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SMUGGLERS BLUES: The DEA and Customs War on Drugs

by The Interceptor

"You see it in the headlines, you hear it every day, they say they're gonna stop it but it doesn't go away. They move it through Miami, and sell it in L.A., they hide it up and tell you right I mean it's here to stay. It's proppin up the governments of Colombia and Peru, you ask any DEA man he'll say there's nothin we can do, from the office of the President right down to me and you. It's a losin proposition, but one you can't refuse, it's the politics of contraband, it's the smugglers blues..."

"SMUGGLERS BLUES"

Glenn Frey, J. Tempchin

As the song goes, the Drug Enforcement Agency and the U.S. Customs Service have a monumental task: to try to stop the illegal river of drugs from flowing into this country. Each year billions of dollars worth of cocaine from South America, heroin from the Far East and marijuana from Mexico are smuggled into the United States.

There are a myriad modes used for smuggling contraband: it's brought in

by illegals on foot sneaking over the Tex/Mex border; high tech aircraft fly low over the Bermuda Triangle to avoid being picked up on radar. Smugglers use many dirty tricks to avoid unwanted detection. The DEA drew some attention to itself recently when an agent was killed in Mexico by Mexican secret police. President Reagan called on the Mexican government to launch an investigation into what happened. Colombian drug smugglers boldly warned that for every Colombian arrested for smuggling and deported by the DEA to stand trial in the U.S., five Americans would die.

As the smugglers' methods get more sophisticated, so do the DEA's methods for catching them. The U.S. Navy has cooperated with the DEA through the loan of several pieces of high tech gear including a Grumman E-2C "Hawkeye" AWACS aircraft and a Bell AH-1T Cobra close-support attack chopper.

THE E-2C HAWKEYE...

Specially built as a carrier-based AWACS platform for the Navy, the Hawkeye is an extremely useful tool for aiding the federals to find

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and track aircraft trying to fly drugs into the U.S. A dual, prop-driven aircraft, topped off by the round flat disc of the rotodrome, the E-2C has a strange appearance in flight, looking suspiciously like an airplane being tailgated by a flying saucer.

But what the Hawkeye lacks in beauty it makes up in its electronic wizardry. Inside the aircraft is the sophisticated APS-125 ADVANCED RADAR PROCESSING SYSTEM which can "look down" and spot with its probing radar any smuggler aircraft trying to fly low over the sea to escape land-based radar detection. The Hawkeye can even detect small boats and surface craft running drugs. Smugglers don't stand

much of a chance trying to sneak by a Hawkeye!

Also onboard is the ATDS (AIRBORNE TACTICAL DATA SYSTEM), the nerve center of the aircraft. From this electronic center the air control officer and radar officer are presented with readouts and displays, not only from the radar but also from some 30 other electronic sensors which include passive detectors (infrared cameras for night spotting) to the UHF, VHF and HF communications systems.

All these electronic gizmos combine to give a complete picture of targets, tracks trajectories and any communication emissions of the smugglers being followed. Also the Hawkeye is

Please turn to page 4



A Grumman E-2C Hawkeye sits poised on the runway, ready for a drug intercept mission.

Season's Greetings

... From all of us at Grove Enterprises

Bob
Angie Rachel
Mitsi Judy

As we enter the holiday season, we are pleased to share with you our newly expanded **Monitoring Times**, now with 40 full pages of timely features on communications monitoring, worldwide frequency lists, equipment reviews, articles by world-renowned authors and, of course, extensive reader contributions. At Grove, we are committed to offering you "a lot for a little," and that is why our 40-page publication will cost you no more than before. So subscribe or renew today. And order a special gift subscription for a friend! It's easy to do, inexpensive—and you'll be introducing him or her to the best communications news source available!

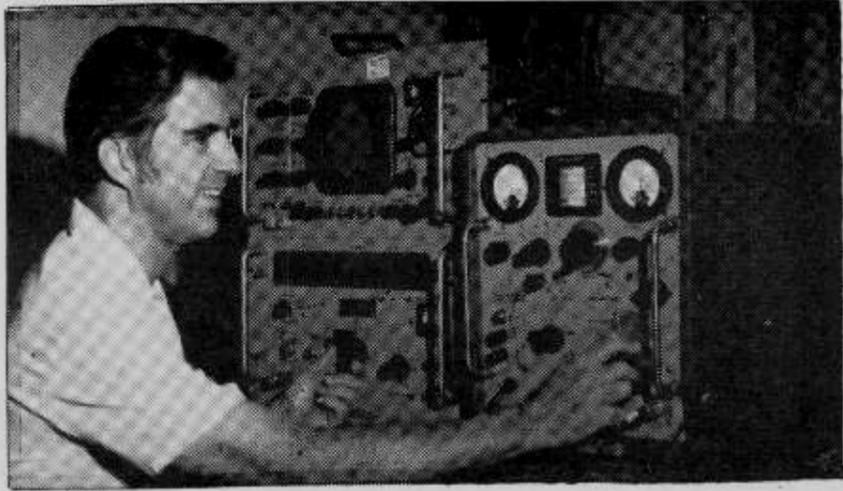
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MONITORING TIMES

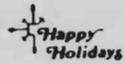
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FROM THE EDITOR



Our Holiday Gift to You: MT Grows Again!



It is always a pleasure to share our successes with our readers, a large percentage of whom have been with us for our entire four year lifetime now. And the good news this time is that we have added another four pages!

Perhaps even more exciting is that there will be no increase in cost! Yes, it will cost us more to print, but the continued growth of our subscription list and increased support from advertisers who recognize the selling power of MT will cover our additional expense...at least for the present.

Along with the increased page count will be additional columns and feature articles. Prospective writers are contacting us after having read our invitation in a previous issue. Let us know what regular features you would like to see that aren't already covered.

Of course we all know that prices are going up all around us; we certainly can't guarantee that our subscription rates won't increase in the future, so this would be an excellent time for you to renew your subscription for up to a total of three years at the

Radio Swan Flies Again

An MT Exclusive

U.S. technicians recently installed a new radio station on Swan Island for use by the Honduran Navy. Although the island had some old equipment left over from the days when the CIA-backed clandestine "Radio Swan" broadcast anti-communist propaganda to Cuba, most of the equipment was beyond repair and the Honduran Navy base there had been without a working radio for almost a year.

The modern station now includes a new antenna and a more powerful transmitter. In addition, an aeronautical V beacon has been set up on the island.

MT would like to thank our anonymous contributor for this excellent news tip.



Viewpoint

CHRISTMAS OF '85

The gizmos are humming all through the house. A computer, a joystick and even a mouse. The CD is playing, its tunes fill the air. While robots serve crackers and cheese here and there. Dad's under the headphones and Mom's on CB, Junior's making a video, Sis watches TV. But what is that terrible ringing and clatter? The home security system! What could be the matter? Be calm, gentle techies, no reason to fear. It's just Santa, bringing electronic gear.

Joe Buday

present low price. Or remember a friend--we will send your MT gift and a card with your holiday wishes.

Monitoring Times will continue to bring our readers the most accurate and up to date information on the broadest range of topics in the publishing industry.

We wish all of our readers a festive holiday season and a prosperous and enjoyable new year.

TWO-METER TELECONFERENCE NETWORK

A special two-part radio seminar will be conducted nationwide via interlinking two-meter amateur repeaters December 13, 1985, beginning at 9 PM EST.

The first topic will be a discussion on amplitude compandered single-sideband (ACSB), the newest mode of voice communications at VHF and UHF. Paul Rinaldo W4RI, Editor of QST Magazine, will be the guest speaker.

The second part will feature James Berry, Engineer in Charge of the Grand Island, Nebraska, FCC monitoring station, who will be discussing radio violations and FCC monitoring stations.

For a list of participating amateur repeaters and frequencies, send a self-addressed, stamped envelope (SASE) to the North American Teleconference Radio Network, P.O. Box 1231, Kearney, NE, 68847-1231.

CQ RONALD MCDONALD

Reference the question posed on page 10 of November, 1985 Monitoring Times ("CQ Ronald McDonald") it should be noted that here in Connecticut, the other side of the conversation may be heard on 154.600. The order manager and window girl use VOX wireless headsets to coordinate food handling. The headsets operate on 154.600 and the order window uses 35.02.

An interesting tid-bit: The New Britain Red Sox use 35.02 for their wireless mike at Beehive Stadium.

Tom Osenkowsky
 Brookfield, CT

WOODPECKER REPORT

About 15 Monitoring Times readers signed up for the Woodpecker Project. Thanks for the publicity! Overall, we got enough volunteers for three full days of monitoring, with good turn-out from England

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If you would like to speak with Bob Grove directly, call 1-704-837-9200 Monday through Friday, 8am-5pm.

VIEWPOINT cont'd

and Japan due to local publicity. In addition, Tektronix has lent us a 492P spectrum analyzer, an amazing and versatile tool. I'll write an article for MT about our use of the specimen.

Robert Horvitz

SPEAKING OF MONITORING TIMES...

John Santosuosso's column is nearly my favorite.

Havana Moon is entertaining, but his "man of mystery," "I know the REAL story," act is getting old. Come on, "Havana," when you have something to say just lay it out on the table without the frills. (What is a "milkshake Mademoiselle" anyway?)

I prefer a monthly MT. Twice monthly wouldn't provide that much more timely information. A better way would be a totally separate "Bulletin," sent out weekly.

Contents would be only sensitive items, such as predicted propagation, really "hot" loggings, or advice on how to tune in the world's latest trouble spot. The bulletin would be newsletter format, only two or three (at most) letter size pages stapled together.

Larry D. Loper
Sugarland, TX

>>>><<<<

Here is some reader input and a renewal check.

My most highly liked columns are: Viewpoint, Scanning 30 MHz On Up, Behind the Dials, Technical Topics.

My most highly disliked columns are: Los Numeros, Pirate Radio and Tune in Canada.

May I suggest some changes of format? Utility Intrigue should have more voice intercepts and less RTTY, FAX, CW, etc. Scanning columns should have more information on how to intercept non-FM modes. Signals from Space should, in addition to telling what is up, tell how to intercept the communications.

You need to do an article on the performance of inexpensive computers used with inexpensive SSB radios (HF) used with indoor whip antennas to decode RTTY and CW. I feel you could save some of your readers from a possible waste of money.

My experience with the above set-up yields the following results:

RTTY--non-existent reception
CW-- Major coastal shore stations copiable
Hams--only if S9 or greater

on scale

I use an MFJ receive-only interface.

Certain columns I would like to see only every other issue. Examples are Pirate Radio, Los Numeros, Tune in Canada and High Seas Radio. This way new featured columns might be test run in the off issue, columns like Ham Radio; a column on who has free or cheap info for the asking.

Finally, I would like to see a twice-monthly paper from Monitoring Times. I would be willing to pay 20-25 dollars per year.

Mark Pagel
El Cajon, CA

>>>><<<<

I really enjoy MT, particularly your technical comments and articles. Please write some articles on interference, its causes and cures (EMI, EMC, RFI, solid state ignitions, computers, etc.) It would be especially helpful if you could tell us where to get help from auto manufacturers.

Ken Proctor
Ft. Monmouth, NJ
(Excellent topic, Ken. How about it, writers?...Bob)

>>>><<<<

Some thoughts for your consideration. I enjoy construction projects but have been badly burned by them in the past. I have gone to unbelievable length to obtain parts from exotic places to build projects only to have them go up in smoke or at best not work at all. These were, of course, published projects in electronics magazines. Months later a blurb would appear telling that the green wire from the fridget should have been connected to C6 instead of 220 volts. I guess that info was for the survivors. By that time I usually had 40 dollars in parts and 55 dollars in postage and shipping. Point is if you are going to do construction projects in Monitoring Times I hope you will have an outside party assemble the parts and build the item to see if it works from the actual sheets you print. I have not built an MT project yet but I am very pleased you are moving in the project direction. I am sure in your time you have experienced what I am speaking of.

I would like to see several things, like a tuner we could build at home with variable rf (antenna) attenuation and variable gain that could be dialed in and out.

My favorite though would be a SW converter for my car radio for 49 and 31

HAMS:

We Win Some, We Lose Some

A new ham band has been added to the amateur radio spectrum but another has been lost--at least to northern U.S. hams.

The FCC, in the face of vigorous opposition from the commercial radio communications industry, has granted the hams virtually any mode of operation in the new 35 centimeter band, 902-928 MHz. Lost, however, to all U.S. hams north of a line 150 miles from the Canadian border, including some major U.S. population centers (Seattle, Detroit, Cleve-

land, Buffalo, etc.) is the 420-430 MHz subband of the amateur 420-450 MHz allocation.

The loss was not totally unexpected; a U.S. Canada treaty dating from April 2, 1982, guarantees the Canadians protection from U.S. interference on that band, a prime Canadian UHF land mobile allocation.

The American Radio Relay League (ARRL) has recommended a band plan for use by hams in the new 35 cm spectrum; it is printed below:

902-928 MHz Band Plan

902-904	Narrow Band Weak Signal
902.0-.8	SSTV, FAX, ACSB, Experimental
902.8-	
903.0	EME, CW Expansion
903.0-.05	EME (Earth-Moon-Earth)
902.07-.08	CW Beacons
903.1	CW, SSB Calling Frequency
903.4-.6	Crossband Linear Translator Inputs
903.6-.8	Crossband Linear Translator Outputs
903.8-	
904.0	Exper. Beacons
904-906	Digital Comms
906-907	Narrow Band FM Simplex Channels every 25 kHz
906.5	National Simplex Frequency
907-910	FM Repeater Inputs (119 pairs every 25 kHz beginning at 907.025)
910-916	Amateur Television
916-918	Digital Comms
918-919	Narrow Band FM Control Links and Remote Bases
919-922	FM Repeatr Outputs
922-928	Wide Band Experimental, Simplex ATV, Spread Spectrum

Hams are permitted to use their new band beginning September 28, 1985.

On another note, a recent release of amateur licensee statistics from the FCC shows that in the first half of 1985, licenses were granted to one new ham four years of age and another at the age of 103!

Amateur radio licensee count is, however, continuing to decline. Following a large exodus from CB to amateur radio a few years ago, the licensed amateur population reached an all-time high of approximately 450,000; it has dropped now to 410,000 and the loss is expected to continue.

meter bands so I could ride down the road listening to the BBC or Radio Moscow. I also think a project I would like to see would be involved in finding a 12 volt car radio that would do particularly well in the house for BCB DX, with a 110/12 power pack of course. I have done one or two, and car radios are usually hot as a firecracker when used indoors, hotter even than the current communications receivers I have seen. A simple 49 meter band converter with a 12 volt car radio from a wrecked car could get someone new into radio in a big (and fun) way for minimum bucks.

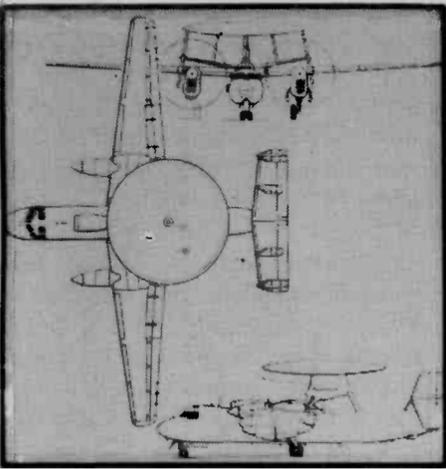
I do want to say how very impressed I am with what you have done with Monitoring Times. The paper is always packed with interesting information on a very broad range of topics. I am not interested in ham radio, as I find hams and what they have to say very dull. Most hams now (my opinion) buy a toaster, plug it in, and do a higher type (one half notch higher) ten-four good buddy act. However, the ARRL Amateurs Handbook and ARRL Antenna Handbook are priceless for anyone who wants to find out how things work.

The Larry Brookwell materials I got from you (82 and 83 Equipment Reviews and supplements and "Tail Gunner") are priceless.

My MiniTuner III is just great. The three year anthology of MT is also great. I have been in on MT almost from the start; I think I still have issues one and two.

Overall I am very pleased with what you do and what you have been able to accomplish in a very short time. Too bad Larry Brookwell is not here now to applaud you also.

R. L. Adams
Charlotte, NC



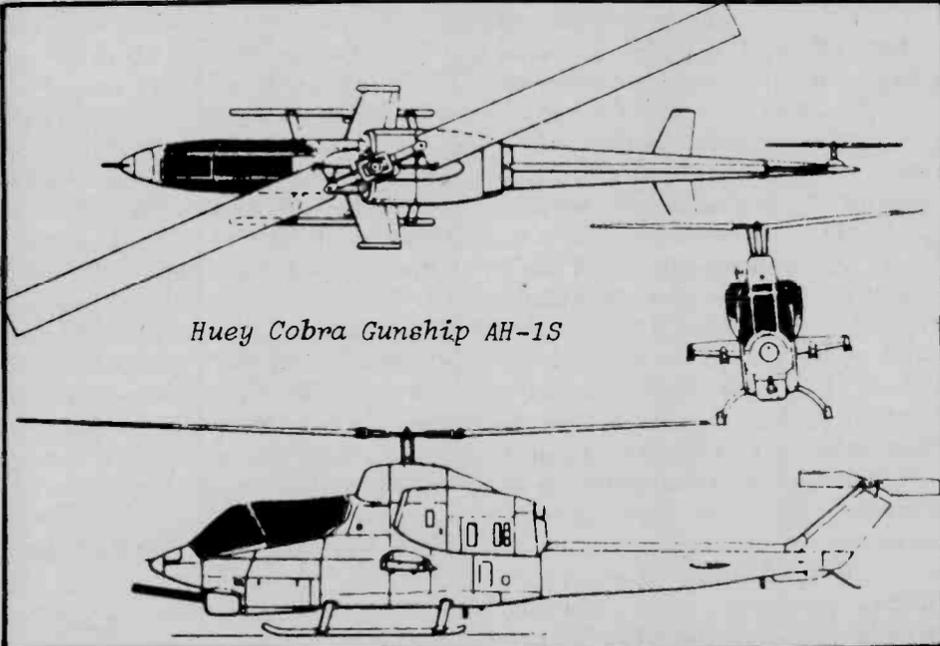
capable of transmitting and receiving radar IFF (identification friend or foe) pulses--the radar officer can tell with a scan of his screen who are the bad guys and who are the good guys.

The Hawkeye can detect airborne targets anywhere in a 3,000,000 cubic mile surveillance area. Any target as small as a hang glider can be tracked by the E-2C. All the information the Hawkeye gathers is relayed to DEA and U.S. Customs chase aircraft who shadow the smugglers to their destinations.

BELL AH-1T COBRA...

Now that the Hawkeye has squealed on the location of the smugglers, getting them to stop is something different. The DEA chase planes aren't too threatening to your average smuggler--he can always try to ditch them. That's where the Cobra comes in.

The Cobra is the DEA's big stick. The Cobra's armament consists of a 7.62mm multi-barrel minigun, a 40mm grenade launcher, a 30mm three-barrel cannon, plus four store pylons containing 76 2.75in caliber rockets, and last, but not least, 16 tube-launched T.O.W. missiles. This helicopter, borrowed from the Army, is rarely armed but its appearance is enough to convince the average dope smuggler to think seriously about getting into another line of work!



Huey Cobra Gunship AH-1S

WHO'S ON FIRST?

by Patrick O'Connor
Plain Road
Hindsdale, NH 03451

PART VI

**30MHz and Above -
VHF and UHF**

The frequencies above 30 MHz--the new frontier of the DX'er--are normally broken into two sections: Very High Frequency (VHF), 30 to 300 MHz; and Ultra High Frequency (UHF) 300 MHz and up.

Although this spectrum is far too large to cover completely in one--or even several--articles of reasonable length, here are some of the band breakdowns.

BROADCASTING:

TELEVISION occupies three separate band sections: VHF LOW (channels 2-6) 55-87 MHz; VHF HI (channels 7-13) 175-215 MHz; and UHF (channels 14-83) 471-889 MHz. The transmission mode used for sound is frequency modulation (FM).

Even if the culprit tries to outrun the Cobra, he had better have a lot of horsepower on his side; the Bell AH-1T has a top speed of 207 mph, more than enough to catch your heavy loaded drug transport. And once the smuggler has landed the Cobra flies above the scene to support the DEA agents on the ground.

Even with all this impressive hardware, tons of contraband slip into the U.S. every day. You can listen in on the action with your home short-wave receiver.

FREQUENCIES

HF NETWORKS (USB)			
4.376	4.500	5.680	6.512
7.527	8.019	8.768	9.802
10.770	11.076	12.222	13.150
14.371	18.666	MHz	

FM RADIO occupies 88-108 with 200 kHz channel spacing on the "odd-numbered" frequencies (i.e.-88.9 MHz, 106.1 MHz). The first four megahertz of the band contain many low-powered, non-commercial stations, with the high-powered stations generally taking the upper portion.

AMATEUR:

Ham radio occupies several bands in the VHF/UHF spectrum, notably 6 meters (50-54 MHz), 2 meters (144-148 MHz), 1-1/4 meters (220-225 MHz), 3/4 meters (75 centimeters) (420-450 MHz), and many others even higher in frequency.

Almost all possible means of transmission are used--AM, FM, Morse code, facsimile, slow- and fast-scan television, data, etc. The pioneering work of radio amateurs has helped to open this range for commercial exploitation.

UTILITY:

Many, many, MANY divisions here! You can hear police, fire, highway and other public-service agencies (37-46, 154-159, 453-512 MHz); aircraft to ground communications (118-136 and 225-400 MHz--it should be noted that communications in this band are in the AM mode; almost all other users are limited to FM above 30 MHz); satellite signals (136-138, 406-406.1, 2287.5 [S-band, used by the Space Shuttle program], 4000 and 12000 MHz); and many other fixed and mobile service applications.

Why would people want to monitor these bands? Curiosity. These are popularly called the "action bands"; here you can listen to real-life cops going up against crooks (sometimes more exciting than watching reruns of "Dragnet" or "T.J. Hooker!"); firemen fighting to save a building; railroad crews working to get a delayed train back on schedule; an aircraft-hijacking emergency--the possibilities are endless.

Many amateur operators prefer the higher frequencies as they provide low-noise local communications; and of course FM radio and television are a large part of our entertainment time at home (I'll bet you never thought of watching TV as "DX'ing," did you?).

There are disadvantages. Outside of occasional unusual conditions, listening range is limited to "line-of-sight"--about 100 miles or so for VHF TV & FM,

even shorter for the higher frequencies (the transmitting and receiving antennas have to be able to "see" one another). The exception to the maximum range rule is the satellite over 22,000 miles up in the sky; still, there has to be a clear path between the satellite and the "dish" antenna.

The equipment used to DX the VHF/UHF spectrum is quite varied, ranging from common FM & TV sets to complex, microprocessor-controlled scanning radios. Rapidly advancing electronic technology has advanced the scanner from the first crude, four channel, crystal-controlled units to the new microprocessor-based sets that need no crystals and scan from 30 MHz on up, utilizing technology that would have been classified as science fiction just a few years ago.

In DX'ing the VHF/UHF spectrum, the crucial element is the antenna. "Beam" antennas are the rule, with the antenna aimed in the direction of the transmitter. For the highest frequencies, dish antennas, aimed with great precision, are needed.

Random or long-wire antennas simply don't cut it here; you need all the gain you can get. Also, the lead-in from antenna to receiver is important; high quality coaxial cable is a must for minimum signal loss.

Unlike the lower frequencies, VHF/UHF is virtually unaffected by day-time/nighttime differences. On FM, there is a phenomenon called "sun-up tropo" occurring at sunrise that can enhance the reception of weak "fringe" stations a little, but otherwise there is no time-related DX system.

Unlike the regular variations in propagation on the lower frequencies, long-haul signals are rather unpredictable on VHF (there are virtually NO long-distance propagation modes for UHF). These include "sporadic-E skip" caused by solar ionization in the upper atmosphere; "tropospheric ducting," a weather-related phenomenon; and various "bounce" modes--meteor trails, aurora, aircraft, and the moon.

Many amateurs are actively involved in EME (Earth-Moon-Earth) "Moon-bounce" experiments using gain antenna arrays and high power.

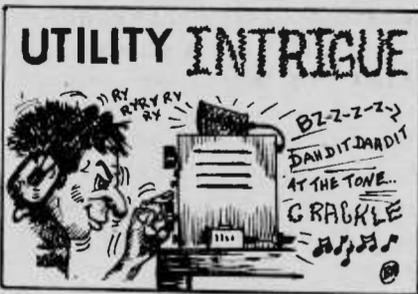
Sporadic-E skip is seasonal--better in the spring and early summer--and cyclical--better at the peak

of the 11-year sunspot cycle. Tropo is weather related and sometimes can be predicted by watching for varying-temperature weather fronts.

Auroras occur mostly toward the peak of the sunspot cycle, while meteor showers are quite predictable (a good almanac will have the dates of most major meteor showers listed). Aircraft bounce is an exceedingly rare--and lucky--catch.

Terrain can have a major effect on reception. Those listeners on hilltops will have much better reception than those in valleys. VHF/UHF is VERY terrain-sensitive: hills, trees, buildings--any tall obstruction--can block reception. If you happen to live in a deep valley and want the DX the VHF/UHF band, you have three options: 1) move to a better location; 2) erect a very high antenna to "see" over the hills; or 3) develop another interest!

Unless you live way out in the boondocks, utility signals are available around the clock--police and fire departments usually don't shut down, aircraft are always coming and going at the larger airports, and the military is always alert. Due to more people being awake at night, many FM and TV stations are now on 24-hour schedules. There is almost always something to hear.



by
Don Schimmel
516 Kingsley Rd SW
Vienna, VA 22180

A different type of NUMBERS broadcast was encountered on 13372 kHz on 30 September at 1719Z. This CW transmission was automatic Morse 5F groups with all numbers sent full and BT was sent after every two groups.

Another new one to me was some number groups sent between 1245-1345Z on 10 and 11 October. The brief message consisted of a 2F group followed by a 5F group and these two groups repeated for approximately five minutes. The two groups would then be changed and

VERIFICATION:

Television and FM stations generally will verify a long-distance report and some take real interest in the phenomenon. VHF/UHF hams are not the best verifiers, but many will verify a correct report accompanied by an SASE. Public-service (police, fire, etc.) stations also aren't the best verifiers, but you MAY get lucky.

Some agencies used to occasionally send unit shoulder patches to listeners; I don't know if this practice still exists. Aircraft and ships, providing you can find an address, are fair verifiers.

Most government agencies will NOT verify reports; neither will most military stations. Since almost all military traffic on VHF/UHF uses tactical call signs, you probably won't know who is involved anyway. The Coast Guard, however, will usually verify a correct report.

With all except amateurs, a prepared-form card and self-addressed stamped envelope are prerequisites for a reply. You should also enclose postage for amateurs, but a PFC is rarely needed, as most have their own QSL cards.

Of course, when you report to a utility station, you NEVER report on the traffic heard! Call signs, and stations in contact are all right, but the traffic itself is private and may not be divulged to anyone. If you call your pal down

this new combination would be sent for about five minutes. This procedure continued for an hour and the transmitter then left the air.

The 11 October transmissions were not the same groups as those on the 10 October schedule. Again, two groups would be repeated for just about five minutes and then they would be changed to two new groups and so on until 1345Z.

A possible Latin American Military activity was intercepted on 4179.5 kHz on 12 October at 1002Z. NEPTUNO was called by MARTE on USB voice requesting a signal check. The stations shifted briefly to RTTY (50/850) but the transmission resulted in garbage for print-out so it was apparently an enciphered RTTY. The stations then went to voice for a few moments and then back to RTTY again.

The next time they went to voice, one station indicated the traffic could not be copied on RTTY so back to RTTY they went for another try. I stayed with the circuit for a while but

the street to tell him you just heard that Joe Jones was arrested for drunk driving, that is a violation of the law. However, there has never been a prosecution for this...yet.

Addresses will be very hard to come by. The FCC (Federal Communications Commission) license records may be of help: the Grove Enterprises catalog shows several types of microfiche which list licensee addresses.

Some club bulletins occasionally list addresses. Libraries and telephone directories are additional sources for addresses.

CLUBS:

The monthly bulletin of The World-Wide TV-FM DX Association (WTFDA, P.O. Box 514, Buffalo, NY 14205) covers TV, FM and VHF/UHF activity, loggings, etc. The Association of DX Reporters (ADXR, 7008 Plymouth Rd., Baltimore, MD 21208) has an FM/TV column; the utility column reports the members' loggings of VHF/UHF utility stations, and the QSL column reports VHF/UHF QSL's and their addresses. \$1 to either club will get you a sample copy of their bulletin and membership information.

These and other clubs are mentioned on a monthly basis in Paul Swearingen's Club Corner column in Monitoring Times.

VHF/UHF DX'ing isn't everyone's cup of tea. For those who like it, however, it can be exciting and varied.

was unable to come up with anything that might lead to identification.

Some strange traffic was found on 4119.5 kHz on 9 October at 0018Z. The message appeared to be in code and a sample of the text looks like this: 42 AAA 327 AAA 412 AAA 41 AAA 340 AAA 421 AAA 40 AAA 320 AAA 415 AAA 42 AAA etc.

Throughout the entire message, a 2F group was always followed by two 3F groups. The unidentified station would call NJH and then later the same station would call CQ. The only procedure signs noted were QSV, OK, VA and possibly a Spanish word (or maybe Portuguese) COPIA.

The same transmitter was heard on 10 October sending the call NJH but he was very sloppy sending it like MJH so it did not appear to be the same operator as the previous evening. I did not note any traffic sent on the second evening.

The 13 MHz region produced two more interesting mystery stations. The first

was on 13450 kHz on 10 September at 2038Z. I believe the CW call was BBV2 which if correct would make it an activity of the PRC. Standard Q and Z signals were used and the heading was a standard military appearing type; i.e., R- 101200Z -GR 69 BT.

The traffic was 5L groups and at the end of 50 groups he sent -B 50 RR K. The letter O was sent for the zero. The remaining groups were sent followed by BT K. No answer was heard.

The second cipher message was copied on 13414 kHz on 9 September at 2231Z; this was also CW activity with the traffic being mixed letters and numbers. Most of the groups would be 5L groups but a few groups were seen with four letters and one figure which sometimes was a 4 and other times was a 5.

The heading was a simple one: -P 091624Z BT. The station being called was BVZ8 which would be a Taiwan allocation and the transmitting station was B..2, and that is all I got of that call sign.

The next net to be discussed is a real puzzle. Similar transmissions were copied in March and April 1985 and were commented upon in the June Monitoring Times. The cipher traffic is 4F groups but the operator chatter is in broken English.

The stations operate between 11300-11355 kHz and the transmitters all have a raspy sound. Now according to both the U.S. and International Frequency allocation charts, the 11275-11400 kHz region is assigned to Aeronautical Mobile use and the above described activity is certainly not that.

I have not observed any call signs from the ITU listing; instead, they are 3L calls/addressee indicators as follows: BYU DE FXB, GMT DE FXB, ALR DE ?, TNQ DE CUG. Some of the other 3L designators seen in message headings were: YPS, KCQ, RYS, PAK, CHT, MZM, PZO, HVG, GZG, GHW, ZBQ, FOA, CBH and BKC.

The message headings are very short but each element in the heading is repeated twice. It was interesting to note that the first time a number is sent it is sent full but usually when the item is repeated the numbers are sent cut.

For recognition purposes, here is a typical message: NR 54 NR 54 GR 5 GR 5 211230 UAAU3T AZM AZM 9214 NUA4 BT 45.. 8291 9762 9420 5101 BT

UTILITY INRIGUE cont'd.

In the operator chatter, liberal usage of Q signals is seen with QSP, QSO, QSA, QSV and QSL noted most often. In addition I have seen QRD (Where are you bound for?), QTV (Stand guard for me) and QTA (Cancel Telegram number--). The stations are most likely ship-based in view of the use of QRD and references in operator chatter to "MASTER."

They must be spread out over a wide area as evidenced by the remark in one piece of chatter as follows: BT HR GO ZONE WK MY OWNER/MASTER FIX GO WK BT HR NEAR DAY WL QSO NORTH ZONE IF CONDITION STL GD WL CHG COS GO NORTH AR MSG PSE QSP TO INDIAN OCEAN QSP TO KAO YES BT etc.

On one occasion I saw a string of 12 short messages sent, one right after the other. I would have to assume from this that the receiving station was to perform the relay because each message had a different

3L indicator in the heading. Several times I heard voice activity in some Oriental language and these transmissions do seem to be associated with the CW activity. I would think that if this is a legitimate (fishing?) operation, normal call signs allocated to the vessels would be used rather than the unlisted 3L call signs.

* I was aware that the Inter-American War Games for 1985 were scheduled for October so I decided I would spend an entire day monitoring their communications. The IA Naval Telecommunications Network was to provide the communications for these games and I therefore began the day by checking the various network frequencies.

NBA Balboa was acting as a communications relay facility and was found to be simulcasting the RTTY traffic on 11570, 12182, 13371.5, 16194, and 19616 kHz. The frequency of 20741 kHz was mentioned in operator chatter by one of the

NBA operators, but I did not hear any related activity on that frequency. I did hear some brief CW on 13555 kHz which is one of the CW frequencies of the network.

I ran my printer almost continuously during the day and, as a result, I had reams of traffic. It was very interesting to go through the intercepts and follow the game events as they unfolded.

The scenario of the games was very realistic with Intelligence Summaries being passed containing itemized actions occurring within the various Task Force areas. Several messages had references to SIGINT. Mention was made of GREEN Forces electronic communications being noted at increased levels and that Signal Intelligence exploitation by the WHITE Forces showed the GREEN Forces had achieved a full state of readiness.

The events included a demand by GREEN for an emergency session of the United Nations to protest attacks against purported unarmed fishing vessels. As the games progressed there were reports of radar contacts, submarine sightings, detection of electronic emissions, aircraft attacks, mining of ports and stra-

tegic points, sinking of boats, etc.

The games had some booboos also. The NBA station at one time sent a short operator note to station CXR and the operator at NBA put the tape on backwards. The error was caught a few moments later and the tape then was run correctly. Then something happened at NBA-- either a power failure or equipment problems.

I had returned to my monitoring position and discovered the printer was getting garbage for print-out. A quick check of the simulcast frequencies showed them all down.

A short while later, transmitter tuning was heard and the NBA transmissions resumed. However, a few minutes later, the NBA signals ceased again so they apparently had experienced a repeat of the failure. A short time later they were back in operation again and the war games messages continued.

In the tabulated lists of message receipt times, it was evident that some of the participating countries were having problems as reflected by the excessive delays in receiving some traffic and a corresponding multi-repetition of a number of messages

LOGGED SEPTEMBER 1985		
KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
13199.2	231326	RTTY 50-850/DE CAI7E (CHILEAN ALLOC) RYS
13247.6	231254	CW/5L GRPS NR59167 CK 44BT
13284.6	281247	CW/H9L DE K6W (UNIDEN) SEE 14583.7 ENTRY
13287	281301	CW/463 463 463 1 (NBR5 BRDCST URCOMING)
13341.4	301707	CW/BQZ (PRC ALLOC), CALLING ONLY
13395.6	271210	RTTY 75-425/SHIFTS TO CW & SENDING CZECH PLAINTEXT.
13404	272258	CW/CUT NBR5, 3 4 5 6 7 SENT FULL, 1 2 8 9 0 SENT CUT AS A U D N T
13417	242311	RTTY 50-425/DE STK (GREEK ALLOC) RY'S
13475	231708	AM VOICE/NBR5 BRDCST, 5F GRPS SS/YL
13624	231712	RTTY 75-850/WX IN ENGLISH FOR CARIBBEAN AREA.
14357	231705	MCW/AUTO MORSE, CONTINUOUS V'S
14403	241227	RTTY 75-170/5F GRPS, SHIFTS TO CW TO RECEIVE QSL (7L1 CZECH EMB, HAVANA)
14430	241217	RTTY 50-850/SPANISH TEXT, STNS SEEM BE PART OF INTERAMERICAN DEFENSE NET
14491.3	251238	CW/SEVERAL SOVIET C/S IN HEADING INCLUDING RIF4(MOSCOW), 5F GRPS
14495	241236	RTTY 50-850/DE CSY (SANTA MARIA, AZORES) TEXT LISTED NOISE RESTRICTIONS AT VARIOUS ENGLISH AIRPORTS
14499.2	271224	RTTY 50-850/APPEARS BE AIRLINE STN IN FINLAND, KARAIR & FINAIR MENTIONED. SENT MSG IN ENGLISH RE PERMISSION TO OVERFLY CERTAIN TERRITORIES FOR HELSINKI TO RIO DE JANEIRO FLIGHT
14508	232029	CW/5L GRPS, SPEC CHARAC AA IM OE OT
14574	281256	RTTY 50-425/PRESS IN ENGLISH, TASS
14583.7	192049	CW/Y3W DE K6W (UNIDEN) CALLING ONLY
14599	242334	RTTY 50-850/DE CAK (SANTIAGO(LOS CERRILLOS AB), CHILE) RY'S
14618	251230	RTTY 50-425/PRESS IN GERMAN (GDR PRESS SVC, ADN-ALLGEMEINER DEUTSCHER NACHRICHTENDIENST)
14639	251216	CW/NO CALLS, PT CZECH MSG, FOSS CZECH EMBASSY, HAVANA CUBA)
14646.8	251210	CW/OMZ DE KNY23 (CZECH DIPL SVC, PRAGUE FROM CZECH EMB WASH DC)
14811.9	251151	CW/NO CALLS/SPANISH LANG OPR CHATTER
14900	251158	RTTY 50-425/DE CLN451 (HAVANA WITH SOVIET NEWS AGENCY PRESS ITEMS (TASS) IN ENGLISH)
16447.7	261846	RTTY 50-425/PRESS IN ENGLISH RE EVENTS IN LEBANON AREA
18166.6	231701	CW/5F GRPS, CUTS ZERO AS T, HAND SENT

LOGGED OCTOBER 1985		
KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
4246	121024	CW/BOFS DE KPH (CHINESE SHIP FROM SANFRANCISCO, CALIF)
11591.8	031323	CW/NO CALLS/5L GRPS, FIRST AND LAST GROUPS PHONETICIZED.
13135.6	091215	CW/CQ DE CLQ (HAVANA(COJIMAR), CUBA)
13198.8	041229	RTTY 50-850/DE CAI7E (RY'S, THEN TAPE TAKEN OFF AND TAPE WITH "DE CAK" RY'S IS RUN. (CAK LISTED AS SANTIAGO (LOS CERRILLOS AB) CHILE)
13258.9	011420	CW/F24 DE F20 (BELIEVE THESE ARE MEXICAN MIL CALLS, THEY DROPPING FIRST LTRS OF CALLSIGN)
13366	041243	CW/LTS DE LTA61 (ARGENTINE ALLOC)
13371	041831	RTTY 75-850/CXR DE NBA (MONTEVIDEO, URUGUAY FROM BALBOA, PANAMA) THIS IS INTERAMERICAN NAVY NETWORK
13390	111317	CW/CLP55 DE CLP1 (CUBAN EMB GEORGETOWN, GUYANA FROM HAVANA) MINREX FREQ
13396	111325	FSK CW/7L1(CZECH EMB HAVANA) OPR CHATR
13400	081255	RTTY 50-425/DE LZG3(BTA-BULGARSKA TELEGRAFITSCHEKA AGENTZIA) SOFIA) PRESS IN ENGLISH, DUALING WITH LZP2 ON 15555
13560	101741	CW/M ⁿ MARKER
13631.5	011416	CW/VVV DE EC3Y (SPAIN ALLOC) CALL TAPE
13949.7	091249	RTTY 50-425/PRESS IN GERMAN
13997.4	091246	RTTY 50-425/PRESS IN FRENCH
14464.5	091222	CW/CQ DE 6YI(KINGSTON, JAMAICA) CALLTAPE
14446	091642	CW/5L GRPS, SPEC CHARAC IM AA OE OT
14469.7	011447	RTTY 50-425/TASS, SOVIET NEWS SVC WITH PRESS IN ENGLISH
14497.4	091229	RTTY 50-850/AIR NOTICES & WX IN ENGLISH, FOSS FROM SANTA MARIA, AZORES
15555	081255	RTTY 50-425/LZP2(BTA, SEE 13400 ENTRY) PRESS ITEMS IN ENGLISH
16307.9	011423	RTTY 50-425/DE Y7A37 Y7A49 Y7K30 Y7A66 (BERLIN, GDR) RY'S
16391.3	011445	CW/DM93 DE UCBV (LUANDA NAVAL RDO, ANGOLA FROM RUSSIAN SHIP)
17590.1	111632	CW/5L GRPS, SPEC CHAR AA IM OE OT

UTILITY INTRIGUE cont'd

being necessary.

It was not possible to determine if this was caused by reception conditions or by somewhat inefficient message handling procedures within certain communications centers.

The details for the Inter-American Naval Network can be found in the Grove SHORTWAVE DIRECTORY (2nd Edition) on page 33. A few additional pieces of information can be added to that in the directory. In the call sign section: 5KM is Bogota Naval Radio, Colombia; HDN is Quito Naval Radio, Ecuador; and CXR is Montevideo Armada Radio, Uruguay. Also, the frequency of 14430 kHz (not listed on page 33) was detected carrying traffic that appeared to be related to IA military matters so it may be another operating frequency of the network.

SCANNING

MORE ON 1090 MHz

Several sharp-eyed readers who know more about aircraft navigational signals than we do spotted an error in our explanation in the October issue of signals heard from aircraft on 1090 MHz.

Rather than DME (distance measuring equipment) which also may be heard around that frequency, 1090 MHz is the transponder frequency used by the aircraft as it automatically identifies itself for ground radar after being triggered from the ground station on 1030 MHz.

It is relatively common for 108-118 MHz VOR (VHF omniranging) signals to be paired with DME beacons in the 1000 MHz range, in which case the system is known as VORTAC.

The VORTAC and 1030 MHz signals will only be detectable by receivers in the vicinity of the ground transmitter; only the 1090 MHz signals are widely heard due to the altitude of the transmitting aircraft.

Reply codes can be anything from 0000 to 7777 (no 8's or 9's). 1200 is the code for VFR (visual flight rules)--aircraft not under radar control. 7500 denotes a hijacking, 7600 a communication failure and 7700 an emergency.

Yet another letter from Gordon Bousman of Lake Villa, Illinois, an instrument-rated pilot, provides additional insight into the system:

"Radar transponder replies are one-half micro-second pulse pairs with 21 micro-second spacing. These pulse trains contain data (altitude information and squawk code) and the usual output power is 250 watts. The ground interrogation signal comes from an antenna which is mounted on top of the air traffic control radar antenna and sweeps with it.

"The replies received from aircraft in the area are decoded by a computer and displayed on the radar scope as enhanced blips (more visible than just the primary radar return) and have a data block that is displayed next to the blip.

"The data block contains such information as altitude, flight number, and ground speed. Normally only one squawk code (4096 are possible) is assigned for the entire flight. The air traffic controller can blot out unwanted targets by asking the computer to display only those transponder replies that he is interested in.

"Radar transponders are not limited to commercial aircraft but are carried by most all aircraft and are, in fact, required by law if you operate any aircraft in a TCA (Terminal Control Area) which are radar control areas set up around larger cities in the U.S.

"Totally separate from but using adjacent frequencies (and usually the same antenna on the aircraft) is the DME system which has nothing to do with radar or air traffic control. In the operation of DME, paired pulses at a specific spacing are sent out from the aircraft (this is the interrogation) and are received at the ground station (usually a VOR station which is used for navigation and not associated with any ground radar).

"These interrogation frequencies are from 1025 to 1040 MHz (military aircraft) and 1041 to 1087 MHz (civil and military aircraft) and have one MHz spacing. The ground station (transponder) then transmits paired pulses back to the aircraft at the same pulse spacing but on a different frequency (962 to 977 MHz military only and 978 to 1040 MHz; additional frequency pairs are in the range 1091 to 1213 MHz).

"The time required for the round trip of the signal exchange is measured in the airborne DME unit and is translated into distance (nautical miles) from the aircraft to the ground station. This information is displayed on the aircraft

MONITOR



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VHF SKIP REPORT

by

Chuck Robertson

RR 2 Box 850

Creal Springs, IL 62922

SKIP ALERT!

Mysterious scrambled skip has been monitored on 30.25 MHz. At present no clear voice has been heard and the users of this scrambling remain unknown!

The scrambling appears to be time division multiplexing used simultaneously with frequency hopping speech inversion. Refer to the October "VHF Skip

instrument panel as a digital readout of ground-speed and distance to the VOR ground station.

"DME is identified by coded tone modulation at 1350 Hz. Frequency pairings reserved solely for military use are known as TACAN. Because these signals are strictly line-of-sight, reception of the ground based signal (transponder) would be difficult unless one is close to the station. On the other hand, aircraft emissions should be audible up to 150 miles or more depending on the height of the aircraft."

Report" for a description of this type of scrambling.

Long encoded tone bursts which begin and end each transmission synchronize the receiving stations to process the scrambling.

Except for the tone bursts, the scrambling is identical in format to that used on Cuba by the Soviets. However, there is a noticeable difference in the tonal quality of the scrambled voice. The stuff on 30.25 MHz sounds much more "scrambled." Could our Caribbean comrades be using more sophisticated equipment?

The scrambling on 30.25 MHz was logged the evening of August 6, 1985, along with skip from Washington, D.C. This would seem to indicate the scrambling originated from the east coast, not Cuba. One fascinating possibility is that the scrambling was transmitted by the Russian embassy in Washington, D.C.! KGB and GRU personnel account for about 90% of the embassy officials.

One look at the extensive array of sophisticated antennas on the top of the Soviet embassy complex shows the Russian capability to transmit and monitor a wide range of frequencies from HF to microwave.

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*Mobile use subject to restriction in certain localities.

VHF SKIP cont'd

another chance to monitor these "unearthly" comms!

GIVE ME LIBERTY

Planning a trip to the Statue of Liberty? You'll want to program the frequency 34.79 MHz into your scanner. It's used for communications on Liberty Island and the ferry boats.

The base uses the call sign KID703 or just "703." Government frequency files show the base licensed for 45 watts and ferries for 5 watts.

Wonder where the antenna for the Liberty Island transmitter is located? For only 45 watts she sure puts out a smashing signal here in Illinois!



"But where's the antenna?"

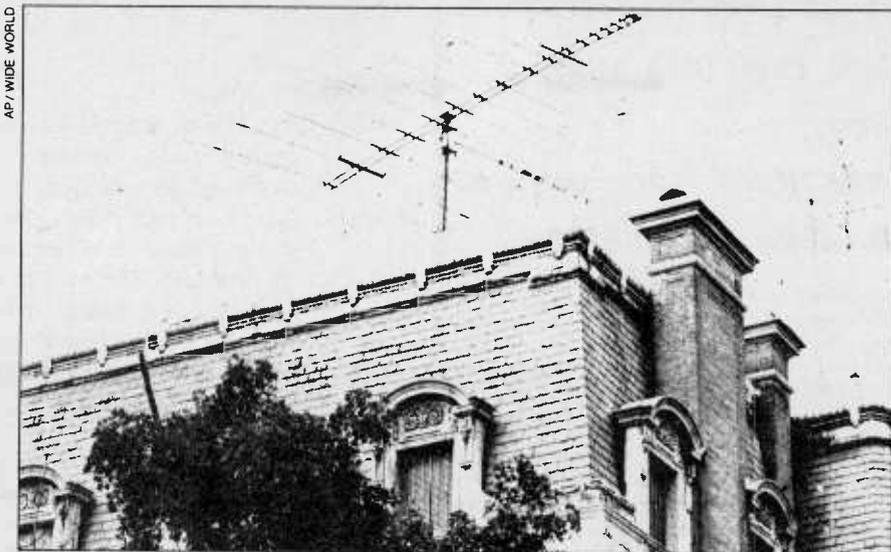
The low power ferries are also occasionally heard. They use identifiers like "Liberty One" and "Liberty Two." Other boats have designators such as "Boat 420," possibly vessels involved in the renovation of the Statue of Liberty.

A second base is located on Ellis Island, KID704, also 45 watts. Ellis Island was the principal immigration reception center in the U.S. from 1892 to 1943. In 1965 it became part of the State of Liberty National Monument.

The government files also show a base at Sandy Hook, about 14 miles southeast of Liberty Island. The call sign is KID705, operating at 45 watts. I've not heard this base on the air, but it may be used by the Gateway National Recreational Area.

IWO JIMA RADIO

A U.S. Government operation with the call "Iwo Jima Radio" has been found



Our nation's capital--Washington, DC--is a hot-bed for ongoing Soviet KGB espionage. These special antennae atop the Russian Embassy in Washington are not there to receive their favorite TV shows, but are used to transmit them back to Russia! The facility is 350 feet above sea level with an overview of much of the Washington, D.C., area. They are in line-of-sight of the White House, State Department, Commerce Dept., Pentagon, and other foreign embassies. The CIA headquarters in Langley, VA, is also partially within "electronic view" of the Soviet Embassy! From: *International Combat Arms*, "The Undercover Spy War," November 1985. AP photo.

making radio checks on 38.00 MHz. It's my guess this is the radio system at the Iwo Jima National Monument in Washington, D.C. Other VHF-low band frequencies may also be in use.

The monument depicts the familiar U.S. flag-raising atop Mt. Suribachi during World War II.

THE PENTAGON, JEEVES

A new Pentagon VIP taxi frequency recently became operational in the Arlington, Virginia/Washington, D.C., area. The channel is 32.87 MHz, narrowband FM. It's used for dispatch by the Pentagon base, with mobiles on the old Pentagon taxi frequency 32.53 MHz. The channels are used semi-duplex.

There are two bases, 600 and 120 watts, and both regularly identify as "315" (actually, WAR315). Mobiles are licensed for 30, 50 and 120 watts.

Encoded tone bursts, another new addition to the radio system, are used mainly by the taxis to signal status - en route or standing by. These high-pitched chirps often occur without any verbal comment by the base or taxi.

As with other VIP taxi services in the Washington, D.C., area, four-digit numbers are often dispatched instead of the specific address or VIP's name. This is done for security purposes. Nevertheless, you'll still be able to hear lots of general locations like NSA House A, the State Department, the Pentagon, etc.

DES-Federal scrambling has also been heard on 32.53

MHz. It's unclear whether this was Pentagon taxi comms or skip coming from some other far flung operation.

Pentagon security officers can be heard on 36.71 MHz. The base is located at Ft. Myer, Virginia, call sign WAR300, 60 watts. Mobile units are licensed for 30 watts.

More Pentagon security operations can be found on 36.79 MHz. The base is

located at or near the Pentagon, call sign WAR430, 100 watts. Mobiles are also licensed for 100 watts, and portables for 5 watts.

Many of the support facilities and personnel which service the Pentagon are located at Ft. Myer. A similar liaison exists between Ft. McNair and Washington, D.C. Here are some other frequencies for the Pentagon area. Sources for this information are Bob Grove's Federal Frequency Direction, the government frequency files and on-air monitoring.

- 30.49 Pentagon, 5 watt AM mobile units
- 32.31 Vint Hill Farms, AAC 614, base 100 watts, mobiles 100 watts, walkie talkies 1 watt
- 32.85 WBFM mobile units using "Langley #" designators have been heard on this channel. Could be Langley AFB or the CIA school at Langley, VA
- 34.15 Langley AFB, mobiles 2 watts, WBFM
- 36.55 Ft. Myer, WAR305, base 100 watts, mobiles 30 watts, fire channel
- 36.99 Pentagon fire channel
- 38.53 Vint Hill Farms, AAC 612, base and mobiles 100 watts, walkie-talkies 1 watt,

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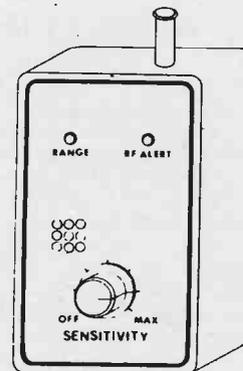
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The fully revised new edition now includes additionally the VLF and LF frequency band from 0 to 150 kHz which is covered by most general coverage receivers, as well as a new chapter listing the transmission schedules of all meteorological FAX stations with full details. The 1985 revision of the 1982 Radio Regulations, as well as the new CCITT genex and telex service codes in force since 01 October 1985, are also listed.

This unique manual covers the complete shortwave range from 3 to 30 MHz, plus the adjacent frequency bands from 0 to 150 kHz and from 1.6 to 3 MHz, and includes details on all types of utility stations including FAX and RTTY stations. Besides CW, FAX, SSB and standard RTTY with its derivatives in the Arabic, Cyrillic and third-shift Cyrillic alphabets, sophisticated modulation systems are represented by hundreds of frequencies of stations using VFT (Voice-Frequency Telegraphy), FEC (Forward Error Correction) and SITOR (Simplex Teleprinting Over Radio) / AMTOR.

The numerical frequency list covers 15083 frequencies of stations which have been monitored during 1985, thereof 29% RTTY and 3% FAX. Frequency, call sign, name of the station, ITU country/geographical symbol, type(s) of modulation and corresponding return frequency, or times of reception and details, are listed. All frequencies have been measured exact to the nearest 100 Hz. Radio Regulations on frequency allocations, including the complete Table of Frequency Allocations from 9 kHz to 150 MHz with all footnotes, are included. With reference to the previous (3rd and 11th) editions, 1705 new frequencies are listed, 1386 frequencies have been deleted, and 3227 entries have been modified.

The alphabetical call sign list covers 2976 call signs, with name of the station, ITU country/geographical symbol, and corresponding frequency(-ies). An additional section--arranged in country order--covers 365 stations operating without complete official call sign, and co-channel stations. The formation of call signs is explained in the Radio Regulations on the identification of stations. The table of allocations of international call sign series is also included.

80 RTTY press services are listed on 502 frequencies--not only in the numerical frequency list, but also

- chronologically in a comprehensive list for easy access around the clock;
- alphabetically in country order with frequency, call sign and schedule.

Additional alphabetical indices cover

- schedules of 63 meteorological RTTY stations on 261 frequencies
- 80 meteorological RTTY stations on 261 frequencies
- 867 mnemonic abbreviations, including all utility station name abbreviations, all abbreviations for regional states in Australia, Canada, USA and USSR, all ITU symbols designating countries or geographical areas, and all traffic abbreviations and signals
- 182 service codes and abbreviations used in genex and telex operation
- schedule of NAVTEX transmissions of navigational and meteorological warnings on 518.0 kHz
- all Q-code groups including all special air/maritime groups from the QA-QO series
- 322 Z-code groups for civil and military use
- phonetic alphabet and figure code
- SINPO and SINPFEMO signal reporting codes
- designation of emissions, with associated examples for ALAAN to R3EGN
- classes of stations from AL to TZ
- comprehensive list of terms and definitions
- reverse list--in area order--of the Aeronautical Mobile Service (AMS) frequency allocation plan, with the corresponding Radio Regulations
- Maritime Mobile Service frequency allocation scheme
- regulations on technical characteristics of facsimile equipment
- addresses of 605 utility stations in 171 countries, in country and category order

Three AMS network allotment area world maps (each 465 x 225 mm) are attached, covering MWARAs, RDARAs and VOLMET Allotment and Reception Areas.

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References

Richard H. Barnes, Director of INTERBOOKS, Perth, Scotland--15 September 1985: "GUIDE TO UTILITY STATIONS... this is the most comprehensive and accurate guide to these shortwave stations on the market."

George D. Kelce, President of Digital Electronic Systems, Inc. (INFO-TECH RTTY equipment), Englewood, FL - 03 September 1985: "Thanks for your books - they make the locally produced manuals look rather amateurish."

Bob Grove in "Monitoring Times" July 1985: "Joerg Klingenfuss has earned a worldwide reputation as being a leader in amassing accurate comprehensive frequency lists of short-wave utility stations. Now, his former utility guide and RTTY guide have been combined into one giant reference... Without a doubt, this is one directory that ute listeners won't want to miss!"

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VHF SKIP cont'd

- security
- 38.95 Ft. Myer
- 39.50 Virginia state emergency radio inter-system, municipal
- 40.10 Davison AAF, Ft. Belvoir, tower & aircraft 35 watts, WBFM. Fort Belvoir is used primarily for Army Corps of Engineer training. Davison AAF is the main Army Air Field in the Fairfax County (Pentagon) area and houses aircraft for the Military District of Washington, D.C.
- 40.17 and 40.19 Langley AFB--Base 50 watts, mobiles 25 watts; Air Force Special Investigators (OSI)
- 40.49 Vint Hill Farms, AAC 614, Base & mobiles 100 watts, walkie-talkies 1 watt, fire channel
- 40.87 NASA Research Center, Langley. Base and mobiles 100 watts
- 41.61 and 46.97 Pentagon, State Dept.
- 46.65 Arlington, WAR335, Base 120 watts, mobiles 120 and 20 watts
- 49.70 Ft. Myer, base & mobiles 50 watts
- 49.80 Ft. Myer, base 100 watts, mobiles 50 & 35 watts
- 49.80 Davison AAF, Ft. Belvoir, base 100 watts, mobiles 50 watts. Could be EOD operations.

D.C. TAXI

Non-stop chauffeuring of VIP's around Washington, D.C., can be heard on 36.63, 36.69 and 36.91 MHz, NBFM.

There are four bases on 36.69 MHz (see the "Monitoring Washington, D.C." list below). The main base is at Ft. McNair, WAR 23.

When the skip is in I often hear these bases "walking on" each other.

Buses, taxis and security patrols can be heard on 36.91 MHz. The base is in Washington, D.C., call sign WAR400.

Taxis and security patrols are also found on 36.63 MHz, call sign WAR200.

I've discovered another Washington, D.C., taxi operation on the unusual frequency of 36.22 repeater-out, 300 watts, NBFM. It's used by the Department of Human and Health Services. Two bases, taxis and general maintenance have been logged on the channel. Mobile designators are "WSP#".

ROADRUNNER

One of the most inter-

esting Washington, D.C., nets can be found on the frequency 32.23 MHz, NBFM. This channel is used for communications among bases at the White House (Crown), Camp David (Cactus) and Anacostia Naval Air Base (Cloudburst).

Mobile units also use this channel. The White House communications van is called Roadrunner. Other mobiles use Cactus and Cloudburst designators (Cactus 413; Cactus 33; Cloudburst 77, etc.).

Telemetry (NESCO) is occasionally transmitted between base and mobiles; secure voice (DES scrambling) is also used.

This channel is very active and makes a good indicator of propagation conditions for the Washington, D.C., area.

MONITORING WASHINGTON, D.C.

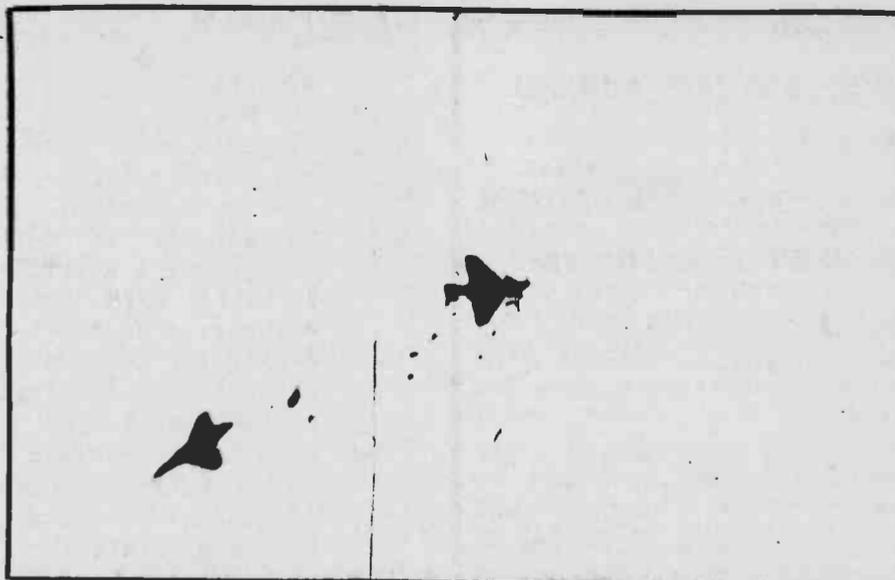
Here are a few frequencies for Washington, D.C., and Maryland.

- 27.85 FEMA, KGB641 (Washington, D.C.) and KGB 643 (Olney, MD) Bases 330 and 250 watts, mobiles 60 watts, NBFM. Also try 27.65, AM emissions, base & mobiles 35 watts, Maryland area
- 29.90 Army, land mobile units, 0.6 watts AM, could be walkie-talkies
- 30.00 Military security patrol, exact location unknown, WBFM
- 30.09 and 32.11 Walter Reed Hospital 0.2 watt, paging
- 30.15 Navy, base & mobiles, 100 watts, WBFM
- 32.00 U.S. Gov. ferry. This channel has only been heard once. Perhaps they change frequency regularly.
- 32.23 White House/Anacostia /Camp David comms
- 33.06 Ambulance dispatch. This channel is very active and makes a good "skip indicator" of VHF openings to Washington, D.C.
- 34.98 Commerce, KCU727, Rockville, MD, base & mobiles 60 watts, NBFM
- 36.22 Repeater-out, Taxis & general operations, H.H.S. Two bases: Bethesda, KID470; and Poolsville, KBJ334. 300 watt repeater.
- 36.31 Ft. McNair, WAR442 Base & mobiles 100 watts
- 36.35 H.H.S., KBJ334, Base & mobiles 60 watts
- 36.51 Base-to-base, 330 watts: Washington,



VHF SKIP cont'd

- D.C., WAR20; Pentagon /Ft. Myer area, WAR28; Damascus, MD, WAR29; Independence Hill, VA, WAR31
- 36.63 Taxis, WAR200, base 300 watts, mobiles 30 watts.
- 36.69 Taxis, four MD bases: Ft. McNair, WAR23, base 60 watts, mobiles 30 watts; Aberdeen Proving Grounds, AAC 219, base 50 watts, mobiles 30 watts; Suitland, base 100 watts, mobiles 100/60/15 watts; Davison AAF, WAR27, Base 60 watts, mobiles 30 watts. Four-digit numbers are used.
- 36.91 Buses and taxis, WAR 400, base 300 watts, mobiles 90/30 watts. Four-digit numbers used.
- 38.00 Iwo Jima National Monument, WBFM
- 39.10 Maryland State Police statewide
- 39.22 Maryland State Police marine patrol
- 40.10 Capitol Hill Air operations, tower & aircraft 35 watts, WBFM. Could be Med-evac.
- 40.17 and 40.19 Bolling AFB; Base 50 watts, mobiles 25 watts, Air Force Special Investigators & the Civil Air Patrol are stationed at Bolling.
- 40.45 VA Hospital, Baltimore, KEZ204, paging, NBFM 100 watts and AM 50 watts. This appears to be a nationwide VA paging frequency.
- 40.47 Dept. of Energy Command Center, Germantown, MD; Base 1,000 watts, 16F9 emissions
- 40.60 Dept. of Defense, Army, mobile and/or walkie-talkies, 0.4W
- 41.83 H.H.S., Bethesda, MD. Base 330 watts, mobiles 80 watts
- 49.40 Aircraft Landing at Andrews AFB. Andrews is the primary AFB in the Washington, D.C. area. Most dignitaries arrive and depart from there. The Presidential Flight Detachment (Air Force 1, Air Force 2, etc.) is also hangered at Andrews.



BLUE ANGELS CRASH

On the morning of July 13, I was monitoring air-to-air comms on 34.35 MHz between U.S. Aircraft attending an air show at Niagara, NY. At one point a pilot stated, "Oh, there you are!" The other pilot only laughed. That was the last I heard from them!

Later the same day I learned that two Blue Angel A-4 Skyhawk jet fighters had collided at the Niagara Falls International Air Show. One pilot was killed and the other parachuted to safety. The accident occurred during a hair-raising stunt called the Opposing Blivot, in which two planes approach head-on at more than 300 MPH. When the planes come to within 200 feet of each other they go into a steep 6,000 foot climb. At the top of the climb the pilots dive downward and crisscross paths at a 45° angle. It was during this climax that the planes collided.

I have no idea whether the remarks I heard on 34.35 MHz were by the actual Blue Angels involved in the crash, but they sure sound like "famous last words"!

Incidentally, the VHF-low band/UHF-aero band radio combination is very popular with U.S. military aircraft. I've regularly heard pilots on low band give UHF aero frequencies over the air for other pilots or range controls to monitor. Next time you hear UHF-aero comms try VHF-low band. You may be surprised to find much of the communications are occurring in that range!

NTS UPDATE

New information has been gained concerning the Nevada Test Site reported on in last month's column. First, Mormon Mesa is in the adjoining Nellis Air Force Range and not in NTS. Here are the underground nuclear test sites which are in NTS: Buckboard Mesa, Pahute Mesa, Rainier Mesa, Yucca Flat,

Climax Stock (North of Yucca Valley), Frenchman Flat, Shoshone Mt, Clark Site (Clark County).

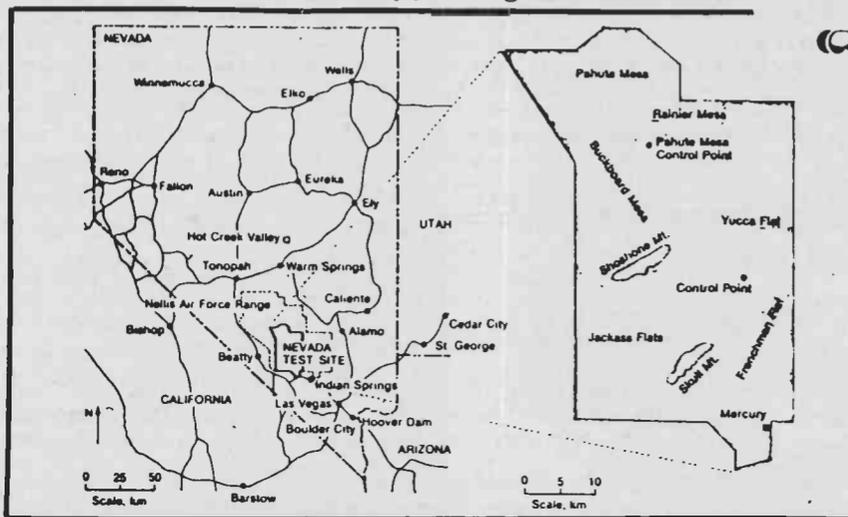
There's also a Central Nevada Supplementary Test Site at Hot Creek Valley,

north of NTS (see map).

Last month I also made the off-the-cuff remark that the multi-crunch sound heard at the end of each transmission on 36.33 and 36.39 MHz might be caused by several repeaters unkeying one after another. Let me clarify that statement. This would only be true if the repeaters are on different frequencies--not the same frequency. Two or more repeaters transmitting on the same frequency would cause tremendous distortion.

Several times I've heard technicians on the repeaters keying microwave antennas by use of audible tones. Quite likely the repeaters are linked by microwave relays.

Here's how the system might work--When a mobile



Salient features of the Nevada Test Site. From "Public Safety and Underground Nuclear Detonations," DOE, 1971.

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Note that 49.40 is a U.S. business channel! Military operations can and do turn up on most any frequency. Other Washington, D.C., area aircraft have been logged on the unusual frequency of 31.85 MHz.



by James R. Hay

REMEMBER THE BC-348
AND BC-375?

Recently a letter arrived from Hugh Miller of Seattle which I found rather interesting and is related to shipboard equipment which was mentioned a few months ago. This month I thought that I would share what was said with you, so here goes.

"Although some ships are fitted with the latest HF receivers and satellite communications costing thousands of dollars, there are many ships out there with gear which would be considered obsolete in any other service--including ham

VHF SKIP cont'd

unit transmits on 41.31 the signal is retransmitted by microwave antennas to the desired repeater site. The signal is then rebroadcast on one of the 36.33, 36.39 and/or 36.05 MHz repeaters.

The multi-crunch sound is the result of the unkeying of the mobile's microphone, then the microwave relay and repeaters dropping out successively.

TIS THE SEASON

A secondary seasonal peak in sporadic-E propagation will take place this month. Skip openings should be frequent and widespread, especially in the first three weeks of December.

There should also be a few brief F₂ layer openings this month. Unfortunately, solar activity has declined to a point where daytime MUFs will generally be below 30 MHz. Noon is usually the best time to check for F₂ skip.

And remember, the skip you monitor in your area may be quite different from what I've heard and reported from my QTH in southern Illinois. I hear a lot of strange and fascinating things, but I don't hear it all. What sort of military, pirate or foreign skip will you discover?

NEXT MONTH: We'll investigate the Private Investigators! Plus--low band police surveillance, tracking transmitters and unlicensed police operations.

radio or the SWL hobby!

"Of course, this is nothing new; raspy spark transmitters were still in use on some countries' freighters at the outset of World War II, together with simple regenerative circuit receivers using as few as three vacuum tubes. Some English freighters, for example, were equipped with such setups when the war began.

"The equipment was hastily changed, especially as there was the fear that U-boats could home in on their prey by listening for the weak radiations from the regenerative receivers. Some were sunk before the new gear could be installed, and their rasping spark SOS'es could be heard through the other static.

"Although World War II brought the definite end for shipboard spark transmitters, I have been told that smaller spark transmitters for emergency use could still be found on lifeboats carried by the shipping of some small, poor countries as late as 1945. In the U.S.A., lake steamers on the Great Lakes still carried the ancient 1920 design IP-501 receiver, which was replaced only in 1945 by the RCA AR8503, another LW regenerative set, albeit of a little more modern design (early 1940's).

"With the end of the war, vast quantities of radio gear were disposed of in the U.S., and much of it went into the ships of many countries. For example, the liaison set of receiver BC348 and transmitter BC375, as carried on thousands of U.S. heavy bombers and cargo planes, was sold in quantity to operators of fishing fleets in the Near East-Mediterranean area for years after it was abandoned as obsolete by the U.S. military and commercial airlines.

"With the end of maritime double sideband AM in the U.S. and Canada in 1976, thousands of the old radios suddenly became surplus. Not all of them ended up at swapmeets and fleamarkets, though; many of the more powerful sets just moved to other countries, where there were eager buyers, and AM was still king.

"For example, many high power sets were sold to Mexican fishermen on the Pacific coast. In the U.S., DSB-AM lingered a while longer in Alaska, as a fishing boat operators who swore that the old AM 'punched through' better than the new SSB rigs hung on to their high powered rigs.

"In the isolated inlets

of Alaska, no authority was around to force them to change. Some Alaskan fishermen even made use of their off-season visits to southern ports such as Seattle to buy up surplus AM gear at a fraction of the price the gear had commanded the year before.

"However, it wasn't only the fishing boats that were using outdated gear. In the U.S. Navy, for example, the 1941 Collins-designed TCS transmitter and receiver were carried on some auxiliary vessels into the early 1970's and in some cases were removed only when the ships were decommissioned and sent to the scrapyards.

"Other World War II gear such as the heavy ship receivers RBA, RBB and RBC were used at numerous shore stations and on some vessels into the 1970's, by which time the Navy had already tried and released other vacuum-tube receivers and was only buying solid state receivers.

"Some of this kind of gear is still in use of older freighters and at a

few shore stations in their world countries--old, ex-military vacuum tube general coverage receivers, not even the 'cadillacs' of the genre, but of the fairly ordinary kind that most SWL's here regard as 'nostalgia toys'.

"So, while some ships have the latest AMTOR and satellite systems, other have radio rooms with equipment that many SWL's and hams would not like to have to rely on! The new gear is very expensive and the old HF CW gear still works--it gets the message through."

Thanks for sharing this fascinating historical perspective with fellow listeners, Hugh. I know that many of us remember those old rigs with nostalgic familiarity.

Please send any correspondence regarding this column, including suggestions for topics to: James R. Hay, 141 St., John's Blvd., Pointe Claire, P.Q., Canada, H9S 4Z2. Good listening until next month.

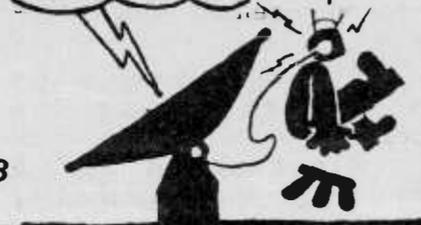
SIGNALS FROM SPACE

by

Larry Van Horn

160 Lester Drive

Orange Park, FL 32073



Of all the satellite systems on which I receive mail every month, MT readers are most interested in U.S. MilComsats. This month SFS will focus on two of the most widely monitored satellite systems: Fleetsatcom and Leasat (Syncom).

FLEETSATCOM

"I take great pleasure in inaugurating...the first satellite of the fleet satellite communications system. The gap is filled." With that message by Admiral James L. Holloway, III, then Chief of Naval Operations in 1978, the Fleetsatcom system became operational.

Since the first satellite was launched, there have been four additional launches of fleetsatcom satellites. These satellites make up the current backbone of U.S. Navy communications worldwide.

The main body of the 2300 pound satellite, a hexagonal structure 7.5 feet wide and four feet high, contains the payload and spacecraft modules. Two solar arrays attached to booms extending from the spacecraft module continually rotate to face the sun. These solar arrays produce a

minimum 1,259 watts of power for at least five years, charging nickel-cadmium batteries that power the spacecraft during solar eclipse periods.

The satellites use three-axis stabilization to keep the antennas pointed at earth. Hydrazine jets alter the satellites' longitude for station keeping purposes.

The payload section contains three antenna systems, transponder equipment and the electronics required to support 23 communications channels. The UHF receive antenna is an 18-turn helix, 12.5 feet long, offset from the satellite payload module.

The UHF transmit antenna is a deployable dish 16 feet in diameter. A separate conical helix antenna sits atop a central mast and serves the satellite's S-band tracking, telemetry and control functions on 2202.5, 2252.5 and 2262.5 MHz.

Each satellite contains the communications package outlined in Table 1.

There are currently three band plans in use by the Fleetsatcom satellites

SIGNALS FROM SPACE cont'd

but, due to space constraints, these plans and those of the Leasat satellites will not be covered. They are presented in detail in my book "Communications Satellites," available from Grove Enterprises, and the band plan names mentioned in this column refer to the band plans mentioned in the book.

Table II is a synopsis of Fleetsatcom launches to date.

Based on extensive monitoring of these satellites, Table III lists band plans currently in use by the Fleetsatcoms in operation.

When Fleet F2 was originally launched in 1979, it was located at 23° west. With the launch of F3 in 1980, F2 was moved to the Indian Ocean relay slot.

Fleet F5 was launched as a spare to be available when F1, the oldest satellite in the constellation, died. Unfortunately for the Navy, the General Dynamics Atlas-Centaur nose cone shroud covering the satellite collapsed inward during launch, destroying the primary antenna. The satellite continues to transmit telemetry, but is essentially useless due to the accident.

Fleetsatcom No. 6 should have been launched by the time this column reaches print, so monitors are encouraged to keep a check for a new Charlie channel transponder or a stronger Alpha channeled transponder.

Current plans also call for the launch of Fleetsatcom F7 and F8 in the 1986-1987 time frame. These new birds will carry special anti-jammable EHF communications packages. This system will have a ship-to-shore as well as a ship-to-ship

communication capability, relieving the Navy of its dependence upon shore stations for relay.

A refined EHF system is targeted for deployment in the 1990 timeframe as part of the follow-on Milstar satellite system.

LEASAT

Assuming that the Fleetsatcom system would die from old age at the end of their five year lifetimes, Congress approved the lease of an interim series of communication satellites. Manufactured by Hughes Aerospace, these Leasats (Leased Satellite) will provide communications to cover the period between Fleetsatcom satellite failures and Milstar satellite system launch.

The space shuttle has now launched four of the Leasat (Syncom) satellites as of this writing, and the satellite has been plagued with major problems almost from the beginning.

Leasats have fewer channels than the Fleets, but with DAMA (demand-assign, multiple access), excellent supplemental channel capacity is realized.

Leasats have a diameter of 168 inches, and overall length of 243 inches, and a weight of 2,900 lbs. each.

Each Leasat communications payload is listed in Table IV. Table V is a synopsis of Leasat launches to date.

Based on information available now Table VI is a lineup of band plans that are currently in use and those of future use on Syncom satellites.

In the October 7 edition of "Aviation Week" it has been reported that Leasat 2 has suffered a wideband (channel 2) failure. Hughes engineers were working to correct the prob-

Channel	Communications package	User
1	1 25-kHz fleet broadcast channel	U.S. Navy
2	1 500-kHz wideband transponder (This transponder will employ frequency division for 21 25-kHz accesses)	National Command Authority
3-8	6-25 kHz relay transponders	U.S. Navy
9-13	5-5 kHz narrowband channels	US Air Force

Satellite	Object No.	Launch date	Shuttle Mission	Orbital Mission
Syncom IV-2 (Leasat 2)	84-93C	8/31/1984	STS-41D	15° W
Syncom IV-1 (Leasat 1)	84-113C	11/ 8/1984	STS-51A	105° W
Syncom IV-3 (Leasat 3)	85-28A	4/12/1985	STS-51D	72° E
Syncom IV-4 (Leasat 4)	85-76D	8/27/1985	STS-51I	178° E
Syncom IV-5 (Leasat 5)		12/ /1985	??	Ground spare

Leasat	Relay	Band plan
Leasat 2	Atlantic Ocean relay	Leasat Whiskey band plan
Leasat 1	East Pacific relay	Leasat Yankee band plan-unconfirmed
Leasat 4	West Pacific relay	Leasat Xray band plan-unconfirmed
Leasat 5	Ground spare	Leasat band plan unknown

lem. This Leasat had been working fine until the last week in September when the failure occurred. As of this writing (mid-October), I still see no indication that the problems have been rectified. The satellite's remaining six relay, five narrowband and one fleet broadcast channels are functioning properly.

Leasat 4 failed completely on September 6 after reaching geosynchro-

nous orbit. Hughes Communications of Los Angeles, owner of the crippled Leasat 4, blamed the failure on a faulty cable between the satellite's UHF radio transmission system and its broadcast antenna. The satellite is now considered an \$85 million loss and Hughes officials have abandoned hope of reviving Leasat 4.

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Channel	Communications Package	User
1	1 25-kHz fleet broadcast channel	U.S. Navy
2	1 500-kHz wideband channel (This transponder will employ frequency division for 21-25 kHz accesses)	National Command Authority
3-11	9 25-kHz fleet relay channels	U.S. Navy
12-23	12 5-kHz narrowband channels	US Air Force

Fleetsatcom	Relay	Launch Date	Orbit
Fleetsatcom A (F1)	78-16A	2/ 9/1978	100° W
Fleetsatcom B (F2)	79-38A	5/ 4/1979	75° E
Fleetsatcom C (F3)	80-04A	1/17/1980	23° W
Fleetsatcom D (F4)	80-87A	10/30/1980	172° E
Fleetsatcom E (F5)	81-73A	8/ 6/1981	93° W

Fleetsatcom	Relay	Fleetsatcom
Fleetsatcom F1	Pacific East relay	Fleetsatcom Alpha
Fleetsatcom F2	Indian Ocean relay	Fleetsatcom Charlie
Fleetsatcom F3	Atlantic Ocean relay	Fleetsatcom Bravo
Fleetsatcom F4	Pacific West relay	Fleetsatcom Bravo
Fleetsatcom F5	In-orbit spare	Fleetsatcom Charlie



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 - 4 KHz Filter replaces stock 6 KHz wide filter. Improves AM Selectivity. COST \$50.00
 - Audio output modification. Increases audio output power, lowers distortion and widens audio bandwidth for pleasurable listening. COST \$35.00
 - AGC time constant change decreases slow time and increases fast time constant. COST \$35.00
 - Spike protection added, no need to spend \$30.00 for a wall plug-in spike protector. It's installed right inside where it is most effective. COST \$25.00
 - Final alignment and over-all check out. COST N/C
 - Installation of ICOM options purchased with your NEW R71A. COST N/C
- TOTAL COST OF THESE OPTIONS IS \$315.00**
 Purchase the R71 HP and SAVE \$115.00
 R71 HP (MF) Mechanical Filter \$849.00
 R71 HP (XF) 8 Pole Crystal Filter \$899.00
 R71A as it comes from ICOM \$649.00
 FREE: One year Option - Purchase R71A from EEB at \$649.00 and you have 1 year to upgrade to the High Performance configuration HP (MF) \$249.00 HP(XF) \$299.00

ICOM R-7000



Commercial Receiver VHF-UHF 25-2000 MHz SAVE \$100.00

Commercial quality scanning receiver. Same high quality as the world class R71A Receiver.

- 25-2000 MHz coverage
- Precise frequency entry via keyboard or tuning knob
- 99 Programmable memories
- Scan-Memory-Mode-Select Memory-Frequency
- 5 tuning speeds: 1, 1.0, 5, 10, 12.5, 25 KHz
- Narrow/Wide filter selection
- Memory Back-up
- Noise Blanker
- "S" Meter or center meter for FM
- AM, FM Wide, FM Narrow, SSB, CW

Watch for ICOM full page Ads for more details. EEB engineers are developing options for the enhancement of the R7000 performance-computer control video output, filter options and more. Call or Write for details.

R7000 LIST \$899.00
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Kenwood offers 3 fine communication receivers to suit your listening pleasures. They cover the full spectrum: Long, Medium and Shortwave. AM-CW-SSB (FM R-2000), Wide-Narrow Selectivity, Noise Blanker and more.

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- R-1000 \$399.95
- R-2000 \$479.95
- VC-10 118-174 MHz Converter for R2000 \$134.95

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SONY ICF 2010 SAVE \$110.00

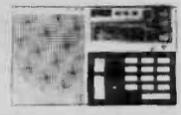
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 - 76 MHz to 108 MHz FM
 - 116 MHz to 136 MHz AM Air Band
 - 32 Programmable Memories
 - 4 Event Timer
 - Synchronous Detector
 - Wide/Narrow Bandwidth
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- 25% size of famous SONY ICF 2001. SONY's best seller
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- Memories
- Keyboard entry
- Scan
- 24 hour clock



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- Safety lock
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- RF8014 800-1400 MHz Down Converter \$219.95
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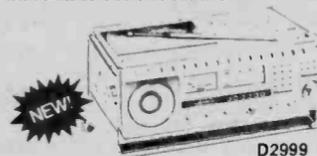
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- Wide/Narrow Bandwidth
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- Here at last - Worth the wait
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The FRG-7700 was a great receiver. Now the new generation FRG8800 takes you a step forward.

- CAT computer compatible
- 12 memories - scan- RIT
- Keyboard frequency entry
- Dual 24 hour clock timer recorder control
- Optional FRV8800 VHF converter 118-174 MHz \$99
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- Green LCD display
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- The 9600 is no typical scanner. And it's easy to see why.
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- Plus there's much more, including a 24-hour clock, multiplexed output, LCD readout, signal strength graph, and an AC power adapter.

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- 1.6 to 30 MHz. FM/LW/MW/SW
- Micro computer multi-tuning system
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Not only offering a quartz PLL Synthesized AM Full Band (MW, SW, LW)-FM Stereo Receiver but also has SSB, CW and Alarm Clock timer

- 5 tuning methods: Key-in, Autoscan, Manual scan Memory, Knob
- 150 KHz-30 MHz AM FM 87.5-108 MHz
- Dual conversion superhet
- Battery power or AC adaptor (included)
- 11.5" w x 6.3" h x 2.36" d — 3.75 lbs. (w/o batteries)
- FM stereo w/headphones
- BFO For CW/SSB listing
- 9 programmable memories
- External antenna jack for better reception.



Introductory Special
\$179.95
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This radio is packed full of features found only in receivers costing much more. Press the S.W. button, you're automatically on 120mt band; press again you are on 90mt, and so forth right through the S.W. bands. No hunting for the band edges. BFO pitch control for SSB/CW listening and much more. Free 100 page SW frequency book and stereo headset included.

Sangean ATS 801

Computerized Radio Is Now Here

Operate with touch of your finger, automatic program searching and 25-memory presetting just a part of its function. Note its perfect design and compact size!



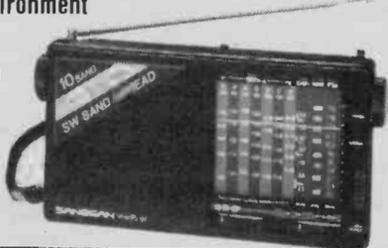
- SW/LW/MW/FM Stereo (using headset)
- SW 5.8-15.5 MHz-MW 530-1620 KHz FM 87.5-108 MHz LW 155-281 KHz
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Offers you greater listening variety than ever before — with ten band and lower power consumption. Sophisticated design makes an attractive addition to the home and travel environment

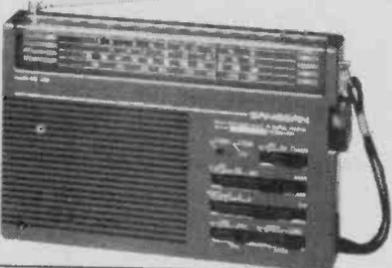
- Small size 6.4" x 3.4" x 1.1" Wt. only 12 oz.
- Covers all tropical and international S.W. bands 120-13 mts
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It's not a shortwave receiver only, hi-fi performance can be obtained from the mini-headphone. Note its compact size



- SW continuous tuning 2.3 to 26.1 MHz in 4 bands
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- FM stereo using headphones
- Built-in whip and ferrite rod antennas
- Free 100 page S.W. frequency book and stereo headset included.

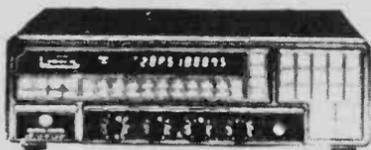
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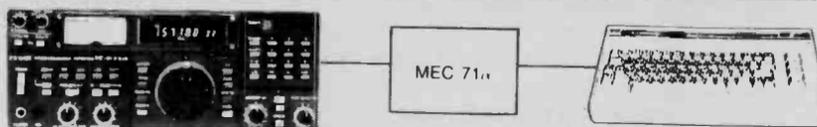
Choose *one* at no additional cost. Once you purchase the SX 400 and one converter you may purchase the other converter at these special prices.

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Hurry this offer is limited

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ICOM R71-751-R7000* COMPUTER INTERFACE



MICROCOMPUTER ELECTRONICS CORPORATION NOW OFFERS THE M.E.C. 71α COMPUTER CONTROL INTERFACE THAT WILL CONTROL AND EXPAND THE CAPABILITY OF THE ICOM R71A.



MAIN MENU Control center for entire system. Showing 24HR UTC time, radio freq. & mode, memory CH, freq. mode plus ID functions for your selection.



32 CH RADIO MEMORY Showing freq to 10 Hz, mode, filter w/n Load/change any memory mode, filter direct from keyboard and print command.



AUXILIARY MEMORY Showing page 1 of 47 pages each having 15 memories. Freq. mode, UTC time and room for your notes. Auto log feature allows instant logging of receiver freq. mode, time.

- Easy to use. No computer knowledge needed, automatic program loading. No disk or tape required (except for aux memory storage).
- Menu driven to aid user at each step.
- No radio modification necessary (ICOM EX309 — not supplied — required).
- AUTO LOG Allows logging of radio freq, mode and time by press of a key.
- UNLIMITED STORAGE via computer disk or tape (store 705 CH per disk side). Let your imagination run wild.
- Software update. As new software is developed MEC will make it available to owner subscribers.

- HARD COPY via computer printer of all memory channels.
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Price to be announced - CALL. Available Fall 85. Dealer inquiries invited. EEB is the exclusive distributor for Microcomputer Electronics Corp.'s product worldwide. Address all inquiries to EEB. EEB is an authorized ICOM dealer and service center. Buy with confidence.

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New for 1986, RADIO DATABASE INTERNATIONAL is getting rave reviews everywhere. This modern reference publication is packed with hundreds of pages of precise up-to-date schedule information. With data gathered from expert world monitors, RDI guides you directly to what's *actually* on the air. It's just the information you need to get the most from your listening.

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With your radio and your RDI, you'll be ready to enjoy the wide world of shortwave listening as you never have before.

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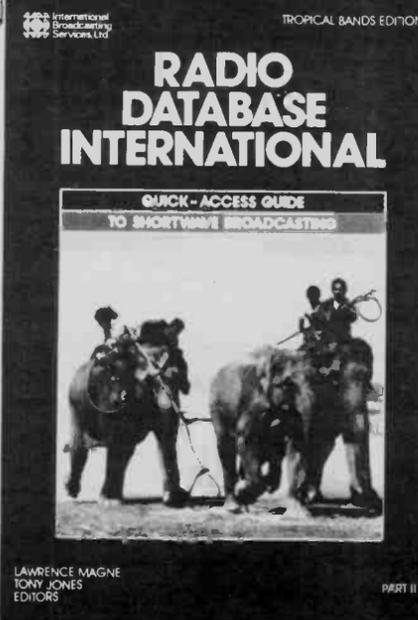
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SIGNALS FROM SPACE cont'd

Leasat 3 was the satellite that was recently repaired by "Ox" Van Hoften on the STS-51I mission. The satellite is currently under Hughes ground control. Telemetry data from Leasat 3 continues to confirm good satellite health. The liquid propulsion systems are intact, and the solid propellant perigee kick motor temperatures appear to be rising toward acceptable levels. Hughes officials give a 50-50 chance of Leasat 3 being fully revived.

Leasat 1, over the continental U.S., continues to be the only fully operational Leasat in service. This satellite puts in a hefty signal, even here on the east coast. It should be audible throughout the U.S.

Leasat 5, the ground spare, could be launched as soon as December 1985. It is now assumed that Leasat 5 will replace Leasat 4 as the PacWest relay satellite. This spacecraft will probably be launched by the space shuttle and west coast monitors should be alert for a new set of miltatcom frequencies that will appear shortly after launch. More than likely the Xray band plan will be in use.

SFS readers are encouraged to send in your observations -- frequency, type of signal (data, voice, encrypt., etc.) and, if available, direction of signal. I plan on updating this article sometime in the spring, so send your observations to Signals from Space, 160 Lester Drive, Orange Park, FL 32073. I would like to thank all those who have assisted in this update, especially those who wish to remain anonymous.

SPACE LAUNCH REPORT

Information for this monthly feature is courtesy of the Spacewarn Bulletin, NASA Thirty Day Special Bulletins--Goddard Space Flight Center; "Communications Satellites" authored by the editor, and the editor's monitoring during the 23 day period covered by this report, August 1, 1985, to August 23, 1985. Numbers in parentheses are NORAD catalog numbers.

1985-64A (15930) Cosmos 1670, USSR, Tyuratam 8/1, F-1-m booster. Period 89.5 min, apogee 274 km, perigee 267 km, inclination 65.01°. Mission: nuclear powered radar ocean recon. Freq: 19.542 MHz, 166 MHz wide band.

1985-65A (15931) Cosmos 1671, USSR, Plesetsk 8/2, A-2 booster. Period 89.3 min, apogee 309 km, perigee 209 km, inclination 72.8°. Mission: Short-lived (14 day) photo recon. Payload decayed August 16. Associated objects:

- 65B(15932) rocket body
- 65C(15961) debris
- 65D (15962) debris
- 65E (15964) debris
- 65F (15965) debris
- 65G (15966) debris

1985-66A (15935) Oscar 24, 8/3. Period 108 min., apogee 1264 km, perigee 1011 km, inclination 89.8°. Mission: Part of the US Navy Transit Navsat system. Freq: Each satellite contains two pairs--Operational channels 149.988/399.968 MHz or maintenance channels 149.97825/399.942 MHz.

1985-66B (15936) Oscar 30 launched with Oscar 24. Period 107.9 min, apogee 1265 km, perigee 1028 km, inclination 89.8°. Mission & freqs same as 66A. Objects associated with 66A & B: 66C (15950) Rocket body, 66E (15951) debris.

1985-67A (15940) Cosmos 1672, USSR, Plesetsk 8/7, F-2 booster. Period 89.9, apogee 294 km, perigee 266 km, inclination 82.3°. Mission: Earth resources film return. Payload decayed 8/21. Associated objects:

- 67B (15941) rocket body
- 67C (15971) debris
- 67D (15972) debris
- 67E (15973) debris
- 67F (15974) debris
- 67G (15975) debris
- 67H (15976) debris

1985-68A (15942) Cosmos 1673, USSR, Tyuratam 8/8, A-2 booster. Period 89.2 min, apogee 290 km, perigee 211 km, inclination 64.7°. Mission: military photo recon. Associated objects:

- 68B (15943) rocket body
- 68C (1549) debris.

1985-69A (15944) Cosmos 1674, USSR, Plesetsk 8/8, F-2 booster. Period 97.7, apogee 676 km, perigee 650 km, inclination 82.5. Mission: Elint/Oceanographic. Associated object: 69B (15945) rocket body.

1985-70A (15946) Raduga 16, USSR, Tyuratam 8/8, D-1-e booster. Geostationary COMSAT. Freqs: 3675, 3775, 3875 MHz; 7250-7750 MHz for military communications. Associated objects:

- 70B (15947) rocket body
- 70C (15948) platform #1
- 70D (??) platform #2
- 70E (??) rocket body
- 70F (15963) debris

1985-71A (15952) Cosmos 1675, USSR, Plesetsk 8/12, A-2-e booster. Period 711.6 min, apogee 39127

km, perigee 619 km, inclination 62.8°. Mission: Early Warning satellite. Freqs: 2292 MHz, 2280-2304 MHz. Associated objects:

- 71B (15953) rocket body
- 71C (15954) debris
- 71D (15955) debris
- 71E (15958) debris

1985-72A (15959) Cosmos 1676, USSR, Plesetsk 8/16, A-2 booster. Period 89.5 min, apogee 359 km, perigee 182 km, inclination 67.1°. Mission: Military photo recon. Associated object: 72B (15960) rocket body.

1985-73A (15967) Planet A, Institute of Space and Astronautical Space Science (ISAS), Kagoshima Space Center, Japan, 8/18. Cylindrical with a 1.4 meter diameter, 0.7 meter height, weight 139.7 kg. On board is an ultraviolet imaging camera to observe the hydrogen corona around the coma of the comet Halley and an energy analyzer of ions and electrons to measure solar wind and probably cometary charged particles.

Transmits on 2293.89 MHz with 0.07/5 watts with coherent / non-coherent modes for ranging/telemetry. Epoch 04h 10m 32s Aug 22 (UTC), inclination 0.888°, apogee 151.467 million km, perigee 100.480 million km, period 282.2 days.

The closest encounter to the comet Halley is 1256 (GMT), March 8, 1986, distance 211 thousand km. Spacecraft renamed "Suisai" (Japanese word for comet). Mid-course correction to be carried out later if necessary. Associated object: 73B (15968) rocket body.

1985-74A (15977) Molniya 1-64, USSR, Plesetsk, 8/22, A-2-e booster. Period 718.2 min, apogee 39371 km, perigee 674 km, inclination 62.8°. Mission: domestic COMSAT. Freqs: 800-1000 MHz, 3400-4100 MHz. Associated objects:

- 74B (15978) rocket body
- 74C (15979) platform #1
- 74D (15983) platform #2

1985-75A (15986) Cosmos 1677, USSR, Tyuratam, 8/23, F-1-m booster. Period 89.6 min, apogee 273 km, perigee 258 km, inclination 65.0°. Mission: nuclear powered radar ocean surveillance. Freqs: 19.542 MHz, 166 MHz wideband.

○ With that I'll bring SFS to a close for our second year as editor. I'd like to take this opportunity to wish each and everyone of you from myself, Gayle and Loyd a very Merry Christmas and the best of

- MONITORING TIMES -
THE PAPER THAT LISTENS
TO ITS READERS

**NASA DIRECT VIEWING
MOVES TO SATCOM**

The National Aeronautics and Space Administration (NASA) has announced the selection of SATCOM F-2R, transponder 13, for broadcasting Space Shuttle and other real-time news events.

TVRO viewers who wish to tune in may select the programming at 3954.5 MHz, vertical polarization, on F-2R which is located in geostationary orbit at 72 degrees west longitude. Monaural audio is available on the normal 6.8 MHz sub-channel.

**Tuning in on Satellite
Communications**

by Bob Grove

As interest in monitoring the radio spectrum moves higher in frequency, readers are becoming more interested in listening to communications on the satellites. Several recent articles in MT have directed attention toward the TV satellites.

TV satellites do double duty--not only do they relay entertainment video to earthbound viewers, but they also carry two way communications on the transponders on subcarriers.

Some TVRO receivers are equipped to tune in a few subscriber services, but it takes a general coverage short wave receiver to monitor the "utilities"--the two way users operating single sideband, facsimile, radioteletype, and data.

But where do you connect the receiver? Look for an output jack on the TVRO satellite receiver marked "video", "6.8", "baseband video", "6.8 sound" or a similar designation indicating output for a special tuner.

Connect the antenna jack of your general coverage receiver to that output jack on the satellite receiver, set the short wave radio to receive upper sideband, and start searching. While most of the subcarrier services will be heard in the 5-8 MHz range, users have been reported anywhere from 1 to 14 MHz! The nominal center frequency of this subcarrier band is 6.8 MHz.

Let us know what you hear!

the New Year 1986. Till next year 73's.

NEW ARRIVALS

Motorola's Digital Encryption Encoder

Motorola's Communications Sector has introduced the DES (Data Encryption Standard) coding algorithm option for use in conjunction with SECURENET Digital Voice Protection Systems.

DES has been established as the common standard for protecting all forms of digital communications used by Federal Agencies. Motorola's DES Voice Encryption System conforms to federal government specifications and can be retrofitted to existing radios as well as incorporated into new systems.

Radio system security is provided by up to 70 quadrillion (7.2×10^{16}) unique key variables. The operator simply chooses a key, manually enters it into the loader through the keypad and then transfers that key to the desired radio(s). Keys can be changed easily and quickly at any time without the possibility of "cross-talk" or partial decoding between any two different codes.

New Literature

Available from Centurion

Centurion International, Inc., has published new color literature on their product lines of portable radio antennas, specialized communications and electronic batteries, cordless telephone replacement antennas and batteries, and their new EAR.COM system.

The 1985 Centurion Batteries catalog includes a helpful crossreference listing of more than 40 brands of communications equipment, more than 300 individual models, and the correct Centurion battery for each.

Another brochure shows their newly acquired EAR.COM line, a miniature earpiece transducer that allows communication by radio or intercom in high noise environments, or hands-free communications in a variety of work and emergency situations.

Copies of each new brochure are available by writing to Sales Department, Centurion International, Inc., P.O. Box 82846 Dept. MT, Lincoln, NE 68501. Telephone (402)567-4491 or toll-free (outside Nebraska) (800)228-4563.

YOUR FRIENDS IN THE RADIO BUSINESS--GROVE ENTERPRISES



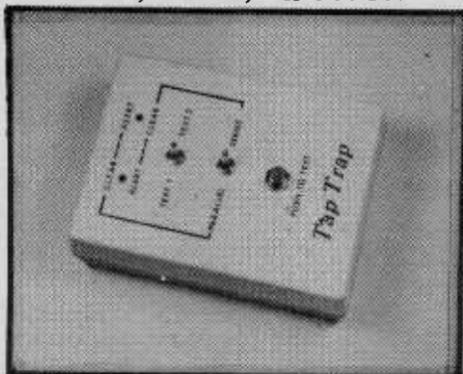
Phone Bugged? Try Capri's Tap Trap

For those who are concerned that their telephone may be tapped or bugged, Capri Electronics introduces the TT-07 TAP TRAP (wiretap detector). Using the TAP TRAP, a telephone line can be quickly and easily checked for on-premises series and parallel bugs and wiretaps. The telephone instrument itself can also be checked for the most common types of hookswitch bypasses which can turn it into an efficient room monitor.

With the Series test, the TAP TRAP detects series devices (such as RF transmitters) that have a resistance of 61 ohms or more. In the Parallel test, it detects parallel devices (such as telephone recording controls) of 38 megohms or less. It also detects capacitively coupled wiretaps and various hookswitch bypasses.

The TAP TRAP weighs 7 oz. and is furnished in a high-impact case that measures 4-1/4" x 3-1/4" x 1-1/2". Priced at \$95, the unit comes complete with all necessary plugs, cords and adapters along with a battery and instruction manual.

For additional information, call (404)376-3712 or write Capri Electronics, Route 1, Canon, GA 30520.



Scanner Tone Decoders from Nova

We recently had some interesting correspondence from one of our readers who noticed an MT suggestion that manufacturers might consider providing add-on tone decoders for scanners. This would allow a scanner to become a paging receiver, responding only to a specific call when the appropriate page tone is received.

Nova Records (729 Elm St. Dept. MT, Kearny, NJ 07032) appears to offer several scanner tone decoders which might be of interest to MT readers. Let's take a look at some of those offerings:

DTMF series 2805 with horn and light option;

Two-tone sequential (800-2800 Hz), high speed (REACH) compatible, with horn and light option;

Two tone sequential (300-1200 Hz), slower speed format such as GE type 99, Motorola Quick Call and RCA 1+1, horn and light option;

Digital decoders for CTCSS, two or eight transmit/receive tones.

While we know nothing of the reputability of this

company, we are pleased to offer the information above in good faith and invite customer reports.

Or, build your own...

A call from an MT subscriber reminded us of an article which appeared in the January 1983 issue of the amateur radio magazine, 73. It offers a home-brew "Storm Alert" for detecting weather bulletin signals on NOAA National Weather Service transmissions and uses two type 567 tone decoder chips. Ambitious experimenters may wish to tackle that project.

BEHIND THE DIALS

The Sony ICF2010

We have had a great many calls on the new Sony ICF2010 portable receiver; most ask why MT has not reviewed it and why Grove Enterprises does not carry it. The answers to both questions are quite simple.

Reviews of the 2010 have been mixed, with most reviewers moderately tolerant but not overly impressed. The price is quite high compared to the now-discontinued Uniden CR-



GALAXY ELECTRONICS

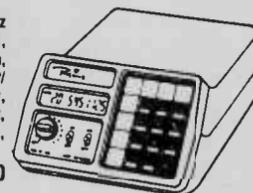
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\$354.50



KENWOOD R-2000

100 khz-30 mhz, 10 Memories, Store Frequency & Mode as it scans/searches. Covers AM/FM/USB/LSB/CW. Digital Readout. 3 speed band scanning & tuning, electronic band switching, MUCH MORE!!!

\$489.50

REGENCY HX-1000

30ch, covers 28-59, 118-180, 350-515 mhz (FM). Scan, Search, Delay, Priority, LCD Display, ONE WATT AUDIO!! W/Charger, Ni-Cads, Antenna, Earphone, Case, Belt Clip.

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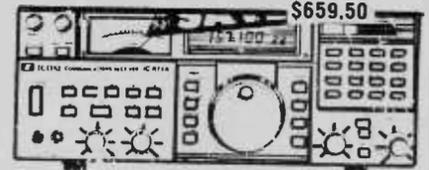


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ICOM ICR-71A

100 khz-30 mhz, has 32 programmable memories, covers AM/USB/LSB/CW/RTTY, Manual or Keyboard Frequency Entry, PBT, Pre-Amp, Scans, 2.3ssb Filter, 3 tuning speeds, AGC, Notch Filter, OPTIONAL REMOTE CONTROL, MORE!!!

\$659.50



REGENCY HX-2000

20ch, covers 118-136, 144-174, 406-512, 800-950 mhz. Has Scan, Search, Priority, LCO Display, Delay, Selectable AM/FM Modes, AC/DC, W/Charger, Ni-Cads, Antenna, Case, Belt Clip. IN STOCK!

\$274.50

SHORTWAVE RADIO

- ICOM ICR-71A 100khz-30 mhz, Digital, 32 Memories. . . 659.50
- KENWOOD R-2000 150 khz-30 mhz, Digital, 10 Memories, Scans. . . 489.50
- R-1000 200 khz-30 mhz, Digital Receiver. . . 409.50
- R-600 150 khz-30 mhz, Digital Receiver. . . 339.50
- SONY ICF-2002 150 khz-30 mhz, Memories, Scan. . . 214.50
- SONY ICF-2010 150 khz-30 mhz, 76-108, 116-136mhz. . . 274.50
- BEARCAT 1000 10 khz-30 mhz, Memories. . . 379.50
- PANASONIC RFB-300 1.6-30 mhz, AM/CW/USB/LSB, Digital. . . 199.50
- RFB-600 1.6-30 mhz, ALL MODES, Memories, Digital. . . 429.50
- RF-3100 1.6-30 mhz, 31 Bands, AM/FM/CW/USB/LSB. . . 266.50
- YAESU FRG-8800 150 khz-30 mhz, Scans, Memories. . . 539.50
- SONY AN-1 INDOOR ACTIVE SW ANTENNA. . . 79.50
- MFJ-959 Antenna Tuner/Pre-Amp, Dual Ant Inputs. . . 89.50
- MFJ-1040 Pre-Selector, Pre-Amp, Dual Ant Inputs. . . 99.50
- COBRA 1486TLL AM/USB/LSB CB Mobile Radio. . . 179.50
- UNIDEN PC-244 AM/USB/LSB CB Mobile Radio. . . 144.50
- COBRA 2000GTL AM/USB/LSB Base CB Radio. . . 359.50
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- HX-2000 20ch, Prog. 118-174, 406-520, 800-999 mhz. . . 274.50
- MX-3000 30ch, Prog. 30-50, 138-174, 406-512 mhz. . . 199.50
- MX-5000 20ch, Prog. 25-550 mhz Straight Thru. . . 354.50
- MX-7000 20ch, Prog. 25-550 & 800-1,300 CONTINUOUS. . . 435.50
- Z-45 45ch, AC/DC, 30-50, 118-174, 406-512 mhz. . . 209.50
- Z-60 60ch, 30-50, 88-108, 118-174, 406-512 mhz. . . 239.50
- D-810 50ch, 30-50, 88-108, 118-174, 406-512 mhz. . . 189.50
- BEARCAT BC-50XL 10ch, Prog. 29-54, 136-174, 406-512 mhz. . . 134.50
- BC-100XL 30-50, 118-174, 406-512, Priority. . . 239.50
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- BC-260 16ch, 30-50, 138-174, 406-512, AC/DC. . . 239.50
- BC-210XW 20ch, 30-50, 136-174, 406-512, AC/DC. . . 234.50
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2021 (Radio Shack DX-400) and grey market New York importers slash the prices so deeply that many hobby retail channels ignore most Sony radios.

We have not made an effort to secure one here at the MT lab for a first-hand check-out since it has been extensively reviewed in club bulletins, but in a nutshell, here are the average findings.

Discount pricing seems to be around \$279; AM international broadcast band reception is very good, although some listeners complain of hum and circuit noise when using the synchronous detection system. Nevertheless, that mode does reduce distortion due to fading signals and improves adjacent channel selectivity to boot.

But listening to single sideband is another story; the receiver tunes in 100 hertz increments, disallow-

Scaled down from the earlier PRO-30, Radio Shack's newest hand-held programmable, the PRO-31, has one distinct improvement: a non-volatile memory which requires no expensive silver oxide backup cells!

Frequency ranges (FM only) include 30-54, 138-174 and 380-512 MHz, storable in ten memory channels. A bold LCD display features bright backlighting for night view-

ing fine tuning and thus resulting in very unnatural sounding voice communications even though the receiver offers excellent stability.

The bottom line seems to be that if you need portability, SSB and AM reception, and don't want to spend more than \$300, then the Sony ICF2010 is probably a good bet. It is certainly better than its Sony predecessors, the ICF2001 and 2002.

ing. The "rubber duckie" antenna is connected via a BNC connector which allows use of an external antenna.

Keyboard features include lockout, channel selectable delay, an entry clear, and keyboard lockout. Separate jacks are provided for an AC adaptor and charger when NICAD batteries are used (not provided). Although an earphone jack is available for personal monitoring, the audio from the internal speaker is loud and clear--unusually so for a small scanner.

Frequencies are programmable in 5kHz increments (low and high bands) or 12.5 kHz (UHF); entries are automatically rounded off to the closest increment. Sensitivity is 1 microvolt or better for 20 dB signal to noise at 3 kHz deviation.

Selectivity is ± 9 kHz (6 dB down) and ± 15 kHz (50 dB down); IF rejection (10.7 MHz) is 50 dB @ 154 MHz. Spurious rejection is 50 dB on low and high band but unspecified for UHF.

Scan rate is a reason-

able 8 channels per second; audio power is 300 milliwatts to the internal two inch speaker.

Power required is nine volts, supplied by an optional adaptor or by six AA cells (not supplied); current drain is 60 milliamps squelched, 160 milliamps full audio.

The PRO-31 measures 7-3/8"H x 3"W x 1-1/2"D and weighs about 1 pound. It is available at all Radio Shack outlets at \$219.95.



The Pope, the President and the Secret Service:

Monitoring an Historic Meeting

by
Mark Edward Springer, WL7BCT

As I stood on the apron of Fairbanks International Airport in late April of 1984, I watched workmen putting the finishing touches on a very special speaker's platform.

Suddenly my attention was diverted as a disembodied voice came from the speaker of the Radio Shack Pro-30 scanner I was carrying.

"You guys want to zero your weapons or anything?" it asked.

I felt a little tingle when I heard that, because I knew then that the show was a little bit more heavy-duty than just "Fairbanks Base" telling "green" to "two-two the radio room."

The United States Secret Service had arrived in Fairbanks Alaska, counter-sniper response vehicle and everything.

We knew they were coming. The announcement that Pope John Paul II would visit our northern city was followed closely by rumors that the President of the United States would join him here in the "Golden Heart" of Alaska.

At that time I was a general assignment reporter for the Fairbanks Daily News-Miner, the local paper.

I placed a call to Monitoring Times publisher

Bob Grove and told him I needed some Secret Service frequencies. He kindly provided me with several, including primary channel "CHARLIE": 165.375; "BAKER": 165.7875; "ROMEO": 166.6125; and "VICTOR" or "TREASURY COMMON": 166.4625. Grove also turned me on to "YANKEE-ZULU," a full-duplex pair which supports the Presidential limousine phone.

I went to the store to pick up the programmable scanner, brought it back to the newsroom and punched in a couple of the S.S. frequencies.

"Chapparal, Fairbanks Base on Charlie," the speaker said. I was like a kid with a new toy.

I didn't know that by then an extensive telephone system had been installed by the White House Communications Agency (WHCA). Most of the radio traffic was to agents (and White House staff) to "two-two" (phone) "the board" or "the radio room" or another agent at a particular "drop" or extension number.

I heard one conversation about "calling the press plane" which at the time was several thousand miles out over the Pacific Ocean!

There were announcements of, and cancellations of, "countdown briefings" and "advance agent brief-

ings" at particular locations.

There was, much to the consternation of my newsroom neighbors, just enough DVP (Digital Voice Protection) used to make everyone within earshot of the scanner quite miserable. It sound like open squelch--real raspy--and you can't really turn it off. A real pain.

The main staff frequency I monitored was 166.5125, code-named "SIERRA." A paging-tone-filled frequency was 167.025.

The day before Air Force One (SAM 27000 or "Angel" as it is code-named) arrived, the "YANKEE-ZULU" frequencies came alive as a WHCA technician began aligning the critical radiotelephone circuit in "STAGE-COACH," a Cadillac limo flown from Guam in a USAF C-5A Galaxy.

The tech put in calls to "Crown Maintenance" via the "Fairbanks radio room."

Alascom, the statewide toll carrier, played an important role in helping provide telecommunications services for the visit.

According to Tom Jensen of Alascom Public Affairs, the Secret Service and WHCA both had their switchboards and communications centers set up in the Fairbanks Toll Center building.

There was a similar installation at the home of Senator Frank Murkowski (R-Alaska) where the President and Mrs. Reagan spent the night.

Always nearby is the guy carrying the "Football,"

the National Military Command apparatus, since the President must have instant and unfailing communications with the Pentagon, SAC, the National Security Advisor, and a number of other agencies.

A satellite earth station was set up at the Murkowski home and Alascom provided another satellite link as well as terrestrial microwave circuits to the Lower 48 for Presidential communications.

The Secret Service and White House switchboards provided constant communications to the Presidential part, Washington, D.C. and "selected points in the Lower 48," Jensen said.

"They're a pleasure to work with," was Jensen's evaluation of the Secret Service and WHCA personnel. "They're very professional. All their equipment is completely portable; they just wheel it in and patch in to the local system. It's all in big suitcases and equipment cases."

He said that although the system was in place 48 hours prior to the arrival of the President, they had everything down and packed up three hours after Air Force One departed Fairbanks International Airport!

One unconfirmed report said that ten tons of communications gear was flown into Fairbanks just for the overnight visit!

I was able to get a look at the "YANKEE-ZULU" radio terminal at Fairbanks

SECRET SERVICE cont'd

International Airport. It wasn't anything fancy, just a couple of big suitcase-type outfits built by Motorola. I imagine it was linked by land-line to the radio room.

There is no question that monitoring Secret Service communications is exciting. I listened to the Secret Service crew as they brought the motorcade up to the building and brought the President and Mrs. Reagan into a holding area near the gym.

It was pretty funny near the end of the rally as one agent said to the man nearest the President, "Do you know about the Polar Bear?" "What are you talking about?" came the bewildered reply. "Oh, don't worry about it," he said as the campus mascot, "Nanook," came up to the podium to present the Chief Executive with a UAF hockey jersey.

The first indication that the President is going someplace is the "ten minute sweep" followed by several other sweeps of the motorcade route. Then the words, "Signal depart, signal depart." The President is on his way. "Signal arrive, signal arrive," indicates he's gotten where he's going.

There isn't much talk during a motorcade; in fact, the base or command post issues an order that non-essential communications be kept to an absolute minimum prior to commencement of a movement.

During the sweeps you might hear references to EOD (emergency ordnance detachment) teams and other radical-sounding things, but usually it is strictly precautionary and doesn't mean they've found anything. In fact, an EOD team will usually check (very discreetly) a podium or other appearance area scant moments before the President arrives.

I found that I didn't have any problem taking the radio into the Presidential appearance area. As I passed through the entrances operated by the Secret Service Uniformed Division, I turned it on and broke the squelch and handed it to a guard. No sweat.

I wasn't the only one packing one of the Radio Shack rigs, either. As I wandered around the press center set up at the Airport, a vaguely familiar-looking fellow walked up to me and asked me how I like the radio.

"Fine," I told him, except that it ate batteries

for breakfast; lunch and dinner.

He agreed with that, and then introduced himself as Vic Ratner of ABC. He had a pretty classy earphone strung up under his shirt and plugged into the PRO-30 on his belt. I told him what frequency the state troopers were on, and he shared a couple of S.S. frequencies with me.

E-detachment of the Alaska State Troopers was right in the middle of it all, as were the Alaska Airport Police and Fairbanks P.D. Troopers provided motorcade services, site security at all locations where the Pope and the President appeared, as well as aiding ID Teams and Intelligence Teams.

An ID Team is made up of several Secret Service agents and local law enforcement personnel who are in the appearance area to provide immediate response to any situation—usually dealing with individuals who appear suspicious in the crowd or problems at the access points to the area.

Intel Teams stand by at the command post or local P.D. office to deal with direct or indirect threat situations, such as a threat made over the phone.

Alaska State Trooper security-related operations were on their Channel One simplex frequency of 155.250, while the Alaska State Airport Police, on whose turf the historic meeting between Reagan and the Holy Father took place, used their 155.100 frequency.

Four networks (NCB, CNN, ABC & NBC) were on the scene and Alascom had to set up about 12 microwave links to accommodate them, besides handling the uplink to satellite AURORA (SATCOM V).

The lobby of the Travelers Inn was a sea of orange and silver transport cases as the networks set up their equipment. ABC provided the pool feed for the other three networks.

Everyone says that Secret Service agents are tight-lipped; in fact, the average agent is talkative as heck compared to the crew from WHCA.

WHCA is a branch of the Defense Communications Agency which is under a unified military command, so their personnel are enlisted men, women and officers from all branches of the military.

Later, a Secret Service agent told me, "Yeah, they tell them not to talk to anyone; they kind of scare them!"

One lasting impression

CLUB CORNER

The backlog of material is increasing, so let's get right to it to get the information into print.

The Second Annual DX Special, hosted by ABC Talk-radio's Ray Briem, will air on many ABC network stations again on the first Saturday of December at 12:06 PST, lasting probably until 5 am. KABC's Greg Hardison is again organizing the event, which will feature some of the same DX'ers and SWL's heard last year plus some new ones, including myself.

Perhaps the greatest tribute to the effectiveness of last year's program was the grousing by several individuals and special interest groups who each

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

felt that they didn't get enough time on the air. Personally, I would hope that the program would introduce the concept of DX'ing to individuals who may be looking for a leisure-time activity, no matter in which spectrum they choose to DX.

As the list of stations carrying Ray Briem's program will change between the time this is being written and the December air date, I'd suggest that you check your club bulletin for more details. Also, some stations may not carry all of the program. I hope to hear many of you during the phone-in segments of the program!

**Mexican 'Quake Spurs
Emergency Comms**

An MT Exclusive
by Bob Grove

The Mexican earthquake disaster took its toll on communications as well as human lives and other property. Because of the damage to traditional wireline systems between Mexico City and the U.S., the FCC has issued special temporary authorizations (STA) to several businesses to support voice communications between the two countries.

Examples of point-to-point links utilizing upper sideband mode radio include the Chrysler Corporation, KPD386, authorized on 11535, 15506 and 18032 kHz; Digital Equipment Corporation, KPD389, on 13955; and another user, KPD379, on 13813.5 and 17550 kHz.

Similar emergency HF networks on RTTY are also being reported between Mexico City and other area with vested interest such as the business communications being conducted on 12131.5 kHz using 66 WPM (57 baud), 170 Hz shift.

I formed listening to and watching the Secret Service was a supreme respect for them; the word "professional" isn't strong enough. I can understand the motivational factor they feel: They have the responsibility of keeping the President safe and, in doing so, guarantee our military security, too.

I am interested in corresponding with other people who monitor Presidential communications and exchanging frequency information. My address is 261 College Road, Fairbanks, Alaska 99701.

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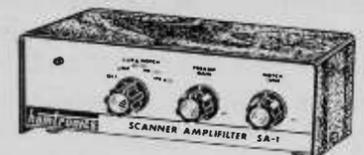
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IC-R7000 automatically memorizes frequencies in use while the unit is in the scan mode. This allows you to recall frequencies that were in use.

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*Specifications guaranteed from 25-1000MHz and 1260-1300MHz. No coverage from 1000-1025MHz. No additional module required for coverage to approximately 2.0GHz.

See the IC-R7000 receiver at your local authorized ICOM dealer. Also available is the IC-R71A 0.1-30MHz general coverage receiver.

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By Bob Grove

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One of the most popular and informative series of articles ever published in the pages of *Monitoring Times*, Huneault's *Gift to the Weatherwise* is now available in a complete, supplemented, up-to-date book form. Twenty-two information-packed pages explain the radio shorthand used by agencies transmitting urgent and official weather information worldwide.

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The most comprehensive and authoritative book on receiving antennas for all frequency ranges! Chapters cover feedline design, dipoles, ground planes, discons, beams, loops, shorted antennas, tuners and matching networks, and more. Learn how impedance is determined, the truth about SWR and antenna efficiency, how to build space-saving effective antennas for mobile, portable and fixed base reception.

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WORLD RADIO TV HANDBOOK

(40th Edition, 1986)

Acclaimed by experts and hobby listeners alike as the ultimate source book of international broadcast monitoring. The *World Radio TV Handbook* remains the best seller in its field—and rightfully so. It is a giant collection of frequencies, addresses, program schedules, beam headings, and other pertinent data concerning every major radio station in the world—longwave, medium wave and short wave. Identify elusive DX stations by their musical interval signals, slogans and languages. Learn how to select the best equipment and accessories for listening.

Order BOK-3 Only \$19⁹⁵

(Note: A limited number of 1985 editions of WRTVH are still available for only \$12⁰⁰, free bookrate shipping)

THE ARRL HANDBOOK

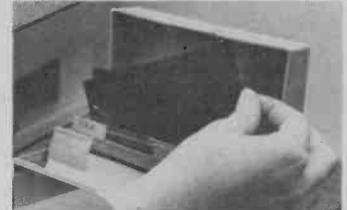
1986 ed. by the American Radio Relay League

Internationally recognized as the single most authoritative and comprehensive publication dealing with radio communications theory and practice, the ARRL Handbook has well over 1,000 pages. Chapters include history and principles of amateur radio, principles of electronics, exhaustive descriptions of receivers, transmitters, repeaters, antennas and associated equipment, construction projects for all levels, test equipment and much, much more.

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This comprehensive list contains over 30,000 entries from 190 kHz to above 100,000 MHz. Of particular interest to aircraft monitors, listings concentrate on the 200-400 kHz beacon band, 3-30 MHz FAA single sideband emergency networks, 108-136 MHz civilian aircraft band and 225-400 MHz military and federal government aircraft band. Now classified, but legal for you to own!

Order FCH2 (33 Fiche) \$12⁹⁵ (Free Shipping in U.S.)

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Yes, this is the famous exhaustive registry of all frequencies on file with the Federal Communications Commission, nearly two million listings from 1 Hz to 100 GHz—the entire radio spectrum! The most complete data set available anywhere in the world, sorted first by frequency, then by state and then by city. Covers the entire 50 states. Save more than half the FCC cost of \$375! New 1985 edition.

Order FCH 17 (Approx. 836 Cards) \$150⁰⁰ (Free Shipping in U.S.)

FCC State Index

The most sought-after data fields contained in the master file above have been condensed into this nation-wide index, sorted first by state, then by city, and including licensee name, call-sign and frequency. Ideal for rapid reference of basic information. New 1985 edition.

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If you know the call sign, this list will identify the frequency, name of licensee, service, and location of the transmitter. Does not include amateurs, CB, boats or aircraft. New 1985 edition.

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CLUB CORNER cont'd

Speaking of audio programs, the NATIONAL RADIO CLUB is sponsoring the "DX Audio Service," a monthly 60-minute cassette tape production put together by Fred Vobbe of Lima, Ohio, and aimed at non-sighted broadcast band DX'ers. However, actualities and other features not included in NRC's printed bulletin make it of interest to any BCB DX'er.

For a sample tape, send a \$3.00 check made out to "NRC" to DX Audio Service, Fred Vobbe, 706 MacKenzie Avenue, Lima, OH 45805.

For the price of a couple of first-class stamps you can also get a catalog of reprinted articles from the NRC, many of which could be of interest to non-BCB DX'ers. The articles dealing with receivers are quite definitive. Address your request to NRC Publication Center, Ken Chatterton, P.O. Box 164, Mannsville, NY 13661.

Trying to cover the wall of your DX shack? THE CLUB ONDES COURTES DU QUEBEC offers listening certificates attesting to the "skillfulness and the perseverance" of those devoted to the DX hobby. If you can confirm reception of ten stations in one or more of five listening areas (continents), they'll issue the certificate. For more information, send a self-addressed envelope plus an IRC to Club Ondes Courtes du Quebec, Case Postale 37, succ. Youville, Montreal (P.Q.) Canada H2P 2V2.

I guess that the ultimate in DX'ing is radio astronomy, making THE SOCIETY OF AMATEUR RADIO ASTRONOMERS (SARA) the ultimate DX club, right? SARA includes some 175 members over the world, 42% of whom are ham radio operators, and its purpose is to circulate technical information about a space-age, state-of-the-art field of amateur science in which many can make a significant contribution to the cause of learning.

SARA publishes "Radio Astronomy," a monthly journal, maintains a development laboratory where radio astronomy equipment is repaired, calibrated, and developed and holds an annual meeting. For an informational brochure, send an SASE to SARA Membership Services, P.O. Box 6020, Wheeling, WV 26003.

I've made it no secret that I feel that anyone should learn to speak more than just one language, and that joining foreign DX organizations is an excel-

lent way to help one learn more about other cultures. If you're interested in Germany, or speak German, you might want to contact the IRF (Interessengemeinschaft Rundfunk-Fernempfang), an amalgamation of clubs in West Germany, Switzerland and Austria.

The group publishes information in both German and English, produces tapes for visually handicapped hobbyists, cooperates in activities with local radio stations, and represents the DX hobby at fairs and exhibitions. The IRF also sponsored and organized with Deutsche Welle the 1982 EDXC conference in Cologne.

For more information, send a couple of IRC's to IRF, P.O. Box 10 13 11, D-4560 Gelsenkirchen, West Germany.

Another overseas club (according to FRENDEX's October bulletin) is the SURINAME DX CLUB INTERNATIONAL which concentrates on Latin America. Their bimonthly bulletin, "Surrical," is published in English and Dutch. Send them a dollar and they'll send you a sample copy of their bulletin and more details. Write to Ravindranath G. Sewdien, Bechaniestraat 58, Paramaribo, Suriname.

Most club bulletins should be carrying information about the ANARC BBS for computer users, which Bill Krause of the COMPUTER INFORMATION COMMITTEE is operating at his own expense.

For a password and more information, send an SASE to Bill at ANARC BBS, 4347 29th St. SE, Rochester, MN 55904-6043. The system can be accessed from 0500-2300 UTC weekdays and 0500-1200 UTC weekends at (507) 289-7903.

The ALL-OHIO SCANNER CLUB's new address is P.O. Box 148, Vandalia, OH 45377, to which all mail and correspondence should be directed. Treasurer Dave Jones notes that the club membership is "rapidly approaching 200" as they mount a campaign to attract more Ohioans to join their club. The use of the P.O. Box will help AOSC provide smoother service to its members as the club expands.

THE CAPITOL DX'ERS of Sacramento are now into their second volume of bulletins, with their August bulletin boasting 32 pages, ads, columns, and much useful information. Philip Reefer says that the all-band club will mount a nationwide campaign to attract members this fall. Dues are \$10 annually; contact Philip at 2021 Wright St.#19, Sacramento, CA 95825.

I LIKE...

the editorials in the "WPE Call Letter" (published by the Great Circle Short-wave Society) even though I really don't agree with much of what is said! Perhaps it's because I get such a kick of nostalgia when I read them and the rest of the bulletin and because I, too, remember staying warm next to a tube-type receiver in a cold, unheated bedroom when I was growing up in Kansas and using the radio as my window to the rest of the world...

○ And that just about cleans out my "in basket" for this column. But don't let me get caught up ... keep the club news coming. My deadline for the February issue is December 10. 73! ●



1986 SPACE SATELLITE HANDBOOK edited by A. R. Curtis (80 pages, 11" x 8-1/2", paperbound; \$10 from ARCsoft Publishers, P.O. Box 132 Dept. MT, Woodsboro, MD 21798)

A tabular accounting of satellites still in orbit beginning with the earliest launches (1958), HANDBOOK is a page-for-page photocopy of NASA's June, 1985 Satellite Situation Report, available upon request from the Goddard Space Flight Center, Greenbelt, Maryland.

Curtis has added his own notes as an orientation for radio monitors.

CLANDESTINE CONFIDENTIAL--Gerry Dexter's name is well known to SWL's and with good reason. His publications reflect personal listening knowledge and expertise. Gerry has several newsletter-format publications which are of interest to MT readers.

His CLANDESTINE STATIONS BY TIME, CLANDESTINE STATIONS BY FREQUENCY, CLANDESTINE STATION ADDRESSES, CLANDESTINES OF CENTRAL AMERICA, and CLANDESTINES OF THE MIDDLE EAST are available at \$3 each.

His CLANDESTINE CONFIDENTIAL newsletter--six issues per year--is available for a \$10 subscription (\$13 foreign, U.S. funds). And a complete set of newsletter back issues may be had for \$10 as well.

Send your order directly to Gerry L. Dexter, RR 4

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Listening to the Love Boat

Staring out the window on a cold winter's day many of us escape in fantasy to a cruise aboard a luxury liner like the fabled Pacific Princess, alias "The Love Boat."

On board, those of us with an eye always open for radio would see members of the crew carrying handie talkies, occasionally lifting them and replying to each other. Conversations concerning luggage, passengers, maintenance, reservations, and other preparations can be heard echoing across the deck.

While common ship-to-shore frequencies are used between the Princess and coastal stations--her home port is Los Angeles--on-board communications are carried out on two high band FM frequencies: 161.350 and 161.450 MHz.

We would like to thank MT reader Harry Preston on New Braunfels, Texas, for this interesting contribution.

Box 110 Dept MT, Lake Geneva, WI 53147.

SCANNER RADIO LISTINGS by Norm Schrein; Denver/Colorado Springs edition and Toledo, Ohio, edition (8-1/2" x 11", paperbound; \$9.95 each from Fox Marketing, 4518 Taylorsville Rd. Dept MT, Dayton OH 45424)

Along with the impending release of the Nevada/East Central California edition, these two new releases from Fox make a total of 28 scanner frequency directories representing major population areas of the United States.

All are cross-referenced by frequency, call sign and licensee and include business, amateur, federal and non-federal law enforcement, aircraft, and all types of land mobile services.

RADIO ASTRONOMY HANDBOOK by R. M. Sickels (approximately 250 pages, 6" x 8-1/4", paperbound; \$32, from the author, 7605 Deland Avenue, Dept. MT, Ft. Pierce, FL 33451)

One area of eager experimentation by a small number of dedicated listeners is that of radio astronomy, essentially confined to

LIBRARY SHELF cont'd

the VHF and UHF spectrum because of electromagnetic pollution and atmospheric absorption at lower frequencies.

Sickels has presented all of the facets of monitoring natural radiation from the depths of space, including excellent charts, tables, diagrams, equipment line drawings, photos, and computer programs as well.

Chapters include a history of radio astronomy and what's to be heard out there, frequencies to monitor and the receivers to do it, antennas and accessories to produce optimum reception, recording equipment, and an index for rapid access to subject material.

Since the vast majority of amateur radio astronomy monitoring is in the 400-1400 MHz portion of the spectrum, the theory and discussions of equipment are eminently suitable for VHF/UHF scanner enthusiasts as well. Extensive material explains the construction of antennas, feedlines, preamplifiers, tuners, and other accessories to improve weak signal reception.

The book is loaded with excellent information and is a welcome addition to the

bookshelf of the serious monitor of the radio spectrum.

WORLDWIDE AIR TRAFFIC CONTROL 2nd Edition (31 pages, 5" x 8", paperbound; \$3.75 from Cambridge Airradio Services, Dept. MTA, Suite 486, 89 Massachusetts Avenue, Boston, MA 0215; see ad on p.40)

With all of the attention recently focused on air disasters, crises and hijackings, it is little wonder that considerable listeners' attention has been drawn to those monitoring frequencies.

While frequencies for VHF domestic flights are readily obtainable, those used by specific worldwide airports for international traffic and utilizing short wave frequencies (upper sideband) are less readily obtainable. Grove's Short Wave directory has exhaustive lists of the frequencies, but not broken down into specific destination cities.

The CAMBRIDGE DIRECTORY is a handy handbook, cross referenced by frequency, country, city, and major air route. Keep it by your short wave receiver, and next time the news flash comes on...

TUNE IN WITH Ed Noll



Especially for international broadcast devotees

Adopt a Band

There are thirteen short-wave broadcast bands and, if you tune an all-wave receiver, a host of other interesting radio communications from LW up to 30 MHz. Your activities may also involve FM broadcasting and listening to the scanner frequencies as well. It is no wonder we learn so little about each individual band. Question! Why don't you adopt a band?

I do a considerable amount of listening on the 19 meter band, my own adopted band. Except when propagation conditions are extremely poor, signals are there from all major world divisions during each 24-hour period, providing listening from before dawn to long after dusk.

When conditions are right I can listen to Polynesian music from Tahiti on 15170 kHz that begins just

after 0300 UTC (11 pm my time) or to the lilting music emanating during Radio Australia's French language program on 15320 and 15395.

Scan the 19M band if music is your fancy--there is almost continuous Latin music from Chile on 15140 and don't forget the Argentinian tango interludes on 15345. Weekends are music days for many of the international short-wave broadcast stations, Saturdays in particular.

Here are some frequency check points--USSR 15175, Brazil 15190, RFI Gabon Africa 15200, DW 15210, Cuba 15230, HCJB Equador 15250, Portugal 15285, DW 15425, Switzerland 15430, and China 15520.

Finally, Arabic music frequently can be heard from Egypt on 15220, UAE on 15320 and Kuwait on 15495. Don't forget the BBC music programming on 15070 and the VOA music scheduling on their channels as well.

Religious programs are many and of all faiths from Arabic to Yiddish. You can listen to gospel singing to the formal services coming from the Vatican. Strong signals are available from religious stations like HCJB and several from the U.S.

The band edges are

RADIO DATABASE INTERNATIONAL



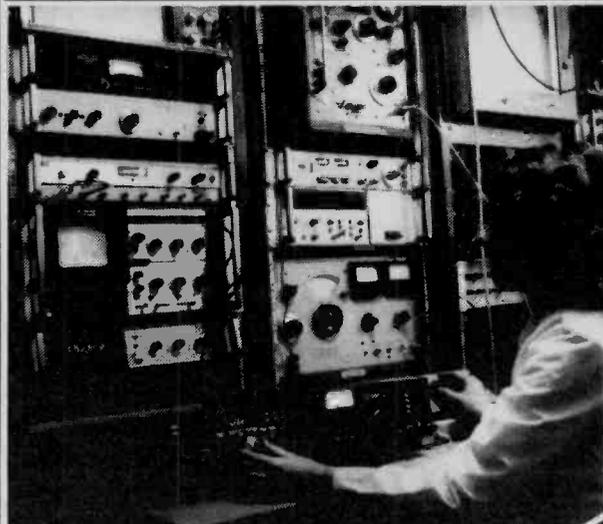
At last, a reference publication that brings you an *accurate, up-to-date* picture of worldwide shortwave broadcasting...frequency by frequency, hour by hour! **RADIO DATABASE INTERNATIONAL** utilizes innovative computer software design to display complex station information in a format that's easy to understand without cross-indexing or page-turning.

Computer-generated graphics display station names, locations, frequencies, operating times, languages, intended areas of reception, and transmitter powers. It's all there at a glance!

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RADIO DATABASE INTERNATIONAL

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often productive below 15150 and above 15400; stations there are less crowded and often new stations appear. Quite often there are no occupants 5 kHz either side, so you can operate your receiver using the wide filter for improved audio quality, especially musical renditions.

As on all bands there is the usual mix of news, politics, propaganda, and travel presentations plus, on occasion, some unique glimpses of and insights into life within the various countries. United Nations broadcasts are transmitted by various VOA stations; frequencies and times can be found in the WRTV Handbook.

VOA programs are also transmitted by many stations throughout the world; the Organization of American States (OAS) uses a VOA transmitter to send out their programs on the 19M band at 15160 kHz.

ADOPTION STEPS

Your first step to band adoption is to prepare a log. Add appropriate columns to several sheets of loose-leaf notebook paper as shown below. Frequency spacing is 5 kHz and, in the spectrum between 15070 and 15600 kHz, there are 111 channels. Be sure to assign four or five columns to each channel because of multiple occupancy of each. A simplified example for seven channels would be:

15255	RFE	Egypt
15260	WYFK	BBC (RCI)
15265	NORWAY	VOA
15270	DV Azada	Austria
15275	DW Antigua	-
15280	KGEI	USSR
15285	Portugal	Norway

Allow three or four rows for each channel that can be used to insert times, program data and other information of interest to you. QSL send and receive dates may be appropriate. After you have come up with a log arrangement for a serious study of just a single band you can run-off copies for future changes, remembering that band occupancy can change considerably from year to year. Keep these logs in a small loose-leaf notebook.

Small profiles of the individual channels can be kept to keep you informed of band occupancy throughout your active listening day as shown below:

15320

UTC	YOUR TIME	STATIONS
1000-1200		USSR
1200-1300		AUSTRIA
1300-1400		(MIX)
1400-1430		(HETS.)
1430-1930		DUBAI UAE
1930-2200		(MIX)
2200-0600		AUSTRALIA

Many of the channels are occupied for 24 hours a day. While others may appear unoccupied, if you set your receiver for CW or SSB you can usually hear a faint heterodyne indicating that at some place in the world the channel is being used but the signal is being directed away from your location.

If you are an avid DXer you may wish to go all out making identifications and completing your log. In the example of 15320 these times of the day are indicated by inserting a MIX designation in the chart.

These individual channel profiles must be kept up to date because propagation conditions change throughout the year and there are also routine schedule changes; hence, you may eventually have a set of profiles for each of the annual operating periods.

In association with your channel profiles you may wish to keep program data and times. When does each of the received stations broadcast in English? Be careful to note specific times of the programs you most enjoy. All of us have at one time or other heard programs we now miss because we did not jot down the appropriate schedules.

A special objective for your adopted band would be to obtain a QSL card for as many of the channels as possible. Devote your initial efforts to obtaining 60 such verifications.

ANTENNA CONSIDERATIONS

A reasonably short antenna is effective on the 19M band. A quarter-wave, ground-plane vertical is only 15'6" long. A vertical dipole or an inverted "V" comprises two such lengths and can be roof or ground mounted in the smallest of antenna mounting sites. Performance will be very good.

Either antenna can be supported from a single mast that need not be very high to support such a simple configuration. If you are cramped for space, you still can adopt 19M.

If you are an avid antenna experimenter you are well aware of how easy it is to handle a small antenna

BROADCASTING...

HANK BENNETT ON SHORTWAVE

As mentioned last month, this column was prepared well in advance of publication date for use in an emergency situation. And as we pointed out last month, your editor has had a time with a smashed hand but this is now rapidly improving. Large thanks go to Amelia Bennett for her assistance during these two months.

Continuing the second of our current two-part series on trivia and nostalgic questions from olden days of radio and television, we offer the following:

- 109- Two stars of the old "National Barn Dance" from WLS, Chicago, were Lule Belle and ...
- 110- Who presided over many fireside chats on radio and what was the name of his dog?
- 111- In Philadelphia many years ago, Strawbridge and Clothiers operated station WFI. Down the street, Lit Brothers operated WLIT. The two stations shared time on the same frequency. Subsequently the two stations merged; the stores did not. Name the new merged call sign. The station still operates.
- 112- What station for years plugged themselves as being "The Nation's Largest Independent Radio Station," where was it and what was their power at the time?
- 113- Who was Lucille Annette Simonelli?
- 114- Name the female counterpart of Phil Harris on his old radio show.
- 115- For years WNEW in New York City carried "The

Make Believe Ballroom." Name the very well-known announcer and disc jockey of this show.

- 116- Two orchestra leaders made recordings for the "Make Believe Ballroom" theme and both tunes carried this title. What two orchestras were involved?
- 117- Those fictional birds - Gertrude and Heathcliff - who made them famous?
- 118- Who was the newspaperman-turned-TV Master of Ceremonies who introduced the Beatles to the American TV public?
- 119- What well-known orchestra made a full-blown 8-1/2 minute production out of the tune "How Dry I Am"? and who was the leader?
- 120- What orchestra had the Bobcats?
- 121- Two radio stations that we know of have exactly the same letters in their call sign as in the name of their town. Can you name them? Perhaps there are others.
- 122- NBC once had two parallel networks named after colors. Anyone remember what they were?
- 123- Who was Elmo Tanner and for what was he best known?
- 124- WOO is a marine radiotelephone station in Ocean Gate, New Jersey. Where and to whom was WOO first assigned? Clue: it was an AM broadcast station.
- 125- There was once an eveningtime news commentator named Carter. He had an unusual first name. Who was it?
- 126- Who made "Yehudi" famous?
- 127- Colonel and Bud. Fill in the blank.
- 128- Who was Billy Greenbush?
- 129- Who was Benjamin Kubelsky from Waukegan, Illinois?
- 130- Who was Norman Brokenshire?
- 131- Does anyone remember a comedian named Phil Cook? Your editor is looking for information on this one.
- 132- In what branch of the military service was the radio personality known as Don Winslow? This was another late afternoon show for kids. Can anyone help me with the name of the sponsor?

when doing experiments. You can use the 19M antenna as a beginning for various antenna experiments working out the bugs and checking performance. It is then possible to up-scale the same antenna for operation on one of the lower frequency short-wave bands.

The logging information becomes invaluable for antenna checks. You will know at what time signals arrive from various directions and you can compare them with the results from a reference antenna. Convenience of such antenna experimentation is one major reason why 19M is my adopted band.

HANK BENNETT cont'd

- 133- Many years ago there was a newsstand publication for the SWL and DXer. Among others who had columns in this magazine were Rod La Rocque and Anne Tenna. Name this once popular publication.
- 134- At one time there were many SWL and radio-related hobby clubs in existence, all of which were of the mail-order type rather than local neighborhood groups. There were the URDXC, R9LL, IRM, GNSWLC, and others. Can you name these? Can anyone remember others?
- 135- "That Wonderful Year" was a part of what popular TV show?
- 136- What orchestra leader featured "Is Everybody Happy?"
- 137- What very well known singing group was originally known as "King Jack and the Jesters"?

- -

- Here are a few that were sent in by John Nagle in Herndon, VA.
- 138- What radio station "covered Dixie like the dew"?
- 139- What company sponsored "The Victory Parade of Spotlight Bands" during World War II? Give name and network.
- 140- A band leader once used a harpist in his group. Name the orchestra leader. However, we can't come up with the name of the harpist. Can anyone help?

- -

- And to round off this column, a few more as supplied by good friend Patrick O'Connor of Hinsdale, New Hampshire.
- 141- A famous rotund comedian once hosted a game show on TV that was allegedly so bad that it was cancelled after one episode; the host spent the next episode apologizing for the show. Who was he and what was the name of the show?
- 142- Who was the Sentimental Gentleman of Swing?
- 143- Who used "Moonlight Serenade" as a theme?
- 144- The TV series "Man from Uncle" - the men of UNCLE were always fighting a group called THRUSH. What do UNCLE and THRUSH stand for?
- 145- What was the address of Sheriff Andy Taylor?
- 146- What famous female trio once sang with the Leon Belasco band?
- 147- The first transmission

SWL WORLD WATCH



by Ken Wood

- of voice was achieved on December 24, 1906, by Reginald Fessenden. Where did he transmit from?
- 148- Before he hit it big on "Dragnet," the late Jack Webb starred in at least three other radio private eye shows. Can you name them?
- 149- This station, a five-watt transmitter, was built by Fred Christian, and began operating as 6ADZ in 1920 in Hollywood, California. It's still on the air today although with different call letters. Who?
- 150- In 1922 WWL in New Orleans, Louisiana, began operating. To whom was it licensed?
- 151- This radio drama was broadcast from 1943 to 1956. The title character was billed as "Defender of Human Rights, Champion of all those who seek justice." The story, on radio, was much more soap opera than courtroom fiction for which the creator was noted. It first appeared on TV in 1956 as a daytime soap opera, with all names and locations changed, but using much of the same radio cast. The mystery show using the original characters and names began in 1957 and ran until 1963 and was one of the highest-rated series of its time. Name the radio version, the mystery show, and the name of the soap opera. (Editor's note: I'm not sure that we have the correct answer on this one but let's see what kind of replies we get.)

- -

- A belated note of thanks to Dick Holbert of Rochester, New York, for his information in identifying a station that I've been hearing on my scanner on 151.925 mc. It was KSX885, operated by Eastern Microwave, Inc., and is located in Sellersville, PA, which was somewhat further than I originally thought. (I told you people that this Bearcat I purchased from Bob Grove was a good one!)

If things seem a little out of sync with the Brazilians on the 49 meter band - they are! Brazilians were scheduled to make major shifts in frequency assignments on 49 meters effective October 5th. Here's the way the new channel assignments are supposed to work:

Station	Old Freq	New Freq
Radio...		
Gazeta	5.955	5.955
Itatiaia	6.070	5.970
Ceara R. Clube	6.105	5.980
Guaruja	5.975	5.980
MEC	5.990	5.990
Guaiba	5.965	6.000
Inconfidencia	6.000	6.010
Educadora da Bahia	6.025	6.020
Gaucha	6.135	6.020
Globo, Rio	6.035	6.030
Clube Paranaense	6.045	6.040
Guarani	6.175	6.050
Universo	6.020	6.060
Capital	6.195	6.070
Journal do Comercio	6.085	6.080
Cultura (Foz de Iguacu)	6.100	6.080
Bandeirantes	6.185	6.090
Tupi	6.115	6.105
Globo	6.125	6.120
Aparecida	6.010	6.125
Record	6.055	6.150
Pampa	6.080	6.160
Cultura Sao Paulo	6.170	6.165

Note that some of these frequencies have more than one station assigned so some extra care should be taken in ID'ing those stations. Radio Aparecida and Radio Journal do Comercio were recently reported to have left short wave so those may not show. In fact, there seems reasonable chance that not all these changes will take place at one time. We'll try and spot check some of these frequencies and perhaps can give you more information next month. Short-wave activity and my own (and Jeeves') listening has been on the slack side for much of the past three or four weeks, but here's what we've come up with.

AFRICA

BURKINA FASO - Radio National Burkina continues to provide excellent reception over their new 50 kilowatt transmitter. Heard to 0000 sign-off and again from 0530 sign-on on 4.815, all French.

ANGOLA - Emissora Nacional at Luanda now showing up on 4.953 around 0100 but IDs are for the "Radio Madrugada" late night program. Usually weak; all Portuguese.

KENYA - The latest

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WORLD WATCH cont'd

schedule registered for the new 250 kilowatt transmitters of the Voice of Kenya: 1230-1530 on 6.050 and 7.225, 1930 to 2130 on 6.050 and 7.225, and 1530 to 1930 on 9.655 and 11.745.

To my knowledge this is not on the air as yet, but it could come into operation at any time. Hopefully that'll mean hearing Kenya without a struggle.

MALI - Radiodiffusion Television du Mali has dropped the use of 4.783 and apparently replaced that frequency with 3.380. Sign-off at 0000, sign-on at 0700. I tend to doubt reports that the Ivory Coast has also recently put 3.380 into operation.

MOZAMBIQUE - Radio Mozambique is also on the move. Recent use of 4.986 has been discontinued and the transmitter is now showing up on 7.734 variable. Noted at fair to poor levels from its sign-on at 0300.

NAMIBIA - Radio Southwest Africa heard at 0200 on 3.295 with FM-type music, announcements.

TOGO - RTT at Lama Kara heard in French at 0555 on 3.222 with African music and chanting. Fair to good.

ZIMBABWE - The Zimbabwe Broadcasting Corporation's two domestic service channels, Radio One and Radio Two, are both currently being heard from around 0330. Radio One on 3.396 and Radio Two on 3.306. Signal strength is only poor to fair.

ASIA - OCEANIA

BANGLADESH - Radio Bangladesh is heard on 15525 with English beamed to Europe at 1230, always bothered by lots of fading.

INDONESIA - Radio Republik Indonesia at Ujung Pandang on 4719 is making its first fall appearances, though still weak around 1100. Usually underneath a very strong utility station.

NEW CALEDONIA - Radio Noumea heard around 0840 in French on 7170 with fair to good strength, mostly music.

NORTH KOREA - Radio Pyongyang on 11800, poor in English at 1405. Listed as beamed to Southeast Asia.

EUROPE

ALBANIA - Radio Tirana heard at 1805 in English on 11660.

BELGIUM - BRT in English at 1320 on 15590, fair to good level.

GREECE - The voice of Greece now doing very well on 7395. Heard with an English newscast at 0135 but otherwise all in Greek.

IRELAND - Radio Dublin

International noted at 0145 on 6910 with the program of World Music Radio.

ITALY - Not heard here yet but a new Italian station, Radio Callabria International, is currently scheduled from 1230-1330 on 13630 on Saturdays and Sundays. However, it is supposed to increase power to 1 kilowatt (now only 200 watts), move to 7615 and add broadcasts at 0900-1030 and 2200-2300, so it may be possible to log this one if these changes happen.

LUXEMBOURG - Radio Luxembourg on 6090 at 0100 in English with rock music, blocking reception of Radio Belgrano in Argentina.

ROMANIA - Radio Bucharest heard at 0200 with English news on 6990, 9510 and 11940. 31 meter frequency best.

NORTH & CENTRAL AMERICA

ALASKA - KNLS heard on 11850 at 0740 with big band music and into religious program. 25 meters barely holding its own at this hour and may be useless now.

CUBA - Radio Rebelde, 5025, noted absent some nights and occasionally with distorted output, drifting down to 5022.

DOMINICAN REPUBLIC - Radio Santiago, heard weakly around 0100 on 9778 with Latin music. Occasionally airs baseball.

HAITI - Radio Citadelle, aside from 4VEH, the only active Haitian station (and even then only occasionally) being heard again on 6155. Weak and mostly talk around 2230.

MEXICO - La Hora Exacta on 9555 noted around 1400 with usual ads and time checks, all Spanish.

SOUTH AMERICA

ARGENTINA - RAE's SWL program "DX Special" noted in English on 9690 at 0130 on a local Saturday night.

BOLIVIA - Radio Progreso at La Paz has resumed activity. Heard around 1000 on 6005. Quite good some days, all Spanish.

CHILE - Nothing so far in checks for the new Chilean some European DXers are hearing. Radio Santa Maria in Coyhaique being noted on the continent on 6030 around 0000. Might be possible around 0900 or 1000.

COLOMBIA - Ondas del Meta, Villavicencio on 4885 heard at 0315 with Latin music, commercials, IDs; all in Spanish.

ECUADOR - HCJB has resumed usage of 6210 in local evenings. Noted with programs in Russian, probably other languages as well.

Sistema Emisora Atalaya

on 4792 at 0415 with Spanish talks, music. Good level. Also Radio Quito on 4920 at 0335 with Latin Music and IDs in Spanish around 0345.

VENEZUELA - Radio Mundial Bolivar on 4770 heard at 0130 with talks and IDs in Spanish.

CHALLENGER

A seldom heard station is the Voice of Asia in Taiwan which apparently uses Broadcasting Corporation of China transmitters at Kaohsiung. On short wave the station uses ten kilowatts on 5980 for broadcasts in English, Indonesian, Thai, and Mandarin.

Broadcasts are intended for Indonesia, the Philippines, Thailand, Singapore, Hong Kong and Malaysia. Not much is known about the actual purpose of the broadcasts; i.e., why the separateness from the BCC or Voice of Free China?

The station can occasionally be heard in the U.S. Try from 1030 sign-on until 49 meters fades out.

If 5980 is clear of QRM this one may slip through now and then. Reception reports go to the Voice of Asia, Box 880, Kaohsiung, Republic of China.

JEEVES SAYS:

Ken has let me take a "vacation." He bought me a plane ticket to Philadelphia where I am at this writing--sitting in a hotel room making two phone calls a day to the headquarters of International Broadcast Services Limited so I can be first in line to get a copy of the long-awaited RADIO DATABASE INTERNATIONAL book as soon as it's off the press. I have the 2010 portable with me and am passing the time with that, having now memorized the IBS telephone number.

The fall listening season should be in full swing before it's time to do the next column and we hope to have some good items for you.

Til next month, 73 from Ken and me.

ENGLISH LANGUAGE BROADCASTS

by Tom Williamson

Greetings to all MT readers and a reminder that all your information and comments are welcome via the Brasstown office.

This month we will take a look at the variety of musical programs available for the short-wave listener; indeed, this might be entitled, "MUSIC FROM THE WORLD."

A topic of this sort covers widely different listener interests; maybe one person prefers rock, another jazz, and another classical music. So I will not attempt to limit choices to any special preference, but include a mixture of available styles.

Of course it is virtually impossible to produce a comprehensive list of ALL the musical programs of the world! Apart from the huge numbers of stations, they do not use English language in their program announcements often, so much of the information about the music may be lost to the North American listener, although he could still enjoy the sounds. So in the main my comments will be about stations with English language programming.

Another problem, commented on before, is that many stations have the habit of using short "snatches" of local music between spoken announcements, which makes it almost impossible to give time listings. In my opinion

this is a pity because one may greatly enjoy a type of folk music and have to listen to a half-hour or more of uninteresting talk before the next melody. Very frustrating!

Another aspect to be considered is the special nature of short-wave reception in which distortion fading can be a severe problem. Such an atmospheric effect may not be severe in understanding a news bulletin, but it sure upsets the esthetic impact of a beautiful piece of music.

To my ear, this is tolerable in pop music where the line of the rhythm is the important component, but it can ruin a complicated piece of classical music where the slow development of complicated inter-related themes is the enjoyment of the music.

Another type of music which is seriously compromised on shortwave is choral or operatic work. Both frequency distortion and sudden volume changes may produce undesirable sound effects here.

Nevertheless, even if we cannot fully enjoy an item, it opens up a world of new music to the inquisitive listener--without any extra cost--and one may then obtain a tape or disc recording for further appreciation!

This is especially use-

ENGLISH LANGUAGE cont'd

ful in folk music, much of which is almost impossible to sample on the AM broadcast bands, and even the selection in large stores of recorded folk music is pathetically limited. If you are stuck, write to the radio station; you may be lucky with a free disc or cassette! I have received a few in the mail.

ALBANIA:

A strange one to start with, but Albanian folk music is rather unique in itself, so don't just turn away from the idea. To your editor's ears this sounds more like music from the Middle East than from a European country. Radio Tirana does not exactly concentrate on its music but you may hear an occasional piece.

Although it's not an English language broadcast, watch out for the 60 meter twins, Gjirokaster, on 5057/5020 kHz, that can sometimes be heard with good strength in the evenings around 0300 onwards. The strange music is usually the give-away that you have Albania on the dial.

ARGENTINA:

Home of the unique rhythm, the Tango, now no longer danced much, but still the national cultural "heart" of the people! You are bound to hear some of these haunting rhythms from RAE, the Overseas Service of Argentine National Radio, in the 31 meter band usually--if you can hear them! Conditions are very chancy for late evening reception, but sometimes they are all alone on the band.

The English announcers will inform you in some detail about the vocals and orchestras, and their programs can be very interesting. By the way, there are many types of vocal tango such as romantic, political and humorous! In addition to these rhythms, the waltz and milonga are other favorites.

AUSTRALIA:

Often somewhat overlooked by the SWL is Radio Australia's musical programming; however, in between the news and information segments, one can hear a lot of "pop" music, often with (to us) unknown Australian artists work. R.A. has musical shows like Australian Country Style, Australian Top Hits, Soundabout (these being all pop-country type), Bill Belchers Band Bazaar (brass band music), and, for the classics, Australian Concert Hall.

BRAZIL:

I'm sure you don't need me to tell you of the wealth of unending talent from this giant South American country; if you haven't heard Radio Nacional in English in the evening, where have you been?! The 25 meter station is a huge signal when conditions are right--which isn't often enough!

Brazilian "pop", instrumental and carnival music (samba/marcha) is frequently programmed as well as many songs. Interesting biographies and historical notes are often presented.

By the way, we shall soon be coming up to carnival time, so watch out for the dial alight with pulsating sambas from many other domestic Brazilian stations. You can't confuse these rhythms with any other country. 60 meters is perhaps the most likely source of local bands, but the 25 meter R.N. Amazonia station is heard in Portuguese a few kHz higher than the English language Brasilia station.

Manaus is on 11780; Brasilia on 11745 kHz. These are giant 250 kW outlets, so signals are quite consistent. Manaus also has the same power on 4845.

CHINA:

Beijing presents several musical sessions of their fascinating Eastern style, such as Music Album (Sundays), and Music from China (Saturdays). Once again, there are frequency problems, with 25/31 meters being the usual channels, and reception is subject to conditions.

CUBA:

Radio Habana has some very good musical programming; indeed, I suspect they get their main audience from this attraction! In particular the home-grown program "From the Land of Music" has been spruced up quite a lot. It may be heard around 0035 daily as a 15 minute segment.

Currently, with me, the 6100 kHz channel is very strong, but try others if you don't like this one. They also have another program of Latin American music in general, rather than Cuban, but the time escapes me at the moment; check out their frequencies.

ECUADOR:

Surely one of the most enjoyable folk-music broadcasts is the "Musica del Ecuador" program from HCJB, Quito, but lamentably short--just 15 minutes like the Cuban one above! This music is aired at 0230 and 0430

weekdays and at 0530 Saturdays. You may also hear other tantalizing "snippets" at different times between programs and in the regular DX Party Line program as well.

EGYPT:

Radio Cairo has some irregular sessions of Arabic music in their English and other language programs, but reception is unreliable. Recently, Arabic music is being heard around 0120 on their 9475 kHz channel. Try other frequencies also at that time.

GERMAN FEDERAL REPUBLIC:

Deutsche Welle seems to have more programs about music than of music! But this comment isn't too important if you are a serious fan of classical music. DW has some fine programming in this style but, apart from saying check them on Sundays, detail is missing from my perspective. Wednesday is also an arts program night.

GREECE:

Athens presents sections of musical programming of characteristic type in their English language programs and at other times. Unfortunately, they don't seem to send program bulletins when requested; rather, a frequency schedule sheet. But many evenings you can hear the quaint Greek music on 9420-9865 kHz.

NETHERLANDS:

Radio Nederland has one special program which often provides insight into the European pop music scene--That's Tom Meyer on Sundays with the famous "Happy Station" program, "Smiles across the Miles," as he says. You may hear some very interesting material at such times as the Euro Song Festival. Also you might get a record request played if you contact them!

PORTUGAL:

Radio Portugal may, from time to time, present some of their unique folk vocals ("fado" music), but reception on their 6095 channel for the evening English broadcasts is temperamental!

SPAIN:

Well, of course, what would this one be like without music?! Spanish Foreign Radio uses a lot of folk music but at irritatingly unexpected moments! However, they have segments such as "Music" at 16 past the hour, weekdays (for all of FIVE minutes) and "regional music," Saturdays at 25 past

the hour, for the same short scheduled period! If that was all they really presented there would be a famine, but the melodies turn up in all sorts of programs, so just keep tuned (maybe that's the idea!).

TURKEY:

Ankara has musical programs scheduled for Mondays and Wednesdays toward the end of their English programs and probably at other times as well. The music is fascinating, often better than the other parts of their broadcasts, but they don't seem to be very popular as a station with North American audiences--or am I mistaken? Let me know your feelings on the matter.

UNITED KINGDOM:

BBC World Service devotes quite a lot of effort to regular musical programs. On the pop music front we have Top Twenty, Sandi Jones Request Show, John Peel; for jazz fans, Jazz for the Asking; for classical enthusiasts, The Pleasure's Yours, Classical Record Review, Concert Hall, and the Sacred Choir. My only comment here is that classical music does not come over well on short-wave due to frequent fading distortion.

U.S.A.:

The venerable VOA has some regular programs which attract quite an overseas audience such as Concert Hall for the classics, Music USA and Music USA Jazz. The former features standards and the latter has jazz yesterday and today, with the famous Willis Conover.

And how about the famous "Rock of New Orleans," radio WRNO with its Jazz 30 music and conversations with famous musicians (Tuesdays and Thursdays); also the Weekly Top Ten (requests of the week) on Fridays.

USSR:

Radio Moscow has a set of musical programs on a regular basis such as Music at Your Request, Folk Box, Musical Quiz, Your Top Tune, Music and Musicians, and others. You may also hear interesting regional folk music over Radio Kiev and Radio Vilnius. Generally these folk music items are among the very best of the Soviet broadcasting spectrum.

NEXT MONTH we will have a tabulated summary of selected stations for musical entertainment and then continue with a review of broadcasts by continent.

SOUTH AMERICA (1) (2) (3)

by Ken Wood

It's a continent of unlimited variety. Its traditions, its different levels of life, its great cities and isolated vil- lages, its jungles, rivers, mountain peaks and high plateaus, its music and culture provide enough variation for more than one lifetime of exploration.

There's variety in the radio stations of South America, too, although many short-wave broadcast listen- ers tend to shrug off the South Americans as too easy or too hard to hear, too boring or too many to handle. And certainly there are a lot of them.

Some nations sport but one or two broadcasters on short wave; others such as Brazil and Peru can tally over one hundred. Many come on for a week or a few years and then disappear, some- times to return later, some- times never to be heard from again.

The small, low power Peruvians flutter up and down the dial; Brazilian Portuguese is often spoken to fast for an untrained ear to pick out an ID, particu- larly during a "futebol" broadcast.

And yes, sometimes stations are reported on that have never been active. All that is part of the fun and challenge of DXing our southern neighbor.

This South American sampler is designed as a something-for-everyone exer- cise. We've listed three stations from each country. The first will be one of the very easy stations to hear, the second one of moderate difficulty and the third - ho boy - that's for tried and tested Latin American DXers who really know their stuff (which isn't to say that anyone can't go after those third level broad- casters!).

Whether you're just thinking about pointing a toe towards the South Ameri- can DX waters, or are in knee deep or up to your chinny chin-chin, you would find a target here that's made to order for your situation!

ARGENTINA - (1) Radio Nacional (RAE) is a near- snap log on 6.060, 6.960, 9.710, 11.710, and 15.345 MHz, among others. Some fre- quencies are used mainly in the early morning hours, some in the daytime, some in the evenings (primarily). Check for English on 9.690 and 11.710 at 0100, or on 15.345 at 1200.

(2) Radio Belgrano operates on 6.090 from 2200 to 0200 and daytime on 11.780 (1600-2000). Brazil is also on this latter fre- quency during the daytime.

(3) Radio Malargue uses just 500 watts on 6.160 with a listed 1000-2200 schedule. It can be heard during good openings at the 1000 sign- on.

BOLIVIA - (1) Radio Illimani from La Paz uses 4.945 and 6.025. Try this one at 0900 sign-on when frequencies are less likely to be covered. 6.025 is occasionally well heard in the evenings.

(2) Radio La Cruz del Sur in La Paz is a religious station that goes through cycles of good and bad reception--right now it's fairly good. It's on 4.875 and signs on around 1000, off at 0100.

(3) Choices for this position are many but we've picked Radio Nacional Huanuni on 5.965. Sign-on varies between 0900-1000 but the Brazilian Radio Guaiba is almost always on this frequency so you need real determination to be up at this hour for weeks or even months in a row - whatever it takes. Fittingly, Huanuni is a terrible verifier!

BRAZIL - There are many Brazilians which would fit into each category. But (1) almost has to be the trans- mitters of Radiobras/Radio Nacional Amazonas. Radiobras runs English at 0200 on 15.290 (sometimes 15.270) and Nacional Amazonas is on 11.780 days and evenings.

(2) Radio Araguaia in Araguaia on 4.905 makes for a good second level choice. Most tropical band Brazil- ians sign on around 0800 or 0900 so check then. But beware: another Brazilian, Radio Relogio Federal in Rio, operates with higher power on the same frequency.

(3) Radio Oito de Setembro in Descalvado uses but 250 watts on 120 meters (2.490) and when there's a good opening on this band it may turn up around 0000- 0100.

CHILE - (1) Radio Nacional is no sweat on 15.140 during the daytime, though it sometimes uses its alternate 15.150 frequency for a few days.

(2) Check variable 9.570 or 6.020 for Radio Diego Portales from 1030 sign-on or in the evenings up to 0400.

(3) Early morning, around 1000 UTC, might one day turn up a signal from the usually inactive Radio Calama on 6.100.

COLOMBIA - (1) La Voz del Llano is one of several easily tuned Colombians. This one can be easily found because of its strong signal and off-frequency operation - 6.117 rather than its assigned 6.115. It's hear- able almost any local even- ing, best late with the QRM less a factor.

(2) Ondas del Orteguaa in Florencia operates on 4.975 until 0300. But a very strong utility station also operates on that frequency, and most of the time too. So it's a question of catching the utility silent when Orteguaa should be in the clear, assuming it is on.

(3) La Voz del Yopal in Yopal operates in the 5.050 area (last reported on 5.051), with sign-on around 1000 and sign-off at 0300, sometimes 0400. There are a number of Latins operating in this general area and Yopal isn't always active, so some patience and search- ing are needed.

ECUADOR (1) You kid- ding? HCJB of course. They're on 24 hours a day and in English to North America most of the evening (well to the post-midnight hours). Check 6.095, 9.745, 11.910, 11.915, and 15.155.

(2) La Voz del Napo on 3.280 signs on at 1000 and you can often catch them then or up until listed 0230 sign-off. There's a ten hour break in their schedule during the day.

(3) Radio Omega, aka Radio RJI operates from Catacocha during the evenings. Sign off time is highly variable - as early as 0200, as late as 0500. And so's the frequency. Search the area around 6.500 to 6.550. You'll need a very good opening to Latin America to get this one.

PARAGUAY - (1) Radio Nacional performs nicely most days to 0300 on 9.735 with its mostly music pro- gram and shouldn't be any problem to hear.

(2) Recently active was Radio Guaira at Villacrica on variable 5.980 with a sign-on around 1000 but it may take some real tuning.

(3) Try around 0900 on 5.995 for La Voz de Amambay, a real patience-tester. It's not always active and this area contains a lot of high power broadcasters.

PERU - (1) Radio Union in Lima on 6.115. When it's good it's very, very good. Check early mornings or late evenings just below the Colombian on 6.117.

(2) Try Radio Chan- chamayo in La Merced on 4.896 running from 1030 to 0500.

(3) Third level Peru- vians are legion. We won't

CB VIOLATIONS CAN BE SERIOUS

It seems that "Thunder Hammer," also known as "Pro- bation Officer Number One," has bitten the dust. U.S. Marshals, police officers and agents of the Federal Communications Commission conducted a search and seizure at the Portsmouth, Virginia, residence of the illegal operator, confiscat- ing six CB radios, three linear amplifiers and acces- sories valued in excess of \$2000.

But the "bust isn't over; criminal charges are pending against the operator who, just last year, was fined \$300 for a restricted- hours violation stemming from interference he caused to a neighbor's heart pace- maker!

If convicted, "Thunder Hammer" could be nailed with a \$10,000 fine and imprisoned for a year.



go all the way to the super difficult. How about Radio Mundo from Cuzco on 5.120? It's one of the current crop of out-of-banders being heard with some regularity now.

URUGUAY - (1) There aren't really any easy pick- ings from this country but let's go with Radio El Espectador (sometimes relay- ing Radio Sport) on 6.045 from 0930 sign-on.

(2) SODRE, once an old standby, is seldom heard anymore. Try 9.620 at 0900.

(3) Radio Oriental, 11.735, was reported around 0000 during the spring but Radio Moscow has occupied the channel all summer. It may turn up if and when Moscow vacates the spot.

VENEZUELA - (1) Radio Rumbos in Caracas is a strong and reliable per- former on 4.970 and 9.660. You can hear the 31 meter band channel most of the day, 4.970 evenings and early mornings.

(2) Radio Mara in Mara- caibo has returned from the never-never land where silent Latin stations go from time to time. It's on 3.275 evenings or early mornings.

(3) Radio Angostura in Ciudad Bolivar on 6.120 is a sometime possibility from around 0900 sign-on.

No, we haven't included French Guiana, Surinam, Guyana, or the Falklands. Not enough stations in those countries and they don't really have a Latin flavor to them, anyway. As for those we listed - hope you hear 'em all!

CB VIOLATIONS cont'd

A GENTLE REMINDER

Although the Citizens Radio Service has been deregulated, the basic technical restrictions still apply -- crystal-controlled (or synthesized) channelizations (no VFOs), 5 watts maximum input for AM (no linear amplifiers), no DX'ing (150 mile distance limit), no deliberate interference.

There are no longer any licensing requirements; call signs are a thing of the past. And with the sunspot cycle being at low ebb, reliable local coverage is now better than when CB was enjoying (?) a popularity peak in 1980.

Although at one time it was estimated that some 20 million operators were active on the CB band, the FCC places that estimate now at about 15 million, still a sizable number!

Canadian Federal authorities have more of an edge in keeping communications firmly under control.

Canada's population is around 23 million, a fraction of the U.S. If there are so many unlicensed operations in the States, it may well be that the FCC simply can't keep track of them amidst a population of 250 million.

Also, the ratio of short wave listeners in Canada probably is lower than the U.S. If few Canadians are listening to short wave, even fewer have their ears open for pirates. How many, then, would have the capabilities - or motivation - to set up an AM, FM or SW transmitter?

BUT

Even if Canadians aren't the type to get out of line and start up an illegal transmitter, they have an advantage. Much of Canada is isolated forest and bush with plenty of back roads. Authorities would have to go to considerable trouble to find a pirate in that situation, especially as regards an HF broadcaster.

"It would take a helicopter with direction-finding equipment to find them," observed Montreal-based ham Fred Zimmerman. "And at what cost to the Department of Communications? It wouldn't be worth it."

Besides, when pirates take to the air in Canada (especially on SW), it's usually in the few months of summer. Not many people are up to freezing in a shack north of Lake Superior, or risking being caught, just to play radio.

However, some say they will take their chances.

"I would like to see more broadcasting of the unlicensed sort in Canada," says Miké Csorbay of the Ontario DX Association, "and everywhere else for that matter, until governments agree to open up the airwaves to the general public. But until then, I am promoting an illegal activity. For truly public radio, people will have to take chances on operating and possibly getting caught in the act, but it is only in this way that we will inject some freshness into the rapidly stagnating radio industry."

Richard McVicar, also of ODXA, has a counterpoint.

"Broadcasting in Canada is extremely regulated, but I think the result is radio of good quality. Pirate stations can offer fresh ideas, but they rarely do. Besides, the quality of a

pirate's sound and signal is almost always lousy and just a waste of frequency space. It's just a fact of life that to send a good, clear signal costs money."

Richard says we may "detect a strong bias here." He had just landed his first "real radio" job, he said.

FM AND MW

In fact, Canada's legitimate broadcasters are regulated by strict rules - including some that dictate actual content of programs. Given this situation, the DOC comes down pretty hard when it turns over an unlicensed operation. The pirate convicted in Vancouver was fined \$1000 and had \$5000 in equipment confiscated for a first offense. Interestingly, not one press release has been issued by the DOC concerning that bust despite media coverage of the trial.

William Jones, a technical inspector for the DOC, says there have only been two cases of unlicensed broadcasting in the past six years in Montreal, Canada's largest city. One of the stations was broadcasting non-stop Greek music from a central part of the city. The station was transmitting on the upper fringe of the MW band (1610-30kHz), well away from the nearest licensed broadcaster.

Jones said his department is committed to closing pirates whether or not they're causing interference or arousing complaints. And with the DOC's sophisticated monitoring post just outside Montreal, it's not hard at all.

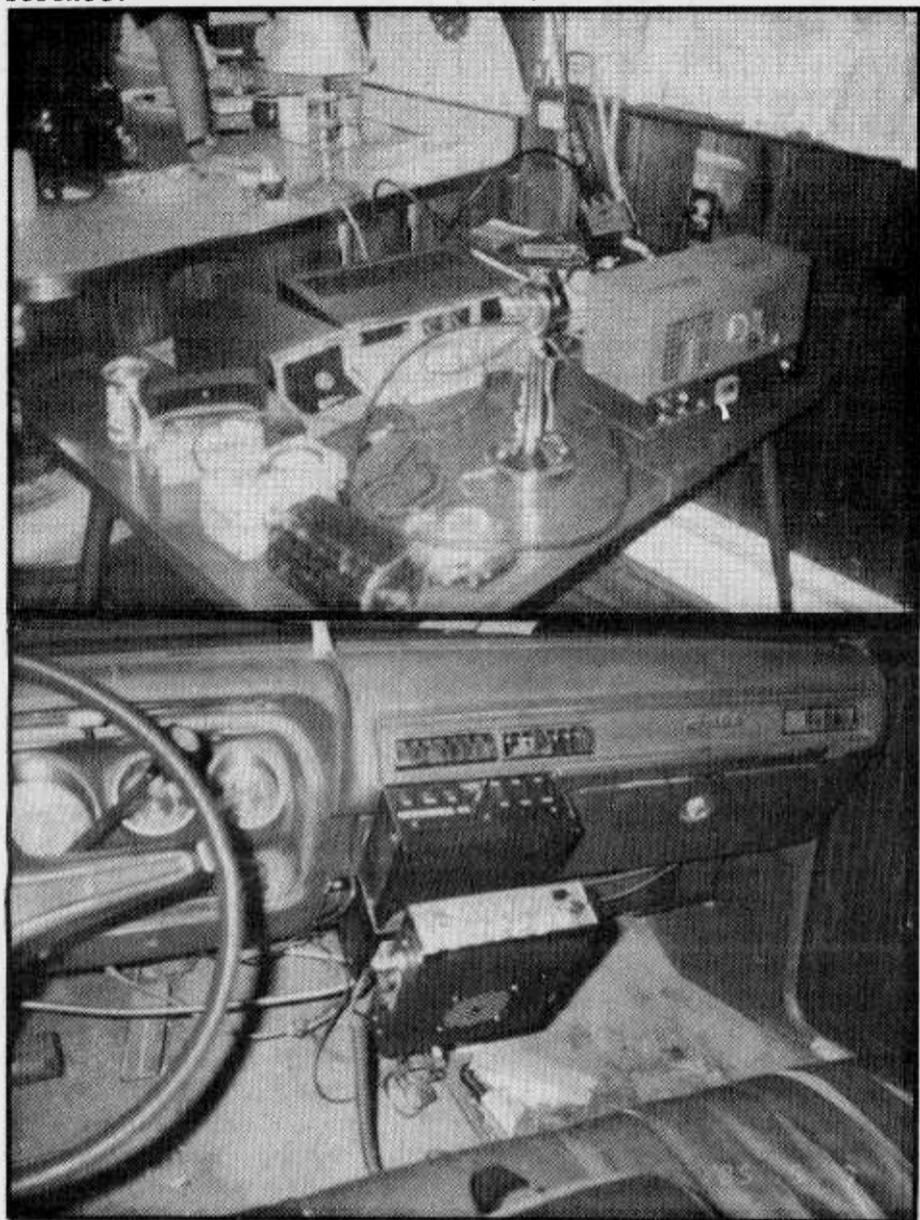
If Canadian radio regulators are beginning to sound like a bunch of ogers, well, they also have a soft side.

The Federal Government is encouraging establishment of "community" stations in remote parts of Canada. Some stations, having obtained the necessary hardware, turn on the juice right away without waiting for DOC's stamp of approval. Technically, it's piracy.

But it's pretty hard to cause interference with low power when the nearest settlement is 600 miles west. And what bureaucrat wants to fly up to Ungava Bay just to pull the plug?

SOME CANADIAN PIRATES

WKKK - This station can only be described as a major embarrassment, despite the fact it existed but a single, wild night in 1981. As the call letters imply it must have sounded something like "Voice of Tomorrow."



"Thunder Hammer's" illegal base and mobile rigs.



Those Canadian Pirates

by Martin C. Barry

Following the arrest and recent conviction of a Vancouver man for operating an illegal FM station, SWL's and particularly pirate radio enthusiasts may be wondering, are there any others flying the Jolly Roger north of the 49th parallel?

Last year regular listeners logged a station that identified itself variously as CFCQ or CFCK on 3240 and 3420 kHz. It claimed a location somewhere in northern Ontario. This summer, however, there wasn't a trace of the station.

Canadian pirates seem to be a rare breed.

SHORTEST BOOK

If there was an entry in Guinness for world's shortest book, "A History of Clandestine Broadcasting in Canada" just might take the prize. The author of that unwritten volume would probably find most of his source material in this article.

While dozens of U.S. pirates are heard regularly on short wave and other bands, with the exception of the occasional very low-powered broadcast, there are virtually none in Canada.

Part of the reason for this may be the typical Canadian's "laid back" attitude. We are autonomous, but didn't fight a revolution for it, so we usually take things as they come. Thus,

CANADIAN PIRATES cont'd

Making things worse, the operators used actual names of prominent Ontario DX Association members who then had to account to angry listeners. It turned out to be a prank.

"WKKK was just a bunch of boys and girls well under twenty years old at a lively summer party," says Richard McVicar. "It was held out on a lake. I was told the antenna was stretched out over the lake." Conditions made it widely heard, unfortunately.

"As far as who was operating the station, there were all kinds of people chipping in comments. Many of them probably thought the transmitter was a CB and didn't remember anything the next morning. As far as I know none of the WKKK people have any interest in the KKK, the CIA or pirate radio for that matter." Richard adds that the transmitter crystal has since been destroyed.

RADIO CLANDESTINE - This frequently reported pirate actually operates from Canada according to Richard McVicar (Their mail drop is in the States). An informed source said that Richard knows more about this pirate than any other Canadian. But Richard says he won't talk. "If I said anything, you could add what I said to what others have said and come up with conclusions by process of elimination. I've promised not to say anything."

CFCQ/CFCK - First logged by SWL's in the summer of 1984 on 3240, 3417 and 3420 kHz, they claimed also to operate on 3250 kHz. They played long sets of rock music with ID's every 25-30 minutes. All reports agree the location was announced as northern Ontario. But there have been none since.

Mike Csorbay theorizes: "They operated from a cabin in a remote location in northern Ontario during their summer vacation from school or work." Or they had equipment failure or were closed by the DOC.

CHNO/CHEZ are (respectively) AM and FM stations in Ontario that were clandestinely relayed via short wave on 3450, 6990 and 7430 kHz in the spring on 1983. Mike Csorbay says they were "one and the same as CFCQ" and they probably pirated the licensed stations' signals for transmitter tests.

The choice of stations, however, is interesting: CHEZ is located in south Ontario serving Ottawa,

PIRATE RADIO



by
John Santosuosso
P.O. Box 1116
Highland City, FL 33846

RADIO CAIMAN: By now "Monitoring Times" readers have been alerted to the newest of the anti-Castro, anti-Sandinista stations. This is Radio Caiman which is currently transmitting on a frequency of 9960 kHz. What was probably its initial broadcast was monitored here in central Florida at 1210 GMT on September 28.

Radio Caiman (Radio Alligator) can normally be heard with good signals. The best times to try are around 0000 and 1200 GMT, although earlier transmissions have been monitored. The change from Daylight back to Standard Time may or may not affect the operating schedule.

There is no doubt that

while CHNO's territory is Sudbury hundreds of miles north. The relay may have been in the expansive wilderness between the two.

STOP THE PRESSES

The morning after completing this article, I was casually scanning 49 metres - a band that usually is inactive here most of the daytime except for a couple of Canadian simulcasters - when I came upon a station broadcasting what seemed like a repeating loop of jazz, banjo and calypso ("Yellow Bird") with strong modulation and minimal fading.

The transmission shifted periodically between 6045 and 6120 kHz and there was no identification. The signal was strong enough that a pocket-sized Toshiba RF-F11 with just the antenna extended received the station with little loss of gain.

Is anyone flying the Jolly Roger in Canada?

"Yellow Bird" is playing again and it's so close. I can't believe what I'm hearing. It's got to be Canadian. A little bird is telling me.

Radio Caiman is the same station which was popularly known for several months as "Radio Nat King Cole." This station broadcast two hour blocks of Spanish and English music and identified only by playing Nat King Cole's song "Ojos Negros" (Dark Eyes) on the hour.

In a message to this writer postmarked September 14, the anti-Castro organization Pro Libertad de Cuba claimed the station was theirs. Contact was made with one office of this group, but it would not discuss either broadcasting activities or the existence of other offices.

We would deeply appreciate it if the office that did contact us would do so again, and if possible, provide us with a means to contact you. Any request that information be kept confidential will be respected. In the event that Pro Libertad de Cuba does authorize us to release additional material about Radio Caiman, we will see that "Monitoring Times" readers are informed.

FCC PIRATE HUNT: Connecticut's Gregg Bares sends along an item from the Waterbury "Republican" for September 14. According to the article by Greg Mizera, the FCC states that a pirate is operating in the Waterbury, Connecticut, area.

The Commission also released the names of 15 other cities known to have active pirates including Richmond, Virginia; Youngstown, Ohio; Miami; Minneapolis; Newark, New Jersey; and San Francisco. From another source we have learned that an additional city in Florida was also on the list.

"THE 1984 PAPERS": C. M. Stanbury is back, and his "1984 Papers" will surely add to the "Havana Moon mystique." Will they raise more new questions about the identity of Havana Moon than they will provide answers? We will leave that for others to decide.

"The 1984 Papers" are being sold through "The Small Press Review," to which Stanbury contributes frequently. Inquiries can be sent to the publisher, Dustbooks, P.O. Box 1056, Paradise, CA 95969. This same organization is the publisher of Stanbury's classic "Anti-Matter." Who really ran Radio Swan, and what was its true purpose? It is difficult to dispute Stanbury's conclusions.

BRITAIN: R. Wilcox of Connecticut sends along a

clipping from the New Haven "Register" for September 10. The article notes that the British government is doing battle with the pirate stations. So far 65 stations have been prosecuted by the Department of Trade and 155 raids have been carried out. At one time there were an estimated 140 pirates, but now only a handful remain.

The government has had less success against the big off-shore commercial pirates, Radio Caroline and Laser 558. However, it now has the vessel Dioptric Surveyor equipped with surveillance gear and is intercepting ships that seek to supply the stations. Laser 558 has responded by broadcasting the song "Who's Afraid of the Big Bad Wolf," but it remains to be seen who will win Britain's "radio war."

CONFIDENTIALLY YOURS:

To Douglas Cruikshank, thank you; it was very interesting. Hope to hear from you again. To B.H.S. of New Hampshire: I tried to contact you, but the letter came back. Hope you will contact me and, just for the record, I am not Havana Moon. To C.M. Stanbury, what's this about a second Radio Marti transmitter in the Florida Keys?

PICKING ON THE RUSSIANS: The anti-Soviet publication "Latvian News Digest" interestingly enough includes a July 15 TASS commentary by Viktor Ponomarev in its September issue. According to Ponomarev, the ship "Baltic Star" was outfitted with radio and television equipment in order to make anti-Soviet broadcasts from the Baltic Sea to the Soviet republics of Estonia, Latvia, and Lithuania.

The project was part of a July "Baltic Peace Cruise" sponsored by groups protesting Soviet control of the Baltic states. TASS appears to imply that specialists from Radio Free Europe assisted in the broadcasting activities.

LOGGINGS AND OTHER THINGS: If anyone has the address of Tom Konard's "Aircheck Factory" would you please send it to me? Thank you.

From Florida, Terry Krueger says he is hearing the clandestine Voice of the Free Sahara via Algeria daily on 9640 kHz from 2201 to 2255. The program is in Arabic and transmission times may vary slightly.

Terry also says he received a QSL from pirate

PIRATE RADIO cont'd

Union City Radio along with a color photo of their transmitting equipment. His report was the first they received from Florida.

In Ohio, George Zeller notes the return of anti-Castro La Voz del CID mornings at 1100 GMT on 6305. He also received a QSL from pirate CCAT. Its address is Box 140, 3090 Danforth Avenue, Toronto, Ontario N1L 1C1, Canada.

It is not pirate activity, but we just have to mention that Hawaii's Chuck Boehnke is getting some fantastic medium wave reception at his location. He hears Calcutta, India, with English news at 1530 GMT on 1134 and Saudi Arabia on 1440 kHz. Keep reporting stuff like that, Chuck, and we will all want to move there!

This writer has not had any luck logging pirates lately, but at least the mailbox has not been empty. We received a full data letter from TV pirate WRAT-TV, on whom we reported last month. We were also very grateful to receive a prepared card from WMTV. So far as we know, it is only the second QSL they have issued.

However, we would suggest you save your time and postage sending reports to WMTV. Details cannot be discussed, but it appears pretty definite that the folks operating this one do not intend to issue verifications.

Now, what are you hearing? Let us know and we will share the information with other "Monitoring Times" readers. Thanks to all of you for your support!

"Los Numeros"

32444 69213 88816 52196 63811 94216

Havana Moon



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B.H.S. of New Hampshire was kind enough to forward "Los Numeros" some most interesting information a few weeks back. This New Hampshire reader and monitor says that El C.I.D. transmissions are heard clearly at his listening post on 6300 and 9950 kHz. C.I.D. programs via RADIO CLARIN are also easily monitored on 9940 kHz.

B.H.S. also says that C.I.D. announces a frequency of 9940 kHz which actually measures 9950 kHz. B.H.S. seems confident that C.I.D. might act to correct this error after reading this column.

I really appreciate the information, B.H.S. I'm certain that John Santosuosso would like to hear from you. John can be reached at P.O. Box 1116, Highland City, FL 33846. I'll present more of the B.H.S. letter elsewhere in this column.

I would ask that any member of C.I.D. or Pro Libertad de Cuba contact me or John Santosuosso.

THE LIST

"Los Numeros" is pleased to present herein what just might be the most comprehensive "numbers" and "phonetic alphabet" station listing available.

"PHONETIC" STATIONS

(some freqs in multiple use)

ru=reduced upper carrier SSB
u =USB
a =AM

- | | |
|----------|-------------------------------------|
| | kHz |
| ART (ru) | 3415 5437 |
| BAC (ru) | 4560 5910 |
| CIO (u) | 6790 9325 9965
10125 13921 17966 |
| EZI (u) | 6840 11565 17410 |
| FLU (ru) | 4056 6500 |
| GBZ (ru) | 4882 6270 |
| KPA (ru) | 7445 |
| MIW (ru) | 8641 |
| PCD (ru) | 3150 |
| RCH (ru) | 5091 |
| ULX (ru) | 4882 |
| VLB (ru) | 4670 7605 |
| YHF (ru) | 5820 7918 |

TWO LETTER PHONETIC" SIGN ON
Groups (5-digits) repeated twice. German or English (mostly German).

- | | |
|---------------|----------|
| 3228 kHz (u) | AM/ER |
| 3262 kHz (u) | AM/ER |
| 4543 kHz (u) | DK/IT |
| 4594 kHz (u) | DK/MU |
| 5015 kHz (a) | PN |
| 7404 kHz (a) | PN |
| 8173 kHz (u) | FS/BJ |
| 9325 kHz (u) | AR |
| 9450 kHz (u) | CD/WP/WR |
| 10177 kHz (u) | FB |
| 10740 kHz (u) | AR/OT/UB |
| 11108 kHz (a) | PN |

- | | |
|---------------|-------|
| 11545 kHz (u) | CD/GC |
| 13775 kHz (u) | GC |
| 14622 kHz (u) | OT/WR |
| 14945 kHz (u) | KW |
| 15610 kHz (u) | KW |
| 16220 kHz (u) | HK |
| 19295 kHz (u) | HK |

It is a widely held belief that these transmissions originate from East Germany.

FIVE DIGIT GERMAN/ENGLISH
Groups repeated twice. CW "NNN" at beginning and end of each transmission.

- | | |
|-----------|-----|
| 6997 kHz | (a) |
| 7379 kHz | (a) |
| 9052 kHz | (a) |
| 9267 kHz | (a) |
| 9973 kHz | (a) |
| 11415 kHz | (a) |

GERMAN 3/2 DIGIT

Sign on as: "929 07 44 190" (repeated)

- | | |
|----------|-----|
| 4395 kHz | (u) |
| 5315 kHz | (u) |
| 5910 kHz | (u) |
| 6708 kHz | (u) |

GERMAN 5-DIGIT GROUPS

Repeated twice with "music box" introduction.

- | | |
|----------|-----|
| 3820 kHz | (u) |
| 5748 kHz | (u) |

SELECTED 5-DIGIT SPANISH AND CW GROUPS

- | |
|-------------------------|
| 3090 and 4022 kHz |
| 3090 and 5080 kHz |
| 3445 and 3080 kHz |
| 4028 and 5742 kHz |
| 4825 and 4044 kHz |
| 4825 and 4055 kHz |
| 5826 and 6227 kHz |
| 6773 and 6784 kHz |
| 6825 and 6833 kHz |
| 6872 and 6892 kHz |
| 7438 and 7482 kHz |
| 7527 and 7846 kHz |
| 7887 and 8027 kHz |
| 8112 and 8186 kHz |
| 9086 and 9124 kHz |
| 9874 and 10138 kHz |
| 10345 and 10382 kHz |
| 11468 and 12230 kHz |
| 12236 and 12324 kHz |
| 13428.5 and 13578.5 kHz |
| 14452 and 14682 kHz |
| 14734 and 15778.5 kHz |
| 8482 and ?? kHz |

First frequency is primary and second frequency is repeat.

All of the above 5-digit Spanish frequencies have been active for the past several months at varying times. "Numbers" monitors are also reminded that many of these frequencies are active only once or twice weekly. Most 7, 8 and 9 MHz frequencies are active after 0500Z. Much of the traffic on 3 and 4 MHz is phantom.

SPY TRANSMISSIONS(?)

The 5-digit USB German

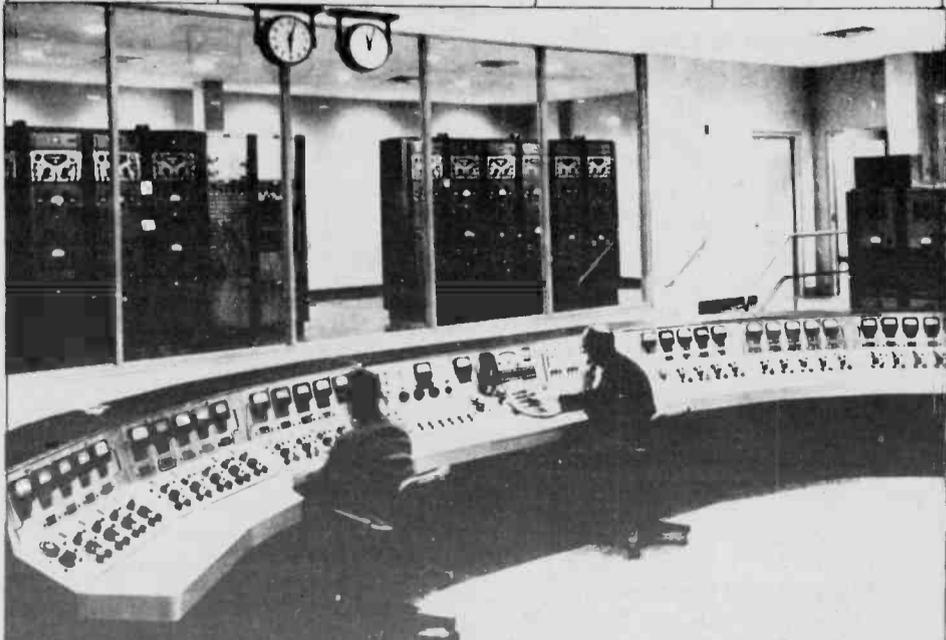


VOA RADIO MARTI SHORT WAVE SERVICES

While SWL's have been following the exploits of the VOA's new voice, Radio Marti, broadcasting on 1180 kHz in Spanish language to Cuba, few of us have been privileged to information on where to tune in this latest U.S. propaganda effort in the short-wave spectrum.

We appreciate MT reader Eugene Munger of Montgomery, Alabama, for sharing with fellow listeners a broadcast schedule just received by him from Radio Marti's chief of technical operations. It is printed above.

TIME (UTC)	E.D.T.	FREQUENCY	POWER (WATTS)
0930 - 1200	5:30 am - 8:00 am	6075 kHz	250,000
1200 - 1415	8:00 am - 10:15 am	9570 kHz	250,000
1415 - 1730	10:15 am - 1:30 pm	11815 kHz	500,000
2030 - 2300	4:30 pm - 7:00 pm	11960 kHz	500,000
2300 - 0300	7:00 pm - 11:00 pm	9660 kHz	250,000



VOA field tests new 500 kW transmitters at its Greenville, North Carolina, site.

LOS NUMEROS cont'd

transmissions on 3370 and 4010 kHz have been linked to the recent West German spy scandals. These transmissions originate from somewhere in East Germany and sign on with a music scale. This revelation received some minor attention on national television some weeks back.

SPY PARAPHERNALIA

"..Coded pads..greeting cards with microdots..transmitting and receiving equipment.."

On an all-too-frequent basis, the above phrases are the basis of most newspaper and magazine accounts of sought after and recently apprehended spies. Nearly identical items will be found in the hide-outs of various terrorist groups.

And what you are reading and hearing about these days is only the tip of the iceberg. There are more startling and bizarre revelations to come. All is not well at (deleted) and (deleted).

UNUSUAL INTERCEPT

B.H.S. of New Hampshire says that he monitors RUSSIAN NUMBERS transmissions on 6839.5 kHz! I would really like to know more about this Slavic YL, B.H.S. Will you provide more information? Do you hear the 4-digit Spanish on 6840 kHz in New Hampshire?

THE CARDS

It is very possible to liken some 5-digit Spanish transmissions to 3-card monte! Think about it.

MOUNT ALTO

Disturbing and disgusting are just a few of the words I have for that Soviet spy city atop the second highest hill in Washington, D.C. The potential for Soviet eavesdropping from this site is appalling.

GUESS WHO?

B.H.S. again to ask if I would consider organizing the column so, at a quick glance, readers would have a short list of all the various frequencies and info discussed in each "Los Numeros" column.

That's a good idea, B.H.S. I'll have to give it some thought. I see the difficulties in reading columns over and over in search of a particular frequency.

MYSTIQUE ENHANCEMENT

The legendary C.M. Stanbury is back and "Dustbooks" has him! Not content with the classic Anti-

Matter, this often controversial Canadian--or so I've been told--attempts to outdo himself with The 1984 Papers. How can you outdo Anti-Matter, C.M.?

There are reports that C.M. even goes so far as to enhance the Havana Moon mystique on some few of the pages of his latest work. And to think that I once thought that mystique enhancement only came about after heroic doses of castor oil with Tecate as a chaser. But what do I know? I wonder what he said about me this time. Give 'em hell, C.M.--you've earned the right.

You'll find the Dustbooks address in the John Santosuosso column. Be sure to tell the good folks at Dustbooks that John Santosuosso and Havana Moon told you to write.

WILL THE REAL TAMMY FAYE PLEASE STAND

What do Bob Grove, John Santosuosso, C.M. Stanbury, Tammy Faye Bakker, certain sinister Miami, FL, and Union City, NJ, individuals have in common? The answer to that question is that none of them is Havana Moon!

TRIVIA ANSWERS

Watch for them in the very next issue.

ATENCION

Canadian DX/SWL cubs are invited to participate by sending loggings and other related information to this column. Other contributors are reminded that pirate and clandestine material should be directed to John Santosuosso.

MIAMI SITES

The things that Crockett and Tubbs would never tell you! Watch for the next issue of MT!

REMEMBER

"Los Numeros" is very interested in what you are hearing. A very big thanks to all of you for your support. HAVE A VERY HAPPY HOLIDAY SEASON.

Time now for a Tecate and...

Adios,

Havana Moon y Amigas

The views expressed in this column are those of Havana Moon and do not necessarily represent the views of the MT management, staff or readers.

I recently received a list of "Canadian Scanner Frequencies" which was assembled by Chuck Chivers. Here are some excerpts from that list.

- 142.245 Ontario Provincial Police--Brampton
- 142.445
- 142.605
- 142.095 --Burlington
- 154.710
- 142.935 --Brantford
- 142.215
- 142.815 --Chatham
- 163.110 Ottawa-Carleton Regional Police
- 164.880
- 165.750
- 166.770
- 167.235
- 156.240 Toronto Harbor PD
- 155.490
- 155.550
- 142.900 Woodstock Police
- 142.920
- 164.770 Saint John Police
- 155.700 RCMP (St. John)
- 169.230 Atikekam Fire Dept. XJJ 678
- 154.950 Brampton Fire Dept. XJH 275
- 154.800
- 154.830
- 154.130 Cornwall Fire Dept. XJH 376
- 154.370 London Fire Dept. XJI 74
- 154.635
- 154.950
- 154.095
- 154.400
- 163.730 London P.U.C.
- 156.300
- 156.550
- 159.420 Ingersol Works Dept
- 160.110
- 308.800 RCAF (North Bay)
- 308.800 RCAF (Winnipeg,Man)
- 308.500 RCAF (Ottawa)
- 136.080 Canadian Satellites
- 136.410
- 136.590
- 136.950
- 401.750



TUNE IN CANADA

by

Norman H. Schrein

FOX MARKETING, INC., 4518 Taylorsville Rd., Dayton, OH 45424

Welcome to another edition of the Tune in Canada column. This time we are going to once again look at frequencies above 27.000 MHz for various sections of the country.

First of all I had a request from a reader who frequents the Cape Breton Island section of Nova Scotia and he was wondering what he could listen to there on his scanner. The Cape Breton Island area is comprised of the following communities--Baddack, Middle Ricer, Nyanza, North River Bridge, Boisdale and Sydney. I could only find frequencies, however, for Baddack, North River Bridge and Sydney. So here they are--

Baddack, NS

- 158.520 VCA 974 Baddack Ambulance, Ltd.
- 162.660 VCA 982 Cape Breton Primary Productn
- 27.340 XJH 44 Baddack Volunteer Fire Dept.
- 153.830 XJH 44 Baddack Volunteer Fire Dept.
- 154.430 XJH 44 Baddack Volunteer Fire Dept.
- 155.160 / 155.580 XJO 88 RCMP
- 155.460 XJO 88 RCMP
- 155.670 XJO 88 RCMP
- 150.305 / 149.590 XMZ 593 Government of Nova Scotia
- 162.570 / 164.880 XMZ 823 Government of Nova Scotia
- 149.590 / 150.305 XMZ 828 Nova Scotia Hwy. Dept.
- 157.440 / 162.210 XNI 697 Nova Scotia Pulp, Ltd.
- 152.990 XOK 47 Nova Scotia Power Commission
- 153.290 XOK 47 Nova Scotia Power Commission
- 162.090 XOK 47 Nova Scotia Power Commission

North River Bridge, NS

- 163.260 VCB 768 Salmon River Construction
- 153.830 XJI 527 North River Fire Brigade
- 154.190 / 154.770 XJI 527 North River Fire Brigade

Sydney, NS

- 95.900 CBAF-24 Canadian Broadcasting Corp.
- 105.900 CBI FM Canadian Broadcasting Corp.
- 168.450 CHD 59 Marin Telephone/Telegraph Co.
- 94.900 CJCB FM Celtic Investments, Ltd.
- 158.640 CJR 45 Sydney Steel Corporation
- 27.580 CJY 686 CHER Broadcasters, Ltd.
- 109.500 NO Ministry of Transport (Air)
- 332.600 NO Ministry of Transport (Air)
- 114.900 QY Ministry of Transport (Air)
- 110.300 QY Ministry of Transport (Air)
- 335.000 QY Ministry of Transport (Air)
- 156.950 VAZ 4 Department of Transport
- 163.680 / 167.460 VCA 27 Fisher Electronics, Ltd.
- 30.560 VCA 932 Kennedy, Allan Alexander
- 153.830 XJL 797 Sydney Fire Department
- 154.370 XJL 797 Sydney Fire Department

That's it for this time. Next time we will once again look at frequencies below 27.000 MHz. Until then --Good Monitoring.



Listener's log

PART II

STATE POLICE-PATROL-DOT
 BY
 LARRY E. WILLIAMS
 10 ELF LANE
 GREENVILLE, SC 29611

CODES:

ABC	ALCOHOL
AID	MUTUAL HELP
AIR	AIRCRAFT CHANNEL
ALL	ALL POLICE DEPT'S
BDG	MAJOR BRIDGES
BOATS	STATE POLICE BOAT
BOX	HWY CALL BOXES
-C-	CENTER OF CITY
C-C	CAR TO CAR
CP	COMMON POLICE CH
CW	CITY WIDE
DOH	DEPT OF HWY'S
DOT	DEPT OF TRANS
>>E	EAST OF CITY
EMS	MEDICAL
HQ	PRIMARY CHANNEL
MR	MOBILE REPEATER
R))	RADAR
RPT	REPEATER
SP	STATE PATROL
SPPL	SPECIAL OPERATIONS
SPM	ST PATROL CARS
SPI	PATROL INTERSTATION
SW	STATEWIDE CHANNEL
TAC	SPECIAL OPERATIONS
TOLL	TOLL GATE ON TP
TP	TURNPIKE POLICE
TUN	TUNNELS
USBP	US BORDER PATROL
USC	US CUSTOMS
VHF	HIGHBAND CHANNEL
W<<	WEST OF CITY
WT	WALKIE TALKIE
WTS	WEIGHT STATIONS
3WY	MR TO DISPATCH ONLY

TUN 453.200
 -EMERGENCY-
 ALL 453.625
 ALL 460.100
 ALL 460.425

CONNECTICUT
 SP1 42.04
 SP2 43.36
 SP3 42.48
 SP4 42.52
 SP5 42.18
 6R)) 42.30
 7R)) 42.20
 8R)) 42.24
 TAC 42.32
 TAC 42.58
 SW 45.86
 SPI 154.665
 MR 154.830
 SWAT 155.475
 DOT 47.38
 DOT 47.30
 EMER 453.550

DELAWARE SP
 SP1 154.665
 SPM 154.770
 SP2 154.755
 SPM 154.650
 SPM 154.710
 SP4 154.695
 SP7 155.475
 SP8 154.860
 SP 45.02
 SPM 44.86
 DOT 47.34
 DOT 47.22
 TP 156.135
 BDG 151.070

ALABAMA SP
 SP1 158.790
 SP2 159.030
 SP3 154.920
 SP4 155.445
 SPM 155.475
 CP 155.010
 DOH 151.055
 NATCHEZ TRA
 NAT 171.675
 NAT 171.775

CALIFORNIA
 SLVR 42.08
 M 42.28
 GOLD 42.12
 M 42.20
 BLUE 42.34
 M 42.18
 PRPL 42.40
 M 42.16
 TAN 42.42
 M 42.84
 RED 42.44
 M 42.28
 PINK 42.44
 M 42.76
 BLK 42.46
 M 42.70
 GREY 42.48
 M 42.68
 BRWN 42.50
 M 42.82
 YEL 42.52
 M 42.30
 GRN 42.54
 M 42.24
 WHT 42.56
 M 42.72
 COPR 42.60
 M 42.74
 ORNG 42.88
 M 42.66
 MR 154.905
 ALL 154.920

IDAHO SP
 SP1 460.100
 SP2 460.200
 C-C 465.275
 SP4 460.025
 DET 460.300
 SPL 460.525
 NEW 460.550
 DOT 453.150
 DOT 453.800
 EMER 461.025

ARIZONA SP
 SP 460.025
 ALL 460.225
 SW 460.275
 SP 460.300
 SP 460.325
 SP 460.400
 SP 460.425
 SP 460.475
 SP 460.500
 BOX 453.025
 SW 154.935
 SWM 155.190
 USBP 163.625
 USC 165.237
 GRANDCANYON
 GGC 172.450
 GGC 172.575
 GGC 168.350

ILLINOIS SP
 CHGO 42.34
 SP 42.36
 SP 42.44
 SP 42.46
 ALL+ 42.50
 SP 42.52
 SP 42.54
 CHGO 42.56
 SP 42.60
 SP 42.62
 SP 42.66
 CAR 42.68
 CAR 42.70
 CAR 42.72
 CAR 42.84
 VHF 154.665
 VHF 154.680
 VHF 154.695
 TAC 154.710
 VHF 154.845
 VHF 154.920
 VHF 154.935
 911 155.055
 SPI 155.370
 AIR+ 155.460
 NAT 155.475
 MR 155.505

INDIANA SP
 SP1 42.42
 SP2 42.40
 SP3 42.12
 SP4 42.16
 SPM 42.26
 SPM 42.32
 TOLL 154.755
 TOLL 155.415
 CD 155.025
 CP 155.130
 SPI 155.370
 MR 155.445
 NAT 155.475
 DOH 47.28
 DOH 47.36

ARKANSAS SP
 SP1 44.74
 SP2 44.62
 SP 44.66
 C-C 44.78
 MR 154.785
 ALL 37.20
 ALL 37.24
 DOH 151.055
 DOH 151.070
 DOH 151.085
 DOH 151.100

COLORADO SP
 SP 154.665
 CAR 154.740
 SP 154.935
 CAR 154.770
 SP 154.695
 CAR 154.830
 ALL 154.905
 NAT 155.475
 DOH 47.02
 DOH 47.10

IOWA SP
 SP1 155.640
 M 154.650
 SP2 155.655
 M 154.755
 SP3 155.565
 M 154.665
 3WY 453.625
 SPI 155.370
 C-C 155.430
 TAC 155.445
 NAT 155.475
 AIR 155.505
 WTS 155.970
 DOT 159.180
 DOT 159.195
 CP1 155.790
 CP2 155.685
 TOLL ROADS
 F1 854.9875
 F2 855.2375
 F3 855.4875
 F4 855.7375
 F5 855.9875
 C-C 155.925
 DOT 150.995

Logging 170 Meters

by Craig Healy, Editor "Top End Yearbook"
 (66 Cove Street, Pawtucket, RI 02861)

NOVEMBER 1985 LOGGINGS

- 1610 NEW HAMPSHIRE Lincoln/Cannon Mt. TIS/traffic info on road construction (HK)
- 1610 WASHINGTON Port Angeles 1218 8/20 ferry info (DM)
- 1615 NEW ZEALAND Ohura 1340 10/13 OR (ET)
 -same- 2115 10/1 OR (PT)
 -same- 1219 8/20 OR (DM)
 -same- 0820 9/29 OR (AP)
- 1620 AUSTRALIA Brisbane 0802-15 9/29 4RPH blasting in w/a "3 min past 6" TC (1 min fast!) and wx for Brisbane, female anncr. (AP)
- 1620 AUSTRALIA Hobart 0802-15 9/29 4RPH (AP)
- 1620t AUSTRALIA Canberra 0802-15 9/29 1RPH; probably the source of the SAH on 4RPH and 7RPH (AP)
- 1623 PAPUA NEW GUINEA Gurney 1025 9/29 GNY (AP)
- 1629 AUSTRALIA Sydney/Melbourne 1005 9/29 2RPH/3RPH (AP)
- 1635 Heard between 0400-1100 on 10/3 to 10/6. Not noted past 1200. Appeared to be two or three groups of sequentials. Normally two were running at the same time. Definitely east of Hawaii. Oil rigs, or new calls for the NWT outlets?? FM775, G35, R321, RHM, J372, V074, K280, and T288 (PT)
- 1653 PAPUA NEW GUINEA Tsili Tsili 1342 0/3 TSL (ET)
- 1653 OREGON Nehalem Bay (all day) 8/20-21 Steady 600 Hz tones, also audible at ±10 and 20 kHz etc. Very loud. Found 40' vertical antenna, shed, and propane fueled generator on the dunes in the campsite. 20+ S9 signal @1/4 mile distance. (DM)(Who owned it? ed.)
- 1675 PAPUA NEW GUINEA Tsili Tsili 1342 10/3 TSL (ET)
- 1685 COLOMBIA Bercaderes 0843 8/20 MER (DM)
 -same- 1010 9/29 MER (AP)
- 1689 PAPUA NEW GUINEA Mt. Hagen 1012 9/29 MH (AP)
- 1692 PAPUA NEW GUINEA Kiunga 1015 9/29 KIU (AP)
- 1692 AUSTRALIA? 0844 8/20 DU type audio. VL2UV? (DM)
- 1702 0845 8/20 Unid oriental talk, not UTE. JJ? Also noted 1223 9/3 in USB (DM)

Credits:
 Howard Kemp Laconia, NH
 Art Peterson Ano Nuevo Pt., CA FRG-7, 1200' beverage
 Don Moman On-the-road in NW R71, AN-1 antenna
 Pete Taylor Poipu Beach, HI ICF 2001
 Eric Thew Ballajura, W.Aust. DX-400, whip & finger

DOT 151.070	CP3 155.700	KANSAS SP
DOT 151.100	FLORIDA SP	SP 44.94
DOT 453.700	SP1 154.665	SPM 45.18
SPI 39.46	M 155.460	SP 44.98
CPSW 39.50	SP2 154.680	SPM 44.82
INDIANA SP	M 155.445	AIR 45.14
SP1 42.42	SP3 154.695	KS TURNPIKE
SP2 42.40	M 155.505	<A> 154.830
SP3 42.12	C-C 154.920	 154.680
SP4 42.16	AIR 154.920	<C> 154.905
SPM 42.26	SPI 155.370	TOLL 151.085
SPM 42.32	TP 453.575	TOLL 151.100
TOLL 154.755	TP 453.625	DOT 47.06
TOLL 155.415	TP 453.675	DOT 47.18
CD 155.025	TP 453.725	CPI 39.46
CP 155.130	ALGTR ALLEY	CP 39.58
SPI 155.370	#84 151.310	CAR 3
MR 155.445	GEORGIA SP	KENTUCKY SP
NAT 155.475	SP 154.680	R)) 453.300
DOH 47.28	SPM 154.800	SP 453.450
DOH 47.36	ATL 155.910	SP 453.500
IOWA SP	SW 154.905	SP 453.550
SP1 155.640	SW 154.935	SP 453.600
M 154.650	GBI 154.815	PR 453.800
SP2 155.655	GBI 155.505	SP 453.850
M 154.755	DOH 47.32	TAC 453.900
SP3 155.565	DOH 47.34	TAC 453.950
M 154.665	ATL AREA PD	MR 154.665
3WY 453.625	ON I-75/-85	NAT 154.475
SPI 155.370	85N 460.175	SPI 155.370
C-C 155.430	85N 460.275	DOT 44.62
TAC 155.445	285E 460.400	DOT 44.78
NAT 155.475	285E 460.450	DOT 45.86
AIR 155.505	285W 158.775	DOH 47.14
WTS 155.970	855 159.210	DOH 47.22
DOT 159.180	75N 460.325	DOH 47.26
DOT 159.195		DOH 47.38
CP1 155.790		
CP2 155.685		

LISTENERS LOG

cont'd

Table listing listener data for various states including Louisiana, Maine, Maryland, and Missouri. Columns include call letters, frequency, and power.

Table listing listener data for various states including Massachusetts, Michigan, Minnesota, Mississippi, and Missouri. Columns include call letters, frequency, and power.

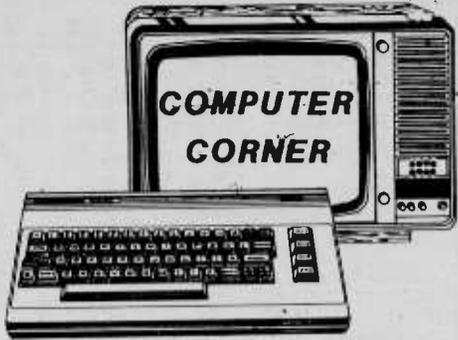
Table listing listener data for various states including Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and West Virginia. Columns include call letters, frequency, and power.

Table listing listener data for various states including New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and West Virginia. Columns include call letters, frequency, and power.

Table listing listener data for various states including North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and West Virginia. Columns include call letters, frequency, and power.

Table listing listener data for various states including North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and West Virginia. Columns include call letters, frequency, and power.

Table listing listener data for various states including North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and West Virginia. Columns include call letters, frequency, and power.



by
C.W. Ellis
 P.O. Box 202
 Ulster, PA 18850

**BACK TO NATURE
 WITH D/A CONVERTERS**

Last month we looked at the various ways an analog signal could be converted to a digital equivalent. This month we will finish off the discussion of A/D by touching on how bipolar signals are handled in an A/D conversion process, and finish out the column with a description of Digital to Analog conversion, in short called D/A.

If you missed last month's column, you should go back and read it before trying to follow the next discussion; unless you already have an understanding of the A/D process, the discussion might prove difficult.

LISTENERS LOG cont'd

DOT	47.20
DOT	47.24
DOT	151.010
DOT	151.025
DOT	151.040
DOT	151.070

W VIRGINIA

SP	42.10
M	42.26
SP	42.12
3WY	155.505
TF	155.430
TF	156.150
CP	39.98
DOH	47.14
DOH	47.28
DOH	47.32
DOH	47.36

WISCONSIN

SP	154.680
M	159.420
SP	155.445
M	159.285
SP	154.905
N	159.450
SP	154.935
C-C	151.460
NAT	155.475
SPI	155.370
DOT	47.32
DOT	47.40
DOT	151.040
DOT	453.325
DOT	453.475
DOT	453.575
DOT	453.925

WYOMING HP

SP1	155.445
SP3	156.750
SP4	154.875
AID	155.640
CID	155.580
DOH	156.015
DOH	156.630

A/D conversion can be done on any analog signal regardless of its polarity. Most A/D converters will accept a differential signal, where an input pin is provided for a + and a - side of an analog signal.

The polarity of the input signal in some converters is immaterial. For instance, a computer may have many different power supplies with different voltage outputs, with some being positive with reference to ground and some negative. In this case, if the A/D converter is to digitize a negative voltage, the negative voltage is input to the converter on the + input, and the return side of the supply connects to the - input pin!

Most A/D converters have additional output signals which come into play at this point. The one of interest to us as far as bipolar inputs is the output bit called polarity. It does just as its name indicates-- it tells us what polarity the voltage we fed to the + pin was in relation to the - pin. If the bit is off, the voltage input was + on the + input, and if the bit is on, it was - on the + input.

I know this tends to get confusing, but hang on, we are almost there. Two more bits are usually present, and their operation is simple. Overrange is a bit which turns on when the voltage fed to the input of the converter is greater than the full scale input allowed.

And last but not least, a status bit is on when the output of the converter is real data. If a microprocessor tried to access the converter output register just as the converter itself is changing the bit pattern after finishing the conversion process, the data transferred to the microprocessor is meaningless. So the converter turns on the status bit only when the data at its output is valid.

Prior to updating the output register, the converter turns the status bit off, and turns it on again after the register is updated. The microprocessor is allowed to read the contents of the register only when the status bit is on.

In summation of the A/D, bipolar operation of the converter and associated chips all utilize a + and - supply voltage to allow converting bipolar voltages to digital values. It is a rule of thumb that in analog work where A/D conversion or other handling of bipolar voltages is needed, + and -

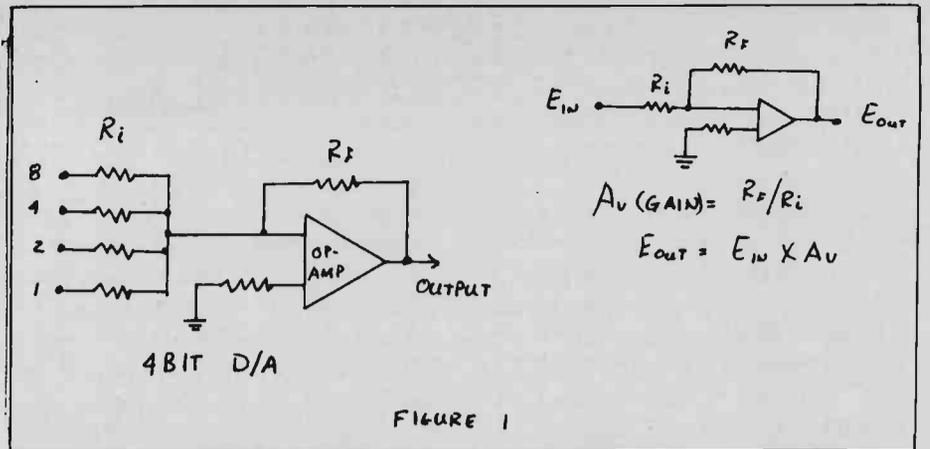


FIGURE 1

supplies will be used.

There are many audio and other analog circuits in use that operate from a single polarity supply, but special circuits and components are needed to shift levels so that the negative portions of the signal appear to be positive in respect to ground. In the area of A/D work, it is usually simpler to use + and - supplies and also achieve greater accuracy in the conversion process.

Now that we have converted an analog voltage to its digital equivalent, how do we convert it back? It's easier to do than getting the digital result and usually required less extensive circuitry.

Look at figure 1, a theoretical design for a digital to analog converter. A rule of thumb with op-amps (operational amplifiers) is that the gain of the op-amp is roughly the equivalent of the resistance ratio of the feedback resistor Rf to the input resistor Ri.

If we want to build a 4 bit D/A, we could build figure 1's circuit. Assume that the inputs labeled 1, 2, 4, and 8 correspond to the digital outputs of a microprocessor. The 1 bit is the smallest voltage we can resolve, and its value depends on the actual resistance values used.

Let's assume that a TTL level of +5 volts on the 1 bit input produces an output voltage of 1 volt, and all bits off is an output of zero volts. With the 1 bit

input on, the output voltage is a result of the resistor ratios, such that Rf divided by Ri of bit 1 = 1 volt.

If Ri is reduced to half of its original value, then the output voltage would double. Instead of reducing bit 1's value, we add bit 2's resistor in parallel with bit 1's resistor. If we now turn bit 2 on instead of bit 1, the output is now 2 volts.

If we repeat the procedure with the 4 bit input, the 4 bit Ri is half the value of the 2 bit Ri, and turning on the 4 bit by itself will produce an output of 4 volts.

Repeating the process once more yields the bit 8 input resistor whose value will be 1/8 that of bit 1's Ri. We are, for purposes of this discussion, ignoring op-amp parameters such as maximum gain, maximum output voltage swing, etc.

As you will see shortly, when we get to full output of the D/A converter, we will have 15 volts out, which would be impossible in a system with + and - 12 volt supplies. In such a case, 18 or even 24 volt supplies would be used.

Back to our figure 1 - notice that each time the input resistor became smaller, the output voltage increased. If we refer to figure 2a and we should turn on two bits, like the 1 and the 2 bits, an interesting result is obtained. Since the +5 on the bit 1 and 2 inputs is the same poten-

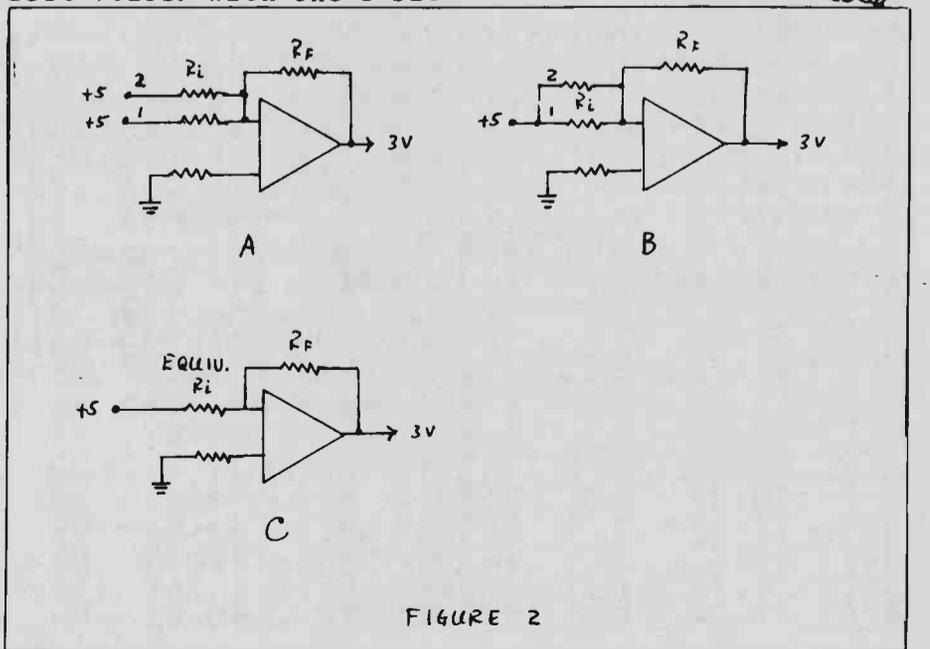


FIGURE 2

tial, we can connect the two inputs together with no change on the output. The equivalent circuit is shown in figure 2c.

The important thing to notice is that when we turn on any bit inputs in parallel, the resistors associated with those bits are effectively in parallel. If we list the possible combinations of input bit patterns and the resultant output patterns, the results look like this:

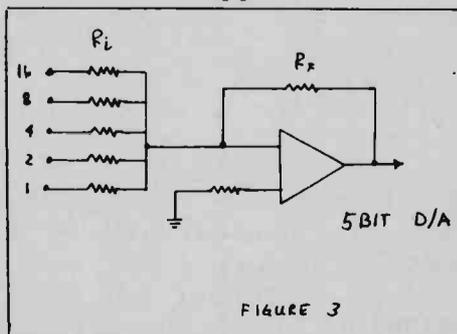
Bit				Output Voltage
8	4	2	1	
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	0	0	0	8
1	0	0	1	9
1	0	1	0	10
1	0	1	1	11
1	1	0	0	12
1	1	0	1	13
1	1	1	0	14
1	1	1	1	15

We now have a D/A converter that can output 16 different voltage values in steps of 1 volt. Not of real practical use, but it serves to illustrate the operation of a D/A converter. Now let's make it useful.

If the resistor values were changed so that instead of 1 volt output steps we now have 1 millivolt output steps, we can output any voltage between 0 and 15 millivolts. Notice that we changed the resistor values, NOT THE RATIO BETWEEN RESISTORS. The 8 bit resistor still must be 1/8 of the 1 bit resistor, the 4 bit 1/4 the value of the 1 bit, and the 2 bit 1/2 the 1 bit value.

This, incidentally, is known as the R-2R approach (Each succeeding value of R is twice the value of the adjacent resistor, of 1/2 its value, depending on which way you count).

As we said in the A/D column, adding bits increases resolution. Let's add another bit to our converter. It will then look like figure 3. Again, the R2R formula applies and the



added resistor is 1/2 half the value of the 8 bit, and 1/16 the value of the 1 bit.

The output range of our converter just doubled from 0-15 millivolts to 0-31 millivolts. Adding still another resistor (the 32 bit input) takes us to 0-63 millivolt output. And here is another exercise for the reader--calculate the range of the output voltage for 8 and then 16 input bits.

In summary, like the A/D, the number of bits sets the resolution, and determines the number of steps available. For the D/A, the value of the Rf and Ri resistors determine the actual output voltage range.

So, what if we take an A/D converter, hook it up to

an audio source and store the resulting digital value for each conversion? Can we then feed the digital patterns to a D/A in the order we stored them, and reproduce the original audio?

If we can assume we have chosen the right number of bits for both converters, the right speeds of operation, the right values of D/A resistors, etc., the answer is - Yes. We have just invented digital stereo! Now you know the basics of the new stereo, TV, and other hi-tech products advertised as new and better digital designs.

Coming next month: a look at RTTY and CW reception on a personal computer.

TECHNICAL TOPICS by Bob Grove

Q Do you have a monitor radio that will pick up the time signals from Arlington, VA? (Raymond P. Brieg, Syracuse, NY)

A What time signals from Arlington, Virginia? The U.S. Navy station NAM at Norfolk has some transmissions on short wave and yes, we have receivers which receive that and WWV at Boulder, Colorado.

Q How can a broadcaster like WRNO advertise a "transmitter power" of 100,000 watts and an "effective radiated power" (ERP) of 3,000,000 watts? Is this ratio (30:1) true for all broadcasters? (Robert Studley, Woburn, MA)

A If the antenna were a simple vertical, it would have a uniform (omnidirectional) pattern of radiation. But WRNO (and all other international broadcasters) uses a directional antenna to focus their signals in particular directions. This is the equivalent of providing higher power to an omnidirectional antenna.

ERP is determined by multiplying the actual transmitter power by the power gain of the antenna which is, in the case of WRNO, 30 times.

Q Is there an attachment available for my Bearcat 20/20 scanner that will allow this unit to receive additional channels? (Robert Hanvey, Etowah, TN)

A Frequency converters that can extend the band limits of scanners are available from Hamtronics, 65 Moul Rd., Hilton, NY 04468. Memory expanders so

that additional channel banks may be added to Bearcat scanners are available from The Dog House, P.O. Box 511, Fairfax, VA 22030.

Q What accessory modifications are recommended for the Icom R71-A receiver? (Marty Burk, L.I., NY)

A The R71A is a fine receiver right off the shelf but, as with virtually anything, some improvements can be made. The internal speaker provides passable audio, but it is greatly improved with the external SP-3 speaker unit. While the stock filters are very good and the use of the passband tuning control helps reduce adjacent frequency interference, the replacement of the filters with the FL-44A and FL-32 SSB and CW filters provide a slight edge in additional rejection. An excellent RTTY filter comes with the receiver.

Don't bother with the EX-257 FM adaptor unless you plan to add external VHF or UHF converters; the only FM you will hear will be obsolete cordless telephone bases units (1.7-1.8 MHz), 10 meter amateur repeaters (above 29 MHz), some U.S. petroleum communications (around 25 MHz), and occasional foreign skip (29.7-30 MHz). Hardly worth getting excited about.

The ICCK-70 DC power kit enables the receiver to be used mobile or during a power outage from an external source of 12 volts DC. The CR-64 high stability crystal oven does provide laboratory stability, but even the original crystal allows virtually drift-free listening on all modes.

The RC-11 infrared remote control permits the listener to control nearly

every function on the receiver at some distance away, just like a TV remote control, and the EX-310 voice synthesizer assists the visually impaired to recognize the frequency setting.

Q In your September '85 issue, page 35, an article made mention of "separator/joiners" for combining and splitting frequency bands on scanner antenna lead-in; could you provide the names and addresses of manufacturers of such devices? (Leo Rigsby, Ashland, KY)

A Sure. The same devices used to TV work well on scanner reception; just make sure that their frequency divisions are appropriate for the separation or combining that you desire.

Many of the frequency-selective devices are available from major TV shops, but manufacturers include: Kay-Townes, Inc., P.O. Box 593, Rome, GA 30161; MACOM Industries, 8230 Haskell Ave., Van Nuys, CA 91406.

Q How do you determine which element is up and down on the Grove OMNI? (Robert Cooke, Columbia, SC)

A Assuming that the upper element is the one connected to the center conductor of the coax, here's how: Hold the horizontal offset pipe in your left hand with the vertical elements on the right; if you can reach out and place your right hand on the connector block like a doorknob, it is oriented properly. If you have to reach around to the other side of the antenna to grasp the connector block, it is upside down.

On the newer versions of the OMNI, it is much easier; the upper element is the longer.

Q Is there available a general coverage beam antenna for short wave reception? (Craig Rocha, San Diego, CA)

A In a word, no. Amateur band beams can be used on frequencies near those for which the antennas are designed, but not for total coverage of the 3-30 MHz short wave range.

It is possible to wind the Grove ANT-2 Skywire around a 10-foot PVC pipe or wood rod, but all shortened antennas are a compromise in sensitivity. A preamp would help.

We would be delighted to hear from other experimenters who have solved the problem of directional short wave antennas that can be rotated.

HELPFUL HINTS

SHORT WAVE RECEPTION FOR THE APARTMENT DWELLER

by Bob Grove

A problem faced by many short-wave enthusiasts is zoning restrictions or landlord's covenants restricting outside antennas. This presents a serious compromise for effective SW'ing.

Several manufacturers offer active antennas which provide one avenue of relief, but even those should be mounted high and in the clear (preferably outside) for optimum performance. And even then all active antennas suffer from overload--intermodulation--to some degree. But there is one other solution.

Recent experiments with the Grove Enterprises TUN-3 Minituner in combination with the ANT-4C wideband preamplifier have disclosed unusually good reception when connected to only 10-20 feet of wire routed conveniently around the ceiling corners of the listening room. The order of connections is: antenna to Minituner, then the ANT-4C, then the receiver.

Best of all the Minituner provides selectivity--no intermod even if the receiver has that shortcoming. Without the Minituner--using the ANT-4C alone--receivers like the ICOM and JRC can probably get by, but the enormous gain provided by the Grove preamp is sure to overload other moderately priced

radios.

In some installations AC hum might be heard on some signals while using the AC adaptor supplied with the ANT-4C; proper grounding may help this, as will the use of coaxial cable leading away from the preamp to the wire antenna. Alternatively, the use of a nine volt battery (12 volts is ideal but harder to find) will totally eliminate any trace of hum. It would be a good idea to disconnect the LED panel indicator in this case to avoid unnecessary battery drain.

And how about using the ANT-4C and TUN-3 with an outside antenna? Yes, it provides considerable gain over reception on the dipole alone. Weak signals often enjoy a substantial boost with this powerful combination.



THE ICOM R71A BATTERY REPLACEMENT: No real problem

Recently, ICOM has endured substantial criticism in the hobby press regarding the consequences of a failed lithium backup battery for the RAM (random access memory) microprocessor circuitry.

It is true that if the battery fails (they normally last at least five to seven years), the receiver will have to be sent back to ICOM for reprogramming. The entire cost to the customer is \$25 including battery replacement, reprogramming, full check out, and return postage. But some preventive maintenance can avoid the consequence entirely. After two or three years (you may wish to occasionally check the three volt lithium cell output with a voltmeter to determine its state) or more--you be the judge--the following simple procedure may be followed by a local technician to replace the battery. You will need a source of +5 volts for the procedure.

INCREASE DISTANCE ON YOUR SCANNER

A few helpful hints by Bob Grove

One of the most frequent questions I receive is, "How can I hear more distant, weak stations on my scanner?" While there is no single answer which will work in all cases, let's take a look at a few possibilities.

For starters, let's assume that the scanner is operating in the worst possible mode: using its own attachable whip. Invariably, range will be substantially increased by selecting an outside antenna. Now, let's improve the situation a little more.

The following list, approximately in order of effectiveness, should be followed, examining your own situation to see which steps may or may not be needed:

1. Change antennas from a small, inexpensive unit to a larger gain type. If you select a directional beam like the Scanner Beam, a lightweight TV-type rotator is recommended.
2. Change coax from inexpensive RG-58/U or RG-59/U to 100% shielded, low loss coax like RG-6/U, RG-11/U, RG-214 or similar.
3. Raise the height of the antenna (just a few feet won't usually make much difference, but doubling the height will).

One of the most commonly overlooked maladies affecting scanner reception is tree foliage; this problem increases with the higher frequencies. If raising an antenna above

Remove the cabinet cover, locate the RAM module (consult your manual) and unplug it from the circuit board, battery still attached.

Locate the diode in series with the positive (+) lead of the lithium battery and attach +5V to the cathode of that diode. Next, attach the negative lead of the external voltage source to the circuit common ground (it is important to attach the positive lead first to avoid shorting out the lithium battery with a grounded soldering iron).

Unsolder and replace the lithium battery with one of similar size and the same voltage (3 volts). Remove the +5V supply and replace the module.

While the procedure is very straightforward, it should be attempted only by individuals with previous electronic experience.

the treetops is possible, range increase is virtually assured. But use good coax!

The validity of this suggestion becomes more apparent in the winter when the foliage is gone and reliable range increases.

4. Consider a low noise preamplifier as a last step.

While none of these rules of thumb carries an iron-clad guarantee, they are tried and true methods used by the experts.

Advice from a reader on how to...

Fix That Ballpoint Pen

Kenneth Hand, an avid MT reader and listener, would seem to spend as much time improvising unusual "fixes" for a variety of listening ailments as he does monitoring the spectrum. A recent hint he passed on to us is worthy of mention.

Are you frustrated while making log entries when your ballpoint pen seems to skip or lighten just when you need a good, black (or red) line? Ken suggests rubbing the tip several times briskly over a cement block or other rough cement surface, then attempt to mark a few lines on a scratch pad until it writes.

The additional pitting of the surface of the ball appears to accept more ink, thus resulting in a darker line.

NEW SW DATABASE AVAILABLE

We were pleased to see a new computer database offered for short wave broadcast listeners. We mentioned in a previous edition that Ron Pokatiloff (2661 Sheridan Rd. Dept. MT, Zion, IL 60099) was developing the handy system.

Ron's program is available in two versions; of greatest interest to most listeners is the hardcopy printout (\$5). For the stalwart Commodore 64 enthusiast, a floppy disk version will be available (write for price and availability).

Early in 1986 Ron expects to offer an advanced version of the program with a capacity of up to 22,400 programs divided into 20 classifications. The database can be searched by station name, time or subject. Printout can be customized to suit the user.

Dust Covers for Electronic Equipment

Dust is one of the enemies of electronic equipment. It can cause erratic operation, reduced ventilation for cooling, static charge or leakage paths, and other ailments which can lead to undependable operation or even premature failure.

CompuCover (P.O. Box 310 Dept MT, Mary Esther, FL 32569; phone 1-800-342-9008 for orders only) provides a complete line of custom covers in the \$10-20 range. Made of plastic or cloth-backed vinyl, the covers may be ordered in any of three colors: saddle tan, black or beige.

Quantity discounts and custom logos are available as well.

We would like to thank reader Frederick White for bringing this to our attention.

Radio Free Ithaca—The Life and Times of a Community Supported FM Pirate Station

(Reprinted with permission by the author from the "1984 Guide to Pirate Radio Activity")

by William J. Martin

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Although the short wave and medium wave pirate stations in North America typically receive all of the publicity and attention within the pirate listening sub-hobby, each night across the country numerous unlicensed broadcasters take to the air in the FM band. These stations usually operate on frequencies near the lower edge of the FM band, such as 88.5 MHz, to avoid interference from the more powerful commercial broadcasters and the aviation services above 108 MHz.

Unlike their short-wave counterparts, the FM pirates typically are not interested in generating nationwide publicity or acclaim—they often exist to serve their local communities, acting as an alternative to the homogenized pap served up by large commercial interests.

One such community oriented—and supported—pirate broadcaster operated from Ithaca, New York, over a five month period commencing in late 1979. That station, calling itself WRFI—Radio Free Ithaca—broadcast its unique mixture of music, comedy and public service programming to an estimated 500 to 1500 listeners each evening.

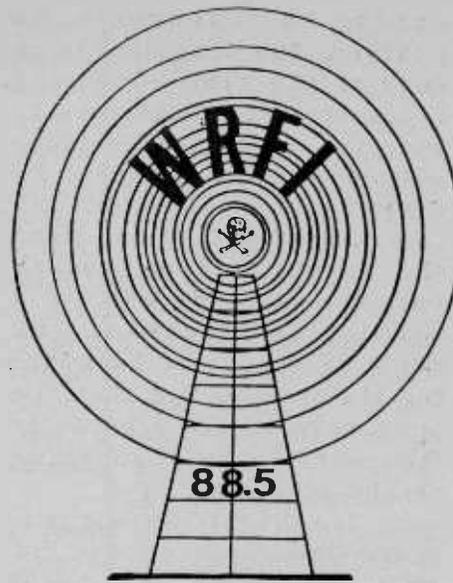
Until the station's bust by agents of the Federal Communications Commission on April 23, 1981, WRFI was undoubtedly one of the most successful and accepted

local pirates in this country, yet little has been written of the station in the hobby press. This article will examine the history of WRFI, the Ithaca community's reaction to the station and the ultimate steps taken by the Federal Communications Commission to shut the station down.

THE EARLY DAYS

Ithaca is a relatively small community of some 30,000 people in central New York State. There are, however, a number of colleges and universities in the area. The students at these schools made up a potentially large audience in 1979 when WRFI was first envisioned by a 30 year old research assistant at the Cornell Particle Accelerator Laboratory. The researcher, an electrical engineer, reasoned that since the area's commercial and college stations had forsaken the "progressive" programming of the type made famous in the late '60s and early '70s, there was an unmet need in the community for diversity and innovative programming...particularly locally produced material.

The young engineer, who would later use the "on-the-air" identity of "The Night Doctor," purchased an unwanted, thirty year old REL-706 model FM transmitter from the Chief Engineer of an Ithaca-area college station in 1979, assuring him that the transmitter was needed for "plasma experiments." With the Night Doctor's electronics background, it did not take him very long to fire up the vintage ten watt transmitter for test broadcast purposes!



RADIO FREE ITHACA

RADIO FREE ITHACA TAKES SHAPE

After its early, crude test transmissions in November of 1979, Radio Free Ithaca became more than the isolated brainchild of an electrical wunderkind...it became a community project. During the next four to five months, more than twenty people assisted the station and helped build a technical complex that would make many commercial broadcasters envious.

To boost the REL transmitter's feeble power, the station personnel erected a sixty foot tower and mounted a vertically-polarized Winegard model 6065 Yagi antenna (which offered 11.2 dB gain) at a height of approximately 35 feet.

The Yagi antenna, together with modifications which were made to the transmitter's output section, enabled the station to be heard over 40 miles out from its main beam, a transmitting lobe that easily covered the area and schools surrounding Ithaca.

The Night Doctor didn't stop there, however; he and his assistants added an RCA Model BTS-1 stereo generator to the station as well as sophisticated homebrew audio compression and limiting equipment.

Not all of the improvements were related to the transmitter; the station's studio was built up to include two turntables, cassette and reel-to-reel tape recording decks, and a five channel mixing board. WRFI then set to work to supplement its library of music and other types of programming, at one point accumulating over 800 albums and numerous listener-provided tape recordings.

REGULAR PROGRAMMING COMMENCES

By March of 1980, the

technical and studio work had been completed and WRFI began regularly scheduled broadcasts in stereo every evening on 88.5 MHz. A number of persons volunteered their time as disc jockeys at the station, with the resultant programming being very hard to categorize...an evening's program might feature jazz, the blues, new wave, and Pink Floyd music! Disc jockeys used names such as "Ozmo the Great," "Vermont" and "Cathy Deeley...Deelz at the Wheels."

Nevertheless, the station did develop one habitual characteristic...every evening at 10:00 p.m. it relayed the British Broadcasting Corporation (BBC) World Service News program, taking the feed off of a Panasonic RF-2800 short-wave receiver kept at the studio. Reportedly, the BBC news relay was an overwhelming favorite among listeners.

To publicize its operations, the station placed notices and advertisements in several of the local college newspapers, telling listeners to look for WRFI every night on its frequency of 89.5 MHz. Listeners were also encouraged to write to the station's postal address at "WRFI-FM, Community Access Radio, P.O.Box 894, Ithaca, New York" and to send in musical requests and tape recordings for rebroadcast.

One such advertisement was read by a free-lance journalist for the Ithaca Times newspaper, who contacted the station in early March to obtain further information for a feature story and to interview personnel. The free-lance writer—who quite coincidentally also held an FCC broadcast engineer's license—was permitted to visit the station and talked to several of the persons involved. His exclusive, entitled, "Riding the Blimp, Riding the Waves" was published in the April 16, 1981, edition of the Ithaca Times.

That article, although written in an affected style couched in terms of fantasy and ambiguity, was generally supportive of WRFI and its aim of providing Ithaca area listeners with alternative radio. At its best, the article let WRFI's operators do their own talking, as when it quoted one of the station's disc jockeys—"Dr. Whoopie"—as saying:

"Radio music is very strange...most stations play what the 'Hot 100' lists in



MONITORING POST



Peter Pompe enjoys monitoring in Belgium with two fine classics: The Hallicrafters SX-122A and the Collins 51S1.

RADIO ITHACA cont'd

the magazines say is popular. Those lists, in turn, are based on record sales, and the records that sell are the ones people hear on the radio. It's all very circular. What really controls the whole market are the record company people... We (on the other hand) program whatever we feel like playing or whatever we have in our vast record collection... We want to play music that can't be played on other stations, to provide a community resource, to put on the air the music and tapes that people in the Ithaca area send to us, with a minimum of interference on our part."

COMPLAINT FILED WITH FBI BY LOCAL CABLE COMPANY

Shortly after the favorable story was published in the Ithaca Times, the Chief Engineer of the Ceracche Cable Television Company--perhaps acting on his own behalf--complained about WRFI's unlicensed operations to an FBI agent assigned to the Ithaca area. The FBI relayed the complaint to the Federal Communications Commission's Field Operations Bureau (FOB) in Washington, D.C.

The Washington FOB office responded by contacting the Engineer-in-Charge (EIC) of its Buffalo, New York, field office and requested that he investigate the complaint.

On April 22, 1981, FCC Technician James Taylor drove to the Ithaca area and there monitored an unlicensed broadcast station transmitting on 88.56 MHz. The station was indeed using the call "WRFI...Radio Free Ithaca." Taylor used the tape recording equipment in his vehicle to record over one hour of programming from 8:13 p.m. past 9:30 p.m. During this time, the FCC investigator noted that the station's programming consisted of music and public service messages, but did not include any commercial announcements.

The next evening, Taylor was joined by FCC Engineer Edward Kelly in the FCC MADF vehicle. The two engineers again drove to Ithaca and by 7:49 p.m. had monitored WRFI. Within a half hour Kelly and Taylor had complete their close-in DF work...the station was traced to a house high on Snyder Hill Road in nearby Dryden, New York.

After taking RF measurements with the equipment in their vehicle, Kelly and Taylor approached the

house, knocked and requested entry to inspect the station. The disc jockey on duty at the time--Ozmo the Great--told the engineers to wait outside while he telephoned the Night Doctor to advise him of the bust and to ask him what to do. Since the agents had no search warrant and WRFI was not a Commission licensee, the FCC's only hope of inspecting the station was that the operators would voluntarily "consent" to an inspection of the premises.

The Night Doctor advised Ozmo to keep the FCC engineers out of the house until he could get up to the station. Upon his arrival at the transmitter site, the Night Doctor did, indeed, consent to the inspection of the station. His recollections of that search...as recounted in a letter published in the August 1981 edition of "The Wavelength," the official journal of the now-defunct Free Radio Campaign U.S.A....were in stark contrast to the reports of the same search which were written by Kelly and Taylor.

In his letter to the "Wavelength" written shortly after the inspection but before any official FCC action, the Night Doctor described the FCC bust in the following terms:

"No hassle--open the door, take one look, and start laughing. (The FCC engineers) were, I almost hate to admit it, pretty cool, too, and dug the joke. They'd waited in the driveway for the album to end before bothering to knock, and let Ozmo do a decent sign-off complete with call for me to haul ass up there...Well, anyway, they waited until I got there, we talked shop awhile...and they very nicely asked for a tour. After it was clear that they were on our side...assuring us that they didn't want to see anyone screwed...we opened some beers for ourselves and showed them our toys."

The Night Doctor's perceptions of that meeting differed markedly from the FCC's. In their report, Kelly and Taylor noted that they obtained the operators' consent to inspect that station and that an "announcement over the air that the station was being closed by the FCC" was made. This practice is consistent with the FCC's standard operating procedure...most likely spelled out in the Field Operations Bureau's Enforcement Manual...to obtain over-the-air corroboration that the inspected station was, indeed, engaged in unlicensed broadcasting.

This type of evidence, together with other useful indicia such as the fact that a transmitter's tubes may be warm to the touch or its transmitting crystal or VFO may be marked "88.5 MHz" are entered in the FCC's internal records of the case to substantiate whatever administrative or criminal sanctions subsequently are taken against the operators.

NOTICE OF APPARENT LIABILITY ISSUED

In a brief but to the point letter dated August 14, 1981, David A. Viglione--the Buffalo EIC--informed the Night Doctor:

"This is a Notice of Apparent Liability to Monetary Forfeiture. You appear to be in willful and repeated violation of Section 301 of the Communications Act of 1934, as amended, and the Commission's (administrative) rules...in that you operated a station which was not licensed for operation...You are therefore apparently liable under Section 503 (b) of the Act, which grants the Commission forfeiture authority, to a monetary forfeiture of \$750."

As in all cases in which the FCC issues a Notice of Apparent Liability, the FCC was required to offer the Night Doctor the opportunity to present a response and add to the record any information that might bear on the proposed fine. The Night Doctor replied on September 10, 1981, admitting the unlicensed operation of WRFI but justifying his actions on grounds that the Ithaca community needed the alternative provided by his station, as evidenced by the "positive and overwhelming" listener support received by WRFI.

The Night Doctor then offered an unusual and novel secondary justification for WRFI's broadcasts, station that "WRFI-FM was also constructed as a technical testing ground for low power service...During transmissions, field tests were being conducted to determine true antenna array radiation characteristics, incremental polarization shifts over heavily wooded terrain (beyond the first Fresnel zone), multipath effects, and other measurements relating received signal quality to transmission path effects when vertical polarization is employed."

After giving justification for the station's operations, the Night Doctor assured the FCC that he would cease all future

unlicensed activity. He then asked the Commission to reconsider its imposition of the \$750 fine.

As a consequence of the appeal, the case file for WRFI was transferred to the Washington, D.C., headquarters of the FCC's Field Operations Bureau. After reviewing the record, Richard M. Smith...the Chief of the FOB...wrote to the Night Doctor on November 17, 1981, to advise him that the \$750 forfeiture would not be reduced or cancelled. Smith's letter said, in part:

"On April 22 and 23, 1981, your radio station was observed in operation on the frequency of 88.56 MHz. The radio operation was determined not to be authorized by a station license, issued by this Commission, as Section 301 of the Act requires...Your response and background information about your station, while demonstrating your interest and concern for broadcasting, does not contain justification for reduction or cancellation of the monetary forfeiture...Payment is due within 30 days of the date you receive this letter."

Closed down and fined by the FCC, WRFI--Radio Free Ithaca--became another station in a long list of pirates that have been built up out of nothing, flourished briefly, but eventually...perhaps inevitably...faded away.

Be assured, however, that as you read this article, someone -- somewhere--is firing up an unlicensed transmitter and broadcasting the type of music and features that can't be heard from the commercial interests. Maybe you should check around 88.5 MHz late one evening; you may be pleasantly surprised.

About the Author

*Bill Martin has been DX'ing since 1968 when he heard his first pirate station. He has currently logged over 100MW, SW and FM unlicensed broadcasters and has verified over 50 pirates. Bill is a member of A*C*E, NASWA and the Long-wave Club of America.*

*Bill lives in Wilmington, Delaware, where he works as a tax attorney. He has written a number of articles concerning the FCC and unlicensed broadcasters which have been published in The A*C*E and in Monitoring Times magazine. He is currently researching and writing a book dealing with the history of pirate radio in North America.*

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FAX FOR THE COCO

In the never ending quest for computerized weather facsimile schemes, the hams have done it again. Mike Stone, editor of SPEC-COM (formerly A5 magazine), has produced software for the Radio Shack color computer which will allow "interfaceless" WEFAX reception with joystick control.

Used in combination with any general coverage short-wave receiver, Mike's "WEFAX 1.1" is available from Patti in SPEC-COM's Membership Services Department, (P.O. Box H, Dept. MT, Lowden, IA 52255) for only \$1, or you may wish to get COCOFAX program #106 on a disk (\$29.950 or cassette (\$24.95); add \$1 each for mailing.

WEFAX 1.1 will receive 60, 90 and 120 lines per minute FAX displayed in full

screen format. The joystick control allows "windowing" and scanning as well as returning the program to the main menu.

A tuning bar indicator allows appropriate centering and printing of the WEFAX image. Hard copy printout is possible with the EPSON MX, FX, RX-88, and Gemini 10 printers. Others are expected soon.

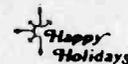
(How about a program for my Commodore 64, Mike?...Bob)

We would like to thank reader Mike Agner for bringing this interesting software to our attention.

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