WHO'S HOPING?  
A Look At The Radio Spectrum

by Patrick O'Connor
Plain Road
Hinsdale, NH 03451

PART I: LONG WAVE 0-500 KHz

As a person enters the hobby of DX'ing he often tunes his receiver at random, stopping to listen to whatever interests him. As time passes he soon realizes that he must become organized, learning where and when to tune for what he wants to listen to. Here, for the beginner as well as the more experienced DX'er looking for new challenges, is the first part in a series that will look at the radio spectrum from the bottom to the top, showing where various signals are located.

The long-wave range--sometimes referred to as "radio's basement"--occupies the first 500 kilohertz (kHz) of the spectrum. Basic allocations are:

kHz: 

0-25 Naval communications; time signals; "OMEGA" navigational system
100 Navigational signals (LORAN-C)
155-281 Broadcasting in Europe, Asia & Africa
160-190 USAF "GWEN" system; 1750 meter license-free experimental band
160-200 Coastal & ship stations

200-285 Morse code nondirectional beacons (NDB's) for air navigation
285-325 Coastal & ship stations
300-400 NDB's, some with FAA weather reports
325-415 Morse code NDB's
400-500 Ship-to-ship & ship-to-shore CW/RTTY signals
500 International calling & distress frequency (CW)

Now we'll take a closer look at the types of stations on this band.

BROADCAST: 155 to 281 kHz is used for AM(amplitude modulation) broadcasting in Europe, Asia and parts of Africa. Unlike conventional broadcast stations that use power outputs measured in thousands of watts, long-wave stations are very high powered, often running in the millions of watts (megawatts). Two megawatts is not uncommon. On occasion, these stations may be heard in the U.S.

UTILITY: Many types of utility (non-broadcast) transmissions are heard on this band. The U.S. Navy uses the lowest part of the band to transmit messages to submerged submarines. Project ELF in Michigan transmits extremely low-speed Morse code (taking up to five minutes to send one letter) on a frequency of 7 Hz (that isn't a misprint; they do, indeed, use 7 hertz). Also used for Naval communications are 14.1, 14.7, 18.6, and 24 kHz.

Time signals are transmitted on 16 kHz from England, 25 kHz in the USSR, 60 kHz in the U.S. and England, and several other frequencies including 75, 182, 412.5, 418, and 482 kHz.

The segment from 160-190 kHz is used by the Air Force for its Ground Wave Emergency Network (GWEN). It is also available to experimenters as a non-license band. There are severe restrictions in this service: ALL other services have priority; only Morse code (CW) is allowed; power output cannot exceed one watt; and the antenna, including feedline, must not exceed 15 feet in length.

From 200-285 kHz and from 300-415 kHz are found low-powered Morse code beacons used for close-in navigation to airports. These beacons transmit their continuous calls so slowly that even if you don't know the code, you can read off the letters as they are transmitted.

Most beacons in the U.S. are transmitting in the calls (between one and three letters), whereas Canadian beacons follow their letters with a long dash. Also, any beacon with the first letter "Y" or including a number is probably Canadian.

Between roughly 300 and 400 kHz, there are several dozen beacon stations that transmit Federal Aviation Administration (FAA) weather reports by voice along with the Morse code identification. Morse-code-only beacons run powers of around 25-50 watts; the FAA weather stations usually have a power of 400-1000 watts.

The segment 160-200 kHz, 285-325 kHz and 400-500 kHz are used for ship-to-shore CW communications; it is in these segments that you are likely to hear "markers" from short-wave stations which allow other stations to tune into the correct frequency. The frequency 500 kHz is reserved for calling and distress use only; this is the most likely frequency to hear an SOS from a ship in trouble.

TUNING IN

There are certain advantages to DX'ing long wave: Since most signal propagation is by ground-wave, fading (QSB) is either non-existent or very slow (but deep); and there are hundreds of aerobeacons to listen for.

But there are also disadvantages: The band is extremely noisy with lots of atmospheric static making it hard at times to pull the low powered beacons out of the noise. Information on stations can be extremely hard to find at a reasonable price. One excellent publication that fits anyone's budget is the Beacon Guide and updates from Ken Stryker ($3.50 N. Boyne St., Chicago, IL 60609). Send an SASE for further information.

What equipment will you need? First, a good sensitive receiver with a BFO is a must. A long antenna is needed—the longer the better—and a good ground is recommended.

Continued on p.4
Hamfests and Conventions

Summertime automatically sparks a glimmer in the eyes of many ham operators and other communications enthusiasts alike; it's the season for hamfesting -- amateur radio conventions, flea markets and informational forums.

Whether you are licensed or not, hamfests are fun places to visit and can save you money if you are looking for equipment. The price competition can be fierce, especially at the larger gatherings where vendors frequently use the large crowds to turn over excess inventory to increase their cash flow.

The world's largest hamfest is the Dayton Hamvention, held this year (as it is every year) at the Hara Arena in Dayton, Ohio. Here, tens of thousands of inspired hobbyists and sellers alike congregate the last weekend in April to watch wits and swap prices.

Approximately 16 acres of flea market is an awesome spectacle, with rows upon rows of card tables and car trunks loaded with junk, good equipment and everything in between.

ANARC

As just about every SWL quickly learns, there is a wide array of clubs from which to choose the particular facet of your listening interest. To help coordinate their activities, an umbrella organization called the Association of North American Radio Clubs (ANARC) provides a variety of publications and services.

Monitoring Times is published by Grove Enterprises, Inc., 140 Dog Branch Road, Brasstown, NC 28902. Phone 704-837-9200. Copyright 1984. Subscription rates: $12 for one year, $22 for two years, $31 for three years. Canada and Mexico add $2 per year. Foreign subscribers: surface mail add $11 per year or air mail add $27 per year.

Viewpoint

For one who expounds the virtues of un-biased journalism, Margolis' editorially does not practice what he preaches. First he states that he doesn't care and it doesn't matter why Demmitt is imprisoned. Two paragraphs later he slams Ron Coogan for not using good journalistic procedure and consulting the public record to bring John's crime to light.

This harangue become the central theme throughout his letter. Mr. Margolis' preoccupation with John is a guest of the state is not the topic and casts a bias of its own on his motives for writing and his understanding of the situation that John is trying to oppose.

Honoring John and his lawyer's wishes not to publicize the details of John's crime pending further judicial actions speaks very highly of Ron's ethics as a journalistic reporter. I suggest that if Mr. Margolis is incensed about not knowing why John is imprisoned, that he research the public record like the journalist that he aspires to be.

Inmates in the Pennsylvania correctional facilities are allowed a clock radio. Why not a SW receiver, too? Listening to SW sure beats Dan Rather and the 6 o'clock news (speaking of biased). I have to sympathize with John and his fear of being culturally deprived by relying on AM radio and TV for news and comments.

Personally I think that most of us would not only be culturally deprived but demented if we had to rely on TV for enlightenment. Face it, CNN and PBS notwithstanding, the thousands of hours of TV programming per month are devoted to trash and violence. Just what a bunch of inmates need to watch while in prison, hours of megaviolence. Think about it.

As for the authorities that were never identified by Ron, they are a bunch of specialists who work extremely close to the margin.

It would be nice to offer sage wisdom to reassure the venerable American electronics industry of quick recovery and economic turnaround; unfortunately, none appears to be on the horizon.

The Dayton Hamvention is renowned for its gigantic flea market.
In all fairness to Monitoring Times and Ronald Coogan who wrote the article entitled, "Request Denied: The John Demmitt Case," I must take exception to the remarks made in the first two letters which appeared in the May "Viewpoint" column.

To Robert Margolis, I would like to remind you that Ronald Coogan carefully wrote an article telling of one inmate's attempts to convince the prison authorities that shortwave receivers do not pose a threat to the security of the institution, but instead can provide a rehabilitative tool in education, culture, religion and so on.

The author did not list my name, the name of the college I graduated from nor my brand of toothpaste because it simply was not germane to the subject he was writing about.

Perhaps you, in dwelling on an issue that was not relevant, missed the issue that some inmates in the United States are censored from listening to international radio stations because some authorities believe radios receive police calls.

I am very sorry if you feel that it is wrong for me to speak up when I see an injustice. I am just thankful that our founding fathers of America did not feel the way you do or we would still be under the rule of England.

It was most unfair of you to imply that in the event I was able to listen to shortwave, that I would listen to Radio Moscow. I personally prefer such stations as the BBC, D.W., R.C.I., Nederland, TWR, etc. I hope you will not be harmed if our tastes in programming are in agreement.

The assertion made by Mr. Margolis suggesting that I cannot read or understand the world news and events by listening to a five-minute radio and a 30-minute TV newscaster filled with commercials is not very astute as any serious shortwave listener knows. When there is a world situation in progress, that listener goes to the source to understand what is happening than by tuning to the countries responsible, listening to their views expressed in their own words, commenting on the news.

As for the person who did not want his name used and classes he has a letter from my warden saying that I am not in jail, I wish that was true! A great many people in the shortwave community will confirm that there is, indeed, a John Demmitt and will tell you my Old Arland, WP7EYR/K7VVA.

To both gentlemen I would like to make one last remark. Although I do not agree with what you have to say, I do respect your right to say what is on your mind and I admire Bob Grove for printing your views in spite of the fact that they are not of the same. In some of your statements were not true. He allowed you the freedom to express yourselves. All I am asking for is the right to be able to listen to international broadcasting stations. I don't feel my mind should be imprisoned as well as my body.

From the many supportive letters that have been arriving, I am happy to say that most of the MT readers agreed with me. I am very thankful for your support and wish to take this time to thank all of the MT readers who have been sending these letters of support to the Pennsylvania officials and myself as well.

For those wishing to know more, including the above mentioned gentlemen, I am including my address so you will be able to write me directly. I will respond to all letters.

Sincerely,
John H. Demmitt
Box A K6R8
Belleville, PA 16823

When the 47 sequence is detected in a SITOR message circuit it disables the previous sender, but it does not disable the other keyboard. This sure keeps both from sending at once.

"Old Sparky" Bill Edwards
RED COUGAR, NAVY MARINE CORP

Being an amateur photographer, I've been taking pictures of TV's for a few years. The price of a TV or a VCR (if theoney happen to send me), but the best condensed booklet I've found was (is?) put out by Eastman Kokak Co., 24th Street, Rochester, NY 14650. It is titled "Photographing Television Images." In the late '70s/early '80s, the price was $75, so would be best to send a card/letter to check availability/price. The booklet covers taking pictures of B/W and color screens by both 35mm and instant-type cameras, so would be of use to most persons w/a camera. The pub cat number was "ACO-10," but may have changed.

Hope this info helps fellow ERs.
Mike Hardester,
Modesto, CA

A comment about the April '83 issue: I'm very glad to see a column on aircraft monitoring. Aviation seems to have frequently been the forgotten step-child of monitoring and I'm glad to see it given the coverage I feel it deserves. I'm an active pilot who keeps a scanner on in the shadow when not flying. The first column was interesting and I look forward to continued good reading.

John Knight, KG8KX
Dallas, TX

In the April article "Plane Talk" the author gave sound advice saying not to rush out and buy an expensive aircraft band receiver. I live close to the world's busiest airport (O'Hare) and have monitored the aircraft frequencies for many years. It is my opinion that with the possible exception of listening to beacons, no hand could be more boring.

Commercial communications are dull, terse instructions about changing altitude, OK to use a certain runway, clear to land and take off, a little bit of VFR, VFR flight identification numbers, etc. No excitement, no humor, no idea where the plane is coming from, going to, or anything, to hold a monitor's interest.

Ken Greenberg
Skokie, IL

Mike Hardester, Modesto, CA

A comment about the April '83 issue: I'm very glad to see a column on aircraft monitoring. Aviation seems to have frequently been the forgotten step-child of monitoring and I'm glad to see it given the coverage I feel it deserves. I'm an active pilot who keeps a scanner on in the shadow when not flying. The first column was interesting and I look forward to continued good reading.

John Knight, KG8KX
Dallas, TX

In the April article "Plane Talk" the author gave sound advice saying not to rush out and buy an expensive aircraft band receiver. I live close to the world's busiest airport (O'Hare) and have monitored the aircraft frequencies for many years. It is my opinion that with the possible exception of listening to beacons, no hand could be more boring.

Commercial communications are dull, terse instructions about changing altitude, OK to use a certain runway, clear to land and take off, a little bit of VFR, VFR flight identification numbers, etc. No excitement, no humor, no idea where the plane is coming from, going to, or anything, to hold a monitor's interest.

Ken Greenberg
Skokie, IL

Mike Hardester, Modesto, CA

A comment about the April '83 issue: I'm very glad to see a column on aircraft monitoring. Aviation seems to have frequently been the forgotten step-child of monitoring and I'm glad to see it given the coverage I feel it deserves. I'm an active pilot who keeps a scanner on in the shadow when not flying. The first column was interesting and I look forward to continued good reading.

John Knight, KG8KX
Dallas, TX

In the April article "Plane Talk" the author gave sound advice saying not to rush out and buy an expensive aircraft band receiver. I live close to the world's busiest airport (O'Hare) and have monitored the aircraft frequencies for many years. It is my opinion that with the possible exception of listening to beacons, no hand could be more boring.

Commercial communications are dull, terse instructions about changing altitude, OK to use a certain runway, clear to land and take off, a little bit of VFR, VFR flight identification numbers, etc. No excitement, no humor, no idea where the plane is coming from, going to, or anything, to hold a monitor's interest.

Ken Greenberg
Skokie, IL
Nighttime is the best time to listen. On occasion, daytime listening may bring in nearby beacons normally inaudible at night. The best time to listen for European and African broadcasters is around sunset; for Asian/Pacific stations near your local sunrise.

Beacons may be heard all night; it is quite possible to upwards of 1000 as the night progresses. Long wave is a colder-weather band; summer thunderstorms produce loads of static, making the band almost useless.

VERIFICATION OF CATCH

Most broadcasters will verify a good, accurate report. You might have some problems making up a good report, as almost all LW broadcasts are in the native languages of the countries where the transmitter is located. To even up matters, most stations will accept reports written in English.

Most government-operated stations don't require reply postage, but those that are privately-owned (like Monaco, on 216 kHz) do; for these include either mint stamps of that country, or 2-3 International Reply Coupons (IRC's).

Most coastal and beacon stations will also verify, but you should include a prepared form card (PFC) with your report, indicating date/time/frequency of reception, and leaving space for the station to add power and antenna type, and the signature of the person who reports. ALWAYS include return postage with reports to coastal and beacon stations!

When you report to a utility station, you may report the call(s) of the station involved, but NEVER report the contents of the message! THIS IS A VIOLATION OF FFC 14-3.1 and may land you in real serious trouble! You can listen to your heart's content, but don't repeat what you have heard. Don't report either on the "marker" transmission, or just note the calls of the stations involved and the times of transmission.

Addresses can be tough to come by. Most U.S. aero-beacon can be reached by addressing your report to FAA Aeronautical, M/A/C, c/o the airport involved. Weather stations usually announce their locations ("This is Elmira Radio") from Elmira, NY, for example. Broadcaster addresses can be found in the World Radio-TV Handbook. Other utility addresses are very hard to acquire unless you are willing to shell out the big bucks required for ITU (International Telecommunications Union) publications; but even those are sometimes inaccurate or incomplete!

Most flea clubs with utility coverage have some listings of LW stations heard. Some carry addresses of utility stations. There is a club exclusively for LW DX'ers - the Longwave Club of America (45 Wildflower Rd., Levittown, PA 19057), which publishes a monthly bulletin called "The Lowdown." For a sample copy and membership information, send $1 to the address above.

Long wave may not be the easiest band to DX, but for those who seek unusual or low-power listening, this is the band to try. Give it a shot if you have the equipment—it can be fun!

IT'S HAMFEST TIME!

by Ed Somme

It's that time of the year again—the ham radio and electronic flea markets. This is where you can find every type of electronic device, old and new. And if you think it's for hams only, you're in for a surprise.

These flea markets, sponsored by amateur radio clubs and associations, are for anyone interested in electronics including the SWL and scanner enthusiast. Most charge a small fee to get in or a rental fee for an area or table to sell equipment.

You don't need to be a ham to buy or sell, and it's a great place to look for a scanner, HF receiver, home computer, antenna, CB radio, antique radios and parts, and other items. Don't let the fact that you are not a ham to keep you from going.

As a listener, you will probably be looking for scanners and HF receivers; you can get a really good deal on them, especially if you are not looking for the latest models available. The choice of equipment available goes from 1950 era receivers to the latest synthesized digital display units. You will, of course, find ham transceivers there, too, obviously at a greater price than receivers. But stick with the general coverage HF receiver; many hams don't sell HF transceivers to someone without a ham license anyway.

For the VHF/UPHF listeners there are scanners (synthesized and fixed frequency), tunable receivers, multi-position crystal receivers, and many commercial two-way radios (some converted to ham radio bands, others not).

Stick with the scanner and crystal receiver type radios. The commercial two-way equipment is for hams or amateurs, and in many cases requires modification and maintenance by qualified technical experts. And remember, the older it is, the more difficult it will be to locate replacement parts.

Many accessories for HF and VHF/UPHF monitoring are available at a bargain. Also, the antennas and parts, are available at great prices, a fraction of the cost of new ones.

One nice thing about the listening hobby is that you can use ham radio antennas and commercial two-way radio antennas for high performance monitoring; just make sure it works on the frequencies and bands you want to listen to.

Prices are always negotiable, and bargains are about the cost. Many sellers enjoy haggling and will usually come to an agreeable price. If they list prices on the equipment, they are usually the highest price they want. While you can usually check out a piece of equipment by looking at it, you should try it out whenever possible before buying it.

New VOA Transmitter Poses A Real Hazard

To Health

A recent item appearing in Newsweek has raised more than a few eyebrows. It seems that the new $150 local VOA transmitter to be constructed in Israel could put out signals strong enough to detonate the electronic fuses of bombs and other explosives at nearby ammunition dumps.

A search is now underway for a relocation site, possibly in the Negev Desert, sparsely populated and far from the troublesome dumps.

A FEW TIPS:

* Take a friend with you who knows about the hobby, too. It's great to have someone to help you check out equipment, bargain and talk to.

* When arriving at the ham radio flea market, walk around making a fast sweep of the entire area. Look specifically for items you need or want. Don't walk around again, looking at equipment in more detail.

* Let the seller know you are interested in a piece of equipment. Many times I have gone back to look at equipment again. If you stay to the end of the day—and the equipment is still unsold—you can often get a good deal while the seller is packing up.

* Physically check over the equipment carefully. Be sure it is complete. Try it out if possible.

* Don't let the seller talk you into anything you don't need (this does not happen too often, though).

* Negociate about the price; it's your money. Some hams will not take personal checks, so try to have cash with you. You can often bargain better with cash.

* Ask for the seller's home phone number so you can contact him if you have problems with the equipment.

* Check around and under tables; many items are placed there because of space limitations.

* Most of all, have a good time!
SWLing the Ham Bands: 1.8 to 29.7 MHz

by Mike Kerschner N3IK
RD 1 Box 181 A
Kunkletown, PA 18038

In more than 30 years as a radio amateur I have received fewer than a dozen SWL cards from listeners in the U.S.A., but have received hundreds from SWL's overseas. A few years ago I began to question every SWL I could find as to why they did not listen to the ham bands. I received four major answers--they are:

1. Hams don't QSL.
2. It isn't copy-code.
3. Too much QRM (interference) on the ham bands.
4. Hams are not interesting to listen to.

I will respond to the above answers, then I will tell you what to expect from each of the high frequency ham bands.

"Hams don't QSL!"

Some hams, like some SWBC stations, do not QSL, but the majority do. Remember: a QSL will cost at least 35 cents to send and many amateurs are on a fixed budget, and there are some amateurs who don't care about SWL reports or, for that matter, about receiving QSL cards from the stations they work. But the large majority of hams want to encourage the SWL and will send a card.

There are some methods by which you have a chance of getting a response from an amateur station and I will discuss this later.

"I can't copy code"

OK, don't listen to the code portion of the ham bands. About 65% of all amateur activity is on SSB, AM, RTTY and SSTV. Most SWLs tune the phone portions of the band, but with home computers and an interface many listeners can monitor the RTTY and code portions as well.

"There is too much QRM on the ham bands!"

There are a lot of stations on the ham bands but, on the average, you should be able to copy about 85% of what you hear without any trouble. If your receiver lacks selectivity the addition of a simple audio filter may work wonders when it comes to separating stations.

"Hams are not interesting to listen to."

This one blew me away, so I spent some time tuning the bands as an average SWL would. I must say there is a lot of "your sig is--" rig-off "thanks and 7'9' good on and they are boring to most folks (including me), but there are many, many interesting contacts taking place.

For instance the guy who just built a ham glider and flew it for the first time that day—or the family that just came back from ice fishing with a bucket of perch (which the XYL was cleaning). There are the traffic nets where messages and weather reports are made as well as the usual DX activities.

Now let's take a close look at the high frequency amateur bands and see what can be expected from each one and how the listener can get the most enjoyment from them.

160 Meters (1800-2000 KHz)

"Top Band" as 160 is frequently called is the lowest licensable ham band. It is in the medium frequency portion of the radio spectrum. Being located just above the distant broadcast band, it behaves much the same way with reliable day-time ranges of 50 to 100 miles widening to several thousand miles or a thousand miles at night.

From autumn till late spring it is possible to work halfway around the earth under favorable conditions. We are at the high end of the present sunspot cycle and DX conditions on 160 will be excellent for several years.

Amateurs are allowed to use phone or CW (continuous wave—Norse code) anywhere in the 160 meter band (and other bands as well). There are several gentlemen's agreements in effect on 160 to avoid problems arising from phone and CW signals trying to occupy the same frequencies. From 1800 to 1820 you will normally find CW operation; phone operation usually commences above 1835 with the segment from 1820 to 1835 reserved for DX stations to call in.

Normal contacts on 160 tend to be chatty and relaxed; a casual listener might think all the operators know one another on a personal basis (many do). Two contests each year turn 160 into something of a madhouse, but they are good times to log that rare state or DX station.

INVENTORY SALE! RUSH YOUR ORDER! LIMITED SUPPLIES!

ALL SALES FINAL -- CHECK or MONEY ORDER ONLY! NO CHARGES

See Grove catalog for full description of products.

MOBILE SCANNER ANTENNA

Reg. $29
NOW $22 - free UPS Order A476

A superior wide-coverage scanner antenna features rugged magnetic mount for reliable anchoring without drilling holes, yet easily removable for security. UHF element is a 3.5 dB gain collinear for maximum distance.

FREQUENCY COVERAGE 25-47 MHZ - 106-107 MHz:

FCH20 1HZ-500Hz $10...
FCH21 1-30Hz $10...
FCH18 1.5-30KHz $15...
FCH2 150-1500Hz $15...
FCH16 6KHz & up $5...
FCH17 1-1000Hz $5...

FREE FREQUENCY MASTER FILE (1984)
(a few broken sets available--no more than 7 cards missing on FCH 1-17; FCH0 has some states AL-IA Missing)

Stock # Frequency Reg.Price Sale Broke Missing
FCH0 10 State Index $15 $10
FCH1 1 Hz-30Mhz $10 $3.50
FCH2 30-150MHz $5 $5
FCH3 150.8-216MHz $15 $10
FCH4 450-656MHz $50 $50
FCH5 806-960MHz $35 $10
FCH6 960MHz & up $50 $50
FCH7 1Hz-1000Hz $15 $50

FREQUENCY LOGGING SOFTWARE FOR HOME COMPUTERS

CMP 2 Reg. $19.95 NOW $15 - free shipping
CMP 2-5 Reg. $14.95 NOW $10 - free shipping

ONE ONLY!!!

AEA/MBA MORSE READER, includes AC adaptor, tilt stand, full warranty. Reg. $389 NOW $289 - free UPS shipping

REGENCY MX4000 SCANNER, NEW, full warranty. Reg. $429 NOW $399 - free UPS shipping

INFOTECH H600A CODE RECEIVER, NEW, full warranty. Reg. $999 NOW $679 - free UPS shipping

GROVE ENTERPRISES

PO BOX 98 BRASSTOWN NC 28902

www.americanradiohistory.com
WHO'S ON FIRST? cont'd

Most activity takes place during the cooler months of the year because summertime brings high static levels and decreasing DX. 160 is a night owl band with enjoyable QSOs (contacts) going on into the wee hours.

80 Meters (3500-4000 kHz)
Expect to hear signals to 200 miles in daylight and 150 at night. Presently conditions on 80 are excellent for DX and hearing all continents on a single weekend of listening is not impossible. 80 is also very popular band for traffic handling networks and "rag chew" type QSOs.

80 meters is subdivided into CW, RTTY, SSTV and phone segments. There are also gentlemen's agreements looking on 80 for low power (QRP) operation. 3500 to 3750 kHz is exclusively CW and RTTY; 3700 to 3750 kHz is set aside for slow speed Novice use (an excellent place to practice your code). Low power operation can be found at 3560 kHz and 1660 kHz. If you hear a low power station and send a report you are almost certain to receive a QSL.

Most DX CW activity is found between 3500 and 3553, while phone (including DX) can be found from 3750 to 4000 kHz (often referred to as 75 meters). Slow Scan TV will also be heard from 3750 to 4000 kHz as well as a scattering of AM.

There are many nets operating on 80. Some of these handle traffic; others are for operators looking for new states or countries, counties or rag chew nets as well as civil defense and emergency communications. This is another night time band and QRM can become a problem at times due to the extreme popularity of 80 meters. Summer static is also a problem on 80 but not as severe as on 160.

40 Meters (7000-7300 kHz)
This band is a transition area between local and DX coverage. Normal daytime range will be over 300 miles and frequently overseas stations can be heard during daylight hours, but DX is more likely heard beginning just after sunset to shortly after sunrise.

Summer static is not as bad on 40 as it is on the lower bands, but still affects band usage at times. 40 is very popular and many amateurs still work this band exclusively. Signals propagate over long distances and the antennas are short enough to erect on the average home.

One problem with 40 meters is SWBC (short wave broadcast) QRM since the band is shared with broadcast stations (outside of the U.S.A.) and 7080 to 7125 can be a hassle at times. 40 meters is also divided into segments from 7000 to 7300 kHz is allowed; phone occupies 7075 to 7300 with SSTV permitted from 7150 to 7300 and RTTY from 7000 to 7150; Novice operation is permitted from 7075 to 7125, and QRP operation will be found on 7040 and 7090. From 7000 to 7040 you will find most CW DX stations; look for phone DX from 7050 to 7150.

You will find some regional networks on 40 with the popular mobile nets being active on this band; you will hear mobile stations from coast to coast and county hunters as well. 40 is generally not as favorable a DX band as the lower frequencies but some rag chess does go on.

This is a fairly difficult band for the beginner to work DX on but it is needed at night when stations moving around a lot trying to get away from broadcast QRM.

30 Meters (10100-10150 kHz)
This is the newest ham band, created by WARC (World Administrative Radio Conference in Geneva) in 1979. Due to the narrow band only CW and RTTY modes are ALLOWED: the IARU (International Amateur Radio Union) has decided that no contacts on this band will be allowed for award credit and contests will not be permitted on 30 meters.

This is a rag chewer's band because you will not have a wolf pack chasing the DX station as is customary on the other bands. Range of 500 miles is common during daylight.

20 Meters (14000-14350 kHz)
The King of the DX bands, 20 meters, is almost always open to some part of the world, all although recent decline in sunspot activity does shift down 20 some evenings. This band is a Dears dream antenna signals are not large and long distance can be worked with modest power.

During a DX contest it is easy from hams to work all continents and 100
countries or more in a single weekend. Competition can be rough with many stations trying to work the same DX station. Contacts on this band may be hit or miss, although it is possible to spend an enjoyable half hour or more chatting with a station thousands of miles distant.

CW is normally found from 14000 to 14100 and RTTY from 14090 to 14150. DX phone is found from 14100 to 14300 and RTTY concentrations in the area of 14100 to 14200. SSTV is between 14150 to 14350.

Low power operation on this band may be found at 14060 CW and 14185 phone. CW will be at 15 wpm or higher, so here is where the code readers come in handy!

15 Meters (21000-21450 kHz)

This daytime DX band closes down at night. Under present sunspot conditions the band is seen fairly for DX more than one or two days a week, and then only to South America and sometimes in early afternoons for a short time to South Africa.

CW is normally found from 21000 to 21200; phone is from 21200 to 21450, with the DX portion runs from 21200 to 21300. 21300 to 21420 is the 15 meter Novice CW band with most stations sending at speeds of 5 to 15 wpm. This is a good spot to nail down some CW DX stations!

Low power CW operation may be heard on 21060 and QRP SB and 21185.

10 Meters (28000-29700 kHz)

Bordering on the VHF portion of the radio spectrum, 10 meters is affected by path and modes of propagation when the sunspots smile on us old ten meters comes to life and a converted CB rig at five watts will work halfway around the world on a whip.

Normally, 10 meters is a daylight band and is not too active at present. A national VHF contest (narrow band frequency modulation) calling frequency of 29.6 MHz and many beacons (see next month's column) make this band easy to check on.

Activity is mostly heard from 28000 to 28300 and a Novice CW band extends from 28300 to 28500. DX phone is from 28300 to 28700, with 29000 to 29700 often used for NBFM.

Want to hear a spacecraft? You can on type meters. Listen between 29300 and 29500 and sooner or later you will hear hams talking to each other via the USSR's RS satellites. These spacecraft were designed for amateur radio communications and experimentation.

Beacons send ID and vital information about the spacecraft to earth. You can hear these beacons on 29330, 29340, 29410, 29450, 29460 and 29500. The beacon will alert you as to when the satellite is within range, you can then tune through the passband of the transponder and hear amateurs all over the globe communicating through the satellite.

These guys want to hear from you and most are only too happy to send a QSL to anyone reporting their signals. ARRL can provide full info as to when the satellites can be heard; check QST magazine or write ARRL for info.

Next Month: Getting the QSL and monitoring the amateur beacons.
part has a raspy tonal quality and tend to drift somewhat.

Operator chatter in broken English and the traffic consists of 4F groups. Callsigns/addressers of the LL type and, in view of the quantity of these, there must be quite a few stations within the network.

Lengthy RTTY testing was noticed on 1339 kHz 21 March at 1811 when RBK-75/RWZ-72/RW-73 ciphers were observed on an RTY tape. I have continued to check for this Soviet transmission but have not come across this testing again.

RTTY Arabic text was copied on 1826.1 kHz on 24 March at 1417Z. A sample of such traffic has been presented for identification purposes: TXXCUK VMT OMYT, DACI OYKC; VJUJK FMWDM----VMT WMFPA: BRCAZ etc., etc. In Arabic printer traffic many words come with letters V, T or B. Another clue is the word endings of ! and ?.

M-600 OPERATING HINT

I have discovered one drawback to the INFO TECH M-600 demodulator. On strong signals you can obtain noise at any one of the shift settings, thus you can easily be misled into thinking the shift is something other than what it really is. I plan to overcome this through use of a tuning scope. The M-600 is still a great demodulator!

LOGGED APRIL 1985

<table>
<thead>
<tr>
<th>KHz</th>
<th>DTOI</th>
<th>MODE/IDENTIFICATION/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4304.5</td>
<td>040340</td>
<td>CW/DE CTT-CUTUL-28/CONSANTO NAVAL RADIO, PORTUGAL</td>
</tr>
<tr>
<td>4780</td>
<td>100126</td>
<td>CW/NO CALLS/5L GRPS, 6 GRPS IN MSG</td>
</tr>
<tr>
<td>5458.9</td>
<td>043434</td>
<td>RTTY 75-850/PRESS IN ENGLISH</td>
</tr>
<tr>
<td>6097</td>
<td>041526</td>
<td>CW/NO CALLS/GRPS OF 5 CHARACS, LTS A-B, FOUTS M(SPANISH TYPE) &amp; FIGS 4, 5, 6</td>
</tr>
<tr>
<td>6281.7</td>
<td>071126</td>
<td>CW/NO CALLS/5L GRPS, BAD SPACING</td>
</tr>
<tr>
<td>6292.5</td>
<td>071221</td>
<td>CW/NO CALLS/COAST GUARD RFC</td>
</tr>
<tr>
<td>6325.7</td>
<td>071228</td>
<td>CW/DE V4WJ(CANADIAN COAST GUARD, HALIFAX)</td>
</tr>
<tr>
<td>6591</td>
<td>092219</td>
<td>CW/DE W3M52(SLIDELL, LA)</td>
</tr>
<tr>
<td>6615</td>
<td>061309</td>
<td>CW/KGC BE AUL/5L GRPS</td>
</tr>
<tr>
<td>6635.8</td>
<td>063130</td>
<td>VOICE USE/GANDER ED/WW IN ENGLISH</td>
</tr>
<tr>
<td>6686.7</td>
<td>040304</td>
<td>CW/DE CC/ROSS HEBRONI NAVY PT SPANISH MSGS, SEE 10011.1 KHz ENTRY</td>
</tr>
<tr>
<td>8129.2</td>
<td>041716</td>
<td>RTTY 75-850/CODED MX</td>
</tr>
<tr>
<td>10081.1</td>
<td>041620</td>
<td>RTTY 50-750/AS IS A FORMATION OF BASED MX ON SPANISH MSGS THIS ACTIVITY IS HEBRONI NAVY</td>
</tr>
<tr>
<td>10031.2</td>
<td>022336</td>
<td>RTTY 50-170/LFL CALLS/ROSS PEU NAVY</td>
</tr>
<tr>
<td>10044.3</td>
<td>001334</td>
<td>RTTY 75-850/DE BG67 (CHINESE ALLOC)</td>
</tr>
<tr>
<td>10066.5</td>
<td>033590</td>
<td>CW/NO CALLS/5L GRPS</td>
</tr>
<tr>
<td>10051</td>
<td>023525</td>
<td>VOICE USE/WX IN ENGLISH</td>
</tr>
<tr>
<td>10324.8</td>
<td>061254</td>
<td>CW/NO CALLS/5L GRPS SPEC CHARAC 25 AM OR CT</td>
</tr>
<tr>
<td>10405.7</td>
<td>040388</td>
<td>RTTY 50-170/DEL 6V(DAKAR, SENEGAL) K1819010</td>
</tr>
<tr>
<td>10676.4</td>
<td>031779</td>
<td>RTTY 50-850/PMUNA LATINA(CUBAN NEWS SVC) PRESS IN ENGLISH</td>
</tr>
<tr>
<td>12948.2</td>
<td>031151</td>
<td>CW/DE W9M(UNIDEN US STN)</td>
</tr>
<tr>
<td>12952.4</td>
<td>021716</td>
<td>CW/DE W6G (BALTIMORE, MD) CALL TAPE</td>
</tr>
<tr>
<td>13175.3</td>
<td>021931</td>
<td>CW/DE 6A1(1 FROM ??) THIS ACTIVITY HAS BEEN HERE PREVIOUSLY IN PAST MANY FREQUENCIES</td>
</tr>
<tr>
<td>13216</td>
<td>081994</td>
<td>RTTY 50-25/ENSCABA FROM HAVANA(CUBAN EMBASSY CANADA)</td>
</tr>
<tr>
<td>13289</td>
<td>071205</td>
<td>CW/ V V QI 51 A.64 (?? UNIDEN)</td>
</tr>
<tr>
<td>13365.9</td>
<td>000045</td>
<td>RTTY 50-850/DE SYD (KAIROBI, KENYA) K1819012</td>
</tr>
<tr>
<td>13373.7</td>
<td>011153</td>
<td>RTTY 75-850/CODED MX</td>
</tr>
<tr>
<td>13379.7</td>
<td>02016</td>
<td>VOICE USE/CONVERSATION IN PORTUGUESE</td>
</tr>
<tr>
<td>13379.8</td>
<td>021621</td>
<td>VOICE USE/STN IN BERNIN, GDR/DEMEN FOR FREQUENCY MACHINES</td>
</tr>
<tr>
<td>13386.8</td>
<td>072129</td>
<td>RTTY 50-25/ENSCABA FROM HAVANA(CUBAN EMBASSY CANADA)</td>
</tr>
<tr>
<td>13399</td>
<td>041216</td>
<td>RTTY 50-850/ROSS BULGARIAN PRESS SVC, PRESS ITEMS IN ENGLISH</td>
</tr>
<tr>
<td>13401.5</td>
<td>030108</td>
<td>RTTY 50-170/NO CALLS/TFC APPEARS BE ARGENTINE BANKING RELATED, SPANISH PT, QUOTES ON CURRENCIES OF THE WORLD</td>
</tr>
<tr>
<td>13403.9</td>
<td>131337</td>
<td>RTTY 50-170/CLY/CW CLM-79 (KALININGRAD PRESS FROM HAVANA CUBA) K1819011</td>
</tr>
<tr>
<td>13620</td>
<td>117114</td>
<td>CW/DE CAG64-69 CAG72-44 (LISBON, PORTUGAL)</td>
</tr>
<tr>
<td>13623</td>
<td>117125</td>
<td>CW/NO CALLS/5P GRPS, LOW, BAD WAVES</td>
</tr>
<tr>
<td>13594.2</td>
<td>051914</td>
<td>RTTY 50-25/CODED MX</td>
</tr>
<tr>
<td>13625.4</td>
<td>021910</td>
<td>RTTY 75-850/CODED MX</td>
</tr>
<tr>
<td>13631.1</td>
<td>020009</td>
<td>RTTY 50-170/GC DE EN (17) 5L GRPS</td>
</tr>
<tr>
<td>13993.9</td>
<td>081990</td>
<td>RTTY 50-25/ENSCABA FROM HAVANA(CUBAN NEWS SVC) PRESS ITEMS IN ENGLISH</td>
</tr>
<tr>
<td>13966.8</td>
<td>021116</td>
<td>CW/NO CALLS/PORTUGUESE PT MEGS</td>
</tr>
</tbody>
</table>

SCANNING

VHF SKIP REPORT

by Chuck Robertson

(PART II IN A SERIES)

Welcome to Monitoring Times’ VHF Skip column! I’m Chuck Robertson, author of the new Low Band Skip Directory from Grove Enterprises, and I’ll be bringing you long distance radio propagation reports for frequencies above 29.70 MHz.

Contributions and questions should be sent to:

Chuck Robertson
Route 2, Box 850
Orleans, IL 62922

It’s summer, so let’s review some of the types of propagation responsible for summertime skip.

THE SPORADIC-E MYSTERY

Sporadic-E (E) skip is one of the most commonly encountered, yet least understood, forms of propagation for the 29.70 to 75 MHz band.

Some say solar flares and related solar activity account for E skip; others point to the weather and high altitude winds. And yet others speculate that auroral and geomagnetic activity (radio storms) are the formative mechanisms of E. They may all be right!

First, let’s look at what we know empirically of sporadic-E propagation characteristics. These are the day-to-day and month-to-month patterns which any North American listener should perceive from first hand experience at receiving E skip.

Sporadic-E may occur any time of the year, day or night, with morning and evening hours often bringing the best chances for skip. Summer is the peak season for this phenomena usually having the largest number of openings.

A second, but shorter, peak occurs in winter, with December the most active month. March is usually the least active month of the year.

Little is known about E patterns in the southern hemisphere, but it stands to reason that they would be reversed, just as the seasons are reversed.

Skip distances range from around 250 to 1300 miles for a single hop, to over 2500 miles for multiple hops.

The ionization responsible for E skip is located in patches or "clouds" at about the same height as the E-layer of the ionosphere, approximately 60 miles above the earth.

However, sporadic-E ionization is significantly different from E-layer ionization.

(by observation)
SCANNING cont'd

...ization which reflects short-wave frequencies. Sporadic-E ionization primarily reflects higher frequencies, with the 20 to 100 MHz area receiving the greatest benefits.

Even higher frequencies than that can be reflected, but only very poorly. It would take exceptionally intense Es ionization to have an MF (Maximum Usable Frequency) of 160 MHz.

The formative mechanisms of Es clouds, and even the source of the ionization itself, remains a mystery that has not been satisfactorily answered.

My own experience leads me to suspect there is a tie-in with both solar and weather conditions. Unlike F2 skip which is solar related, and unlike tropospheric ionization which is weather related, Es skip appears to be a unique and complicated interplay of several natural phenomena.

The weather map shown below is a good example of the tie-in surface weather has with the production of Es skip. Air movements at higher altitudes are often directly related to surface weather, and it is these high altitude winds which can produce wind shear.

When two air masses at different altitudes, and moving in opposite directions, come into contact, the molecules between the two air masses can become ionized. This ionization is then collected by the earth's magnetic field into dense "clouds" at E-layer height. These are the sporadic-E clouds.

Es Skip Received on the Morning of August 9, 1984

29.76 Quebec Ministry of Public Works, French.
30.48 (Repeater) Ontario Ministry of Community in Ontario, just 12 miles north of Toronto.
30.54 Trucking, Canada.
36.69 Taxi, U.S. Gov't. Base located at McNair AFB, Washington, D.C. 60 Watts, narrow band FM.

...emissions.
38.10 Ft. Drum, Watertown, NY. Mobiles on range were heard.
38.30 Wheeler AFB SAC operations, Waimea, Wa. Aircraft communications originating from inside the con
gregious U.S.
46.62 The F layer at 20 kHz steps: This band is used by the Ontario Ministry of Natural Resources. French language was heard on some channels. Here are the frequencies active on the 9th:
46.62, 46.64, 46.68, 46.72, 46.76, 46.82, 46.84, 46.86
47.52 "KNES 812" Mauritawes Brothers Oil Service, Owings, Maryland.
47.00 to 50.00 in 10 kHz steps: This general frequency segment is used for hydroelectric operations in some areas of Canada, mainly Quebec and Ontario. Wire stringing, maintenance, and power plant operations are heard. French and English languages used. Here are the channels active on the 9th:
49.67, 49.68, 49.77, 49.78, 49.79, 49.83, 49.84, 49.88
49.90 Canadian Forces (Military) French language.
The frequency 49.90 is allocated Canada-wide to the military. On this day U.S. easy range control comms were also logged on 49.90 MHz. All were wide band FM.

Other sources of ionization which may enhance these Es clouds are ultraviolet radiation from the daytime sun and auroras produced by solar flares.

Solar ultraviolet radiation accounts for most of the ionization in all layers of the ionosphere; this may be the reason most Es occurs during the day.

During solar flares large amounts of ultraviolet radiation are released, but only for a few minutes. This bombardment of ultraviolet radiation could have had an effect on the production or enhancement of sporadic-E ionization.

Traveling at the speed of light, the ultraviolet radiation produced by a solar flare takes about eight minutes to reach the earth; 18 to 36 hours later the slower-moving charged particles emitted by the flare reach the earth's magnetic fields and are funneled to the magnetic poles. This results in the ionization of molecules in the E-layer which produces aurora.

Much of the Es produced during the winter months is thought to be due to auroral ionization.

The effects of such an avalanche of charged particles from a flare usually last one to three days or longer. Geomagnetic intensities also increase at this time, and may facilitate the collection and compression of ionization into Es clouds.

The May 1985 Monitoring Times article, "VHF Low Band Skip Report" (page 1) documents F2 skip logged around noon on the 5th and 6th of 1985. In the evening hours, Es skip was received from areas where heavy weather was occurring!

The skip may have been due to the effects of a coronal hole near the central meridian of the sun. Large numbers of charged particles were emitted which resulted in a measurable increase in geomagnetic fields, as recorded by the National Geophysical Data Center in Boulder, Colorado.

Since there was very little skip monitored in February 1985, it seems more than a coincidence that this F2 and Es combination occurred two days in a row.

There may be other explanations—sporadic-E remains a mystery!

TROPOSPHERIC SKIP

Tropo favors VHF-high and UHF frequencies well over 1 GHz. Unfortunately frequencies below 50 MHz will usually not travel more than 300 miles via tropo.

NEXT MONTH we'll observe the 38.00 to 38.25 MHz radio astronomy band. There's more there than meets the eye.

While you were out...

SOMETHING HAPPENED!

Now you can record all the scanner action that occurred while you were away for playback later. The Scan Recorder offers you a message and route the audio from the scanner to the recorder.

The recorder runs only when a message is received. It does not run when the scanner is just scanning. This lets you record a lot of action on one tape. In addition to scanners, it will work with any receive that has a squelch control.

The easy to use Scan Recorder features user selectable drop-out delay, adjustable sensitivity, activity indicator and recorder control switch. The unit is all solid-state with no relays to slide or stick out. It operates on DC 15 volts DC and can be powered by a 9 volt battery or AC adapter.

All you'll need in addition to your scanner and the Scan Recorder is a tape recorder with a microphone jack and a remote control jack. The Scan Recorder comes complete with all connecting cables.

Your complete satisfaction is guaranteed. Order your Scan Recorder today for only $35.75 plus $3 shipping and handling.

Mail and phone orders are welcome. Send check or money order or ship via UPS COD to: CAPRI ELECTRONICS, 710 Lander Street, Tiffin, OH 44883.

FREE CATALOG featuring scanner accessories, carrier/subcarrier detectors, voice scramblers and unusual kits sent on request.

CAPRI ELECTRONICS
Route 1-M
Canan, GA 30520
(404) 376-3712

Page 9
This month we return to have a look at the Great Lakes. For those interested in beacons or who have never tried them, below is a listing of the various maritime beacons operating on the Great Lakes. For those who have general coverage receivers which cover the range of 285 to 315 kHz and who have never tried it, you might be surprised at where there is and at the distance over which you can hear beacons.

The identification codes of some of the local beacons are shown in the form of Morse code characters as listed above, usually sent three times followed by a long dash, but may be sent any other time (for 48 seconds) followed by a brief silence and long dash. This characteristic holds true also for the sequence of beacons listed below.

Sequenced radio beacons are a method of conserving frequencies. Up to six beacons operate in the same general area, on the same frequency, but sequenced so that each operates only for one minute of a specified sequence. Thus, during six minutes each beacon will have operated for one minute without interference. On the Great Lakes there are 44 such beacons as follows:

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>FREQ (kHz)</th>
<th>SEQUENCE</th>
<th>IDENTIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whitefish Point, MI</td>
<td>292</td>
<td>1</td>
<td>O (---)</td>
</tr>
<tr>
<td>Caribou Is., ON</td>
<td>292</td>
<td>2</td>
<td>A</td>
</tr>
<tr>
<td>Marquette, MI</td>
<td>292</td>
<td>3</td>
<td>W</td>
</tr>
<tr>
<td>Slate Is., ON</td>
<td>292</td>
<td>4</td>
<td>b</td>
</tr>
<tr>
<td>Michipicoten Is., ON</td>
<td>292</td>
<td>5</td>
<td>Q</td>
</tr>
<tr>
<td>Michipicoten, ON</td>
<td>292</td>
<td>6</td>
<td>R</td>
</tr>
<tr>
<td>Cleveland, OH</td>
<td>294</td>
<td>1</td>
<td>C</td>
</tr>
<tr>
<td>Long Point, ON</td>
<td>294</td>
<td>2 &amp; 5</td>
<td>L</td>
</tr>
<tr>
<td>Port Colborne, ON</td>
<td>294</td>
<td>3 &amp; 6</td>
<td>Y</td>
</tr>
<tr>
<td>Erie, PA</td>
<td>294</td>
<td>4</td>
<td>Y</td>
</tr>
<tr>
<td>Delia Is., WI</td>
<td>286</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Two Harbors, MN</td>
<td>296</td>
<td>3</td>
<td>P</td>
</tr>
<tr>
<td>Duluth, MN</td>
<td>296</td>
<td>5</td>
<td>O (---)</td>
</tr>
<tr>
<td>Keweenaw, MN</td>
<td>296</td>
<td>6</td>
<td>A (---)</td>
</tr>
<tr>
<td>Owen Sound, ON</td>
<td>298</td>
<td>1</td>
<td>X</td>
</tr>
<tr>
<td>Collingwood, ON</td>
<td>298</td>
<td>2</td>
<td>B</td>
</tr>
<tr>
<td>Hope Is., ON</td>
<td>298</td>
<td>3</td>
<td>F</td>
</tr>
<tr>
<td>Snug Harbour, ON</td>
<td>298</td>
<td>4</td>
<td>R</td>
</tr>
<tr>
<td>Gereaux Is., ON</td>
<td>298</td>
<td>5</td>
<td>J</td>
</tr>
<tr>
<td>Burlington, ON</td>
<td>302</td>
<td>2 &amp; 4</td>
<td>R</td>
</tr>
<tr>
<td>Detour, ON</td>
<td>302</td>
<td>1 &amp; 2</td>
<td>CH</td>
</tr>
<tr>
<td>Pof Reef, MI</td>
<td>302</td>
<td>2</td>
<td>W</td>
</tr>
<tr>
<td>Lansing, MI</td>
<td>302</td>
<td>5</td>
<td>Z</td>
</tr>
<tr>
<td>Grays Reef, MI</td>
<td>302</td>
<td>6</td>
<td>X</td>
</tr>
<tr>
<td>Main Duck Is., ON</td>
<td>306</td>
<td>2</td>
<td>Y</td>
</tr>
<tr>
<td>Point Petre, ON</td>
<td>306</td>
<td>3</td>
<td>P</td>
</tr>
<tr>
<td>Oswego, NY</td>
<td>306</td>
<td>4</td>
<td>W</td>
</tr>
<tr>
<td>Rochester, NY</td>
<td>306</td>
<td>5</td>
<td>M</td>
</tr>
<tr>
<td>Sandusky, OH</td>
<td>306</td>
<td>2</td>
<td>X</td>
</tr>
<tr>
<td>Southeast Shoal, ON</td>
<td>306</td>
<td>3</td>
<td>H</td>
</tr>
<tr>
<td>Ashtabula, OH</td>
<td>306</td>
<td>6</td>
<td>G</td>
</tr>
<tr>
<td>Keweenaw, MI</td>
<td>312</td>
<td>1</td>
<td>C</td>
</tr>
<tr>
<td>Angus Is., MI</td>
<td>312</td>
<td>2</td>
<td>F</td>
</tr>
<tr>
<td>Rock of Ages, MI</td>
<td>312</td>
<td>3</td>
<td>Z</td>
</tr>
<tr>
<td>Manistock, MI</td>
<td>312</td>
<td>4</td>
<td>M</td>
</tr>
<tr>
<td>Passage Is., MI</td>
<td>312</td>
<td>5</td>
<td>X</td>
</tr>
<tr>
<td>Eagle Harbor, MI</td>
<td>312</td>
<td>6</td>
<td>J</td>
</tr>
<tr>
<td>Cove Island, ON</td>
<td>312</td>
<td>1 &amp; 4</td>
<td>D</td>
</tr>
<tr>
<td>Harbor Beach, MI</td>
<td>312</td>
<td>2</td>
<td>U</td>
</tr>
<tr>
<td>Thunder Bay, MI</td>
<td>312</td>
<td>3</td>
<td>K</td>
</tr>
<tr>
<td>Great Duck Is., ON</td>
<td>312</td>
<td>5</td>
<td>B</td>
</tr>
<tr>
<td>Fort Gratiot, MI</td>
<td>312</td>
<td>6</td>
<td>P</td>
</tr>
</tbody>
</table>

The sequence number refers to the order in the local sequence in which each beacon operates.

In addition to the continuously operating and sequential beacons there are four beacons which are occasionally used for the purpose of calibrating direction finding equipment.

These calibration beacons are identified by the Morse code identification, "T." They are operated on request through the local Cool Guard Radio Station.

The beacons at Burlington, Ont., Port Colborne, Ont., and Fort William, Ont., all operate on 312 kHz; that at Collingwood, Ont., operates on 316 kHz.

Some former beacons on the Lake Michigan have been deleted by the U.S. Coast Guard to reduce the number of stations and cut costs. Any information on this would be appreciated and will be shared with other readers in a future column.

As usual your correspondence is welcome. Address all letters regarding this column to: James R. Hay, 141 St. John's Blvd., Pointe Claire, P.Q., Canada H9S 422.

Good listening until next month.

---

**"PLANE TALK"**

**by Jean Baker**

In this month's column we will look at the frequency allocations of the VHF Aeronautical Communications Band and discuss the various types of transmissions which can be monitored.

(VHF)

118,000-121,400

- Air Traffic Control

121,500 (243.0 VHF)

- This is the aural emergency guard frequency. It is utilized by both voice and ELT (Emergency Locator Transmitter) devices.

121,600-121,925

- Flight Service Station (FSS). These provide services for general aviation (non-commercial). Also used by flight watch, voice facilities, and selected VORs (NAV-AIDS), UNICOMS, MULTICOMs, hell}

copter control/comunications, etc.

123,100

- Search and rescue communications

123,125-123,425

- Flight test

123,430

- This freq. is unoffi-

- Search and rescue

123,475-123,690

- Flight test, flight

123,675-132,000

- Air Traffic Control

128,850-132,000

- This portion of the VHF aero band is one of the most fascinating of all to moni-

132,025-135,975

- Air Traffic Control

i have placed an asterisk* beside the words "Air Traffic Control" in each area of the VHF aer band where they have an allocate-
PLANE TALK cont'd

tion. This simply means that
these frequencies are utilized by both Air Route
Traffic Control Centers (ARTCC), to use their full
designation, and Air Traffic Control Towers: Approach/
Departure Control, Ground
Control, Clearance Control, ATIS (Automated Terminal
Information Service) record-
ings which update semi-
hourly giving weather, run-
way, frequency, and other
information (including alti-
meter settings) for
approaching and departing
aircraft.

Now that you have an
idea of what you can hear on
the VHF band, let's discuss a
few other related
subjects:

Please don't let the
news and entertainment media color your image of
air traffic controllers, pilots and other folk who
work in the airline transport industry (and private
aviation). Unlike their stereotyped image, as a
group air traffic controllers are not all tranquil-
izer-popping, neurotic, wild-eyed maniacs who
strike at the drop of a hat. Nor are pilots all conceited
Greek-god look-alikes. And
flight attendants are not
giggly/hysterical round-
heeled women, nor are their
male counterparts all effeminate as they are so often
portrayed in the movies, novels, TV shows,
etc. These people do not fit
those images as a group any
more than do employees
within other industries.

The reader response to
the first column was really
terrific; thanks to all of
you who responded so encour-
gaingly. Please bear in mind
that I'd like to hear from
anyone who would like to
comment about the contents
of "Plane Talk"—both good
and bad comments are wel-
come. Reader feedback will
make this column as inter-
esting and as informative
as possible.

In the next install-
ment, we will talk about
monitoring the HF aeronau-
tical bands; how to get started, what you will hear,
how to get QSLs (yes, it can
do be done), and other related
topics.

Until then, 73s and out
- Jean Baker,
Registered Monitoring
Station K1Y9DD

---

SIGNALS FROM
SPACE

by Larry Van Hore

As I write this column of Signals from Space, Gayle, Loyd and I are now in
sunny Florida. Over the last several months, time has
been at a premium and I have
gotten behind on correspon-
dence. Those of you awaiting
a reply please be patient.

Between getting the manu-
script for Communications
Satellites ready and Uncle
Sam moving us, I have put
all correspondence on hold.

Now that we are here
and settled, I will take
care of the backlog and
resume normal correspondence
with all. Those individuals
desiring a reply from the
author be sure to include an
SAAR. My new address is
Signals from Space, c/o
Larry Van Horn, 160 Lester
Drive, Orange Park, Florida
32073.

A new distribution
service for regional or
specialized radio networks
using single-channel-per-
carrier (SCPC) distribution
over SATCOM-I satellite is now
operational. This service will
provide 7.5 and 15 kHz
signals as well as access
into RCA America's digital
audio transmission service
(DATS).

SCPC Radio Service is
designed to grow with
programmers' requirements
using an existing network of
receive-only antennas
located throughout the
country. At very low cost
and with protected service,
special music, sports,
seasonal, regional, or state
networks can access affilia-
tes simply by directing
their uplink antenna at
SATCOM-I satellite.

"SCPC Service will pro-
vide a long-needed means of
consolidation of these net-
works on one satellite,
SATCOM-I-R," says Harold W.
Rice, RCA America's VP,
Video/Audio Services. "The
advantage to the programmers
is virtually unlimited
growth opportunity for the
network because virtually
all of the nation's radio-
station antennas are, or can
be, directed to one satel-
lite."

The advantage for
listeners is new SCPC chan-
nels to search out. TVRO-
equipped monitors listening
to new SCPC channels on
SATCOM-I-R are encouraged to
drop Signals from Space a
note and let us know what
special services you are
hearing.

The information on
the new Russian amateur radio
satellites is starting to
come out of the Soviet
Union. Latest information on
RS-9, due to be launched
later this year, indicates
that at least one beacon
will be on 29.402 MHz. The
satellite's transponder will
be a Mode A type uplink
145.860 to 145.900 MHz,
downlink 29.360 to 29.400
MHz. It also appears that
RS-9 will carry an automatic
robot of similar design to
those on RS-5 through RS-9.

According to Amateur
Satellite Report 30, 98/99,
RS-9 and 10 are in Kaluga,
200 km southwest of Moscow
undergoing tests. G3I0R
obtained the following
frequency information on RS-
10 from UA3CR.

Mode A
145.960-146.000 MHz uplink,
29.460-29.500 MHz downlink
Beacon
29.457 or 29.503 MHz, 250 mW
or 1 watt

Mode K
21.260-21.300 MHz uplink
29.460-29.500 MHz downlink

A third (unnamed mode)
transponder may also be
included. Its frequencies
were specified as follows:

21.260-21.300 MHz uplink
145.960-146.000 MHz downlink
Beacon 145.957 MHz

Yes, folks, the Rus-
sians are going to use the
15 meter amateur band for
uplinks to the 10 and 2
meter bands. This should
bring the 10 and 15 meter
bands alive during this
period of low sunspot
activity.

At present, both RS-9
and RS-10 are to be orbited
from a single launcher;
however, builders and
organizers are thought to
be seeking separate launches
for each, hopefully placing
them into 2,000 km polar
orbits.

These satellites should
offer the SWL as well as HF
operators the oppor-

Send $1.00
(or 3 IRCs)
RE FUNDABLE.

UNIVERSAL SHORTWAVE RADIO
1260-1350 MHz
Reynoldsburg, Ohio 43068
Phone: 614-886-4267
As of this writing I still do not have any details to offer you on monitoring Tony England, W4UVV, in-space mission. I have heard that 10 meter SSTV gear might be carried aboard as well as the HF that Ken Garrett carried. There is some talk about a two-to-ten-meter repeater but this is not confirmed. Interested readers are urged to monitor W1AW and AMSAT nets for the latest information.

This month’s mailbag is full. A lot of listeners are starting to listen to military aircraft and satellites and some of this information has finally caught up with me.

Rich Kerner, Pennsylvania recently dropped me a note with a question. He asked if the downlinks from the milsat are variable with regard to the uplinks being used. For example, if the downlink for channel number 4 is 260,500 and uplink is 360,300 and a ground station transmits on 300,315, will the downlink come through 260,515?

Well, Rich, the system you described would indicate a linear transponder and milsat wideband channels act as repeaters throughout the whole bandpass in a linear fashion. So, yes, 260,515 is a valid frequency. The way I understand it, the channel numbers throughout the wideband portion of the milsat is for reference only and do not represent discrete frequency transponders.

The reason Rich asked the question is that he heard Brandywine communicating with SAM 26000 on the LES 9 bird indicating that it could use any frequency from 2 to 400 MHz for their uplink. I find that statement very misleading and would invite other MT readers to comment.

A friend recently sent me an update on current Fleetascom/Leasat activity. This material is referenced to the milsat section of my new book, Communications Satellites (available from Grove Enterprises).

From the eastern U.S. Fleetascom plans A,B,C are now being heard. For a while Leasat plan "Whiskey" was up and running but now only some fleet relay channels are available; they broadcast 250,350 MHz fleet broadcast channel is down.

It appears that Leasat "Whiskey" bandplan has replaced Fleetascom "Charlie" for fleet broadcasts. Other listeners are urged to send their notes during this transition period between Fleetascom and Leasat satellites.

Len Merkoske in Canada has managed to catch another Russian Ocean Radar Recon satellite on HF. Len monitored Cosmos 1579 several months ago on 19,544 MHz as the nuclear reactor was being raised to a safe height. Len now has monitored Cosmos 1607 launched October 31, 1984 from Tyura-Tam. These satellites are kept in 89-900 minute orbital periods until end of mission when the reactor sections are hoisted into 109 minute orbital periods. Len caught the transmissions over a 25-day period February 1-25, 1985. It appeared as though towards the latter periods of Len's monitoring, the on board power supply (batteries) failed and no more signals have been received from 1607.

H. Lillibridge in Bay Shore, NY, has sent me some interesting mil aircraft frequencies from his area. He uses an SX400, MXX500, BC3000.

The following frequencies are used by Navy P3's on surveillance and Air Force reserves on maneuvers from McGuire, Andrews, and Langley AFB.

Base callsign: "Boltswing";
Planes: "Bolt", "Bolt II";
Flights: 264.2 222.7 318.7 282.5
258.0 236.6 321.2 233.6
292.8 261.8 305.0
357.2 329.4 292.8 263.6
218.0 327.2 278.4 252.0

Base callsign: "Gunfighter";
Planes: "Gunfighter", "Gunfighter II";
Flights: 255.0 292.8 266.5 249.8
288.0 252.6 305.0 310.1
237.7 251.6 312.3 350.0
338.1 239.2 308.0

Base callsign: "Collingdale";
Planes: "Collingdale", "Collingdale II";
Flights: 263.9 259.4 301.6 283.8
314.2 275.9 238.7

Some of the tanker aircraft callsigns he has monitored include Dusty, Shake, Robe, Duub, Cutty, King, Chintz, Minor, Red, Mine, Pro...

Fighter aircraft monitored on these frequencies were used the following callsigns: Aces, Wade, Brave, Smash, Hex, A.K., Cosmos Rival, 100 Lima and Snake.

He also sent along a list of VHF ATC frequencies which I will pass on to Jean Baker, MT's Plane Talk editor. Welcome to the family, Jean.

I would like to receive your listings of satellite and mill aircraft (225-400 MHz) UHF. Remember, VHF aircraft material should go to Jean.

SATELLITE DISHES AND GAIN
by John Wilson W4UVV (6413 Bull Run Rd., Prince George, VA 23875)

(ED NOTE: John Wilson, author of a previous MT feature on satellite FM-SCPC monitoring, has contributed this fellow listeners this excellent reference list. Thanks, John, for sharing this useful set of data.)

C BAND TVRO ANTENNA SIZE AND GAIN

With the vast proliferation of various antenna sizes available for TVRO installations today, it can be confusing as to the actual antenna diameter that is shown in some advertising. Manufacturers list their antenna sizes in feet, but some use meters.

When determining the size of an antenna, it is advantageous also to know the theoretical gain of a given antenna; gain is an important factor in the TVRO configuration relating directly to the expected transponder signal strength to be delivered to the Low Noise Amplifier (LNA).

The cross reference table of commonly used antenna sizes/gain tables shown at Figure 1 will provide a handy reference for use in various TVRO applications.

SATELLITE SWLing: Monitoring FM-SCPC
by John Wilson W4UVV

Welcome to the world of satellite short-wave listening - really short waves - microwaves. This article will discuss briefly three popular methods of FM-Single Channel Per Carrier (SCPC) reception which is rapidly becoming increasingly popular, cost effective and efficient method of satellite audio and data transmission.

A LITTLE HISTORY

For over 40 years radio and TV networks had been technically "tied" to the AT&T terrestrial-microwave point-to-point relay or "hard-wired" for distribution of their network programs. This method was a very expensive way to transmit programming services. With the advent of improved technology in this mid '70s, the satellite alternative was available, technically feasible, cost effective, and afforded other advantages.

One of these other advantages was that the uplink (transmit site) could be almost anywhere geographically within the downlink's (receive site) "footprint" signal and vice versa. In other words, if a...
On The Road With Grove
We've Got Scanners and Accessories Flexible Enough to 'Follow You Anywhere'

Take It On Vacation... The Superb Regency MX-7000
This compact scanner (5½" x 3" x 8") is a top-notch performer at home or on the road. Delivering a continuous frequency range of 25-550 MHz plus the 800-1300 MHz band, the MX-7000 is loaded with many of the same features found on much more costly units: 20 channel memory; AM, wide or narrow FM on any channel; high sensitivity (0.3uV FM) and sharp selectivity (+7.5 kHz). A large LCD display shows frequency, channel, priority function, lockout of unused channels, delay of resumed scanning or searching, search increments, reception mode and time of day.

Order SCN 6 ONLY $479 (Retail $699) Plus 15 UPS or 10 U.S. Mail

Universal Whip Antenna For Hand-holds
With a simple twist of a wrist, you can replace that range-limited "rubber ducky" on your hand-held scanner with this full-sized whip—then STAND BACK! Our universal whip is guaranteed to increase range.

Standard BNC base allows custom length extension from 7" to 46" inches! Great for amateur hand-helds and scanners like the Bearcat 100, Regency HX-1000 and Radio Shack PRO-30.

(Screw-in BNC adaptor for earlier BC-100 available as model BC-BN for $7.50 plus shipping from Centurion International, Box 82846, Lincoln, NE 68501.)

Order ANT-8 ONLY $12.95 PLUS 1.50 Shipping

Order These Items Today! Call Toll-Free:
1-800-438-8155 (Master Card or Visa)

Hand-holds Are Portable & Affordable
With Features Rivaling Many Full-sized Scanners

Regency HX-1000 (Above)
This recent addition to the Regency line of high performance scanners offers 30 channel memory, 0.5uV sensitivity, sharp 15 kHz selectivity and an FM frequency range that won't quit: 26.5-64.5, 117.7-193.8 and 309.3-538 MHz (wider than specified by Regency!) Other features: search, scan, delay, priority, lighted LCD display, top-mounted squelch and volume controls and BNC antenna connector.

Order SCN-7 Only $244 (includes UPS)

Regency HX-2000
Finally a hand-held programmable with the 800 MHz band! This feature-packed new entry sports 20 channels of memory, each individually selectable for AM and FM mode. Continuous frequency ranges include: 318.0-174.995, 406.0-512 MHz, 800.0-999.975 MHz, AM or FM. Selectivity is a sharp 15 kHz (+6 dB) on FM. Scan and search speed is a fast 15 channels per second. An LCD display provides accurate readout as well as status indication of control functions. VHF/FM sensitivity is 0.4 microwatts. Unit measures 3¾" x 6" x 8½", weighs 1½ lbs. Two screw-on flexible antennas (800 MHz and VHF/UHF, rechargeable batteries and plug-in wall unit included.

Order SCN-9 Only $409 (includes UPS)

Mobile Scanner Antenna
This 38" heavy-duty stainless steel antenna offers wide coverage and a rugged magnetic mount for reliable anchoring without drilling holes—yet it is easily removable for security.

UHF element is a 3.5 dB gain collinear for maximum distance. Covers frequencies of 25-54, 118-174 and 406-512 MHz. VSWR: better than 1.5:1 at all midbands. Impedance is 50 ohms (nominal). Comes with 12" RG-58/U cable with Motorola plug.

Mount it anywhere—roof top, trunk lid, fender cowl—for outstanding mobile reception.

Tested personally by Bob Grove. He says: "The best mobile scanner antenna I have ever used."

Order ANT-6 ONLY $29 PLUS 12 UPS or 14 U.S. MAIL

Write for our free catalog

Grove Enterprises P.O. Box 98, Brasstown, N.C. 28902 704-837-9200

120 VAC or 12 VDC Permits home and auto use
LET'S TUNE IN

The present popularity of FM-SCPC reception today is similar to RTTY (radio-teletype) reception after WW II. Little was known about RTTY by the average SWLer and reception required specialized equipment and the users were relatively small in number. Today RTTY abounds as a popular SWL interest.

As with RTTY, FM-SCPC reception requires a special signal demodulation process for proper reception. FM-SCPC signals differ from the 5.5-8.0 MHz subcarrier audio "piggybacked" signals heard on video transponders: Each FM-SCPC signal is a "stand-alone" carrier typically 60 kHz wide.

When tuning your present satellite TVRO receiver across an FM-SCPC transponder, you will probably see and hear not only "white noise" or a slight darkening of the video, you would not know these signals were there.

There are three popular methods of receiving FM-SCPC transmissions; all require at least a four-foot antenna (preferably six-foot or larger on the coasts) and a 100 KHz LNA (low-noise amplifier) correctly installed and aimed at the desired satellite with the proper polarization set for the transponder to be searched.

- The first method (see figure 1) involves the use of a TVRO down-converter and a VHF-TV (Ch.2-6) converter interfaced with an AM radio set at approximately 1400 kHz. The TVRO separately-down-converted FM output at 70 MHz is connected to the input of the VHF-TV converter which, in turn, is fed to the AM radio. Tuning from channel 2 to 6 on the converter corresponds to the 40 MHz bandwidth of the transponder being searched.

Separating the received signals may be a problem; signal-to-noise ratio may be poor because the converter's frequency bandpass is about 150 kHz wide and the FM-SCPC signals are only 60 kHz wide (or less) so some noise will also be passed. This receive method assumes that you TVRO down-converter was designed to lock onto 4.5 MHz video transmissions, not those narrow-bandwidth transmissions. At least 90% of TVRO receivers/down-converters probably cannot "lock" onto these transmissions although this method has been proven to work with certain receiver configurations such as Scientific Atlanta.

- My FM-SCPC receiver system is the second method (see figure 2). The system is not cheap, costing approximately the same as a small-dish TVRO system. A special purpose FM-SCPC receiver designed for 60 kHz reception is used offering continuous tuning, triple conversion, good sensitivit

- The third method of reception requires the use of a customized block down-converter and a Regency MX5000, MX7000 or JIL SX4000 scanner (see figure 3). A typical TVRO "off the shelf" block down-converter will not work (or, at best, will not work properly) and interfacing with any other scanner would yield inadequate tuning range. The cost for this method, if you

FIGURE 1: FM SCPC RECEPTION METHOD ONE

FIGURE 2: FM SCPC RECEPTION METHOD TWO

FIGURE 3: FM SCPC RECEPTION METHOD THREE

radio station, music service, news service, or whatever, primarily in the 48 contiguous states, could access the desired satellite transmissions. In its physical location was not a prime technical consideration. The uplink site did not have to be in New York, Chicago, or Denver; it just as easily could be in Bristol, Tennessee, Shov Low, Nevada, or Anchona, Montana.

Additionally, each uplink had its own assigned frequency within the transponder so interference such as found on HF was nonexistent. As far as the FM-SCPC listener was concerned the signal either was there or not, and weak or strong, depending upon the carrier-to-noise relationship of the receive system. There was no atmospheric signal fading (only occasional minor signal absorption) or phase-distortion-type reception problems, a phenomena only experienced in the lower portions of the RF spectrum.

A final big advantage was that because of the different FM-SCPC, downlink carrier-to-noise/signal-to-noise performance requirements, smaller-aperture parabolic antennas could be used with good results. We were now talking about using 4 and 6 foot antennas for threshold-plus reception. For an AM or FM radio station located in a congested area where antenna roof mounting formerly was not possible due to elevation look angle problems or building structure unsuitability, this was a significant advantage.

For transponder usage efficiency purposes, FM-SCPC signals are usually transmitted on dedicated FM-SCPC transponders. Two of the more popular SCPC satellites are Westar III transponders 1, 3 and 4, and Westar IV transponders 1, 2, 3, 4, 5, 6. Satellite hopping through the arc on other non-video and common carrier transponders will disclose other transmissions.

Some Intelsats and the Russian Cosmos 7 satellite also use FM-SCPC. You may wish to keep your own reception log since there currently is no "TV Guide" listing of what's up there; however, at least two industry publications have recently begun listing programming services on an occasional basis for some satellites.
presently own either scanner and have your own TVRO antenna and LNA, is comparable to the cost of a general coverage HF receiver. Method three has been proven to work well with detailed frequency readout for cross-reference purposes using the scanner’s search mode. Again, slight variance in readings will occur if the down-converter is remotely mounted.

For those readers who like challenges such as deciphering HF “numbers,” new intrigue awaits you. For example, on one video carrier where one normally would not expect to find an FM-SCPC transmission, I recently received a tone/audio tape loop with the cryptic message: “Stations, the primary circuit will be magenta and secondary cyan.” Other types of transmissions can be found on FM-SCPC transponders including stand-alone FDM, subcarrier FDM, subcarrier SSB, and subcarrier FAX.

**A WORD OF CAUTION**

If you presently have a TVRO system and are attempting to use existing components, be careful not to damage anything. If you are not sure of what you are doing seek competent technical help.

**THE MENU**

The following list represents recent typical FM-SCPC programming found on just one satellite—Westar III. Some programming is occasional or seasonal such as football, baseball and basketball. Network and network news are usually on the hour or half hour and music services usually offer 24 hour programming.

**TRANSPONDER 1**

<table>
<thead>
<tr>
<th>Approximate Frequency (MHz)</th>
<th>DC Digital Frequency (MHz)</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>3720.5</td>
<td>15.3</td>
<td>Tick-Tock Carrier/Network</td>
</tr>
<tr>
<td>3723.5</td>
<td>17.6</td>
<td>Carrier/Wall St. Journal</td>
</tr>
<tr>
<td>3724.3</td>
<td>18.3</td>
<td>Radio 650-WSM Nashville, TN-</td>
</tr>
<tr>
<td>3724.5</td>
<td>18.5</td>
<td>Country music format</td>
</tr>
<tr>
<td>3725.2</td>
<td>19.1</td>
<td>Unidentified Carrier</td>
</tr>
<tr>
<td>3726.8</td>
<td>20.2</td>
<td>Unidentified Carrier</td>
</tr>
<tr>
<td>3727.5</td>
<td>21.1</td>
<td>UPI Radio News (English &amp;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spanish/50 state UPI RTTY</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(LSB 11.4 kHz [east coast]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>subcarrier and LSB 15.4 kHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[west coast subcarrier)</td>
</tr>
<tr>
<td>3727.6</td>
<td>21.4</td>
<td>WPTA-Patterson, NJ-good music format</td>
</tr>
</tbody>
</table>

**TRANSPONDER 3**

<table>
<thead>
<tr>
<th>Approximate Frequency (MHz)</th>
<th>DC Digital Frequency (MHz)</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>3742.6</td>
<td>1.5</td>
<td>Transworld Radio (Left Channel Stereo) Colorado Springs, Co-Current and past popular hits-commercial fee</td>
</tr>
<tr>
<td>3743.0</td>
<td>1.8</td>
<td>Transworld Radio (Right Channel Stereo) Colorado Springs, Co-Current and past popular hits-commercial fee/ LSB 17.5 kHz RTTY-Unidentified</td>
</tr>
<tr>
<td>3739.8</td>
<td>3.0</td>
<td>San Francisco Giants Baseball Network</td>
</tr>
<tr>
<td>3739.9</td>
<td>3.1</td>
<td>Chicago Cubs Baseball Network</td>
</tr>
<tr>
<td>3740.0</td>
<td>3.2</td>
<td>Tone Pulse Carrier-Unident</td>
</tr>
<tr>
<td>3740.2</td>
<td>3.3</td>
<td>Detroit Tigers Baseball Radio Network</td>
</tr>
<tr>
<td>3740.4</td>
<td>3.4</td>
<td>Milwaukee Brewers Radio Network Carrier/ Michigan Farm Radio Network/ Spartan’ Baseball Network</td>
</tr>
<tr>
<td>3742.0</td>
<td>4.0</td>
<td>Tick-Tock Carrier/ RKO News/ Florida Network News/ Florida Sports Network</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KJJO-Los Angeles, CA-Jazz music format/ Motor Racing Network</td>
</tr>
<tr>
<td>3743.5</td>
<td>4.4</td>
<td>Unidentified Carrier</td>
</tr>
<tr>
<td>3744.9</td>
<td>4.7</td>
<td></td>
</tr>
</tbody>
</table>
NEW ARRIVALS

YAESSU FRG-9600

With continuous frequency coverage from 60 to 905 MHz and 100 channels of memory, this hot new Yaesu scanner should generate considerable interest in the VHF/UHF monitoring market.

Detection modes include AM, narrowband FM, wideband FM, and even a product detector for SSB/CW listening. Seven tuning/scanning rates may be selected between 100 Hz and 100 kHz, and frequency selection is by both keypad entry and a tuning dial.

Operated from 12 VDC for mobile installation, an optional AC adaptor is available.

The receiver is a triple conversion superheterodyne, offering 3 dB bandwidth selectivities of 180 kHz (FM wide), 15 kHz (FM narrow), 6 kHz (AM wide), and 2.4 kHz (AM narrow and SSB). Average sensitivity is 1 microvolt for 12 dB SINAD.

Signal strengths are indicated on a two-color matrix display, a 24-hour clock-timer is included and as a recorder output with automatic on/off switching.

Additional jacks provide CPU access for band selection, FM wide/multiplex, AF and RF muting, and other control functions.

A Yaesu CAT interface allows interconnection with most home computers for virtually unlimited control functions including custom memory bank access, automatic tuning and scanning. List price is expected to be $599.

Monitoring Times will present an in-depth review of the new scanner in a future issue.

RUMORS FROM ICOM

With the Yaesu FRG-9600 attracting attention from VHF/UHF listeners, it wouldn't be at all surprising if we learned of a major competitive introduction from ICOM. MT will present full details of this specu-

AND FROM BEARCAT

Rumor has it that Uniden, new owner of the Bearcat scanner brand, will be releasing four new programmable models before the end of the year. It is expected that these will be several models under development before Uniden's acquisition of the company's assets two years ago.

MT will present complete details when they become available.

KILOTECH WEATHER BOOTS

An alternative to sticky, messy sealants is now offered by Kilo-Tec (P.O. Box 1001, Dept. MT, Oak View, CA 93022). Useful for RG-58, 59 and 85, the vinyl boots resist moisture and solar breakdown.

A kit of six boots, your choice, is $8.95 post-paid. Be sure to specify your cable and connector.

1985 Schedule For The Thunderbirds, Golden Knights and Blue Angels

TB = USAF Thunderbirds

GK = Army Golden Knights

BA = Navy Blue Angels

<table>
<thead>
<tr>
<th>JUNE</th>
<th>JULY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2 Flinr, MI</td>
<td>4 Memphis, TN</td>
</tr>
<tr>
<td>1-2 Greenville, SC</td>
<td>4 Grand Rapids, MI</td>
</tr>
<tr>
<td>2 Val d’Or, Quebec</td>
<td>4-6 St. Louis, MO</td>
</tr>
<tr>
<td>8 Harrisburg, PA</td>
<td>6 Little Rock, AR</td>
</tr>
<tr>
<td>8-9 Harrisburg, PA</td>
<td>6-7 Moffett Field, CA</td>
</tr>
<tr>
<td>9 Myrtle Beach, SC</td>
<td>7 Offutt AFB, NE</td>
</tr>
<tr>
<td>12 Moody AFB, GA</td>
<td>11 Plattsburgh AFB, NY</td>
</tr>
<tr>
<td>13-14 Niagara Falls, NY</td>
<td>13-14 Chicago, IL</td>
</tr>
<tr>
<td>15 Ft. Dix, NJ</td>
<td>13-14 Des Moines, IA</td>
</tr>
<tr>
<td>15 Lowville, NY</td>
<td>13-14 Meridian MS</td>
</tr>
<tr>
<td>15-16 Meridian MS</td>
<td>14-16 Dothan, AL</td>
</tr>
<tr>
<td>16 Fort Garry</td>
<td>22 Scoth AFB, IL</td>
</tr>
<tr>
<td>17-22 Denver, CO</td>
<td>22-23 Travis, CA</td>
</tr>
<tr>
<td>17-22 Milwaukee, WI</td>
<td>23-24 Jacksonville, FL</td>
</tr>
<tr>
<td>23 England AFB, LA</td>
<td>23-24 Nike City, IA</td>
</tr>
<tr>
<td>24 Randolph AFB, WA</td>
<td>24-26 Edwards AFB, CA</td>
</tr>
<tr>
<td>25-30 Redding, CA</td>
<td>27 Pensacola Beach, FL</td>
</tr>
<tr>
<td>26-30 Eerie, PA</td>
<td>28 Annapolis, MD</td>
</tr>
<tr>
<td>29-30 Penasco, WA</td>
<td>29-30 Great Falls, ND</td>
</tr>
</tbody>
</table>

A list of FM-SCPC equipment sources is available from the author. Send an SASE to: John Wilson (W4UVV), 6413 Bull Hill Road, Prince George, VA 23875.
Klockit World Time Clock

An inquiry from a reader a couple of months back sparked a reply from another reader—the first was looking for a clock that showed times for various listening target areas around the globe, and the second provided a source: KLOCKIT, Highway H-North, P.O. Box 62N, Dept.WT, Lake Geneva, WI 53147 (phone 414-248-1150).

We ordered the World Time Desk Set pictured herein to sample the clock and were quite pleased with the accuracy of the quartz movement which has not shown loss or gain of even one second in nearly a week of observation.

The gold finish pen and pencil desk set may be purchased separately as a kit, with the 7" x 9" sloped wood base requiring final finishing and staining.

The 5" diameter clock movement is powered by a single size C cell and features the names of dozens of representative worldwide cities with matching times for those zones.

Clock movement alone, $14.95; plans and hardware, $10.95; complete kits, $42.95.

MONITOR THESE SPACE SHUTTLE NETWORKS

It’s as predictable as the spring rains—every time the Space Shuttle is launched, MT telephones light up with calls from listeners eager to tune in on shuttle voice frequencies.

During the days of Project Gemini, the HF band was responsive with single-sideband traffic related to the space shots; even the capsule itself had HF capability on board, frequently reported on 15.016 Hz USB.

But the days of simple reception of space related activities are over; S-band (2:2 GHz) communication is primary, while some UHF support can be heard.

Still, tracking stations around the globe utilize HF for some voice and data links, and UHF is used for limited shuttle-to-ground communications.

Here are some of the S-band reported frequencies; only reported frequencies are listed below, along with typical uses where applicable.

<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3187</td>
<td>Mission Control</td>
</tr>
<tr>
<td>4704</td>
<td>On-site Capsule</td>
</tr>
<tr>
<td>5738</td>
<td>Orbital Capsule</td>
</tr>
<tr>
<td>5810</td>
<td>Avalon, CA</td>
</tr>
<tr>
<td>6896</td>
<td>Cape Radio to Antigua Island</td>
</tr>
<tr>
<td>6897</td>
<td>Mission Control</td>
</tr>
<tr>
<td>7525</td>
<td>Booster receiver</td>
</tr>
<tr>
<td>7765</td>
<td>Mission Control</td>
</tr>
<tr>
<td>10780</td>
<td>Mission Control</td>
</tr>
<tr>
<td>14455</td>
<td>Mission Control</td>
</tr>
<tr>
<td>20183(2)</td>
<td>Cape Radio to Ascension Island</td>
</tr>
</tbody>
</table>

HEAR THE NEW BANDS ON YOUR SCANNER

Get clearer distant reception using ACT-1 POWER ANTENNA instead of scanner's built-in whip. This compact 2" -inch antenna has integral preamplifier, gives you up to 15 db gain (30 times as strong), plus all the advantages of a high antenna away from noise pickup. Often outperforms a much larger indoor antenna! Easy to install on any vertical surface indoors or out. No mast required. Covers all bands: 30 - 900 MHz. Complete with 50 ft. cable, ready to plug into scanner.

ACT-1 POWER ANTENNA
ONLY $79 + $3.40 S&H

D0 away with HF feedthrough, images, cross-modulation, and other interference. Tunable 3-band VHF trap plus fixed HF trap eliminate undesired signals. Low-noise preamp clips weak signals out of the noise. Adjustable-gain preamp can be added, or used with traps, giving you complete signal control freedom for 110-960 MHz bands.

SA-1 SCANNER AMPLIFIER
ONLY $79 + $3.00 S&H

Order by phone or mail. Use Visa or MC, COD. Or send $1 for complete catalog by return mail.

hamronics, inc.
65 K Moul Road
Hilton NY 14468-9535
Phone: 716-392-9430

NEXT MONTH: A review of the complete J.L.L.C. SX-400 wide range receiving system.
Radio Nostalgia

by D.K. deNeuf, WAlSPM

Before the typewriter came into use in the early 1900s, telegraph operators copied messages in longhand. Virtually all operators used a style called "telegraphic script." They were taught very early in their training that it was mandatory for them to produce handwriting which was 100% legible to anyone.

In railroad dispatching misinterpreted orders could mean disaster; a misspelled or misinterpreted message might have resulted in a train collision or similar disaster. A telegraphic message might result in a false alarm or similar disaster.

The average Morse sending operator transmitted at a rate of 20 to 25 words per minute. Sending operators could not send fast enough to keep receivers really busy. The introduction of the semi-automatic telegraph key, or "bug," not only made the sending operator's job easier, but it speeded up traffic movement.

In press telegraphy the "Phillips Code," a set of some 3,000 abbreviations for words and phrases, helped to speed up news movement still further. (The code was very confusing, and operators had to "hit" the code, not spell it.)

One of the more interesting examples of a natural approach to radio was that of William Loomis, a dentist who, around 1865, developed "aerial telegraphy." The emphasis on naturalness contained in some phrases in his original 1872 U.S. patent is interesting. He wrote:

"The nature of my invention...using natural electricity...without aid of wires or artificial batteries..."

You see, Loomis developed his system on the premise that the upper atmosphere was a "static sea" of natural static electricity. This natural sea of electricity could be utilized by raising a tall tower and putting a conical top at the very top of it giving a low-resistance ground return circuit for electrical energy which would strike as a destructive lightning almost any point on the earth. Loomis claimed, as Hertz had, that a galvanometer (a device to detect tiny changes in current) placed at the top of a tower would detect static electricity. Loomis even claimed that he had a patent on the 1872 telegraph circuit. He also claimed that he had a radio circuit which had a switch or key in series with it. This system probably actually emitted electromagnetic waves, as the switch sparked upon being opened.

On the other hand, the galvanometer was not a detector of electromagnetic radiation and, as such, it was not a radio system. It was a means of measuring static electricity. He claimed a radio system as a switch, rather than as a true radio system. He did, however, communicate over distances greater than 1 mile. He claimed to have invented a radio system; his was more likely a conduction through the atmosphere and earth) wireless system. He claimed a radio system as a switch, rather than as a true radio system. He did, however, communicate over distances greater than 1 mile.

In case you haven't yet realized it, lightning bolts are actually nature's own version of the old-time spark-gap wireless transmitter. They send electromagnetic waves far and wide—just listen to an AM broadcast signal during a thunderstorm if you think that claim might be incor
Joseph Henry in 1842 connected the metal roof of his home to the ground through a coil of wire, thus creating the world's first vertical receiving antenna system. In this coil he placed an iron needle and found that lightning bolts would magnetize the needle. He would thus magnetize the needle! Both Henry and Popov thus developed systems which could warn of approaching storms without the need of a weatherman or radio news-caster at an "unnatural radio station," as an intermediary: the work of each of these pioneers gives an excellent example of natural radio.

Eyewitness accounts of early wireless communications are rare. One such account was related by Dr. Lee de Forest who was pursuing radio at the turn of the 20th century. He once saw a coil of wire on the side of a hill. De Forest set up a transmitter and tuned it to the same frequency. He then received an electrical shock when he touched the wire. He reported that he was struck by lightning, but in reality, he was simply touching a metallic wire that was connected to a high voltage transmission line. De Forest's account of the incident indicates that the bush worked fine!

So, you can see that natural radio is not just a clever phrase, it is a reality that has shown some interesting accomplishments in radio's past. So far as we know, it is possible that its full potential has not yet been realized. When I think of the work already done in this area, I can't help but wonder what would happen if some curious-minded inventor, amateur, engineer, or physicist seriously applied himself to the investigation of the atmospheric electricity idea as conceived by Loomis and furthered by Child. Who knows? There may be a Nobel prize waiting for the creative mind that closes in on that goal!

During some research he was pursuing in 1903, deForest was making reception in a remote location and needed a ground connection for his portable receiver. Not having a prepared ground rod handy, he merely took the base off a nearby bush and used the connection to earth formed through the moist interior of the plant and its roots. DeForest's account of the incident indicates that the bush worked fine!
Loggers and information for the 1600-1800 kHz range. All times are GMT.

[五百字内容]
The FCC has stopped taking applications for broadcast station remote pickup stations on 1606, 1622, and 1646 kHz. This is in preparation for the deletion of the service in this part of the band, due to the coming expansion to 1700.

Rob Gerardi sends a few beacons in the 160m band. Might be handy as propagation pointers:

- 1805 0A36 Peru
- 1830 DHL Germany
- 1831 DSM Belgium
- 1834TL3 Central African Republic
- 1834 NITON Radio France (USB)
- 1837 ZML Albania
- 1837 0712 Paeroa Islands
- 1865.5 MFG England
- 1870 JD18 Japan

Geir Stokkeland of Norway sent a nice letter and...
hobby, in spite of the occasional "noamer and groamer" who insists that listening conditions have deteriorated so much that he just can't DX any more.

With FCC deregulation, many changes are taking place in the broadcast band; some stations are unable to meet the competition and are going silent, but far more are vying for open channels in the few clear channels. New shortwave stations are taking to the air in the U.S. Best of all, good inexpensive portable receivers (such as the Sony ICF-2002) are now available, so that the venerable Panasonic RP-2200, to name only a few) make it possible for almost anyone to be able to afford to become an SWL.

I firmly believe that we are seeing only the beginning of things to come; although we have yet to reach the same degree of participation in SWL'ing, in this country as happened in Japan ten years ago. (Companies with clubs in schools and/or magazines devoted to SWL'ing) we'll continue to see new clubs come into being and the older clubs reach the "competition." And I'd appreciate receiving info from club officers as things happen! Thanks to those of you who have been forwarding bulletins from the new clubs, too, by the way.

Chuck Boehnke of Los Gatos, California, brings up an interesting problem which I'm sure will draw a solution from one (or more) MT reader. (Note that it's difficult to determine exchange rates when one is attempting to join a club in another country, and that there are a few experienced clubs.) Orders available from the USPS are "clumsy and difficult to arrange."

He continues, "What we need is some kind of a clearing house or some such method where people could join foreign clubs-easily, inexpensively, and on a method of payment. There are many good clubs outside the USA and there must be some way for us DX'ers to join them. It's much hassle and difficulty."

My banks charges me a whopping rate for converting currency, too, Chuck, and although IRC's are fine for ordering sample copies from clubs, I don't think that they would be thrilled to receive a basket full of IRC's for the membership. Perhaps ANARC, EDXG and SPARC could come up with some kind of cooperative effort aimed at exchanging international memberships.

I don't have a ready solution, Chuck, but let's hear from some of our readers with their suggestions. Sounds like a good topic for discussion at the ANARC meeting this July, too. Thanks for the idea, Chuck.

**DX'ers in the Denver area** seem to be getting together about every two weeks, according to a newsletter (entitled DX Get-Togethers) published by Rob Harrington. I hosted a get-together March 31, and although I thoroughly enjoyed the event, I'm not sure I could plan get-togethers more than once or twice a year ... but I applaud the enthusiasm of the Coloradans!

**The Great Circle Shortwave Society** has taken on a unique and historical program to defend Popular Electronics magazine started a registration program for SWL's, issuing 40,000 calls worldwide for listeners to list on their records have been lost, and the GCSS is attempting to list as many WPE call holders (including those changed to WSW by WJ and others) under Hank Bennett's current program) in a directory.

If you hold a call or know of others who do, send them to GCSS WPE/WSW, Attn: Vern A. Weiss WPE9/GP/ WAPLX, Box 874, Kankakee, IL 60901. If known, please include the date of the registration certificate.

Great Circle also plans to offer exact reproductions of the original shortwave section of the registration certificate. Information about this or the GCSS awards program, the weekly SWL net, conducted on ham radio by members, is available.

... and many other features of special interest to shortwave enthusiasts are published regularly in the club's newsletter. It's a good buy for a 22-cent stamp sent to the same address.

**Make plans now to attend one or more radio club conventions this summer!** Remember, to get the best rates if you're flying into town you have to book your travel reservations 30 days in advance.

**ANARC may well be sponsoring the conventional that will make Milwaukee famous, July 19-21. Send 22-cent stamps or three IRC's to ANARC '85, P.O. Box 24, Cambridge, WI 53523-0024 for information on registration, rates and programs. The National Radio Club is host sponsor;**

their own convention will be August 30-September 2 in Rhode Island. Send another SASE to the same address for registration information.

**Southern California Area DX'ers** will get together Saturday, June 15, 10-4, at the Village View School Auditorium, 5361 Sisson Drive (east of Bolsa Chica), Huntington Beach, CA. Bill Pastersak W4TTP of the "Wenklist Report" will be guest speaker. Send a #10 SASE to SCADS, 3809 Rose Ave., Long Beach, CA 90807-1934 for further information.

Due to non-cooperative gathering place management, the International Radio Club of America had to change both the location and date of its convention. It will now be held August 23-25 in Portland, Oregon. Send an SASE to W5MBP, 2615 ALPHA Block (3037 S.E. Clay, Portland, OR 97216) for an update.

**August 2-4 will find Worldwide TV/FM DX Association members in New Orleans for their convention. An SASE to WTFA, P.O. Box 514, Buffalo, NY 14205-0514 will get you details.**

I like the first issue of Enjoying Radio, David Newkirk's new publication. The focus of the publication is on receiving equipment (although not confined to it) and the articles are literate, accessible, authoritative, specific, and thoroughly enjoyable.

**The annual bulletin, ER, is not meant to be profit-making venture, either, and Mr. Newkirk (who reprints this monthly column in "Review of International Broadcasting") is actively soliciting articles to be included in ER. Send $1.75 for a sample copy or, better yet, send $19.50 for a year's subscription.**

I'll remind you again that the AMR Bulletin (published by the Amateur Radio Research and Development Corporation) is available for those of you who are interested in computer technology. A one-year membership in AMRAD is only $15 ($5 for full-time students); send an SASE to SASE AMRAD, 5829 Parakeet Drive, Burke, VA 22015 for details. They also pay an honorarium for original material published in the Members of AMRAD seem to be at the forefront of computer technology development, and they'd be more than happy to have articles in them in their endeavors.

That's about it for this month; don't forget that my deadline for the August column is June 15.

---

**POLICE CALL RADIO GUIDE** edited by Gene Hughes (9 volumes, 8-1/2" x 11", paperbound, $6.95 each. Available from Radio Shack or from Police Call, Dept. 1, P.O. Box 600, NY 08547 for $6.95 plus $.75 4th Class mail, $1.75 first class.)

Still recognized as the leading scanner frequency directory nationwide, the 1985 edition, finally in circulation, is bigger and better than ever.

**Concentrating on public safety (police, fire, local government, and emergency), POLICE CALL also includes an appendix containing aircraft, government, and railroad frequencies assigned in the region covered by the specific volumes.**

**Listings are cross referenced by state and location, with subsections by call sign and agency name.** POLICE CALL also includes an appendix containing aircraft, government, and railroad frequencies assigned in the region covered by the specific volumes.

**Volume 1** contains an average of 20,000 to 25,000 entries, they are regionally assembled as follows:

- CT, ME, MA, NH, NY, RI, VT
The ENCYCLOPEDIA of ELECTRONIC CIRCUITS edited by Rudolf F. Graf (#1938, 7" x 9", 760 pages, softbound; $29.95)

The previous collection of 1001 circuits were primarily designed around discrete semiconductors. With the advent of domination by integrated circuits in the electronics marketplace, TAB elected to update the compendium around IC circuitry.

As with the previous edition, the book is largely--virtually exclusively--an assemblage of manufacturers' applications notes. Diagrams are largely given elsewhere; they are provided by both consumer and commercial chip manufacturers like Motorola, GTE Sylvania, National, TI, Analog Devices, Burr-Brown, and others.

Categories of circuits include amplifiers, receivers, oscillators, transmitters, power control, sonar, energy diodes, oscillators, converters, waveform generators and many, many more. All in all, quite a massive collection!

The TAB HANDBOOK OF RADIO COMMUNICATIONS by Joseph L. Carr (#1636, 7" x 9", 1048 pages, softbound; $29.50)

This ambitious undertaking is designed to present the basics of radio communications--the circuits, the techniques, the tables--without laborious chapters on advanced theory. Recognition of schematic symbols is required since the book is liberally illustrated with simple diagrams to support the text. Pictorial representations are also included for familiarity.

The encyclopedia might be thought of as an introductory alternative to the ARRL HANDBOOK; while not as complete, it does offer the radio hobby from a much more readable perspective. The text is written in a conversational style to avoid the intimidating frequently encountered in more theoretical works.

Chapters include topics on components and basic electromagnetic theory, transmitters and receivers, amplifiers, test equipment, antennas, shop techniques and safety--58 chapters in all.

BROADCASTING AROUND THE WORLD by William E. McCavitt (#1933, 6" x 9", 336 pages, hardback; $22.95), the text, however, is well written, showing the polish of professional journalism.

The TAB HANDBOOK OF RADIO BROADCASTING by Andrew J. Browne (#1573, 7" x 9", 285 pages, softbound; $19.95)

The book is comprised of various articles covering broadcasting, the history of broadcasting, broadcasting in various countries, broadcasting in the U.S., and broadcasting techniques.

The book can be read as a historical document of radio broadcasting, or as a practical guide for those interested in broadcasting. It covers a wide range of topics, from the early days of broadcasting to the modern era, and provides a comprehensive overview of the development of radio broadcasting around the world.

The book is well-researched and thoroughly documented, with a wealth of information on the technical, social, and cultural aspects of broadcasting. It is a valuable resource for anyone interested in the history and evolution of radio broadcasting.
"W2PNA from WD4JTS. Sure been nice talking to you, Hank, and hope to be able to contact you again in the near future. Please QSL and I'll get my card in the mail to you, 73."

Sound like the tail-end of a typical ham radio QSO? Could well be, although I haven't had the good fortune of actually talking to John Heaton, WD4JTS, of Largo, Florida, as yet. To confirm the fact that I might have worked him, I sent the promised QSL card and anticipate receiving his within a few days.

A QSL sent between ham operators is much the same thing as a verification sent from radio stations to shortwave listeners, So, you ask, what is this leading up to?

Just this. In years past, and in the present time as well, hams and radio stations were not the only people to have station cards. Virtually every serious SWL at one time or another has had his own station card made up to his own specifications and design. Some were fairly simply while others were fantastically done.

Most of these cards contained much the same type of information as that found on the ham radio QSL cards: places for date, time, station identification, latitude, reports, frequency, perhaps even one line for program data. Receiving equipment and antenna systems would also be listed.

Note that I mentioned "perhaps even one line for..." This one line would be fine for reports to ham operators but it would be a sorry excuse for a report to a broadcast station if sent by itself. More on this later.

At one time these SWL cards were used extensively for card swapping among the SWLs. SWLs often used to have the finest card available and some of them would appear to have been prepared by a local chamber of commerce. Those states that boasted fewer SWL cards than others (Nevada, the Dakotas and South Carolina, for example) would often find the SWLs requesting return postage for the privilege of, having someone else have their card. One SWL in one of the states mentioned above once had the colossal gall to send his card out in return for one buck.

Card swapping was often accomplished by a short list of other card swappers and if the recipient hadn't already received or swapped cards with those listed, he was, of course, welcome to go after the others. Most of the radio clubs in those days devoted anywhere from a quarter page to several pages listing SWL card swappers and it was a simple matter to fill up a wall with incoming cards in little time.

Card swapping was an interesting and fun part of the hobby and we're sorry to see that it has virtually disappeared. Oh, there are still a few swappers around but it brings one in now and again.

Have you heard the International SWL Network on the air yet? The Red Cross Broadcasting Service continues to broadcast on the last Sunday of each month from Central America. There are also directional broadcasts on 7210 kHz in English at 1100, German at 1200 and Spanish at 1220, with a repeat in English the following day at 1700. There are broadcasts in English at 0940-0955 to west Africa on 17795 kHz, to east Africa on 21630 kHz, to Australia on 21520 kHz, and to Asia on 17390 kHz.

There is also a broadcast to Asia at 1545-1600 on 21630 kHz, in Portuguese at 1010-1025 to west Africa on 11795 kHz, and to east Africa on 21630 kHz. There are broadcasts in Spanish on the following day (still Sunday in the target area) to Central America at 0000 and 0200 on 9635 kHz. (Our thanks to Sweden Calling DXers for this schedule.)

The WDX Monitor Registration Program has helped to revive this facet of the hobby a bit since SWL cards can now have a specific identifier listed on them rather than the more vague references such as SWL-W. While unofficial with no legal status, all of the WDX identifiers now in use have been issued on an individual basis with no two alike.

More on this can be obtained for return postage from your editor at Box 3333, Cherry Hill, New Jersey 08034.

Returning to the sixth paragraph, I have always strongly recommended against using SWL cards for reports to broadcast stations since they rarely, if ever, contained sufficient technical and program data to warrant verifying by the station receiving the report. Cards were intended to be sent with a separate detailed report, of course, along with return postage, but the use of the card by itself -- and usually without return postage -- often quickly found their way into the round file.

As a parting shot for this month, I'm requesting help in identifying a station (possibly a repeater of some sort) on 151,925 kHz using the CM callsign of K3XBBB. It's probably within 50 miles of Camden, New Jersey.

The arrival of the summer months brings to mind that sick old joke about selling your mob-band radio to go over a cliff in your brand new car; your feelings are decidedly mixed! Summer's many attractions are very welcome but at the same time the tired 'n true SWL cringes a bit and mourns the loss of quiet band conditions.

Take heart; summer may bring higher noise levels but it occasionally brings some excellent openings that aid reception of the flyweight out-of-band latins. And, despite the low sunspot count, you should also find the higher bands open later in the evening. Keep at it and let the QBN get you down.

**TOP O' THE LINE** — An intriguing new mystery station is presenting a puzzle. It's been noted over the past few weeks on 7,400
(before that on 7.360), airing the same music tape night after night - much of it sentimental Latin vocals by a man.

The station signs on 0000, usually hourly until around 0200 with no announcements whatsoever.

Signals are very strong, dominating La Voix del CIDI on the same frequency. More recently the station has also been heard around 1400 on 9.920.

Radio Nacional Archangel in Argentina has been noted lately on 14.474 in Spanish to sign-off around 0040. Frequency and sign-off time are both slightly variable.

The Chad station, Radio Moundou, is being occasionally heard around 0500 with weak signals on 5.286. Power is noted to be around the just under 2.5 kilowatts. Broadcasts are in French at this hour.

AFRICA - ANGOLA - Gary Hickerson in Arkansas hears Radio Nacional on new 5366 variable (ex-5334v) from 0405 sign-on. Mostly music and all in Portuguese (editor).

BENIN - ORTB in Parakou noted at 0510 in French on 5.025, but Radio Rebelde in Cuba usually blocks this channel.

BURKINA FASO - Radio Burkina now noted often on 4.815 in French around 0630.

BURUNDI - Rare La Voix de la R évolution on 3.300 heard during a very good African evening around 0500 after TGNA had left the frequency.

CAMEROON - Radio Bertoua heard at 0500 on 4.750.

CENTRAL AFRICAN REPUBLIC - RTC at Bangui in French and local languages on 5.035 from tune in around 0520, often quite good level.

CLANDESTINE - A Vox de Verdad (Voice of Truth) anti-Sandinista on 0430 sign-on at 4.950 and to sign-off at 0530. Weak but clear, best in ECGS/USB. Pop music, several IDs and abrafted at 0350 reports Hickerson.

Radio Truth, the anti-Zimbabwe station, continues to be heard at very good level on 5.035. 0430 sign-on with a bird call, then into a half hour English program.

CONGO - Radio Televisi on et Radi olo ise noted in French at 1900 on 15.190.

LIBYA - JIBC heard in all-Arabic on 3.200 virtually every evening with good signals. Radio One in Tripoli heard on new 9.890 evenings and at night in Arabic with a good signal, reports Hickerson in Arkansas.

MADAGASCAR - Radio Madagascar officials on 5.010 variable with sign-on around 0257. Also at 0500, both transmissions in French.

MALAWI - Radio Malawi has returned to 4.783 and is noted to sign-off at 0000.

SIEGEO LEONE - SLBS noted around 0600 on 5.980 with good signals.

SOMALIA - Radio Mogadishu heard in vernaculars around 0400 on 7.200 but reception is very difficult due to a Voice of America outlet on the same frequency.

SOUTH AFRICA - Capital Radio, Transkei heard on variable 3.970 at 0345 with pop music, commercials in English.

SUDAN - Omduran Radio on 5.039 in Arabic from sign-on at 0427.

SYRIA - IRAQ - La Voix du Zaire from Kinshasha sometimes found with African music and French announcements around 2200 on 15.245. Luhum Bushi is noted tuning at 0357 on 7.205, in parallel to 4750 (variable), but the 41 meter band outlet is usually better.

ASIA - AFGHANISTAN - Radio Afghanistan via USSR transmitters is noted at 1730 on 9.665.

BANGLADESH - Radio Bangladesh has its new 250 kilowatt outlet at Kabirpur in English at 1230 on 11.935, but reception is still poor despite the higher power.

BURMA - The Burma Broadcasting Service noted occasionally in Burmese around 0300 on 4.725, but usually quite weak.

CENTRAL AMERICA - COSTA RICA's Radio Universidud on 5.107 variable is noted with sign-on just prior to 1300 but with the earlier sunrise that's unlikely now. Also heard occasionally in the evening up to 0400 sign-off.

Argentina - La Rumba noted at 1200 on 6.072 with music and commercials in Spanish. Announcements are often just "Buenos Aires". Location is Cartagena.

HONDURAS - La Voix del Mundo 6.075 heard several evenings recently around 0300, in Spanish and with pop music.

NICARAGUA - Michael Chinakos in Washington state notes the Voice of Nicaragua on 6.015 with its English hour at 0407 tune in. Jammed or interfered with from 0446.

Radio Zinica at Bluefields on 5.600 is very good within 1100 variable sign-on, mostly music and time checks.

Radio Sandino, 6.200, all Spanish at 0130 with music and political talks.

MEXICO - XEIQ, which relays medium wave outlet XEQ, has been reactivated after a multi-year absence. Often heard in the 1300-1600 time slot.

Nicaragua - Radio Sandino, 6.480. Announced as "La O' or "La O" Mexicana."

EUROPE - AUSTRIA - ORF's English service to North America well heard at 1000 and again at 0330 tune on 6.000.

DENMARK - Radio Denmark on 15.165 at 1300 in Danish but its usual English identification just prior to the start of the Danish hour.

ICELAND - European sources report that the Voice of Iceland is now using 9.859 around 2000 with an all-talk, all-Icelandic program.

IRELAND - RAI in English noted on 9.475 at 0100.


MONACO - Trans World Radio heard from sign-on at 0725 on 7.160 with English and announcing a parallel frequency of 9.495.

MIDDLE EAST - IRAQ - English from Baghdad heard on 9.610 at 2130.

KUWAIT - Radio Kuwait heard with English at 1900 on 11.675. Sometimes good, but normally only fair reception.

SYRIA - The English program from Damascus is still being noted at 1200, but now on 17.840 rather than the previous 17,510.

TUNED ARAB EMIRATES - Voice of the UAE at Abu Dhabi heard on 7.310 with an English program at 0330.

SOUTH AMERICA - BRAZIL - Radio Liberal on 3.125 noted around 0600 with pop music, commercials; all Portuguese.

Peru - Radio Cultural Araracuara on 3.365 at 0205.

Radio Clube do Para on 4.895 at 0415.

Radio Araguari on 4.905 at 0500.

Radio Rio Mar on 6.965 at 2305; all the above in Portuguese only.

COLOMBIA - Radio Nacional on 3.635 at 0500 in Spanish at sign-off.

Ondas del Ortegozua occasionally shown through on 4.975 when the strong utilisation station, normally here, is silent. Evenings or around 1000.

Armonias del Caquetá still being heard around 1100 on 4.915.

ECUADOR - Religious and cultural outlet La Voz de
ENGLISH LANGUAGE BROADCASTS
by Tom Williamson

This month we will take another look at broadcasting in English from Asian countries. It should be understood, however, that apart from a few stations such as Beijing and Tel Aviv, reception is less reliable than from most other areas. This may be due to both geographical and economic reasons.

BANGLADESH: This is a rare visitor to the dial these days, but Dacca (Dhaka) has been heard in its English segment 1230-1300 in the 16 meter band on 17745 kHz (DKO, Sellers/Hopkins). Also has English scheduled for 1815-1915 (frequencies currently uncertain, but perhaps in 31/41/49 meter bands).

CHINA: As per earlier issues, Beijing has several broadcasts directed to North America: between 0800-1100 on 15385/15520/11650 kHz; and 1900-2100 on 15520/11650 kHz. These are directed to the east coast, while for the west coast, they are scheduled at 1100-1200 on 17795/15520/13385...and 1200-1300 on 17795/15385 kHz.

However, China jumps around a bit, and they have recently been heard on 11360 and 9820 so check out these channels. Programs include their viewpoint on the news and interesting musical selections (see previous articles).

CYPRUS: Nicostas has not been heard here for some time but has an English schedule around 1730 in the 49 meter band. Anyone hearing them now?

SWL WORLD WATCH cont'd
carry its broadcasts and is thus in a state of limbo. We understand they have an application in the works for a station of their own which would operate from the island of Curacao-in the Netherlands Antilles. In the meantime, we wish the Radio Eastern Band luck in finding an inland home.

As we sail into summer, Ken and I hope you'll continue to monitor the SWB bands and let us know what you hear. It may surprise you but my duties as a gentleman's gentleman prevent me from doing all of this reporting for this column by myself. So, let us know what you are hearing.

'Til next month - I hope you will be out into your tan - 73s from Ken and me.

KOREA-SOUTH: Seoul has some powerful transmitters, but you wouldn't know it from the scarcity of logs. 15575/11820/1810 are the most likely bets at 0200-0300 and 1400-1500, but other times are scheduled.

KUWAIT: Now here is one of the more regular signals on the dial. The 1800-2100 segment in English is audible most days with variable strength. Programs of news and music, with an occasional segment (in Arabic) to be heard in Arabic. I'm not a good try at this, but perhaps we'll have a variable performer with days of absence from the dial.

MYANMAR: Daungas has an improved service these days with two English segments being heard: 1200-1300 on 17510, and 2000-2100 on 11685 kHz. News with emphasis on Middle East, Oriental music-sometimes classical music.

UNITED ARAB EMIRATES: Dubai service to North America at 0230-0415 seems to be best on 7310 kHz, but a broadcast to Europe is sometimes audible here at 1600 on 15320 kHz. Note that Abu Dhabi (Voice of the U.A.E.)—a different station from the above U.A.E. Radio—has been testing a high power transmitter lately on different channels including 60 meters. It was widely heard both in Europe and North America, so perhaps we will have a new English voice soon from this part of the world.

There are other smaller countries such as Burma, Singapore, Sri Lanka, etc. with English language broadcasts, but their reception is, in general, so infrequent as to make their meters somewhat impractical at present. So we conclude with a table of selected schedules from some of the above listed broadcasters.

SELECTED ASIAN SCHEDULES

<table>
<thead>
<tr>
<th>Country</th>
<th>Frequency (kHz)</th>
<th>Time (24-hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHINA</td>
<td>15385</td>
<td>0800-1100</td>
</tr>
<tr>
<td></td>
<td>15520</td>
<td>1900-2100</td>
</tr>
<tr>
<td></td>
<td>11650</td>
<td>1200-1300</td>
</tr>
<tr>
<td></td>
<td>17795</td>
<td>1100-1200</td>
</tr>
<tr>
<td></td>
<td>15520</td>
<td>1200-1300</td>
</tr>
<tr>
<td></td>
<td>13385</td>
<td>1200-1300</td>
</tr>
<tr>
<td></td>
<td>17795</td>
<td>1200-1300</td>
</tr>
<tr>
<td></td>
<td>15385</td>
<td>1200-1300</td>
</tr>
<tr>
<td>ISRAEL</td>
<td>9815</td>
<td>0000-0300</td>
</tr>
<tr>
<td></td>
<td>9440</td>
<td>0200-0400</td>
</tr>
<tr>
<td></td>
<td>11650</td>
<td>1100-1200</td>
</tr>
<tr>
<td></td>
<td>15520</td>
<td>1200-1300</td>
</tr>
<tr>
<td></td>
<td>11685</td>
<td>0500-0700</td>
</tr>
<tr>
<td></td>
<td>15320</td>
<td>1600-1700</td>
</tr>
<tr>
<td>KUWAIT</td>
<td>1800-2100</td>
<td>0000-0300</td>
</tr>
<tr>
<td>TAIWAN</td>
<td>0200-0400</td>
<td>0500-0700</td>
</tr>
<tr>
<td>TURKEY</td>
<td>0400-0500</td>
<td>0500-0700</td>
</tr>
<tr>
<td></td>
<td>0900-1200</td>
<td>1000-1300</td>
</tr>
<tr>
<td></td>
<td>1300-1600</td>
<td>1000-1300</td>
</tr>
</tbody>
</table>

Also...
PIRATE RADIO

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

KFP-941: Last month we reported the return to the airwaves of the new fawz KFP-941. Now more good news has arrived from Al Weiner, owner of KFP-941 Yonkers, New York, and WZIZ FM and WOZI AM of Presque Isle, Maine. According to Mr. Weiner, Congressman Blagg of New York is going to submit a bill to establish KFP-941 as a legal broadcast station for Yonkers. Currently it must operate as a "preparation tool" for WZIZ and WOZI.

Weiner reports the power and antenna of KFP-941 remain the same as they have been from the start. The station uses 100 watts and a 40-foot vertical. Look for it on 1622 kilohertz.

PROGRAMMING PERSPECTIVE BY JOHN T. ARTHUR: A different kind of station is appearing these days that isn't afraid to speak its mind. KNBS appears to be something of an outspoken relay station. The broadcast on tape sent by a friend in Oklahoma featured relays of the Voice of Laryngitis and Tangerine Radio, as well as a tribute to Q5BS and an editorial advocating decriminalization of pot. Phil Muzik, announcer, and Pat Seedy, studio engineer, say KNBS is operated by the California Marijuana Cooperative and supports NORML's attempts to change the law. Of course, they also say they operate from Alcatraz Island.

The Cannabis 41 staff is a friendly bunch, but mail from there smells kind of strange, and the mailman may look at you funny. If you hear them and want to write anyway, send a complete detailed report and three mint first-class stamps to KNBS, Box 982, Battle Creek, MI 49015. Say you read about 'em in MT.

IRELAND: A wealth of material from Ireland's Tony Donlon recently arrived, bringing us up to date on the free radio scene in that country. Tony feels that current government proposals could lead to the legalization of non-government radio within six months. In the meantime the Irish pirates, most of whom are commercial, continue to operate in great numbers thanks to loopholes. There are at least 49 outside the Dublin area with many more in that capital city. Dublin the hottest station right now is Q102 which began broadcasting in January. Similar to American stations in format, it has been the most popular radio ever, it had to overcome the difficulty of having its original transmitter stolen a few days after transmission began.

Meanwhile, the owner of still-popular Radio Dublin finds himself in trouble with the authorities, but not for broadcasting. He is currently facing a charge of arson, but Radio Dublin can still be heard in North America on its shortwave relay on 6910 kilohertz. Sometimes even in the summer months it will put in a surprisingly strong signal.

THE 1985 PIRATE POL! John Arthur notes that his popularity poll was not limited to just those involved but rather on supporters of free radio, so there is a statistical skew. Nonetheless, according to all but two ballots, the most popular North American pirate is the Voice of Laryngitis. Second is Radio Clandestine; third is Secret Mountain Laboratory; and fourth is tied between KQSR, KQSB International, Radio Sine Wave, and Tangerine Radio.

Good show, Maynard!" to Global American Network, KPRC, NWRI, the original Radio Free Insanity, Radio Morania, Radio North Coast International, Radio USA, Radio Springfield, Samurai, Radio vocalist, Bob, Voice of Comunism, Voice of Venus, WBST, WDX, WIMP, and WYTM. pirate station listeners clearly love to hate is Voice of Tomorrow (political commentary, no variety). WWAY pirate station is mainly for overkill. WMVY ranked third for insipid Top 40 programming and only sending out one QSL.

 Dishonorable Mention to PRN (pretentious), Radio Bag (stupid), Radio Clandestine (anyone can talk over a record), WBST (too fake), WIMP (too heavy on KPR), KROK and WKUE (same old crap), and KTKR (too technical). There was no Dishonorable Mention to KNBS.

Both this poll and one taken during 1982 indicated the desire for original, creative programs. When the most popular stations were Radio Confusion and Syncom.

GREECE: Three anarchists have been sentenced to five months in prison for running an unlicensed radio station called "Mole." They had been sentenced to seven months for an unlicensed operation known as "Free Radio." Four others were acquitted (Black Flag, Feb. 25, 1985, via Raunich Rick of Tangerine Radio).

PUBLICATION REVIEWS: The Wave is the new quarterly publication of Tangerine Radio. Issue one recently arrived here, and it is six pages of anarchist editorials, technical material, letters from listeners, and other interesting information pertaining to Tangerine Radio and the free radio movement. Anyone intrigued with pirate radio may enjoy this: it's only $2.00 (cash only) per year via DVS Communication Specialists, Box 5074, Hilo, Hawaii 96720.

The 1984 (latest) edition of the Free Radio Handbook has arrived. If you ever wondered what is involved in putting a pirate on the air, this 20-page book will tell you. There are some excellent background articles on the nature of free radio as well as some solid technical information. Suggested sources for parts and manuals are also given. This makes a fascinating read even if you have never entertained the slightest thought of becoming an "unofficial broadcaster." It is just $2.00 (cash only) from the DVS address indicated above.

PERU: Commenting on an item appearing in our April column, Luis Suarez of Venezuela says that the title of the Cuban radio program "A Los Cuatro Sueños" is translated incorrectly. The best be translated as "To the Four Incas' Territoires." Luis declares that the ancient Incan Empire included the north of Argen-

tina and Chile, Bolivia, Peru, Ecuador, and southern Colombia. It was divided politically into four suyos or territories, and it is usually a coincidence that the word "suyo" is written similarly to the Spanish possessive pronoun of the third person, "suyos." Quechua, one of the languages used in the broadcast, was the language of the Incas. Today it is an official language of Peru, along with Spanish, and is spoken by several million people in South America.

Finally, Luis notes that in addition to the above Radio Bibico program several eastern European stations broadcast instructions to the Sendero Luminoso (Shining Path) terrorists of Peru.

CAROLINE RADIO: New York's Dave Alpert sends along an item from the March 8 issue of Black Flag, covered with increasing competition, including fellow offshore Laser 558, Europe's legendary North Sea pirate is now trying to attract the American advertising market. British advertisers are prohibited by law from purchasing time on the station, but Caroline's legal consultant, Lee Abrams, hopes to lure the American movie industry, breweries, record companies, and others.

Radio Monique, also transmits from the present vessel anchored off England's southeast coast.

While on the subject of the European offshore pirates, it is interesting to note that some are currently speculating there may be American government stations sitting silently backing such stations as Caroline and Laser 558. Since European government stations are often in disagreement with American policy, perhaps Washington wants to make sure its position will be heard. Much of the staff of these stations is American.

HOLLAND: Those who have been reading this column for some time will recall Michiel Schaay's outstanding article on clandestine stations which appeared here in condensed form. We were approached by Stu Michiel's material after Europe's Benelux DX Club refused to print it. Now Michiel writes from
Holland to tell us that both he and the club want us to know they have settled their differences. A compromise version of the article has been published, and the club has dropped proposals for his expulsion. In fact Michel is once again writing for the Benelux DX Club bulletin. It is good to know that one of Europe’s most talented writers in the field of radio communication and one of its most respected clubs are a team again. Among other things, Michel’s article dealt with Radio Freedom, the anti-apartheid station of the African National Congress of South Africa.

COLOMBIA: A last minute item from David Crawford has just arrived. The Colombian revolutionary group M-19 has now established a clandestine radio station. From his Florida location Dave logged in April 7 on 1054 kilohertz from 2102 to sign-off at 2150. He obtained a tentative ID as "Radio Maquisart" along with additional IDs: "Revolutionary Armadas", "Voz de las Fuerzas Armadas Revolucionarias de Colombia" (Voice of the Revolutionary Armed Forces of Colombia) and "Signal strength was good but with extensive fading. Programming consisted of commentaries with some music.

ODDS AND ENDS: Havana Moon reports hearing announcements by an anti-Castro clandestine in the 5050 kHz band. The transmissions are no longer than five minutes in length and give a schedule for the 7 megahertz spectrum of the broadcast. So far he has been unable to get an ID, but he notes the hams are rather unhappy about this intruder.

Radio Freedom has been hearing La Voz de los Cubanos en Africa on 6045 kilohertz at 0500 GMT. This writer understands that the anti-Castro organization Abadala is the sponsor, and the station’s purpose is to broadcast to the Castro forces in Angola.

Terry Krueger says that the formerly silent clandestine Radio Frei Surinan (Radio Free Surinam) is not broadcast over the entire capabilities of the anti-Castro La Voz del CDF. One possible frequency to try is 11680 around 2030 GMT.

People who wrote the controversial political pirate Voice of Tomorrow are now starting to turn up on some interesting mailing lists. They are receiving mail from organizations expressing a philosophy similar to that of the station.

In Italy even organized religion is into unlicensed radio, which for now at least is legal there.

Copyright, 1985. All rights reserved, including the right to reproduce this article, or portions therefrom, in any form except for the inclusion of brief quotations in a club bulletin, review or international broadcast.

"Los Numeros"
32444 69213 88816 52196 63811 94216

Havana Moon

A well placed source--

In the article, "Los Numeros" features a table of 5-digit Spanish frequencies that have been monitored by various stations worldwide. The table includes the following information:

- **Frequencies and IDs**: Various stations monitoring the 5-digit Spanish transmissions.
- **Date and Time**: When the monitoring took place.
- **Programs and Comments**: Details about the programs and notes on any unusual activity.

Among the notable stations mentioned are:
- **Radio Freedom**: Monitoring activities on various frequencies.
- **La Voz de los Cubanos en Africa**: Broadcasts on 6045 kHz.
- **La Voz de los Cubanos en Africa**: Broadcasts on 6045 kHz.

The table is a rich source of information for anyone interested in the monitoring of unlicensed radios in various parts of the world.
LOS NUMEROS cont’d

where the FCC reported-

3/2-digit, English 0230Z

5-digit Spanish (in pro-

Continuous musical tones at

4-digit English on 0500Z at

5-digit German on 0300Z at

BULGARIAN NUMBERS STATION(?)

the views expressed in this
column are those of Havana
Moony and do not necessarily
the views of the Monitoring
Times management, staff or
readers.

CRYPTOGRAPHY

PART II

by Bob Hess

As mentioned earlier, the "slide" crypto is pos-
sibly the oldest form of alphabet crypto; for a
brief message, it is probably as good as any other
kind of crypto.

The longer a message is, regardless of form, the
more vulnerable it becomes.

Top experts have said that
one thousand characters are
enough of any crypto to
allow entry and solution.

THE SLIDE

By a "slide," we mean
taking one alphabet and
sliding it against itself, thusly-

This "flipped" slide crypto is said to have been
used by Julius Caesar to communicate with his
generals. It could well have been as
"slide" as well the char-
acters of a good "Field"
crypto. Battles and wars have been lost because
of an otherwise brilliant command-
or used poor crypto.

The difficulty with the
simple shift is that a few
trials will solve it—no
sweat. A slide of this type
can be broken in ten minutes
or less.

The next step up the
ladder of complexity is to
slide an alphabet against
itself, but reverse one of
the two alphabet series, thusly—

In intelligence literature

by Michael Speers

If anyone doubts that
the publication of books on
various aspects of intelli-
genence is a growth industry,
one need simply visit any
well stocked new bookstore
and examine the titles dis-
played therein. The public
fascination with intelli-
genence/spy-mage matters has
always been considerable and
nothing more evident than the
British Isles where the
number of new titles
regularly exceeds those in
the U.S.

This difficulty has
always been to make some
sort of judgement as to the
relative worth of such books
before investing in them.

This same problem exists in
regards to early books now
out of print.

Unless one has had an
extensive career in intelli-
genence and therefore had
access to the facts in a
particular case or on the
operations of the CIA or
the NSA, it is very difficult to
determine whether one is
reading artfully contrived
"disinformation"—a book by
a hack essentially just
press reports and handouts
from the Agency's press
relations people—or is
truly reading about subjects
that have not been published before or repre-

BULGARIAN NUMBERS STATION(?)

John Santostesso reports that
his sources indicate that a Bulgar-
ian(? numbers station is operating
on 6676 KHz at approximately
2300Z. Thanks for the infor-
mation, John. Let's keep a
close watch on this fre-

IT'S BEEN A LONG TIME

Despite fears of an
"electronic Bay of Pigs," legis-
lation for Radio Marti
was approved on August 10,
1982. Now, after months and
months and million of dol-

minutes there is--AND MAY
NEVER BE--a Radio Marti on
the AM or any other band.

WHAT HAS BEEN LEARNED

1. Not all "numbers" monitors
subscribe to the prem-
ise that 5-digit 'num-

2. Many—but not all—4-digit
Spanish, 4-digit Eng-

3. Most "numbers" stations

tend to "cluster" around
the same fre-

4. CW and MCW trans-
missions of similar
content as 5-

digit Spanish are com-
monly within the frequen-
tytes of 3090 KHz and
4030 KHz. They are more

domestic groups that

5. At least four transmission

Another common termi-

most 5-digit Spanish

Continuous musical tones at
3030Z on 7400 kHz (3/31/85);
not a station
interval tone or
Bulgarian.

4-digit English on 0500Z at
7375 KHz (3/30/85) AM/ YL;
exact format as 4-
digit Spanish.

5-digit German on 0300Z at
9068 KHz (3/23/85) AM/ YL;
intro is Morse "N" for
several minutes.

Random Spanish numbers
on 0025Z at 3644 KHz AM/ YL.

1. The "slide," we mean
taking one alphabet and
sliding it against itself, thusly—

2. This "flipped" slide crypto is said to have been
used by Julius Caesar to communicate with his
generals. It could well have been as
"slide" as well the char-
acters of a good "Field"
crypto. Battles and wars have been lost because
of an otherwise brilliant command-
or used poor crypto.

3. The difficulty with the
simple shift is that a few
trials will solve it—no
sweat. A slide of this type
can be broken in ten minutes
or less.

4. The next step up the
ladder of complexity is to
slide an alphabet against
itself, but reverse one of
the two alphabet series, thusly—

5. The common terminators for
most 5-digit Spanish

This "flipped" slide crypto is said to have been
used by Julius Caesar to communicate with his
generals. It could well have been as
"slide" as well the char-
acters of a good "Field"
crypto. Battles and wars have been lost because
of an otherwise brilliant command-
or used poor crypto.

The difficulty with the
simple shift is that a few
trials will solve it—no
sweat. A slide of this type
can be broken in ten minutes
or less.

The next step up the
ladder of complexity is to
slide an alphabet against
itself, but reverse one of
the two alphabet series, thusly—

www.americanradiohistory.com
BIBLIOGRAPHIES

A SCHOLAR’S GUIDE TO INTELLIGENCE LITERATURE: BIBLIOGRAPHY OF THE ROSSELL J. WESTON COLLECTION. University Publications of America, Frederick, MD 560. This book lists and categorizes some six thousand titles in the classic early field of intelligence literature. The Bowen collection is one of two famous collections of intelligence literature. Bowen turned over his collection to Georgetown University but continues to build the collection.

The titles are grouped under various categories, but the book is simply a listing of titles, authors and dates of publication. There is no analysis as to the history and significance of the field. In particular, no significant related material listed comprises 54 titles. Because

CRYPTOGRAPHY cont’d

the century. It was basically a slide, but used a mixed alphabet slide against it. There is no example of such a technique that I have found in the reference books.

To make it even messier for the cryptologist, this crypt used very unusual keywords, such as “sycythe,” “acplets,” “spixny,” and other horrors. The whole thing was nightmare.

In this day of computers, the shift has been jumped up still higher in complexity. Now, the best computer is a “key phrase” which may be up to 256 characters in length. The breaker’s agony has been prolonged to where it may take several months or years to find the right key to sweat out solutions.

And in answer to H. Moon: The “numbers” are probably wheel or table slide rotator. There is a much more complex than a dozen characters in length -- classic field crypto. Text for drills are mottoes and should be recoverable.

ALPHABET SHIFT WITH WHEEL

RSTUVWXYZACEDFHIKLMNOPQRSTUVWXYZ

Shift 51

BCDEFGJILMONPSRUWXYZ

Shift 101

OPQRSTUVWXYZACEDFHIKLMN

Shift 151

Shift 201

LAST PART OF A POLYALPHABETICAL

TABLE

ACDEFGHIJKLMNOPQRSTUVWXYZ

ABCDEFGHIJKLMNOPQRSTUVWXYZ

STUVWXYZACEDFHIKLMNOPQRSTUVWXYZ

ABCDEFGHIJKLMNOPQRSTUVWXYZ

STUVWXYZACEDFHIKLMNOPQRSTUVWXYZ

ABCDEFGHIJKLMNOPQRSTUVWXYZ

STUVWXYZACEDFHIKLMNOPQRSTUVWXYZ

For example, the book was published in early 1961, it does not list David Kahn’s later book, KAHN ON CODES, nor Bamford’s THE PUZZLE PALACE.

George Constantines' AN ANALYTICAL BIBLIOGRAPHY OF INTELLIGENCE LITERATURE. The author was an official before retirement and is a considerable scholar of intelligence literature. In my estimation, this is the most valuable of the current bibliographies although it, too, is somewhat dated, has been published in 1961 by the West Virginia University of Boulder, Colorado ($60).

Constantines lists over six hundred books, appraising each with an analytical description. A full text of contents, assessing the author’s credentials, and the relative merits of the author’s books. There is no comparable bibliography.

U.S. DEFENSE INTELLIGENCE COLLEGE, BIBLIOGRAPHY OF INTELLIGENCE LITERATURE. This official document lists, analyzes, and grades titles. It is intended as a reading guide for those studying at the College. It is edited by Walter Forzen, who, together with Bowen, is considered the leading authority on intelligence literature. As an official document it reflects official thinking as to the merits of the works covered. A new and expanded edition is due soon.

The guides listed above are expensive but valuable if one wishes to assess what a particular book is about and what the experts think of it.

RECOMMENDED READING

The classic cryptic textbook which stand high on my own particular list are as follows:


Patricia Beesly, ROOM 40, BRITISH NAVAL INTELLIGENCE 1914-18. Published in 1982 by Hamish Hamilton in London. I am unsure whether this book was ever reprinted in the U.S.


Ronald Lewin, THE AMERICAN MAGIC: CODES, CIPHERS AND THE DEFEAT OF JAPAN. Farrar Strauss Giroux, New York, 1982. Levin, who died recently, was a highly regarded British military historian. This book deals with the U.S. successes in breaking the Japanese codes. Herbert G. Yardley, THE AMERICAN BLACK BOOK MARCH 1941. This classic early book in the cipher field was written by one of the most gifted and colorful figures in the field (and an arch enemy of William Friedman). It is long out of print.

-- Yardley, YARDLEY-GRANS. NY 1932. This is a valuable book dealing with actual intercepts of German submarine traffic during World War I. The author describes his technique with a number of pages of the double column of cipher text. The reader is invited to use in breaking the code (with hints and guidance supplied by Yardley). Long out of print.

-- Yardley, THE CHINESE BLACK CHAMBER. Houghton Mifflin, Boston, 1983. This is his autobiography by the author relating to his days as an employee of the Nationalist Chinese in wartime Chungking. The book contains an introduction by James Bamford. Copies can still be located now and then at new bookstores.

Yardley also wrote a best selling book on poker, THE EDUCATION OF A POKER PLAYER which is regarded as one of the classics in the field. It went into numerous printings and can often be found in used bookstores. It contains no significant material but does serve to give an interesting profile of this unusual man.

Yardley also tried his hand at spy fiction with mediocre results. One was THE BLONDE COUNTESS, RED SUN OVER NIPPON and CROWS ARE BLACK EVERYWHERE. His books are interesting reading but difficult to find.

Finally, many of William Friedman’s training manuals and dissertations have been compiled in a format paperback form by the Aegean Press which has published a total of some 39 books by Friedman and others under their “Cryptographic” series.

SOURCES

As a dealer in rare and out of print books under the name of WESTON BOOKS, I can supply or have on hand most of the titles listed above—or can order them. The only exceptions are the scarce novels by Yardley.

One of the major difficulties encountered by those seeking intelligence and cipher books is that books and significant matters are considered to be of interest and are more than likely that few copies were originally printed. This is compounded by the fact that used book dealers know little and usually care less about such books and regularly misfile them on their shelves and in their catalogues.

Weston Books publishes quarterly lists of intelligence/sigint books, most of which are out of print or are foreign and have never been reprinted in this country. My most difficult task is to find such books, a task which usually takes me a month or two. In addition, I have several hundred books to sell at monthly meetings of the Colorado Book Soucy, months of searching out at used book stores, through dealer’s catalogues, at bookfairs, and library sales. It is a painfully slow and frustrating process.

I also receive books in trade from customers who have a similar interest as librarian societies, often built up while on active service in intelligence. My first list, published four years ago, contained some 200 titles; my latest list contains over 600 separate titles.

I am probably the only specialist dealer in such books, and believe that my great knowledge in the field, but because I like to read them myself. Customers can either order from me or write to me. I can supply books from my personal collection, or order them for you after I have finished reading one of the books!

JUST BECAUSE IT’S IN PRINT...

One of the worst of the world of books is that there are many authors and many books in the field which should be viewed with caution if not outright disbelief. However, an interesting new book has been published in English by my partner and co-editor of our newsletter, The Intelligence Quarterly. It is entitled UNRELIABLE WITNESS: INTELLIGENCE MYTHS OF WORLD WAR II by Nigel West. It deals with many of the well known books and popularly believed facts (Pearl Harbor, for example). By careful research and reporting, West demonstrates how much of what we have come to believe is, in fact, untrue.

One of those to fall before West’s analysis is William Stevenson, author of the MAN CALLED INTREPID. The book is shown to be well

www.americanradiohistory.com
While all of us have had the opportunity to listen in on public service communications, few of us have had the opportunity to see some of the remarkable advances in communications recently introduced by the communications industry.

Author John Dorsey guides us in a tour of a new system developed by the undisputed leader of land mobile communications, Motorola.

MOTOROLA CENTRACOM II:
Total Communications Control

by John Dorsey

On a beautiful day in spring the normal work load in the communications room of most communities consists of a kid needing rescue to get a fish hook out of his finger or the sheriff checking off for lunch. Turn a line of tornadoes loose on that tranquil scene and we've got instant Bedlam! Switchboards that normally sit idle light up like Christmas trees. Instead of the normal two or three agencies, we're now handling traffic for Red Cross, National Guard, various state agencies, news media, and thousands of terrified people. The radio room is simply not equipped to handle the increased traffic.

Motorola has designed--or rather, upgraded--a system that is intended to be custom-equipped for the user's individual needs. It can be set up for digital or voice operation, or a combination of the two. From the smallest to the most complex operation, there is something here to help. While it permits central dispatching, it still allows individual agency dispatching controlled by a central station.

I certainly can't guess the goals Motorola had in designing the system. If their ultimate goal was to produce a system that minimizes the switching functions required by a dispatcher and gives a central station knowledge and control of what's going on in the community, they've come mighty close to achieving it.

The average radio room involves too many people and too much passing of information. Mention "simulcasting" in the conventional radio room and you'd need an octopus to press all the necessary buttons! The Centracom II permits DIRECT COMMUNICATION BETWEEN THE INVOLVED PARTIES! With the cross-patch and phone-patch features the need for a dispatcher to transfer information is eliminated. I don't care how good your dispatchers are, they can transpose letters on occasion. Misspell a word handling hazardous material and you can blow up half the country.

Paging is always a time-consuming function; if you need the sheriff, for example, you have to determine the proper channel, find the pager number, then press three buttons. In this system you punch the button marked "sheriff"--the machine handles the rest! The conventional pager in the system can be set up for roughly 10,000 pagers and can also do group paging.

From a manpower-utilization standpoint (important to all operations, critical to larger ones) this system has numerous ways to vary the number of people required in the operation. On a mid-winter 3 AM Thursday morning one dispatcher could handle the whole community. At 11 PM on the fourth of July you're going to need extra chairs.

The system diagnoses its own problems and will switch to a back-up unit automatically. It also tests its own audio loops and phone lines, invaluable to digital use.
In the auxiliary feature department, you can control bay doors, magnetic lock doors, alarms on the mayor's whiskey cabinet, public address, intercom—name it. We've seen the system installed in two localities; the old equipment is still in place in both locations. The "old" features the usual control heads, microphones, pagers, telephones of the desktop variety, and 25 or 30 cb cetersas never found in radio rooms complete with warning labels in big red letters reminding the user to shut off speakers not in use before he fires off a different radio to avoid creating a feedback audible in Central Siberia.

The new system is in one console about four feet wide with no wire in sight.

OTHER FEATURES AND OPTIONS

* Select and unselect audio routing
* Swivel or goose neck mounted microphone
* Headset operation
* Telephone interface for headset operation
* VU meter for transmit and receive levels
* Foot switch or panel transmit switch
* LED indicators for long life
* Channel busy indicators with lockout of parallel dispatchers
* Timed mute of all unselected radio channels
* 3 distinct alert tones to communicate different levels of urgency to field units
* Monitor speakers are available as required
* Logging recorder outputs provide mixed transmit and receive audio without guard tone (per operator and per channel)
* Public address output is available at each dispatcher post
* Error tone indicating improper operator action
* Auxiliary switches with momentary, latching, or two momentary button operation
* Telephone line testing (with Motorola MSF 5000 base station)
* Per radio channel capabilities:
  - Main/standby site selection
  - FCC supervisory control of remote radio control units
  - Repeater disable
  - Remote busy indicator (L.O.T.L.)
  - Wildcard tone signalling
  - F1 to F8 frequency select
  - Multi PRIVATE-LINE or DIGITAL PRIVATE-LINE select
  - Mute receiver #2
  - Positive mode control of DVP or DES scramblers

C. W. Ellis
13 Public Avenue
Montrose, PA 18801

(We are pleased to continue our BITS column under the able leadership of C. W. Ellis, whose expertise in computing is welcome. Readers with specific questions are invited to send them directly to the author at the address above.)

RFI ELIMINATION

In a previous column I discussed some of the ways home computers and radio equipment interfere with each other. This month I would like to take a look at some methods and tricks that can be employed to help that interference.

One product I have found to be an indispensable tool in the fight against RFI and other noise is a copper tape that works wonders for shielding, grounding, bonding, and in general taping loose little EMI gremlins down tight.

Called Scotch Brand (tm) Electrical Tape No. 1181, it comes in one inch by eighteen yard rolls, complete with a pressure sensitive adhesive backing. The amazing part about this tape, and really what makes it so useful, is that the tape itself is conductive. Tape-two pieces of metal together, with this stuff, and not only is it sealed, but for all practical purposes they are one and the same electrically.

I use it for ground busing and for heavy conductors on experimental printed circuit boards. It cuts easily with common scissors, and the adhesive will hold it tightly to the board even after it has been soldered. Since I have quite easily I find it useful for a wide range of homebrewing and EMI tasks.

Getting your hands on it might not be too easy, but check with industrial supply houses, electrical supplies, or write the Radio Electric Products Division, Industrial Electrical Products Division, St. Paul, MN 55144 for the name of your nearest distributor. One more caution—this tape has devilish sharp edges and can cause a painful cut for the careless, much like a paper cut.

POWER LINE NOISE

Let's take a look at the ac line that supplies power to every device in the typical nonindustrial or computing setup. Supposedly it supplies 117 or 220 volts of 60 hertz alternating current within narrow limits. Other criteria for use of varying voltages or frequencies but, in general, the EMI and noise problems are the same. The noise on a residential or suburban ac line can be so intensive that radio reception is virtually impossible over some portions of the spectrum.

Almost everyone is familiar with the noise effect of a fluorescent light on the AM broadcast band. This is just one source of noise that can be conducted over long distances via the ac wires.

Take a look inside most of the cheap and medium priced FM receivers sold today; most have an internal antenna consisting of a metal clip wound around the ac power cord to provide capacitive coupling and, using a wire from this clip goes directly to the receiver antenna input. The ac wiring is the antenna.

It is not uncommon for a large inductive load such as a refrigerator or an old oven burner turning on or off to induce large voltage pulses on the ac line, often to several thousand volts. These pulses are extremely short in duration and seldom do much damage to the average device on the line; however, when these voltage spikes get too large, damage can occur.

Most prone to damage are electronic equipment and appliances, especially those containing MOS devices, such as CMOS and HMOS logic chips, and FET transistors.

Such devices are extremely sensitive to high-voltage, short-duration pulses from whatever source is causing a spark across a carpet and then touching the antenna terminal could cause damage to a receiver. It is a tribute to the many electrical designers that more equipment is not damaged.

So how do we cut the interference from the ac line to an acceptable level? There are many commercial devices on the market that claim to condition the ac line, and with the increasing popularity of home computers, many more are showing up every day.

In that some of the tactics used to sell these devices involve the computer field lean slightly toward the "scare the customer" side, with threats of loss of data and even equivalent damage that can occur with the "delicate" computer equipment.

Truth is that the average home computer is no worse off than any other piece of electronic gear as far as damage from the ac line is concerned. However, the devices do provide some insurance againstage spikes and line noise, but this is every bit as important to a radio or TV or scanner, etc., as it is to a home computer.

These protection devices range in complexity (and price) from a multi-outlet strip with a circuit breaker to a ceramic capacitor or two across the ac line to large units with varsators, isolation transformers, ferrite beads, and who knows what else in them. Some are overkill for the job, and some are overpriced for any job.

Figure 1 shows how a simple line filter and surge protector can be put together in a reasonable time to provide a rather large amount of protection and filtering for a small outlay in cash. Here is how you go about putting it all together:

1) Decide how many
...SOLID STATE...

What Does It Mean?

Most of today's radio equipment is "solid state," as opposed to the vacuum tube or "magnetic" or "tungsten" variety.

"Solid state" simply refers to the material being solid rather than gaseous or liquid. Another term is semiconductor. "Semiconductor" means half, so the material is half way between a conductor (conducts electricity) and an insulator (does not conduct electricity). Semiconductors are the heart of solid state devices such as the diode and the transistor.

The most common semiconductors used today are:

1. Germanium (rare chemical element)
2. Silicon (not so rare)
3. Selenium (another rare one)
4. Gallium arsenide (rare synthetic)

Before the transistor radio was introduced, crystal set radios were used. The heart of a crystal radio was a natural semiconductor, usually gaseous (lead sulfide). Such a semiconductor was a natural process—look out. Things are going to happen.

A PN Junction is created when N Type material and P Type material are manufactured next to each other. The magic happens when electric current is introduced to a PN Junction so as to cause current flow.

Because chemicals can change the amount of conduction/insulation and also the mechanism of current flow. Chemicals are introduced into the semiconductor during manufacture in a process called "doping".

Doping is used to create either (a) an excess of free electrons or (b) a P Type material. This excess of electrons is called a "donor". While doping chemicals change electron concentrations, it is not possible to change the composition of a semiconductor to accept donors (or "acceptors").

The dopant material is called "doped" or "doping."
With reverse bias, only a small amount of current can flow through a diode—on the order of .7 volts. There is no such limitation with forward bias. If current in excess of the rating of the component is pushed through it, the device will be destroyed. With reverse bias the device is much more forgiving.

The direction of the current flow as I have explained is exactly backwards from the way some electrical circuits are drawn. N type (—) material has excess electrons and they flow to the (+) battery terminal. Ben Franklin and his pals assumed that positive flows toward negative; they drew electrical diagrams that way.

A diode is N type material bonded to P type material. Its symbol is:

![Diode Symbol](image)

To forward bias the diode, attach the battery (+) to the P type material and the battery (—) to the N type material. Just remember, the arrow in the symbol is pointing from (+) toward (—) for forward bias.

To reverse bias the diode, connect the (+) battery terminal to the N type material and the battery (—) to the P type material (positive on the diode so that the arrow points toward (—) for forward bias.

If we are going to use two materials to form a junction of three materials, then we are going to have to use one material twice. Thus, we have two types of transistors:

1. P-N-P
2. N-P-N

Either kind of transistor is composed of three parts:
IMPROVING THE NXL-1000 ACTIVE LOOP ANTENNA
by John Henault KDXISWL

(ED NOTE: After a brief flurry of promotion by the manufacturer, customer dissatisfaction became apparent and Contempo Listener Products ceased operation, leaving many owners high and dry. A caveat was published by Monitoring Times after it was manufactured. The shortwave listener faction that the company had no intention of making good on their mail order business.

But experimenters take heart—apparently there are a few modifications which can be performed, rendering the NXL-1000 loop usable once again.

Some time back, a company called "Contemporary Electronics" of Florida offered for sale an NXL-1000 noise cancelling, active, indoor loop antenna. The NXL-1000 offered the listener several innovative features and one was ordered and subsequently received.

As received from the manufacturer, the NXL-1000 consisted of a metal box base unit with a selection of controls and a 12-1/2 inch shielded loop terminated in PL259 connectors and a coaxial "T" connector to mate with an SO239 connector mounted on the top of the control box.

After reading the instruction manual and assembling the loop antenna, the unit was put to use and although the unit performed well and high, there was something about the usage by this listener showed there was room for improvement.

Being the type of listener who is not totally qualified to go digging into the interior of this type equipment without hazard of rendering the equipment totally useless by the time I'm finished, I decided to have a few friends, qualified in electronics, explain some of the ins and outs and decided to experiment with some modifications.

Fresh from the factory, the NXL-1000 offers the operator four control: power on/off switch, attenuator on/off switch, range select switch (which also offers calibrator markers of 1 MHz and 100 kHz), and a tune control.

Performance was greatly enhanced through the modifications described below.

The nine volt battery required to power this unit (which can also be powered with an ac adapter) was originally mounted inside the metal case. A nine volt battery clip holder was mounted on the rear panel of the base using a couple of screws. The battery clip, top and wires were unsoldered, rerun through a small hole and rubber grommet near the new battery clip, and then resoldered. This allows for rapid change of the battery.

The original power and attenuator toggle switches would not make positive contact each time and, after several hours of use, fell apart. They were replaced with good quality switches.

A coax loop antenna configuration, a coaxial "T" to-SO239 arrangement, would constantly loosen the mount allowing the coax cable to become wrapped up and eventually part from the connector.

It was discovered that an inferior coax cable had been used in manufacture and I replaced it with high quality RG174 cable. At this time it was determined that a BNC type connector would allow for easy rotation of the loop and a UG099 bulkhead connector was used to replace the original SO239 connector.

NOTE: Care must be taken here to avoid damage to the rf coil (indicated at "1") in the accompanying schematic diagram soldad onto the base of the SO239 connector. It is resoldered to the center conductor of the new coax cable and center connection of the new UG099 connector. Be sure to check the grounded end of the rf coil for cold solder joint.

Even now, the tune control gave me headaches when trying to fine tune the antenna. Many times it was impossible to get the tune control to stay in the position required for best signal reception. Close inspection revealed a cheap variable capacitor of the type used in any portable AM radio.

First consideration was to attempt to use the same type originally provided by the manufacturer, but I learned that these were actually the poorest quality variable capacitors manufactured. Shopping around at the various electronic supply houses in this area I found a single section 365 picofarad variable capacitor manufactured by the Colectro Corp.

Upon disassembling the NXL-1000 and removing the existing cap, I found that the original unit is plastic faced and therefore insulated from the enclosure. I decided to use small rubber grommets to insulate the cap from the case.

A period of testing followed and the improvement in performance was truly noticeable; the unit performed as expected.

After several months of use there was an unexplained degradation in performance. Several resistors and capacitors were out of tolerance and were replaced with good quality equivalents. Resistors were all replaced with tightest tolerances available at the local Radio Shack stores and capacitors were replaced with poly-styrene or mylar types when available.

After completing all modifications I determined that I had spent approximately $25 to improve the unit.

To those of you who have purchased the NXL-1000 and relegated it to some dark corner of your shack for whatever reasons, why not dig it out, dust it off and try for some modifications and enjoy what was conceived as a good idea.

Should anyone reading this article know how to increase its low down range of 550 kHz to 1.5 MHz, I'd appreciate hearing from him.

LIGHT SWITCH FOR YOUR PRO-30
by Larry Whately

If you are like me, you carry your Radio Shack PRO-30 portable scanner with you just about everywhere. But if you use it often, at night or programming in the dark, it's hard to see the display without holding the light button down. I used to use a rubber band and piece of plastic to hold down the light button, but a small slide switch can be added to do the job much better.

Caveat: Keep in mind that any modification done to a commercial product will void the warranty, so proceed only if you know what you are doing!

Remove the six screws from the back of the PRO-30, two of which are under the battery cover. Turn the PRO-30 over and carefully remove the front cover by pulling it straight up to prevent bending the touchpad pins when pulling up the circuit board. Also be careful of the speaker wire.

After the cover is off, you will see where the touchpad was plugged in. Starting at the bottom, pins 1 and 2 will be where you will solder the wire from the switch. Run the wire to the switch under the circuit board to the other side. I have found the best place to put the switch is on the back cover over the battery and charge jacks. Use a small slide switch (SPST Radio Shack part #257-327 or equivalent). You will have to shorten the tabs on the switch in order for the switch to fit under the cover. Make sure there is slack in the wire for taking the cover off.
HAMS IN SPACE

A year ago astronaut Owen Garriott, W5LFL, WA8LFL, made amateur history as the first ham radio operator to work earth stations from an orbiting spacecraft. The frequency used was 145.55 MHz.

Now it would appear that the same frequency will be busy again, this time with Tony England, WD9RE, operating aboard Shuttle flight 5/1-F, slated for a July 15th launch.

Tony's busy schedule will emphasize working clubs and youth groups; a special list of unpublished uplink frequencies will be made available to qualifying organizations by writing American Radio Relay League (ARRL) headquarters, 225 Main St., Newington, CT 06111.