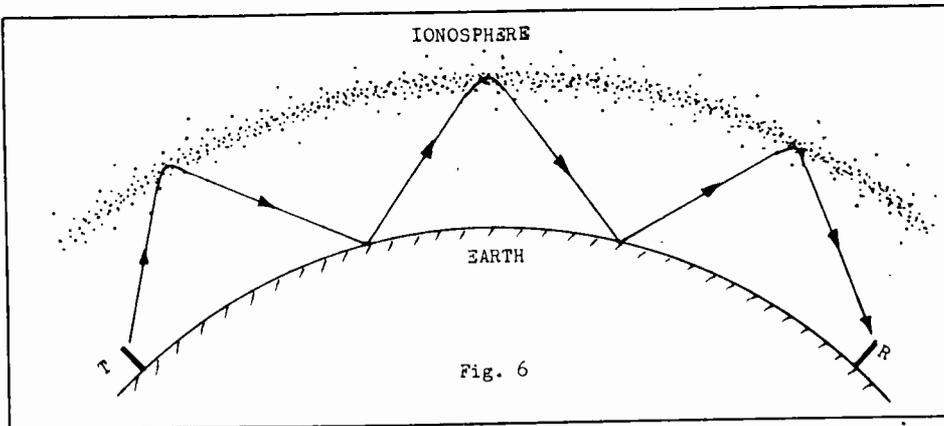


Fig. 6

The intense radiation and charged particles cause a variety of disturbances in the ionosphere, including ionospheric storms, sudden ionospheric disturbances (SID), polar blackouts, and auroras.

Radiation from solar flares can cause increased ionization of the D layer, resulting in increased absorption of HF signals, and even causing sudden radio blackouts on the daylight side of the earth. These SIDs typically last from one-half to two hours.

The charged particles mostly affect the upper regions of the ionosphere, causing the F layer to break-up and virtually disappear or undergo rapid changes in ionization. This results in a lowering of MUFs, rapid and erratic fading, echoes, increases in noise level, and possibly complete HF blackouts on the dark side as well as on the sunlit side of the earth. During years of maximum solar activity, these "northern lights" can sometimes be seen as far south as the southern USA.

These ionospheric storms typically last from one to three days or even longer.

The charged particles emitted by solar flares are generally deflected by the earth's magnetic field toward the polar regions where they bombard the gas atoms and molecules of the ionosphere, creating auroral displays and playing havoc with shortwave communications due to the increase in ionospheric absorption.

The End is in Sight!

Solar activity is currently very low; solar cycle number 21 which started in 1976 and peaked in 1979 is expected to end next year. As we approach the bottom of the cycle, the sun is almost "spotless"; consequently, ionospheric density is at a low point and MUFs are way down.

No wonder that the 10 meter (29 MHz) ham band and the 11 meter (27 MHz) CB band are virtually dead these days, as those frequencies are above the MUF for most radiation angles. But because periods of high sunspot activity generally produce MUFs about twice as high as during quiet sun periods, we can look forward to renewed activity at the higher end of the HF spectrum within the next few years, with the peak in solar cycle number 22 expected around 1990.

WWV Propagation Bulletins

Besides the sunspot count, another measure of solar activity is the 10-centimeter microwave flux which has been monitored daily since 1947 by the National Research Council of Canada in Ottawa. This 2695 MHz solar flux correlates closely with the sunspot number.

Solar flux values are broadcast hourly (at H+18) by station WWV, and constitute a readily accessible indication of solar activity. During solar cycle minima, solar flux values of around 70 are observed, while values well in excess of 200 occur during years of maximum solar activity.

Fading

As all SWLs know, a certain amount of fading usually occurs on shortwave signals; that comes with the territory!

Fading may be rapid or slow, severe or hardly noticeable.

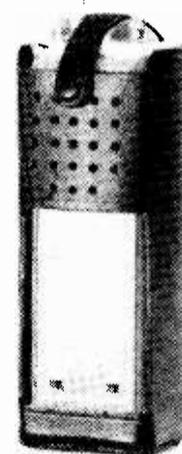
Slow fading is normally caused by variations in D layer absorption and by random motions of the ionosphere. Rapid fading is caused by irregularities in the ionosphere and during periods of ionospheric storms.

Fading can also be the result of multi-path propagation via different layers of the ionosphere, causing signals to arrive at the receiving antenna in phase, then out of phase. This is often heard with AM broadcast band signals at night when ground wave and sky waves compete for the receiver's attention!

Strange Things Are Happening: Sporadic E

While all of the above concepts are quite well understood by scientists, and propagation predictions can be surprisingly reliable at times, there remains an interesting mystery surrounding the ionosphere: clouds or patches of abnormally high ionization frequently form in the general vicinity of the E layer. This intense ionization is capable of reflecting back to earth not only HF signals with frequencies well in excess of the MUFs normally

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associated with the E and F layers, but even VHF radio waves!

Sporadic, random and short-lived as well as small in size, these patches are known as "sporadic-E" ionization. These ionized clouds drift rapidly with the strong winds which prevail in the ionosphere. As a result, skip zones change quickly and signals can fade out rapidly and return strongly within a matter of a few minutes.

The writer recalls witnessing sporadic-E DX one summer, several years ago, when channel-2 signals from KPRC-TV, Houston, Texas, came booming in with such strength that they wiped out the local channel-2 picture from Detroit at about 9 p.m. one evening.

TV DX due to sporadic-E ionizations is particularly common in June and July, and is usually the cause of "venetian blind" interference commonly seen on VHF channels 2, 3 and 4 at that time of year.

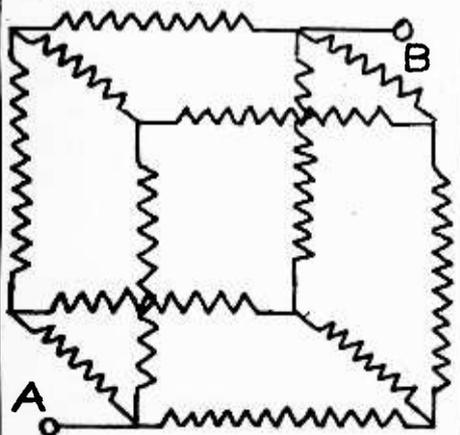
What causes sporadic-E?... That's a good question! Because it can occur at any time, day or night, summer or winter, its actual cause appears to be complex and remains a mystery. Although scientists and ham radio operators have been investigating the phenomenon for a long time and have come up with a number of theories, none of them is conclusive. So, for the time being, the best we can do is conclude with this little bit of doggerel:

If you mess around with VHF,
summer or spring,
Beware of the E layer where
strange things are happening.
But if HF is where you do your thing,

Here's wishing you the very best
in DXing! Δ

So You Think You're Smart?!

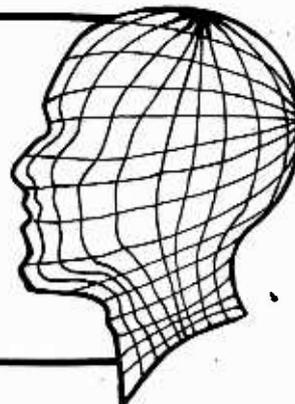
You may know Ohm's law, but what is the total resistance between points A and B on this cube of one-ohm resistors? If you really can't figure it out, either build one and measure it or, better yet, check the answer on page 37.



We'd like to thank Joe Strolin for submitting this teaser for our technically titillated readers.

Station Profile

RADIO PRAGUE CZECHOSLOVAKIA



For almost a year, engineers in the Kbely district in Czechoslovakia's capital city of Prague had worked feverishly to convert a 1 kW telegraphy transmitter to broadcast use. There were the usual troubles and back in those days, if you needed a part, you didn't just drive out to the local Radio Shack. You made it yourself. But after months of hard work and preliminary testing, the moment had finally arrived. On May 18, 1923, radio broadcasting in Czechoslovakia was born with a short transmission.

The results were somewhat modest. But then, so were the resources. After all, the transmitter wasn't really designed for broadcast, there was no studio and the entire facility was housed in a tent. Nonetheless, encouraged by their success, the Czech engineers got back to work. Two years later they were back, this time with a transmitter with the then-unheard of power of 5,000 watts. By signing on that transmitter in 1925, Czechoslovakia leapt to the forefront of broadcasting in Europe. But for all their advances, Czech authorities delayed the decision to go into shortwave.

Cautiously, the communications authorities in pre-war Czechoslovakia decided to buy a single shortwave transmitter. This time they would not waste time with experimentation. In 1934, a purchase order was drawn up and a brand new 30 kW affair was brought in from the United States.

It was agreed that this new transmitter -- itself a marvel of sorts in that it could tune across the bands from 100 to 13 meters -- would be housed at the Podebrady telegraphy center. It took a year for the necessary antennas and --this time no tents -- building to house the transmitter to be completed and yet another year before the broadcast actually began. But in 1936, Czechoslovakia finally entered the international broadcasting arena.

The transmitter for the shortwave station was plate modulated. Four tubes of the final stage were connected into a push-pull sort of arrangement. To handle the finished product, an array of antennas were used, mostly omni-directional with the exception of one: a directional unit designed to reach North America.

Today, shortwave broadcasting is still headquartered at spa town of Podebrady (actually about 30 miles east of Prague). But a lot has changed there. New transmitters were built and antenna systems erected. And a new center, used exclusively for shortwave, was constructed in Slovakia near Velke Kostolany (about 35 miles north-east of Bratislava, the capital of Slovakia).

Today, Czechoslovakia doesn't import its transmitters from abroad. They're built right in the capital by Telsa. And they're up there with the big boys, pumping out 100,000 watts on a number of frequencies simultaneously.

CZECHOSLOVAK RADIO PROGRAM SCHEDULE

- Mondays:**
 - Introducing Czechoslovakia
 - Sports Round-up
 - The WFTU (World Federation of Trade Unions) Calling
 - Programme Review
- Tuesdays:**
 - History and Today
 - Youth Magazine
 - Folk Music/Science and Technology
- Wednesday:**
 - Economics/Culture
 - Health and Medicine
 - 40 Years On
- Thursday:**
 - Peace Tribune
 - The WFTU Calling
 - DX Chat
- Friday:**
 - Culture/Economics
 - Mailbag
- Saturday:**
 - The USA in the Czech Press
 - Commentary of the Week
 - Stamp Corner/Here and There
 - Join George (plus a quiz)
- Sunday:**
 - Sunday Magazine including:
 - Prague Mosaic
 - Tourist Guide Book
 - Question and Answer Session
 - Meeting the People
 - Concert

Target: North America

0100-0157 UTC: 5930, 7345, 9540, 9630, 9740, 11990
0300-0357 UTC: 5930, 7345, 9540, 9630, 9740, 11990

Target: Europe

0530-0545 UTC: 6055, 9505, 11990
1630-1657 UTC: 5930, 7345
1900-1927 UTC: 5930, 7345
2000-2027 UTC: 5930, 7345
2130-2200 UTC: 6055

Target: Africa and Asia

1530-1625 UTC: 6055, 7345, 9605, 11990, 15110, 15205, 17705, 21505
1730-1825 UTC: 5930, 7345, 9605, 11990, 15110, 15205, 17705

Target: South and East Asia, Pacific

0730-0800 UTC: 11855, 17840, 21705
0830-0900 UTC: 11855, 17840, 21705

Transmitting tube cathodes are heated by the direct current. Heat dissipated by the tubes is disposed of by circulating water. High frequency energy of the carrier is amplitude modulated and the modulation level is maintained at 100%. Low frequency characteristics of the Tesla transmitters is practically straight on the spectrum from 30 to 10,000 c/s per second with a maximum deviation of 2 decibels. The signal to noise ratio ranges from 60 to 70 decibels. The oscillator stages of the transmitters are mostly crystal controlled.

direction antennas in use for transmission to nearby areas, but for intercontinental transmissions, direction rhombics are used.

Czechoslovakia can be heard on shortwave on a number of easily heard frequencies. But if you're the type who likes a real challenge, try for them on long and mediumwave.

There's a one million, five hundred thousand watt unit -- absolutely dwarfing the country's famed 5,000 watt unit of 1923 -- operating on 272 kHz out of Topolna on longwave. On

AM, there's another unit with the same monster power on 639 kHz and a 600,000 watt transmitter on 1521 kHz out of Cizatic.

Undoubtedly, most people in North America -- despite the odd chance of tuning in Czechoslovakia on long and medium wave -- will turn to their shortwave radio for a look at this landlocked Socialist nation.

And tuning in Czechoslovakia over the years has produced some exciting listening. The country was occupied by the Germans in 1939, went

Communist in '48 and was invaded by the Soviets when Dubecek tried his hand at "Socialism with a human face" back in 1968. At that time, listeners could actually hear live coverage of the invasion from Radio Prague commentators watching the events below from the window of their studios.

Today, things are calm and prosperous in Czechoslovakia and if you tune them in, you'll hear the listed programs, including a DX show on Thursday nights hosted by Peter Skala. △

There are still some of the old omni-



To whet your appetite...

Look What MT's Dishing up for September!

TAHITI...The mere mention of the place takes most people on a long, imaginary trip away from the day-to-day routine of life. But Radio Earth's Dave Rosenthal actually visited this island paradise and reports on the island, the station, and DXing in the South Pacific.

The 1986 ANARC CONVENTION in Montreal was among the best-attended shortwave events in history. But even if you couldn't make it there yourself, you'll be able to see it all in *MT's* special ANARCON '86 Scrapbook.

And you'll be able to meet RADIO CANADA INTERNATIONAL'S BOB CADMAN. When Cadman first tried to get into radio, he didn't have much luck -- despite some fifty applications. But the Korean War left Canadian stations with lots of vacancies and Bob got his break, doing radio in a number of small places -- one so small that the program director and his dog lived in the station's studios.

MONITORING THE U.S. NAVY -- *Rasberry Mirimar this is November Five Lime* -- the U.S. Navy is the world's largest user of the radio spectrum. Learn more about the vessels, frequencies and how to QSL the warships in this comprehensive article by veteran military DX'er Mike Chabak.

DX'ing THE ARCTIC. It may be hot here, but it's still cold in the Arctic. Fortunately, the weather has broken enough for the big ships to get through the ice, and *MT's* Jim Hay takes us on a radio tour of the maritime shortwave frequencies.

The new general coverage VHF/UHF receiver, the ICOM R7000, has taken the world by storm. Jim Dantin points out a few improvements that can make this fine receiver even better.



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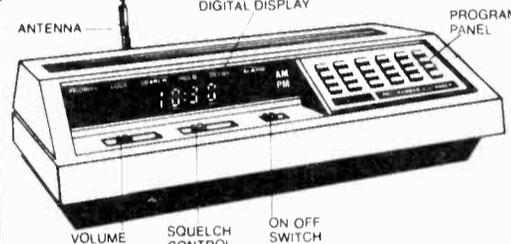


Bearcat® 300

Special \$239.99 (7.00 shipping)

50 Channels — Mobile/Base

Features include simple raised button keyboard programming of the following frequency ranges: 32-50 MHz, 118-136 MHz, 144-174 MHz, 421-512 MHz. Vacuum fluorescent display, dim control, priority, count transmissions, non-volatile memory retains memory without power back-up, automatic search, scan speed control, automatic search, scan delay, lockout, service search, automatic squelch, crystal-less, digital clock, external speaker & tape jack, auxiliary equipment control, plus much more. Built inside the rugged metal cabinet. Includes AC & DC cords, telescopic antenna, mobile mounting kit, and one year factory warranty on the Bearcat 300 for only \$239.99 and \$7.00 shipping. (Optional extended warranty: 3 years \$35, or 2 years \$25.)



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 \$35, gives you a total of 4 yrs complete warranty or 2 yr extended warranty only \$25, gives you a total of 3 yrs complete warranty.)

REGENCY HX1200

Digital programmable 45 channel hand-held Scanner. Frequency coverage 30-50MHz, 118-136MHz, 144-174MHz, 406-420MHz, 440-512MHz. Covers public service bands plus Aircraft. Has priority, search, lockout, scan plus much more. Package includes HX1200, AC charger, adapter, ni-cad battery, carry case, rubber antenna and 90 day factory warranty.

\$216.99 (6.50 shipping) (3 year extended warranty only \$35.00, 2 year \$25.00)

Regency® HX2000

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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 HX-2000 package includes Ni-Cad rechargeable batteries, wall charger adapter, protective carry case, and rubber antenna. All for the low price of only \$159.99 plus \$7.00 shipping each. (Optional extended warranty: 3 years \$35, or 2 years \$25.)

Bearcat® 100 XL

\$199.99 (6.50 shipping) Handheld digital programmable, no crystal portable scanner. 16 channels, search feature, plus more! Frequency range: 30-50, 118-174, 406-512 MHz. Included in the package is a flexible rubber antenna, earphone, battery charger/AC adapter, 6 AA Ni-Cad rechargeable batteries and a heavy duty carry case. All for the low price of:

\$199.99 (6.50 shipping) (3 year extended warranty only \$35.00, 2 year \$25.00)

REGENCY RH-256®

PROGRAMMABLE TRANSCIVER

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: \$399.99** (7.75 shipping) (2 year extended warranty \$48.00 — 3 year \$68.00)

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(*) Add (\$) per scanner, and \$30.00* 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.

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Making Waves

AM DXing with

Paul Swearingen
P.O. Box 4812
Panorama City, CA 91412

Broadcast band DXing is entering a crisis stage. The traditional "clear channels" are being filled up by local stations; QRM (man-made noise) has been a recurring problem for years; more stations are broadcasting satellite feeds and IDing once per hour and many Canadian stations don't ID at all.

Further, understaffed stations refuse to return verification requests; DX clubs are losing members; the hierarchy of the two leading BCB clubs in the U.S., the National Radio Club and the International Radio Club of America, are under fire, with IRCA president Richard Wood resigning after a clash with his editors and board members. Other clubs are having problems in getting members to contribute to BCB DX columns.

To top it off, DXers can't even agree what to call the hobby... broadcast band DXing, medium wave DXing, standard band DXing, or, in the stormy summer, "that #%^&@ noise!"

Never having been one to avoid problems, I offer these common complaints and suggestions to help you keep up with DXing in the broadcast band, from 500-1800 kHz.

Too Much Noise for DXing

If the problem is atmospheric static (QRN), last month's column treated this. Selective nulling may help and waiting until the thunderstorms die down in the early morning will help you fatten your log book. But if QRM is the culprit, you have two choices: find and fix the problem, or take the portable to a quiet location.

Your local utility company will cooperate in tracking down transmission line noise, and depending upon your relationship with your neighbors, they may cooperate with you in shutting off light dimmers, replacing noisy fluorescent fixtures, and repairing defective components. You may even be doing them a favor by tracking down hazardous situations which could lead to a serious fire in their home!

If you don't have a satisfactory portable, use your car radio. Most OEM (Original Equipment Manufacturer) car radios are quite sensitive, although they may not be as selective as DX-quality portables. Don't overlook your kids' boom box either. Some of them are of better DX quality than the pocket multi-band portables.

I've Heard All the DX I Can Hear

Don't you believe it. Try DXing after midnight Sunday or perhaps

Saturday when many stations leave the air for equipment maintenance. Tune to a regional frequency just before your local sunset or at sunrise EDT and log the stations as they fade in and out. Make a target list of your closest ten unheard stations and dog the frequencies until the pop in.

Listen just above and below the band, from 520-540 and 1600-1650 kHz, and you may hear TIS (Travelers' Information Stations), airport stations, pirates, or foreign stations. Make a list of new stations as they come on the air and listen for them at opportune times.

I Can't Get Many Stations to QSL

As more stations are operating with fewer personnel, this situation is not likely to improve. Nevertheless, if you are creative, you may be able to increase your rate of return by somehow catching the interest of the reader. Try enclosing a cassette tape of your reception, and include on the second side of the tape a recording of a local station which broadcasts the same format as your DX station. Make your request a personal letter rather than a form letter listing just the essentials.

Don't demand a verie; nothing turns off a chief engineer quicker and ruins everyone else's chance of getting a QSL than a nasty letter from a DXer. Improve your reception details, and key them to exact times. And always include return postage. Even though most stations will return it, there are still a few clods who will keep it.

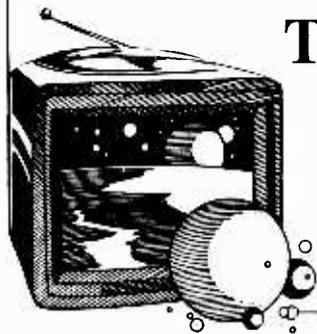
I've Lost Interest in the Hobby

Something has happened to replace your interest -- family demands, less leisure time, a bad experience, simple burnout. If you've been a lone DXer, try doing it with others. And don't overlook your family members as potential DXers. Wouldn't it be nice if you were able to share your hobby with your child or spouse? Visit a local station with your family or other DXers. If all else fails, buy a new DX toy and play with it!

No, the state of broadcast band DXing just isn't the same as it was a generation ago, during the so-called "Golden Years." And yes, it's virtually impossible to hear a 100-watt local station from coast-to-coast now and KFI-640 may not be a regular catch on the east coast. But you can hear AM in stereo now and for thousands of miles and much more.

The top DXers in the country are DXing smart these days. And as a result, they're pulling in the difficult ones all the time. You can, too. Until the next time, 73.

△



THE OUTER LIMITS

by Scott McClellan
P.O. Box 982
Battle Creek, MI 49016



As hinted here last month, ramed pirate *Radio Clandestine* is planning to make waves, literally!

A press release from R.F. Burns claims that "now is the time for *Radio Clandestine* to grow and greater serve the listening audience. A sixty foot ocean-going vessel is being purchased, and this boat will be the permanent home of *Radio Clandestine*."

Ever since the beginning, *Radio Clandestine* has claimed to be "off the North American coast." Perhaps in their own minds, they were! But now they are attempting to make that dream turn into reality. They hope to be on the air with a regular schedule by the summer of 1987.

Are they serious? I believe they are. They are actively seeking equipment and staff members for the offshore station, as well as potential financial backing. They want to be "America's answer to *Radio Caroline* and *Laser 558*." Hopefully, in time, they will be on the air from international waters nearly 24 hours a day, with commercial advertising covering the high costs of operating.

If you'd like a chance to be a part of this, you can apply for a position on the staff. For more information, you can write in care of P.O. Box 982, Battle Creek, Michigan 49016. Send three first class stamps to cover forwarding costs. Only those who believe in this need apply.

Tangerine Radio sends along a copy of their quarterly newsletter, "The Wave." The latest issue is 12 pages in length, and covers everything from the construction of dipole antennas, to album reviews, and much more. To receive the next 4 issues, you can send \$3.00 (cash, or a money order with the "pay to" line left blank) to *Tangerine Radio*, c/o P.O. Box 5074, Hilo, Hawaii 96720. This station might be testing soon at 1500 UTC on 14950 or 14960 kHz, and at 0500 UTC on 7400, 7435, and/or 7475 kHz. In the past, they've used both the SSB and AM modes for their broadcasts.

Attention Commodore 64 Owners: A new adventure game is now available to shortwave listeners with a Commodore 64 and a disk drive. It's called "Junior Pirate Buster." It was developed by the *Voice of Laryngitis*, and is based on their continuing radio drama, *Junior Pirate Busters*. They were kind enough to provide me with a preview copy, and I must say, it's like no other game I've seen! The player becomes Billy, who must search his neighborhood in search of illegal radio transmissions.

But it isn't easy. Billy encounters numerous obstacles in his way. For more information, send two 22 cent stamps.

The April 22 edition of the *Jerusalem Post* contained a very interesting article entitled, "The Voices of Lebanon." It seems that the articles in Beirut are being overrun by pirate and clandestine stations! As of the writing of that article, there were 42 unlicensed stations in operation. Eight of them belong to political leaders and parties, and 27 privately run stations are providing music and entertainment programs, using the slogan, "Escaping from the War." Several others are run by some of the various Lebanese ethnic groups.

The politically run stations (clandestines) operate on the mediumwave band, whereas the entertainment stations (pirates) are found on the FM band. The pirates have commercial advertising to cover their expenses, and are much in the format of the well-known "Voice of Peace," operated by Abie Nathan. These pirates often bear English names and slogans such as: *Voice of the Cedars*, *Voice of the Youth*, *Radio Flash*, *Radio S.O.S.*, *Radio Paradise*, *Radio 2000* and *Radio Beirut* to name a few. Thanks to Rob Horowitz for that clipping.

Juan Palmer in Kansas logged another broadcast of *TNFM* on 7414 kHz from 0811 until 0833 UTC with a fair signal. Static hampered reception. They were taking collect calls from listeners, and playing pop and rock music with a male DJ. The featured artist was the rock group, [Yes. Nice catch, Juan. I guess the early bird may catch the worm, but the late bird catches the pirate!]

Radio Clandestine was logged by Tim Austin in Illinois from 1950 until 2030 UTC on 7360 kHz with a very good signal. He says that R.F. Burns played some good rock music, and presented some very funny comedy routines. The address for QSLs is P.O. Box 982, Battle Creek, Michigan 49016.

A newcomer to the airwaves is *WOW*, logged by James Hiller of New York. He heard what was announced as their first broadcast on April 1st, from 0210 to 0227 UTC, on 7470 kHz. The two announcers played the same song four times in a row! I'd say they need a little work in the creativity department. No address was given.

Always remember that your input is what makes this column tick. I'd like to hear from you and thank you for joining us in visiting the *Outer Limits*. See you again next month.

△



QSL'ing Air Force One:

Not a Simple Task!

Edward Bugliarelli listened to Air Force One, the Presidential aircraft, last fall and hoped the Air Force communications installation at Andrews Air Force Base would confirm his catch. As we see from the following response, it isn't all that easy!

Mr. Edward Bugliarelli
P.O. Box 350
Bronx, New York 10462

Dear Mr. Bugliarelli

I appreciate the pleasure you receive from being a short-wave listener, and understand your request for confirmation. I cannot, however, confirm or deny anything you may have heard on 2 September, 1985.

Sincerely

CAROL A. GRAHAM, TSgt, USAF
NCOIC, Presidential-VIP Station

Offshore Oil Industry to Use Cellular Radiotelephone

No doubt about it--the 800 MHz cellular telephone band is expanding explosively. Competition for licensing is often fiery, with the possibility of lottery awards very real.

In the heat of all this, a new proposal for a novel service to support the communications needs of the offshore petroleum industry is now coming into focus with Petroleum Communications of New Orleans a strong contender.

The present microwave "backbone" networks designed by major oil companies to interconnect offshore platforms with on-land operation centers are extremely expensive to implement and maintain; system costs run from \$3 to \$6 million.

Now, with exploration reaching even further into the Gulf and into remote regions under lease like Ewing Bank, Green Canyon, Garden Banks, and East Breaks, communications are even more difficult to maintain. Clearly, a new technology must be considered.

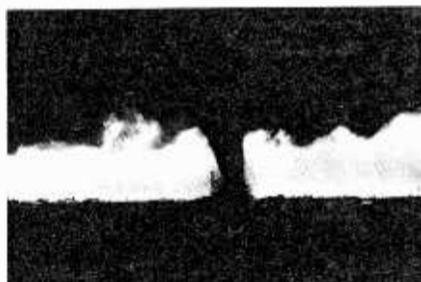
PetroCom has proposed a satellite backbone network interlinking base stations and mobile/portable radiotelephones and data terminals which have 666 channel duplex capabilities.

Utilizing 6/4 GHz transmitter-receiver terminals in a cellular grid, a central controller interfaces with the Public Switch Telephone Network at New Orleans, Lafayette and Houston providing a 60,000 square mile offshore coverage area.

MT would like to thank reader Reed Darsey for sending in the information for this article.

BRING YOU ALL THE ACTION WHEREVER YOU ARE!

When you need to hear the action from wherever you are, Regency delivers. Our portable scanners keep you in touch with the local news. Whether it's bank hold ups, three alarm fires, weather, business, marine radio or aircraft calls, Regency portables bring you the on the scene action. While it's happening from where it's happening.



Check the local weather

MORE CHANNELS PLUS AIRCRAFT

Regency's most popular portable scanner, the HX1000, has just been improved! The new HX1200 has all the same important features of its predecessor; keyboard programmability (no crystals are required), a rugged die cast aluminum chassis, display messages, preprogrammed frequencies, liquid crystal display, sealed rubber keyboard, direct access, and priority control. In addition, the new HX1200 has 45 memory channels, covers seven public service bands plus the aircraft band, and has a permanent EAROM memory circuit that

REGENCY HAND HELD SCANNERS



Model HX 1200

Model HX 2000

never needs batteries. Plus a handy wall charger, carrying case, belt clip, earphone, flexible antenna and rechargeable Nicad battery are included.

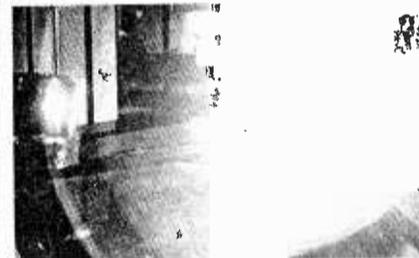
800 MHZ

For those of you who live in an area where public service frequencies use the new 800 MHz band, Regency offers the HX2000. It covers VHF and UHF frequencies plus the 800 MHz and aircraft bands. Like the HX1200, the HX2000 is keyboard programmable, so no crystals are required. Other features include a 20 channel memory, liquid



Hear the action of a three alarm fire

crystal display with programming messages, priority control, and memory battery. Plus, each HX2000 comes complete with a wall charger, belt clip, 2 antennas, and rechargeable Nicad batteries.



Stay informed during emergencies

DECIDE FOR YOURSELF

Your Regency Scanner dealer would be happy to give you a demonstration of these and other new Regency Scanners. Stop in today. Or, write Regency Electronics, 7707 Records St., Indpls., IN 46226.



Tune into aircraft and tower transmissions

Regency Hand Held Scanners...
the choice of professionals

ELECTRONICS, INC.
7707 Records St.
Indianapolis, IN 46226

UTILITY INTRIGUE



Don Schimmel
516 Kingsley Road SW
Vienna, VA 22180

Several flyers received from Aegean Park Press caught my eye. *Cryptograms in Portuguese* contains message texts made up of quotations and sentences from contemporary Portuguese language newspapers from both Portugal and Brazil. This volume makes a nice companion to the *Cryptograms in Spanish* which was commented upon in the May MT. The soft cover version is \$9.80 while the hard cover book is \$17.80.

The other book which looked interesting was *Intelligence and Cryptanalytic Activities of the Japanese during WW II*. The text of this book was highly classified for almost 40 years and is an edited version of a U.S. National Archives document, this latter dated 1945. The soft cover sells for \$24.80 and the library binding volume is \$32.80. The address for ordering is P.O. Box 2837, Laguna Hills, CA 92654.

For shipments outside the U.S. \$2.00 must be added per book for postage/handling, and for shipments inside the U.S., the P/H charge is \$1.00 per book. California residents add 6% sales tax.

I observed the Armed Forces Day activities by commencing my monitoring early in the day. At 171406Z on 7371 kHz the RTTY (50-170) transmission of NAV was copied for a brief period, but it was noted that his tape was bad with the print-out appearing thusly: MTA IS THE TCME XOG ALL GOOB MEM TO VOME TO THE AIB OX T EIG VOUNGS etc. I checked some frequencies of the other services and finally decided upon several for monitoring in the evening when the Secretary of Defense

"Greetings" message was to be transmitted.

That evening I copied some of the transmissions as follows:

CW on 6995.5 KHZ CQ DE AIR
RTTY on 13993 KHZ CQ DE AIR
CW on 7393 KHZ CQ DE
NAM/NMN

(Note: Carrier went off the air shortly after NAM/NMN commenced sending the message)

CW on 4005 KHZ CQ DE
NAM/NMN
RTTY on 4005 KHZ CQ DE
NAM/NMN

I packaged up the logs and mailed them off to the appropriate addressees. Approximately two weeks later I received my certificates. For those of you who are not acquainted with this program, one is printed below.

Some messages like those previously reported in the May 1986 *Utility Intrigue* were again encountered, but this time the traffic was found on 14616 kHz. This RTTY station (50-425) was active on 30 May at 1114Z and sent cipher traffic with the 3L addressee indicators.

After a number of cipher messages had been passed, a plaintext German language message was passed. The station is believed to be that of the GDR Foreign Office; thus, both observed frequencies would appear to be links to GDR embassies.

Another unidentified RTTY station was seen on 4214 kHz on 30 May at 0129Z. This transmission was 50-425 and consisted of continuous RY's. No identification was noted.

MAY 1986 LOGGINGS

KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
3487	160244	USB/NY AIR TERMINAL WITH WX FORECAST FOR EAST COAST CITIES
4063	181149	USB/WCM (PITTSBURGH, PA) WRKNG BARGES WITH TFC RE CREW AND CARGO TONNAGES
4160	300120	RTTY 50-425/DE TUH (ABIDJAN, IVORY COAST) RY'S
4191	300125	CW/NOCS/OPR CHATTER IN SPANISH
4673	170204	AM/SS-YL CLNG 140 & COUNTING 1-0
4722	160048	USB/EE-OM WITH WX, BRITISH ACCENT
4782	170208	CW/5L GRPS/FEMA
4814	170212	RTTY 50-425/CODED WX
5391	300114	USB/TWO YL CONVERSING IN FRENCH
5618	170215	USB/AIR TFC CONTROL TALKING TO UNID PLANE RE POSSIBLE REROUTE AT DIFF ALT
5924	301110	RTTY 75-850/CODED WX
6577	300059	USB/UNID AC FROM YANKEE SIERRA CONTROL/2 OM CONVERSING RE FLIGHT CLEARANCE
6604	300100	USB/GANDER RADIO WITH WX AT CANADIAN LOCATIONS
7365	171302	USB/NMN0JM, NMN0RTA, NMN0MCP WITH TFC CHECKS. PROBABLY MARS NET
7848	181141	CW/5L GRPS, BAD HUM ON CARRIER
13024	151312	CW/DE WL01 (MOBILE, AL) WITH FREQ LIST
13129	142122	USB/SS-OM & SS-YL CONVERSING RE HIS ARRIVAL IN MIAMI
13535	161307	RTTY 50-425/PRESS IN GERMAN
13582	091305	CW/DE EC3Y (SPAIN ALLOC)/CALLTAPE
13372	092008	CW/5F GRPS, AUTOMATIC SENT, ALL NBRS FULL EXCEPT ZERO WHICH CUT AS T
13995	161256	RTTY 50-425/TFC (IN FRENCH) WAS ENTITLED "REVIEW OF ITALIAN PRESS"
14456	302338	USB/TWO OM/SS MAKING ARRANGEMENTS FOR CONTACT ON FOLLOWING DAY
14826	301428	CW/STN IN NIGER WRKNG STN IN LOME, TOGO
16321	301414	RTTY 50-425/PRESS IN ENGLISH FROM ADN, GERMAN DEMOCRATIC REPUBLIC
16346	291941	RTTY 50-425/PRESS IN ENGLISH (TASS)
16756	162115	CW/WX IN SPANISH
18260	151334	RTTY 50-425/PRESS ITEMS IN ENGLISH THEN LATER IN ARABIC. KUNA, KUWAIT NEWS AGENCY
18310	161321	CW/312 312 312 TTT
18696	151346	RTTY 50-425/DAP, WEST GERMAN PRESS AGENCY

Also noted sending continuous RY's was a station on 5879 kHz. The usual trademark of these stations is that they generally do not indicate any identification during the transmission. However, on this particular occasion, "DE 70C" was noted a couple of times. The speed and shift was 50-580.

Unidentified stations utilizing abbreviated calls (2L calls) were up briefly on 12621.5 kHz on 14 May at 2111Z. Station VR called VE and FV and after exchanging QRU's, all of the stations went down.

A RTTY transmission (50-425) of 5L groups was picked up on 9 May at 2109Z. The message was lengthy (I copied about 150 groups) and when it was completed the station shifted to CW, sent a short transmission and the carrier went off the air.

On 30 May, at 2320Z on 13629 kHz, a tone appeared of about 2 secs duration and was immediately followed by a very high speed transmission of approximately 4 seconds duration. The carrier went down and nothing further was heard. These "burst" type transmission are frequently observed when listening to the SW bands.

Two transmissions of varying pitchtones (PICCOLO?) were observed with one taking place on 30 May 1147Z on 18562 kHz, and the other on 30 May at 1623Z on 18148 kHz.

This next signal has been heard several times in the past but I still have not been able to identify the type or the source. The tone sounds

like someone blowing air through a straw in a glass of liquid--that is, "bubbly" sounding. The signal is a wide one covering about 10 kHz. This most recently heard instance was on 18542-18552 kHz on 16 May at 1645Z.

A series of commercial appearing telegrams was logged on 16 May at 2127Z. The frequency was 14556 kHz and the traffic seemed to have been originated in Santiago, Chile, and was destined to Iquique, Chile. All texts were in the Spanish language.

Yet another possible Spanish Naval activity was detected on 12692 kHz on 9 May at 2102Z. The RTTY signal was 75-850 and carried the calls "56UAZ DE 58JDQ" with RY's following at the callsigns. Spanish language plaintext messages were sent.

On 14 May at 2109Z unidentified callsigns were noted on 16775 kHz. IA called DQ and instructed DQ to QSY to 12619. A transmitter was heard tuning on the latter frequency, but I am not certain if it was DQ as IA sent QSG NX VA and nothing further was heard from either station.

A cut number transmission was copied on 30 May at 1137Z. This CW station was on 18735 kHz and sent B6UV 6ET4 64NT over and over. This particular system would appear to be the following one:

1 2 3 4 5 6 7 8 9 0
A U V 4 E 6 B D N T

Department of Defense

CERTIFICATE OF MERIT



ARMED FORCES DAY 1986

This is to certify that

DON SCHIMMEL

has demonstrated unusual proficiency by receiving and transcribing without error the Armed Forces Day message of the Secretary of Defense transmitted via military radio on May 17, 1986. Transcribed from twenty-five words per minute International Morse Code.

Washington, D.C.

Joseph A. ...
Secretary of Defense



KEEPING AMERICA FREE

The transmitter went off the air at 1141Z.

I just finished sorting through a number of catalogs that have arrived over the past several weeks and thought I would share some of my observations with my readers. The *Subject Bibliography on Telecommunications* (SB-296), which is available from the Superintendent of Documents, Washington, DC 20402, shows two titles of possible interest to SWLers.

The first one is *U.S. Frequency Allocations* and is a colored chart showing government and nongovernment radio frequency allocations. The catalog number is S/N 003-000-00469-4 and its cost is \$1.75.

Selected Worldwide Marine Weather Broadcasts is the second title and contains information and schedules of marine weather broadcasts made in the English language. Data on broadcasts in other languages are included only when English broadcasts are not available in the area. The 1985 edition is S/N 003-017-00522-4 and its cost is \$7.50.

Catalog 1986-2 was received from CRB Research. It is chock full of many interesting SW related titles. A copy can be obtained by writing to P.O. Box 56, Commack, New York, 11725.

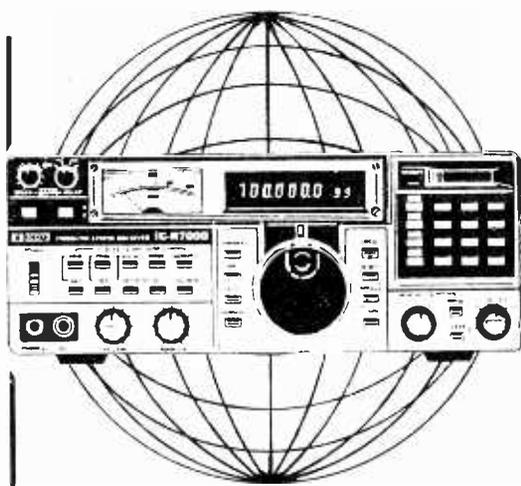
A new publications list can be obtained from Universal Electronics, Inc. They are located at 4555 Groves Road, Suite 13, Columbus, Ohio 43232. The new listing contains updates of quite a few of the publications they have carried over the years. I did note that the list does not include the Klingenufuss cassette tape recording of modulation types, so I am not sure if that item is available from them. If interested in the tape, send a query to Universal.

By the way, the only other taped collection of signals of which I am aware is a cassette called "Sound of Shortwave" by Bob Grove. It is no longer available, so if you would like to see it again, request Grove Enterprises reissue this excellent tape.

And last but not least is the catalog from TAB Books, Inc. The Spring/Summer 1986 edition has oodles of interesting books on a wide variety of subjects including some pertaining to communications, radio, computers, and electronics. Their address is P.O. Box 40, Blue Summit, PA 17214.

Fred Osterman of Universal Shortwave Radio recently furnished me with a couple of copies of *The RTTY Listener* which he prepares every so often and these 6-8 pages newsletters are a goldmine of information. Unfortunately, they are only available to Universal customers who have purchased advanced RTTY equipment.

I would hope that in the future Fred will be able to offer this fine publication on a subscription basis or perhaps he could be encouraged to provide this excellent explanatory material as a monthly RTTY column for *Monitoring Times*. Δ



With all the commotion about cellular telephones and the legislation concerning who can listen to what, let's take a look into what is involved in setting up a cellular system. We will look into the license application of a cellular telephone company.

We need to distinguish between the two types of cellular carriers--the non-wireline company (radio common carrier - "RCC") and the wireline company ("Ma Bell"). Both of these companies have telephone interconnect available to their customers and; if you were to listen to one over the other, you would not be able to tell the difference.

The non-wireline bases operate between 870.030 MHz and 879.990 MHz; the wireline bases operate between 880.020 and 889.980 MHz. The mobiles operate exactly 45 MHz lower in frequency from the base transmitters.

We are going to look at the application of a non-wireline company serving the Los Angeles, California, area. Where better to look at a system than in California?--After all, that's where all the legislation to outlaw scanning these frequencies began!

The non-wireline carrier is Los Angeles Cellular Telephone Company, 1500 Capitol Towers, Jackson,

Current Sites of L.A. Cellular Telephone Co.

1. 1st Interstate Bank, Los Angeles
2. Flint Peak, Glendale
3. Angels Crest, La Canada
4. Holiday Inn, Long Beach
5. Sepulveda Blvd, El Segundo
6. Saddle Peak, Monte Indio
7. Oat Mountain, Horse Flats
8. Houser Peak, Palmdale
9. Loop Canyon, San Fernando
10. Kellog Hill, Pomona
11. South Coast Plaza, Costa Mesa
12. Arcadia Avenue, Fullerton
13. Norconian Drive, Norco
14. Little Mountain Road,
San Bernardino
15. Alessandro Place, Riverside
16. Mount Davis, Beaumont
17. Mission Viejo, Laguna Niguel
18. Hilltop, White Water
19. Indio
20. La Brea, Los Angeles
21. Westwood, Bel Air
22. Dominquez Hills, Compton
23. Signal Peak, Corona Del Mar
24. San Pedro Hill, San Pedro

Worldwide Scanning with Norm Schrein

Fox Marketing, Inc.
4518 Taylorsville Rd.
Dayton, Ohio 45424

Mississippi. The call sign for this system is KNKA 351 and the system is presently licensed for 24 sites in Los Angeles, Orange, Riverside, and San Bernardino Counties.

The grant date of the license was December 17, 1984, date of issue was September 30, 1985, and the expiration date is December 17, 1987. There are currently 60,000 mobile units authorized under the license.

Although the system is currently licensed for 24 cell sites the application shows that eventually the system will have 60 sites (see insert).

Now on to a look at how they are going to make the frequency plan work out: Los Angeles Cellular has prepared a five-year frequency plan for 60 cells (6 omni, 54 sector) using 3,070 voice channels. System capacity will grow to 54,440 subscribers.

The Technique

The goal of the cellular concept is to multiply the number of radio channels (312 pairs) available for use in a metropolitan area by shrinking the size of the cells and re-using the channels at close distances. This process of subdivision is expected to raise the ultimate capacity of the system to well over 100,000 subscribers.



ANSWER TO CUBE TEASER

("So You Think You're Smart")
from page 32

Effective resistance between A and B
is 5/6 ohm.

As the channels are utilized, they may be re-used in the omni-transmit configuration. The D/R ratio (distance between cell centers to the radius of the cell) of 6/1 is required to meet the interference criteria when omni transmit is used. Specific cases can violate this rule if the terrain features favor re-use closer than that.

The frequencies in a cell are assigned sixty-degree sectors according to their subgroup, and all sectors having the same subgroup have the same orientation with respect to their own cell site. This assures maximum frequency re-use, because no two cells using the same frequency subgroup will be directionalized towards each other.

"Channel borrowing" is the term for use of cellular voice channels out of their normal place in the re-use pattern. If an area is served with four cells, the normal maximum for any one cell is 78 channels; however, user distribution may result in a need for 87 channels in one cell and only 40 in the other three. To increase capacity without cell subdivision, seven channels can be "borrowed" from the normal compliment of one of the three cells and installed in the cell requiring 85.

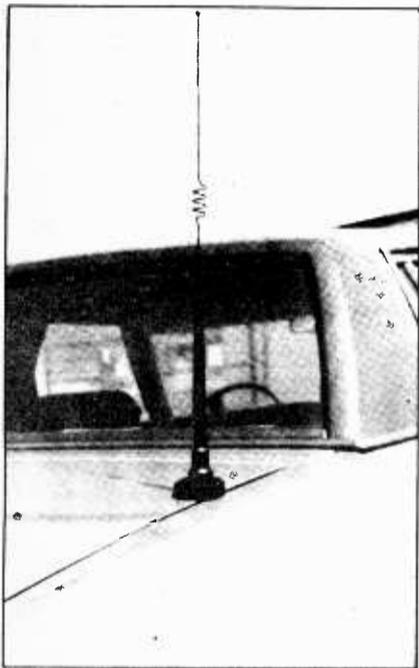
(Worldwide Scanning, cont'd)

This interim measure is used in non-uniform demand distributions to increase capacity. If cell subdivision is eventually required, the "borrowed" channels may be returned.

For longer-term increases in capacity, LAC will add new cell points where the normal channel allocation cannot adequately serve demand.

Typical Cell Frequency Plan

To help get a better idea of how this system is supposed to work, take a look at the illustration of a typical cell as it expands on a five-year plan: cell site number 1 at First Bank.



Above and below: Typical mobile and base cellular antennas.



Los Angeles cellular telephone, call sign KNKA 351, is typical of the non-wireline bandplan. Base transmit conversations may be heard every 30 kilohertz from 875.580-876.090 MHz. Mobile transmissions will be exactly 45 megahertz lower.

Needless to say, the cellular telephone issue is a complicated one, not only on the legal part concerning the monitoring of such stations, but in the sheer work involved in setting up such a system. As can be easily seen in this Los Angeles example of cellular telephone, there is not going to be anywhere in the Los Angeles area, either inside a building or out, that you cannot hear a cellular telephone conversation.

The cellular systems are constantly expanding in the U.S. and Canada shown by the accompanying list of some of the cities that either have a current cellular system on line or at least have one licensed.

I hope this shows some insight into the ever-growing cellular telephone industry. Until next time -- Good monitoring.

CHANNEL ASSIGNMENTS

1st Interstate Bank
Year 1

Signalling Channel: 329 879.870 MHz
Voice Channels:

Chan	Freq								
312	879.360	291	878.730	249	877.470	228	876.840	207	876.210
186	875.580	165	874.950	144	874.320		873.690	123	873.690
102	873.060	81	872.430	60	871.800	39	871.170	18	870.540
308	879.240	287	878.610	266	87.980	245	877.320	224	876.720
203	876.090	182	875.460	161	874.830	140	874.200	119	873.570
98	872.940	77	872.310						

Year 2 - Change to Sectorcd Operation

Signalling Channel: 321 879.630

Voice Channels:

Chan	Freq								
312	879.360	308	879.240	304	879.120	300	879.000	296	878.880
60	871.800	291	878.730	287	878.610	283	878.490	279	878.370
275	878.250	39	871.170	270	878.100	266	877.980	262	877.860
258	877.740	254	877.620	18	870.540	249	877.470	245	877.350
241	877.230	237	877.110	233	876.990	56	871.680	228	876.840
224	876.720	220	876.600	216	876.480	212	876.360	35	871.050

Year 3 - Same as Year 2 with added channels:

Chan	Freq								
207	876.210	203	876.090	199	875.970	195	875.850	191	875.730
14	870.420	186	875.580	182	875.460	178	875.340	174	875.220
170	875.100	52	871.560						

Year 4 - Same as Year 3 with added channels:

Chan	Freq								
165	874.950	161	874.830	157	874.710	153	874.590	149	874.470
31	870.930	144	874.320	140	874.200	136	874.080	132	873.960
128	873.840	10	870.300						

Year 5 - Same as year 4 with added channels:

Chan	Freq								
123	873.690	119	873.570	115	873.450	111	873.330	107	873.210
48	871.440								

CELLULAR LICENSEES

- Chicago SMSA Limited
- Boston CGSA, Inc
- Pittsburgh SMSA Limited
- Buffalo CGSA Communications
- Bell Atlantic Mobile (Philadelphia)
- New York SMSA Limited
- Milwaukee Telephone
- Indianapolis Telephone
- Los Angeles SMSA Limited
- Buffalo Telephone Co.
- GTE Mobilnet of Portland
- Newvector Communications (Seattle)
- Mobilnet of Indianapolis
- Atlanta SMSA Limited
- Saint Louis Cellular
- Newvector Communications (Denver)
- GTE Mobilnet of Houston
- Cincinnati SMSA Limited
- Kansas City SMSA Limited
- New Orleans CGSA, Inc.
- Miami CGSA, Inc.
- Yankee Celltel Company (Boston)
- GET Mobilnet of San Francisco
- Dallas SMSA Limited
- Washington DC SMSA Limited
- Detroit SMSA Limited
- Bell Atlantic Mobile (Baltimore)
- Boston CGSA, Inc.
- Cybertel Cellular Telephone (St. Louis)
- Northern Ohio Cellular (Cleveland)
- Pactel Mobile Access (San Diego)
- Boston CGSA, Inc.
- Syracuse SMSA Limited
- Southern New England Cellular (Hartford)
- Toledo Cellular Telephone Co.
- Southern New England Cellular (New Haven)
- Washington/Baltimore Telephone
- Detroit Cellular Telephone
- New York CGSA, Inc.
- MCI/Collcom (Minneapolis)
- GTE Mobilnet of Cleveland
- Memphis SMSA Limited
- GTE Mobilnet of Hawaii (Honolulu)
- Boston CGSA, Inc
- Nynex Mobile Communications (Springfield)
- Orlando SMSA Limited
- Rogers Radiocall, Inc. (Chicago)
- Wichita SMSA Limited
- Southern New England Cellular (Norwalk)
- United Inter-Mountain (Johnson City, TN)
- Contel Cellular of El Paso
- Newvector Communications (Ogden)
- Harrisburg SMSA Limited
- MCI Cellular Telephone Co. (Pittsburgh)
- Bellsouth Mobility, Inc. (Birmingham)
- Cellular System One (Albany)
- Bellsouth Mobility, Inc. (Boca Raton, FL)
- Interstate Mobilephone (Portland, OR)
- FLouisville Telephone Co.
- GTE Mobilnet of Akron
- Chicago SMSA Limited (Gary, IN)
- Bay Area Cellular Telephone
- GTE Mobilnet of Lansing
- Albucell Limited Partnership (Albuquerque)
- Sacramento-Valley Limited
- Bay Area Cellular Telephone (San Francisco)
- GTE Mobilnet of Greenville (SC)
- Alltel Cellular Association (Charlotte)
- Nashville SMSA Limited
- Mobile SMSA Limited
- San Antonio SMSA Limited
- Seattle SMSA Limited
- Youngstown-Warren SMSA Limited (OH)
- Bell Atlantic Mobile (Wilmington, DE)
- Toledo MSA Limited Partnership
- GTE Mobilnet of Canton
- Cincinnati SMSA Limited (Dayton)
- Tucell Limited Partnership (Tucson)
- Jacksonville MSA Limited
- Chattanooga MSA Limited
- Allentown SMSA Limited
- Centel Cellular Company (Asheboro, NC)
- Providence Cellular
- Raleigh-Durham MSA Limited
- Cellular System One (Syracuse)
- Omaha Cellular Limited
- Oklahoma City SMSA Limited
- Rochester Telephone Co.
- Compucell, Incorporated (Earlsboro, OK)
- Charleston-North Carolina Cell (SC)
- GTE Mobilnet of Grand Rapids
- Fresno MSA Limited Partnership
- GTE Mobilnet of Austin
- Metro Mobile CTS of Phoenix
- Interstate Mobilphone (Seattle)
- United States Cellular (Tulsa)
- Norfolk-Virginia Beach Tel
- Contel Cellular of Richmond
- Columbus Cellular Telephone
- United States Cellular (Knoxville)
- Cellular Telephone Co. (NYC)
- Long Branch Cellular (NJ)
- Akron Cellular Telephone
- New Haven Cellular Company
- Allentown Cellular Telephone
- Gencom Cellular of Atlanta
- Greensboro Cellular (NC)
- Genesee Telephone Co. (NY)
- Youngstown Cellular
- New Brunswick Cellular
- Gary Cellular Telephone
- El Paso Cellular Telephone
- Tacoma Cellular Telephone
- Sacramento Cellular Telephone
- Chattanooga Cellular Telephone
- Knoxville Cellular Telephone
- Northeast Pennsylvania Cellular (Hazleton)
- Charleston Cellular Telephone (SC)
- Oxnard-Ventura-Simi Telephone (CA)
- Charlotte Cellular Telephone (NC)
- Norfolk Cellular Telephone
- Springfield Cellular Telephone (MA)
- Albuquerque Cellular Telephone
- Southern Ohio Telephone Co. (Cincinnati)
- Nashville Cellular Telephone
- Oxnard Cellular Telephone Co. (CA)
- Omaha Cellular Telephone Co.
- MCCAW/MCI Cellular (K.C., KS)
- Northeast Pennsylvania Telephone (Scranton)
- Harrisburg Cellular (Hershey)
- Tucson Cellular Telephone
- Gencom, Inc. (San Diego)
- Jacksonville Cellular
- Birmingham Cellular
- Dayton Cellular Telephone
- New Bedford Cellular Telephone (MA)
- Memphis Cellular Telephone
- Orlando Cellular Telephone
- MCI/MCCAW Cellular Telephone (Denver)
- Flint Cellular Telephone
- Richmond Cellular Telephone
- Los Angeles Cellular Telephone
- Radiofone, Inc. (New Orleans)
- Wilmington Cellular Telephone
- Tri-Cities Cellular Telephone
- West Palm Beach Cellular Telephone (Johnson City, TN)
- West Palm Beach Cellular Telephone
- Tulsa Telephone Company
- Wichita Cellular Telephone
- Carolina Metronet, Inc. (Raleigh)
- Worcester Telephone Company (MA)
- Greenville Cellular Telephone (SC)
- Baton Rouge Cellular Telephone
- Detroit SMSA Limited (Flint, MI)
- Bridgeport Cellular (Danbury, CT)
- Florida Cellular Telephone (Miami)
- Lansing Cellular Telephone
- Fresno Cellular Telephone
- Houston Cellular Telephone
- Centel Cellular Company (Las Vegas)
- Midwest Cellular Telephone (Oklahoma City)

Communications at Garrison Dam:

The Army Corps of Engineers

by Zel Eaton

Garrison Dam, roughly 65 miles north of Bismark, North Dakota, holds back the waters of the Missouri River forming Lake Sakakawea. The lake is 178 miles long, contains 24,620,000 acre-feet of water and drains a 181,400 square mile area. Garrison Dam is a rolled earth fill type 202 feet tall and 11,300 feet long. The power generating capacity of this dam is 400,000 kilowatts.

Aside from these rather impressive figures the Garrison dam also has several very interesting communications antennas, easily spotted when I visited the dam on my vacation last summer. A letter to the U.S. Corps of Engineers in Riverdale provided me with an explanation.

The antenna farm is located at the western approach to the dam. HF dipoles are cut for various frequencies between 2 and 7 MHz and are used for voice communications only. A VHF corner reflector mounted midway on the tower accesses Western Area Power Association's communications system. WAPA has charge of transmission and distribution of power generated at Garrison and other power plants.

The visitor will note HF dipoles on the roof of the powerhouse itself. These dipoles are also cut for frequencies between 2 and 7 MHz and are used for SSB voice and data transmissions. A 27 MHz ground plane is used for monitoring CB channel 9 for public safety purposes.

Garrison dam also has a VHF log-periodic antenna for monitoring National Weather Service broadcasts. A single long-wire antenna is used for monitoring EBS transmissions on the AM broadcast band.

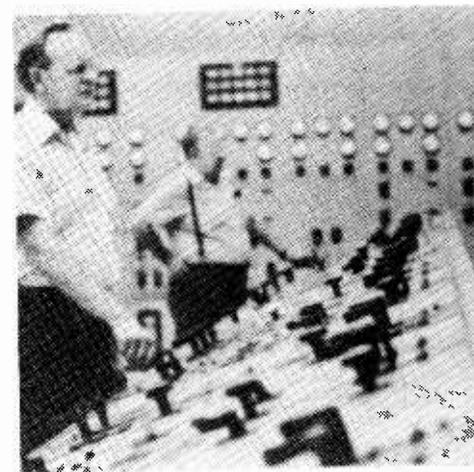
Another method of communications to the Corps at Garrison dam is not readily apparent to the uninitiated: through the RF transmission lines leaving the switch yards below the dam and the powerhouse. These 3-phase high voltage transmission lines carry data, remote-relaying, transferring, telemetry, and voice signals to various sub-stations and dispatch centers directly.

These RF signals are between 50 and 300 kHz. Coupling to the line is done through 230 kV capacitors. Traps tuned to the specific frequency limit the RF generated to the line and prevent interference.

I was also advised that the Corps of Engineers makes use of a non-synchronous satellite to up-link data from various remote locations. The data collected are stored aboard the satellite and interrogated on each pass over the ground station.

A VISIT

The powerhouse is a fascinating place to visit. Guided tours are given

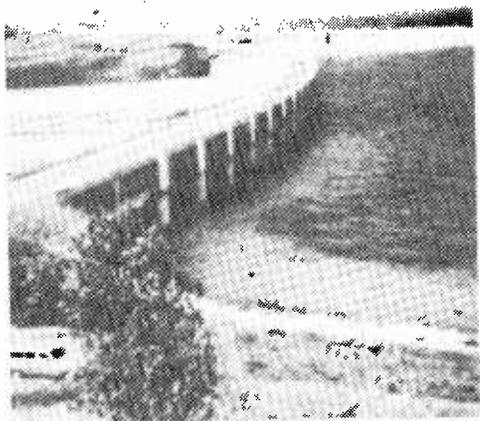


on the hour. You can observe the control room through a glass viewing window, then go to the turbine room and finally down to the very base of the dam where you walk under one of the five 29-foot-in-diameter tunnels that carries the water from the lake to the turbines.

Standing under the water tunnels and feeling the vibrations of the water passing overhead gives a new meaning to the word "awesome"!

The author would like to thank the Communications Technician at the Garrison project, Riverdale, North Dakota, for supplying the communications information for this article.

△



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EQUIPMENT MAY BE RESERVED FOR 5 DAYS PENDING ARRIVAL OF PAYMENT BY CALLING 1-704-837-9200.

RECEIVING EQUIPMENT

(Cost is the lowest advertised retail price)

REGENCY MX3000 SCANNER - manual, mobile bracket, battery backup, AC adaptor, excellent condition. Cost \$198, sell \$139.

BEARCAT 100 SCANNER - new condition with accessories. Cost \$269, sell \$89.

YAESU FRG7700 SHORTWAVE RECEIVER - excellent. Retail \$399, sell \$279. Accessories available.

ALLIED (RADIO SHACK) SX-190 SHORTWAVE RECEIVER - very good condition with manual. Retail \$249, sell \$99.

BEARCAT 50-XL HANDHELD SCANNER - like new with manual, rubber duckie, AC adaptor and rechargeable battery. Cost \$175, sell \$125.

BEARCAT 100 HANDHELD SCANNER - excellent with two whips, leather case, batteries, AC adaptor, earphone and manual. Cost \$279, sell \$149.

BEARCAT 210XL SCANNER - like new with AC cord, whip and manual. Cost \$225, sell \$129.

PANASONIC RF 3100 SHORTWAVE RECEIVER - like new with manual and original packaging. Cost \$266, sell \$179.

ACCESSORIES

ARCOMM active antenna/preselector. Includes AC adaptor, like new. Cost \$129, sell \$69.

RADIO SHACK LAB-55 TURNTABLE - \$35

PALOMAR DESK TOP LOOP ANTENNA WITH PREAMPLIFIER - like new, 500 kHz - 5 MHz (additional loops to 30 MHz available from Palomar). Cost \$195, sell \$149.

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Call 1-704-837-9200 for a used equipment trade agreement if you are interested in swapping!



The Great Airfreight Race

Up until about two years ago, the midshift (11 pm - 7 pm) at the Indianapolis Air Traffic Control Center was a relatively easy time to work; it was quiet and not much traffic came through. Then, in early 1984, the air traffic controllers started to notice that they were handling almost as much traffic during the wee hours of the morning as they were during the regular "heavy" hours of the daytime.

What was happening was a nearly 100% increase in air express freight carriers business in addition to the regular airline, military and general aviation flights normally handled during this time period. One air traffic controller supervisor likened this nightly occurrence to the midwest's version of the Battle of Britain.

Thanks to the concentration of several of the nation's eight hubs in the midwest, the Indy ARTCC is busier in the dead of the night than any of the other 18 centers on the U.S. mainland.

Guiding freighter traffic at night is easier than routing passenger flights by day. There are several reasons for this. For one thing, flights aren't as confined to the narrow airways that they are required to stay in during the day when the skies are more congested. "The freight companies love it when they're not restricted to the airways," says one controller. "Saves them a fortune!"

Another factor is that freight carrier pilots aren't as critical about light "chop" at their flight levels as passenger carriers' pilots are because they don't have to be as concerned about passenger comfort back in the cabin and interruption of meal service therein.

"The packages don't mind!" chuckled one captain of a "freight crate" when a controller asked if he'd like a different flight level because light chop had been reported by other aircraft at that particular altitude. All cargo is secured onto pallets inside the aircraft and cannot bounce around.

Of course when livestock is being carried, that's another story altogether. There was the time that some zoo animals were being carried on a certain cargo flight, and one of

the tigers got loose because the aircraft hit some turbulence and the tiger's cage door somehow sprung open.

"That was one mad pussycat!" the captain of that particular flight told the controller the next that that his flight took him through Indy ATC airspace. "By the time that we landed in Cleveland (their destination), the tiger had left his mark all over the place. He (the tiger) was in remarkably good shape, though!"

Another nighttime advantage for the controllers and freight flights in this area is being able to use the restricted air space over Wright-Patterson AFB near Dayton, Ohio. That opens up a large area of the sky which is off limits for civilian traffic during the day when the Air Force jets are flying through it.

Midwest Hub

Many full-service air companies have located their main sorting operations terminals in the midwest, including Burlington Northern (Ft. Wayne); Purolator Courier (Indianapolis); United Parcel Service (Louisville); Flying Tigers (Columbus, Ohio); Emery Air Freight (Dayton); Airborne Express (Wilmington, Ohio); DHL (Cincinnati); and Federal Express (Memphis).

Many other companies handle air freight in and out of cities in the midwest, although they don't have sorting terminals located there, including several foreign lines.

The midwest is home to the air freight industry by the accident of geography; planes can reach the east coast cities by early morning; west bound flights make up for longer flying time to western cities by gaining hours while crossing time zones.

A Big Gamble

To have an air freight terminal in your city, with a large number of aircraft bound for world-wide destinations is seen as a prize plum. Midwestern cities have lured the freight companies with offers of low-rent terminal space and expanded airport facilities.

A professor of aeronautical engineering at a large midwestern

university compared the giving of millions of dollars in subsidies to such a young industry with something akin to a lottery.

If - and when - a shakeup in the industry comes (and many predict that it will), several midwestern cities could be left with cavernous sorting terminals and outstanding bills.

The Indianapolis Airport Authority spent close to \$9 million dollars in federal airport user fees to upgrade airport facilities to attract Purolator Courier in 1984. The state had chipped in an additional \$1.25 million dollars.

Ft. Wayne is pushing for an \$11 million dollar bond issue to upgrade Baer Field for Burlington Northern Air Freight, which opened a terminal there earlier this year.

Baer Field's main runway would be extended from 9,000 feet to 12,000 feet, which would make it the longest public runway in the state. Burlington Northern, incidentally, lost \$9.2 million on its air freight business last year, but the mayor of Ft. Wayne defends the city's financial support, "For a middle-sized city, having an air freight hub is a tremendous advantage. You can leverage this. It's like the rail head of the 1800s."

Obviously, only time will tell if he's correct in his optimistic outlook.

Precious Cargo

One of the air freight companies (DHL Worldwide Express) with a large number of operations here in the midwest has its domestic hub in Cincinnati. They have 43 departures at night. DHL serves Europe from its air hub in Brussels (Belgium); Latin America from Panama City, Panama; and the Middle East from its air terminal on the island of Bahrain.

In 1983, when a terrorist bomb blew up a United States Marine Corps barracks in Lebanon, the country's postal service stopped operating, but DHL didn't. They offered to carry letters free from the United States to our troops in Lebanon, with about 10,000 letter-writers taking advantage of the free offer.

DHL does some unusual business domestically, also; several years ago, it carried A. J. Foyt's racing helmet to the Indy Speedway for the 500-mile race. In 1984, DHL shipped the Olympic torches that were carried by runners across the United States.

Ever since deregulation of the air freight industry in 1977, anyone with airplanes (and the cash to go with it) can enter the business. An industry was born - hauling "time-sensitive" items to their destination overnight, and businesses have come to depend on the freighters that cross the nation's darkened skies. These items

can (and do) range from birth certificates and computer chips to diesel engines and mini-submarines; livestock to vitally important medical supplies.

Notes from the Hangar

Starting with this month's column, and whenever space is available in future issues, we'll have items of general interest for our readers with a section labeled as above.

☆ It's summertime, and reception is great (summer storms notwithstanding). Those readers who have portable/handheld scanners and high frequency receivers should remember to take them along on picnics and vacations. There's a lot of good DXing to be had if you do. The skips are superb!

☆ The Manager of Air/Ground Operations (Communications Supervisor) and Nandi (Fiji) Aeradio is interested in receiving reception reports from anyone who has monitored Nandi Aeradio working flights in the South Pacific. Write to:
Etika Eliesa
Nandi Aeradio
Nandi International Airport
Fiji Islands
Frequencies (kHz) most likely to be heard on the N.A. continent are: 3467, 5643, 8867, 11339.

☆ Quite a few readers have written to me asking for airline company frequencies. Unfortunately, most airlines don't use the same frequencies for every city they service, so it would be impossible to fulfill those requests. The few airlines that consistently use the same frequencies (MHz) nationwide are as follows:

USAir:	130.100
Eastern:	130.700
<i>(They also use 130.450 & 130.750 for their aero enroute services which they offer to other airlines besides their own.)</i>	
Britt:	131.2, 131.025

☆ I got quite a few chuckles out of the following:

The captain of a "heavy" jet (whose company shall remain nameless) was on final approach to the St. Louis International Airport when the approach controller asked him to cut back on his airspeed for spacing purposes. The pilot got a bit huffy and said to the controller, "Sir, do you know what stall speed of this aircraft is?" (It had been a long, miserable flight, and the captain was a bit on the grouchy side.) The controller thought a moment and shot back, "No, but your copilot might!"

That's it for now. Keep those cards and letters coming; I appreciate all of the encouragement and comments!

73s until next time.

SIGNALS FROM SPACE

Larry Van Horn
160 Lester Drive
Orange Park, FL 32073



Manned activity continues aboard the Salyut 7 and Salyut 8 (MIR) space stations and SFS reporter John Biro has been monitoring developments. John reports voice comms aboard the Salyut 7 have been monitored on 142.417 MHz and Salyut 8 transmissions on 143.625 MHz. In addition John has reported wideband telemetry on 166.120 MHz from the Salyut 7. John has also monitored wideband telemetry from Salyut 8 in the 166 MHz region.

The accompanying timeline table was submitted by John and have been compiled from public domain sources (All dates are 1986).

I would like to thank John for all the fine efforts in keeping track of the Soviet manned space program and look forward to more reports in the future.

Lloyd Scott, my neighbor down the road apiece in Bartow, Florida, reports that Gstar II, GTE Spacenet's fourth communications satellite, which was launched on March 28, has reached its orbital slot of 105° west. The satellite has successfully complete in-orbit testing to become fully operational for commercial traffic.

Lloyd also reports, however, the signal from the Geostar receive/relay package on board Gstar II ceased to transmit on May 19. The receive/relay package had been operating properly during the past month of testing.

The signal loss was confirmed by engineers at Spacenet's Satellite Center in McLean, Virginia, on May 20. While the Gstar satellite communication package is unaffected, attempts to restart the receive/relay electronics have not been successful. RCA Astro-Electronics is the manufacturer of the Geostar package.

AMSAT officials have reported that after three years of on-orbit performance, Amsat-Oscar 10's Integrated Housekeeping Unit (IHU) has experienced a major malfunction. The IHU is the satellite's central computer that runs the whole satellite.

The failure apparently occurred late May 17. As more details become available, SFS will pass them on to MT readers. For the latest info monitor the AMSAT nets.

Kenneth Clum of Tampa would like to monitor military aircraft flying out of MacDill AFB, Florida. He has asked me to provide

some frequencies. Ken, while I do not have the complete frequency picture at MacDill, the following should help you get started:

MacDill AFB - Florida
Headquarters, Readiness Command (REDCOM); Det 1, 20th Missile Warning Squadron; FSS-7 SLBM warning radar. Global Command and Control Station; 660th Radar Squadron JSS radar; 56th Tactical Training Wing: F-16 training.

Pilot to Dispatcher	-- 372.2
Tampa Approach Con	-- 354.0
Ground Control	-- 275.8
TAC Command Post	
(Raymond 19)	-- 381.3
ATIS	-- 270.1
Tower	-- 294.7
Departure Control	
(Dep runway 22)	-- 269.1
(Dep runway 04)	-- 279.6

There will be other frequencies, so you might want to use your search feature of your scanner to find them. Be sure to report any new ones to SFS.

The following frequencies are in use at NAS Fallon, Nevada, by U.S. Navy aircraft.

NAS Fallon	
Clearance Delivery	-- 271.5
Fallon Tower	-- 340.2
Fallon Approach Con	-- 360.2
Area B-17 East	-- 271.4
Area B-19	-- 265.8
Electronic Warfare	
range	-- 262.7
Austin MOA	-- 275.6
Oakland Control	
(Southbound)	-- 285.5
Fallon Ground	-- 382.8
Desert Control	-- 263.6
Area B-16	-- 341.0
Area B-17 West	-- 267.4
Area B-20	-- 344.1
GABBS MOA	-- 310.6
Oakland Control	
(Northbound)	-- 269.3
Flight Service Sta	-- 255.4
SAREX	-- 282.8
Fallon Base radio	
(Prince base)	-- 340.5
Air Wing Common	-- 345.0

One of the first places that might launch shuttles after they are flying again will be Vandenberg AFB. I do not have a lot of frequency information on Vandenberg but here is what I currently have. Anyone in that area is urged to update this list and add to it any new HF/VHF/UHF frequencies including those that will be used by the space shuttle.

Vandenberg AFB	
Pilot to Dispatcher	-- 372.2
Vandenberg Tower	-- 124.95
	126.2
Ground Control	-- 118.2
	275.8
Command Post	-- 311.0
	321.0
PMSV: Metro	-- 344.6
Approach Control	-- 118.0
	118.35
	339.1
	363.8
Departure Control	-- 121.4
	296.5
	386.6

In a future issue of MT, I'll try to list all known VHF/UHF authorizations for Vandenberg to better help listeners in that area.

I would like to take this opportunity to thank all the MT contributors that have taken so much time and expense to aid this column on a regular basis. I would like to especially thank John Biro, Lloyd Scott, Mark Chinsky, and Geoffrey Falworth.

To the individual who sent me a tape via MT headquarters (first name is Robert in Baltimore, Maryland) the post office forwarded it to me in pieces. I am sorry I could not make out your address or the question you asked me concerning the shuttle. Please try again, but

Larry Van Horn, editor of MT's popular "Signals from Space" column and author of *Communications Satellites*, will be speaking at the Jacksonville (FL) Hamfest, Saturday, August 9, at 10 a.m., at the Convention Center.

Larry's topic will be general satellite listening and MT readers near the area would enjoy his presentation.

remember, if you are sending material (cassette tape) through the mail, package it carefully. The post office in Jax loves to eat things--especially tapes, floppy disks, NASA mail, and personal mail!

To those of you who write, please enclose an SASE if a personal reply is desired. I also welcome any and all contributions to this column. If you wish to remain anonymous, your wishes will be adhered to.

Information on new satellites, frequencies, and military aircraft frequencies are welcomed. I also invite MT readers to review the newest edition of *Communications Satellites* and any help with filling holes in that publication would be appreciated.

You can send your information to the address listed in the column masthead.

SALYUT 7 AND 8 MANNED ACTIVITY

Feb 19	MIR/Salyut 8	Launched from Baikonor Cosmodrome (Tyuratam) Intl desig: 1986-17A NORAD No: 16609
Mar 13	Soyuz T-15	Launched from Tyuratam @ 12:33 UTC. Live worldwide TV coverage. Cosmonauts: Commander Leonid Kizim (age 44) Engineer Vladimir Soloyev (age 39)
Mar 15	MIR/T-15	Soyuz T-15 docked with MIR 12:38 UTC docked 14.38 UTC cosmonauts inside MIR 17.38 UTC live TV coverage from inside MIR
Mar 19	Progress 25	Launched from Tyuratam Intl desig: 1986-023A NORAD No. 16645
Mar 21	P-25/MIR	Progress 25/ MIR docked
Mar 30	MIR	MIR crew conducted test of new radio system. Allows communications with USSR over the horizon.
Apr 12	25th Anniv.	25th Anniversary of Yuri Gagarin first space flight. MIR crew held live TV conference and called for nuclear test ban treaty.
Apr 20	Progress 25	Jettisoned from MIR
Apr 21	Progress 25	Decayed in earth's atmosphere.
Apr 23	Progress 26	Launched from Tyuratam. Carried supplies of fuel, water, food and equipment to MIR.
Apr 27	P-26/MIR	Progress 26/MIR docked
May 04	Radio Moscow	Announced the transfer of the MIR crew to Salyut 7 would happen on 5 May
May 05	Soyuz T-15/MIR	Crew leaves MIR in "space taxi." T-15 leaves with supplies.
May 06	Soyuz T-15/S-7	Crew arrives at Salyut 7 at 16:58 UTC Tuesday completing an 1,875-mile journey in a "space taxi" from MIR to Salyut 7 space station. The two cosmonauts sked to replace equipment and transfer equipment supplies and even plants cultivated in space.
May 21	Soyuz TM	An unmanned version of a new model Soyuz space capsule launched from Tyuratam.
May 23	Soyuz TM/MIR	Soyuz TM docks with MIR at 1412 Moscow time, 50 hours, 10 minutes after launch.
May 28	Spacewalk	Leonid Kizim and Vladimir Soloyev took pieces of material out of a cylinder and clipped it together and then attached it to a platform above the Salyut 7, gave one dimension of the structure as being nearly 50 feet. TASS reported the spacewalk began at 0543 UTC and lasted 3 hours and 50 minutes.
May 28	Soyuz TM/MIR	Per Radio Moscow, Soyuz TM separated from MIR at 0923 UTC. Soyuz TM did the first computer controlled NAV docking and undocking of an un-manned Soyuz. Welcome to the computer age.
May 30	Soyuz TM	Soyuz TM lands in Kazakhstan republic.
May 31	Spacewalk	Both cosmonauts spend 5 hours outside S-7 welding parts onto a tower. Instruments were mounted on the 40-foot-high tower to monitor vibrations and other data. A low power laser beam relayed data to the S-7. Soviet TV carried 15 minutes of the spacewalk.

UHF AIRCRAFT FREQUENCIES

Georgia and the Carolinas

We appreciate Larry Williams' excellent contribution of UHF-AM military aeronautical frequencies and encourage other MT readers to share their interesting frequency files with fellow monitors for all frequency ranges.

226.3	Greensboro TWR	259.3	Charlie Brown TWR
.4	Columbus APP	263.0	Charlotte TWR
.5	GSP Greer	268.7	Columbia TWR
.8	Asheville APP	269.1	Columbus TWR
	Albany APP	.2	GSP Greer TWR
228.3	Dekalb APP	.3	Fayetteville TWR
233.2	Greensboro APP	270.3	Atlanta Center-NE
234.4	Cairnes APP	272.7	Cherry Point APP
239.0	Charleston TWR	276.3	GSP Greer TWR
.3	Augusta TWR	277.4	Fayetteville TWR
	Wilmington TWR	279.6	Atlanta Center-So
243.0	->EMER/ELT	285.6	Augusta APP
254.3	Tallahassee APP		Washington Center
255.4	New Bern APP	290.4	Washington Center
256.9	Atlanta Center-SE	295.0	Jacksonville Ctr
257.1	Charleston APP	306.3	Macon APP
.2	Charlotte APP-West	.9	Columbia APP
.6	Atlanta TWR	307.9	Valdosta APP
	Wilmington APP	309.7	Jacksonville Ctr
.7	Greenville SC TWR		Fayetteville APP
.8	->UHF TOWER PRIMARY	316.7	Atlanta Center-NE
	Ashville TWR	317.4	Florence APP
			Raleigh APP
			Charlotte APP-East
			Tallahassee APP

319.8	Charleston APP
320.1	Seymour-Johnson
322.3	Greensboro APP-NE
323.0	Washington Center
324.3	Macon APP
.8	New Bern TWR
327.3	Shaw AFB APP
	Macon ATIS
334.1	Donaldson Dev Corp
.7	->UNICOM PRIMARY
336.2	Athens TWR
338.0	Kinston TWR
	Columbus APP
.2	Columbia APP
.6	Seymour-Johnson
340.7	Fayetteville APP
341.7	Florence APP
343.6	Atlanta APP
.9	Wilmington APP
348.6	->GROUND CONTROL
	Charlotte/Raleigh
	Wilmington/Spbg
	Augusta/Columbus
	Charleston/Sav
	Charlie Brown
350.2	GSP Greer TWR
353.5	Jacksonville Ctr
.7	Atlanta Center-NE
354.0	Savannah APP
355.6	Eliz City TWR
358.3	Shaw AFB APP
363.2	Jacksonville Ctr
370.9	Atlanta Center-NE
374.9	Cherry Pt APP
379.1	Chattanooga APP-So
.8	Florence APP
.9	Atlanta APP
380.2	Washington Center
381.2	Hickory TWR
.6	Atlanta APP
385.4	Charleston Ctr/Del
	GSP Greer TWR
385.5	Greenville Downtwn
387.1	Atlanta Center-No
388.0	Savannah APP
.2	Raleigh APP
393.0	Macon APP
397.2	Fayetteville APP
	Mvrtle Beach TWR

RADIO RESEARCH 10 ELF LANE
GREENVILLE, S. C. 29611

Air Force Proposes Giant Communication Complex

The United States Air Force is supplementing their worldwide HF communications capability with a \$22 million electronics complex near Hawley, Massachusetts.

Just a year ago Air Force representatives held meetings in Hawley and Granby, Massachusetts, to begin work on a Draft Environmental Impact Statement (DEIS) in preparation for the construction of the Northeast Regional Communications Facility (NRCF).

The NRCF will consist of three separate components -- a control point at Westover Air Force Base, a receiver site at Granby Communications Annex and a transmitter site near Hawley. The Air Force must acquire an additional 500 acres from private land owners to complete the complex.

It is hoped by Air Force officials that the entire project will be completed during 1988, a decision to be made following the review of the EIS.

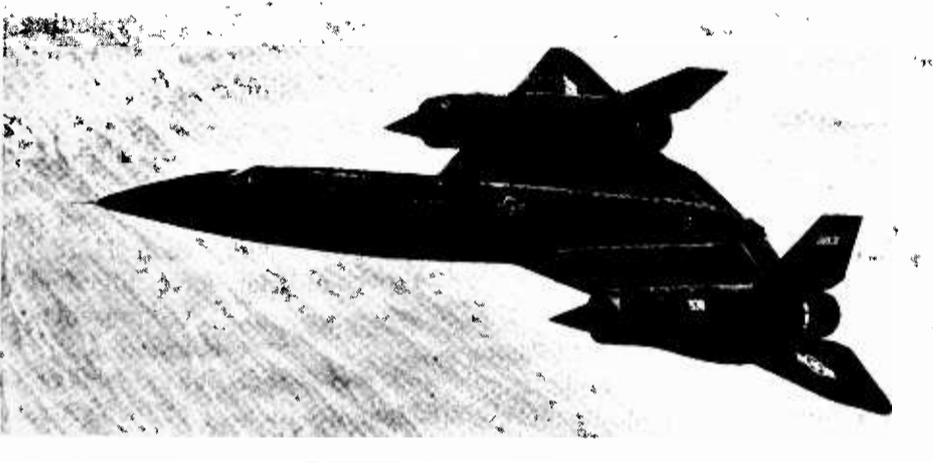
The major USAF communications installation will complement the existing National Communications System (NCS), a confederation of 22 government entities who have pooled their telecommunications facilities.

NCS provides routine federal government communications as well as fulfilling emergency military and civilian needs. It is administered by the Air Force.

Proposed equipment includes rotatable log periodic antennas 100-300 feet in length and height, 20 kilowatt 3-30 MHz transmitters and a microwave control link tying together the component installations.

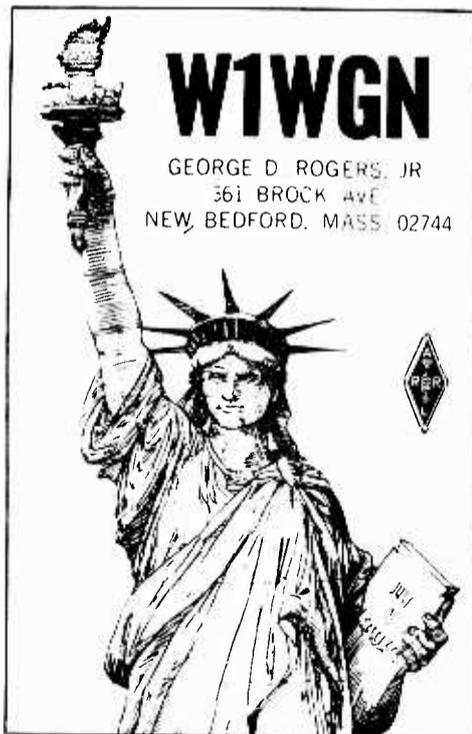
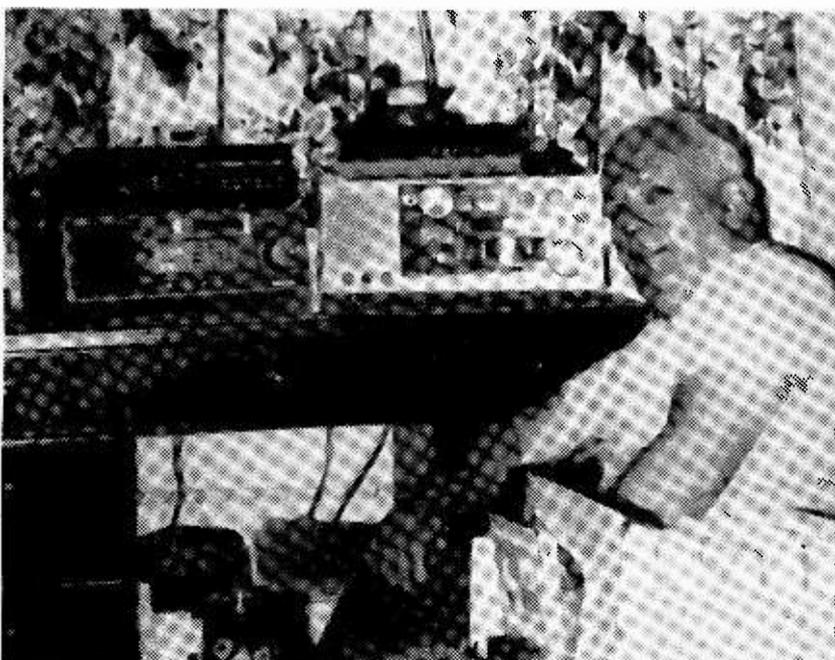
The control link between the transmitter and receiver sites will utilize 20 watt transmitters operating in the 1800 MHz band and implementing highly-directional 25 dB gain antennas.

A total of 13 preliminary sites have been studied in an effort to choose the final location which offers the best combination of isolation from electrical noise pollution, minimum environmental impact and lowest cost.



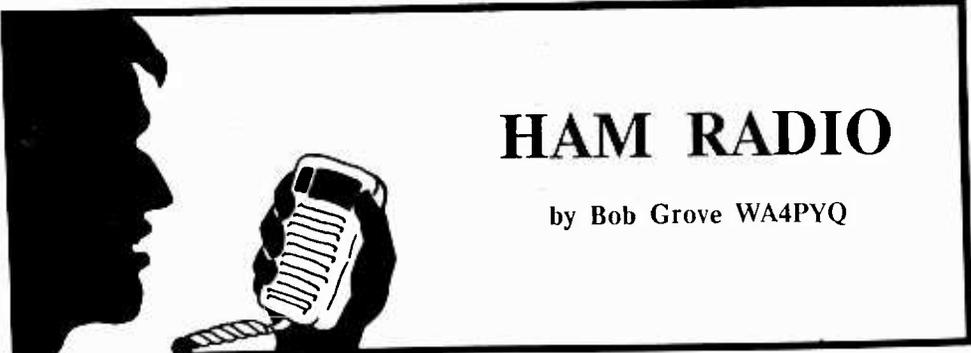
MT MONITORING POST

Proud of your monitoring post or ham shack? Then this is your column--Send your photo and a brief description to Monitoring Post c/o Bob Grove or Larry Miller and see yourself in print!



Though we usually do not publish QSL cards, this timely commemorative card from George Rogers caught our eye.

Charles Allen of Rochester, NY, shown with his Bearcat 300 and 250 scanners, Panasonic RFB-600 and Sony ICF 6800W short wave receivers.



HAM RADIO

by Bob Grove WA4PYQ

We have had quite a number of requests from hams and SWL's alike to start a column on amateur radio since hams are omnipresent throughout the radio spectrum.

Other readers plead that the listening hobby should remain quite separate and fear that a ham column would grow to the point that it would infringe upon the monitoring aspects of the hobby.

MT has always responded to the will of its readers and feels that a monthly column on amateur radio is desirable to our readership; we shall make sure, however, that it doesn't intrude into other articles and columns.

| New Novice Incentives |

There is a grass roots movement under way to encourage more radio hobbyists to consider the rewards of ham radio. The allure of talking to remote lands, communicating with vessels at sea and orbiting space ships, has been persuasive to many of us, creating a worldwide fraternity.

The CB boom of the late 1970's created an influx of ex-CB'ers into the licensed amateur ranks, but that thrust has dwindled. Now, with Novice class amateurs about to be awarded voice privileges as well as traditional Morse code provisions, there is hope that the downward trend can be reversed.

Gordon West (Gordon West's Radio School), Fred Maia (*Dits and Bits--The W5YI Report*) and I have recently formed a coalition of three to attempt to provide--at cost--a Novice

package aimed at school-aged youngsters, but available to potential hams of all ages.

The package consists of a code practice oscillator, a hand key, an FCC rule book, the AMECO Novice manual, the W5YI Novice study package, a "Learn the Code" cassette, a five word-per-minute test preparation cassette, and an FCC form 610 application.

The package represents an enormous bargain--only \$19.95 (plus \$2.40 first class postage) for a study kit normally sold for \$46.30! It may be ordered from W5YI, P.O. Box 10101, Dallas, TX 75207. Ask for a sample copy of Fred's excellent *W5YI Report* with your order. It's packed with useful information for all radio hobbyists.

| Tragedy Mars Field Day |

Field Day, an annual exercise in which tens of thousands of active radio amateurs attempt to work as many stations as they can from portable locations throughout the country, was marred this year by an accident.

Mike Mankey, WB0TEE, North Dakota Section Manager of the American Radio Relay League, was electrocuted when an antenna being erected in a wooded Field Day site touched a hidden power line in one of the trees.

The tragic accident underscores the fact that radio hobbyists are all too frequently becoming statistics as antennas they are erecting touch electrical power lines. This is the reason that, by law, antenna manufacturers affix warning labels to TV antennas.

| Astronaut Owen Garriott, W5LFL, Resigns |

Citing disappointment with the grounding of the Space Shuttle, veteran astronaut and amateur Owen Garriott has resigned from the astronaut corps.

Garriott was the most space-experienced astronaut; having served aboard Skylab and the Shuttle, while aboard the latter working hams worldwide on two meters.

It is expected that Garriott will go into private enterprise as a consultant upon his departure from NASA.

| EPA to Limit RF Exposure Levels |

The Environmental Protection Agency has revised downward their recommendations for exposure of the human body to radio frequency energy. At present there are no federal standards for RF energy levels and various effects on the human body have been shown in the laboratory.

The new proposed standards are more involved to interpret than the former ANSI limit of 1982 (100 milliwatts per square centimeter for frequencies below 3 megahertz, dropping to 1 mW/cm² from 30-300 MHz, increasing to 5mW above 15 GHz).

EPA takes body weight into consideration for a unit "watts per kilogram" above 3 MHz. A typical (and very tight) specification would state a specific absorption rate (SAR) of 0.04 W/kg with an electric field intensity of 87 volts per meter and a magnetic field intensity of 0.23 amps per meter.

While a specification this restrictive would cost at least \$34 million for the broadcast industry alone to comply with, there are lesser restrictive proposals as alternatives, including the simple expedient of alerting the public to the hazards of RF radiation.

| CB Hit Man Invades Home |

A bizarre incident in La Harbra, California, has left one CB radio dead and its owner badly shaken. The story comes to us from the *Orange County Register*.

Dennis Carrico claims he was talking on his CB after midnight when he became aware of another presence in his radio room. Turning around he was greeted by the spectre of an armed intruder who told him to move away from his CB radio. Carrico complied and the gunman blasted the set three times, turned and left.

Police theorize that the attack was in retaliation for television interference (TVI).

| Boy Scout Merit Badge Updated |

It has been some 25 years since ARRL staff member Perry Williams, W1UED, wrote the Boy Scout Amateur Radio Merit Badge pamphlet. This time the job was done by Mike Brow, WB2JWD.

According to officials at the Boy Scouts of America national headquarters, the new edition should be ready for distribution in September.

CB Aftermath

by Bob Grove

At the turn of the decade, CB radio was enjoying its heyday; retailers were thriving and hobbyists were so entrenched in working DX that the entire band (and outside as well) was resplendent with carriers nearly anytime one wished to listen (and often later wished he hadn't!).

The craze has died down and a casual tuning of the 27 MHz spectrum now reveals little of that portion of the spectrum's former glory.

The sunspot cycle which supported the long range communications is now at low ebb; but the potential for using CB is now more inviting: There is little interference, CB transceivers are at the lowest prices in history, no license is required, and reliable ranges are good for local communications.

Will there ever be another CB boom? Interesting thought.

CB Mobile Radiotelephone?

The FCC is considering a proposal from a county emergency management director and a CB communications specialist to permit the 27 MHz citizens band, in frequency-modified form, to be used for mobile telephone service.

The applicants envision personal communicators and belt-worn devices operating in the present 40-channel 27 MHz band, while the FCC seems more likely to promote the service as part of the reconstructed 450 MHz GMRS (General Mobile Radio Service).

At present, the petition is only at the Notice of Inquiry stage; a full FCC hearing would be scheduled after questions are answered, including: technical specifications, range, mode, geographical limitations, power for bases, and marketing ramifications.

We would like to thank *MT* reader James Moore of Leesburg, Florida, for alerting us to this newly proposed legislation.

MT

WHAT'S NEW?

SOFTWARE

ACCESSORIES

BOOKS

CHARTS

EQUIPMENT
RECEIVERS

Equipment Shelf

Coming from Kenwood

Although no details are yet available from the manufacturer, *MT* has been told that Kenwood will be releasing another general coverage receiver around the end of the year.

The spokesman for the company said that the new receiver, though not intended to be a high-end product to compete with the new Japan Radio Company NRD-525, will be more professional than the consumer-oriented R-2000 which will remain in production.

Kenwood recently discontinued their R-600 due to lagging sales.

LIBRARY SHELF

SHORT WAVE DIRECTORY, new expanded third edition by Bob Grove (220 pages, 8-1/2" x 11", paperbound; \$14.95 plus \$1.50 shipping from Grove Enterprises, P.O. Box 98, Brasstown, NC 28902)

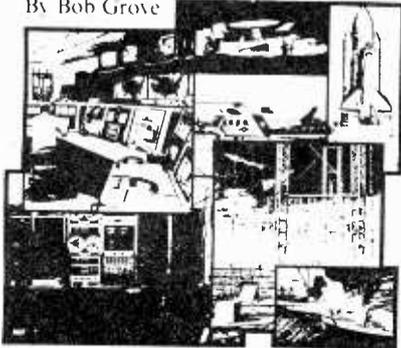
After several years of careful updating and expanding, the **SHORTWAVE DIRECTORY** has become a standard reference among utilities listeners worldwide. This latest edition (1986) contains exhaustive frequency listings of U.S. and foreign military agencies, Coast Guard, State Department, embassies and diplomatic communications, FBI, unlicensed pirate and clandestine broadcasters, aircraft and ships, space satellite tracking networks, INTERPOL, and much more.

Although voice communica-

SHORTWAVE DIRECTORY

A Frequency Guide for the 1.6-30 MHz Spectrum

By Bob Grove



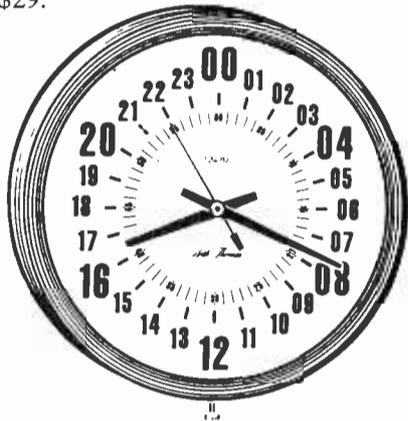
THIRD EDITION, COPYRIGHT 1986
By Grove Enterprises, Brasstown, N.C. 28902

Coming from Grove

A professional studio wall clock featuring a precision 24 hour quartz movement has been announced by Grove Enterprises. Measuring more than 13 inches across and powered by a single AA cell (not supplied), the clock is guaranteed to an accuracy within one-half second per day.

The Seth-Thomas movement has bold black letters, hours and minute hand, accented by a red sweep-second hand.

Normally retailed for \$34.95, Grove has it specially discounted at only \$29.



tions are emphasized, radioteletype and Morse code operations are included along with handy glossaries, lists of abbreviations and a quick-lookup frequency cross reference.

SOUTHEASTERN REGIONAL SCANNER RADIO LISTINGS by Norm Schrein (530 pages, 8-1/2" x 11", paperbound; \$13.95 plus shipping from Fox Marketing, Dept. MT, 4518 Taylorsville Rd., Dayton, OH 45424)

With Fox already the leading publisher of metropolitan scanner directories (29 as of this writing), the addition of one more book comes as no surprise. What does come as a surprise, however, is its size and contents.

With convenient cross referencing by service and city, the Southeast Regional Directory covers the states of Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Puerto Rico, Tennessee, and the Virgin Islands.

While one might question that Puerto Rico and the Virgin Islands can be considered southeastern United States, no one is likely to quibble about the girth of the contents.

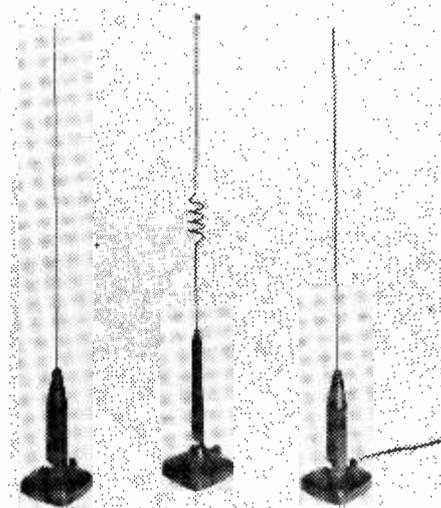
Police, fire, ambulances and rescue squads, local government, forestry, marine and aircraft radio, mobile telephone, weather--they're all here. If you are planning a trip in the eastern states, take a scanner and Schrein's newest directory.

"New Breed" CB Antennas from Antenna Specialists

A new line of high performance, high style CB antennas, including a trunk lip model that looks for all the world like a cellular phone antenna, has been announced by The Antenna Specialists Co., world's largest producer of mobile and base communications antennas.

Borrowing extensively from its advanced professional antenna technology, the new line, called "Black Stallion," comprises three basic configurations providing for every conceivable mobile mounting requirement: trunk lip, trunk mount and a powerful ceramic magnet mount.

The Model M-900, a no-holes, trunk lip design, looks like an elevated feed cellular phone antenna. For more details, contact: Marketing Department, The Antenna Specialists Co., P.O. Box 12370 Dept. MT, Cleveland, OH 44112-0370.



Antenna Specialists "Black Stallion" CB mobile antennas

RADIO SHACK UNLEASHES SCANNER SURPRISES

The new Radio Shack catalog should be in your hands shortly and it holds a number of surprises, including scanners with high memory capacity (up to 210 channels) and extended frequency coverage (25-520, 760-1300 MHz).

A total of six new scanners--and one price decrease (the PRO-30 is now \$199.95)--grace the pages of the catalog, an ambitious marketing thrust during a period when other manufacturers are cutting back.

Radio Shack scanners are all made offshore by one manufacturer who has been their prime source for many years. The new line represents both hand-held and desktop/mobile models with a multitude of features.

MT will be providing reviews of at least two of the new entries when they become available this fall. No new shortwave receivers will be offered.

COBRA ENTERS SCANNER FORAY

Cobra Consumer Electronics Group, a Chicago-based company, has introduced four programmable scanners. Looking very similar to Uniden's popular BC-50XL, BC-

100SL, BC-145XL, and BC-175XL, with specifications to match, the Cobra models are identified as SR-10, SR-12, SR-900, and SR-925.



With the wide popularity of the HX-1200, it is difficult to imagine what (or why!) Regency would do to supplement their scanner line with this new model. Nonetheless, there are several differences.

First, 55 channels of memory are now provided, making the 1500 particularly useful in metropolitan areas; more important, these channels may be banked into four overlapping groups allowing selection of services to be scanned and permitting several channels to be scanned in more than one bank.

The non-volatile ROM is preloaded at the factory with 55 of the most popular frequencies nationwide as a test procedure for Regency and a head start for the new owner who may not be sure just where to look for active channels. They are erased and substituted as the user enters frequencies of his own.

An auxiliary scan button atop the unit permits ready rescan command by the user when the 1500 is worn on a belt. In earlier models it was difficult to remember which of the myriad keys on the front panel had to be pressed for this function looking down from above.

The 1500 has dual scan speeds and a search feature as well. The familiar keyboard "beep" confirms command entries as they are pressed.

Direct channel access permits the listener to select any of the 55 channels manually without having to step through the banks repetitively.

Eight standard or rechargeable NICAD AA cells (not supplied) are required to power the 1500. The belt clip, earphone and flex antenna are included, but the carrying case, batteries and charger are optional.

The specifications of the 1200 are virtually identical to its predecessor: Sensitivity 0.5 μ V low band, 0.7 μ V high band and UHF, 1.0 μ V aircraft; scan/search speed 8 or 13 channels per second; published frequency range 29-54, 118-174, 406-420, and 440-512 MHz.

The old slide switches at the bottom of the HX-1200 have been replaced by pushbuttons for delay (2 seconds scan, 4 seconds search) and priority (samples channel 1 every 2 seconds).

I.F. selectivity is \pm 7.5 kHz @ 6 dB, \pm 18 kHz @ 50 dB; audio output is 0.2 watts (less than 10% distortion).

With a suggested retail price of \$369.95, the HX-1500 is now available from Grove Enterprises for \$239 including shipping, and from other MT advertisers as well.

NEW! Lower Price Scanners

Communications Electronics,™ the world's largest distributor of radio scanners, introduces new lower prices to celebrate our 15th anniversary.

Regency® MX7000-EA

List price \$699.95/CE price \$399.95/SPECIAL 10-Band, 20 Channel • Crystalless • AC/DC Frequency range: 25-550 MHz, continuous coverage and 800 MHz to 1.3 GHz, continuous coverage. The Regency MX7000 scanner lets you monitor Military, Space Satellites, Government, Railroad, Justice Department, State Department, Fish & Game, Immigration, Marine, Police and Fire Departments, Broadcast Studio Transmitter Links, Aeronautical AM band, Aero Navigation, Paramedics, Amateur Radio, plus thousands of other radio frequencies most scanners can't pick up. The Regency MX7000 is the perfect scanner to receive the exciting 1.3 GHz, amateur radio band.

Regency® Z60-EA

List price \$299.95/CE price \$179.95/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-EA

List price \$259.95/CE price \$159.95/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® RH250B-EA

List price \$674.30/CE price \$329.95/SPECIAL 10 Channel • 25 Watt Transceiver • Priority The Regency RH250B is a ten-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 ten 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 RH250 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 RH600B is available for \$454.95. A UHF 15 watt version of this radio called the RU150B is also available and covers 450-482 MHz, but the cost is \$449.95.

NEW! Bearcat® 50XL-EA

List price \$199.95/CE price \$114.95/SPECIAL 10-Band, 10 Channel • Handheld scanner Bands: 29-74, 136-174, 406-512 MHz. The Uniden Bearcat 50XL is an economical, hand-held scanner with 10 channels covering ten frequency bands. It features a keyboard lock switch to prevent accidental entry and more. Also order part # BP50 which is a rechargeable battery pack for \$14.95, 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.

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-RL021-1; State of Arizona-RL025-1; Baltimore, MD-Washington, DC-RL024-1; Buffalo, NY/Erie, PA-RL009-2; Chicago, IL-RL014-1; Cincinnati/Dayton, OH-RL006-2; Cleveland, OH-RL017-1; Columbus, OH-RL003-2; Dallas/Ft. Worth, TX-RL013-1; Denver/Colorado Springs, CO-RL027-1; Detroit, MI/Windsor, ON-RL008-3; Fort Wayne, IN/Lima, OH-RL001-1; Hawaii/Guam-RL015-1; Houston, TX-RL023-1; Indianapolis, IN-RL022-1; Kansas City, MO/KS-RL011-2; Long Island, NY-RL026-1; Los Angeles, CA-RL016-1; Louisville/Lexington, KY-RL007-1; Milwaukee, WI/Waukegan, IL-RL021-1; Minneapolis/St. Paul, MN-RL010-2; Nevada/OK-RL005-2; Orlando/Daytona Beach, FL-RL012-1; Pittsburgh, PA/Wheeling, WV-RL029-1; Rochester/Syracuse, NY-RL020-1; San Diego, CA-RL018-1; Tampa/St. Petersburg, FL-RL004-2; Toledo, OH-RL002-3. New editions are being added monthly. For an area not shown above call Fox at 800-543-7892. In Ohio call 800-621-2513.

NEW! Regency® HX1200-EA

List price \$369.95/CE price \$214.95/SPECIAL 8-Band, 45 Channel • No Crystal scanner Search • Lockout • Priority • Scan delay Sidelit liquid crystal display • EAROM Memory New Direct Channel Access Feature Bands: 30-50, 118-136, 144-174, 406-420, 440-512 MHz. The new handheld Regency HX1200 scanner is fully keyboard programmable for the ultimate in versatility. You can scan up to 45 channels at the same time including the AM aircraft band. The LCD display is even sidelit for night use. Order MA-256-EA rapid charge drop-in battery charger for \$84.95 plus \$3.00 shipping/handling. Includes wall charger, carrying case, belt clip, flexible antenna and nicad battery.

NEW! Bearcat® 100XL-EA

List price \$349.95/CE price \$203.95/SPECIAL 9-Band, 16 Channel • Priority • Scan Delay Search • Limit • Hold • Lockout • AC/DC Frequency range: 30-50, 118-174, 406-512 MHz. The world's first no-crystal handheld scanner now has a LCD channel display with backlight for low light use and aircraft band coverage at the same low price. Size is 1 3/4" x 7 1/2" x 2 1/2". The Bearcat 100XL has wide frequency coverage that includes all public service bands (Low, High, UHF and "T" bands), the AM aircraft band, the 2-meter and 70 cm, amateur bands, plus military and federal government frequencies. Wow... what a scanner! 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.

Bearcat® 210XW-EA

List price \$339.95/CE price \$209.95/SPECIAL 8-Band, 20 Channel • No-crystal scanner Automatic Weather • Search/Scan • AC/DC Frequency range: 30-50, 136-174, 406-512 MHz. The new Bearcat 210XW is an advanced third generation scanner with great performance at a low CE price.

NEW! Bearcat® 145XL-EA

List price \$179.95/CE price \$102.95/SPECIAL 10 Band, 16 channel • AC/DC • Instant Weather Frequency range: 29-54, 136-174, 420-512 MHz. The Bearcat 145XL makes a great first scanner. Its low cost and high performance lets you hear all the action with the touch of a key. Order your scanner from CE today.

TEST ANY SCANNER

Test any scanner purchased from Communications Electronics™ for 31 days before you decide to keep it. If for any reason you are not completely satisfied, return it in original condition with all parts in 31 days, for a prompt refund (less shipping/handling charges and rebate credits).

FROM DC TO DAYLIGHT

If it travels by a wave, whether short or long, MT is interested and so are our readers! We welcome contributions of newspaper clippings, column and project ideas, your experiences. MT wants to be YOUR paper!

Subscribe today!

NEW! Bearcat® 800XL-EA

List price \$499.95/CE price \$317.95 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 1 1/2".

OTHER RADIOS AND ACCESSORIES

- Panasonic RF-2800-EA Shortwave receiver \$179.95
 - RD95-EA Uniden Remote mount Radar Detector..... \$128.95
 - RD55-EA Uniden Visor mount Radar Detector..... \$98.95
 - RD9-EA Uniden "Passport" size Radar Detector..... \$239.95
 - BC-WA-EA Bearcat Weather Alert..... \$49.95
 - DX1000-EA Bearcat shortwave receiver SALE..... \$349.95
 - PC22-EA Uniden remote mount CB transceiver..... \$99.95
 - PC55-EA Uniden mobile mount CB transceiver..... \$59.95
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 - MX3000-EA Regency 30 channel scanner..... \$198.95
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 - UC102-EA Regency VHF 2 ch. 1 Watt transceiver..... \$124.95
 - RH250B-EA Regency 10 ch. 25 Watt VHF trans..... \$329.95
 - RH600B-EA Regency 10 ch. 60 Watt VHF trans..... \$454.95
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 - P1412-EA Regency 12 amp reg. power supply..... \$164.95
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 - MA917-EA Ni-Cad battery pack for HX1200..... \$34.95
 - SMMX7000-EA Svc. man. for MX7000 & MX5000..... \$19.95
 - SMMX3000-EA Service man. for Regency MX3000..... \$19.95
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 - FB-E-EA Frequency Directory for Eastern U.S.A..... \$12.95
 - FB-W-EA Frequency Directory for Western U.S.A..... \$12.95
 - ASD-EA Air Scan Directory..... \$14.95
 - SRF-EA Survival Radio Frequency Directory..... \$14.95
 - TSG-EA "Top Secret" Registry of U.S. Govt. Freq..... \$14.95
 - TIC-EA Techniques for Intercepting Comm..... \$14.95
 - RRF-EA Railroad frequency directory..... \$10.95
 - CIE-EA Covert Intellegent, Elect. Eavesdropping..... \$14.95
 - A60-EA Magnet mount mobile scanner antenna..... \$35.00
 - A70-EA Base station scanner antenna..... \$35.00
 - USAMM-EA Mag mount VHF/UHF ant. w/ 12' cable..... \$39.95
 - USAKE-EA 3/4" hole mount VHF/UHF ant. w/ 17' cable..... \$35.00
 - USATLM-EA Trunk lip mount VHF/UHF antenna..... \$35.00
- Add \$3.00 shipping for all accessories ordered at the same time. Add \$12.00 shipping per shortwave receiver. Add \$7.00 shipping per scanner and \$3.00 per antenna.

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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.

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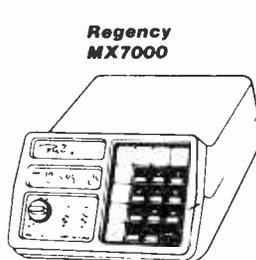
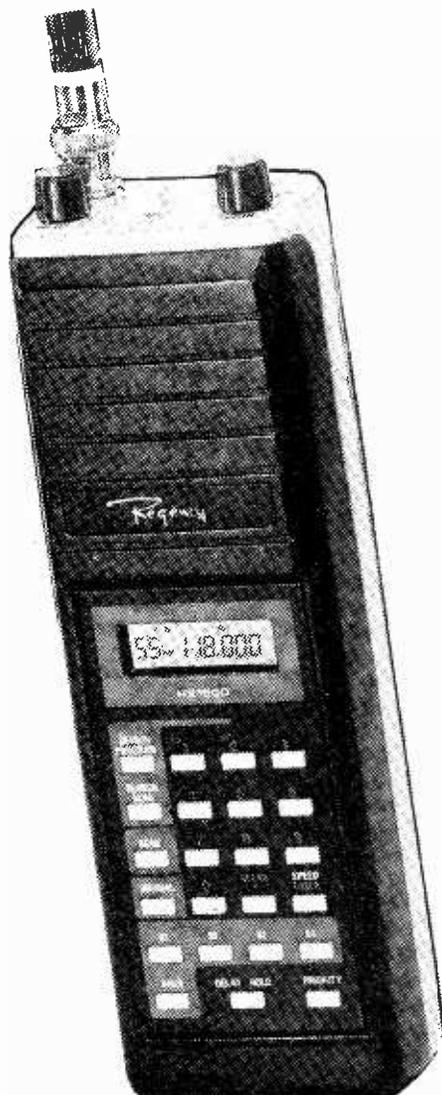
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YAESU FRG-8800

RDI Rating of Overall Performance: ****

A Very Nice Table-Top Receiver

by Larry Magne

Yaesu has an interesting tradition of producing only one receiver at a time. First there was the pioneering "Frog" 7, then the "Frog" 7000 and the 7700. Now comes the FRG-8800, which replaces the FRG-7700 and continues the series,

The '8800 is typical of certain newer Japanese receivers in that it makes considerable use of microprocessor capabilities to make operation easier, but at the same time more sophisticated. Keypad entry and programmable channel memories are featured, along with a scanner and conventional tuning knob. Even the signal-strength meter is digitalized.

Traditionally, manufacturers have included simple signal-strength meters on shortwave receivers. Newer designs sometimes have had a few LED "lights" that glow sequentially to show the approximate strength of the received signal. But the '8800 breaks new ground, standing head and shoulders above the competition. The '8800's indicator measures signal levels digitally in no less than 31 liquid crystal display (LCD) increments. The height and width of each bar-increment increase simultaneously with signal strength, so readings resemble an expanding and contracting triangle. Quick, accurate readings, using either the SWL's SINPO code or the more traditional "S" units, are a snap.

The receiver has a dual-time-zone clock with daily on-off cycles, as well as a "sleep" switch to shut off the set after a period of time. Alas, the clock/timer digital display is shared with the frequency readout; you can read one or the other, but not both at the same time. The clock displays hours and minutes, but not seconds.

A timer can switch the receiver on and off a number of times each day to permit automatic recording of programs for playback at more convenient times. But what if those programs are broadcast by different

stations? In that situation, a timer offers no help. It cannot automatically control such non-time factors as frequency or reception mode. For that, Yaesu will be offering an exotic extra -- external computer control. With a personal computer and the optional "CAT" serial computer interface, the user nominally will be able to custom-program all sorts of sophisticated control applications, from expanded channel memories to automated shortwave listening.

Something else unusual at any price is that the single-sideband controls don't require that the tuned frequency be changed. This makes the '8800 unusually easy to use for exalted-carrier selectable sideband reception of shortwave broadcasts.

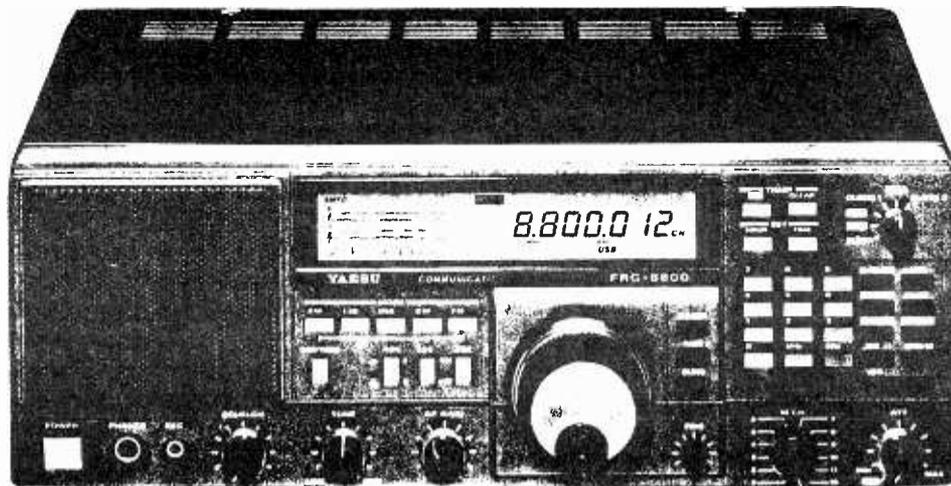
Dynamic range is fairly good -- markedly better than most comparably priced receivers -- though the '8800 is not as free from overloading as is the ICOM IC-R71. This favorable attribute has allowed Yaesu's designers to omit the usual step attenuator. A control labeled "ATT" is actually an IF gain control -- something of a throwback to vacuum tube sets -- which allows sensitivity to be adjusted exactly. It is a control with marginal usefulness, with a true attenuator or RF gain control being a more effective way of controlling such strong signal overloading as might occur. Audio quality generally is above average, though with a touch too much bass.

The '8800's controls are somewhat more logically arranged than those of the 'R71. Still, there are some relatively minor drawbacks: difficulty in telling whether certain switches are "in" or "out"; some problems with labeling and knob markings; and a few controls crowded together or inconveniently located.

On the Negative Side

With the sweet comes the sour, and the '8800 falls short in an important respect: It uses the same sort of modest bandwidth filters that have been found on inexpensive Japanese communications receivers for some years, now.

Two operator-selectable AM voice bandwidths -- as opposed to three on the FRG-7700 that was replaced by the '8800 -- are provided. In the single-sideband mode, also used for ECSS reception, only the narrower is usable. The 8.3 kHz "wide" bandwidth is so wide as to be all but useless for reception of shortwave broadcasts. The 3.8 kHz "narrow" bandwidth is too narrow to serve as a "wide"



shortwave broadcasting filter, yet is somewhat wide for either conventional or ECSS reception of shortwave broadcasts. The '8800 thus is effectively left with only one useful shortwave bandwidth.

Image rejection, on at least some samples, is also disappointing. Although the '8800 is a dual-conversion receiver, the 455 kHz second IF rejection can be so poor that you can hear "repeats" of powerful signals 910 kHz below the fundamental signals. So, RCI's 49-meter-band signal on 5960 kHz pops up not only where it's supposed to be, but also on the 60-meter channel of 5050 kHz. Of course, if you're trying to hear a broadcaster on 5050 kHz, this is definitely going to be a problem.

Available Modifications

Outboard preselection can upgrade image rejection by another 15 dB or so. One preselector that is above average in reducing 910 kHz images is the \$99.50 Mizuho SX-3 (Mizuho Tsushin Co., Ltd., 2-8-6 Morino, Machida City, Tokyo 194, Japan; ACE Communications, Inc., 22511 Aspan Street, Lake Forest CA 92630 USA); another is the Palomar P-308 or P-305 (Palomar Engineers, Box 455, Escondido CA 92025 USA).

And dealers such as EEB and Radio West (3417 Purer Road, Escondido CA 92025 USA) modify the '8800 with more-suitable voice bandwidth filters. We checked out an EEB-modified '8800 with a 2.4 kHz mechanical filter (\$95, installed) in place of the factory 3.8 kHz ceramic "narrow" filter and found ECSS and SSB selectivity much improved, but AM reception "muffled" except for DX purposes. Replacing the "wide" filter with one that is narrower with improved skirt selectivity would compliment this by allowing for an equivalent improvement in regular AM reception. *No such modification was available during the test period for this report, but such options may become available in due course.*

Good Overall Performer

In other respects, the '8800 is more than satisfactory.

Frequencies are selected by either keypad entry or conventional tuning knob. The '8800 also has programmable channel memories and a

scanner. Scanner circuitry, useful in a VHF monitoring set, is less successful in a shortwave receiver. Fading confuses the "stop" function. And the vagaries of propagation make any single channel choice chancy, since the scanner cannot differentiate among the signals it is acting upon. On a given night, the automatic tuning device might lock in on the BBC from England on 5975 kHz, yet the next evening would find Colombia's Radio Macarena covering the BBC on that same channel.

The scanner could be helpful to the listener wishing to listen regularly to the programs of such multi-frequenced major broadcasters as the BBC. With a series of BBC World Service frequencies punched into the memory, the receiver will scan the selected channels until it finds a signal exceeding the threshold level for satisfactory listening. Unfortunately, if that signal should later fade out, the scanner will remain locked onto the then-empty frequency until manually commanded to continue scanning.

Automatic resumption of the hunt for a more suitable frequency would have been a design plus. Keypad tuning requires that the decimal point be entered between the megahertz and kilohertz digits. While this is a slight complication when going from one MHz range to another, it actually simplifies matters when changing frequencies within a band, since only the kHz digits need be entered.

The single-sideband controls generally don't require retuning the frequency when going from upper to lower sideband -- a convenience. Still, slight repeaking of the poorly-marked fine-tuning control can be helpful. The FRG-8800 is particularly easy to use for ECSS tuning of shortwave broadcasts. Yaesu carefully explains how to do this in the comprehensive and well-written owner's manual.

The receiver is quite stable. Its frequency synthesizer is adequately quiet for most applications, although it is not in the same league as that of the more costly IC-R71 or Japan Radio NRD-515 and NRD-525.

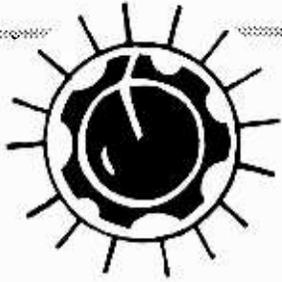
The '8800 has a very effective noise blanker with two settings -- narrow for auto ignition or other pulse-type noises, and wide for the interference

RDI Scale of Overall SWL/DX Performance

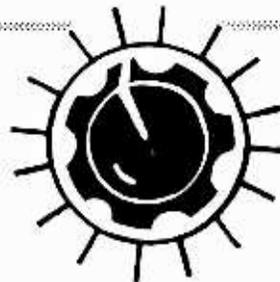
- ***** Superb
- **** Excellent
- *** Very Good
- ** Good
- * Fairly Good

Larry Magne's equipment reviews are conducted independently of Monitoring Times. The views expressed herein are not necessarily those of the staff and management.

MT



BEHIND THE DIALS



ICOM WIDEBAND VHF/UHF ANTENNA

In general, scanner antennas tend to be made of cheap aluminum; not so with the new AH-7000 "Super Wideband Omnidirectional Antenna" from ICOM. Basically a 16 element (eight disc and eight radial) discone, the AH-7000 elements are made out of rugged stainless steel, yet it weighs only about two pounds.

Equipped with over 40 feet of low-loss coaxial cable (weather-booted type N connectors included), the discone is designed to match the wide tuning range of the new ICOM R7000 receiver (25-2000 MHz), although the antenna specifications are given for only 25-1300 MHz.

Since no antenna—even a discone—can have a frequency range this broad without tricks, the AH-7000 is a hybrid, utilizing a loaded vertical whip for the lower frequency range.

The nominal impedance of the antenna is 50 ohms and it may be

used for transmitting up to 200 watts of power in the amateur 50, 144, 430, 900, and 1200 MHz bands. Due to its inherent broadband nature, it would probably work as well in the commercial and government high and UHF bands.

Assembly

While assembly is easy since the AH-7000 uses carefully machined parts, one must follow the instructions exactly as numbered to avoid frustration.

When ready to mount the antenna on a mast, two extruded aluminum brackets are slipped over the support tube and tightly locked into position by two screws, the nuts of which are placed on the side of the brackets which are formed to hold them in place while the screw is turned. Nice touch, but unmentioned on the sketch.

How Well Does it Work?

An elaborate series of experiments was conducted switching an ICOM R7000 receiver between the ICOM AH-7000 discone, the Grove ANT-5B OMNI, and the Grove ANT-1B Scanner Beam. Frequencies from 25 through 1100 MHz were tested for comparative received signal strengths.

In virtually every case, the ICOM discone outperformed the OMNI, and in some rare cases equalled the Scanner Beam in its favored direction.

Curiously, the discone's performance was not impressive at our location in the 60-80 MHz, of minimum interest to most monitors except for the 72-76 MHz low power services.

Of considerable importance was the consistently higher signal levels registered when using the AH-7000 compared with the reference antennas. On low (26-55 MHz), high (108-174 MHz), and UHF (406-512 MHz) signal strengths were nearly always higher on the ICOM discone. Reception of 225-400 MHz military aircraft was excellent.

We can learn several things by these experiments. First, different locations on the same roof will yield different results; second, height is not always as important as location;

third, metal masts play an important part in altering the performance of an antenna alongside it; and fourth, the quality of coaxial cable is important, especially when using long lengths (more than 50 feet) at UHF (above 300 MHz).

The lesson is simple: Move the antenna around while someone checks signal strengths on various frequencies, and use the shortest length of low-loss cable that will bring the signals from the antenna to the receiver.

Some variances could be attributed to location or nearby reflective surfaces, but the message was clear: The ICOM AH-7000 is the best omnidirectional receiving antenna we have ever tested.

(ICOM AH-7000 wideband discone, \$89.95 plus \$3 UPS shipping from Grove Enterprises; also available from other ICOM dealers.)

Introducing the **CRITIQUE 800**

A SCANNER CONVERTER THAT ADDS 800 MHz, WITHOUT THE LOSS OF EXISTING FREQUENCIES

The CRITIQUE 800 features

- easy attachment to scanner's 12 volt power source
- compatibility with all UHF crystal and programmable scanners
- sensitivity of .5 microvolt
- supplied with connection coax cable, power cable and antenna
- attractively styled metal cabinet with LED light
- 90 days parts and labor warranty

Price: \$99.95 plus \$3.00 shipping and handling, Illinois residents add 6% sales tax. C.O.D., check, money order, Visa and Mastercard accepted. (personal checks allow 14 days for processing)

CRITIQUE ELECTRONICS
21 4th Street, Downers Grove, IL 60515
(312) 963-4841 Dealer Inquiries Invited

(Yaesu FRG-8800, cont'd)

caused by the infamous Soviet "woodpecker" shortwave radar system. The blanker does not degrade dynamic range, although the manual correctly advises that it be switched off when not needed to combat noise problems.

The receiver has capabilities outside the shortwave range, although sensitivity within the longwave and mediumwave ranges is considerably less than on shortwave. This is fairly common with most shortwave receivers and helps reduce the possibility of local stations "breaking through" into the shortwave spectrum. Additionally, one version of the model -- the FRG-8800V -- has an inboard VHF converter covering the 118-174 MHz range, albeit with some spurious "birdies" noted throughout the tuned range. However, the standard '8800 can easily be retrofitted with the FRV-8800 VHF converter to receive 118-174 MHz signals.

Yaesu Musen Co. Ltd. (C.P.O. 1500, Tokyo, Japan, or Yaesu Electronics Corp., 15954 Downey Ave., Paramount CA 90723 USA) has set a suggested retail price of \$599.95 in the US for the basic FRG-8800. With most flaws correctable, this receiver is worth serious consideration for shortwave listening. Δ

New from Grove Enterprises

GROVE POWER ANT III

Apartment dwellers looking for an effective indoor antenna should rejoice at the new PRE-3 preamplifier and ANT-6 Hidden Antenna package from Grove Enterprises.

The PRE-3 "Power Ant III" replaces the popular ANT-4C "Power Ant II" no longer in production. Let's take a look at the improvements.

With increased interest in the 800 MHz cellular band, the PRE-3 has been totally redesigned to give additional boost there at no sacrifice at lower frequencies.

Actual lab tests show the PRE-3 usable from about 10 kilohertz through above 1100 megahertz (the limit of our signal generator). Gain figures showed 30 dB at 1 MHz; 28 dB at 30 MHz; 21 dB at 150 MHz; 13 dB at 450 MHz; and 10 dB at 900 MHz. Noise figure for the transistor used in the circuit is under 2 dB through about 1000 MHz.

Two output connectors are provided on the PRE-3 for simultaneous operation of two receivers. Scanners,



shortwave receivers, or a combination of each may be used together.

Some interaction between the two receivers may be observed in rare cases where an oscillator from one receiver is detected as a signal by the other receiver. This condition is called "lockup" in scanner lingo, and the PRE-3 literature discusses methods to reduce the problem.

Although some users may balk at the presence of TV-type F connectors on the PRE-3, they are extremely low loss and adaptors are readily available through Radio Shack discount chains and in the new CK2 adaptor packages from Grove Enterprises.

Although it would have been handy \Rightarrow

(Behind the Dials, cont'd)

for an interconnect cable to have been provided, it is difficult to know what combination would be necessary without knowing what radio the PRE-3 would be connected to.

The PRE-3 requires 12 volts DC power at about 40 milliamperes of current, readily available from an automotive battery line (Grove includes a DC cord with the PRE-3) or with a universal AC adaptor like the Grove ACC20 (\$9.95 in their new catalog).

A front panel gain control allows custom adjustment of amplification from the PRE-3 signal booster and has a switch to turn off the power as well. An LED pilot light indicates the on/off status of the preamp.

The gain control serves an additional function: If you are uncertain as to whether you are hearing a legitimate signal or intermod on a frequency, turn the control down; a legitimate signal will grow weaker, while intermod will grow stronger!

Our Test

Shortwave:

Even using a short antenna like the Grove OMNI or the new Grove ANT-6 Hidden Antenna, worldwide shortwave signals came booming in as though we were using an outdoor dipole.

As with any broadband (untuned) preamplifier, extremely strong signals (greater than S-9 +40 dB) produced minor intermodulation products (phantom signals heard on frequencies where they should not have been present).

Intermod was readily tamed with the use of a passive preselector like the Grove TUN-3 MiniTuner. Even without the preselector, the intermod should not cause problems when a small outdoor whip or indoor Hidden Antenna is used.

Occasional AC hum was heard at our location on some (not all) strong signals when using the PRE-3 and outdoor OMNI antenna combination; this situation changed with the weather and could have been attributed to insufficient grounding. Hum and its elimination are discussed in the PRE-3 literature.

If the PRE-3 is used in conjunction with a large antenna, a passive preselector like the Grove TUN-3 MiniTuner is mandatory to avoid excessive intermodulation from overload.

VHF/UHF:

Scanner enthusiasts will find the PRE-3 a good signal booster, especially for UHF targets or when used with an indoor antenna like the new Grove Hidden Antenna.

We experienced some intermod from strong shortwave stations popping up on the 30-40 MHz range of our scanner, but it was easily eliminated by making a small internal connection as recommended in the instructions.

The use of a broadband preamplifier is not recommended in large metropolitan areas, especially if connected to outside scanner antennas, or excessive intermod is likely to be encountered. Even then, appropriate filters like the Grove FTR-3 Scanner Filter may be employed to partially control the situation.

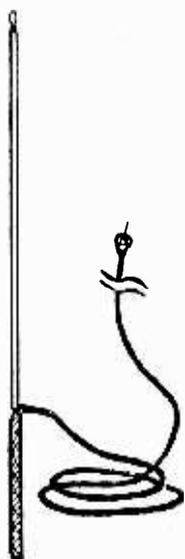
(PRE-3 Power Ant-III, \$39.00 plus \$2 UPS shipping from Grove Enterprises, P.O. Box 98, Brasstown, NC 28902)

THE "HIDDEN ANTENNA" - PRE-3 accessory for scanners and short wave reception

Based on the popular Grove OMNI outdoor scanner antenna design, the ANT-6 Hidden Antenna is a low profile flexible indoor wire antenna designed to be hung vertically from a wall corner, behind a curtain, inside a closet space--just about anywhere that is out of the way, yet accessible to radio signals.

We found that the relative placement was extremely critical for scanner listening--just a few inches one way or another could make the difference between strong reception and no reception at all. Much of this probably has to do with nearby metallic surfaces and housewiring.

Ideally, the Hidden Antenna should be placed on an outside-facing wall, away from electrical wires, pipes, ducts, and other metal obstructions. The new owner should find a temporary place, sample several favorite frequencies, and repeat the process until a permanent location is found.



On shortwave the relative placement of the Hidden Antenna is not anywhere nearly so critical; in fact, it may even be placed in a horizontal position and the 18 inch braid cut off (or taped back against the coax jacket) since it is only functional at VHF and UHF.

The Hidden Antenna is simplicity itself, made out of a single piece of RG-58/U coaxial cable, trimmed back to expose a 48" upper vertical section of insulated center conductor, and permitting an 18 inch length of braid to droop down as a ground plane (counterpoise) for VHF/UHF.

It is important that the two elements be in as nearly a straight line as possible with the coax cable leading away at a right angle. Approximately 15 feet of coax is provided, terminated in an F connector to attach to the PRE-3 preamp.

(ANT-6 Hidden Antenna, \$8.95 and free shipping when ordered with PRE-3)

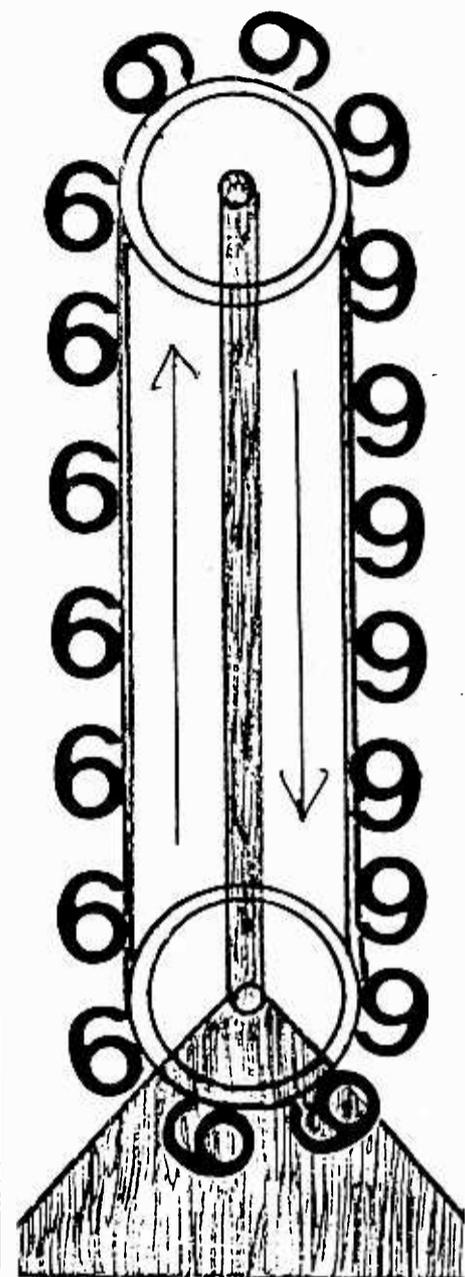
CONNECTOR/ADAPTOR KITS

Nothing is handier than having the right connectors to interconnect antennas, radio equipment and accessories. The new Grove CK2 series is designed to mate with virtually every imaginable combination you are likely to encounter hooking up radio equipment.

Three versions of the connector/adaptor kit are available: CK2-SC for scanner radios (\$11.95); CK2-SW for shortwave receivers (\$10.95); and the CK2-U, a large universal assortment for all types of equipment (\$19.95).

JOE STROLIN'S PERPETUAL MOTION MACHINE

Nines being greater than sixes and thereby heavier, this machine is self-starting, will always run, and will operate in only direction only.



Drug Interdiction Moves North

For the first time in history, a concentrated effort by the U.S. Customs Service, Department of the Treasury, has begun undercover operations in New York waters using high-speed patrol boats and aircraft from Long Island to intercept drug-laden vessels.

The tactics being used are similar to those proven in Florida waters, comprising in New York a sport-fishing yacht, two racing boats, a helicopter, and a twin-engine aircraft.

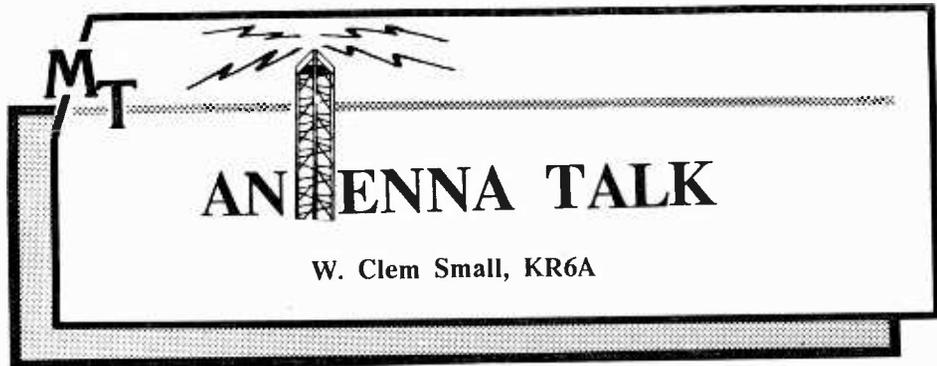
Although Florida officials in the past say that they intercept less than ten percent of the contraband chemicals coming over their shores, the heat has apparently moved smuggling operations further north, along the Carolinas and into New York Harbor.

Two of the new speedboats can chase suspect vessels at speeds of 55 miles per hour, while a third boat is equipped with a computerized radar system which can target its quarry and radio the other boats to zero in.

A Bell jet helicopter and a two-engine Beechcraft will be added to the squadron shortly.

Radio communications used by joint operations among the coast Guard, Customs, DEA, Navy, and other departments are heard frequently throughout the spectrum by alert listeners.

Single sideband messages are heard on shortwave frequencies, while narrowband FM is monitored on VHF/UHF scanners, usually in the 165 and 418 MHz ranges.



W. Clem Small, KR6A

VARIATIONS ON A THEME: The Halfwave Dipole

The halfwave dipole ($.5\lambda$ dipole) is a very basic element in antenna design and is heavily utilized in antenna engineering throughout the world of communications. There is a striking similarity between the basic $.5\lambda$ dipole antenna element, and various elements which go to make up the more complex antenna systems which literally seem to sprout from every cottage and skyscraper.

One of the most obvious examples of an antenna which utilizes $.5\lambda$ dipole elements as basic building blocks in its design is a Yagi-Uda television receiving beam antenna (fig. 1). The center element is a folded $.5\lambda$ dipole, and the other two (the reflector and director elements) are essentially simple $.5\lambda$ dipoles.

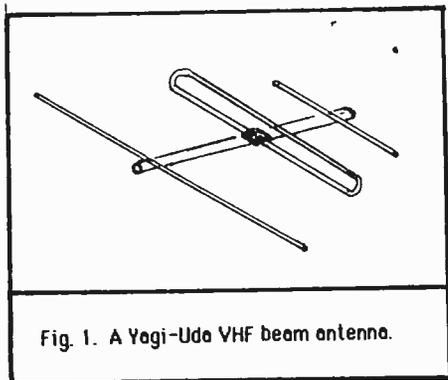


Fig. 1. A Yagi-Uda VHF beam antenna.

Hertz produced the first scientifically designed dipole 100 years ago, yet most of the antennas in use today are either composed of $.5\lambda$ dipole elements or are derived from the dipole element.

Antennas with such names as: groundplane, coaxial, Marconi, Zeppelin, J, colinear, and many others have evolved from a consideration of the function of combining $.5\lambda$ dipoles with other basic elements of antenna design, or with each other. Let's take a look at some of them now.

The Two Common Basic Antenna Types:

Many texts on antennas mention that the two most basic antenna designs are the Hertz (the $.5\lambda$ dipole) and the Marconi (the grounded $.25\lambda$ vertical). Historically, we know that the Marconi derived from the Hertz, but have you ever considered the relationships shown in figure 2a through 2e?

Figure 2a shows the typical horizontally-polarized Hertzian dipole, $.5\lambda$ long, with feedline attached. Then in 2b we see that a dipole can be used as a vertically polarized antenna in contrast to the horizontal polarization of its orientation in 2a.

Now look at 2c and notice that the vertical dipole design has been varied by routing its feedline up the center of one leg of the dipole to connect at the center feed-point. This design, called the "coaxial antenna," avoids the problem of bringing in the feedline at the side, as in 2b, where it would interfere with the radiation from the dipole element.

Thus, starting from the basic horizontally polarized, and somewhat directional, $.5\lambda$ dipole, we see a derivation of the coaxial antenna with its nicely symmetrical, vertically polarized, non-directional radiation pattern.

Now check over figures 2b through 2e. Note that, from a straight linear or tubular element on the bottom half of the antennas in 2b and 2c, we have opened the tube up as though it were slit. In 2d we have opened the tube up bringing the radials out at a small angle to the feedline.

In 2e we have essentially made the radials into a flat or plane surface by bringing them on up to a right angle with the top element of the antenna.

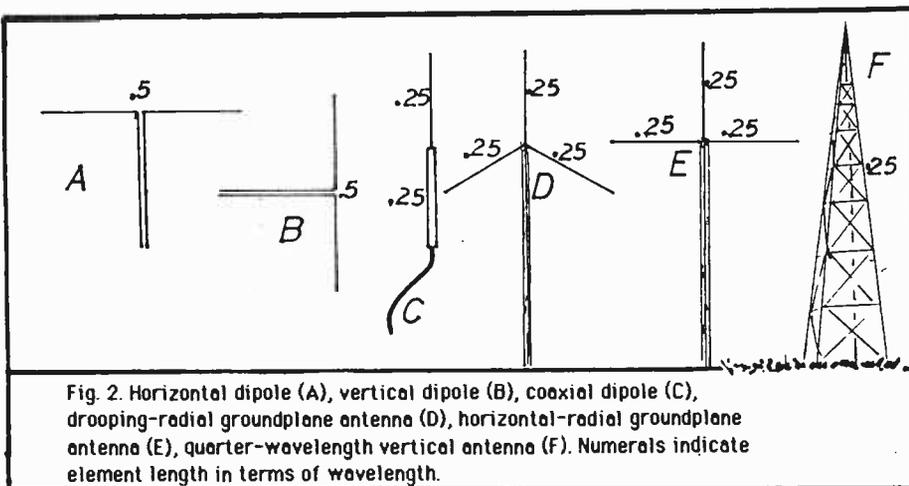


Fig. 2. Horizontal dipole (A), vertical dipole (B), coaxial dipole (C), drooping-radial groundplane antenna (D), horizontal-radial groundplane antenna (E), quarter-wavelength vertical antenna (F). Numerals indicate element length in terms of wavelength.

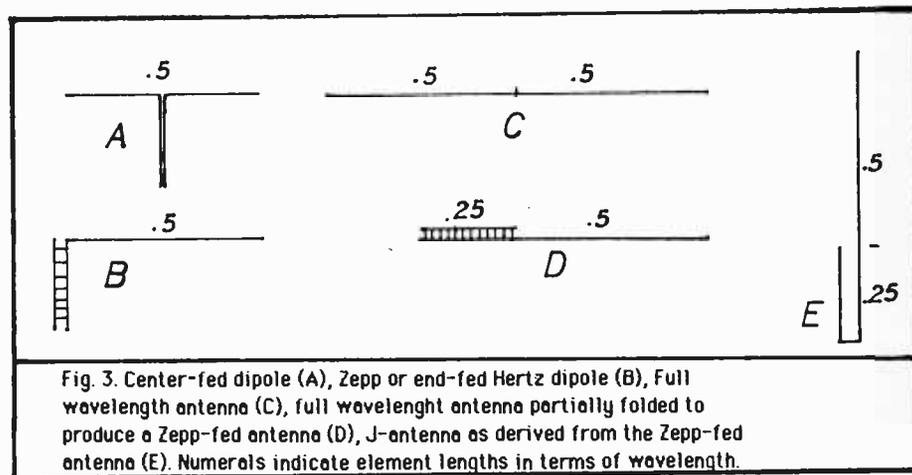


Fig. 3. Center-fed dipole (A), Zepp or end-fed Hertz dipole (B), Full wavelength antenna (C), full wavelength antenna partially folded to produce a Zepp-fed antenna (D), J-antenna as derived from the Zepp-fed antenna (E). Numerals indicate element lengths in terms of wavelength.

We still have a $.5\lambda$ total antenna length from the tip of the top element to the bottom of any radial.

At this point you may be able to guess what is to be said about broadcasting tower 2f. Although this vertical antenna is drawn on a more reduced scale than the other antennas in figure two, you can imagine that the earth or ground replaces the radials of 2e, and thus the "groundplane" on which the antenna is mounted is actually made of "ground"!

This is the Marconi $.25\lambda$ vertical antenna, in which the earth appears to substitute for the radials of antennas 2d and 2e. However, antenna texts will tell us that the earth acts as a reflector or mirror to the $.25\lambda$ earthed antenna in this case and, in a sense, furnishes the "other $.25\lambda$ " of the Hertzian $.5\lambda$ antenna.

So you see all of the antennas in figure two are related, in the theoretical sense at least, to the $.5\lambda$ dipole with which Hertz started us off. Historically, they didn't come in the order shown, but the relationships discussed above are more easily approached in the order we've outlined.

Changing the Feedpoint:

The feedpoints of the antennas discussed above are all said to be "low impedance"; that is, attaching the feedline at the center of the $.5\lambda$ dipole element introduces the signal into the antenna at a low impedance point, nominally, 50 ohms. For optimum power transfer, we use transmission line of a similar low impedance with such antenna connections.

One such connection is shown in figure 3a. Compare that feedline attachment to the one in 3b where the same antenna element has been fed at the end, rather than the center.

Feeding a $.5\lambda$ dipole at either end applies the signal at a high impedance point on the antenna, and thus requires a high impedance feedline (see figure 3 and 4).

If we end-feed the $.5\lambda$ antenna of figure 3b with a $.25\lambda$ of feedline, it becomes what we commonly call a "Zepp-fed" or "Zeppelin" antenna. When fed with other than $.25\lambda$ of feedline, it is called an "end-fed Hertz." The Zeppelin antenna and

end-fed Hertz are two more examples of the $.5\lambda$ dipole!

An interesting derivation of the Zepp feed is as follows. Consider two elements $.5\lambda$ connected together as in 3c to make a 1λ "long-wire" antenna. If we feed the signal to this antenna at the center-feed position of the left hand $.5\lambda$ element of the antenna, the entire antenna will take energy and radiate as a 1λ antenna.

Let's play a trick on this skywire now. Let's take the end of the antenna, just left of the center feedpoint, and fold it over to the right as shown in 3d. We've added some spacers to it so that it looks like "ladder line." In fact, that's just what we made: We took a $.5\lambda$ dipole and folded it into a $.25\lambda$ section of ladder line.

If you will notice, we have also made a Zepp-fed antenna at the same time. All that is needed to show this identity is to bend the antenna at 3d to look like that at 3b, and our Zepp becomes obvious! So, the Zepp antenna is really built from two $.5\lambda$ dipoles, or from one $.5\lambda$ dipole and a $.25\lambda$ of transmission line, whichever way you prefer to think of it!

If we leave the antenna of 3d straight, but rotate the whole antenna 90° , it becomes the J-antenna found in VHF mobile work (3e).

Are you convinced yet of the utility of the $.5\lambda$ dipole in antenna design? Let's take another set of examples for good measure!

The Colinear Beam:

Look at figure 4a. Yep, we're starting off with an end-fed Hertz again. Now, let's add another $.5\lambda$ dipole as shown in 4b. This produces what is sometimes called "two half wavelengths in phase," or the well known "colinear" wire-beam antenna.

If we add a shorted $.25\lambda$ line and another $.5\lambda$ dipole to our antenna as in 4c (sort of like adding a Zepp-fed antenna to one end of our colinear), we now have three $.5\lambda$ s as in phase, creating a directional beam with more gain than that of 4b. We can go on in a like manner, adding more shorted $.25\lambda$ phasing stubs and more $.5\lambda$ dipoles for more directivity and more gain, but you get the point. Incidentally, this antenna is also known as a "Franklin" after one of

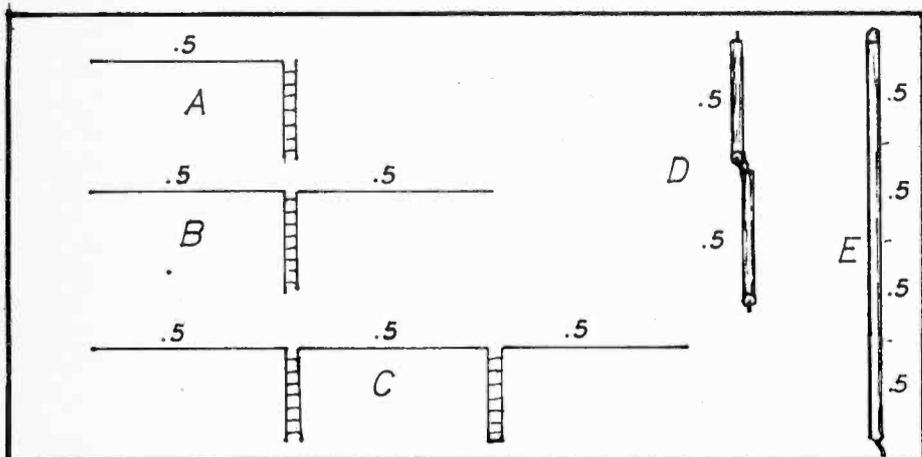


Fig.4. End-fed Hertz antenna (A), colinear antenna (B), colinear antenna with three halfwave dipoles in phase (C), hook-up technique to keep in-phase relationship on half-wave elements made from coaxial-cable (D), Commercial colinear antenna with several coaxial dipole elements enclosed (E). Numerals indicate element lengths in terms of wavelength.

(Antenna Talk, cont'd)

Guglielmo Marconi's engineers who designed it.

Of course the colinear can be made with vertical polarization also. Figure 4d shows a technique of cross-connecting coaxial cable $.5\lambda$ dipoles such that they constitute a colinear antenna without the use of $.25\lambda$ matching stubs.

Figure 4e is a commercially-made colinear vertical antenna sealed in a fiberglass tube. You see many of these atop utility base stations these days. They are nondirectional toward the horizon, beam their signals close to the ground to contact their mobile units for considerable gain over a traditional groundplane antenna.

Summary:

The $.5\lambda$ dipole, first recognized by the scientific world almost 100 years ago, is still a very basic element in today's antenna design world. If you have any remaining doubt about the topic, just pick up any good antenna manual and thumb through its pages. With a little attention to the techniques discussed above, you should be able to recognize the ubiquitous $.5\lambda$ dipole rearing its head on almost every page!

RADIO RIDDLES

Last Month's Radio Riddle:

What communications concept do the initials LUHF represent? One hint told you that the UHF in LUHF did not stand for ultra-high frequency. In fact, LUHF is from HF work rather than UHF.

If you recall from a past "Antenna Talk" column, one of the ionospheric layers (the D-layer) absorbs HF signals to some degree as they pass through it in ionospheric communication. The lower the frequency, the greater the absorption.

The state of this D-layer puts a lower limit on HF skywave communication. That lower limit, or "lowest useful high-frequency," is abbreviated as "LUHF."

This Month's Radio Riddle:

There are two parts to this one: First, from what does the name "dipole" derive? And second, at times you may see the $.5\lambda$ dipole referred to as a "doublet" antenna. Is this a correct use of that term?

Answers next month. And again, write and let me know what antenna related articles you'd like to have covered in this column. I'll try to oblige where possible. For now, 73.

MT FAMILY ALBUM: Wiley Clemon Small

Clem Small has written for *MT* since 1984, imparting his wisdom in a number of radio-related subjects including antennas and history. Equipped with an Extra class amateur radio license (call sign

KR6A), Clem has done radio and electronics work for the military and for industry.

Having earned many credentials in physics, chemistry and mathematics, Clem has gone on to acquire a Ph.D. in experimental psychology, a field in which he presently teaches communications skills at California State University at Hayward.

We are proud to have Clem as a columnist for *MT* and are pleased to acquaint our readers with his special talents.



MT COMPUTER CORNER

C.W. Ellis
P.O. Box 202
Ulster, PA 18850

Keeping Secrets: COCOM

This month I'd like to unravel some little-known yarns about a high-tech security measure. Have you ever heard of a government concern called COCOM? No? Read on!

COCOM (the Coordinating Committee for Multilateral Export Controls) is headquartered in Paris, France, where it was started in the early 1950's to thwart the export of high tech information and hardware to Communist Bloc nations.

Interestingly enough, computers and software were high on the Soviet wanted list, right up there with satellite communications, laser technology and specialized radio antenna systems.

It was rumored that in the mid sixties the number-one-wanted item was one of the supercomputers being developed by Cray Industries. Naturally, one reason for wanting the Cray was for weapons systems design and testing, complete with simulated wars of all types.

Now the Cray supercomputers are monster machines as far as computing power goes, and not something you load on the back of a pickup truck to move. Obviously, getting your hands illegally on one of these is more difficult than stealing a crate of light bulbs from a warehouse. Not that the Russians wouldn't have paid top dollar for one, but no one was supposed to sell them one under any circumstances.

In the case of the super computer, I think they never did get their hands on one; but that didn't stop them from masterminding a great many schemes to spirit other technology out of foreign countries by whatever devious means fell to hand. Probably no one will ever trace all the components, drawings, machinery and ideas that wound up in Soviet hands and, from all indications, the well isn't dry yet!

Chicken Thieves?

Now comes the most unbelievable story yet - the equivalent of the owner of the candy store hiring a four year old to run it, or the farmer hiring a fox to guard the hen house.

In 1970 the Soviets decided a huge truck manufacturing plant was in order. With a railroad system already overloaded and a pressing need for diesel trucks, they planned a whole new city to contain the thousands of workers that would be needed to

build over 100,000 trucks a year. This ambitious project came to be known as the Kama River Complex.

Now this might not sound much like a raid on a hen house, but it opened the door to a whole raft of varmits. By the early eighties, over \$400 million dollars worth of western technology such as foundry capacity, assembly lines, design and engineering facilities, and so on were contracted for, with Washington's grudging approval.

One of the items supplied by the helpful Americans was an IBM 370 Model 158 mainframe computer. By no means a Cray class machine, it was still a heavyweight compared to most Soviet machines.

The collective world held its breath the day Soviet tanks rolled into Turkey; not too long after that the Soviets struck again, invading Afghanistan, and guess where the Soviet military got their trucks? Yep, from Kama River, where only peacetime agricultural vehicles were being produced!

Naturally, this touched off a controversy that ebbed and flowed for years among various American government bureaus and allied governments. There was and still is a great deal of friction between our own departments of Customs, Commerce and Defense.

No one can ever quite agree who should check, enforce, license, and attend to the thousand other details necessary to enjoin cooperation with other free world countries to halt the flow of high technology abroad.

Someone eventually got the bright idea to conduct PSV's (Post-Shipment Verifications) for equipment sold to a Communist nation. In effect, this was posting the fox at the hen house door. The intent was to check periodically that the high tech computer sold to the Russians last year was, in fact, being used as intended: for business, research, national health, or whatever.

We really believed that what was running the day the inspector showed up was the same stuff that had been running for the previous month. Bosh! In most cases the inspector wasn't even allowed in the facility to inspect.

This was like selling you a paring knife with the stipulation that you only peel carrots with it. To make

sure you comply, I send an agent around once a month to see that you are in fact peeling carrots! So much for PSV.

If You Can't Buy It...

All this equipment was sold legally to the Soviets with American blessings, but illegal transfers make spy stories sound tame. An incident in 1977 involving a California manufacturer called AMD (Advanced Micro Devices) will illustrate the point.

A Swedish company called Datsaab had a contract to overhaul a Russian air traffic control system used in several major Soviet airports. Datsaab bought the needed integrated circuits from AMD, but Washington refused re-export licenses for the chips to be used in the Russian equipment, so Datsaab had the chips sent to another Swedish electronics company.

This company "tested" the chips and added a /R to each part number. These "Swedish" chips, then placed in the Russian air traffic control systems, played an important part in the Afghanistan invasion in 1979.

After everyone who was anyone in government had a turn at negotiations, the whole ball of wax wound up in a criminal court. Participating were both the Justice and Commerce departments. When the dust settled, the court ruled that the components had been illegally exported and played an important part in the upgrading of Russian

military air traffic control. In 1984, as a result of that finding, Datsaab was fined a mere \$3,120,000.

The Rock and the Hard Place

A lot of pressure is brought to bear on free world companies when they are told by COCOM or their respective governments that they have to forego sales to Communist countries. It is hard to look a million dollar sale in the eye and say no. What makes it even harder is the knowledge that another manufacturer may get the sale anyway.

A company that wants to sell a high-tech item to a Soviet Bloc customer must prove that the same type equipment is available within the Soviet Bloc, or is not of a nature to aid military development, production or capacity.

The goal with all the licensing, restrictions and sales basis to deny the Soviets and their allies the ability to copy, reverse engineer or engage in the production of any of the newest and fanciest stuff the free world has developed. It matters not what the technology is. There are people out there who want everything from hydraulic pumps to the latest in computer hardware. Believe it or not, some of the computer stuff you and I as Americans can walk into some sales office or distributor's warehouse and buy with no questions asked is in high demand in Communist countries.

"Communications"

by Don deNeuff

Telecommunication is usually considered to embrace the transmission and/or reception of information, ideas, instructions, or inquiries from one person or point to another person or point. The majority of conventional telecommunication is carried out through the human sense of sight and/or sound involving signals of various types. There are, or have been occasions where the sense of touch, smell, or taste is utilized.

The "reading" of Braille symbols through the sense of touch by a blind person is an example. The injection of oil of peppermint into compressed air lines in mining operations quickly reached the noses of the drill operators underground where high noise levels and restricted illumination and sight are common. It is the emergency signal alerting miners to immediately evacuate the tunnels.

"Taste communications" were sometimes conducted by Morse operators not having at hand the customary instruments by placing one line conductor and one "ground" connection in the mouth on the tongue. The off-and-on flow of current keyed in Morse code produced sharp acid-like tastes which could easily be read by an operator! (*Shocking! Is that why Morse code leaves a bad taste in some people's mouths?...Bob*)

Telecommunication can be of the simple, fixed "pre-arranged" type, whether by means of sound or sight. An example is a railroad or vehicular traffic signal - its ability is limited to simple instructions - "stop," "caution" or "proceed." Some systems are comprised of only a warning or identification signal - such as that provided by a lighthouse or air-raid signal.

Most types of telecommunications involve the use of a "code" - an established signal system - whether it be in a form of telegraphy, the spoken word or information in some visual form. You are reading (and understanding, I hope) what I am writing here because you are skilled in the "code" of the written English language.

Some simple codes are, however, almost universally recognized - the color red or the symbol of a skull and crossbones usually signifying "danger," "beware" or "stop" - as does a raised human hand or arm. In vehicle operation the sound of a police siren conveys a message quite different from that of a conventional automobile horn.



NEW!

POWER ANT III

The new Grove PRE-3 Power Ant has taken all of the best from its successful predecessors and combined them into one powerful signal booster for scanners, shortwave and longwave receivers, even TV and FM radios!

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

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

USE WITH OUR FAMOUS TUN-3 MINITUNER FOR INCREDIBLE SHORTWAVE/LONGWAVE RECEPTION!

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Technical Topics

by Terry Staudt
4807 S. Blue Spruce Road
Evergreen, CO 80439

AT THE FLEA MARKET

So, you want to get started in shortwave but for 35 to 70 bucks or so? This isn't easy, but it can and is being done every day. You can sometimes stumble onto a REAL bargain through the newspaper when a widow sells her husband's radio gear.

A more likely place is the flea market, and since flea market season is in full bloom, we'll pass along some helpful hints on what to look for and what to do with it once you've got it.

Taking the above figures, with few exceptions, we're looking at a tube-type radio 20 to 40 years old, and new tubes, being made only for replacement, are very expensive.

The first thing to look for on a flea market find is obvious rust, damage and excessive scratches showing a gross lack of care or having been tossed in a junk box that's seen a lot of rummaging. You sure don't want something like that! Also, the low end units (radios prices have stayed remarkably constant since World War II) weren't any good to start with, so beware the Hallicrafters S-38, National SW-54 and Lafayette pieces.

Units in good condition that work well are the Hallicrafters SX-88 and all with large "double dials." The National NC-88, 98, 125, 190 and 183 D are quite ok. Stay away from the "HRO" models as they use plug-in coils which are a pain and, if one of them is missing, almost impossible to find. The Collins 51-J and R 390 are fine, as are the Hammarlund HQ-160, 180 and SP-600.

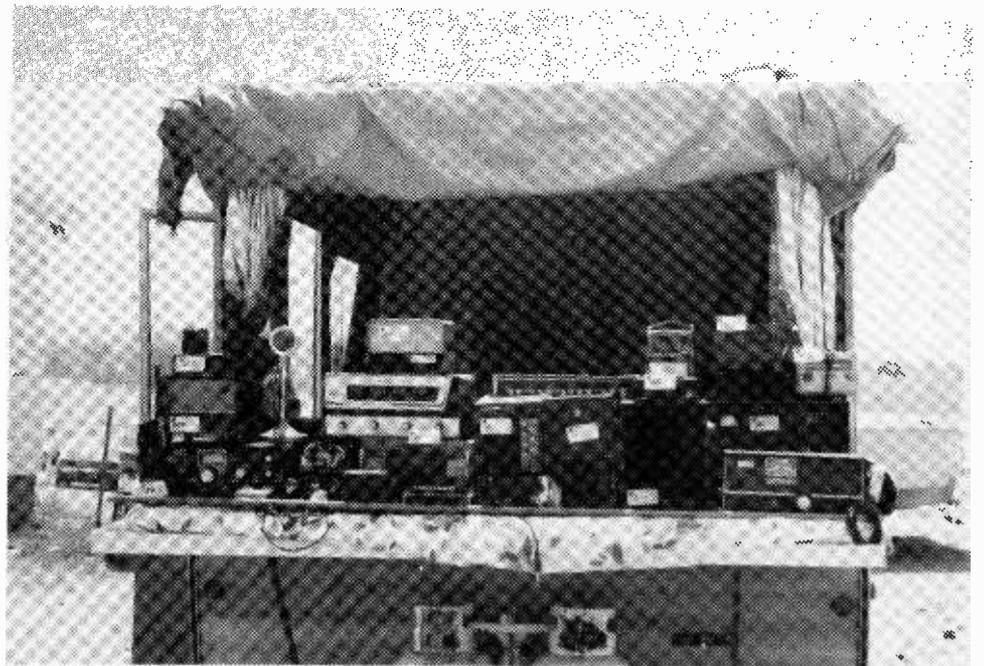
The Realistic (Radio Shack) DX-150 and 160 are solid state and work extremely well. There are others, such as the Heathkit SB-303 (international shortwave only) worth considering. However, if at all possible, have the seller give a small "live" demonstration! Once you've gotten what you feel is "it," the first thing to do is unplug the AC power cord, mark down the tube types on masking tape, unplug them and go check 'em. Mark any questionable ones with a felt tip pen and replace any showing a "dead" short or no filament (no meter reading at all).

Always be sure that the AC cord is unplugged when working with the circuitry. Lethal voltages are present!

Next, remove the case, or at least the bottom cover, to look for burned resistors or "white stuff" oozing from the electrolytic and other capacitors (the paper or aluminum "stand-up") units. This is normally no big deal, as replacements are usually around \$5.00.

Plug the tubes back in and be sure the fuse, if there is one, is the right size (about 3 amps). Turn the radio on and look for smoke, arcing in the tubes or any funny smell like burned roofing tar. If everything is OK up to this point, see if you can tune in your closest broadcast station. It should be at a good, strong level.

If the above checks out, tune for WWV at 2.5, 5, 10 and 15 MHz. Your dial will most probably show "Mc" and Kc". Same thing. If you hear WWV well, it's a safe bet you've got a winner.



Remove the speaker and take it to Radio Shack for a proper size comparison. Say your old speaker was a 3.2 or 4 Ohm unit and all you could find was one perfect in every way except it was 8 ohms. Not to worry. It's OK to go up in impedance, but not down. The reason to replace the speaker is simply because it's all dried out, probably "off center" and sounds like a tin can. Do not replace it with a speaker with a "whizzer" cone. This is a little cone physically attached to the main one to enhance high audio frequency reproduction. It's the last thing on earth you need since your radio is already full of hiss.

Burned resistors can usually be deduced with a strong lamp and a magnifying glass. Usually when one end is "lifted," they are found to have gone 10% high. After checking with an ohmmeter, replace with the next JEDEC value down and one watt higher to keep that from happening again. Many manufacturers were famous for using a half watt resistor in an 0.8 watt circuit!

Spray out the tuning capacitors with TV tuner "wash" and put a pin-point of oil on each end. If the tuning is sloppy, notice a spring attached to the capacitor tuning drum. There are usually three holes and putting the spring in the next closest hole to the shaft with a small pair of pliers will take up the slack in the dial cord.

There's a good chance that one or more of the pilot lamps are burned out or missing. Odds are they're #47s. If all your tubes start with "6," it's a sure thing. They, or others, can be obtained at Radio Shack very inexpensively (usually two for 59 cents).

There are many other things that you can do, such as touching up scratches by blending Pactra or Testors hobby paints to the right color and touching up the alignment for frequency accuracy and sensitivity.

The chances are excellent you didn't get a manual with the radio and the company that manufactured it (National, Hallicrafters, Hammarlund) is out of business. Don't give up! The adjustments are obvious to the qualified technician and Sam's Photofacts, "ham" repair facilities and local concerns that did warranty work back when the manufacturers were in business still probably have the information in their files.

A little sweet talking plus a buck will usually get you a copy -- at least you've found out where to get the job done.

If you follow these suggestions from start to finish, you may just be very pleasantly surprised with your \$30.00 shortwave radio. But there are other models and makes and the prices do vary widely. So it never hurts to take along a knowledgeable friend! Δ



THOSE 'SPARKLIES' ON YOUR SATELLITE TV PICTURE

How to identify 3700-4200 MHz out-of-band terrestrial interference

by John Wilson

When the subject of terrestrial interference (TI) is written or talked about, the terms "in band" and out of band" usually will appear. Obviously, in-band TI covers 3700-4200 MHz (the actual assigned transponder range is 3710-4198 MHz).

Out-of-band TI can be from various sources and, in some cases, be of a multiple nature. Some of the more frequently encountered interference sources are common carrier, government and military, radiolocation (radar), and operational fixed (private point to point). Figure 1 shows these services allocated various frequency ranges covering a considerable portion of the RF spectrum.

TI sources operating adjacent to 3700-4200 MHz seem to be the most common source of out-of-band TI. Next in unpopularity is the 2000 MHz range of common carrier and private point to point links and, to a lesser degree, TV relay transmissions. Fortunately, these latter types of transmissions frequently represent only temporary interference situations.

My data base indicates relatively few 2000 MHz common carrier users compared to the large number at 6000 MHz. The bad news is that both types of users geographically are situated broadly throughout the continental 48 states and, as you may have suspected, 3700-4200 MHz in-band common carrier users abound in 49 of the 50 states.

If your TVRO site is located near an airport or military facility then watch out: Government military radar and point-to-point links are active in the 1300, 7000 and 8000 MHz ranges. The FAA has a rather sophisticated microwave point-to-point network and radars in the 5000, 7000, 8000, and 9000 MHz spectrum portion.

"Government" listed under "Service" in figure 1 does not imply that government agencies are restricted to operate only in that particular frequency range. Departments of the Interior and Agriculture can be found with networks in the 1700 and 1800 MHz ranges.

50 state 3700-4200 MHz non-government common carrier transmit site point-to-point links with detailed frequency information is available from the author. Send SASE for details to: John Wilson, 6413 Bull Hill Road, Prince George, VA 23875.

Adding more confusion, under certain circumstances, private sector licensees such as government contractors may operate in government-assigned frequency ranges.

IDENTIFYING IN-BAND AND OUT-OF-BAND TI

Typically, out-of-band TI is characterized by all transponders appearing noisy when viewed on both polarizations of a TV satellite receiver. There appears to be a direct relationship between the degree of interference from the out-of-band frequency and the TVRO in-band frequency. The less the frequency difference, the greater the interference and vice versa.

If the worst affected transponder is 1, and 2 is better and 3 even better, then most likely the offending TI frequency is below 3700 MHz. Conversely, if the worst affected transponder is 24, and 23 is better and 22 even better, then most likely the offending frequency is above 4200 MHz.

If no appreciable change is observed in sparklie level from one end of the band to the other, then the offending TI frequency source is probably considerably removed from 3700-4200 MHz and, in most cases, will require special filtering.

With the breakup of AT&T, more common carriers such as MCI, GTE Sprint and others are spending millions of dollars in upgrading their present telcom and data distribution networks. The majority of this traffic will be relayed via satellite for long haul point to point. However, for regional/local downlink signal distribution terrestrially, more point-to-point links are being required.

Over the past 40 years, AT&T has spent hundreds of millions of dollars building their present terrestrial network and it would be unrealistic to think they would abandon such an established system. At best, reduced transponder loading could be expected on existing circuits for most AT&T links.

Many of the other common carriers are constructing new point-to-point in-band and out-of-band links, so the TI problem in the future will become worse before it gets better for C band TVRO reception.

The Frequency Assignment List (figure 1), though not absolute, will provide a handy reference and an aid in troubleshooting out-of-band TI situations.

Figure 1
Frequency Assignments

Band	Frequency (MHz)	Service
L	950-1215	Amateur Radio
L	1215-1350	Aeronautical Radionavigation (DME/IFF/TACAN) (Global Positioning System [GPS] downlink-1228)
L	1350-1400	Government (Military) (Point-to-Point)
L	1400-1427	Radio Astronomy
L	1427-1435	Industrial/ Land Transportation/ Public Safety/ Earth & Base Telecommand/ Fixed & Mobile Telemetry
L	1435-1535	Telemetry (MARISAT Downlink-1500)
L	1542-1543.5	Aeronautical and Mobile Satellite
L	1543-1558.5	Aeronautical Mobile Satellite (Global Positioning System [GPS] downlink-1570)
L	1558.5-1592.5	Aeronautical Radiolocation Land
L	1592.5-1622.5	Aeronautical Radiolocation Land/ Mobile (Collision Avoidance)
L	1622-1636.5	Aeronautical Radiolocation (MARISAT uplink-1600)
L	1636.5-1644	Maritime Mobile Satellite
L	1644-1645	Aeronautical & Maritime Mobile Satellite
L	1645-1660	Aeronautical Mobile Satellite
L	1660-1670	Radio Astronomy/ Radiosonde
L	1670-1700	Meteorological Aids (Radiosonde)
L	1700-1710	Space Research/ Meteorological Satellite
L	1710-1850	Government (Military)/ Government (Point-to-Point)
L	1850-1990	Operational Fixed (Common Carrier) (Private Point-to-Point)
L	1990-2000	TV Pickup (Studio Link/ TV Relay/ ENG)
S	2000-2110	TV Pickup (Studio Link/TV Relay/ ENG) (TDRSS Downlink 2000-2100)
S	2110-2130	Domestic Fixed Public (Common Carrier)
S	2130-2150	Operational Fixed
S	2150-2180	Multipoint Distribution Service (MDS)
S	2180-2200	Government (TDRSS uplink)
S	2200-2290	Space Research
S	2300-2450	Amateur Radio
S	2450-2500	Fixed/ Radiolocation (Police Radar-2455/ Microwave Ovens-2455/ (Private Point-to-Point)
S	2500-2690	Broadcasting Satellite/ Fixed/ Instructional Fixed Television Service (IFTS)/MDS/ Private Point-to-Point)
S	2690-2700	Radio Astronomy
S	2700-2900	Government (Military Radar) (Airport Surveillance)
S	2900-3100	Maritime Radionavigation
S	3100-3300	Radiolocation
S	3300-3500	Amateur Radio/ Radiolocation
S	3500-3700	Radiolocation
S	3700-4000	Domestic Public Fixed Satellite (Common Carrier) (SATCOM downlink)
C	4000-4200	Domestic Public Fixed Satellite (Common Carrier) (SATCOM downlink)
C	4200-4400	Aeronautical Radiolocation (Radar Altimeter)
C	4400-4990	Government (Military) (Point-to-Point)
C	4990-5250	Aeronautical Radionavigation (MLS 5000-5250)
C	5250-5350	Radiolocation (Police Radar-5255)
C	5350-5460	Aeronautical Radionavigation (Weather Radar 5350-5460)
C	5460-5470	Radionavigation (Weather Radar 5460-5470)
C	5470-5600	Maritime Radionavigation
C	5600-5650	Maritime Radionavigation/ Meteorological Aids
C	5650-5925	Amateur Radio
C	5925-6425	Domestic Public Fixed (Common Carrier) (SATCOM uplink) (Point-to-Point)
C	6425-6525	Common Carrier/ Land Mobile (Point-to-Point)
C	6525-6625	Operational Fixed (Point-to-Point)
C	6625-7125	Fixed Satellite/ TV Relay/ TV Studio Link
C	7125-7250	Government (Military) (Point-to-Point)/ Government (Point-to-Point)
C	7250-7775	Government (Military) (SATCOM downlink)
C	7775-7900	Government (Military) (Point-to-Point)/ Government (Point-to-Point)
C	7900-8000	Government (Military) (SATCOM uplink)
C	8000-8400	Government (Military) (SATCOM uplink)
X	8400-8500	Space Research
X	8500-9000	Radiolocation (Airborne Doppler Radar)
X	9000-9200	Aeronautical Radionavigation (Precise Approach Radar)
X	9200-9300	Radiolocation
X	9300-9500	Maritime Radiolocation/ Meteorological Aids (Weather Radar)
X	9500-10,000	Radiolocation
X	10,000-10,500	Amateur Radio/ Radiolocation
X	10,500-10,550	Radiolocation (Police Radar-10,525) (Gunnplexers) (Point-to-Point)
X	10,500-10,680	Mobile (Operational) (ENG)
X	10,680-10,700	Radio Astronomy
X	10,700-11,700	Domestic Fixed Public (Common Carrier) (Point-to-Point)
X	11,700-12,000	Broadcasting Satellite Fixed (Common Carrier) (SATCOM downlink)
Ku	12,000-12,200	Broadcasting Satellite Fixed (Common Carrier) (SATCOM downlink)
Ku	12,200-12,500	Fixed/ Satellite (DBS downlink) (Point-to-Point)
Ku	12,700-12,950	Fixed/ Satellite/ CARS/ TV Relay/ Studio Link (ENG 12,750-12,950)
Ku	12,950-13,200	CARS/ TV Relay/ Studio Link (ENG 12,950-13,250)
Ku	13,200-13,250	Fixed (Private Point-to-Point)
Ku	13,250-13,400	Aeronautical Radionavigation (Airborne Doppler Radar) (TDRSS downlink-13,775)
Ku	13,400-14,400	Fixed Satellite/Radionavigation (SATCOM downlink)
Ku	14,400-14,500	Domestic Public Fixed Satellite (SATCOM uplink 14,000-14,500)
Ku	14,500-15,350	Government (Military) (TDRSS uplink-15,000)
Ku	15,350-15,400	Radio Astronomy
Ku	15,400-15,700	Aeronautical Radionavigation
Ku	15,700-17,700	Radiolocation (Radar) (DBS SATCOM uplink 17,300-17,700)
Ku	17,700-19,700	Domestic Fixed Public (Common Carrier) (SATCOM uplink 17,700-17,800)
Ku	19,700-20,000	Fixed Satellite (MILSTAR downlink 20,000)
K	20,000-20,200	Fixed Satellite
K	20,200-21,200	Government (Military) (SATCOM downlink)
K	21,200-22,000	Domestic Fixed Public (Common Carrier) (Point-to-Point)/ Satellite
K	22,000-23,600	Domestic Fixed Public (Common Carrier) (Point-to-Point)
K	23,600-24,000	Radio Astronomy
K	24,000-24,050	Amateur Radio/Satellite
K	24,050-24,250	Radiolocation (Police Radar 24,150)/ Amateur Radio
K	24,250-27,500	Government (Military) (Point-to-Point)
Ka	29,500-30,000	Fixed Satellite (SATCOM uplink)

Ka	30,000-31,000	Government (Military) (SATCOM uplink)
Ka	31,000-31,300	Fixed (Private Point-to-Point)
Ka	31,300-31,500	Radio Astronomy
Ka	31,500-31,800	Space Research
Ka	31,800-36,000	Radionavigation (Radar)
Ka	36,000-36,800	Government (Military) (Point-to-Point)
Ka	36,800-40,000	Fixed (Private Point-to-Point)
V	40,000-41,000	Fixed Satellite
V	41,000-43,000	Fixed Satellite (Broadcasting)
V	43,000-48,000	Aeronautical Mobile Satellite/ Maritime Mobile Satellite/ Aeronautical Radio Navigation Satellite/ Maritime Radionavigation Satellite (MILSTAR uplink 44,000)
V	48,000-50,000	Radiolocation/Amateur Radio

RADAR ALTIMETER TERRESTRIAL INTERFERENCE

When satellite hopping, have you ever tuned slightly above transponder 24 and seen black horizontal bars over the white noise and sometimes heard a buzz in the audio? If so, then rest assured that the FAA and NOAA are on the job.

Your TVRO site is probably being zapped by scattered signal reflections of a weather radar altimeter transmission whose location may be in your local geographic area or hundreds of miles away. In the latter case, reception depends to a larger degree upon cloudy weather conditions.

The authorized frequency range for these out-of-band C band terrestrial interference sources is 4200-4400 MHz. Transponder 24 transmissions usually end about 4180 MHz, but the receive frequency allocation is to 4200 MHz which all TVRO receivers cover. 4200 MHz also is the beginning frequency of the authorized range for radar altimeter transmissions.

The weather radar altimeter concept is shown at figure 1. Transmissions usually are of a constant nature and provide the National Weather Service with an aid in primarily determining current cloud height cover for a particular transmitter site.

Even though the transmissions are vertical (90 degrees to the horizon) some of the RF energy

reflected from the cloud or clouds does not return directly to the receive antenna, but instead is scattered at different angles and headings toward the horizon.

Under certain circumstances a transmission may be seen and the next time there is no signal present, or a signal may vary in strength.

Identifying Radar Altimeter TI

Identification characteristics of a received radar altimeter TI transmission are:

1. Video and audio intensity may vary from slight to strong as the radar uplink signal encounters a more reflective cloud cover, then fades again as the cloud moves by the altimeter site.

2. Signal typically is noticed on higher-elevation look-angle satellites above 25 degrees, but may be seen on lower-elevation look-angle satellites if sufficient signal strength is present.

3. The uplink site may be located many miles away or locally within a few miles of the TVRO site.

4. If present, this type of signal normally will be seen slightly above transponder 24 and is more easily identified with receivers having continuous transponder tuning capacity. △

WEATHER RADAR ALTIMETER CONCEPT

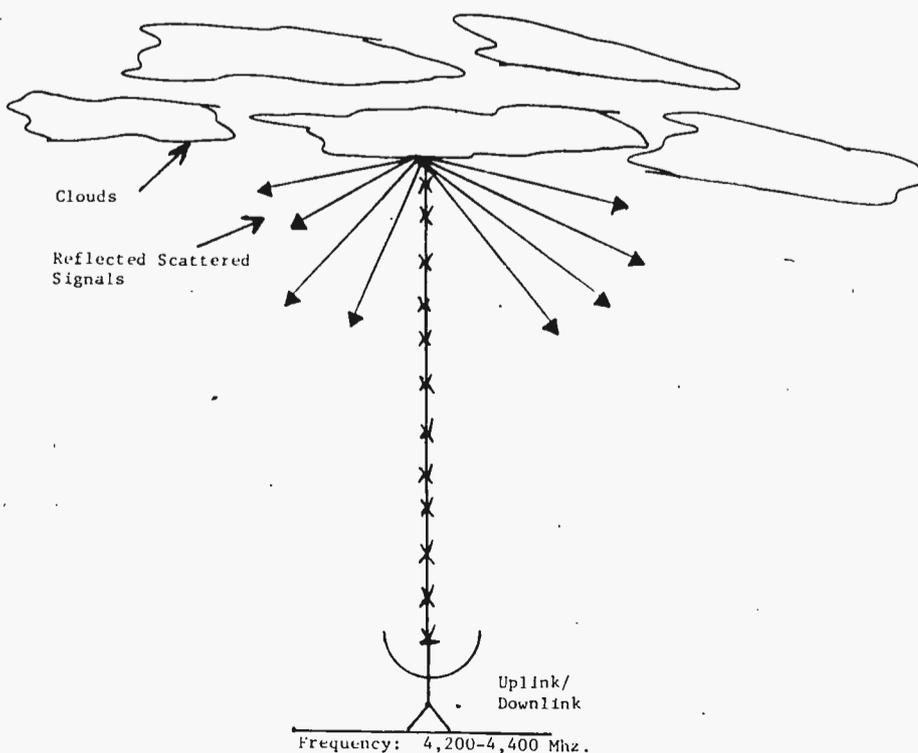
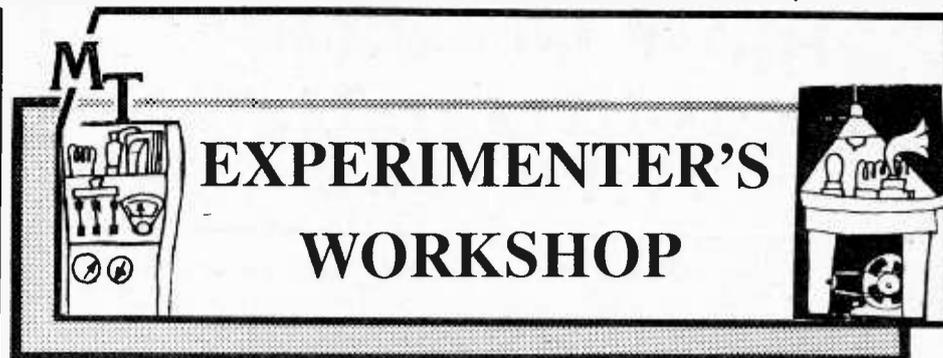


Figure 1



PREDECTION RECORDING: The DX Time Machine

by Craig Healy

(EDITOR'S NOTE: The following article illustrates the principle used by top secret agencies like NSA for recording the spectrum for later playback and analysis. So far as we know, this is the first time such a procedure has been covered in a hobby publication. We would appreciate comments and suggestions from our readers...Bob Grove)

Ever wish you could have perfect DX conditions year-round and 24 hours a day? Did you ever get distracted, miss an ID and wish you could do it over again? Here is a way to record the entire AM band off the air to get all that and more.

Parts Needed (see text)

- 1 VHS video recorder (unmodified)
- 1 Adapter box: Antenna to VCR
- 1 Adapter box: VCR to receiver

The History

Let me backtrack a bit, back to *DX News*, April Fools issue, 1983. On page 17 is a short article, "The Monday Morning Tape Recorder," presented as a humor piece. I tried it and it didn't work. The one missing bit of information was how to get the VCR to lock up on a stable speed. Without that stability it is impossible to tune in stations--they move around the dial at incredible speed, never staying in any one spot.

The Cure was as simple as adding a 60 Hz, 0.5 volt (rms) signal in with the RF spectrum. The VCR locked to it and everything was OK--almost!

The Limitations

The VCR and tape have limited dynamic range; put too much signal in and it overloads like a cheap receiver. Put in too little and the DX gets lost in the internally-generated noise. Mine works fine with a signal of about 10 mv/m, about S-10 on my Drake R7A receiver.

The MHW-591 is an expensive part, about \$80 at last check. It is very good and is highly recommended if you can afford it.

It is entirely possible that one of the new MM1C hybrid devices like the Avantek 0104 series or NEC 5205 would work as well if care is given to signal level settings.

MHW-591 specs: 36.5 dB gain from .5 to 150 MHz, usable to 200 MHz. It will put out around a half a watt relatively cleanly. The noise figure is

about 3.7 dB. Good construction practices are a must or the module will self-oscillate.

The RF choke and the .05 capacitor keep the 60 Hz and the RF where they belong. The 270 ohm resistor and the Aux. output are designed to work with my regenerative tuner (schematic at end for reference). They can be deleted if you don't need them. No parts values are critical.

The VCR to receiver interface is nothing more than a very simple high-pass filter (the capacitor) and a 30 dB pad (approximately) to prevent receiver overload. Its purpose is to lower levels to those that a receiver can handle and blocks the 60 Hz sync. signal.

In Use

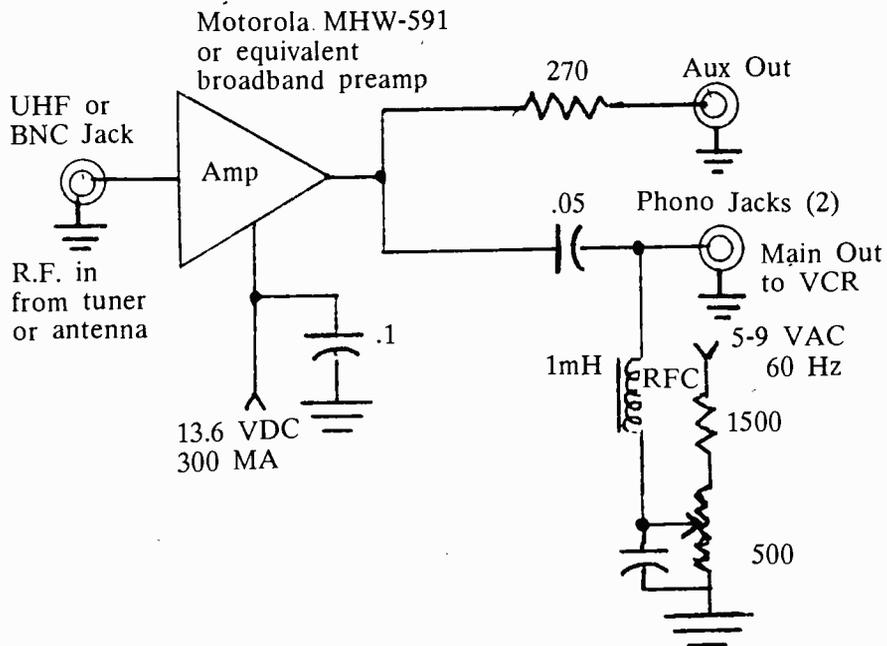
As a compromise between strong signals and weak DX, I limit myself to only a portion of the AM band. I have no strong locals above 920 at night so most of my DX is there. I can record from 1070 to 1600 with usable, DXable signals. You will have to tailor the signal levels and bandwidth to your location.

Thoughts

- Most VCRs have a built-in timer for automatically recording. Very handy. And the fast forward gets you from ID to ID quickly.
- If you go on vacation or a DXpedition then bring the VCR, record the band and DX later at home.
- Swap tapes with friends, particularly those in more exotic location.
- For a DX test, one VCR at a remote location and one at home doubles your chances.
- Buy a bunch of tapes and record the whole month of December for later dissection.
- Tune your radio to WWV and put the audio into the audio input of the VCR for a perfect time reference.

I have specified VHS; the Beta

ANTENNA TO VCR ADAPTER SCHEMATIC

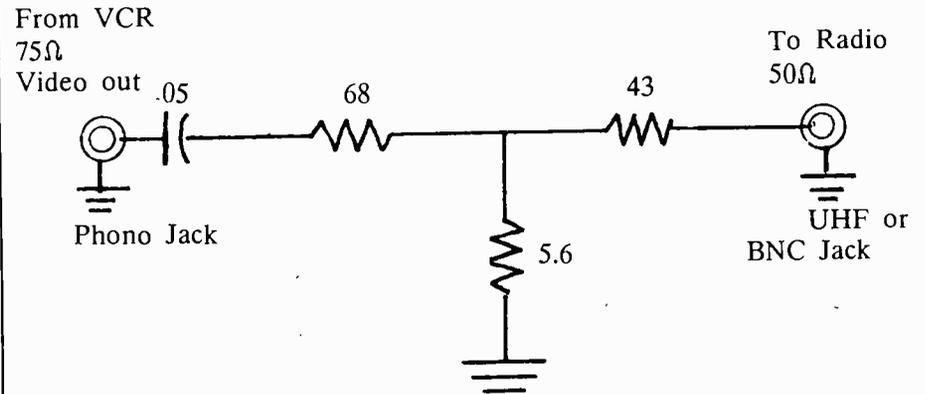


BOX: 3-3/4 x 3 x 2-1/8
LMB C.R.-332 or equivalent

Use power connectors to fit what you're using. A small plug-in power supply is a good source of 60 Hz.

Got a nifty project or fix that's worked for you?
Write to us to see if it might be of interest to other MT readers.
We'd like to hear it!

VCR to Receiver Schematic

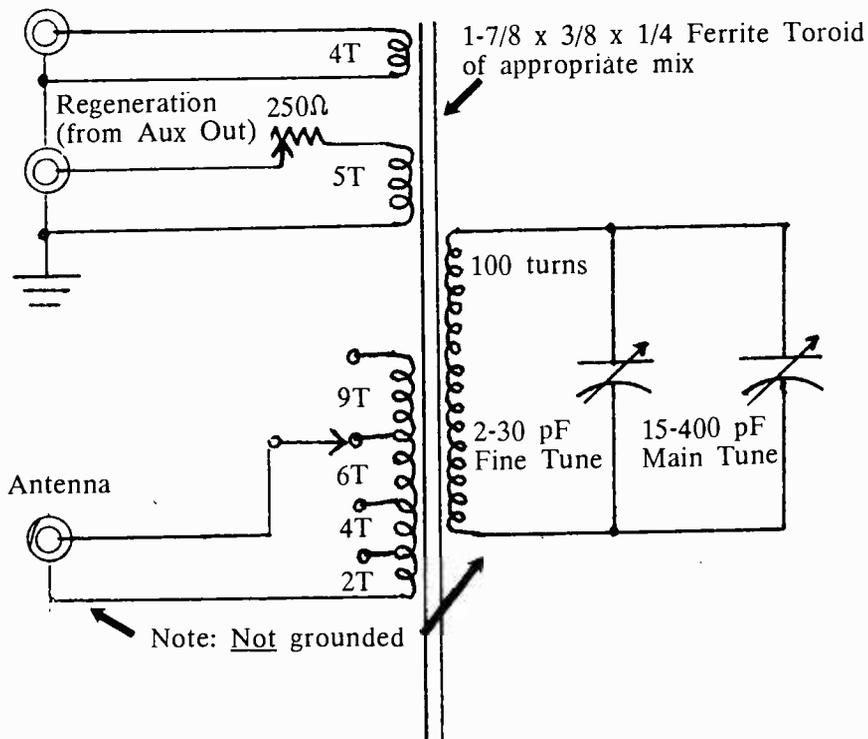


BOX: 2-1/4 x 1-1/2 x 1-3/8
LMB C.R.-211 or equivalent

format may be as good. I simply have not tried it. Nor have I tried every VCR on the market!

We hope this article will encourage experimenters to develop further this civilian method of predetection recording. What is the highest frequency we can record? How about switching in block converters? Let us know your findings!

Out to Radio or amp



REGENERATIVE TUNER SCHEMATIC

(Optional; included for reference)

Hook the tuner to the corresponding points on the antenna to VCR amp box, then peak the signal with the tuning. Bring up the regeneration control for more gain and peak the tuning again. Repeat until it brings the tuner/amp near the point of oscillation. It may be necessary to reverse the connections on the regeneration winding if proper results aren't obtained.

This particular tuner covers from 500 to 2000 kHz in one band. It can be padded down to work as low as 160 kHz. It's really sharply tuned down there and has been instrumental in some rare DX catches for me.

Regulated 12 Volts from your Car's Cigarette Lighter

by David Zantow, N9EWO

For any receiver (or transceiver) that operates on 12 VDC, it's always a great convenience being able to operate it directly off the car cigarette lighter socket without any DC converters. But there is always the possibility of transient surges or spikes from the car's electrical system getting in to it and destroying your prized electronic gear.

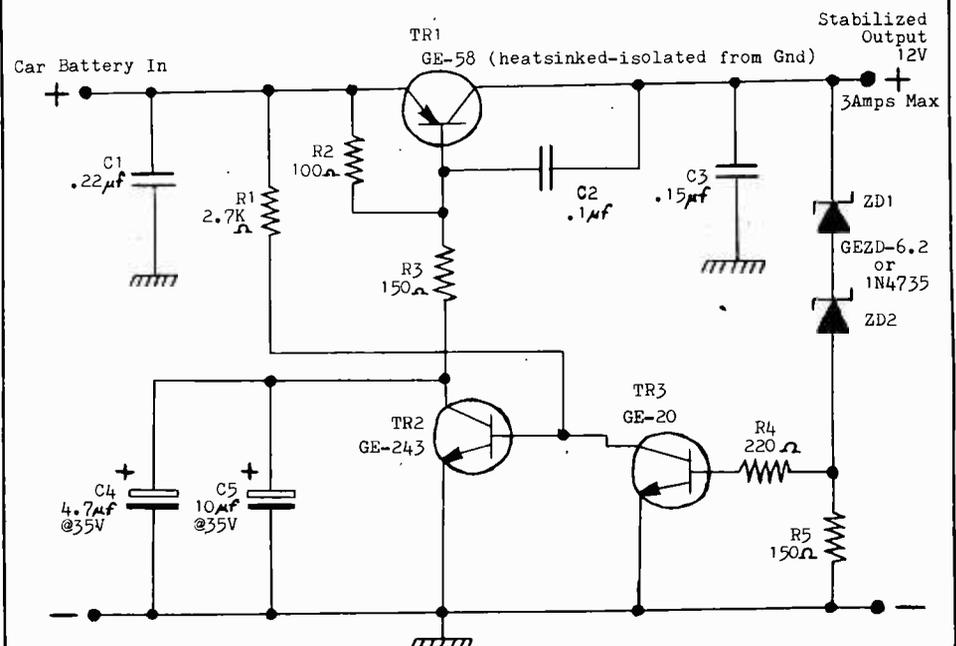
This circuit will give a nice, stabilized 12 volt output up to 3 amps current. GE general purpose transistors are specified, but electrical equivalents may be substituted.

TR-1 MUST be heatsinked. If you

use an aluminum enclosure, you may heatsink TR-1 inside on the case, but you must keep the device isolated from ground (negative). Use the proper mounting hardware--mica insulator, spacer, etc. A dab of heatsink grease on the back of TR-1 (just before mounting) would be advisable.

The importance of this stabilizer is greater with equipment that does not incorporate full or any internal regulation (handheld scanners, handie talkies, portable radios, etc.); but even with the internal regulation in some equipment, it's always nice to have one more stage of protection when using current from a car's electrical system.

CAR VOLTAGE STABILIZER



('Seeker', cont'd from p.27)

Like many other listeners I don't have the amount of time needed to devote to my monitoring hobby. Although digital-readout receivers and keypad entry and memory channels have made the task easier, 'SEEKER' is like a dream come true. Here are just a few examples.

International Broadcasting

In the international broadcasters mode you choose one of 26 broadcasters from a menu which indicates which ones are scheduled to be on the air at the current time (figure 2). The 'AUTOSEEK' function tests each available frequency for signal strength and consistency, selects the best one, and displays a monitoring control menu (figure 3).

If the signal fades, 'AUTOSEEK' will check all frequencies and tune to the best alternate. At scheduled transmitter changes, 'SEEKER' will make sure you are tuned to the highest rated signal.

If a sampled frequency is occupied by an unwanted station, that channel may be selectively toggled on or off by a function key. Under difficult reception conditions, pressing another function key will switch to either of two ECSS modes and automatically re-tune the receiver.

Utilities Monitoring

'SEEKER' scans over 100 internally stored marine channels, automatically testing both the ship and coast sides of communications on duplex channels. Additionally, 'AUTOSEEK' will scan all of the frequencies you have stored, stopping to monitor any frequency which appears to have communications activity (figure 4), and resuming when the activity ceases and after a waiting period you determine. When 'AUTOSEEK' reaches the last frequency in memory, the sequence restarts.

Individual function keys allow you to scan forward, backward, skip a channel, or return to the first frequency.

If you connect a tape recorder to the remote control jack on the ICOM, 'SEEKER' will allow unattended recording of activity on any of the channels you are scanning.

Mailbag...

Shortwave

Larry Miller, MT Broadcast Editor, P.O. Box 691, Thorndale, PA 19372.

The verdict is in. The new *MT* is a winner! According to your notes and letters, we've hit the mark and we're glad to find that you're enjoying the new magazine.

Charles Signer who is with the US Agency for International Development in Cairo says that "Your merger with *Monitoring Times* is like merging *The Smithsonian* with *Popular Mechanics*. I like both."

Otto Strauss of New York says that the new *Monitoring Times* is "informative, interesting and attractive."

"I finally received the first issue of the new *Monitoring Times*" writes Doug Tavender of Springfield, Illinois. "It was worth waiting for. I have read every article in it and I was impressed."

Doug would also like to write to any *MT* reader who operates "on the 1750 meter band." If you'd like to correspond with Doug, drop me a note at P.O. Box 691, Thorndale, PA 19063 and I'll pass along your name and address.

Jim Boynton of Newton, Massachusetts says that he "liked the first issue of your magazine but there's room for improvement." Jim complains

about the use of the abbreviation EST in the frequency section when it should be EDT. "I hate writing in corrected abbreviations on my magazine. Damn! Get it right." Jim adds that he writes "not to put down" the magazine but "to make the new *MT* as good as possible."

And for that, Jim, we thank you. Yes, you will find a few "bugs" here and there, but I think you'll agree that we've come a long, long way since '83. And we'll work just as hard in the coming years to make *MT* live up to everyone's expectations.

We've had quite a lot of comment about the item on Radio Canada dropping its U.S. service. And frankly, when we first heard about it on the air, we were a bit stunned, too. But it all seems to come down to money and that's sad.

"I almost feel like I'm losing a friend" says Peter LaCross of Louisiana. "I've listened to RCI for years and years and to hear that they're now cancelling their U.S. service is indeed disturbing."

This is true and echoes the feelings of many other readers. But, if there is a good side to all of this it is that most of Canada's other transmission are audible in the U.S. so they won't

You cannot run both 'SEEKER' and a C-64 RTTY program at the same time, but you can load active RTTY frequencies into the ICOM's memories while scanning with 'SEEKER,' then run your RTTY monitoring program and using the receiver's memories.

Advantages of using 'SEEKER'

By adding the capabilities of 'SEEKER' to the ICOM IC-R71A

communications receiver, you will have a communications monitoring facility more useful (and fun) than anything known to be available. As the 'SEEKER' computer aided communications monitoring system is expanded, you will have greater capabilities without having to invest hundreds or even thousands of dollars in the latest communications receiver. △

be gone completely. And, of course, as we mentioned in the item, the weekend programs will continue to be broadcast, including the very popular *Shortwave Listener's Digest* -- with Ian Mc Farland, the winner of last year's International Radio "most popular broadcaster" remaining as host. So it's not all bad.

Incidentally, look for our second annual shortwave survey in the November issue of *MT*.

Radio Truth has been something of a mystery since the station first signed on in October of 1983. Located somewhere in southern Africa, it is highly critical of Zimbabwe Prime Minister Robert Mugabe's ZANU-Patriotic Front. Circumstantial evidence points to the South African government as the originator of these broadcasts, but solid evidence is not at hand. You can try for *Radio Truth* in English at 0430 UTC on 5015 kHz. Listen for the eerie bird call interval signal prior to sign on.

W.H. Scarbrough of Knoxville, Tennessee says that "after listening to *Radio Truth* on several occasions, a QSL and information on the station was requested from the address given in *International Radio* magazine." In response to his letter, Mr. Scarbrough received a QSL letter, a 10 page pamphlet, and a printed statement of intent for *Radio Truth*. That was for a broadcast heard on January 18; the letter was postmarked from England on June 17.

The material that Mr. Scarbrough received advised that observations on program content or reception reports should be sent to *Radio Truth*, c/o Mr. Stanley Hatfield, P.O.B. 815, Thayer Avenue, Silversprings, MD 20910. However, *MT's* Greg Jordan sent a letter to that address recently only to have it returned as "Moved: No Forwarding Address." What will be interesting is that Greg is going to request, under the Freedom of Information Act, the name of the actual boxholder for *Radio Truth's* U.S. address. Let's see if Mr. Hatfield left a trail and if so, if any interesting information about this puzzling station comes from it.

Incidentally, W.H. Scarbrough put together a short article on *Radio Truth* based on the information he received and we'll be publishing it in this issue. Thanks, W.H.!

ANARC 86, the convention for DXers in Montreal has now come to a close and, as usual, it was quite an experience. It was great to meet so many *MT* readers. We'll have a special photo spread in the September *Monitoring Times* and tell you all about it.

Until then, keep in touch. We welcome your cards and letters.

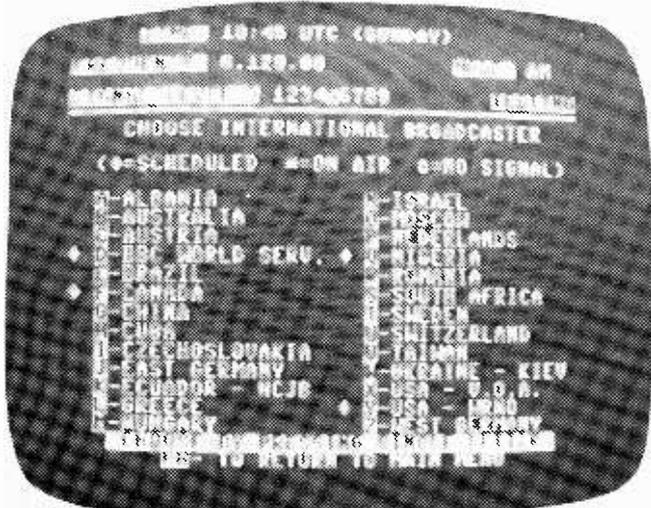


Figure 3 - International Broadcaster Selection Menu

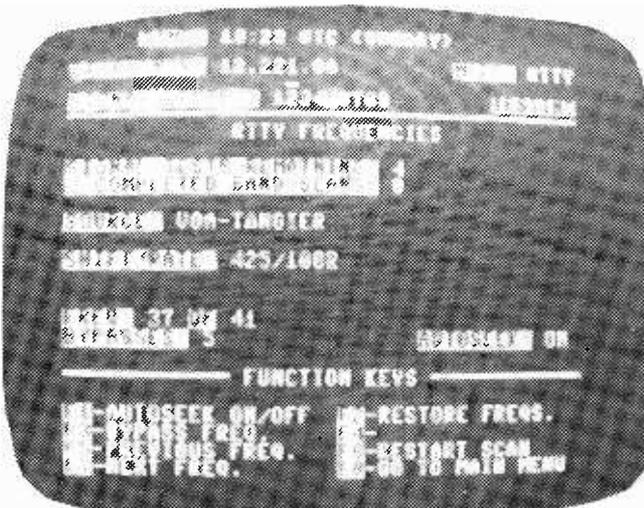


Figure 4 - RTTY Control Menu

Mailbag

Utilities

Bob Grove, Utilities Editor, P.O. Box 98, Brasstown, NC 28902

"NEW LOOK" BRINGS NOTHING BUT ACCOLADES (almost)

The expanded MT looks real good

Best of luck with your enhanced venture.

Skip Tenney W1NLB
Publisher,
Ham Radio Magazine

On behalf of the guests and members of the Radio Listening hobby club, SOUTHERN CALIFORNIA AREA DXers; (S.C.A.D.S.) thank you and the staff of Monitoring Times for a great publication. Always up-to-date shortwave information.

Monitoring Times is proudly displayed and reviewed at all S.C.A.D.S. meetings.

Don R. Schmidt, Director

My eyebrows really raised when I saw the new MT in the pile of papers I yanked from my mailbox. What color! Articles! Illustrations! Amazing, astounding, terrific! You and Larry Miller certainly have a right to be very proud of what you've created, and it looks like a swell piece of news for radio enthusiasts of all kinds! In fact, from what the first new issue looks like, I will be saving all future issues for my own archives, they're sure to be interesting and attractive enough to be instant collectibles.

Hugh Miller
Seattle, WA

I wish you success with the merger of International Radio and Monitoring Times.

The entire DXing Community looks forward to the continuation of the fine service that your publications have provided to radio hobbyists and listeners.

I have already received the Premiere Issue of the New MT (7/86) and I am finding the expanded format most comprehensive and also very enjoyable to read.

Mark Chinsky
Glen Head, NY

Member: AFCEA, SPEEDX, RCMA, ADXR, RCDXC
Patron: AF ASSOCIATION

A GREAT BIG CONGRATULATIONS FOR THE NEW MONITORING TIMES.

Monitoring Times has always been the finest publication I have ever seen for us listeners...I have been a "HAM" for almost 50 years but monitoring has always been my hobby. Keep up the very good work

and don't let TOO much HAM radio get into this fine publication, there are enough Ham publications. Please keep this MT a monitoring paper. I hope everyone will mention Monitoring Times when they write to advertisers, I am sure that they would like to know that their advertising dollars are well spent.

H.J. Paine K7CC
Tucson, AZ

My compliments to one and all who worked so hard to make the combination of our NEW Monitoring Times the big success that it is! A job well done, indeed! I am only a 90 year old subscriber who has been in radio continuously since 1930. Maybe I am your oldest reader?

John Creamer
Denver, CO

Congratulations and good luck on the launch of Monitoring Times! As someone who's been listening to shortwave radio for 25 years, I can't say how much I enjoy your publication...and what a need it fills!

I subscribed to International Radio just one month before your latest publication came out, so I'm happy there weren't any subscription hassles, and you carried over my term to MT.

But what you need, however, are more advertisers! Go get 'em! If your subscription rates had to go to \$24/year, a 71% increase, I think you might only lose 20% of your subscribers, so go up in price gradually.

Meanwhile, keep delivering the stuff the reader can't get elsewhere and you'll prosper!

Clark Nobil
Miami, FL

Grove Enterprises is not a new name in our home or in our ham shack--and certainly Bob Grove has been considered a long time friend. Whether we are in California or New York or somewhere in between--we have always felt Brasstown, N.C., was the home of the square deal.

We just received our first copy of the new Monitoring Times and a critical review could only say kudos, congratulations on a job well done. You are satisfying a long felt need for the entire radio community.

Lois (WA6OHH) and
Charles (WA6ODN)
Steinbrenner
Medford Sta., NY



FORUM

RCI UPDATE: Program Changes in the USA Service

by Ian McFarland, Producer,
RCI English Weekend Programming

Effective with the start of the winter broadcasting season on Sunday, November 2, 1986, Radio Canada International will be making some program changes on the service to the U.S.

The three half-hour broadcasts at 2000, 2200 and 2300 EDT Monday-Friday (Tuesday-Saturday at 0000, 0200, 0300 UTC) in which the news and the RCI Journal are heard, will be replaced by two 90-minute broadcasts at midnight and 0200 UTC.

Featured in these two broadcasts will be the two CBC English domestic radio network programs--*The World at 6* and *As It Happens*. With this change listeners will be able to hear *As It Happens* in its entirety. This is in response to the many requests RCI has received from both U.S. listeners and Canadians traveling or vacationing in the USA.

There will also be a new sixty-minute broadcast at 1300 UTC aimed at both U.S. listeners and Canadians in the U.S. This will allow for expanded coverage of news, sports and economic and trade matters.

These changes affect just the Monday-Friday EDT schedule. As was mentioned on the *Listeners' Corner* program, there will not be any changes in broadcast times for the weekend transmission schedule.

I think that listeners in general will be more than pleased with the changes since they will now be able to hear all of *As It Happens*.

There are a few other more immediate program changes which may be of interest. These affect the African service at 1800 UTC and the U.S. service at 2400 UTC on Saturdays.

▷ Effective Saturday, July 19, the program *Canada a la Carte* will no longer be heard and will be replaced by the following lineup:

African Service - 1800 UTC: Review of the Week; Innovation Canada: Canada Rocks, a pop music record review feature; Spotlight on Science.

USA Service - 2400 UTC: SW Listeners' Digest; Canada Rocks; Spotlight on Science.

▷ The program *Coast to Coast* remains at 0300 UTC on Sundays; however, the program is now off for the summer and will return in November. Until that time it will be replaced by a repeat broadcast of the *SWL Digest*.

▷ Effective Monday, July 21, on the 0300 UTC broadcast to the U.S., there will be a repeat broadcast of *Review of the Week* and *Innovation Canada*, replacing the rescheduled *SWL Digest*.

So, as our listeners can see from these changes, listeners in the U.S. will get a net increase of five minutes broadcast time rather than a loss.

We hope that this clears up any confusion about the forthcoming changes to the service to the United States.

Foreign Subscribers: GOOD NEWS!

Now that MT has qualified for second class postage, not only will domestic subscribers benefit from quicker delivery, but so will non-U.S. subscribers--and at lower cost!

If you are presently receiving MT outside of North America, your subscription has been automatically extended to compensate for the lower postage rates. Refer to page 58 for the new foreign subscription rates.

Received today the premiere issue of the new MT. Frankly it's for the birds. Go back to the old publication.

H.B. Williamson
Chambersburg, PA

We warmly appreciate the encouragement which so many of you have provided upon receiving your premier issue of the new combined MT with International Radio. And, believe it or not, we also welcome criticisms!

We know that we will never be perfect, but we will strive to provide the balance, accuracy and timeliness of reporting that you, our readers, deserve. The only way we can guarantee that our efforts will continue is if you let us know what is right, what is wrong, and what is missing...Bob

(Privacy Act cont'd from p.3)

selective enforcement and future restrictions.

Other provisions in the bill increase government wiretapping authorizations, loosen restrictions on who can perform the taps, increase the number of crimes for which wiretapping can be conducted, allow government officials to obtain records on private citizens from public computers without notifying the subjects, and apparently hold government officials immune from recrimination for misuse of wiretaps.

Regency Discontinues Opposition

Apparently in an economy move, Regency Electronics has withdrawn their opposition efforts against the bill, allowing a clearer road to its passage through the Senate Judiciary Committee. It was a Regency ad encouraging monitoring of mobile telephone calls that originally raised the 'hackles on legislators' backs.

The two senators now carrying the bill through the Senate are Patrick Leahy (D-VT; phone 202-224-4242) and Charles Mathias (R-MD; phone 202-224-4654). They may be phoned directly to register your opposition to the present wording of the bill.

STOCK EXCHANGE

NOTE: Monitoring Times assumes no responsibility for misrepresented merchandise.

PERSONAL-SUBSCRIBER RATES: \$.10 per word; NON-SUBSCRIBERS RATES: \$.25 per word. All ads must be paid in advance to Monitoring Times. All merchandise must be non-commercial and radio-related. Ads for Stock Exchange must be received 45 days prior to the publication date.

COMMERCIAL RATES: \$30 payment must accompany ad, payable to Monitoring Times. Send 2-1/4" x 2" camera-ready copy or we will type.

ALLIED SX-190 receiver \$95, MIZUHO SX-3 RX/TX pre-selector \$65, BT VHF 45 dB MATV amplifier \$40; YAESU FL2100B linear amplifier \$425; KENWOOD TS-520 SSB/CW transceiver with SHORE 444 and DD-1K digital readout \$450; VHS videotape rewinder (new) \$25; car stereo speaker system 10 watt 4" 8-Ohm (new) \$5; AUDIO VOX 600C Booster/Eq 60 watts \$30; PANASONIC RF-2800 receiver \$95; two 4CX1500B tubes \$200. All items new or like new. Send SASE for complete details. Mike, 6333 Hwy. 2321, Panama City, FL 32404. 904/785-7824.

Wanted: DX200 or DX302 or R7. Must be in working order and good condition. 1116 Bachman Drive, Lexington, SC 29072.

For Sale: 3 IEC Voice Pagers. 152.240 MHz with chargers and batteries. Excellent condition. \$15 each. Money orders only. Curtis Harbin, Route 15, Box 326, Gray, TN 37615.

MOTOROLA Pagers: all hi-band - 152.240. All with chargers and spare batteries. All tone/voice units. Excellent condition.

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1 HT-220 slimline port. No battery or charger - 159.705 MHz \$50. Money orders only. Curtis Harbin, Route 15, Box 326, Gray, TN 37615

For Sale: NATIONAL HRO-500 receiver and LF-10 preselector, RACAL RA-17 receiver and pan adaptor, RACAL 6217E receiver, ROHDE and SCHWARTZ selective microvolt/ammeter, HP-606A signal generator, HP608D signal generator. Darell Brehm, 1000 Forge Road, Carlisle, PA 17013. 717/249-8736.

For Sale: HAMMARLUND HQ105TR 540kHz-30MHz receiver with built-in CB transmitter - \$75; REGENCY K500 scanner - \$60; GROVE Scanner Beam 1 antenna (new) - \$16; GROVE PRE 1 VHF/UHF signal amplifier (new) - \$22; GROVE Scanverter 1B - \$20; PALOMAR ENGINEERING VLF converter - \$16; PALOMAR ENGINEERING loop antenna amplifier with 4 loops - \$30; KANTRONICS UTU with CPM software - \$95. D. Dotson, Box 2616, Sedona, AZ 86336. (602) 284-1220.

JOIN A RADIO LISTENING CLUB. Complete information on major North American clubs and sample newsletter \$1.00. Association of North American Radio Clubs, P.O. Box 462, Northfield, MN 55057.

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Monitoring times will print at no charge (as space permits) announcements and questions of a non-commercial service nature.

Need service info for EICO 633 CRT tester, SEMCOR capacitor analyzer RC115, PANASONIC TR515A B/W T.V., SONY TC-630 reel to reel recorder, GARRARD Lab 95B turntable, HEATHKIT HM2141 VHF watt meter, LEADER LSG-11 signal generator. Contact N4EVS, 6333 Hwy 232, Panama City, FL 32404.

Wanted: Frequency file program for TANDY 1000 or IBM-PC; also info on NYC area bulletin board systems.

TV DX'er and MT columnist Larry Van Horn would like to swap your local area TV guide for my North Florida and Orlando editions. These do not have to be the latest edition. Will exchange 1 for 1 to: Larry Van Horn, 160 Lester Drive, Orange Park, FL 32073.

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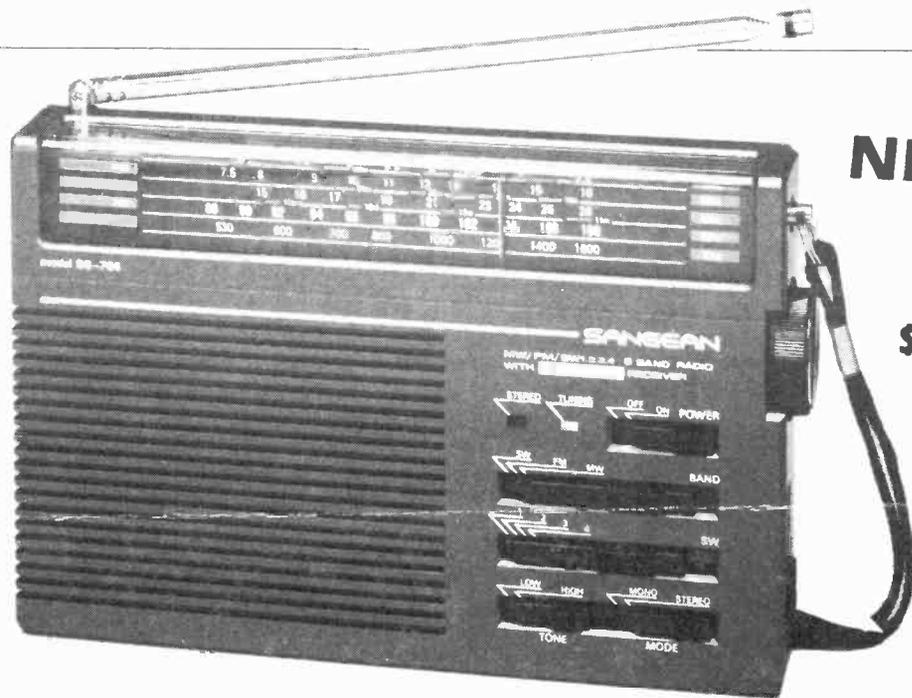
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