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MONITORING TIMES

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MONITORING THE AWACS NET

By Robert J. Lewallyn

"DEMON 14, DRAGNET BRAVO paints triple bogies southwest your position at level 050. DRAGNET BATTLESTAFF is requesting you make ELINT sweep from level 200 and rotate to terminate at Nellis. Be advised BATTLESTAFF is requesting you say your tac comms freq on UNIFORM, and will be monitoring UNIFORM 376.2 with your flight vectors. How copy me? Over."

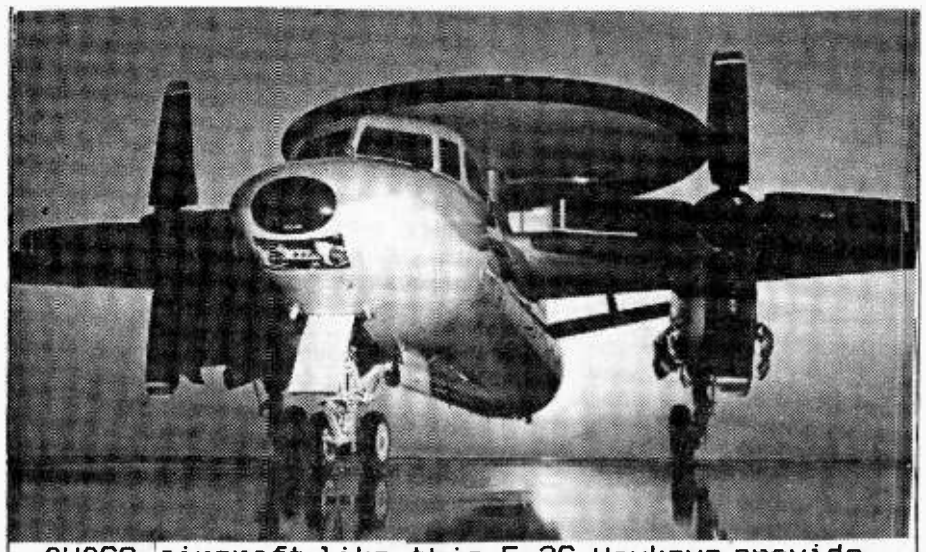
"DEMON 14 has charlie copy, BRAVO. My UNIFORM ops will be 391.8 - repeat 391.8 on UNIFORM. Beginning descent to level 200 at high-Mach. Will maintain 6800 upper on HOTEL as our primary with you, with 15091 as secondary. Switching to BATTLESTAFF ops now. DEMON 14 out."

The carrier drops with a pop, but other strange-sounding ID's soon pop up on frequency.

Don't look so bewildered. If you have ever intercepted signals similar to these on your HF receiver, you have gained a brief glance into one of the most interesting aspects of USAF communications monitoring -- the flight operations of Tactical Air Command E-3A Sentry AWACS aircraft.

Actually, AWACS are not a new development, counter to what the American media might lead you to believe. The acronym itself refers to Airborne Warning and Control System", and denotes any aircraft capable of tracking airborne vehicles via radar, and to relay these tracking/vectoring data to combat units and vehicles.

In its essence, AWACS is an airborne tactical battlefield command center. One of the first was the Grumman E-1B Tracer, a twin-piston engined machine in service with US Navy carrier task groups since 1958. The UK and USSR also have several AWACS types in service, both shipboard and land based.



AWACS aircraft like this E-2C Hawkeye provide long- distance vision to the U.S. strike force.

The history of the E-3A Sentry began July 8, 1971 with the eventual selection of 24 Boeing 707-720/382B Intercontinental basic airframes for conversion to AWACS configuration.

The most obvious physical characteristic of the airframe is a 30-foot diameter rotating radome mounted on twin struts above the rear of the aircraft forward of the vertical stabilizer. It is this radome which houses the "eyes" and "ears" of the Sentry, a Westinghouse AN/APY-1 S-band pulsed Doppler Surveillance radar and an IFF/TADIL-C fighter control/data link radar.

While exact specifications of the Westinghouse unit are highly classified, it is known that maximum acquisition range is in excess of 250 miles.

The inside of the Sentry is an electronic buff's heaven, to say the least. An IBM 4Pi CC-1 mainframe handles data from the radars and all console stations, making information available at all terminals. Seven UHF military/government, three VHF AM civil aviation, a VHF FM, and two HF SSB transceivers are operable from the fuselage section (aside from standard cockpit avionics), all capable of handling either clear or encrypted voice.

In spite of its weight (325,000 lbs unserviced), the E-3A may orbit a station point 1000 miles from base for up to 6 hours at altitudes in excess of 29,000 feet, retaining sufficient fuel for a return home at 530 mph...without refueling!

NATO E-3As and all subsequently produced USAF models are equipped with RTTY terminals and an extra Collins HF radio to better cope with a largely maritime environment.

All late model Sentries are fitted with the IBM CC-2 computer, having quadruple the capacity of its older brother, along with an underwing hardpoint just inside of each inboard turbofan for attachment of defensive munitions.

A major improvement is the JTIDS transceiver (Joint Tactical Information Distribution System), a digital data transfer system capable of simultaneous accomodation of up to 98,000 users.

If you are ready to give AWACS monitoring a try, read on. Easiest of AWACS communications to hear are those from various 552nd AWACW E-3As on training flights over the North American continent.

These E-3As will identify as EDGY ##, and are often monitored running phone patches via the Scott AFB Airways station in Belleville, IL, with the following Airways stations serving as secondary guards: McClellan AFB, CA; MacDill AFB, FL; and Loring AFB, ME.

Frequencies in the 11 MHz range are heavily used, including USAF Airways channels 11176, 11179, 11180, and 11182 kHz USB. The frequency of 11214 kHz USB is often used for direct links with RAYMOND 24 (TAC Command Post at Tinker AFB), in addition to serving as an intership channel between multiple E-3A flights.

(CONTINUED ON PAGE 2)

MT NOW ON COMPUTER

If you have noticed the new format of Monitoring Times, we have just installed an elaborate computer system with hard disk storage at headquarters.

This modern facility will allow us to enter newsbreaking stories, up-to-date frequency information and other subjects of interest as soon as they are received.

Is the print too large? too small? too light? too heavy?

Readers are invited to send in criticisms and suggestions so that we may implement this powerful system in the ways that are most useful to you.

MONITORING TIMES

is a bimonthly tabloid published by Grove Enterprises, Inc., 140 Dog Branch, Brasstown, NC 28902.

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SPECIAL BONUS!

This month, in order to bring you several late-breaking articles of importance, Grove Enterprises advertising has been deleted from the pages of Monitoring Times.

The popular Grove merchandise will appear in full in your new PRODUCT SHOWCASE, now being mailed to you separately.

FROM THE EDITOR

Possibly no requests come through our offices as often as those for MONITORING TIMES to be issued monthly. While our files of stories and features burgeon with exciting information, the cost to you of doubling our output has been the deterrent.

For MT to be issued in its present tabloid form 12 times a year, we would have to double our subscription rate from $9.50 to $19, assuming all costs remain the same..which they won't.

Many of you have requested MT change its format to a magazine style, 8-1/2" x 11". While this would be desirable, the cost would double again to $38!

There is, however, one very tantalizing possibility: If readers would be willing to accept bulk rate mailing--a possible one week's delay--MONITORING TIMES could be sent monthly at very little increase in annual subscription!

That's right; 12 issues for hardly more than the present cost of only 6 issues. And, for those of you who would like more permanent printing for your favorite articles, a reprint service could be offered. Back articles no longer available could be reprinted by request.

Let us know how you feel about some of these exciting possibilities to improve our service to you. I'm sure there are other ideas we haven't even thought of; won't you share them with us?

S.A.S.E.

We at Monitoring Times constantly receive letters from readers which begin, "Please send me everything you have on...".

As much as we would like to help, we are not a public library service.

Letters received with an SASE will be answered.

And as always, my telephone line is open for prepaid calls weekdays 8-5 Eastern (704-837-2216)...Bob.

Amateur Monitoring Network

In a previous issue we suggested the possibility that readers of Monitoring Times who are also active amateur radio operators might be interested in starting an on-air net to exchange monitoring information.

Such a net could also provide a great deal of useful information for SWL's who could listen in, participating with their own receivers.

Let's try Wednesday evenings for starters, 0100 (9 PM EDT) on 14316 (+-5) kHz beginning July 13, 1983.

Alternate dates, times and frequencies will be discussed at that time and announced in MT.

Net control will be Bob Grove, WA4PYQ.

-AWACS con't from p.1-

On overseas operational missions, E-3As will run patches to involved support stations and units, usually via any one of a number of USAF Airways stations located abroad. For a very complete list of USAF Airways stations and frequencies, refer to pages 14-16 of Grove's Shortwave Frequency Directory.

Note that AWACS a/c on operational flights do not use EDGY-series callsigns, instead sporting single word IDers sometimes followed by a digit, such as ALLIGATOR, CONCAVE, ICE CAKE, etc.

When attempting to verify a particular ID as being that of an E-3A, listen for patches to either the 965th or 966th AWACS (the two squadrons composing the 552nd AWACW) or the following support units: 960th AWAC/SS, NAS Keflavik, Iceland; 961st AWAC/SS, Kadena AB, Okinawa; and the 962nd AWAC/SS, Elmendorf AFB, Alaska.

The exchange of technical lingo between Sentry personnel and their maintenance unit is unmistakable, especially if it deals with the extremely sophisticated radar equipment!

Hobbyists listening in for E-3A tactical comms will do well to keep watch over common TAC channels, listed in full on page 11 of Grove's SWFD.

When on flights under NORAD command, Sentry aircraft will often use 4872, 6708, 9023, 9793, 11441, 14894, and 20855 kHz USB for direct comms with FERTILE, the NORAD Air Defense System Network Center at Fort Lee AFS, VA.

E-3As on NORAD missions will most often use DRAGNET-series IDers, with suffixes such as SURVEILLANCE, ALPHA, BRAVO, and BATTLESTAFF denoting specific onboard console stations.

The most intriguing and hardest to hear of all E-3A mission types are war games conducted on the USAF TAC Weapons Ranges at Fort Irwin, CA and Nellis AFB, NV. The Nellis reservation alone covers some 3 million acres and above it abound military aircraft of every description from most NATO forces, participating in the "RED FLAG" combat exercises. The initial paragraphs of this article were just a sample of what goes on during a day's fun and games on the range. Communications similar to these have been heard on 5700, 6708, 7460, 9568, and 11610 kHz USB, not to mention several common TAC freqs and a myriad one-time-only discrete channels.

Familiarize yourself with USAF radio procedure by monitoring regular Airways traffic. Don't be afraid to let a radio sit on a channel for a time if a burst of chatter is heard and above all, be patient and keep your ears open!

VIEWPOINT

Bob,

I don't have much time at the present but I want to tell you that your paper MONITORING TIMES is the best thing for all types of radios that I have ever seen. Keep up the good work. You also do a great business for anyone connected with any type of communications.

M. F. Rockefeller
Lexington, KY

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Not being one to resist wading into a controversy, here are my thoughts:

1-Radio direction finding techniques are legal.

2-Mysterious numbers stations, beacons, illegal communication and sources of interference are not using the airwaves for the purposes for which they were intended.

3-What is the reasoning behind Section 605 of the 1934 Communication Act? Is it not to protect only the licit users of the radio waves?

4-Would the President and other Government officials give unscrambled or uncoded important information over the air? I hope not.

5-As far as I am concerned, criminal transmissions are fair game. Why protect them? If Hams and SWLers can aid law enforcement groups do we not have the responsibility as well as the right to do so?

Ruth Hesch
White Plains, NY

Dear Bob,

"Those Spy Stations"

I have been picking up one of those mysterious "numbers" stations here in New Zealand.

Transmitting on 9.435 between 2130-2140 UTC (GMT) it consists of: (i) A female voice with American accent

(ii) Numbers in groups of three

(iii) A consistency in delivery that suggests to me that the transmission was pre-taped and then the tape was transmitted

(iv) Received at Readability 3, Strength 3

(v) Antenna position suggests point of origin Central/South America.

I enjoy MONITORING TIMES and look forward to each issue.

Brian D. Strong
Wellington, NZ

A 59.25% reduction of your MONITORING TIMES gives me 8-1/2" x 11" copies that I file in regular binders. Newspapers have always been difficult to file.

Rene Borde
Sunnyvale, CA

(Good idea, Rene! Thanks for sharing it with our readers...Bob)

— — — — — —

Dear Bob:

THANK YOU, THANK YOU, THANK YOU....just got the Mar/Apr issue of MT in my mail box (despite the efforts of the APO mailing system to deny me of my simple pleasures while serving overseas with the U.S.A.F.). Enclosed is a check for a year's subscription to MT. I am VERY impressed with the issue that I received. It is about time that someone took the hint and gave us SWLs/DXers a periodical that wasn't overpriced, filled with ads, news that's 4 months old, etc., etc.

I have a comment to make about the proposal to start a home brewing magazine. I must disagree with Mr. Ken Greenberg's letter in the Mar/Apr MT. I find now that the supply of parts and parts suppliers are darn near unlimited. Home brew is NOT dead. Far from it...it's very much alive and kicking. Computers and hobby electronics is responsible for a lot of this parts bonanza that we have available to us today. I do not like computers (I have owned two and find that they are very STUPID) but we must give some credit where credit is due. Along with MT in todays mail, I received three electronics parts catalogs from three different dealers, namely: Circuit Specialists, JameCo, and DIgi-Key. That isn't even the tip of the iceberg. Parts abound. Granted you may not find the 455KHz IF cans used in a Hallicrafters RX 40 years ago, but who wants or needs those IF cans except people trying to restore old radios?

I belong to the G-QRP-Club here in the UK. This is a home-brew-aholics dream come true. The majority of the membership (slightly over 2000) builds regularly. Granted it is an amateur radio type club, but we build things, and that's home brewing. The UK ham radio rallies (hamfests) have a multitude of parts suppliers that help us out with those hard to find articles. Buying resistors and capacitors in bulk (10 or 20 of preselected common values) help out a lot. Transistors, filters, LEDs, etc. are everywhere. I find that the "one-of-a-kind" type project (early Ham Radio Mag) isn't worth building anyway.

The fun in building is being innovative. Most beginners (and some advanced builders, too) are afraid to substitute component values or try what they have on hand in the junque box or on an old printed circuit board that is laying around the shop. I find that my greatest source of parts is from old radios, scanners, CB sets (and Hygain boards), tape recorders, etc., that I've acquired over the months and years. I still believe that if a project works the first time it's fired up, I did something wrong. I have learned more about electronics by troubleshooting my own mistakes (and those of others) than I ever did in my 3 years of college or the A.F. tech schools.

Home brewing should be fun. The beginner should have the first few projects work the first time (it builds confidence). Being fun doesn't mean forgoing the challenges of trying to figure out what went wrong if the project doesn't work. That is where the builder LEARNS about electronic theory and sound troubleshooting techniques. Logic is not only for computers. It takes logic to understand what is not working right in a project and why.

I personally feel, Bob, that a home brew magazine is really what's needed to fill the void created by the Ham magazines and the computer type drivel that abounds today. I for one, will subscribe upon receipt by word-of-mouth that you are going to launch a home-brew mag. Congratulations on MT, it's really good. Rich Arland.

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(The following letter reproduced in its entirety. Reader Mike McCloskey has some excellent suggestions. What do the rest of you think? Prospective authors: Let's see some of the articles Mike recommends!)

When I sent for my sample copy of MT I had no intention of subscribing, as I figured it was probably just another ripoff on the SWLer. Boy was I wrong! Please enter my subscription for two years!

Like many others, I've become disenchanted with several magazines because they changed their format to computers. But, I also recognize that computers have their place in DXing, such as keeping logs, antenna directions, as well as using them for Morse and teletype readers. I even went out and bought a TI99/4A. Now if I can figure out how to program the chrome-plated hoopty-do, and interface it to my receivers, I'll have it made.

In response to several readers mention of monthly publication, and to including home projects in MT, may I make a suggestion? First, keep the every other month publication (at least for the next year or so), and go to a magazine format. Along with the usual DX comments and articles, add in one computer article (How to Interface Your Computer To Your Receiver, or How To Program Your Computer For DX Log, Reading Morse or RTTY (baudot, ASCII 1 & 2 etc.) and two or three home brew projects, complete with part lists and suppliers. Maybe make one of those projects an old tube type for those who want this type of article (re: Ken Greenberg's letter Mar/Apr MT). I believe that in one year, your readership would increase by leaps and bounds, and you could go to a monthly mag. Put the issue to a vote with your readers. Heck, I'd even be willing to increase my subscription fee.

Whatever you do, don't decrease the number of articles on DXing. I am real glad to see that you picked up Hank Bennett. I've enjoyed reading his articles in PE for many years.

Incidentally, another reason I'd suggest a magazine, periodically I clean out the shack, and dispose of old mags. First though, I go through each one and remove those items I'd like to keep. It's a great deal easier to xerox a mag page and store it than it is to xerox a newspaper article. Also, colored articles show better on mag print (and copy better) than newsprint.

Incidentally, I'm an LW, HF fan, and I'm just getting into satellite, building my own LNA, mixer, IF strip etc. I'd like to see articles about uplink and downlink for military and commercial satellites.

Anyway, whatever you might do, I'll be an avid reader of MT for years to come.

Mike McCloskey, Placerville. CA.

(continued on page 27)

Propagation Forecasts And The Shortwave Listener

By Philip E. Humes

Solar storms and flares--electromagnetic eruptions on the sun's surface--often have profound effects on earth communications.

Within 5-10 minutes of the event X-rays bombard the upper ionosphere (D layer) creating sudden ionospheric disturbances (SID's) which may last for hours.

The results include abrupt shifts in radio wave paths which produce shortwave fadeouts (SWF's).

Geomagnetic storms may cause power surges in long-distance power lines, disorient homing pigeons, decay satellite orbits, affect aerial magnetic surveys and induce the aurorae (northern and southern lights).

But by monitoring the propagation forecasts on time and frequency standard WWV, Boulder, Co. (5, 10, 15 and 20 MHz) at 16 and 18 minutes past each hour, you can be right on top of things.

Conditions are stable if you hear, "No adverse propagation in existence at this time". However, a polar cap anomaly (PCA) caused by a solar-flare induced proton storm might elicit an announcement like this: "Solar terrestrial indices for 10 July 1983 follow. Solar flux 140, estimated A index 15 (repeated). The Boulder K index 1200 UTC on 11 July is 3; repeat, 3".

The announcement might continue, "Solar terrestrial conditions for last 24 hours: solar activity was low; the geomagnetic field was active to occasionally unsettled. The forecast for the next 24 hours: The solar activity will continue to be low; the geomagnetic field will be unsettled".

How do we interpret the technical vernacular? Simple, once we define the terms.

SOLAR FLUX: Intensity of arriving energy ("solar wind")

A INDEX: Average of 24 hour K Indices; updated at 0000 UTC (see table)

K INDEX: Scale of 0-9, updated every 3 hours starting 0000 UTC

(See Table)

SOLAR ACTIVITY: Proton, gamma ray or X-ray solar emission

GEOMAGNETIC FIELD: Effects on the earth's magnetic field.

FORECAST: Predictions for further solar and geomagnetic events.

As a general rule, when the A index reaches 30 (K of 4 or greater) minor solar activity is occuring. As these indices rise, so will the solar influence on terrestrial communications.

SOLAR INDICES AND THEIR INTERPRETATION

K	0	1	2	3	4	5	6	7	8	9
A	0	3	7	15	27	48	80	140-240		400

A 0-7, K 0-2 equals QUIET
A 7-15, K 3-4 equals UNSETTLED
A 15-30, K4 equals ACTIVE
A 30-50, K 4-5 equals MINOR STORM
A 50-400, K 6-9 equals MAJOR STORM

Solar activity will be announced by levels "very low" through "very high". A solar flare announcement at 18 minutes past the hour on WWV might report, "A X5/2B flare occured at 15 July at 1620 UT".

Flare intensities are rated according to the following scale:
C Great
M Greater
X Greatest
1-12 Typical Range
F Faint
N Normal
B Brilliant
1-5 Importance (solar surface affected)

Solar flares produce shock waves which travel at speeds of 500-1500 kilometers per second, reaching the earth 24-50 hours later.

Proton events travel much faster, reaching the earth in 3 to 10 hours. Due to the concentration of magnetic lines of force at the earth's poles, the polar caps see far more electromagnetic disruption. The aurora is one visible effect of a proton storm.

Solar influences at the poles will have far more profound effects on communications than at the mid latitudes. "Aurora" is a popular communications medium for amateurs reflecting VHF signals over greater-than-normal distances.

Still, HF signals may be seriously altered or absorbed by the energized upper layers of the earth's ionosphere and magnetosphere. With the information you now have at your fingertips you may be able to predict when worldwide communications may be disrupted, affecting your listening to shortwave signals.

For a more thorough understanding, readers may wish to consult the following: The Handbook of Solar Flare Monitoring And Propagation Forecasting by Carl M. Chernan (TAB Books); Introduction to Solar Terrestrial Phenomena by Stelphen J. Mangis (NOAA Technical Report ERL-SEL32, January 1975); Preliminary Report and Forecast of Solar Geophysical Data (weekly publication by NOAA/USAF SESC.).

—SCANNING→

SURVIVAL COMMUNICATIONS...

What Should I Monitor?

By Mark Johnson

One of the first problems facing every newcomer to survival communications monitoring is knowing what to listen to and where to find it.

Fortunately a number of excellent frequency directories are available which will help in locating the frequencies used by civilian, federal and military agencies during an emergency. Notable among these are the FEDERAL FREQUENCY DIRECTORY and SHORTWAVE FREQUENCY DIRECTORY, both edited by Bob Grove; the POLICE CALL series edited by Gene Hughes; and the CONFIDENTIAL FREQUENCY LIST by Oliver P. Ferrell.

A new publication by Tom Kneitel, the NATIONAL DIRECTORY OF SURVIVAL RADIO FREQUENCIES, is especially useful in locating the frequencies used in each state by the various agencies that would be activated during an emergency.

Accurate weather information is a must during any survival endeavor so the survivalist should begin his communications monitoring with the various agencies and services that provide this information.

There are several sources but the most common are, in order of importance, NOAA Weather Radio, Transcribed Weather Broadcasts (TWEBs), VOLMET and coastal stations.

Of the foregoing sources NOAA Weather Radio is the most well-known. This service of the Department of Commerce provides continuous broadcasts of the latest weather information available from National Weather Service offices around the country.

NOAA broadcasts are revised every one to three hours, or more often if conditions warrant. Most of the stations operate on a 24 hour basis and can be heard on either 162.400, 162.475 or 162.500 MHz.

NOAA Weather Radio is important for another reason. In 1975 a White House policy statement designated this service as the *sole* government-operated radio system to provide direct warnings of natural disasters and nuclear attack into homes equipped to receive the broadcasts.

If the NOAA broadcasts are unavailable or reception is poor, the survivalist can try tuning the low frequency band between 190 and 400 kHz for stations offering TWEBs. These broadcasts are aimed primarily at aviators and differ from the NOAA broadcasts in the language used to describe the weather conditions.

Examples of stations offering such broadcasts are listed below. A more comprehensive list of these stations is found in Kneitel's survival directory.

Pittsburgh, PA	254 kHz
Atlanta, GA	266
Seattle, WA	362
Denver, CO	379
Boston, MA	382
Detroit, MI	388

The shortwave bands offer another source of weather information to the survivalist in the form of the VOLMET broadcast. These broadcasts are used by ground stations to transmit weather information for cities along airline routes to aircraft aloft. Much of this information will be of little use to the survivalist unless he is located in or near one of the cities on the airline route.

Two VOLMET stations, Oakland Radio and New York Radio, are easily heard throughout the U.S. The schedules for these two stations are given below.

New York Radio - 3485, 6604, 10051, 1327 kHz on the hour and half hour.

Oakland Radio - 2863, 6679, 8828, 13282 kHz at five and thirty-five minutes past the hour.

Coastal stations operated by the U.S. Navy, the U.S. Coast Guard and private corporations such as AT&T also operate on the shortwave bands and provide weather information. However, much of the information contained in these broadcasts is aimed at ships at sea and will be of little use to the survivalist. More information on these stations, for those who are interested, can be found in the CONFIDENTIAL FREQUENCY LIST by Oliver P. Ferrell and the SHORTWAVE FREQUENCY DIRECTORY by Bob Grove.

After weather information the survivalist will want to keep track of the activities of the various public safety agencies that will be operating during an emergency. This includes law enforcement personnel, fire departments, medical services and highway maintenance crews.

In emergencies law enforcement personnel are usually the first to become involved so the survivalist will want to monitor as much as possible. In addition to the channels used for routine communications the survivalist should monitor those used by detectives, narcotics teams and tactical units such as SWAT.

Channels used for intersystem or intercity communications (often 155.370 MHz) as well as those used by county and state police should also be checked on a regular basis. Those living in small or rural communities may find that only one or two frequencies are needed.

(continued on page 5)

According to the December 1982 issue of the JOURNAL OF CIVIL DEFENSE, fire departments and firefighters are the backbone of civil defense. This probably comes as no surprise to fire buffs, but it may be something of a shock to the survivalist who is trying to figure out what services to monitor.

Since firefighters are trained to handle situations ranging from chemical spills to drownings to radioactive emergencies, it is important to monitor their communications.

The survivalist should pay particular attention to the channel used for dispatching fire equipment as well as any frequencies used at the scene to coordinate the activities of the firefighters.

The intercity frequency (often 154.370 MHz) should also be monitored from time to time if one is used.

Medical services including hospitals, ambulances and paramedics, always become involved in emergencies and should be monitored. In some areas the ambulance personnel also perform resuce duties as well.

Frequencies to note are 155.280, 155.340 and the Med 1-10 channels on 462.950, 462.975, 463.000 to 463.150 (base) and 468.000 to 468.150 MHz (Mobile).

Related to medical services are search and rescue units which become involved in certain emergencies. These units may be specially trained groups that specialize in search and rescue, members of a ski patrol or simply a group of volunteers with no formal training. A frequency widely used for search and rescue operations and hospitals is 155.160MHz.

Highway maintenance crews are also important during emergencies. In the winter the local and state highway departments are excellent sources of information about current weather and road conditions. Also since most state highway departments are tied into the state and federal civil defense agencies, they should be monitored closely in the event of a widespread disaster.

It would be impossible to list the frequencies used by every public safety agency in the U.S. It is recommended that the survivalist consult the appropriate POLICE CALL directory for his state as well as other publications such as Kneitel's survival directory for the frequencies used in his area.

Civil defense communications are notoriously difficult to monitor since the frequencies are hard to find and are infrequently used unless there is an emergency. Once again Kneitel comes through by listing the frequencies used by state civil defense agencies in those states that have such organizations.

The Federal Emergency Management Agency (FEMA) maintains an extensive HF network that can be easily monitored on a communications receiver. Basically, FEMA is a civil defense organizations and is responsible for maintaining communications during an emergency.

Typical frequencies are 4604, 5211, 10493 (primary), 12216, 12909 and 20026 kHz (USB).

More HF listings are in Grove's SHORTWAVE FREQUENCY DIRECTORY.

The Red Cross, while not primarily a civil defense organization, is involved in a variety of disaster relief work. The primary frequency used by the American National Red Cross is 47.420 MHz with backups on 47.580 and 47.660 MHz.

Additionally, the International Red Cross maintains an emergency radio network from its headquarters in Versoix, Switzerland. The primary frequency is 20753 kHz (USB).

Depending on the type and severity of the emergency certain federal agencies will become involved. The survivalist should pay particular attention to the so-called 'fire control' agencies such as the Bureau of Land Management (BLM), the Department of the Interior fire crews and the Interagency National Emergency Fire Cache (BIFC) headquartered in Boise, Idaho. The frequencies for each of these agencies can be found in Kneitel's survival directory and the last pages of Hughes' POLICE CALL DIRECTORY. It should be noted that those listed for the BLM and the Department of the Interior may vary in some areas.

The Environmental Protection Agency (EPA) and Nuclear Regulatory Commission(NRC) are important for the survivalist to monitor in the event of environmental emergencies. Accidents involving toxic chemicals, hazardous wastes or nuclear plants create serious health hazards and prompt a quick response from these agencies. Frequencies used by the EPA are 41.630, 163.4375 and 165.4125 MHz. The NRC uses 168.050, 168.200, 168.600, 168.625, 169.100 and 170.000 MHz.

Survivalists may also wish to tune the new Disaster Service communications frequencies, all upper sideband (kHz).

2326 2411 2414 2419 2422 2439 2463 2466

2471 2474 2487 2511 2535 2569 2587 2801

2804 2812 5135 5140 5192 5195 7477 7480

7802 7805 7932 7935

Rounding out the survivalist's list of what to monitor are the special units of the U.S. Air Force. These are the Civil Air Patrol (CAP), the North American Aerospace Defense Command (NORAD) (as during satellite reentries), the Strategic Air Command (SAC) and the Tactical Air Command (TAC).

Exhaustive lists of frequencies for all these agencies and more are found in Grove's directory.

The CAP is involved in search and rescue operations, civil defense and disaster relief missions. During floods, fires, tornados or other natural disasters the CAP may augment the communications of other services.

While each CAP region uses its own frequency for daily net operation, all regions use 2371, 2372.5, 2374, 4582, 4585 and 26620 kHz as well as repeater outputs on 148.150 and 149.925 MHz. For communications with the USAF all regions use 7635, 7918.5 or 14905 kHz.

NORAD is primarily responsible for aerospace surveillance and warning of enemy attack. The Cheyenne Mountain complex houses surveillance and warning systems as well as the U.S. civil defense National Warning System.

The primary frequency for NORAD is 14894 kHz with 9023, 9793, 11411 and 20855 kHz also being used. A UHF channel, 364.200 MHz, is also listed. Most communications are routine and hourly radio checks can be heard on the hour duing the day on the primary frequency.

The mission of SAC is training for aerospace combat reconnaissance and other tasks including aerial refueling. A variety of frequencies are used by SAC so it is impossible to list them all. Those carrying the coded FOXTROT Broadcasts, heard on the hour and at 15 minute intervals thereafter, are 4725, 6761, 9027, 11243, 13241, 15041 and 17975 kHz. SAC also uses 311.000, 321.000, 372.200 and 375.700 MHz. The last frequency is used during aerial refueling operations.

TAC is concerned more with tactical air operations and support of ground troops than with retaliatory operations. The primary HF channels used are 6753, 8711, 13204 and 18019 kHz while the secondary channels are 3032, 4746, 5703, 15091 and 23206 kHz. The primary UHF channel is 381.3 MHz and is designated as 'Golden.'

Other military groups such as National Guard and Reserve units, Army, Navy, Coast Guard and Army Corps of Engineers may also be monitored in some situations. Frequencies for these are found in Kneitel's and Grove's books.

This list is by no means comprehensive. As the survivalist becomes more familiar with his needs, more frequencies will undoubtedly be added for a variety of other services. The selection of frequencies and services is virtually endless and the final choice of what to monitor will come with experience. ~

Beating The Bearcat 160

One of the most popular of scanner sports is beating the frequency limits. The latest out-of-band program comes to use from reader Lyndel Thiesen, of Bozeman, MT and he claims it works with his BC-160.

Press: MANUAL

Press: Lowest frequency published for any of the bands

Press: LIMIT LIMIT SEARCH HOLD LIMIT

The receiver may now be stepped down manually below the normal lowest frequency for the band chosen.

Lyndell adds that the cumbersome procedure also uncovers a lot of images, but it works! ~

Let's Pioneer Some New Antennas

Over the years, antennas have remained virtually stagnant; enormous numbers of "me too" products copy previously-successful competitors' items. One needs only consult ads from accessory manufacturers to see this.

Sadly, one of the most promising areas for aggressive experimentation, the one most often ignored, is antennas.

Few articles which have appeared in Monitoring Times have drawn attention like the Grove all-band dipole described on Page 24 of the May/June 1983 issue.

Incidentally, for listening only, builders may ignore the 300 ohm twin lead, and may also substitute an inexpensive TV-type balun transformer (Radio Shack 15-1140 or similar) for the high-power transmitting balun specified. The coax would be attached directly to the balun which would be mounted right at the insulator separating the two dipole sections (yes, those funny little ovals are egg insulators!). And the dimensions may be halved (22 and 45 feet).

Substituting the TV balun transformer (for impedance-matching purposes), the response of the antenna will now be extended well into the VHF/UHF range. But how will its reception be?

Frankly, I don't know. Its pattern will be less predictable; higher harmonics of fundamental frequencies (such as using a 40 MHz dipole on 80, 160, 320 MHz, etc.) tend to favor more and more the ends of the antenna rather than the sides. Also, communications in the VHF/UHF range use vertically-polarized antennas; just try to mount the 134-foot-long Grove dipole vertically!

However, skip signals are of mixed polarity; the antenna should work very well on low band skip and higher when the skip is active.

Additionally, TV sig-

(continued on page 7)

Visual Monitoring --

The World Of Amateur Television (part III)

By John Edwards

In Parts I and II we learned some basic facts about amateur television; now it's time to find out what there is to see.

As with every other amateur radio mode, the most popular ATV activity is ragchewing. Perhaps watching the participants chew a rag is a more accurate description. In any event, the added dimension of sight certainly gives the art of radio conversation a new twist.

For instance, many ATV'ers have patched videotape players and film chains (devices that convert motion picture images into video) into their systems. With the exception of music, all sorts of--ah--informational programs are aired. One word of warning: beware of ATV operators who have just returned from vacations, since you may end up being a captive audience for hours of family-travel films. Unfortunately, birthday party films are a hazard at any time.

REPEATERS

The history of ATV repeaters (which because of their strong signals are the easiest way to monitor ATV) is closely linked to that of FM voice machines. Like FMers, ATVers needed to expand the coverage possible through direct transmissions. They also wanted the side benefits of having a common frequency to experiment on and, by paying dues, to help the development of a local ATV club. Also, like FM repeaters, ATV machines have played an important public service role. A good example is Cherryville, New Jersey's ATV repeater.

Trustee Charles Kosman, WB2NQV, explains how his machine helped officials keep watch on a local marathon: "With a mobile unit ahead of the runners, we televised pictures of the leaders back to the starting point. Also, with the help of a "minicam" backpack unit, we assisted officials and police in coordinating crowd control."

Of course, the east coast isn't the only place where ATV is performing valuable public service. The ATV repeater in San Jose, California, provides annual television coverage for the Bay Area March of Dimes Walk-a-thon. By placing cameras at strategic points throughout the walk, the repeater is able to beam pictures of lost children back to nervous parents at the finish line.

But repeater user Werner Vavken, WB6RAW, notes that the San Francisco area's full-color repeater isn't used for public service alone. He calls attention to the fact that local activities include playing home computer games over the air and even monitoring (for security) the repeater site.

Back in Cherryville, even more interesting technical features are being used. Besides visually flashing its call sign on viewer's screens for identification, the machine keeps club members informed of the latest ham news by running it across the bottom of the screen in true news bulletin fashion.

CONCLUSION

All of these video pyrotechnics bring out the point that ATVers are experimenters in the true sense of the word. While only a Technician-class license is required, Advanced and Extra-class holders are far more common on ATV. Most of this, of course, is due to the fact that originally you had to be pretty smart to get on the mode. That's changing now, to the regret of some. But, if anything, most ATVers are now glad that the availability of components is bringing more activity.

As one west coast ham summed up the situation, "It seems that we old timers have just about solved all the problems for the newcomers. About the only thing we haven't been able to fix is the problem of looking presentable on television during a 3 AM QSO.

Knowing ATVers, they're probably working on it.~

Shortwave Viewing With SSTV

Monitoring Times is pleased to present this guest article by Dave Ingram, popular columnist for CQ Magazine.

As we all know, shortwave monitoring offers something for everyone. There's foreign broadcasting, government communications, law enforcement, survivalists, hobbyists, clandestine, RTTY monitoring, and much more.

One special interest involves watching long distance visual communications by the concept known as "slow scan television".

Present SSTV activity is primarily centered around amateur radio operations on the 80, 20 and 10 meter bands. The majority of these personalized and quite impressive video operations are conducted around 3,845, 14,230 and 28,680 kHz, with 14,230 kHz being a hotbed of activity evenings and weekends.

During a typical evening's activity one might see pictures of an Alaskan sunset from the window of an amateur in that area, views of the Mexican pyramids or streets in quaint Mexican villages, scenes of a party at an amateur's home in the Bahamas, plus many views of equipment setups.

The activity becomes most profound when SSTV'rs arrive home for the evening, and continues until one by one they fall asleep or trek off for family activities!

The unique aspect of these visual communications is their worldwide range--television pictures are transmitted and received over thousands of miles via regular (HF) shortwave bands rather than via VHF channels or satellites.

The exciting news concerning SSTV for readers of MONITORING TIMES is you can "look in" on this action with the aid of an SSTV scan converter and your existing HF receiver.

HOW IT'S DONE

The concepts of slow scan TV involve storing a conventional type TV picture, slowing it down approximately 1000 times and transmitting the resultant tones via conventional single sideband equipment. As a result of this "decelleration process", the television's normal 4 MHz bandwidth decreases significantly.

Another change, employing frequency shifted tones, then allows the TV pictures to encompass the range of 1200 to 2300 Hz.

When heard on the shortwave bands, these SSTV pictures sound similar in nature to RTTY transmissions. SSTV, however, can be recognized by its slightly more "musical" nature and an obvious "blip" of 1200 Hz approximately each 8 seconds.

One of the most profound trade-offs in SSTV's voice band pictures is the exclusion of movement. This means the views are transmitted as a group of "stills" (similar to a slide show) rather than moving images. Yet, even with this trade-off, SSTV is unique in the fact it permits worldwide visual communications without the aid of wideband satellite relays.

HOW YOU CAN WATCH

Reception of SSTV signals today is best accomplished with the aid of a digital scan converter. New, these units vary in price from about $450 to $900 and are available from such companies as Microcraft and Robot Research (both of which advertise monthly in amateur radio magazines).

The Robot Research model 400 unit and its color equivalent are outstanding and reliable performers which are used by radio amateurs around the world.

(continued on page 25)

(New Antennas from pg. 5)

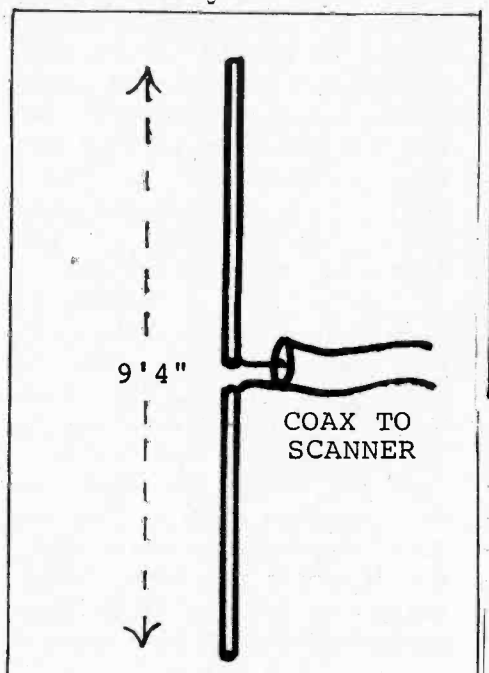
nals and FM broadcast signals are often circularly-polarized, readily-receivable on horizontal antennas.

But what if we trim the antenna down somewhat for VHF/UHF communications applications? To establish the fundamental frequency for the dipole simply divide 468 by the lowest frequency of interest. Thus, a 50 MHz antenna would be 9.36 feet long. Using aluminum tubing or other thick diameter conductor like pipe, the antenna will show excellent bandwidth of probably 20% or so.

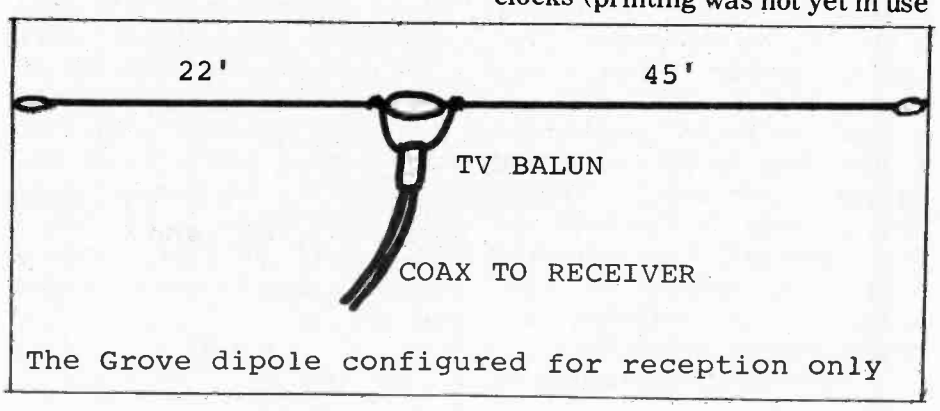
Now here's where the trick comes in. Odd harmonics of the fundamental frequency will also be closely matched by the antenna. That's right: use the 50 MHz design, connected directly to low-loss coax, for reception of low band, high band, military aircraft and UHF as well (50, 150, 250, 350, 450 MHz)!

In this direct-feed configuration, the dipole is center-fed and no balun transformer is needed. Simple? You bet! Will it work? I don't know. Let's try it!

What if we bend the dipole into a loop (without joining the ends)? Will we have an all-band directional scanner antenna? I don't know. Let's hear from our incurable experimenters out there with their favorite antenna designs! ~



Experimental antenna for scanners



The Grove dipole configured for reception only

(BITS con't from pg 20)

to the Census Machine which had a pin for every possible hole, the handle of the machine was then pulled down. Wherever there was a hole, the pin (which was spring loaded) passed through to make electrical contact with a cup of mercury. This caused a counter connected to that cup to add one (1).

There were 40 counters like clocks (printing was not yet in use for "computer output.") That electrical impulse also opened the lid of the sorting box so that the operators could hand place the cards in the box and resume their duties--a crude form of sorting.

In time for the 1890 census, Hollerith had improved upon the conductor's punch and was using a decktop punch. Some people felt that the machines undercounted, but members of the scientific community stated (and proved) that the 1890 census was the most accurate to date. Now it took less than 3 years to count 62 million Americans, while the 1880 census took over 7 years to complete!

Next, Hollerith improved the punched cards used to give us the present standards of 80 columns, in 1894. In 1896 he founded the COMPUTING TABULATING RECORDING MACHINE Co. Later, he helped the Russian government establish their census as well as helping other businesses with his sytems.

By 1900 the census machine was improved still further, but the cards needed to be hand-fed. He solved this problem in 1910 when his machines became hopper-fed.

All this time his business had been growing to the point where one person could not handle it alone, so Hollerith sold his business. In 1917 it merged with other smaller firms and entered the Canadian market as the International Business Machines Co., Ltd., known today as IBM.

Until this time most applications were of a business nature, but in 1927 the British National Almanac office used a Hollerith machine to process lunar position information at noon and midnight for all dates between 1935 and 2000 A.D. ~

(To be concluded next issue)

BROADCASTING

RED FACES AT RADIO MOSCOW

Shortwave listeners worldwide could hardly believe their ears Monday night, May 30 as English-language announcer Vladimir Dancheve announced, "The population of Afghanistan plays an increasing role in defending the country's territory against Voliet occupants."

Subsequent news bulletins throughout the evening referred to "bands infiltrated from the Soviet Union" and "struggle against Soviet Invaders."

While official news releases from the service described the bulletins as a "personal mistake," privately, insiders called the startling accusations "an act of sabotage."

Experts at the BBC monitoring station revealed that a similar "mistake" had been made a week earlier. Danchev no longer works for Radio Moscow.~

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VOA FEEDER SCHEDULE

How do international broadcasters get newsbreaking features from their offices to worldwide transmitters in time? By radio, of course!

Nearly all broadcasters use suppressed carrier double sideband (independent sideband or ISB), often running separate program feeds on each sideband simultaneously.

Reproduced here is the schedule for Voice of America feeds used in early summer 1983.

VOA FIXED FREQUENCY SCHEDULE

Station	Freq.	Time (UTC)
Bethany	19480	1130-1400
		1600-2300
	19261.5	1100-2230
	10869	0200-0815
Greenvle	20125	1130-1400
	20060	1245-2000
	19505	1400-2000
		2300-0015
	18782.5	1400-2000
	18605	1300-1430
		1445-1500
		1545-1600
	18275	1000-1100
	15752	2315-0815
		1000-1100
	15650	2330-0100
	10869	1900-2030
	10454	1000-1100
		1900-2300
	10380	2300-2400
	7768.5	0100-0715
		2300-2400
	7651	0100-0300
		0400-0600
	6873	0000-0430
Delano	13860	0945-1045
Monrovia	13995	1000-1100
		1130-1400

Additionally, reader Michael Proaise sent us the following interesting fact list about the VOA, released by the U.S. Information Agency and appearing in USA Today.

USA's voice

~More than 100 million people around the world hear 957 hours on Voice of America each week.

~VOA broadcasts in 42 languages on a regular basis with other languages for specific programs.

~The first broadcast, in German, was 79 days after Pearl Harbor, Feb. 24, 1942.

~VOA has 2,307 employees, 1,571 in the U.S. and 736 abroad.

~The projected operating budget for fiscal year 1983 is $141,767,000.

~VOA has developed an integrated network of 105 transmitters around the world, representing an investment of $139 million.

◆◆◆◆◆◆◆

A QSL is a QSL(?)

by Hank Bennett
P. O. Box 3333
Cherry Hill, NJ 08034

Have you received a QSL from Radio Canada International as yet? The station has begun a new verifying policy which is original, to say the least. Your Editor isn't sure exactly why RCI instituted this new policy, nor do I feel that it is going to serve the needs of the SWL to any great degree, but it is what they are presently offering and I guess we must learn to live with it. Here's how it works:

The station will send you, upon request, their schedule of programs and frequencies and a copy of their station QSL card with none of the blanks filled in. At this point you have a QSL (the word is on the front) with none of the pertinent data (on the reverse) filled in, such as date, time, frequency.

Now you have a QSL that you can hang in your shack for the world to admire. But wait, it isn't a QSL...yet. You must complete the reverse side yourself, filling in all of the necessary elements, including program details, and return it to RCI. If they find your report to be correct, it will be returned to you.

I assume that someone will actually have to authenticate the QSL with a station signature although this was not mentioned in their information sheet. One more thing - the only time, according to the station, that this QSL card will be available will be with the mailing of the summer/fall program schedule. It will "not be available at any other time" according to RCI.

Get yours today. Send your request for their schedule and QSL card to Audience and Public Relations, Radio Canada International, P. O. Box 6000, Montreal, Quebec, Canada H3C 3A8.

* * *

In our last column we mentioned that Radio Baghdad, Iraq, was requesting reception reports on cassette tape and that the tapes would be returned with recordings of Iraqi music. Now we learn from a European source that the import and export of audio cassettes to and from Iraq has been forbidden and is only permitted in bulk quantities by official state organizations.

Radio Sweden reports that this seems to have had something to do with Ayatollah Khomeiny's successful use of cassettes smuggled from his exile in France in overthrowing the Shah of Iran. However, music from all parts of the world is sold in Baghdad shops. For the present, send your reception reports to Iraq in writing.

* * *

Lawrence Cotariu (8041 North Hamlin Avenue, Skokie, IL 60076) is interested in having a lot of publicity given to the shortwave listening hobby since this year, 1983, has been declared as World Communications Year by an act of the United Nations. Larry states that to the best of his knowledge, no manufacturer or dealer of SWL equipment is offering any promotions on the hobby.

Shortwave listening is big business in many parts of the world but right here at home many people are totally unaware that they can tune in such far-away places as Moscow, Melbourne, Tel Aviv, Johannesburg, Tokyo, and Rio de Janeiro. If any of our readers would like to possibly work with Larry on a project of this type, please contact him directly.

* * *

John Kapino, WDX1AM (86 South Quinsigamond Avenue, Shrewsbury, MA 01545) has begun a new Swaps Newsletter on an experimental basis, to see if the need and desire for such a publication is warranted.

If you have radio-related items that you'd like to trade for other items, write to John with your list and your desires. For the present there is no charge but please send John return postage.

* * *

Radio ham operators try to work every state, and to obtain QSLs proving that fact. SWLs try to verify every country in the world. Here's a new twist.

The other day we noticed a boxcar on a passing Conrail train with the call letters of a ham operator and "Pse QSL" under it. Now that is a novel way to verify uh - wonder what his goal really is?

* * *

Do we have any readers that are interested in the long-wave band? We've been eavesdropping on the aero beacons that inhabit the 170-400 kHz band. There are lots of beacons to be heard and it's a great place for you code-learners to get some slow-speed practice.

With only a makeshift apartment antenna, your editor has only been able to hear up and down the East Coast from the Maritimes to the Caribbean, but hopefully, if we can get away to our favorite spot in the New York Adirondacks this summer, we'll get some long-wires up and really do some serious DXing on that band.

* * *

TEN WATTS?? A shortwave broadcast station that runs only 10 watts? Honest, it's true. Don Paul of Mesa, Arizona, reports good reception of 10-watter CKFX in Vancouver, British Columbia, at 0700 on 6080 kHz.

East Coasters will find this one a real challenge. Your editor has never logged it. But DXers in the western half of our country should stand an even chance to get it.

* * *

(Continued on page 10)

NEW ARRIVALS!

A BEVY OF BEARCATS

Electra Company of Cumberland, Indiana has unleashed a barrage of new products in time for the summer Consumer Electronic Show (CES) in Chicago. A brief rundown follows:

BC-151 Sixteen-channel programmable scanner; 30-50, 138-144, 406-512 MHz; scan delay, lockout, direct channel access; $249.95.

BC-260 Compact mobile ten-channel programmable scanner, all-metal cabinet with mounting bracket, 3 watts audio, memory backout during power outage, bright fluorescent display with dim switch, electro-luminescent keyboard backlighting for night viewing, audible "chirp" key commands, priority, weather key, search, lockout, direct channel access; $399.95.

DX-1000 General coverage receiver, 10 kHz-30 MHz, direct keyboard entry plus knob tuning, 10 memory frequencies; AM, FM, USB, LSB, CW; selectable filters, 12/24 hour clock; multi-frequency/multi-time automatic record control; up/down frequency stepping in any increments 1-99 kHz; $599.95. Made overseas for Electra; big competition for the R-2000!

BC-5/6 Hand-held crystal scanner; six channels; low, high, UHF and aircraft bands; 300 mw. audio; scan delay, LED channel markers; lockout; comes with rubber ducky antenna and BNC connector for external antenna; belt clip. AC adaptor included for NICAD batteries (also included). $179.95.

Freedom Phone 350 Cordless telephone with ten memory numbers and extended 500 foot range; no external antenna on handset; redial feature; selectable volume; mouthpiece mute switch; wall or desk mount. $159.95.

UNIDEN RE-INTRODUCES THE SONY

A new release from Uniden Corporation of America (6345 Castleway Court, Indianapolis, IN 46250) looks remarkably similar to the discontinued Sony ICF-2001.

Designated the CR-2021, the radio features LCD readout, digital frequency entry, 150-29999 kHz AM/CW/SSB and 76-108 MHz FM bands, step tuning, LED tuning strength indicator, antenna tuning, RF gain switch and an SSB/CW fine tune control.

An improvement over its predecessor, however, is the inclusion of narrow/wide IF filter switching, 12 memory channels and rotary volume and tone controls.

The receiver has triple conversion and a built-on whip. $299.95.

IS THE CR-2021 MERELY A SONY LOOKALIKE? WE'LL HAVE A COMPLETE PRODUCT REVIEW IN THE NEXT ISSUE!

SONY ICF-2002

The long-awaited replacement for the popular Sony ICF-2001 has been formally announced by that manufacturer.

Due for an August release, the ICF-2002 will be even more of a bargain than its popular predecessor.

With the 6/memory channels of direct-entry frequency synthesis, the new entry is the same size as the miniature ICF-7600 and is packaged in a handsome brushed chrome decor.

Battery consumption is much better than the previous model, with 20 hours expected on the inexpensive AA cells (6 required; 4 for the circuitry and 2 for the memory). An optional 4.5 V AC adaptor is available.

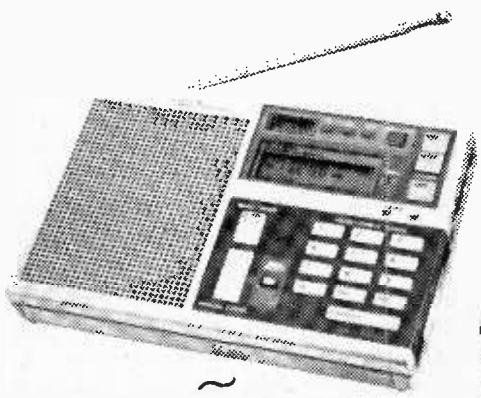
A special "Band Select" memory for scanning international broadcast bands, with 3 kHz separation on longwave, 10 kHz on medium wave and 5 kHz on shortwave.

Additionally, a tunable BFO allows for fine tuning SSB and CW signals. Dual purpose presets on the keyboard provide an additional level of function convenience not found on earlier models.

The new ICF-2002 includes a 12/24 hour LCD quartz clock as part of its frequency display. A dual-function timer acts as a sleep switch and alarm as well as a recording activator.

Frequency range for the new Sony is 153 kHz-30 MHz (AM/CW/SSB) and 76-108 MHz (FM). Sensitivity is specified as 1 microvolt for 6 dB signal-to-noise ratio at 10 MHz; image ratio at that frequency is 72 dB, with selectivity of 3 kHz @ -6 dB and 6 kHz @ -60 dB.

Perhaps most impressive is the low price of the new pocket marvel, expected to list for only $249.



OHRA WALKPHONE

Recently, a new generation of short-distance personal communications has appeared on the market: headset transceivers.

Operating in the 49 MHz license-free band (49.83-49.89 MHz), these low power transceivers afford reliable short-range communication for hikers, athletic events, antenna installers and other users who depend upon keeping in touch.

We decided to take a look at one of the most recent entries, the Walk-Phone from OHRA. Unlike the other units, the Walk-Phone features full duplex operation.

Just like a telephone, the units simultaneously transmit and receive--no missed words, no noisy VOX circuits.

Our field tests verified reliable communications in excess of 1/4 mile, even around a mountain bend. While car-to-car contacts would be expected to be reduced somewhat because of metallic shielding, still the units provided excellent hands-free operation in a caravan or typical traffic pattern.

For battery conservation, a standby mode permits monitoring for calls with the transmitter shut down. Current drain is typically 25 ma. on receive, 60 ma. on transmit.

The headsets are extremely lightweight and comfortable; the compact body unit is conveniently attached to a belt by a secure clip.

Disadvantages include, of course, the restriction of the system to two units; more than that and you would receive interference from two units transmitting on the same frequency.

But for the vast majority of applications where a pair of reliable, short-range transceiving headsets are required, the OHRA units will provide excellent performance.

(Walk-Phone, $159.90 per pair from OHRA Corporation, Dept. MT, 3555 Lomita Blvd., Torrance, CA 90505.)

MORE NEXT ISSUE!

(Broadcasting from pg. 8)

The Falkland Islands Broadcasting Station in Stanley is operating on 3958 kHz where it has been for years. It is now rated at 3500 watts and is being widely reported in Australia, New Zealand, and in many areas of the U.S., including both coasts. You may have to fight ham radio QRM, though.

They reportedly have a Breakfast Show at 0845-0900, a BBC news relay at 0900, a British Press review at 0910, and weather at 0915 along with the latest in British pop music. This is primarily for British forces and local residents.

* * *

Harold Ort, Jr., of Fort Wadsworth, Staten Island, New York, inquires about a station that he has been hearing on 5000 kHz around 0949 with a male announcer in English giving weather for Hokkaido. We show a listing for JJY in Koganei, Japan, which is a likely candidate.

Harold also reports good reception of Radio Tahiti, Papeete, on 15,170 kHz with French, Tahitian, and Polynesian music and even a few call-in telephone conversations. The usual fast drum beats and flute can also be heard around 0300.

* * *

Canada is represented in our mailbag in the person of James Howlett of Hamilton, Ontario. He has been DX'ing for 14 years and has over 60 countries verified without counting any relays. James reports hearing Radio Cameroon on 5010 kHz at 0530-0545 with home news and editorials in French.

He'd also like some information on "The Voice of the Socialist Libyan Arab Republic" that he has been hearing in the 25 meter band at 2339 with station ID and Arab music. If you can help James, please drop him a note at 340 East 42nd St., Hamilton, and his ZIP there is L8T-3A7.

* * *

Radio Norway reports that their two new 500 kW transmitters will be in final test stages this summer and that they hope to place them in service in September. Work is now underway for yet another shortwave station to be located in Sveio, just north of Kvitsoy. The target date here is 1986-1987 with three 500 kW transmitters.

European listeners are being advised to listen for the new medium wave outlet on 1314 kHz at 2300-0000. The power is said to be 1,200,000 watts! East Coasters might also be able to hear this one during early evening hours in the coming fall and winter months.

* * *

A United Press report states that a group of German radio amateurs has disappeared in the South China Sea after reporting that they were under attack. Amateur operators in Hong Kong say they received an SOS from the group, who said that their yacht was under attack and afire off the Spratly Islands.

The islands are between the Philippines and Vietnam and disputed by China and Vietnam. This could have been an attempted "DXpedition" to the islands.

* * *

Marshall Somers of Cherry Hill, New Jersey, gave his mailman a QSL card. So what's the story? The mailman is your editor; Mr. Somers is one of my 'customers.' He spotted my first column and left a QSL in his letter box indicating his approval of the column.

At my age, you gets your QSLs any way that you can get them!

* * *

In addition to those persons whom we have already mentioned in this column, we would like to credit Sweden Calling DXers, the Association of DX Reporters, and Radio Canada for their contributions. We would also like to remind other clubs that you are welcome to write in to us with newsnotes that you'd like to have in print. We're here to serve everyone.

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DX'ING THE FM BAND

By Danny Buntin

Ever heard "92 CITY-FM" from Winnipeg, Manitoba, or "Crystal FM Estereo" from Mexico City, or perhaps more likely KABL of San Francisco, the FM station named after the famous cable cars?

For those who never believed the FM broadcast band could offer much serious potential for DXing compared to other bands, such questioning may sound absurd. Actually, there is a lot of FM DX to be heard, and it has some advantages unique to it.

For instance, FM monitoring is freer from interference and noise while letting you hear your DX in stereo, often fully quieted. Also, during the warmer months when the medium and shortwave DX is in a slump, FM DX becomes active.

While it's true that most normal FM reception does not range much over 100 miles, when atmospheric conditions become favorable most vacant FM channels can become alive with strange stations from many hundreds of miles away.

FM DX most commonly results from two major modes of propagation. The most impressive distant reception is by sporadic E-skip. Es materializes when a "patch" in the E-layer of the upper atmosphere, about 60 miles up, through circumstances not well understood and much theorized, becomes ionized (electrically charged) to the point where normally-penetrating FM signals bounce off and land back to earth 450 to 1500 miles from the original source. Signals may be weak or strong and rapid fading is typical. Sometimes several stations will fight for dominance on the same channel.

Es usually first affects the 30 to 50 MHz low VHF band, then TV channels 2-6 as it builds upwards to a maximum useable frequency (MUF). Therefore, it is wise to monitor the lower TV channels for horizontal bars and flashing that typifies Es interference to clue you in on FM Es.

Keep in mind not all TV Es builds to FM. Es can occur any time of the year with June and July most prominent by far.

The best time of day to check for it is early to mid-morning and late afternoon to early evening. Most Es lasts several hours. Some very rare events have lasted up to a full day.

Since Es tends to be mobile, it is not unusual to hear from more than a dozen states as the opening progresses.

The other major mode of propagation, tropospheric bending (trop), is directly related to weather developments in the lower atmosphere. Trop may occur when the circulation of a low pressure center on a slowing advancing cold front attracts a northward flowing band of warm, moist, stable air.

Directly above the warm air a dry, sharply-contrasting air layer can be found. Along the boundary line FM signals will be made to flow along it as if in a duct, remaining close enough to earth to be picked up as DX. Trop can also form along the front if the weather there is settled.

Air inversions also play a role in trop development, most readily recognized by calm air and hazy skies. Be sure to check the band when such weather is observed. distances heard from most often are in the 200 to 700 mile range with 1000 miles and somewhat beyond possible.

Unlike Es, trop signal quality is stable. Any fading usually stays gentle.

WFCR
88.5 FM

Hampshire House University of Massachusetts Amherst, MA 01003-0015 (413) 545-0100

3 August 1982

Mr. Danny Buntin
1312 N. Skyline
Stillwater, OK 74074

Dear Danny:

Thank you very much for writing to WFCR. In regards to your reception report, you are absolutely correct with your data.

Nearly every summer WFCR receives reports from listeners in distant areas. Mostly from Florida etc. Yours is the first skip report from Oklahoma. Congratulations and keep up the good work.

Sincerely,
Charles Ferguson
Charles Ferguson
Chief Engineer

CF:dw
Encl.

An FM DX QSL is likely to be a letterhead from the chief engineer.

The best times of the year for trop to occur is May-June and September-October. Any time of day is possible with afternoons least likely.

The most favorable parts of the country for trop are the Great Plains, around the Great Lakes and along the Gulf and Atlantic coasts. A classic Gulf trop opening will have the Texas DX'ers catching the Florida FM stations. West of the Rockies produces the least trop because of the arid, mountainous terrain. Since conditions have to be just right, not all likely-looking weather systems form trop.

There are two other forms of FM DX; they are not as prominent as the previous two. One is meteor scatter. A briefly-ionized trail of debris is left behind when meteors enter the earth's atmosphere. FM DX signals that result are weak, brief and choppy. Most only last a second or two. Exceptional events last up to a minute or somewhat longer, making station identification more likely. Distances receivable are similar to Es.

The other form is aurora reception. DX'ers in the North are naturally more likely to receive it. Signals are weak, often garbled because usually more than one station tries to dominate a channel. Most likely times for reception are March-April and September-October.

FM DX equipment need not be elaborate, though it stands to reason that quality sets will achieve the best results. There is nothing better than a stereo receiver or tuner hooked up to an outdoor FM beam antenna with a rotator.

If your living arrangements do not permit an outdoor antenna, don't despair. Simply bring the beam indoors and install it at ceiling level while making it hand-rotatable.

One Oklahoma DX'er who did this experienced trop reception out to 1000 miles--and only a 10 watter --via Es!

For those on a budget, inexpensive portables with no means to attach an external antenna should be avoided. A good choice would be Radio Shack's Mini-Tuner TM-102 and FM rabbit ears.

Good transmission lines to choose from are fully-shielded 75 ohm types such as RG-11 (lowest loss), RG-6, RG-59 and shielded twin lead, 300 ohm. Common flat twin lead should be avoided because of signal loss when near metal and when wet. It also is not as durable as coax.

For those interested in further pursuing FM DX, membership in the Worldwide TV-FM DX Association is a great aid. The club puts out a monthly publication. More information is available by writing: WTFDA, P. O. Box 514, Buffalo, NY 14205. Yearly dues are $15.

☆☆☆

VHF SATELLITES

by Bob Grove

Readers often ask, 'Is it possible to hear satellites without special equipment?' The answer is a resounding 'Yes!'

Many listeners have reported tones in the 149.98-150.03 MHz range of their scanners. In most cases, this is actually the US Navy 'Transit' (NAVSAT) navigational satellite sending its telemetry to military vessels for accurate bearings.

Russian COSMOS and navigational satellites are also reported to be using this part of the spectrum.

Another spot to look is 161.99-162 MHz for similar data transmissions. And we have discussed the ATS-1 and ATS-3 NASA communications satellite with voice and data reported on 135.575 and 135.600 MHz (see adjacent article).

Listeners with 136-138 MHz coverage may wish to search those ranges for any number of data and telemetry transmissions from mapping and weather satellites. Here in Brasstown, North Carolina using only a Scanner Beam, PRE-1 preamp and an out-of-band programmed Bearcat 300 we have heard satellite signals on the following frequencies (MHz):

136.080 136.110 136.200 136.230 136.320
136.380 136.440 136.500 136.620 136.650
136.695 136.725 136.750 136.770 136.800
136.840 136.860 136.920 136.980
137.080 137.100 137.100 137.170 137.180
137.195 137.205 137.220 137.300 137.325
137.420 137.440 137.460 137.480 137.500
137.620 137.760 137.780 137.850

Satelllites may be from many technological countries of the world, but most often U.S., Canada, Russia, Japan, Great Britain and France.

Some signals are very faint while others (137.500) seem strong enough to knock your scanner off the table!

A directional antenna is not necessary; in fact, when the satellites are nearly overhead where they are strongest--a directional antenna is no longer directional!

Listening To 225-400MHz Military Aircraft

Newcomers to the fascinating military UHF aeronautical band are often initially disappointed at the lack of activity there. After all, their scanners explode with activity when monitoring the civilian 118-136 aircraft band.

Several factors are responsible for the diminished returns, including: there are fewer military aircraft than civilian; UHF signals are more line-of-sight and attenuate more quickly; conventional scanner antennas don't work well in the 225-400 MHz range; coax lines are more lossy at UHF than at VHF; military transmissions are likely to be brief, evading interception; fewer frequencies are in use in a given geographical area making search unproductive.

So what does the insatiable hobby listener do to hear these fleeting signals?

1. Use an outside antenna designed for 225-400 MHz reception. A ground plane with 10" elements works fine such as a converted Radio Shack 20-176 (although it will not work well on other ranges); a good discone like the Grove ANT-6; or the Grove ANT-1 Scanner Beam. The two Grove products will work on all other normal scanner ranges as well as the 225-400 MHz band.

2. Acquire lists of frequencies used by nearby military bases and airport control towers. If not obtainable from the agencies, try publications like Tom Kneitel's "Top Secret Registry" or locate a copy of Grove's "Federal Frequency Directory."

3. Try programming the following frequencies, in use over most of the United States (conversion frequencies included in parentheses for those of you using the Grove Scanverter): 236.6 (128.6); 241.0 (133.0); 243.0 (135.0); 255.4 (129.4); 257.8 (131.8); 272.7 (128.7); 311.0 (131.0); 321.0 (123.0); 381.3 (129.3); 381.8 (129.8).

4. If you encounter a "birdie" (spurious signal) on one of the frequencies, add or subtract .005 to the entry (123.0 could be either 122.995 or 123.005); signals may be slightly weaker, but at least receivable.

5. Add an external preamplifier to increase the apparent strength of incoming signals.

6. Use only low-loss coaxial cable like RG-8/U, RG-8/M, RG-6/U or RG-59/U foam dielectric, well-shielded. ~

An excellent omni-directional antenna is the discone; they provide not only out-of-band coverage, but normal scanner bands as well. Discones are available from several manufacturers including Grove Enterprises (ANT-6).

While most of these signals are indecipherable to us, rest assured that someone out there is copying them! For the most part they are benign--weather reconnaissance, geological exploration, communications experimentation--but some are undoubtedly of a tactical nature.

Finally, American and Russian hams have put their own satellites in orbit. Listen for OSCAR'S (U.S.) beacons on 145.825 and 435.025 MHz. If you have a shortwave receiver, you can hear the hams' downlink frequencies between 29.4 and 29.5 MHz. Phase III is operational; listen for beacons at 145.812 and 145.990 and downlink communications around 145.900.

Interested listeners may wish to tune in on the AMSAT ham network: Wednesday 2100-2300 Eastern on 3850 kHz LSB; Sunday 1800 UTC on 14282 kHz USB and 1900 UTC on 21280 kHz USB.

DX'ING THE ARCTIC

By James R. Hay

EASTERN ARCTIC

During the summer months, the weather warms up enough for ships to get into the northern ports, particularly those on Hudson's Bay. This activity allows SWL's a chance to hear some of the coast stations anc ships in the arctic.

Starting in the east, around Hudson's Bay, one will find Killineck, N.W.T. (VAW), Frobisher Bay, N.W.T. (VFF), Coral Harbour, N.W.T. (VFU), Inoucdjouac, P.Q. (VAL) Poste-de-la-Baleine, P.Q. (VAV), and Churchill, Man. (VAP), the northernmost station is that at Resolute, N.W.T. (VFR).

All of these stations are equipped to handle messages, and all but Killineck, Inoucdjouac, and Poste-de-la-Baleine have facilities for duplex telephone calls. All of the stations have 2182 kHz, and Coral Harbour is equipped with 2514 kHz, while the rest have 2582 kHz. Due to the limited amount of traffic which they handle, Inoucdjouac and Poste-de-la-Baleine do not have any other frequencies.

The remaining stations, for longer range communications, do have other frequencies, including some cw channels. For the moment only voice frequencies will be discussed.

All of the stations (save those with only 2 MHz frequencies) have 4376.0 kHz. Resolute is also equipped with 8793.3 kHz, and Frobisher Bay has four other frequencies: 6512.6, 8753.0, 13100.8, and 17335.2 kHz. Frobisher Bay is the major communications station in the eastern arctic.

For those proficient in code, the telegraphy frequencies will be of interest. Churchill, Coral Harbour, Cambridge Bay, Killineck, and Resolute all have 500 kHz as well as one other LF frequency:

VAP Churchill	420
VFU Coral Harbour	416
VFF Frobisher Bay	430
VAW Killineck	484
VFR Resolute	474

In addition, Frobisher Bay also has 4236.5, 6493, 8443, 12671 kHz.

The Port of Churchill uses VHF frequencies of 156.400, 156.550, and 156.600 MHz for Port Operations.

WESTERN ARCTIC

In the western arctic, information about the various oil company frequencies is quite hard to come by, however, two frequencies on which bases and/or oil rigs have been heard are 16377 and 13420 kHz upper sideband.

In the Athabasca-McKenzie River area there are five stations which operate on the frequency 5803 kHz usb. These are:

VFF 7 Fort Chipewyan, Alta.
VFF 6 Fort Simpson, N.W.T.
VFH 3 Hay River, N.W.T.
VFN 8 Norman Wells, N.W.T.
NYO 21 Tuktoyaktuk, N.W.T.

Hay River is also equipped with 156.800 and 161.800 MHz. The Canadian Coast Guard operates three other coast stations in the arctic: VFC Cambridge Bay, VFU 6 Coppermine, and VFA Inuvik, N.W.T.. Each of these stations is equipped with 2182 kHz and 4363.6 kHz. Inuvik and Cambridge Bay alsc have 2598 kHz and 5803 kHz. Inuvik, in addition, has 6335.5 kHz, and the same two VHF frequencies as Hay River. Two telegraphy frequencies are in use at Cambridge Bay: 6351.5 and 12671 kHz.

ALASKA

Alaska offers something to those who are interested in northern DX, and who live on the west coast. Along with communications stations, there are also several Naval and Coast Guard stations. For those in Alaska, 161.900 and 162.000 MHz will offer public correspondence traffic from several stations, too numerous to mention here.

On the MF there are some stations which can be heard in the southern areas when conditions are right. All of these stations will have 2182 kHz in addition to their working frequency; WKR Nome and WGG 58 Juneau are both using 2400 kHz, WGG 53 Cold Bay and WDU 29 Sitka are both on 2312, WDU 26 Cordova and WGG 56 Ketchikan are both on 2397, and WDU 23 Kodiak uses 2309 kHz usb.

On HF, 8802.6 and 6509.5 are shared by KWL 43 King Salmon, KLW 39 Port Walter, and KWL 21 Juneau, and 4125 is shared by WBH 29 Kodiak, KGB 91 Yakute, KGD 58 Anette, and KGI 95 Cold Bay.

Station KXW Anchorage operates on 8291.1 kHz. The U.S. Naval station at Adak (NOX) can be heard on 500 and 450 kHz, and Kodiak (NOJ) on 500 and 470 kHz, both in cw, as well as on the following frequencies for Kodiak:

4143.6	4428.7
6218.6	6518.8
6521.9	8294.2
8718.9	8765.4

8768.5 kHz. ~

(DX'ing Ships on pg 13)

COSMONAUT COMMUNICATIONS

Just as with US space missions, the Russians have a communications network for mission support.

Most frequently reported by listeners are transmissions in the 19900-19998 kHz range, just below 20 MHz WWV.

Occasionally, transmission just above 20 MHz will also be heard, most notably from 20003-20084 kHz., with considerable activity previously reported on 20005 and 20008 kHz, often CW and telemetry data.

Scanner enthusiasts may srike paydirt listening to 121.75, 142.417, 142.40, 142.60, 143.144 and particularly 143.625, widely reported with FM voice on previous missions.

A detailed list of frequencies used for space communications is found in the Shortwave Frequency Directory by Bob Grove. ~

Coast Stations in Western Arctic and at Resolute

Coast Stations in the Eastern Canadian Arctic

DX'ING SHIPS IN THE ARCTIC

By James R. Hay

In addition to the many coast stations which are in the arctic, it is also quite possible to hear ships in the arctic. The Canadian Coast Guard uses a fleet of heavy icebreakers in the Arctic during the navigation season to help commercial ships.

One frequency which is likely to see a lot of activity is 6292.5 kHz. While this frequency is for code traffic, one can usually identify the call-sign of the stations heard.

Other ships which may be heard include:

Arctic Surveyor, Chimo, Bill Crosbie, Esso Gjoa, Explorer II, Eastern Shell, Freedom Service, Irving Birch, Irving Cedar, Pacnorse, Pelerin, Pioneer Service, and Charles de Vanier. These are some of the ships which have been to the arctic in the past few years; while there is no guarantee that these ships will be in the north this year, many of them make trips regularly each year.

Other than the icebreakers, the ships are either involved in the oil industry, supplying northern villages, or picking up grain from Churchill to take to Europe, or ore from some of the northern mines such as that at Nanisivik.

From now until November is the arctic shipping season, so there's no time like the present to try for arctic DX.

For those interested in reading regularly about arctic and antarctic DX, the Canadian International DX Club has an Arctic DX column in its monthly newsletter. For information about CIDX, and a sample issue, send $1 to CIDX, 6815-12 Ave., Edmonton, Alberta, Canada, T6R 3J6.

My thanks to Bob Curtis, editor of Arctic DX for providing some of the information used in this article. ~

Coast Guard Icebreakers, and other ships which you might hear this summer.

CGCW	CCGS Camsell
CGDX	CCGS Des Groseillers
CGBT	CCGS J.E. Bernier
CGGM	CCGS Labrador
CGBB	CCGS Montcalm
CGBZ	CCGS Norman McLeod Rogers
CGSJ	CCGS Simon Fraser
CGBK	CCGS Sir John A. MacDonald
CGDT	CCGS Sir John Franklin
CGCV	CCGS Tupper
CGCG	CSS Hudson

The following Swedish Icebreakers are also ships to listen for in northern Europe:

SHPQ	Ale
SBPQ	Ejord
SCYN	Tor
SHPR	Atle
SBXQ	Oden
SDIA	Ymer
SBPT	Frej
SCKD	Thule

U.S. Coast Guard ships which can likely be heard from Alaska include:

NRPN	USCG Ironwood
NLBH	USCGC Cape Romain
NODL	USCGC Firebush
NRUC	USCGC Storis
NHKW	USCGC Confidence
NRFY	USCGC Flametree
NODU	USCGC Sedge
NRFJ	USCGC Northwind
	USCGC Sand Tracker
	USCGC Cape Coral

Among the cruise ships which visit the arctic are:

GCCG	Cunard Princess
SKMW	Lindblad Explorer
PJSU	Rotterdam
PJSF	Statendam
LFSA	Sagafjord
ELBM9	Tropicale
	Daphne
	Island Princess
	Sun Princess
	Pacific Princess

(Yes, this is the "Love Boat").

Other ships which may be heard include:

VY7841	Robert LeMeur
VOBJ	Fred J. Agnich
VCLM	M/V Arctic
VXMM	Arctic Trader
VYBL	A. C. Crosbie
VGQB	Chesley Crosbie
VOTF	Sir John Crosbie
VCRJ	Irving Eskimo
VCTG	Irving Ocean
VYWD	Edgar Jourdain
VGLN	Irving Arctic
VCLW	M/V Mesange
PGEF	Neddrill II
CZ3946	Pandora II
VOPV	Polar Prince
VGXZ	Jos. Simard
VYZJ	Ludgar Simard
LAPH	Skauvann
VGZX	Lefrene
HPFO	Texaco Alaska
OXKT	Arctic Skou
	Petrel

Coming in September--

HIGH SEAS RADIO

MILITARY ENCRYPTED RADIOTELETYPE

by R. F. Heard

Recent computer analysis has yielded some interesting data concerning encrypted FSK RTTY from military bases.

The primary encrypted RTTY mode used by the US Navy is 75 baud with a unit code of 7.00; thus, it is 106 words per minute.

If it were not cryptocovered, 106 WPM would be readily copyable with a standard 100 WPM reader or demodulator.

In the encrypted mode, the start and stop bits are not encrypted, and every 15th character is commonly a complete pause without a start/stop bit.

When idling, however, blanks separated by pauses one bit in length are transmitted. The usual shift is 850 Hz, sometimes 170 Hz.

When a channel comes up as a fleet MULCAST (Multiple Channel Broadcast) transmission, the shift is 85 Hz. These modes are common on many HF frequencies.

The U.S. Navy also uses encrypted 50 baud/71.4 WPM (7.00 unit code); in this mode, even the start/stop bits are encrypted. Similar to the 106 WPM transmissions, if it were not for encryption, this baud rate could be copied by a standard 67 WPM machine.

When heard in the HF spectrum, shift is usually 850 Hz; examples are often simulkeyed (simultaneously transmitted) on 7455, 10130 and 11689 kHz.

Canadian military station CFH in Halifax (actually Mill Cove) also uses 75 baud (7.00 unit code), 106 WPM, 850 Hz RTTY, and they also encrypt their start/stop bits.

CFH makes two encrypted simulkey broadcasts:

(1) 4347, 6425, 8542, 12814, 17084 and 73.6 kHz; and

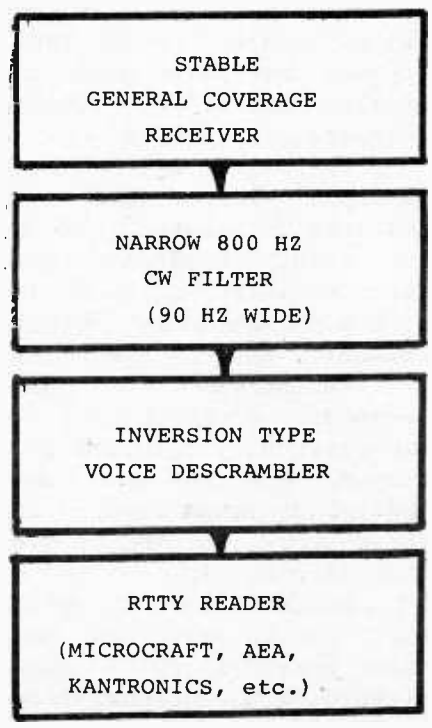
(2) 4225, 6450, 8662, 12985, 16880, 22337 and 133.15 kHz.

(NOTE: the two longwave frequencies utilize narrow shift keying)

U.S. Navy MULCAST generally consists of 16 channels, employing 85 Hz shift and another 85 channel spacing. HF MULCAST is actually a backup system for the primary satellite broadcast mode.

Although most MULCAST transmissions are 75 baud encrypted, UPI/AP news is often sent in the clear at 50 or 75 baud, and some weather is also sent in the clear at 75 baud.

But is it possible to extract copyable data from the multiplexed channels? The system shown below has been used with some success:



The CW filter selects the discrete channel desired, while the inversion-type voice descrambler, commonly available to scanner listeners, is tuned to convert the tones from the sharp CW filter (approximately 800 Hz) back to tones near 2 kHz for the RTTY reader or demodulator.

The system shown here was used with an inexpensive Microcraft reader set for 170 Hz (85 Hz is internally adjustable if preferred).

This bare-bones approach to extracting readable copy from sophisticated military MULCAST broadcasts works suprisingly well. ~

★ ★ ★ ★ ★ ★

CIA GRADUATES TO SATELLITE AGE

Sources close to Washington have informed us here at MT that the Central Intelligence Agency is keeping touch with field agents via satellite relays.

In one installation, a home TVRO dish is equipped to transmit as well as receive, using a 3M "Whisper 1000" portable data terminal/printer with 128K. RAM. ~

EXPERIMENTER'S WORKSHOP

ASSEMBLE THIS SIMPLE INDOOR SCANNER ANTENNA

By Bob Grove

Many apartment dwellers would like to improve their scanner reception but are unable to erect outside antennas.

While the little collapsible whip provided with scanners do a remarkable job for local reception, some improvement may be realized with a specially-designed extension antenna system.

Recently, two solid weekends were devoted to experimentally developing a simple, inexpensive indoor scanner antenna which offered some improvement over that little whip.

While the reception will not be anywhere near that provided by a full-sized outside antenna, some improvement may be offered, especially if the antenna is hung or taped high on an outside wall or against a window.

Mount with the appropriate elements vertical and horizontal as shown, running the coax away horizontally for at least 2-3 feet.

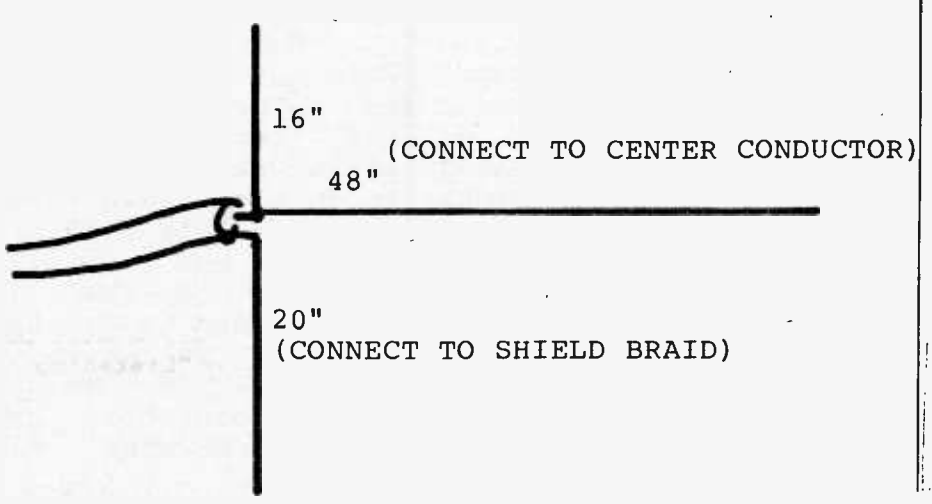
Try to stay away from electrical wiring, heat and air ducting, and other large metallic surfaces.

Experiment with several alternate locations while listening on various frequencies to weak signals of interest for best compromise reception.

There are no tricks; absolutely any kind of wire may be used, insulated, stranded, solid, thick or thin....it doesn't matter.

Coax may be any variety because the run will be short--a few feet at most. If you can find attic space, then go for a full-sized antenna and good coax.

Give the little Grove indoor scanner antenna try, and let us hear of your successes and improvements so that we can pass the information on to our readers in Monitoring Times!



BUILD A VOICE UNSCRAMBLER

by Jon E. Zalac

Have you ever listened to your scanner and all of a sudden the clear voice that you've been used to hearing now sounds like Donald Duck? If this has happened, you are now listening to a mode of voice scrambling call speech inversion. The circuit shown here will enable you to "unscramble" those unintelligible voices. It will not work on digital voice scramblers or frequency hopping.

To determine if this circuit will work in your area, the first thing you must do is listen to the voice coming from your scanner and if it sounds like the voice is backwards, mixed up, or has a Donald Duck sound to it, this circuit will unscramble the voice.

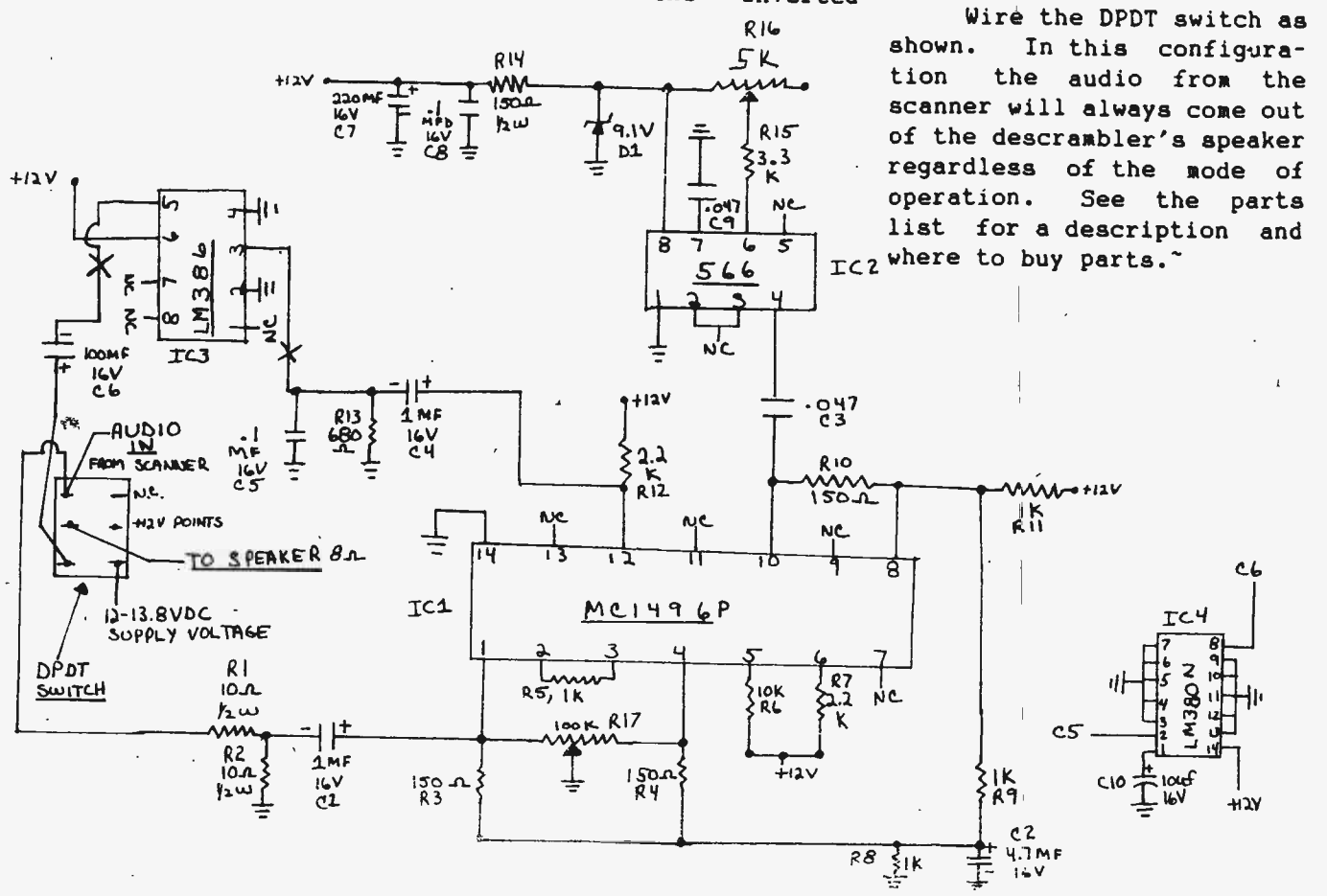
About the Circuit

This circuit inverts the voice back to its normal sound. As shown in the circuit, the inverted audio from the scanner passes through the DPDT switch into IC1 which is a balanced mixer. IC2 is a phase locked loop oscillator which injects reference frequency into IC1. The sum and difference frequencies appear at pin 12 of IC1, are filtered, then passed to audio amp IC3.

The circuit was designed to operate from 9 to 13.8 VDC. Since the output of IC2 (reference frequency) can be affected by fluctuating supply voltages, R14 and D1 are used to hold the operating supply around 9 volts. The rest of the circuit operates on 12V.

R16 determines the reference frequency to be injected and mixed with IC1 to unscramble the inverted speech. IC3 is a 1/4 watt audio amp. If more audio is desired, an alternate method is also given.

IC4 is a 2 watt audio amp. Simply remove IC3 at the X's shown in the circuit (pins 3 and 5 ofIC3) and substitute IC4 in place, connecting IC4 as shown. On IC4 pin 2 is audio in (connect at the X which is near C5) and pin 8 is the output which is connected to the minus of C6.



IMPROVING THE BEARCATS

by Art Kimball

RECORDING OFF THE AIR

While the easiest method to record is to place the tape recorder microphone near the speaker of the scanner, quality is often unacceptable...not mention the inconvenience of picking up room noises along with the scanner audio.

The following device not only allows direct coupling of the line output to the recorder, but also isolates the recorder from scanner ground on the audio line thereby eliminating hum and the need for the uncoupling capacitors suggested by Electra.

The solution is a simple audio output or audio driver transformer in the record line. The specifications are not at all critical. In tests, I have used one with 10K Primary and 2K Secondary and one with 1K Primary and 500 Ohm Secondary. The main consideration is size.

Radio Shack has one that is nearly perfect (Part No. 273-1380) for $1.29. A Calectro Model D1-728 or D1-722 also works fine and can be found at most electronics stores. Just ask for the smallest audio driver transformer they carry with a 1K to 10K Primary.

Connection is extremely simple. First cut off the center tap leads (if there are any) from both sides of

BEHIND THE DIALS

ELECTRICAL PROTECTION AND FILTERING FROM ESP

Of increasing importance in this solid state age is protection of vulnerable electronic equipment from AC-line-carried high voltage spikes.

Perhaps of equal importance with the widening distribution of computer equipment is relief from radio frequency interference (RFI).

One company which specializes in such add-on devices is Electronic Specialists, Incorporated (171 S. Main St., Dept. MT, Natick, MA 01760).

Their free catalog lists an extensive depth of products for CB, ham, shortwave and scanner and computer protection. These products include equipment isolators, AC power line filters and suppressors and antenna filters.

We recently sampled two of those products, the models SFK33M and SFK33S, for a lab test here at MT headquarters.

The SFK33M ($82.95) is a quad balanced-pi section filter with internal spike protection (Panasonic metal oxide varistors) featuring up to 65 dB attenuation of noise in the 10 kHz-200MHz range.

Spike protection of up to 9000 amps instantaneous is provided with ten amps (1250 watts) circuit load.

The SFK33S ($62.95) provides dual pi section filtering and no MOV transient clamping.

PUTTING THEM TO THE TEST

Several separate experiments were performed to test the noise filtering capability of the two units.

We found that the filters worked best when installed on the AC cord of the offending appliance rather than on the affected receiver (although some relief was noted that way, too).

This is no doubt due to the early prevention of the RFI from reaching the power lines where it can be radiated (an ounce of prevention....).

Brush-type motors (hand drills, sweepers) are particularly troublesome, and the ESP filters installed on their cords were quite effective in reducing their interference, especially when the cords were wrapped up tightly to provide additional trapping.

Oddly enough, the filters seemed to be more effective when used on two-wire appliances than those with a third wire ground.

Computer-generated RFI was considerably reduced, especially when compared to another brand selling at greater cost.~

(BEARCAT con't from pg 14)

the transformer. Connect the Secondary side to the scanner record output, and the Primary to the microphone input of the tape recorder.

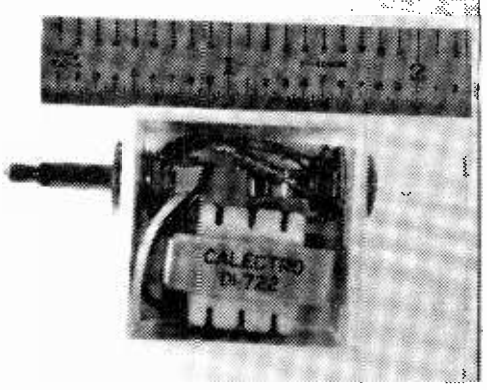
If both sides of the transformer have one wire that is the same color, consider them isolated ground returns to the cable shields.

You may wish to attach a mini phone plug to one side of the transformer and a mini phone jack to the other. (If you want to make this an integral part of the patch cord, you can, instead, attach the one side to one end of a patch cord with a plug on the other end.)

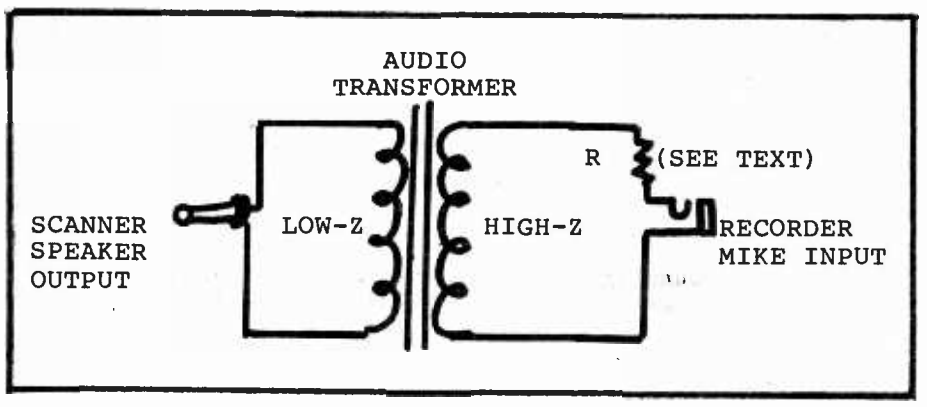
If the recorder you are using has only a microphone input, you will probably need some attenuation. Experiment with various values of resistors in series on the "hot" side of the output of the transformer, until you find one that gives you the best level. If your recorder has a line input, you won't have to bother with this.

The entire device can be wrapped in electrician's tape to prevent shorting, or with a little ingenuity, you can find a small plastic jewelry box (such as the kind a very small tie tack or pin comes in) and install the transformer in it with a plug attached to the box and a jack on the other end.

This neat package allows you to use any patch cord with it. I stole such a box from my wife for my installation. (See photo!)~



The hum-immune scanner recorder coupler



Schematic diagram of recorder coupler

listener's log

CW INTRIGUE

Reader Don Schimmel shares a recent logsheet of interesting intercepts he has heard on the shortwave bands.

Can any of our readers identify some of these phantom CW communicators?

Freq. kHz	Time	
13383	1201	"MLU" repeated; garbled tape
14444	1816	Spanish govt TFC
13436	2145	5 figure grps; "BT" at end of each 10 groups
13439	0125	5 letter grps w/4 special char: AA, OE, IM, OT
13441	0012	5 number/fig. grps
6604	0020	5 letter grps.
7429	0027	Portuguese plain text
14441	0309	"AEB" repeated; 4 char grps sent very slow; nbrs 4 & 6 sent in normal fashion; rest sent cut; possible match up is as follows: A-1, U-2, V-3, 4-4, E-5, 6-6, B-7, D-8, N-9, T-0.
6602	0105	5 fig. groups
13429	2214	HRL4 DE HRL2. Honduran govt.
6614	0059	"28 DE 83"
7600	0106	"83 DE 28" & "45 DE 28"
13479	0141	other end of 13487 link (below)
13487	0145	5 letter grps (prev. 13439)
13439	2126	2/3/4 letter groups
7601	0331	5 letter grps as on 13487
6600	0228	5 letter grps as on 13487
6623	0239	other end of 6600 link
13422	1733	Portuguese navy
7431	0300	Port. traff.
13546	1333	digit groups
7492	1402	5 char. grps.
7492	1800	ZTG XQI DE LIA CSA IMI (also heard on 10140)
7487	1757	other end of 7492 link

DAVIS-BESSE NUCLEAR POWER STATION (located near Oak Harbor, Ohio)
Contributed by Kevin Trickey
Delta, OH

Active Freq During Emergency

33.86	Ottawa Co. Fire
39.56	Ottawa Co. Sheriff
39.58	"
39.72	"
47.22	OH Dept. of Trans., Oak Harbor&Ott. Co.
151.025	Ottawa Co. Eng. (KAR962 & 3)
155.805	Ottawa Co. Disaster Serv. Agency Officials/Davis-Besse Siren
451.425	Toledo Edison - Emerg. Control Ctr.
461.50	Davis-Besse Security (KXC216)

Kevin advises us of several errors which crept into his frequency lists on p. 16 of the May/June MT.

Onondaga Co. Sheriff should be 154.74.

Auto Club should be 150.935-150.965.

Onondaga Co. Fire should be 155.715 and 155.775.

Phoenix PD should be 45.40. ~

NEXT MONTH: A Comprehensive listing of central California scanner frequencies!

GROVE TO SPEAK AT ASHEVILLE HAMFEST

Bob Grove, editor of Monitoring Times and president of Grove Enterprises, will be a featured forum speaker at the Asheville, N.C. hamfest July 30, 1983 at 2 PM at the Civic Center.

Bob's topic will be his favorite, "Listening Intrigue". New equipment available to the listener will also be highlighted. ~

The Low Down On Elf *Part II*

By Larry L. Ledlow, Jr.

In Part 1 we introduced the unique characteristics of the extremely low frequency (ELF) band, including abilities to penetrate earth and water and to propagate over very long distances relatively unattenuated.

We also discussed some of its disadvantages including noise from lightning and ionospheric phenomena. Further, the bandwidth available for communicating at ELF is extremely limited. The Navy feels that despite its disadvantages, ELF may serve a useful role in maintaining communications with its submarines, allowing them to remain submerged at safe depths.

In Part 2 we are concerned with how to transmit ELF signals, with special consideration of antennas. Before describing particular types of antennas, a review of certain ELF antenna fundamentals is necessary, because many concepts familiar to the antenna designer working with higher frequency ranges must be handled differently. Antenna gain and antenna pattern, for example, need special consideration at ELF.

Any radio frequency signal is sent via electromagnetic waves. There are BOTH electric and magnetic field components to the waves, each at right angles to the other. Familiar receiving antennas (half wave dipole, yagi, etc.) take advantage of the electric field in order to induce a current in the antenna.

At ELF it is sometimes advantageous to detect the magnetic field; a commonly-used magnetic field antenna is the loop antenna. Broadcast band and LF DXers are familiar with this type of antenna.

Far (i.e., many wavelengths) from the source of an electromagnetic signal, the wavefronts are essentially flat; we call these electromagnetic waves plane waves. When detecting plane waves a receiving antenna, whether electric or magnetic, should be aligned such that it is sensitive to the appropriate field component. In other words, if we want to use a yagi ("beam") antenna to receive, we should align our antenna so that it lies in the same plane as the electric field component.

By convention, we say that if the electric field of the e-m wave is vertical with respect to the surface of the earth, then the wave is vertically polarized.

Closer to the source, however, the relationship between the field components and the direction of propagation is no longer so simple. This is the case with ELF, because wavelengths are on the order of 1000 miles, and the receiver will never be very many wavelengths from the transmitter. Thus, the choice between a magnetic or electric type of antenna may be different, and its alignment for maximum effectiveness would be different.

We also have to consider that the antennas used may be within a conducting medium--a submarine's antenna is surrounded by seawater, for example. Then, terms used in conventional systems such as antenna pattern, effective length, gain, and radiated power become misleading.

In order to discuss antenna performance characteristics in conducting media it is necessary to go back to very basic concepts. By doing so, scientists have come up with the following definitions for describing antennas.

Receiving antenna sensitivity is expressed as the equivalent noise field (ENF), the root mean square (RMS) open circuit noise voltage of the antenna divided by the effective length of the antenna. In principle, the LOWER the ENF the HIGHER the sensitivity.

The effective length of the antenna is the ratio between the output voltage and the arriving electric field strength of the signal, considering both direction and polarization of that wave.

Does this read like a physics text so far? Do not despair, we are just getting to the good part!

With regard to antenna efficiency, a general rule of thumb is that the greater the physical size, the more efficient an antenna will be. Since ELF wavelengths range from 1000 to 10000 km, it is not unreasonable to expect practical-size ELF antennas to be very inefficient. Simple power inefficiency does not make an antenna unusable, however. Other factors such as cost of construction and space availability may make an antenna acceptable even without much power efficiency.

Furthermore, power efficiency is not a consideration in receiving antennas. If an antenna is sensitive enough (i.e., the ENF is low enough) for atmospheric noise to be received, then it is generally acceptable for receiving communications. However, ELF receiving antennas of this sort would be unsuitable for transmission, because an antenna current high enough for transmitting would probably melt the antenna conductors or, at the very least, lead to voltage breakdown of the insulating material.

Many problems encountered with VLF antennas are of concern to designers of ELF systems. Even at VLF, high radiating efficiencies and high power capacities can only be achieved with huge structures. For example, a VLF facility at Cutler, Maine, is in the form of two umbrella-shaped, top-loaded vertical monopoles, each about 2 km in diameter and 250 meters high! Its grounding system uses 3000 km of copper wire. At 20 kHz its radiating efficiency is about 86% and has a voltage-breakdown-limited radiated power of nearly 2 megawatts.

At ELF, where the wavelength is 100 times greater, it can be seen that construction problems become almost insurmountable. Calculations have been done to show that at 100 Hz the Cutler antenna would radiate a maximum of only 15.6 milliwatts! The radiation efficiency drops from 86% at kHz to approximately 0.1% at 100 Hz!

Vertical antennas, such as those constructed at the Cutler, Maine facility, are clearly unacceptable for ELF transmission.

One type of antenna does, however, appear to be favored over others for ELF transmission--the horizontal electric antenna. Basically, this antenna consists of a very long, insulated wire running parallel to the earth's surface. Each end is grounded, and at the center of the wire the transmitter is connected.

The advantages of a horizontal electric antenna over others depend on its use of the ground to provide a return path for the current.

Airborne transmitting antennas are at a disadvantage because no grounding is possible. The choice for an ELF antenna to be used in an aircraft is limited to a vertical and a horizontal magnetic one. Both pose severe size and weight problems for anything other than very short range communications, as we shall see later.

A rather interesting idea proposed by M.G. Morgan in 1960 was the use of an island as a natural ELF/VLF antenna. Microwave TV enthusiasts may be familiar with slot antennas. A microwave slot antenna consists of narrow holes, or slots, cut into a large sheet of metal which serves as a ground plane for the antenna. Because there is a great difference between the conductivity of the slots (0 conductivity) and the ground plane (very high conductivity), the slots will tend to radiate if they are the correct size.

Morgan's idea is that an island is of much lower conductivity than the surrounding seawater and can therefore be used as a slot in a large ground plane. If the island

is long and narrow, it begins to behave very much like a conventional slot. By placing a transmitter in the middle of the island with terminals grounded in the ocean at both ends, the island can radiate a signal!

Unfortunately, it has been demonstrated that this method offers no more power than a transmitter grounded with the same length of cable on a very large area of soil with the same conductivity as the island. And there is no island on earth which meets the required conductivity difference between the island and the ocean!

A loop antenna comes to mind. With all practical considerations, the distance a loop antenna may be used to transmit over is considerably less than that of a large, fixed array (100 km versus 10,000 km). This is because of the necessary antenna dimensions and/or current values required to generate relatively high field strengths at great distances.

In order to be competitive with a large ELF array, a loop would have to have a magnetic moment of about 400,000,000,000 ampere-square meters. What does this mean? The significance is better demonstrated through example.

Suppose an aircraft loop antenna encircled an area of 10 square meters (approximately the maximum we might expect an airplane to accomodate). The current required for the loop would be 4,000,000,000 amperes!!! And even if the area of the loop were increased to 1 million square meters, the current would still have to be 400,000 amperes!

There are two kinds of loops to consider--the air core loop and the ferromagnetic core loop. One "practical" design suggested by one researcher involves an air core loop some 2 meters in diameter weighing almost 5000 pounds. This loop would dissipate more than 8.5 kW.

A ferromagnetic core loop with the same signal strength would require a cylinder 2.5 meters in diameter and 0.5 meters long. This antenna would weigh as much as 6500 pounds and at 60 Hz would dissipate approximately 6.5 kW.

There are other problems associated with ELF loop antennas in mobile applications. In particular, interference problems with the other electrical systems in a vehicle would be extremely difficult to solve.

Earlier we discussed a horizontal electric dipole. Conceivably, we could have a VERTICAL electric dipole suspended, say, from a helicopter or a balloon. It turns out that the power, weight, and maximum voltage of a vertical dipole are well within practical limits.

But, it would be necessary to have the antenna hang vertically, and with vehicular motion this would be unlikely. If the antenna were to remain motionless it would be better to have a horizontal electric dipole on the ground. Other problems, such as establishing a feedpoint in the center of the wire far away from the aircraft may degrade system performance even further.

One additional concern with ELF transmitting design is that of safety. It is possible to generate a horizontal electric field at the surface of the earth of sufficient intensity to be dangerous. Even a much smaller field can be dangerous if a person touches a long metal conductor (e.g., a wire fence) running parallel to the antenna wire. Therefore, the maximum horizontal electric field must be limited to a small enough value so that relatively few structures near the antenna would be long enough to establish dangerous potentials.

To a certain extent, the large scale ELF facility is very much like an electric power distribution system. One significant difference, though, is that the ELF antenna is a one way conductor of current with the return path via the ground.

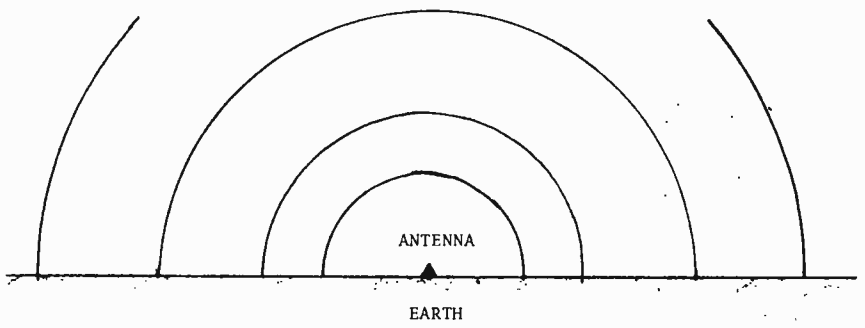
A power system is balanced with respect to ground, consisting of parallel conductors with a net current flow very much less than that in an ELF transmission system.

Interference from such a system may affect power distribution systems, telephone networks, railway signalling systems, pipelines, and any other system where long conductors are an integral part. Installation of appropriate isolation transformers may considerably reduce, if not eliminate, interference with these systems.

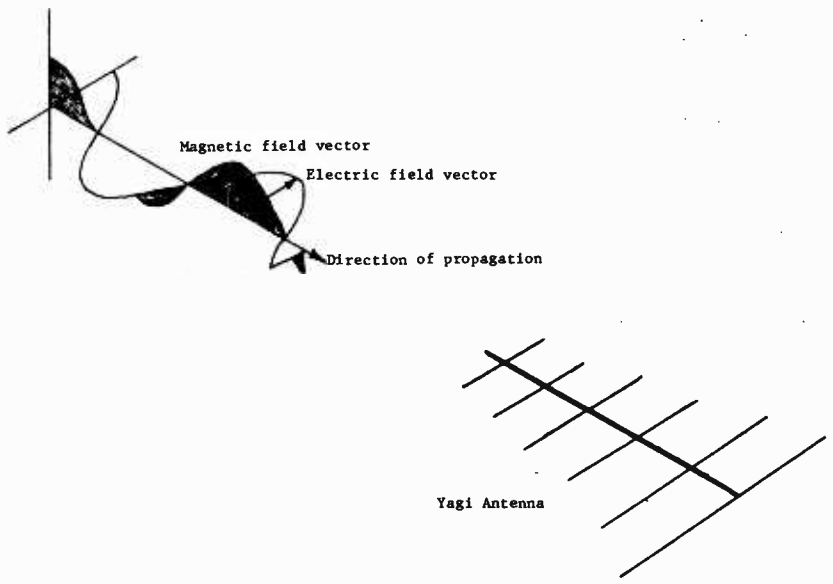
But what about the magnetic fields induced by a large ELF antenna? It has NOT been demonstrated that there are detrimental effects of strong magnetic fields on plants, animals, or people. Further, interference should only effect sensitive electrical instruments.

The US Navy has been very concerned with these problems and their solutions for many years because of their development of their SANGUINE/SEAFARER systems.

ELF transmitting antennas, then, have special problems to overcome. In particular, size, weight, and current requirements are their principle disadvantages. The ELF receiving antennas also have special problems, but these are generally not the same as with transmitting antennas. ELF receiving antennas do require certain design considerations and therefore deserve a detailed look. In Part 3 we will study these considerations. ~



This figure illustrates that as distance from an antenna increases to many wavelengths, the wavefronts change from spherical to planar in shape. In many calculations, considerations are simplified with plane waves. Unfortunately, with terrestrial ELF propagation we are never very many wavelengths away and so have more complex problems.



An electromagnetic field consists of two components- an electric field and a magnetic field-- which oscillate in a particular way. If we use an electric field antenna, then for optimum reception the elements must be aligned with the electric field vector.

U.S. PROPAGANDA: FANNING THE HOT FLAMES OF THE COLD WAR

Shortwave listeners who have RTTY equipment are missing quite an eyeful if they haven't tuned into the strongly-editorialized news transmissions of the United States Information Agency (USIA) and the Voice of America (VOA).

These hotly-worded broadcasts are intended for reception by embassies, State Department installations and other pro-west sources of news information.

Transmissions are 100 WPM 425 Hz shift. Look for them at 5460, 10880, 10992, 12223.5, 13770, 13995 and 18542 kHz. ~

NOAA WEATHER RADIO

by Lawrence I. Cotariu

"A Tornado Warning has been issued for LaSalle and Putnam Counties in Illinois. At 5:00 P.M. a tornado was sighted 35 miles north of Peoria moving northeast at 25 MPH. Radar has confirmed this storm."

"Heavy rain will continue to move into east-central Mississippi and a flash flood warning has been issued." "A few tornadoes are possible from the Gulf Coast of the state to 100 miles inland."

"An earthquake of magnitude 7.3 has occurred in Tokyo, Japan. A possible Tsunami (tidal wave) may develop within the next 12 hours and head towards Hawaii."

....Such are some of the bulletins issued from various National Weather Service Offices in the United States. Storms and other natural phenomena can cause numerous injuries and extensive property damage. Since the late 1940's it has been the goal of the Weather Bureau to provide enough warning to the public so that people may take necessary precautions to protect themselves and their property.

While tornadoes have been known to occur in nearly every part of the world, they are most numerous in the Great Plains of the United States. One reason is the proximity of the Gulf of Mexico to the Great Plains.

The Gulf supplies abundant moisture that feeds the developing storm over the middle of the country. Giant cumulonimbus clouds, spawner of the tornado, achieve heights of 50,000 in the Plains. The Rocky Mountains help channel the Gulf moisture into the Central Plains. Additionally, the jet stream provides the spinning motion necessary for the funnel cloud.

Tornadoes can occur any time of the night or day, but in the Midwest, most occur just before the time of the highest temperature: between 4:00 P.M. and 8:00 P.M.

On the average, 625 tornadoes are reported each year in the United States, but the figure continues to rise.

Hurricane Betsy, which occured between August 27th and September 12th, 1965, will long be remembered for the destruction it brought to Louisiana. Betsy passed through the Bahamas, but modest tides and adequate precautionary measure prevented serious damage. As it crossed the Florida Keys, flooding and high winds hit areas south of Ft. Lauderdale. Wind gusts in the Keys were estimated to be about 160 MPH.

On moving into the Gulf of Mexico, Betsy changed course to a more northwesterly direction and accelerated its forward speed. The storm reached the New Orleans area in the afternoon of September 9th with an eye 40 miles in diameter. Damage from Betsy in Louisiana alone amounted to over one billion dollars!

BE PREPARED

The National Weather Radio Service is operated by the National Oceanic and Atmospheric Administration (NOAA) of the United States Department of Commerce. It provides continuous broadcasts of the latest weather information directly from National Weather Service Offices.

Taped weather messages are repeated every 4 to 6 minutes and routinely revised 1 to 3 hours, or more frequently if needed. Most stations operate 24 hours daily.

The broadcasts are written to cater to the needs of the people within the receiving area. For example: stations along the sea coast and Great Lakes include special weather information for boaters, fishermen and others engaged in marine activities.

Inland broadcasts often provide information for farmers.

During severe weather, National Weather Forecasters interrupt routine weather forecasts and substitute special warning messages.

Such receivers sound an alarm indicating an emergency exists, alerting the listener to turn the receiver up to an audible volume or, when operated in a muted mode, are automatically turned on so that the warning message is heard.

NOAA Weather Radio Broadcasts are made on one of seven VHF FM frequencies: 162.400, 162.425, 162.450, 162.475, 162.500, 162.525 and 162.550 MHz.

The National Weather Service operates more than 350 stations; approximately 90% of the nation's population is within listening range.

Weather radio receivers, both crystal-controlled and tuneable, are available in a variety of styles and prices. Recommended are receivers with a 0.5 to 1.0 Microvolt sensitivity for 20 Decibel quieting, selectivity of 45 to 80 db down ± 25 kHz, tuneable or switchable to all frequencies, warning alarm features, dual power source of AC/battery (with automatic switch-over to battery during commercial AC power outages) and collapsible or fixed indoor telescoping antenna with provision for external input connection.

When the receiving antenna is inside the building, some of the signal will be absorbed or reflected by the material which makes up the building.

In fringe areas, placing the radio and attached antenna close to a window on the side of the building from which the broadcast comes will often substantially improve reception.

The use of a properly matched outside antenna will improve the reception of the broadcast. The range and clarity of the reception is dependent upon the antenna height and its orientation.

Weather radio transmits a vertically-polarized signal; therefore, a matching receiving antenna (elements up and down, perpendicular to the ground) that will receive signals in the 130-175 MHz range will give best reception. ~

Tune In Canada

by Norman H. Schrei..

The first edition of the "Tune in Canada" column brought in a fair amount of response, and surprisingly, not all of it from Canada.

From Melocheville, Quebec, a reader informs me that the Saint Lawrence Seaway Authority uses 156.700 MHz and call sign VDX 20 in that area. The microfiche reveals the company code of 200040 and other frequencies licensed to the same agency: 141.735/139.095 call VDX 20; also 156.800 MHz call sign VDX 20.

In Iroquois, Ontario the agency is licensed for the following frequencies and calls: 141.735/139.095 call VDX 21, also 156.450 call VDX 21, 156.550 call VDX 21, 156.800 call VDX 21, 170.730 call VDX 21, 465.1625 call VDX 21.

Another reader writes with information on the RCMP which in the Windsor, Ontario area has a simplex operation on the following frequencies: 140.190 MHz, 140.310 MHz, 141.400 MHz and 140.490 MHz. All stations use the call sign XJO 45 and the associated company code is 800428.

He also reports that CBET TV (Channel 9) uses the frequency of 163.380 MHz. I did find a frequency in Windsor, and suppose that is the station in question, but would like verification. The call letters there are VCY 920 and the company code is 600055.

Speaking of Windsor, I was there lately doing research on an upcoming directory. While there I tuned across 455.350 MHz. This frequency is used by radio station CKLW to send the programming from their studios in downtown Windsor out to transmitter site.

By way of the state of Illinois comes information concerning frequencies in various areas of Canada. The first reported frequency comes from Keling, Sask. And that is 46.060 MHz and call sign XNL 576. This station is supposed to be used by Adams Argo Center, Ltd.

One listing which he did send me was located on the microfiche: Station XLK 471 operating on 40.060 MHz in Lundy, NS. This station is supposedly operated by the Atmospheric Environment Service and the company code is 821971. That same call letter and company code comes along with another frequency in Lundy, that being the frequency pair 451.2875/456.2875.

Here are a few mysterious frequencies that I have not identified as of yet in the Toronto area, and again reader input would be most helpful.

Freqeuncy MHz	Callsign	Co. Code
94.100	CBLFM	600064
401.7279	CF 346	500010
166.080/163.050	CGD 364	800745
463.3625/468.3525	CGD 697	800745
463.175/468.1875	CGD 704	800745
152.350	CGD 273	900074
152.480/157.740	CGG 273	900074
152.510/157.700	CGG 273	900074
152.525/157.785	CGG 273	900074
152.540/157.800	CGG 273	900074
152.550/157.815	CGG 273	900074
152.570/157.830	CGG 273	900074
152.585/157.845	CGG 273	900074
152.615/157.785	CGG 273	900074
152.630/157.890	CGG 273	900074
454.600/459.600	CGG 278	800745
454.625/459.625	CGG 278	800745
454.650/459.650	CGG 278	800745
452.600/457.600	CGG 279	800745
453.550/458.450	CGG 501	900074
142.800/138.780	XJK 787	854264
153.905	XJK 774	836281

I do believe that the majority of the above (especially company codes 900074 and 800745) are mobile telephone or telephone company related and I believe that a couple are police frequencies.

Now for information that can be identified: this list comes out of the Chatham, Ontario area:

FREQ	CLSGN	USER
42.060/42.220	XJB 76	Ontario Provincial PD
46.680	XLN 408	Ontario Natural Resour.
46.700	XLN 408	Ontario Natural Resour.
46.760	XLN 408	Ontario Natural Resour.
46.860	XLN 408	Ontario Natural Resour.
140.190	XJL 214	RCMP
140.310	XJL 214	RCMP
140.400	XJL 214	RCMP
140.490	XJL 214	RCMP
140.970	XJP 202	Ontario Provincial PD
141.435/139.155	XJP 202	Ontario Provincial PD
141.690/139.455	XJP 202	Ontario Provincial PD
142.770/138.750	XJP 202	Ontario Provincial PD
142.770/148.750	XJL 496	Chatham Police Dept.
143.655/139.065	XJP 202	Ontario Provincial PD
153.770	XJH 384	Chatham Fire Dept.
154.070	XJL 511	Chatham Fire Dept.
154.325	XJH 307	Chatham Fire Dept.
154.550	XJH 307	Chatham Fire Dept.
154.680	XJH 307	Chatham Fire Dept.
160.665	CHB 635	Canadian National RR
160.785	CHB 635	Canadian National RR
160.935	CHB 635	Canadian National RR
161.115	CZA 507	Canadian Pacific RR
161.415	CAZ 345	Canadian National RR

(Continued on page 20)

National Radio Club Convention

Labor Day weekend is slated for the 1983 National Radio Club convention to be held in Enfield, Connecticut.

NRC is one of the oldest listening clubs in the country, specializing in AM broadcast band DX'ing. Interested members and readers may learn more about the club and its convention by writing: National Radio Club, 1983 Convention, P.O. Box 118, Poquonock, CT 06064.

(Canada con't from pg 19)

161.475	CZA 507	Canadian Pacific RR
162.120	CJP 87	Union Gas Company
162.690	CJP 87	Union Gas Company
163.950	XNC 42	Courtesy Cab Co.
164.370/168.390	CHC 213	Essex Communications
165.495	CGE 231	Bell Canada, LTD.
166.740	XJP 76	Ontario Provincial PD
460.560/465.560	VCZ 69	Chatham Coach Lines

That should conclude this edition of "Tune In Canada", but remember that with your assistance in providing frequencies, locations and call letters, I will be able to expand the information you supply to more frequencies in your area. Once again you can contact me by mail by writing to: Norman H. Schrein, 1107 Sharewood Court, Kettering, OH 45429, or if you wish to call, you can call me at 513-298-5746. ~

CANADA SCAN

MONITORING TIMES is pleased to present a new column to be inaugurated soon. Gilles Thibodeau, a bilingual listening enthusiast in Quebec, will host the column.

French-speaking radio hobbyists are invited to write directly to Gilles, enclosing a self-addressed, stamped envelope for personal replies and for contributing material for the Canadian column.

Naturally, Canadian contributions in English are also appreciated!

Readers may write directly to: Gilles Thibodeau, 3653 Montcalm, Lac Megantic, Quebec, Canada G6B 2H8.

Gilles would like to expand his collection of airport and aircraft frequencies and is looking particularly for airport police, security, customs, maintenance, emergency (ground only), fuel companies and aircraft companies (ground communications).

A sampling of active aeronautical frequencies for the Montreal area is shown here

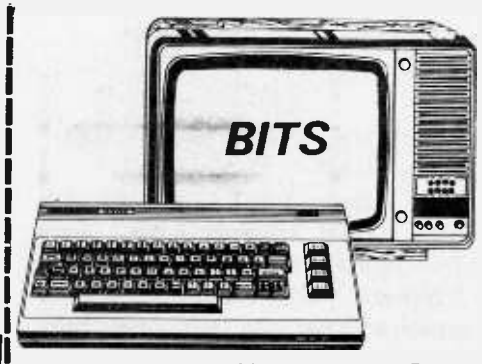
DORVAL INT'L AIRPORT (all frequencies MHz):
Communication: Montreal Radio 122.2, 126.7
Montreal arrival: 125.15, 118.9, 287.2
Dorval Tower: 119.3
Ground: 121.9, 275.8
Montreal Departure: 124.650, 323.2
Clearance Delivery: 125.6
VFR Advisory Service: 125.4, 268.3
International Air Carrier: 126.9
ATIS: 120.2
Shell Aero Center: 122.85
Esso Aviation: 129.3
Texaco: 122.95
Customs: 162.180

MONTREAL MIRABEL INTERNATIONAL AIRPORT
Communication: Montreal Approach 125.15, 287.2
Mirabel Tower: 119.1
Ground: 121.8
Apron: 122.4
De-ice: 123.45
Montreal Departure: 124.65, 125.15, 323.2
Clearance Delivery: 120.5
VFR Advisory Service: 125.4, 268.3
ATIS: 125.7
Montreal Centre: 132.35, 133.225, 134.4, 229.2, 245.0, 294.0

AIR CANADA
Base nationwide: 460.700, 462.425
Mobile nationwide: 468.2875
Base/mobile Dorval Airport: 462.425, 467.4375, 167.850
En route aircraft: 128.050, 130.175, 130.375, 130.975, 131.000, 131.900, 133.225, 135.050

Additionally, Gilles reports reception of US skip on the following frequencies late afternoons: 30.58 (page), 30.695, 30.70, 30.74 (Morgan City), 31.35 (page), 33.78, 35.22 (page), 35.38 (telephone) and 35.58 (page/telephone).

All right, Canadian listeners, the column is yours!~



A Brief History Of Computing

By Mike Edelson

Many people think computing began with IBM or Apple (maybe UNIVAC). In truth, those clever Chinese (along with the Egyptians and Romans) invented the abacus, a device for calculation that had beads on parallel rods. This device, invented over 5000 years ago, is still in use after 3000 years.

In 1617 a Scotsman, John Napier, published a paper on how to use specially-marked rods of ivory (he called them "Napier's Bones") to multiply or divide. This laid the groundwork for the development of the modern slide rule.

The first mechanical desk calculator was called the Arithmetic Machine. It was invented in 1642 by a Frenchman, Blaise Pascal, to help his father reckon the tax records in Rouen, France.

In Germany, Gottfried Leibnitz proposed (1672) and built (1694) a machine called the "Stepped Reckoner" which performed multiplication by repeated addition. Unfortuantely the Stepped Reckoner was far from dependable.

Many years later, in 1820, the stepped reckoner was improved upon by C.X. Thomas of Alsace, France. He made it possible for the machine to perform all 4 arithmetic operations. He named it the Arithmometer.

That device was placed into commercial use. It won Thomas the Legion of Chevalier of the Legion on Honor by the French government. Unfortunately, only a few were built.

Other areas of endeavor have helped to advance the art of computing. Jacques de Vaucanson invented a delicate automatic loom to weave figured silks in 1741. Thread selection was made using metal drums.

In 1804 Joseph Marie Jacquard expanded this idea and built the "Jacquard Loom", designed for larger-scale weaving. What makes it significant to computing was that it used punched, stiff paper sheets or cards instead of the drum as used on Vaucanson's machine.

The Jacquard Loom was capable of repetitive loops by stringing the cards in a continuous loop. The most famous product of this system was a portrait of Jacquard done on the loom. It required 2400 cards. This demonstrated a method of semi-automatic action (programming).

Within 8 years 11,000 Jacquard Looms were in operation in France.

Some men of vision thought of devices but they were far in advance of the technology of the day. Charles Babbage talked to the British government in 1823 about financing a project of his called the Different Engine. This Engine was never completed because England withdrew support in 1833.

In that same year he conceived of a device he began to build in 1835 called the Analytical Engine. This machine incorporated Jacquard's punched card system for input. Babbage worked on this machine until his death in 1871.

It is thought that he would have succeeded if not for 3 problems: (1) the parts could not be manufactured to necessary percision; (2) he refused to scale down a working prototype; and (3) if his detractors had not been as forceful, he could have gotten all the help he needed.

American ingenuity played a part in the elderly development of computing. In 1885, the Felt and Tarrant Manufacturing CO. (later the Victor Comptometer Corp.) invented an experimental key-driven calculating machine built from a wooden macaroni box with meat skewers for keys, staples for key guides, and rubber bands for springs!

A refined version in a metal box was manufactured in 1886. It was the forerunner of the comptometer.

One of the major names in computers today is Burroughs Corp. founded by William S. Burroughs as the Burroughs Adding Machine Co.

In 1889 Mr. Burroughs built a calculator called the Listing Accountant, similar to the FELT machine discussed previously, but it had one advantage in that it used the carrying mechanism similar to that of Pascal's machine. This was supposedly the first commerical adding machine designed for production in quantity.

The 1880 U.S. Census took over 7½ years to complete. The Census, which is taken every 10 years by the Bureau of the Census of the Department of Interior, needed a faster way to prepare the results of the census.

Herman Hollerith, who had graduated from Columbia University in 1879 at age 19, was hired by the Census Bureau. In 1882 while an instructor at M.I.T. he began experimenting with ideas that would make up his census machine.

For his machine he decided to use standardized cards about the size of the large dollar bills in use at the time. This card was divided into 240 areas with each square having a separate distinct meaning. The holes were punched using a train conductor's hand punch.

After the cards were punched they were inserted, one by one, in-

(continued on page 7)

"Los Numeros"

32444 69213 88816 52196 63811 94216

Havana Moon

CORRECTION

Page 4 -- MT May/June, 1983. The first full paragraph of column 2 should have read:

"There has been, for the past several months, a 4-digit "Spanish" transmission at 0000Z on 11532 kHz with a parallel transmission on 9075 kHz. Is it possible that this 11532 kHz transmission began on the wrong frequency? This has happened on numerous occasions with 5-digit "Spanish" transmissions."

****

THE VOICE SPEAKS OUT

By Havana Moon

"...It's a lengthy series of questions that have been presented to the VOICE. Perhaps the answers will be revealing."

***

Sound familiar? It should! This was the terminator of REQUIEM FOR A QSL in the May/June edition of MT.

Some of those questions have now been answered. Here's what the VOICE has to say:

Q: Do you have an explanation for the morse code heard on 11895 kHz?

A: VOA uses 11895 kHz from 0000-0300 UTC for Spanish broadcasts to Latin America. The transmission in question was observed approximately one hour after our sign-off and has no connection with the VOA. It should be noted that Radio Portugal has had an assignment on this frequency from 0400-0700 UTC effective March 6. It is possible that this station was checking out equipment and/or operating staff early on a Friday morning in anticipation of a new broadcast to begin the following Sunday morning.

Q: Would it be possible to activate a VOA transmitter in a "downtime" state from a remote site?

A: No. Although today's technology can be utilized to operate "unmanned" transmitter sites, there is no such facility within the VOA broadcasting system.

Q: Would it be possible to inject extraneous audio signals into a VOA circuit from a remote site?

A: VOA provides program material from the Washington studios to domestic and overseas relay stations in several ways. These include commercial satellite circuits, commercial terrestrial circuits, a VOA microwave system, and by short wave feeds. Since these are not secure circuits, it is conceivable but extremely unlikely that extraneous audio signals could be injected.

Q: Does VOA have an intruder or encroachment watch in regards to frequencies used by the VOA?

A: VOA does not have an intruder or encroachment watch in the sense of your question. In view of the existing international procedure for assigning frequencies and the congestion in the shortwave broadcasting bands, no broadcaster is afforded (the) luxury of exclusive use of any frequency. VOA does have a worldwide network of monitors who regularly report on the reception quality of VOA broadcasts. When interference from another broadcaster is reported, the merits of the specific case are evaluated. VOA might adjust its schedule if possible or we might request the other broadcaster to make a schedule adjustment.

Q: What actions are taken when unusual incidents occur on VOA frequencies?

A: One must bear in mind that VOA does not have exclusive rights to the frequencies we use. Thus, an incident that appears unusual to a layman is not necessarily unusual to organizations that regularly transmit in the shortwave bands. VOA is concerned about interference to our broadcasts. When interference and/or its source is identified, actions such as those described above can be undertaken.

There is no basis for concern when another organization uses a "VOA frequency" while we are not using it. VOA uses 11895 kHz from 0000-0300 UTC for a Spanish broadcast to Latin America. We have indications that prior to March 6, 1983, Radio Moscow used this frequency from 0330 to 0700 UTC for an African Service. We also know that Radio Free Europe used this frequency from 0400 to 0600 UTC.

Effective March 6, Radio Portugal is scheduled to use 11895 kHz from 0400-0700 UTC. Either of these organizations could have been the source of the transmitter tune up that you heard.

Q: Can you provide a list of all VOA relay and/or feeder frequencies?

A: Enclosed are lists of the VOA broadcasting frequencies and fixed (feeder) frequencies for the summer broadcasting season, (March 6, 1983 to September 24, 1983). (reprinted herewith *on page 22*.

Q: Are all VOA frequencies registered with the ITU?

A: All VOA transmissions are notified or registered with the ITU in accordance with the relevant Radio Regulations.

****

And what about the strange incident involving an "English numbers" transmission and a VOA(?) news broadcast?

As stated in the May/June issue of Monitoring Times, we're still waiting for a reply on that one.

AROUND AND ABOUT...

It would appear that the frequencies of 3090 and 4200 kHz are now the most active 5-digit Spanish frequencies. Usage of 4044 and 5135 kHz has been terminated. Perhaps 3090 kHz is not as dead as first reported.

Thanks Contributors

On occasion, Bob Grove, editor of Monitoring Times, receives informative material for which the sender does not want to be identified.

Most often (and desirable) are identifications of federal frequencies restricted from public access. While all federal government frequencies are now classified "Confidential" (including those previously released as "Unclassified"), dissemination among individuals once they are obtained is not unlawful.

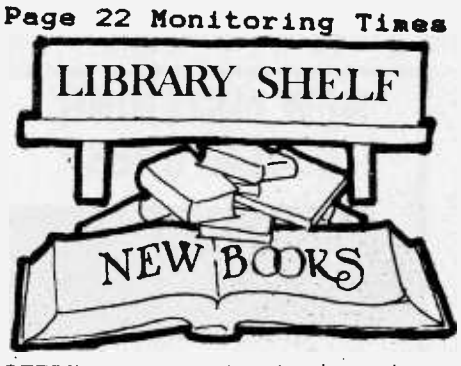
Perhaps most coveted of all would be a recent run of the IRAC GMF, the unexpurgated Government Master File, in any form--microfiche, computer tape or printout.

We appreciate these gestures and assure such sources that their anonymity will be protected.

CRYPTO ALPHABET...

Rumors circulate that some of you are attempting to recover the CW crypto alphabet in regards the CW transmissions monitored first on 3060 and 3090 kHz and now on 3090 and 4100 kHz. CW and number groups equate as follows: A/1, N/2, D/3, U/4, W/5, R/6, I/7, G/8, M/9 and T/0.

Adios,
Havana Moon ~



SPEEDX REFERENCE GUIDE TO THE UTILITIES edited by Mike Chabak (6" x 9" looseleaf bound). Available from SPEEDX, Dept. MT, PO Box E, Lake Elsinore, CA 92330.

Gradually evolving a section at a time, the perennial SRGU is a cornucopia of well-researched, comprehensive information dealing with shortwave utilities communicators.

At this writing chapters on allocations and callsigns, propagation and modes, Morse code monitoring, commercial aeronautical monitoring, automatic letter beacons and US Coast Guard operations are included.

Future transmittals are planned to include military, numbers stations, government, radiotelephone, maritime, INTERPOL, and embassies.

Cost for the present volume including binder is $12 bookrate, $14 first class. Foreign listeners should inquire as to their respective postage.

SCANNER MASTER (Edited by Richard Barnett and Rick Prelinger)

This series of soft-covered frequency directories are regionally organized to meet the needs of major metropolitan areas of the Northeast.

Presently published in volumes for Massachusetts, Connecticut and Rhode Island, and New York Metro/Northeast New Jersey, the guides are cross-referenced by service, frequency and location.

The Connecticut and Rhode Island Guide is available as two publications, one for frequency and the other for codes and unit designators.

Price at $9.95-$12.95, the soft-cover 8-1/2" x 11" directories are well written and provide in-depth profiles of communications systems used by business, public safety, local and federal government installations.

For more information write Scanner Master Company, Dept. MT., PO Box 428, Newton Highlands, MA 02161.

THE COMPLETE BOOK OF OSCILLOSCOPES by Stan Prentiss (Tab 1532P, 5" x 8-1/4", 230 pages, softbound. $10.95 from TAB Books, Dept. MT Blue Ride Summit, PA 17214).

For many of us the oscilloscope remains a mystery in spite of its well-earned reputation as the most useful test instrument ever developed.

Prentiss' new publication helps clear up some of that mystery in a straightforward, step-by-step manner, starting with the basics and advancing through spectrum analysis and time-domain reflectometry.

Chapters include waveforms and analysis, vectorscopes, sampling and storage, digital and signature analysis, video, patterns and many other aspects of visual identification.

"Oscilloscopes" is authoritatively written and profusely-illustrated.

NORTHERN CALIFORNIA GOVERNMENT RADIO SYSTEMS DIRECTORY edited by Robert Kelty (8-1/2" X 11", 64 pages, softbound; $15 from Mobile Radio Resources, 2661 Carol Drive, San Jose, CA 95125).

Containing approximately 3400 entries, "Systems" is divided into three distinct sections: local government by county, state of California, and U.S. government.

Assembled through the cooperation of official administrators, NTIA/IRAC microfiche reserach and on-site inspection, "Systems" is one of the most accurate frequency listings we have seen.

Future publications for the same region will home in on business and utilities.

THE SOUNDS OF FRENCH PIRATE RADIO (cassette) (90 minutes; $5 postpaid from Magic Media, Dept. MT, PO Box 695, Amherst, MA 01004).

For french-speaking enthusiasts of free radio, this new high-quality tape is a goldmine of avant-garde radio. Recorded on Maxell tape and mastered in Paris, a wide array of original programming is presented.

Listen to Radio Libertaire, Radio Renaud, Radio Solidarite, Frequency Gaie (yes, that's right!), Radio Riposte and Radio Arabie-Belize.

A unique collection for your cassette player...if you understand French!

INSIDE YOUR COMPUTER by I.R. Sinclair (5-1/2" x 8-1/2", 108 pages, softbound; $12.97 from Wayne Green, Inc., Dept. MT, Peterborough, NH 03458)

Intended as a tutorial introduction for the beginner, "Inside" takes a comprehensive look at the inner workings of the home computer.

For the novice, the glossary will prove helpful in understanding terms like overflow, matrix, binary code, operating system. Chapters on software, microprocessor functions, program writing and hardware descriptions will provide greater user familiarity with this complex equipment.

FOX SCANNER RADIO LISTINGS edited by Norman H. Schrein (8-1/2" x 11", 80-100+ pages, softbound; ordering information 1-800-543-7892).

Scanner enthusiasts will be pleased to hear that MT columnist Norm Schrein is now affiliated with Fox Marketing and is expanding his prolific collection of frequency directories.

Recently added are the Columbus, Ohio area edition (RL003-1) and Detroit/Windsor edition (RL00801).

As with Schrein's other directories (reviewed earlier in previous MT book sections) the new publications are up-to-date and cross referenced by agency, callsign and frequency.

It is Schrein's intent to systematically collect and publish scanner data for all major metropolitan areas in the country, and his editions so far are an excellent start.

DOMESTIC LOG STATE-CITY INDEX edited by Michael G. Knitter and John Clements (8-1/2" x 11", 54 pages, softbound; $5 postpaid USA from the National Radio Club, Dept. MT, PO Box 24, Cambridge, WI 53523.

Although designed to stand alone, the Index makes an ideal supplement to the successful NRC Domestic Log, listed by frequency ($9.50, same address).

The Index is a compilation by state of AM broadcasters of the US and Canada, 540-1610 kHz. It is organized in sequential order by state, city, callsign and frequency.

SCANNER FREQUENCY DIRECTORY for NW OH and SE MI (5-1/2" x 8-1/2", 83 pages, softbound; $5.95 from Midwest Software Services, PO Box 399, Holland, OH 43528).

Approximately 5000 entries covering business, public safety, railroads, aircraft, marine, ham and federal government are included.

The handy directory concentrates on signals to be heard in the 9 Ohio and 7 Michigan counties which surround the Detroit metropolitan area.

Two cross-reference sections in order of frequency and callsign are included for all services except business (available separately). ~ See ad this page.

(from Los Numeros on pg 21)

VOA FIXED FREQUENCY SCHEDULE J-83

Station	Freq(kHz)	Time(UTC)
Bethany	19480	1130-1400, 1600-2300
	19261.5	1100-2230
	10869	0200-0815
Greenville	20125	1130-1400
	20060	1245-2000
	19505	1400-2000, 2300-0015
	18782.5	1400-2000
	18605	1300-1430, 1445-1500 and 1545-1600
	18275	1000-1100
	15752	2315-0815, 1000-1100
	15650	2330-0100
	10869	1900-2030
	10454	1000-1100, 1900-2300
	10380	2300-2400
	7768.5	0100-0715, 2300-2400
	7651	0100-0300, 0400-0600
	6873	0000-0430
Delano	13860	0945-1045
Monrovia	13995	1000-1100, 1130-1400

PROFILES

MANY READERS will be disturbed--and saddened--to learn that one of our regular writers, John Demmitt, is a prison inmate.

John accepts his incarceration philosophically. He does not look for sympathy. But he does hope to be accepted for what he can offer MT readers. This special article is a sample of his commendable openness.

A TIME TO REFLECT

By John H. Demmitt

Many DX'ers and SWL's know that my QTH is a state prison. I have been asked to tell what prison life is like so potential newcomers will have second thoughts about doing things which may put them in the same position I am in now.

I feel I can do this because of the genuine and sincere friendship I enjoy from the many DX'ers and SWL'ers who have accepted me for the person I am and not for what I was. From Maine to Florida, California to Idaho, points in between and around the world, many of you have touched my heart with your warm friendship.

It is in appreciation of this that I dedicate this article to my very dear and special friends.

***

Upon entering prison gates for the first time in my life I saw huge stone buildings with bars surrounded by a tall fence topped with barbed wire. Even though it was a warm day in June, I felt cold and empty.

The first thing I received was a number to replace my name. Not only is that number impersonal, it stigmatizes a person to a dogmatic state. To further remind me that I was an inmate, I was issued prison clothing: a brown hat, a brown shirt, a brown pair of pants, a brown pair of socks and a brown pair of shoes. I hate brown!

I was then assigned a cell with a commode which leaked, a sink with green water marks, a rusty cabinet, a bed with stretched springs and a thin mattress. The floor was covered with dust and dirt which served as hiding places for roaches and waterbugs. I could stand in the center of the room and touch all four walls.

Along with the cold and emptiness came loneliness. When you go to prison you learn who your true friends are. You don't have many and the longer you're behind bars, the fewer friends you have.

You lose family members also. Some will be too ashamed and embarrassed to write or visit. Some will simply want to have nothing to do with you anymore. Letters will get fewer and fewer as time goes on.

Loneliness soon changes to depression when the letters stop coming. The letters are the only contact you have with the outside world but no one out there seems to realize just how important that correspondence is to an inmate.

Suicide comes after severe depression. It's more common than the public is led to believe. Prison officials keep such things under wraps in the name of security so that embarrassing investigations aren't launched. Prison officials do not want the public to learn of the corruption and violence which is very common in the prison system.

Overcrowding has an effect on all prisoners, even those not celling with another inmate. The food budget designed for a population last year must now feed twice as many inmates. Starchy foods are often served to keep the weight on inmates.

Food has a different taste in prison. Pork patties taste like sawdust; mashed potatoes taste like air and sand; vegetables are over-cooked to the point where they seldom have any taste at all.

There is no privacy in prison - none at all. Doors are designed so anyone passing by can see the entire room. There are no closed areas to be alone. There is always noise--noise from inmates shouting threats and obscenities across the cell block fills the ears day and night.

You may wake up to hear two cellmates fighting over whether the light should be on or off. Some nights are so noisy you might not even get to sleep.

Every night at least once an hour a powerful beam of light hits your eyes as the guard takes inventory of the prison warehouse.

There is nothing private in prison. Letters are opened to check for contraband and sometimes read even though it's against the law. A simple message on the envelope saying "opened by mistake" excuses the breaking of the law. Meanwhile, prison officials know what the attorney wrote the prisoner.

There are telephones in prison to call those who are willing to accept a collect call. These phones are believed to be monitored, so personal messages to a loved one cannot always be said.

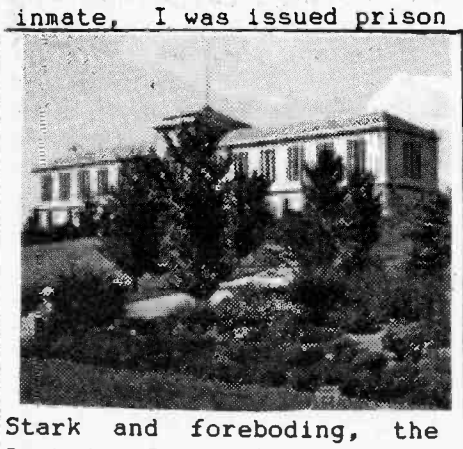
When prison officials do anything against the law it's done in the name of "security" which justifies the illegal actions.

Newspapers, magazines and books are sent to a book review committee which decides if the inmate should have the publication. I have been refused many electronic publications simply because the committee did not understand what was being discussed in the materials.

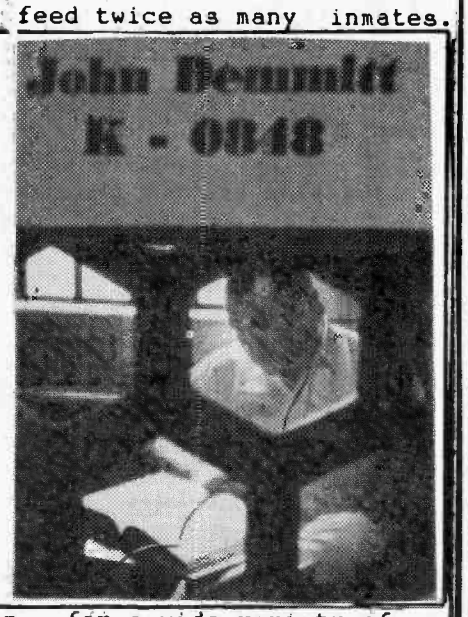
Security is always the reason for not permitting a publication; never the word "ignorance".

Ignorance in the name of security plays an important part in deciding what is to be allowed in the form of personal belongings. Prison officials will not permit cameras, tape players, video games or short-

(continued on page 24)



Stark and foreboding, the Rockview State Penitentiary is now home for author John Demmitt.



"Almost anyone can go to prison, for a wide variety of reasons. What happens there today is that everyone sinks to the lowest common denominator, and no one is raised to his potential of productivity" --- Sydney Harris, syndicated columnist.

(Profiles con't from pg. 23)

wave receivers in the name of security. They are afraid a tape player can be converted into a recorder and used with a camera to record acts of corruption and violence.

No one has even figured out the reasoning for restricting video games; we are told that to tell us would be a breach of security. Shortwave receivers are restricted because prison officials fear it can receive police calls and transmit.

These are well known misconceptions, but when offered evidence to provie that shortwave receivers are not a threat to the security of the institution, the officials again cry, "security!".

Any attempt to change the system from within is usually met with harassment. Mail is censored, delayed and sometimes disappears. Word is put out for staff members and guards to watch for the slightest infraction. Some guards take this to mean that they can harass the inmate.

The work area is a place where there is usually no meaningful work which will prepare an inmate for a vocation once he's released. Where there is work, it is often an area with unsafe working conditions which contribute to frequent accidents. All this earns the inmate 13¢ an hour.

Health conditions are very poor in a prison setting. Sickness and disease are often widespread. Sometimes health problems go untreated for months at a time. I can attest to a personal experience.

I came down with active tuberculosis, but was treated for it four months later. The first two months I was given cold medication. The second two months the medical department gave me antibiotics for a lung infection which had no effect on the TB. Finally, after four months when my weight dropped from 165 lbs. to a mere 105 lbs., I was referred to a doctor. The doctor immediately sent me to a hospital so I could receive treatment for the active TB.

I spent several months under heavy medication until my health was partially restored. The result of being denied proper medical attention at the beginning has shortened my life expectancy and has made breathing sometimes painful and difficult.

My only happiness in prison outside of corresponding with friends is going out to the TV repair shop where I sometimes repair radios and TV's for staff members and guards. While there I can hook up a piece of test equipment to a TV set and rig my own homebrew shortwave set.

The few precious moments I spend listening to shortwave stations from around the world frees my mind from the ugly bars, barbed wire, stone buildings, harassment, violence and noise.

These moments are not long enough. I am soon shocked back into the reality of the cold, cruel, lonely and violent place I'm in.

Hear Shortwave On A Portable Radio

By John H. Demmitt

How many times have you been unable to listen to your favorite shortwave programs because your communications receiver was too large and bulky to take with you? Have you ever gone hunting, fishing or traveled a long distance in your car only to wish you could be listening to the shortwave bands?

Now there is a way you can have a shortwave receiver and you won't have to pay a penny for it! You do not need a background in electronics to have a handy portable shortwave receiver you can take wherever you go.

All you need is an old pocket portable radio, a length of wire and a screwdriver. With these items you will soon be listening to shortwave.

After performing this simple operation your AM radio will receive little if any medium wave broadcast stations; however, once the procedure is reversed, reception will be back to normal.

Most people have an extra radio or two around the house which is no longer used so I urge you to use the receiver you no longer need!

We begin by placing a fresh battery in the transistor radio so we know that the radio is fully operational.

Remove the back of the radio so the screws of the main tuning capacitor is exposed.

Step One

Locate the strongest station on the high end of the AM band and adjust the tuning knob slightly to the lower side of the frequency so that it can still be heard, even though it is now weaker.

Now look at the screws of the tuning capacitor. If the radio is an AM/FM, it will have four screws. Avoid the two closest to the coils.

With a small screwdriver carefully turn one of the screws of the tuning capacitor and adjust slightly, remembering the position so you may return to it should this not be the correct screw.

Listen for the station to get very loud and with further tuning the station should disappear completely. If the station only gets louder or weaker as the screw is being adjusted, go to the other screw. When you are adjusting the correct screw (oscillator) the station will be found lower and lower on the dial.

Keep adjusting slowly, remembering to keep resetting the dial lower each time. At one point the station will start to rise. Back up and take the station to its lowest frequency.

Now go to the other screw (R.F.) on the AM side of the tuning capacitor and adjust it until the station can be heard strongest. You will have to turn the volume up as the frequency is lowered.

Near the tuning capacitor is a can (mixer coil) with an adjustment which will allow the receiver to go even lower in frequency. Locate this through trial and error remembering to reset the adjustment back to where you started should the adjustment have no effect. When you find the correct can, turn the adjustment all the way in the direction which lowers the frequency.

Step Two

Take a length of insulated solid bell wire and wrap several turns around the coil of the ferrite antenna rod starting at one end and run the excess out through the hole in the back of the radio cover and bare the end.

For the next and most important adjustment, wait until the hours of darkness, ideally from 7:00 P.M. until 11:00 P.M. local time. Propagation is good and many stations are on the air and you will be able to identify the stations you hear.

Step Three

Without using an external antenna, tune the dial of your new shortwave receiver to the upper portion of the band. Turn the volume up and tune very slowly until you hear a group of broadcast stations.

When you hear these, tune back and forth until you have a rough idea where the center of this group of frequencies is. Now go back to the R.F. screw on the tuning capacitor. Tune the screw for the loudest volume level. Reception will be better on the higher end of the dial so stay with this group of frequencies. Chances are that most radios will pick up either the 31 or 49 meter bands. Depending on the receiver you use, you may be able to pick up lots more.

To improve reception you can connect a 25-100 foot wire antenna to the length of wire which extends from the radio. Another method which can be used if an antenna is not available is to place the radio near the telephone, telephone wire, or other large metal objects. You may even want to experiment by placing a length of wire around the radio until the radio is covered. This inductor antenna works very well.

Your new shortwave radio will not work as well as an expensive communications receiver, but it will pull in those high-powered stations such as VOA, AFRTS, BBC, Voice of Germany, R. Nederlands, Moscow, Albania, Cuba, WWV, CHU and many, many more.

It may surprise you to know that at times you can even find good DX signals on this type of shortwave radio. Now you may take shortwave with you wherever you go.

(For those readers who may have questions or who may require additional information, please feel free to write this author.)~

JAPANESE CODE NETWORK REPORTED

Reader Dave Shite W1SZJ reports hearing several networks using Kana (Japanese characters). The common frequency 3700 kHz is used, right at the bottom end of the amateur 80-meter Novice band.

Dave says that the nets can be copied evenings between 0045-0215 UTC following at least 4 distinct schedules.

Could these be illegal fishing or whaling nets? They appear to be from fixed locations rather than mobile.

Listeners with additional information are invited to share their findings in the pages of Monitoring Times.

Thanks, Dave, for sending this interesting item in.~

(SSTV con't from page 6)

Owners of Apple II home computers can also join the SSTV viewing action with the aid of a hardware/software package available from Commsoft, Inc., which also advertises in amateur radio magazines. This "converter and programming package" takes only a few minutes to install in the Apple, and results are outstanding.

Through close monitoring of the international SSTV calling/working frequency of 14,230 kHz/(USB) one may learn of other computer programs and software for his particular computer. Since this field changes quite rapidly, listen for others using a computer in which you're interested and then write them directly for details.

There are, for example, SSTV packages available for the TRS-80C from K6AEP, and there's talk someone is working on a similar package for Commodore VIC-64 computers.

It's interesting to note some shortwave broadcasters are investigating SSTV for use in conjunction with their international programs. The Voice of Israel in Jerusalem, for example, has transmitted views of their city, the statue of David, their famed city wall and so forth, during Ben Dalfin's weekend "DX corner". Frequencies have been in the 49, 40 and 31 meter bands.

Assembling and using an SSTV setup for picture reception is relatively simple, usually allowing the SWL enthusiast to move from carton to viewing in less than 30 minutes time. The shortwave receiver's audio output is connected to the scan converter's input jack.

Conventional RCA phono plugs and jacks are used in most cases. The scan converter outputs "raw video", similar to that of simple home computers and video games. That signal is directed to a simple TV modulator which, in turn, connects to the antenna terminals of a conventional TV set.

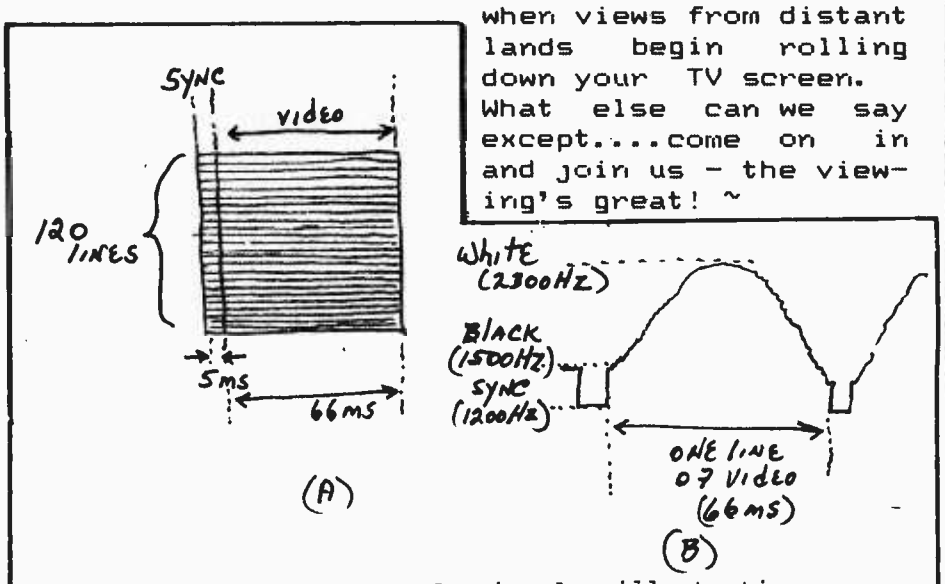
The TV is then tuned to channel 2 or 3 for displaying the received SSTV pictures.

Most scan converters include built-in gray scale test pattern generators for system checkout and alignment when an incoming SSTV signal is not present.

Tuning SSTV signals is easier done than said. We suggest beginning by tuning some of the action on 14,230 kHz during week nights. Remember SSTV signals sound like "musical RTTY", and whenever possible, tune for the most natural sounding voices from SSTV operators (they will occasionally break video transmissions to describe views and compare notes with other on-frequency amateurs).

Alternately, you can slowly tune across incoming SSTV signals until pictures begin rolling down the TV monitor screen. As with RTTY, tuning SSTV signals takes a bit of experience. Be patient and note which tuning actions work best for you personally.

The results will truly be worthwhile, when views from distant lands begin rolling down your TV screen. What else can we say except....come on in and join us - the viewing's great! ~



Composition of Slow Scan TV signals, illustrating scan rates and frequencies. Horizontal sweep rate is 15 Hz. Vertical scan takes 8 seconds to produce a single 120 line picture.

SPY LOG '83

By Lani Pettit
(Spy Centre editor for A*C*E*)

Writing an article for a respected publication like Monitoring Times is indeed an honor; pirate and utilities buffs find it a necessary part of their DX libraries. And, of course, those of us into "spy-chasing", are great fans of the mysterious Havana Moon! (Thanks for the nice comments about A*C*E*, H.M.)

The following guide to spy numbers broadcasts has been compiled from loggings by A*C*E* members, with some gleanings from Spence Naylor's fine utilities column in ASWLC.

Special recognition goes to David Markwick, A*C*E*'s spy expert in the U.K. for his regular reports of GG (German) and RR (Russian)-type broadcasts that are not so easily heard in this country.

Most transmissions are full carrier AM, although some SSB is reported.

There are different formats and voices within a language, yet there are striking similarities between broadcasts of differing languages. Sometimes the spy makes a mistake, and we learn from that.

It is all very intriguing for would-be detectives who wonder: "Why does the YL (female) of GG 5-digit broadcasts on 9266 sometimes transmit in English (EE)? Or, "Why are the clicks heard with one the SS/5 spies at about the rate of 78 rpm's? Don't they have a tape recorder?"

The common 4-digit Spanish (SS/4) spy has revealed some interesting facts in recent weeks. Transmissions are on the following frequencies, often with two in parallel: 4305, 4670, 5810, 6840, 8417, 9072, 10700, 11532, 13450, 15650 and 16450...give or take a few kHz.

There are two other spies definitely related to the SS/4. One is the SS/3 on 10570//13808, which comes on with time pips at 0125, almost every day. At 0130 there is a longer tone, and the YL of SS/4 fame comes on with 3 or 4 groups of 3 digits, repeating them over and over until 0140. And at 0325, there are the same identical pips and format, but with CW from 0330-40.

The CW is very slow, and gives the 2 to 4 groups of 4 letters and numbers over and over. This CW spy uses only 8 different letters and 2 different numbers in all its broadcasts. That makes 10 figures....exactly the same as any voice spy uses!

While working on this article, I made an interesting new discovery. CW/4 was heard on 9266, at 0208, with traffic; and the next day at 0308 a different CW/4 spy was busy for at least an hour on 14441, also with traffic.

They both used the same 10 figures that the 6840's CW spy uses, and in the same too-slow manner. Does this make the GG/5 a cousin to the SS/4???

Now it's your turn to look for spies! Transmissions usually begin on the hour, fifteen after the hour and sometimes the half-hour. If you use an ICF 2001 like I do, you can put the frequencies in memory and then check them periodically.

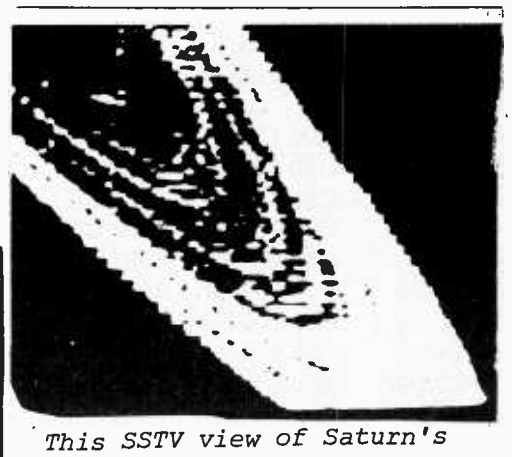
XXXXXXXXX

CC-Chinese, EE-English, GG-German, RR-Russian, SS-Spanish, CW-Morse Code, and PH-phonetic alphabet used by any language broadcaster (such as "Kilo Papa Alpha 2" or "Papa November"). An item followed by * has been reported more than once this year. Those marked ** are heard often, and likely to be found again if you check regularly. A triple *** indicates a very regular, almost daily spy transmission.

Remember, these listings are only as accurate as the listener reported them. Some were heard in Europe and will not be receivable in the U.S.

All are subject to change and some will be obsolete by the time you read this.

Happy hunting!



This SSTV view of Saturn's multiring structure was received from Voyager II and relayed to radio amateurs and SWLs around the world by W6V1Ø at J.P.L. in Pasadena. The "ringside seat activity" was conducted on 14,230 kHz.

0000 UTC	0200 UTC
5015 GG/5*	4670 SS/4**
9040 SS/5	5810 SS/4**
9050 SS/5	6825 ??/?
9074 SS/4**	7445 PH/x
9972 GG/5	9050 GG/5
11532 SS/4**	9074 SS/4*
	9265 GG/5*
0100 UTC	9972 GG/5
4010 GG/5	11532 SS/4*
4015 SS/5	
9052 EE/5	0230 UTC
9074 SS/4**	7750 GG/5
9265 GG/5*	
9972 GG/5	0300 UTC
11532 SS/4**	3445 SS/5
12315 SS/5*	4305 SS/4*
13450 SS/4*	4670 SS/4*
	6214 EE/5
0130 UTC	6572 SS/5
4670 SS/4	8173 PH/x
4670 PH/x	8225 PH/5
8173 GG/5*	9050 GG/5
10570 SS/3***	9072 SS/4*
13808 SS/3***	9265 GG/5*

(continued on page 26)

(Spy Log con't from pg. 25)

9265 EE/5
9435 EE/4
11420 SS/5
11518 SS/5
11532 SS/4*
11540 SS/5
13442 EE/5
14410 GG/5
14441 CW/x

0330 UTC
4706 SS/5
6840 CW/4***

0400 UTC
3240 SS/5
3435 SS/5
4780 SS/5
4825 SS/5
5812 SS/4*
6226 SS/5*
6235 SS/3?
6240 ?EE/x
6500 PH/5
7375 EE/4
8418 SS/4*
9074 SS/4★
11054 SS/5*
11532 SS/4*
12415 PH/x

0430 UTC
3220 GG/5
6875 SS/5

0500 UTC
3240 SS/5
3445 SS/5
5175 SS/5
6780 SS/5*
6870 SS/5
7375 EE/3
7885 SS/5*
8119 SS/5*
8418 SS/4*
8870 SS/5
9074 SS/4
9450 SS/5
10610 EE/4*
11532 SS/4
11630 SS/5*

0530 UTC
6780 SS/5*

0600 UTC
4025 SS/5*
5015 GG/5
5760 SS/5
6780 SS/5
7404 GG/5*
7854 SS/5
8110 SS/5
11034 EE/4
12315 SS/5

0630 UTC
3820 GG/5*
5015 GG/5
6780 SS/5
6870 SS/5
6875 SS/5*
7407 GG/5*
9360 SS/5
10015 SS/5

0700 UTC
4835 SS/5
6748 SS/5
7845 CW/5
17410 PH/5

0730 UTC
3260 GG/5
6315 SS/5
6735 SS/5

0800 UTC
6455 GG/5*
6780 RR/5
6855 GG/5*
7380 RR/5*
7410 GG/5

0830 UTC
6455 GG/5
7404 GG/5*

0900 UTC
7375 GG/5

1000 UTC
5923 SS/5

1030 UTC
5410 GG/5
6226 SS/5
6410 GG/5
11465 GG/5

1100 UTC
11450 GG/5

1200 UTC
6410 GG/5
7407 GG/5

1300 UTC
12950 PH/5

1330 UTC
5476 CW/x

1400 UTC
6855 GG/5
7375 GG/5*
7407 GG/5*
9830 CW/4*
14935 GG/5

1500 UTC
4010 GG/5
7407 GG/5

1600 UTC
3380 GG/5
4010 GG/5*
4730 GG/5*
7830 GG/5

1630 UTC
4010 GG/5*

1700 UTC
3260 GG/5
3370 GG/5*
3380 GG/5
4010 GG/5*
5440 GG/5
9465 CW/4
11215 CW/4

1800 UTC
3220 GG/5
3380 GG/5
4010 GG/5

1830 UTC
3260 GG/5*
4010 GG/5

6373 GG/5
8925 PH/5*

1900 UTC
3220 GG/5*
3370 GG/5
3380 GG/5
4010 GG/5*
10740 GG/5*
11350 GG/5

1930 UTC
4010 GG/5
7605 PH/x
8925 PH/5

2000 UTC
3260 GG/5*
3380 GG/5
3820 GG/5
4010 GG/5
4022 GG/5
5230 PH/5*
7445 PH/5*
8450 ??/?
8925 PH/5

2100 UTC
3062 PH/x
3220 GG/5*
3240 RR/x
3260 GG/5*
3370 GG/5*
3380 GG/5
3808 GG/5
3820 GG/5*
3852 GG/5
4010 GG/5*
4022 GG/5
4780 SS/5
5230 PH/5
5440 GG/5
7445 PH/x
8078 EE/5
8925 PH/5
10500 EE/5
11532 SS/4
14845 SS/5

2130 UTC
3260 GG/5
4010 GG/5
10460 GG/5

2200 UTC
3150 PH/x
3230 GG/5**
3240 RR/x
3260 GG/5*
3370 GG/5*
3380 GG/5*
3416 PH/x
3820 GG/5*
3852 GG/5
4010 GG/5*
4022 GG/5
4545 GG/5
4790 GG/5
4990 GG/5
5016 GG/5
8925 PH/5
12415 PH/
14420 SS/4*
14945 GG/5
15560 SS/4

2230 UTC
3260 GG/5*
3370 GG/5*
3820 GG/5
4010 GG/5*
4670 PH/x
8871 CC/x

2300 UTC
3260 GG/5*
3365 RR/x
3370 GG/5
3820 GG/5*
4010 GG/5
4545 GG/5*
5015 GG/5
7445 SS/x*
11532 SS/4*
13450 SS/4*
14419 SS/5

2330 UTC
8425 PH/x
9446 SS/x*
12160 CW/4
12315 SS/5
15650 SS/4
16450 SS/4

The Drug Smugglers...An Update

A year ago, Monitoring Times was the first publication to expose the elaborate drug smuggler radio networks. The feature caused quite a stir among federal officials and outlaws alike.

In the year following, was there any change worth noting? Yes. The increasing availability of general-coverage transmitters such as the ICOM 720 and Kenwood TS930 provided ample opportunity for evasive frequency jumping.

The notorious "Black Tuna" gang, a subsidiary of the mob, no longer concentrates its communications just below the 20 meter band (13964 and 13979 kHz) or just above (14505-14515 kHz), but may be found throughout the HF spectrum.

Other rival traffickers also populate the mid and upper part of the HF spectrum with daily contacts to coordinate shipments, arrange payoffs, alert boats of Coast Guard positions and apprise fellow gangsters of the latest busts!

It is sometimes difficult to tell the good guys from the bad (you can't see their white and black hats!), so Monitoring Times presents the following frequency update resulting from extensive listening.

Military Affiliate Radio System (MARS) frequencies commonly encountered are included to avoid confusion of identification. Not all English and Spanish-speaking entries are necessarily smugglers, but content of their communications was suspicious.

ENGLISH	MARS	SPANISH
6355	7301	6953
6910	7312	6980
	7345 USB	6983 LSB
	7366 USB (USN)	6988 LSB
	7371 USB	6995
	7373 USB	7335
	7383.5 USB	7355
	7391.5 (USN)	
	7407 USB	7410
		7415 LSB
		7430
	7432.5 USB	7432
		7450
		7453
		7457
		7460
		7471.5
		7476
		7492
		7516
	7540 USB (USAF)	7517
		7550
		7560
	7635 (CAP)	7645
		10085
13280.5 USB Sat 2230		
13333.5 LSB Cap, Charles, Grease; Sat 2200		
13240 USB 7 pm net		
13700 USB/LSB "CQDX" "Bruce calling Nigel"		
	13826	13370.5
		13840
13933 "Airplane" "ETA" "Go Green" then scrambling		13903
		13917
	13971 (Canada)	13964
	13974	13983
	13977	13989
		13990
	13993	13993 LSB
	13996 (USA	13994
		13995
		13998
14360 6:50 am also 8 pm Sun phone patch "PE1"		14001
		14349
		14352
14362.5 (7 pm Sun.)		14360
14374 LSB (P-P telephone French)		14363
		14365
		14368.5
	14382 (USN)	14382
		14380 callup Sun 8 pm
14391.5 14400 1pm Mon (AAROUSB)		14390 tractical middle Eas
14404 LSB		14396
14407.5 1 pm/2 pm Monday		14400
14410 (sec) 2 pm	14402	14402
14425 (pri) 8-9 pm		14410 8 pm Sunday
14422 Sun 11:20 am "DZT"		14419
		14421
		14430 call up Sun. 7 pm
		14432 call up Sun 8 pm
		14437
	14441.5	14440 call up Sun 8 pm
	14445	14445 call up Sun 7:30 pm
		14448
14450.5 USB "Big Brother" "Little Brother" 8pm		14450 call up Sun 7pm 8pm
14450 USB		14452
		14454
		14455
		14457 Sun 7:30 pm
		14460 (major pool at 7 pm)
		14462
	14467	14465 call up 7pm Sun
14470	14470.5	14470
	14477	14475
		14480
		14482 1 pm Mon callup
14485 7 & 5 Sun		14484 7 pm
		14487.5
14493 "C6A4" "C6B1" Sun 11 am		14490
14495 7 pm "AAL" "RFQ" "mobile to base"		14493 Sun 8 pm
		14500
		14501.5
		14503
14510 "J7" "A9" 1800 callup		14506 Sun 8 pm
		14510 callup 6 pm Sun
		14512
14516 USB		14515 LSB
14519 LSB		14518
		14525
		14527
14563 LSB		14530
14626 USB "V2T48" "K9C81"		14533
		14543 LSB
		14587
14818.5 (USN)	14606	14615
14889 USB	14640	14650
	19937	18923
	20886	20961 LSB
	20936	25231
	20970 (Canada)	
	20987	
	20991 20994.5 20997 (USN)	

TECHNICAL TOPICS

Do you know the new UHF frequencies in use by the Nassau County, NY sheriff's office?

John J. Moran
Bethpage, NY

The new frequencies in use in your area are:

477.2375 Precincts 1 and 7
477.3875 Precincts 2 and 8
478.9125 Precincts 3 and 6
477.2125 Precincts 4 and 5
477.2625 Highway Patrol
477.1875 Northside Admin.
477.2875 Southside Admin.
478.7125 Detectives
478.7375 Tactical
478.9375 Special Details

Notch filters and tuned coax stubs have failed to improve my problems with intermod and aircraft images on my Bearcat 250.

Are there other devices which I can make or purchase to help with the problem?

Brent Basinger
Alta Loma, CA

Sounds like you have real problems with those aircraft images. Since all notch filters are narrow-bandwidth devices, it's quite possible that you need to remove much of the entire aircraft band. There are two possibilities: 1) Design a band-reject filter; 2) Design a high-pass filter which will remove everything below about 150 MHz or so, including low band.

Another possibility which is used on occasion is the use of two cascaded (in series) Scanner Filters. Each is adjusted to a slightly different frequency from the other like 125 and 130 MHz.

That technique works quite well in high signal level areas like yours.

There is the possibility that what you are hearing is intermod resulting from a strong local signal (FM, TV, mobile phone, weather) beating with the aircraft signals producing output on high band. If this were the case, you would hear the modulation from that other station as well.

Can you use a Bearcat 210XL as a frequency counter for a DX-200 Radio Shack Shortwave radio?

Pat Eckenrode
Ormond Beach, FL

To my knowledge you can not use any digital-display scanner for a frequency counter because the display is controlled by an algorithm program from the microprocessor, not by measuring the oscillator frequency.

Would you know of any CB publications on the market now that I may subscribe to such or similar to the old S-9 or CB Times?

David J. Sage
Boston, MA

Both CB Magazine and S9 Magazine folded about a year ago after an attempt to merge. At present no magazine has picked up the pieces, although Tom Kneitel's new venture with CQ Magazine, Popular Communications, touches upon the CB scene somewhat.

Which scanners can be used with the Grove Scanverter?

Walter F. Ahern
Fayetteville, PA

The 225-400 MHz military aircraft band is almost exclusively AM, just like the domestic commercial 118-136 MHz aircraft band. For that reason, the conversion must be into a scanner that has an AM band...the 118-136 MHz band.

Could you please let me know if one must have an outside antenna to have a Globescan Shortwave Converter. I have a Bearcat 350 with aircraft reception. Will it work with built in antenna on scanner?

Betty Curran
Clifton Springs, NY

While you can not use the built-on whip which came with your scanner for shortwave reception, a random (10-20 feet long) wire strung around the ceiling, between rooms or through an attic crawl space will provide worldwide reception.

Incidentally, the Bearcat 350 will work quite well with the CVR-2 Globescan. ~

(Viewpoint, con't from pg 3)

Bob, I want to say once more how much I appreciate the chance to get some articles published in MT Thanks to the experience I've gotten from writing for you I managed to sell an article to Survive magazine that will be published in October. The fact that I had been published in your magazine helped them in their decision to purchase my article. (Name withheld).

Thanks for putting together a great publication. I have purchased books and accessories from you and enjoy them all. Your ideas are great, your publication was needed and above all your thoughtfulness to your readers is appreciated. Don Bernard, Milwaukee, WI.

Keep up the great job on MT - last issue sure was dynamite! John Henault, Abington, MA.~

HELPFUL HINTS

ANTENNA CONNECTOR FOR HAND-HELDS

by Art Kimball

A brand new product from Radio Shack, just put on the shelves in the past couple of weeks, is made to order for owners of Bearcat Hand Held crystal scanners, but not the BC-100.

Catalog Number 20-020 ($2.95) External Antenna Adapter, which is made for Realistic Pocket Scanners, allows connection of a Motorola-type antenna plug to the unit. It also has spade lug attached so you can use a base-station antenna with it by attaching the center conductor with an alligator clip.

I have used the adapter with my Bearcat 4-6 in the car, and it works fantastically well. A machine shop can turn down the screw threads to fit the Bearcat 100 (10-32 thread) or an adapter could be made to fit the 100. You may have to ask your nearest dealer to reserve one for you; they have been hard to come by.

MODIFYING RECEIVERS

A number of electronic specialists offer modification services for popular brands of shortwave receivers. These include Electronic Equipment Bank (EEB), Radio West and others.

For the adventurous hobbyist, component kits are available for home refurbishing. Two outstanding sources for Kenwood and Yaesu improvements are well known.

The Fox Tango Corporation (PO Box 15944, West Palm Beach, FL 33406; ph. 305-683-9587; also 3977 Sedgwick Avenue, Box 274, Bronx, NY 10463; ph. 212-796-6200) specializes in Yaesu equipment parts, filters and articles. Some Heath, Drake and Collins are available.

The Users International Radio Club (Newsletter: 364 Kilpatrick Avenue, Port St. Lucie, FL 33452; ph. 305-878-7296; technical information: Suite N, 1532 SE Village Green Drive, Port St. Lucie, FL 33462; ph. 305-335-5545) centers on Kenwood product improvements.

Request catalogs from these reputable companies to see what they have to offer for your rig, mentioning that you saw their names in Monitoring Times.~

STOCK EXCHANGE

Note: Monitoring Times assumes no responsibility for misrepresented merchandise.

SUBSCRIBER RATES: $.10 per word, paid in advance. All merchandise must be listening related. Ads for Stock Exchange must be received 30 days prior to publication date.

ONE-ONLY SPECIALS FROM BOB GROVE:

Bearcat 100 pocket synthesized scanner, updated recently and in perfect, new condition with accessories and charger, Centurion external antenna adaptor, Centurion flex whip and special telescopic whip. $260 postpaid.

Spectrum Analyzer, Singer/Polarad UPM/84-A, 10-64,000 MHz, see the entire spectrum on video display! Manual and accessories included; excellent condition. See top photo on P.3 Sept/Oct 83 MT, left side. Original cost approx. $15,000; yours for only $495 shipped!

Oscilloscope, dual-trace Hickock OS-121IC/USM-140, DC-22 MHz usable to 50 MHz; includes manual, probe. Excellent. See same photo (above), right side. $395 postpaid.

Bob Grove, 140 Dog Branch Rd., Brasstown, NC 28902, or call 1-800-438-8155.

SP-600-JX1 Hammarlund receiver, 0.55-54 MHz, complete manual and RL-259 adaptor. Very clean. $200 plus shipping. Tom Swanson, 919-782-0791.

Bearcat Thin-Scan - Aircraft/UHF, 4-channel $75. Braun T-1000 (Gold Tuner Contacts) $250. Bearcat 100, charger, screw in whip $250. Rod Bourne, 4500 S. Four Mile Run #204, Arlington, VA 22204. 703-379-0388 evenings.

Bearcat 100 with two antennas, two sets nicads, charger, etc. 1 year old with manual and original carton. Excellent condition. $250 firm. David Gness, 16 Dow St., Salem, MA 01970.

Sell Yaesu 7700 and MFJ 722 CW/SSB notch filter both mint condition. $395. Elcan, 559 Longfellow Ave., Bronx, NY 10474. (212-542-9300 day) (212-548-1444 night).

HEAR FRENCH "FREE" RADIO! 90 min. cassette samples six "pirate" FM stations in Paris. High-fidelity recording. Fascinating! $5 postpaid, Magic Media, Box 695, Amherst, MA 01004.

Listen to Ohio at work--RR's, aero, business, federal government PLUS MORE! Sample newsletter $1 or SASE for details. All Ohio Scanner Club, 10 Avalon Rd., Mt. Vernon, OH 43050.

Yaesu FRG-7700 with FRT-7700 antenna, tuner and FRV-7700 VHF converter. All units in new condition. Used very few hours. $375 complete. Will ship UPS prepaid. Call 201-743-0600.

Yaesu FRG-7000 receiver in mint condition. Will ship UPS in original carton. Make offer. B. Thurman, 616-731-5600.

Collins 51S1 receiver (0.1-30 MHz), winged, mint, manual, $750. I ship. Dan 816-331-6959.

Panasonic "World-Wide" and Sony multi-band portables. Good for emergency use, parts for projects. Together $45. GE 3 ch WT, CH 9, 10, 19 incl. Two watts. New! $30. Sears 40 ch CB - NEW! $70. Money order. Harold Ort, 335-B Lasher RD., Ft. Wadsworth, Staten Island, NY 10305. Shipping USPS included.

WANTED: Monitoring Times vol. 1 Issues 1,2,3 and 5. Fred Childs, 2257 Fairmount Ave., St. Paul, MN 55105.

Pirate broadcasters, numbers stations, clandestines, mystery transmissions, drug smugglers, and Euro-pirates are some of our interests. If you share them, join the Association of Clandestine Radio Enthusiasts, an ANARC associate club. Information for SASE. Sample of our monthly bulletin, $1. Yearly membership, $8.50. A*C*E, PO Box 452, Moorhead, MN 56560.

Sell or trade Hallicrafters SX-71 completely restored receiver. Need DX302 or FG7. H.C. Ponder, Rt 1 Lawndale, NC 28090. 04-538-8364.

FOR SALE: 24 channel memory unit "NDH-515" for use with JRC NRD-515. Excellent condition. I bought the newer 96 channel memory unit and so I have no use for it. $100. Ed Flynn, PO Box 138, Ft. Meade, MD 20755.

Realistic DX-302 for sale. 2 years old, just got realigned, excellent condition. Digital frequency readout, covers 10 kHz to 30 MHz, USB, LSB and AM. Narrow and wide bandwidth selectors, adjustable RF attenuator and much more! Will take best offer! Contact Kevin John, 216 Park St., NE, Vienna, VA 22180. Phone: (703)938-4502.

FOR SALE: AN-UR-35C receiver. Tuneable for 225-400 MHz. Operation manual, power cord and antenna connector included. $90 plus shipping. Contact Joe Thornton, 3230 B. Carey Rd., Kinston, NC 28501.

FOR SALE: ACTIVE ANTENNA Preamp and Coupler boards with JFET (no other parts), as described in RADIO-ELECTRONICS Feb, Mar, April, 1983. $10 check or MO, no COD, Ohio res. add 5.5% tax. BURHANS ELECTRONICS, 161 Grosvenor St. Athens, OH 45701.

Wanted to buy any working police type radar unit. Also any non-working Motorola handy talkey for parts. Send description and asking price to O.L. Beaver, 904 San Felipe, Angleton, TX 77515. ~

Information Please

MONITORING TIMES WILL PRINT AT NO CHARGE (AS SPACE PERMITS) ANNOUNCEMENTS AND QUESTIONS OF A NON-COMMERCIAL SERVICE NATURE.

I would like to hear from everyone interested in NASA communications. All letters will be answered. Bruce M. Boston, 815 East Third Street, Beardstown, IL 62618.

The following equipment was stolen from my home in May: Kenwood R-2000 (SN 18502375), ICOM R70 (SN1080058). Any information please forward to Melvin Pratt, 312 Randall Drive, Apt. 115, Midwest City, OK 73110.

I am interested in DXing but have been unable to find a company that sells verification report sheets which can simply be filled out and sent in for QSL cards. Don Green, Sr., 27631 Cliffwood Ave., Hayward, CA 94545.

I would like to exchange scanner frequencies with people in or near the following cities/counties that have unlimited knowledge of these areas: Battle Creek, MI (Calhoun County), Miami, FL (Dade County), Quincy, IL (Adams County), Watertown, NY (Jefferson County). Please call me at 1-419-822-5587 and ask for Kevin or write: Kevin Trickey, 312 Jackson, Delta, OH 43515.

WANTED: Any state Office of Emergency Services (OES) frequencies; also federal frequencies. Kenneth Jillson, PO Box 462, Coulterville, CA 95311.

Are there any repair companies who can service my Tennelec MCP-1? Eugene D. Krolak, Jr., 173 West Labo Rd., Carleton, MI 48117.

I am having trouble verifying such countries as Algeria, Mauritania, Tunisia, and Somalia even after follow-up reports and additional IRC's. Any suggestions? Bob Brossell, 274 Meadowside Ct. Pewaukee, WI, 53072.

Would like to swap California area scanner frequencies, especially LA SWAT, movie studios. Dick Ferreira, 2200 N. Parmalee, Compton, CA 90222. ~

MILLER, H. E. 3/ 1/84
11205 1ST ST. N. E.

SEATTLE WA 98125