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CIA SPY STATION Uncovered in Nicaragua

by Vito Echevarria

(c) 1984

Recently, Monitoring Times readers were the first ones to find out the origin of one of the so-called "spy number" stations, revealed to be transmitting from a military base outside of Washington, D.c. Earlier last year, I came across a bilingual "newsmagazine" from Managua, Nicaragua called Soberania, which seemed to be a pro-Marxist, anti-American publication.

One of the articles in that magazine (May-June 1983 issue) was titled, "**Criminal CIA ring smashed in Nicaragua**"; that story contained information that connects with the recent discovery of the spy numbers station revealed in Monitoring Times.

The story dealt with a woman named Marlene Moncada, a Nicaraguan who was allegedly recruited by the CIA to assassinate Nicaraguan Foreign Minister Miguel D'Escoto back in 1982. Marlene, at that time employed by the Nicaraguan embassy in Tegucigalpa, Honduras, was allegedly trained by CIA

agents on how to operate a shortwave radio they have given to her for her "assignment," instructing her to tune in on the frequencies of 9074 kHz and 14421 kHz at 11 pm in order to receive secret messages from the CIA in Langley, VA.

They supposedly taught her how to use secret writing and gave her two small bottles with chemicals for developing the writing, as well as giving her a notebook whose pages, if necessary, could be chewed up and would turn into chewing gum!

Brigade Commandant Lenin Cerna, chief of the Nicaraguan State Security, presented in a news conference all the "working tools" that the CIA delivered to Marlene. On a table stood two wooden idols about 20 cm. tall, one of which could be opened to reveal a tube where the keys to decipher the radio messages she was to receive by radio were found. The spy messages would be written in four digit groups that make up the content of the radio messages.

"Soberania" magazine also showed photos of some of the radio messages (in

transcript form) that were sent to Marlene by the CIA, instructing her where to pick up a bottle of wine that was allegedly intended for Foreign Minister D'Escoto (the wine was allegedly poisoned). Code books were also shown containing four digit groups that would be used to decode radio messages intended for her.



Sony ICF-6500W receiver with special notebook and writing chemicals.

The article also had a story on the CIA's recruitment of Nicaraguan Carlos Rodolfo Icaza Espinoza, who was given the same "working tools" as Marlene Moncada, and was instructed to tune in on 14156 kHz and decipher radio messages for further instructions.

If the Nicaraguans' story about the two alleged agents is true, then this, along with the April 1984 cover story on Monitoring Times will truly symbolize the breakthrough of revealing the origin of at least one or two of the mysterious spy number stations and demonstrate how the transmissions from these stations affect political situations around the world.



Indigenous wooden idol concealing cypher keys.

NEXT MONTH: MT Files With The STRATEGIC AIR COMMAND...

Do you know where Looking Glass (SAC airborne command post) got its name? According to an official Air Force spokesman it is because the advanced aircraft is a mirror image of the underground command post at Offut AFB in Omaha.

First launched on February 3, 1986 some seventeen Boeing 707 EC135's have assumed the lofty role of "Looking Glass." Originally flying 12 hour missions; each now remains aloft for 8-1/2 hours and may be heard checking in with worldwide ground stations on the primary SAC nets (frequencies and schedules in Grove's Shortwave Frequency Directory).

At an average speed of 506 miles per hour, Looking Glass has flown some 8600 days, equivalent to over 4000 times around the earth, to the moon and back 253 times, or past the sun!

Next month MT writer Art Kimball treats fellow listeners to an exclusive VIP tour of SAC headquarters arranged by Monitoring Times with the United States Air Force.

Ham Monitors Guerilla Radio Traffic

An unidentified amateur radio operator from southeastern Indiana has notified MT that he intercepted tactical communications between Cuba and El Salvador.

The two-way transmissions in Spanish language were monitored on 14280 kHz in the amateur 20 meter band on Sunday, May 13, 1984. Communications were established by whistling and using tactical ID's, common for unlicensed South American operators such as drug smugglers.

Once communications were established topics discussed included ammunition needed, types and numbers of guns required and replacements for field troops.

The Cuban station asked

questions regarding progress of actions and expected future activity.

A Nicaraguan station then checked in, providing the same list of information, then requested tools to repair a machine gun. A list of casualties was passed to Cuba along with a phone patch from field personnel.

Later, a station in Miami, Florida joined the net to deliver telephone messages in coded language concerning business in the United States.

The episode, which lasted several hours, was reported to the CIA who replied politely that they were monitoring the net also!

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BEARCAT/

UNIDEN:

It's Official

Tuesday, May 28, 1984 brought with it some good news and some bad news. Uniden Corporation of America, the domestic arm of a prominent Japanese manufacturer of consumer electronics including the popular CR-2021 portable receiver and a number of cordless telephones, announced the acquisition of the Bearcat division of Electra Company.

Masco Communications, Inc., the affiliate which has been manufacturing the Bearcat line, will continue to be a supplier for Uniden. Since the former scanner manufacturer is now a manufacturing plant only, all peripheral marketing, sales, engineering and other support activities have been eliminated.

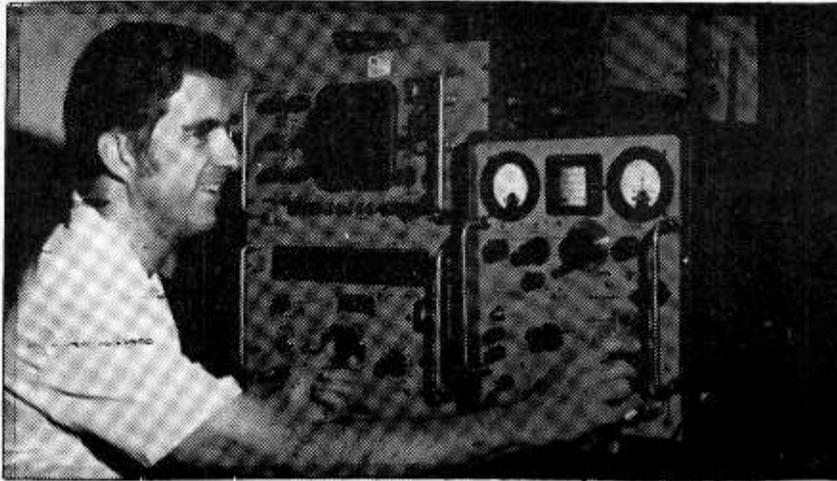
It is safe to assume that several new products, including a BC-100XL with aircraft band, a BC-450 wide-coverage scanner and a BC-210XLT with 800 MHz, will never see the light of day.

Presently-manufactured products which have been cancelled include the BC-250, BC-350, CompuScan 2100 and the new TV satellite terminal.

Sources close to the industry revealed that approximately 120 employees were laid off Friday, June 1, 1984.

Rumors have begun to circulate that Phone Mate is now being considered for acquisition by Uniden. The acquisitions are part of a major thrust from a pool of prominent Japanese investors.

FROM THE EDITOR



CAVEAT EMPTOR

Unlike other commercial publications, Monitoring Times is not advertiser-supported. We are supported entirely by subscriptions from our readers. Advertising revenue is supplementary and advertisers are carefully chosen to represent their merchandise in the pages of MT. We shall continue to be objective in our reporting of new products, notifying our readers of poor merchandise and unethical marketing practices.

Following complaints registered with us by MT readers regarding a product advertised recently (May MT, P.10), we checked up on the company.

CONTEMPORARY ELECTRONIC PRODUCTS, a Miami, Florida firm specializing in indoor-loop antennas, has had its phone disconnected. We would advise prospective customers to withhold any purchases until clarification is made by manager Mark Thomas of that company as to its intent to honor their commitments to previous customers.

Another Florida firm is presently marketing an "automatic antenna matcher" for dipoles. Reliable sources indicate that the \$1000 device contains a matching transformer and several power resistors to dissipate transmit power as



REMEMBER!

"S.A.S.E."



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

As much as we would like to help, we are not a public library service. Letters received with a Self-Addressed Stamped Envelope will be answered.

And as always, my telephone line is open for pre-paid calls weekdays 1-5 pm Eastern (704-837-2216)...Bob

heat, looking like a better match to the transmitter.

Additional fragments of unconnected printed circuits are apparently included to confound analysis after anyone would attempt to dissolve away the epoxy encapsulant.

While MT makes no indictment against the device, we do question the exorbitant selling price when weighed against the contents.



MT

ON CASSETTE FOR THE BLIND

Monitoring Times has authorized a source of recorded transcriptions for the sightless hobbyist. Interested persons are invited to contact Phillip M. Dampier, general manager and producer of the DX Radio Network, 3176 Elmwood Avenue, Rochester, NY 14618-2535 for additional information on this special service.

Be sure to include a self-addressed stamped envelope with your inquiry.

What can citizens do about this matter? First, write a letter to Mark Fowler, Commissioner of the FCC:

The Federal Communications Commission
Attention: Mark S. Fowler
1919 M Street, N.W.
Washington, D.C. 20554

You may also write to your congressman and/or senator to express your views on this matter, as the ultimate decision rests with Congress. If you don't write to support the FCC Fairness Doctrine, then who will?

GUEST EDITORIAL

The FCC Fairness Doctrine: Yes or No?

by Donald McCants
104 Magnolia Street
Trussville, AL 35173

Readers of Monitoring Times may be aware of a debate in Congress regarding proposed legislation to do away with the so-called "Fairness Doctrine," a policy of the Federal Communications Commission that mandates television and radio broadcasting stations provide free air time to political candidates who wish to make rebuttals to statements made by other political candidates over the publicly-owned broadcast airwaves. It also provides free broadcast time to members of the general public who wish to express their opinions about matters of public concern.

It is the opinion of this writer that the doing away of the FCC Fairness Doctrine would have a detrimental effect on the quality of life of the people of the United States. How?

I believe that it would have at least two bad effects on the United States.

First of all, elimination of the FCC Fairness Doctrine would close off an important medium for the dissemination of divergent points of view on public matters in an age when it is becoming more and more difficult to have a wide variety of view-points publicized over the public airwaves.

Secondly, with the loss of the doctrine which mandates all broadcasters provide free time to citizens for the airing of divergent viewpoints, we could logically assume that the more wealthy and influential newspaper and television broadcast chains would monopolize the media.

Their dissemination of views and positions of political candidates who are able to purchase large blocs of broadcast time and to publicize their campaigns could stifle their opponent's views.

Do we in the United States really want to see this sort of thing come about? This writer thinks not.



Viewpoint

I have recently been hearing a number of good things about Monitoring Times and was getting ready to send in a subscription when I received your letter. Now that I have read the copy you sent I can see that I would have made an excellent decision. Therefore, please find the enclosed check for \$10.50 and start the magazine rolling.

James Bamford
(author: "The Puzzle Palace")

>>><<<<

I really liked your article "FROM THE EDITOR" in the May issue ("Whatever happened to old-fashioned service?"). Boy!!! You sure hit the nail on the head this time. I know that feeling myself. But one thing is for sure...I doubt that anyone can allege these claims against Grove of "MT." You and your staff have always been more than courteous to me and I view you more as a friend than a company.

Bob Skwirsk
Wayne, MI

>>><<<<

Update on two items in MT/May 84.

(1) In Los Numeros, mention of a station near Napa-Sonoma Wine Country: It is, Naval Security Group, Skaggs Island, Sonoma CA 95476.

(2) In diFillippo's letter, he mentioned Two Rock Ranch. It is now operated by the Coast Guard, not the Army. The Coast Guard has a cooks' school there for the 4-5 years.

Question: **What is the purpose of Air Force Station, Point Arena, CA?** It is a two hour drive north of me, but I cannot find out anything about it. Point Arena is the location where the trans-oceanic telephone cable arrives on the west coast. Do they monitor phone calls for the CIA? They keep everything low key. (Any of our readers help here?Ed.)

The largest solar flare in six years occurred on 25 April 84/0004Z. It was an X12/3B. This solar flare with a polar cap anomaly has caused the "northern lights" to appear at lower latitudes. Many SWLers probably noticed odd transmission, fade outs and other unexplainable things going on. This is the probable reason. It also disrupted the Omega

navigation. It caused three-fourths error in each lane. This could mean an error of 500-800 miles.

Philip Humes
P.O. Box 3816
Santa Rosa, CA 95402

>>><<<<

I'm writing with regard to Don Schimmel's column in the May 1984 Monitoring Times. I wholeheartedly second many of the points he makes. **Knowing another language certainly increases enjoyment of nearly any aspect of SWling many fold--** broadcast listening, RTTY, military/government monitoring of the situation in Central America, Interpol, and all the rest.

Language skills and monitoring are mutually reinforcing; you increase your proficiency in both at the same time. As someone who ekes out a living as a linguist, I recommend a language course at a local community college or evening program for any radio hobbyist. North American monitors would probably get the most out of Spanish.

Monitors who are interested in military communications, of which there are many these days, might wish to add a couple of books to Schimmel's list. I have found some of the old Army Technical Manuals extremely useful. These include:

SPANISH MILITARY DICTIONARY, TM30-500, Dept. of the Army, 1950

GLOSSARY OF SOVIET MILITARY TERMINOLOGY, TM30-544, 1955

DICTIONARY OF SPOKEN RUSSIAN, TM30-944, republished by Dover Books in 1958.

There is also a GPO publication entitled SPANISH FOR BORDER PATROL OFFICERS that I haven't been able to get hold of yet. **The military dictionaries were put together to train monitors originally, and they contain all the specialized usage that a listener is likely to encounter, especially when added to the ham conversation guides mentioned by Schimmel.** By the way, the GPO also sells the large CIA wall map of Central America (stock number 041-015-00150-7)!

The description of the extra Morse letters mentioned in the column was correct for a number of European languages, but in Cyrillic (Russian) Morse the values of the sequences is as follows: **.-.-=ya, ..--=yu, ---.=ch, and ----=sh.** Hearing these four combinations of dits and dahs that we don't use in English is no guarantee that you are hearing Russian, however, as the letters are used to

transmit several other languages as well.

One more item. I've been monitoring the Russian broadcasts from Cuba evenings on 4765 kHz fairly often since Andropov's death and have discovered that they are no longer relaying "MAYAK," the so-called Second Program. At times they relay the First Program, but at other times they are not parallel to any other Soviet shortwave service or feeder. At these

times they appear to be carrying special military programs from satellite feed. One evening recently I listened to a long broadcast for armoured personnel (dlya tankistov). **Evidently they have begun a genuine Armed Forces Radio service for their troops stationed abroad.** These special programs are intensely anti-American as one might expect.

Bob Rankin
Lawrence, KS

☞ Cont'd on p.27

NCS: National Communications System

...two viewpoints

Several people have written MT stating that NCS stands for "National Cryptologic School." According to official sources, it definitely does not.

Station A is the headquarters facility on Highway 802 in southwest Warrenton; it has no antennas and does not appear to be a radio facility.

Station B is on a tall hill on Highway 690 in northwest Warrenton. It has microwave towers and two radomes but no apparent HF antennas. A phone company microwave facility shares the same hill.

Station C is on Highway 651 two miles from the town of Remington. It appears to be the primary HF facility. Most HF, including the 4-digit Spanish YL, come from here. There are many wire antennas and non-planar log-periodic beams.

Station D is on Highway 669 between Brandy Station and Route 3. It appears to be a secondary HF facility and has three radomes.

Several people have mentioned **Vint Hill Farms** near Warrenton; this is an INSCOM (Army Intelligence and Security Command) operation in support of NSA (National Security Agency). It is a receiving--not transmitting--facility.

Some readers have heard rumors that A.P. Hill Military Reservation is an NCS location. At present no transmissions regularly originate from there.

The CW station **KKN50** on 6925.5 (32), 10637 (41), 12022.5 (43), 15540 (36), 18525 (45), and 23975 (49) normally (although not always) come from Station C in Remington.

Additionally, the 4-digit Spanish transmissions on 4307, 4670, 5238, 5812, 6802, 9074, 9222, 11532, 14421, 15651 and 16450 all come from Station C. These transmissions are all reduced-carrier upper sideband and use two frequencies at once.

Remington was also noted with similar 3/2 English digits as well as 5 digit Spanish on 5090 and 6840 (these frequencies are also used for cut numbers mentioned below). **However, most 3/2 and other 5 digit numbers transmissions do not appear to be Warrenton NCS activities.**

A new 3/2 English transmission has been noted simulcasting on 13808//14750 kHz Thursdays at 0600.

CUT NUMBERS

Cut numbers originating from Remington use the system A-1, U-2, V-3, 4-4, E-5, 6-6 B-7, D-8, N-9, and T-0. These transmissions use two carriers 1 kHz apart keyed together; the lower frequency is the reference frequency. Messages are of two types. The first is 3-digit call-up on the hour, a group count, and either 4 or 5-digit groups with the message repeated twice. The second type starts on the half hour and repeats several 4-digit groups.

Frequencies in use at Station C for these cut numbers include 5090, 6840, 9958, 11605 and 18737 kHz. (Note that 5090 and 6840 were mentioned earlier with voice groups.)

Several cut numbers on other frequencies are known not to be from Warrenton. These include 7375/ 8215, 11527/12238, 12163/14440 and /20128 kHz. Could they be on the west coast?

DIRECTION FINDING

Several groups and one magazine columnist have expressed interest in direction finding with simple loop antennas. At HF, long distance direction finding with such loops is not possible.

Even if the loop can be tilted and good nulls obtained, the bearings are meaningless due to polarization error. This is why the double loop (also called spaced loop) and Adcock arrays were developed. Reading

☞ Cont'd on p.27

LISTENING LAWS

A State-by-State Look

by Bob McGovern

This table is designed to inform MT readers which states have laws regarding monitoring. It does not include city or county ordinances which are very difficult to obtain on a nationwide basis as they are not all found in one central place.

Changes may have occurred in the following list; we would appreciate corrections which will appear at periodic intervals.

Enforcement of these laws is difficult to assess as they are many variables which include officer bias toward monitor radio listeners, the violator's attitude toward the officer, the policy of the officer's department and, in some cases, the fiscal condition of the town or city coffers! **Happy monitoring!**

MONITORING LAWS QUICK REFERENCE LIST

STATE	L	W	W	E	E	T	T	T	M	M
AL	N									
AK	N									
AZ	N									
AR	Y	A	P	F	1	2				
CA	Y	A			3					
CO	N									
CT	N									
DE	N									
DC	N									
FL	Y	M	A	C	4					
GA	N									
HI	N									
ID	N									
IN	Y	M	P	P	A	4	1	2		
IA	N									
KS	N									
KY	Y	M	P	S	N	4		3		
LA	N									
ME	N									

STATE	L	W	W	E	E	T	T	T	M	M
MD	N									
MA	N									
MI	Y	M	P	A	4			4		
MN	Y	M	P	H	4					
MS	N									
MO	N									
MT	N									
NB	N									
NV	N									
NH	N									
NJ	Y	M	P	F	5			1		
NM	N									
NY	Y	M	P	A	4			1		
NC	N									
ND	Y	M	P	I	6					
OH	N									
OK	Y	M				7				
OR	N									
PA	N									
RI	N									
SC	Y	M	T			8				
SK	Y	M	P			9				
TN	Y	A				0				
TX	N									
UT	N									
VT	N									
VA	N									
WA	N									
WV	Y	A				A				
WI	N									
WY	N									

KEY

- L=Monitoring law in existence**
Y=Yes
N=No
- W=Where is monitoring prohibited**
A=All (Base, Mobile, Portable)
M=Mobile
P=Portable
- E=Exceptions to monitoring laws**
A=Holder of valid amateur radio license
C=Commercial television and radio station
F=Fireman

- H=Holder of permit issued by Dept of Criminal Apprehension
- I=Holder of permit issued by Dir of Institutions
- N=Newspaper reporters
- P=Police officer
- S=Seller of police radios
- T=Holder of any FCC license
- T=Type of prohibited monitoring or activity**
0=Unlawful to retransmit law enforcement transmissions
1=Monitoring police with use of a descrambler
2=Monitoring fire service with the use of a descrambler
3=Divulgence of police radio traffic about a suspect to that suspect
4=Law enforcement
5=Police fire and local government
5=Operating or possessing a transmitter on police radio frequency
7=Monitoring police during commission of a crime
8=Any police transmission within Anderson County
9=Possession of police radio by convicted felon
A=Monitoring Dept of Public Safety and using information to commit a crime
- M=Miscellaneous and additional information**
1=Also exempt-Citizen who holds permit issued by any law enforcement agency
2=Also exempt-Person engaged regularly in newsgathering activities
3=Also exempt-Licensed tow trucks
4=Also exempt-Citizen who holds permit issued by state police

IF YOU LIKED THE RUSSIAN WOODPECKER, YOU'LL LOVE THE SEQUEL!

Masochistic shortwave listeners who delight in the ear-rollicking "knock-knock" of the infamous "Russian Woodpecker" backscatter radar system will revel at the news that the US Air Force will begin construction of a noisemaker of its own.

With a transmitter near Christmas Valley, Oregon and a receiver near Alturas, California the system will be operated from Mountain Home AFB in Idaho, assisted by a systems support facility near Klamath Falls, Oregon.

Known as OTH-B (over the horizon backscatter), the pulses will emanate from several thousand feet of antenna which must be separated from the receiver by 100 miles to avoid interference.

OTH-B, according to AF chief of staff Lt. General Robert D. Russ testifying before the House Armed Services Committee, is necessary to provide faster detection of a proposed Soviet missile-carrying "Blackjack" bomber, expected to be operational within five years.

know how well his signal is being received. Don't forget to report the type of receiver/antenna you are using.

Obtaining addresses to write for ham QSLs is as easy as looking them up in the phone book, though in this case the "phone book" is called the "Radio Amateurs Callbook," available in two editions, one for U.S. hams and another for foreign. Cost is about \$20 each and they can be obtained from many advertisers in Monitoring Times.

As an adjunct to QSLs, there are many awards available to ham band SWLs: 50 States, 100 Countries, All Canada, the coveted "VPX" and "USA-CA" from CQ Magazine and many others. Garry Hammond - VE3GCO, 5 McLaren Ave., Listowell, Ontario, Canada N4W 3K1 has compiled an excellent Directory of Awards which is available for \$8.00 U.S. funds.

A TIP:

For ham band DXing, try 3800 kHz LSB after dark local time and 14200 kHz during local daylight. You might be amazed at what you hear!

DX'ING THE HAM BANDS

by John M. Kapinos - WDXIAM

DXing the Ham Bands has become, in recent years, an almost moribund hobby through no fault of its own. Today only one publication (from the Association of DX Reporters--ADXR) includes a section devoted to this most interesting aspect of the radio hobby.

According to the ARRL Country list, there are well over 300 Nations available on the amateur bands, ranging from such "fly speck" islands as Cueta (a Spanish possession North of Africa) to the gigantic Soviet Union. Some countries have several hundred thousand amateur operators, others might be available only once in several years.

EQUIPMENT

Equipment requirements range from the simple to the elaborate. Receivers range from 1950's era "5 tube specials" to today's gems such as the Kenwood R-2000, Yaesu FRG-7700 and Icom ICR-71A. Antennas range from simple "whips" mounted on the backs of portables to elaborate (and often expensive) dipoles cut to specific bands and "beam" type Yagis.

The receiver chosen must have the ability to receive SSB signals. Some of the earlier sets utilizing a BFO are extremely hard to tune. Virtually all hams use lower sideband on 160, 80 and 40 meters and upper sideband on 20, 15 and 10.

"QSLING"

QSL cards are available from most hams, but return postage is an absolute must. For domestic stations an SASE is fine; for "DX" stations it's imperative to send at least an IRC or stamps of the country reported to.

Unlike shortwave broadcasting stations, one does not have to report 20 minutes of details to receive a verification. One should report the station that was being heard, the station he was in contact with, the band, the date (in GMT/UTC) and the time in GMT/UTC, as well as a signal report. Exaggeration of signal reports should not be done, as the ham really wants to

The RadioSpectrum: A Gift to the Weatherwise

by Bert Huneault

WEATHER SYMBOLS: THE OLD AND THE NEW

In parts 4 and 5 of my series of articles titled THE RADIO SPECTRUM: A GIFT TO THE WEATHERWISE (Monitoring Times, March and April, 1984), some sections dealing with symbols and abbreviations representing sky conditions were not included: they appear below.

SKY COVER	OLD SYMBOL	NEW ABBREVIATION
Clear	○	CLR
Scattered	◐	SCT
Broken	◑	BKN
Overcast	◒	OVC

The circular symbols were used on teletype circuits throughout North America until the mid-1970's when, with the advent of modern computer-based telecommunications, they were replaced by three-letter abbreviations. Even though the circular symbols are no longer in official use, I still use them for recording my own weather observations, and I strongly recommend them for SWLs who attempt to write down the fast-spoken aviation weather reports in VOLMET broadcasts. The symbols are much faster to write and read, and more efficient than the three-letter abbreviations.

For SWLs not familiar with meteorological terminology, SCATTERED means that a cloud layer covers from 1/10 to 5/10 of the sky; BROKEN indicates a layer covering from 6/10 to 9/10 of the sky; and OVERCAST means that more than 9/10 of the sky is covered. NOTE: a minus sign (-) in front of a circular symbol or three-letter abbreviation indicates a "thin" cloud layer (not opaque).

RADIOTELETYPE REPORTS

In part Five of the series, I mentioned radioteletype weather broadcasts from CFH and WBR. For MT readers interested in RTTY aviation weather reports, the following is a "decoding" of a weather bulletin from CFH that appeared on the screen of my computer monitor when I snapped the accompanying picture one day last April.

At the top of the screen, RTTY 100 indicates

that I was monitoring a 100 w.p.m. transmission. S01234 shows that the computer was programmed (by the Radiotap software) to decode standard RTTY signals, i.e. the five bits of the Baudot code in their normal order.

The time shown (01:23:24) is irrelevant because I had not bothered setting the computer's time-of-day clock before taking the photograph. METOC is the meteorological center of the Canadian Armed Forces, in Halifax, Nova Scotia. SA indicates regular hourly aviation weather reports (surface observations). The date-time group 132010Z shows that the reports were collected at 2010 GMT on the 13th of the month (April, 1984, in this case).

Oddly enough, the bulletin has a QUEBEC heading even though the reports that follow all come from the province of Ontario! I presume that the reports were collected from a teletype circuit based in Quebec (e.g., Montreal). The time of observation was 2000 GMT, as indicated on the first line of each SA report. The reports can be decoded with the information given in Parts Three and Four in my series of articles.

This particular bulletin reads as follows:

YYZ (Toronto International Airport): 1000 (feet) scattered, measured ceiling 1400 broken, 7000 overcast, visibility 8 miles, sea level atmospheric pressure 1010.6 millibars, temperature 7 (degrees Celsius), dew point 4, wind 120 degrees at 05 knots, altimeter setting 29.82 inches, clouds stratus-fractus 2 (two tenths of sky), a higher layer of stratus-fractus 4, and altostratus 4. The semicolon is a "message separation signal"; it marks the end of each sta-

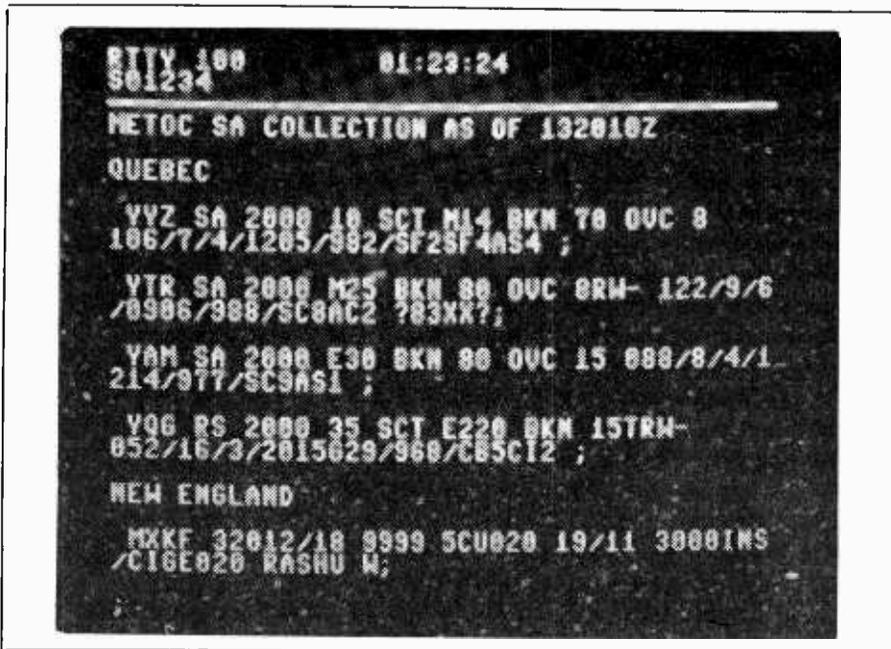
tion's report.

YTR (Trenton Airport): measured ceiling 2500 broken, 8000 overcast, visibility 8 miles in light rain shower, pressure 1012.2 mb, temperature 9, dew point 6, wind 090 degrees at 06 knots, altimeter 29.88 inches, clouds stratocumulus 8 and altocumulus 2. The ?83XX? group is a special climatological group dealing with tenths of degrees (for temperature and dew point) as well as cloud amount and opacity); this group is normally removed automatically by the telecommunications computer, but it is occasionally retained for some stations.

YAM (Sault Ste Marie Airport): estimated ceiling 3000 broken, 8000 overcast, visibility 15 miles, pressure 1008.8 mb, temperature 8, dew point 4, wind 120 degrees at 14 knots, altimeter 29.77 inches, clouds stratocumulus 9 and altostratus 1.

YQG (Windsor Airport): RS indicates a "special" weather report issued at the "regular" observation time (2000 GMT); 3500 scattered, estimated ceiling 22000 broken, visibility 15 miles in a thunderstorm and light rain shower, pressure 1005.2 mb, temperature 16, dew point 3, wind 200 degrees at 15 knots, gusting to 29 knots; altimeter setting 29.68 inches, clouds cumulonimbus 5 and cirrus 2.

The beginning of the next bulletin, headed NEW ENGLAND, then appears near the bottom of the screen. The station report shown is for Bermuda Naval Air Station (MXKF) and is in the international METAR code rather than in the North American SA format. It decodes as follows:



Wind 320 degrees at 12 knots, gusting to 18 knots; visibility more than 10 kilometers (coded 9999); 5 oktas cumulus clouds based at 2000 feet (oktas are eighths of the sky); temperature 19 (degrees Celsius) and dew point 11; altimeter setting 30.00 inches; ceiling estimated at 2000 feet; rain shower of unknown intensity to the west.

So there you have it, RTTY weather buffs--There's a wealth of meteorological data on the air, just waiting to be decoded and enjoyed.

PART VII

"OBS"- SHIPS' WEATHER REPORTS

Often heard in the maritime CW bands, "OBS" are also coded in five-figure groups; but they are an entirely different bag of tricks! Under the regulations of the International Conference for the Safety of Life at Sea, 1960, the master of a vessel is required to send weather messages when the ship meets with a tropical storm.

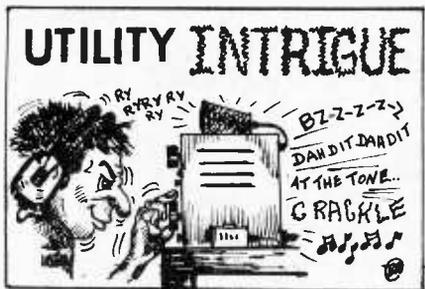
But in addition to this, many governments arrange for certain ships to be equipped with meteorological instruments and to take weather observations every six hours while at sea (at 0000, 0600, 1200 and 1800 GMT). These observations are then coded and transmitted to the nearest coastal station in the vessel's region.

Provided that the radio officer aboard ship includes the service indicator "OBS" at the beginning of his transmission and directs the message to one of the official weather service addresses such as "METEO WASHINGTON" or "METEO HALIFAX," the coast station will handle the traffic at no cost to the ship owners, and relay it to the addressee via landline.

The governmental weather service pays for all communication charges involved. Thus, ship officers are encouraged to send weather observations; the more abundant these ship reports, the better the quality of weather forecasts issued to mariners in return.

When and where can SWLs tune-in to these ships' weather reports?...Well, in the maritime radiotelegraphy bands, and generally during

Cont'd on p.30



by Don Schimmel

OPERATOR AIDS:

Our discussion of Operator Aids this month features several books that pertain to general topics relating to Shortwave Listening.

HOW TO TUNE THE SECRET SHORTWAVE SPECTRUM, (\$7.95 from TAB BOOKS, INC., Blue Ridge Summit, PA 17214), authored by Harry Helm. Subjects include numbers stations, official communications, clandestine and pirate broadcasting plus information on space comms and unidentified signals.

As a companion to the above, I found Bob Grove's **COMMUNICATIONS MONITORING** to be an excellent source of information for the shortwave listener. The book contains good solid facts covering receivers and antennas with hints and tips for improving your reception. The section of projects has many fine devices/circuits that are clearly described with a detailed parts list included for each

project. Its cost is only \$6.50 and is available from Grove Enterprises.

BETTER SHORTWAVE RECEPTION (\$5.95) and **INTERFERENCE HANDBOOK** (\$8.95) round out this month's aids. Both are published by RADIO PUBLICATIONS, INC., Box 149, Wilton, CT 06897. The first one is somewhat similar in content approach with the two previously mentioned titles; the second is very valuable in understanding and correcting various forms of interference.

This latter book has been of particular help to me because I have experienced some severe RFI. With the information given in the book I was able to outline the problem for the local power company in a manner which assisted them in detection of the location on the power lines of the offending RFI.

INTERNATIONAL TELECOMMUNICATION UNION:

MT reader A.O. Edwards recently mailed to me an excerpt from an ITU publication that described another Cut Number system (See **UTILITY INTRIGUE**, April 1984). This system is one being used in the Maritime Service.

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

The ITU material also contained a listing of Morse code characters representing punctuation as a supplement to the compilation of CW Abbreviations/Prosigns carried in the June 1984 **UTILITY INTRIGUE** column.

PERIOD	..--.
QUESTION MARK	..--..
QUOTATION "	..--.
APOSTROPHE	..--.
RH BRACKET*	..--.
COLON	..--..
COMMA	..--.
SLANT	..--.
HYPHEN	..--.
LH BRACKET	..--.

*NOTE: The right hand bracket is often used also for the left.

EQUIPMENT AIDS:

If your antenna connectors are giving you moisture problems, there is a product called "COAX-SEAL" (UNIVERSAL ELECTRONICS, INC., 4555 Groves Rd., Suite 3, Columbus, OH 43232), a putty-like substance in a 1/2-inch-wide tape form. It remains flexible regardless of temperature and can be easily removed from the fitting for servicing your antenna and/or transmission line. Grove Enterprises includes strips of this excellent all-weather sealant in their Skywire, Signal Amp and connector kits.

MORE LOGGINGS:

A 20-page collection of 1983 loggings (approximately 200 listings) is available for \$5.00 postage paid from Don Schimmel, 516 Kingsley Road SW, Vienna, Virginia 22180. Please make certain you have indicated your complete address with zip code.

Loggings on p.27

BLUE ANGELS MONITORING

When the Navy Blue Angels precision flying team comes to your area, listen in on their communications. Recently while executing their maneuvers in Washington, DC they were heard coordinating their acrobatics on 143.000 using the AM mode. The frequency was used both for air to air and ground to air communications. Unlike the Air Force Thunderbirds, no UHF transmissions were observed.

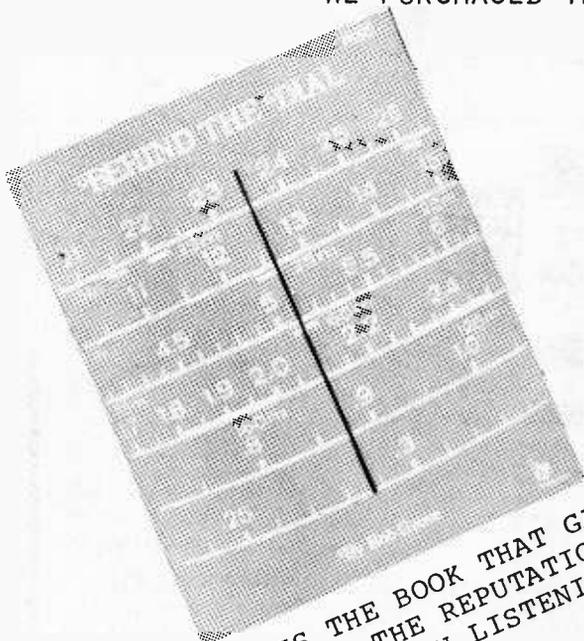
Another listener in Michigan reports Blue Angels traffic on 118.2 and 275.35 early last year.

Previous reports from other MT readers have suggested alternate frequencies of 142.0, 143.0, 241.4, 360.4, 391.9 and 395.9 MHz, often coordinated with local military and FAA control towers.

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- SCANNING ->

Cellular Radio: Another Look

by Larry L. Ledlow, Jr.

(ED.NOTE: In the March 1984 issue of MT we presented an introductory article on the 800 MHz spectrum by Allen Ray Odell. This month, author Larry Ledlow, Jr. expands our horizons with current perspective on the present and future uses for cellular radio, a dominant mode of operating the 800 MHz band.)

There has been a lot of talk during the past couple of years about cellular radio, particularly with regard to mobile telephone applications. Since the first of the year advertising for cellular mobile telephone services in large, metropolitan areas like New York, Washington, and Chicago has taken off like a skyrocket.

This new technology provides a significant increase in the number of available mobile telephone channels in a given geographical area. Future applications of cellular technology will not be limited to mobile telephones. Public service and transportation organizations will eventually utilize this technology.

Subsequently, the monitoring enthusiast is presented with more things to listen to. The challenge to the listener is great, and effective monitoring of cellular communications will require a good understanding of its basic principles.

BACKGROUND

Most scanner enthusiasts are familiar with the standard mobile telephone system; this system has gone through very little evolution during the past decade, and in the United States it has remained a considerably limited service. A large metropolitan area may have only several hundred users (New York has approximately 700 mobile telephone subscribers), due largely to limitations imposed by spectral overcrowding.

So-called "cellular" technology promises to change all that, possibly offering improved service to literally hundreds of thousands of users in a large city.

Land mobile communications have seen a 10-12% annual growth rate of users

for the past two decades. The result is that the 40, 150, and 450 MHz land mobile bands are overcrowded, and all services suffer from various degrees of interference.

Even utilization of the new 900 MHz band with 30-40 times more channels than available on the other bands can only be considered a short-lived solution to spectral overcrowding. Expected growth rates are even higher than the past figures quoted above.

Cellular technology is a reasonable alternative to the expansion of the overall number of frequencies available, because it makes more efficient use of the spectrum, as we shall see.

Cellular technology implementation standards such as recommended transmission modes (SSB, FM, digital, or spread spectrum) have yet to be agreed upon, but we can outline the general principles behind its implementation and use.

THE CELL AND THE MOBILE CALL

The only fundamental point of cellular technology implementation actually agreed upon to date is that a given service area will be divided into identical adjacent cells with no overlaps or gaps. As illustrated below, hexagons are popular for diagramming individual cells.

At the center of an individual cell is a base station which is connected via landline to a local mobile telephone switching office. Certain frequency bands are assigned to individual cells, but not shared with adjacent cells to avoid mutual interference.

A mobile unit wishing to initiate a call will go "off hook" and transmit digital source-and-destination codes. These transmissions take place on special set-up channels and are just strong enough to reach the base station in the local cell.

The base station then receives the codes and forwards a message to the central switching office which in turn sends out a paging signal to all cells in search of the second mobile unit whose number has been dialed. When the destination unit is finally found, it responds to the paging sig-

nal by transmitting an acknowledgement code to its local base station on a set-up channel.

The switching center then assigns a pair of frequencies (channel pair) to each of the mobile units for actual voice communications to take place. These channel pairs are not necessarily the same for the respective cells each mobile unit is in. These frequencies are also relayed through the base stations and central switching office.

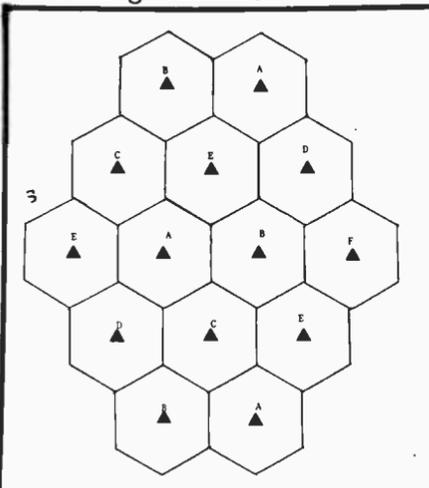


Fig. 1. Cellular radio service areas are often diagrammed using hexagons. Triangles here represent base stations at the center of each cell. Frequency bands assigned to a particular cell are depicted using capital letters. Assignments are so chosen to avoid adjacent cell interference.

And when one unit moves into another cell, things get really interesting. Upon entry into another cell, the mobile units must transmit through a new base station. An automatic handoff to the new base station is carried out by another exchange of data through the set-up channel.

Termination of a call is a simple matter. When the call ends, "on hook" signals are exchanged via the set-up channels between the mobile unit and the base station. The main voice channels are then cleared.

The main advantage of using cellular radio is that the number of users in a given area can be almost unlimited. By reducing the size of the cells, power levels can also be reduced, limiting the interference range around each cell.

ADVANCED MOBILE TELEPHONE SYSTEM

In 1979 AT&T began test marketing its version of a cellular mobile telephone system in Chicago. This system is called the Advanced Mobile Phone Service (AMPS).

Some 2100 square miles in the Chicago metropolitan area were divided into 10 cells to serve approximately 2000 customers. Full duplex

Cont'd on p.27

Books for the Ham Shack from WAYNE GREEN BOOKS



Novice License Study Guide
by Timothy M. Daniel
N8RK

This book emphasizes the practical side of getting a license and putting a station on the air. Complete with information about learning Morse code, the latest FCC amateur regulations and application forms, this guide is easily the best path into the exciting world of ham radio.
SG7357 \$4.95

General License Study Guide
by Timothy M. Daniel
N8RK

Learning rather than memorizing is the secret. This is not a question-and-answer guide that will gather dust when the FCC issues a new test. Instead, this book will be a helpful reference, useful long after a ham upgrades to General. Includes up-to-date FCC rules and an application form.
SG7358 \$6.95

Behind the Dial
by Bob Grove

This book explains, in detail, what's happening on all the frequencies, from shortwave up to microwave, including some of the secret stations of the CIA and FBI. Surveillance, station layout considerations, antenna systems, interfacing, and the electromagnetic spectrum are included.
BK7307 \$4.95

The New Weather Satellite Handbook
by Dr. Ralph E. Taggart
WB8DQT

This revised edition contains all the information on the most sophisticated and effective spacecraft now in orbit. The book is also an introduction to satellite watching, providing all the information required to construct a complete and highly effective ground station. Not just ideas, but solid hardware designs and all the instructions necessary to operate the equipment are included.
BK7383 \$8.95

The Magic of Ham Radio
by Jerry Swank WB8HXR

Under various call signs, WB8HXR has been heard on the ham bands since 1919. He has watched amateur radio grow from the days of Model A spark coils to an era of microprocessors and satellite communications. Drawing on his own colorful experiences and those of many other hams, Jerry has compiled this word-picture of ham radio during the past six decades.
BK7312 \$4.95

World Repeater Atlas

2000 repeater listings are indexed by location and frequency, pinpointed on more than 50 maps covering the USA. Foreign listings include Europe, the Middle East, South America, and Africa. In addition to covering the popular two-meter repeaters, the **World Repeater Atlas** lists repeaters for six meters, 220 MHz, and the other bands.
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by James R. Hay

MONITOR THE "TALL SHIPS"

In last month's column it was mentioned that there will be a special celebration for the 450th anniversary of the arrival of Jacques Cartier. This month I will offer some information about some frequencies which might be of interest to persons who might be in the Quebec City area to see the tall ships or who might like to hear them of MF or HF.

Contrary to what I said in last month's column, the tall ships left St. Malo about mid-April and not the end of March. Once the ships reach this side of the Atlantic and past Boston on their way to Quebec, and also on their return to their home countries, Halifax Radio might be one of their regularly-used stations on HF. Some frequencies to try, especially during their return voyage would be:

SSB	CW
4410.1	4285
6518.8	6491.5
8787.1	8440
13138.0	12874
17242.2	16948.5
	22387

Halifax also uses 446 and 484 kHz (CW); the ships could use any ship transmitting frequencies assigned by the coast station at the time of the call. Quebec radio (VCC) uses 474 kHz.

VCF (Mont Joli) is another station which the ships could use, operating on 446 in CW and 2582 in SSB. There are several other stations which will undoubtedly be used. By listening on 500 or 2182 kHz, one may well be able to hear many of the "Tall Ships."

If you are near Quebec City, try listening to the VHF-FM marine channels. VCC (Quebec Coast Guard Radio) operates on channels 16, 24 and 26 for calling, and channels 21 and 83B for weather and notices to shipping broadcasts. The Coast Guard also operate a vessel traffic management system on the St. Lawrence River on channels 6, 11 and 12.

In the Quebec region of the Canadian Coast Guard channel 19 is used as a Coast Guard working frequency, and channel 83 may be used near Quebec city. With

the number of pleasure boats expected, the Coast Guard may beef up their public correspondence facilities on channels 85 and 88.

Yacht clubs in the Quebec area which have radios will very likely be heard quite frequently on channel 68; up to 3000 pleasure craft will be vying for the 150 berths and moorings available in Quebec!

If you plan to go to Quebec to see the events and the ships, or if you are planning to listen for them on the radio, I wish you good listening and a good time.

ARCTIC UPDATE

The following table is a generalized summary of some of the better frequencies on which to hear the Arctic Stations which were published in the July/August 1983 Monitoring Times.

Arctic Frequencies - SSB	
4376.0	Canadian CG Stations
6512.5	Frobisher Bay CG Radio
8753.0	same
8793.0	Resolute CG Radio
5803.0	Athabasca-McKenzie River Stations
4363.6	Western Arctic Can CG Stations
6335.5	Inuvik CG Radio
8802.6	Alaskan Coast Sta
Arctic Frequencies - CW	
6493.0	Frobisher Bay CG Radio (VFF)
8443.0	same
6351.5	Cambridge Bay CG Radio (VFC)
12671.0	same
6292.5	Ships in Eastern Arctic & Hudson Bay

Correspondence about this column should be sent to: James R. Hay, 141 St. John's Blvd., Pointe Claire, P.Q., Canada H9S 4Z2.

KLC GALVESTON: COASTAL RADIOTELEGRAPHY

by Bruce W. Murray, Pres.

Seventy percent of the earth is covered by water. One hundred forty-seven million square miles of lakes, rivers and the great oceans of the world. The world's shipping industry utilizes much of this area to transport cargo from one destination to another; either between ports within a given country or ports at opposite ends of the globe.

The world's shipping industry depends on radio communications to chart their course. KLC Galveston Radio serves this important industry by transmissions to ships worldwide 24 hours a day, seven days a week.

Messages may regard the unloading of cargo, adverse weather conditions, distress calls, locating the edge of the fuel-saving Gulf Stream, or ordering groceries or parts for the next voyage.

As one of the surviving high seas public coast radiotelegraph and radioteletype stations in the United States, KLC stands watch on international channels to cover maritime activity from the Guatemala Basin through the Gulf of Mexico and the Caribbean to the Sargasso Sea Basin, Galveston-Houston and the world.

A maximum in-station message time of less than 19 minutes, KLC's operators are highly skilled and expedient

in handling each message from the time it is received in-house through transmission and receipt by the addressee.

KLC has increased its high seas reliability with the addition of new transmitters and receivers, in addition to state of the art radioteletype equipment, SITOR (simplex telegraph over radio).

A privately-owned and operated Public Coast Radiotelegraph Station, KLC stands watch twenty-four hours a day, seven days a week on 468 and 500 kilohertz and international channels:

CH5	CH6	CH9
4181.8	4182.2	4183.4
6272.7	6273.3	6275.1
8363.6	8364.4	8366.8
12545.4	12546.6	12550.2
16727.2	16728.8	16733.6
22232.0	22234.0	22236.0

KLC transmits traffic lists on the odd half hour GMT and includes weather at 0530/1130/1730/2330 GMT on KLC transmitting frequencies of (kHz):

484	4256.0	6369.0
8666.0	13038.0	16871.3
22467.0		

SITOR	
4354.0	4174.5
T	R
6205.5	6264.5
8709.0	8348.0
13095.0	12515.0
17221.0	16684.0
22565.5	22200.5

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CONSUMER ELECTRONICS SHOW

Twice a year electronics manufacturers worldwide meet at two expositions to hawk their wares to prospective dealers. This summer's CES in Chicago (perhaps the last for that city) drew some 90,000 visitors.

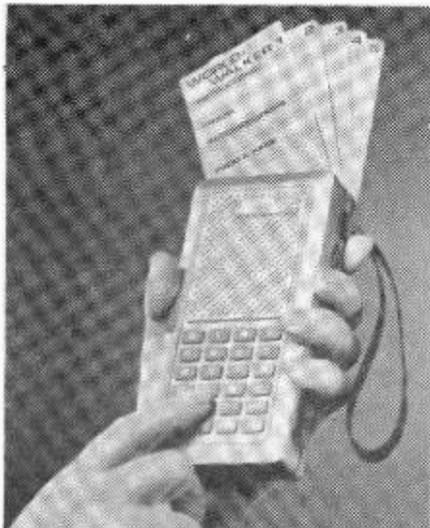
Next January the winter CES will convene once again in Las Vegas with rumors rife that lack of enough Chicago space next summer due to the closing of a major hotel may lock CES into Las Vegas in June as well.

While some spectators complained that there was nothing really startling at June CES this year, there were many new cornerstones being laid as consumer electronics products inched forward. Let's take a look at some of them.

WORLD WALKER TRANSLATOR

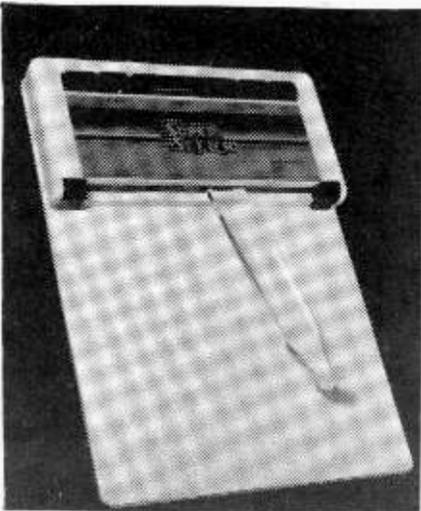
That's right; simply key in up to 600 words and phrases for immediate voice-synthesized translation between any two available languages.

At \$239 for the basic translator and \$49 for each dual-language module, the "Talking Translator" is available from SE&A, 15920 Haynes St., Van Nuys, CA 91406.



SUPER SKETCH GRAPHICS PAD

This low-cost artist's sketchpad will allow the user to "paint" in color a variety of artistic renderings, graphics and other visuals on home and business



Biggest Ever

computer screens.

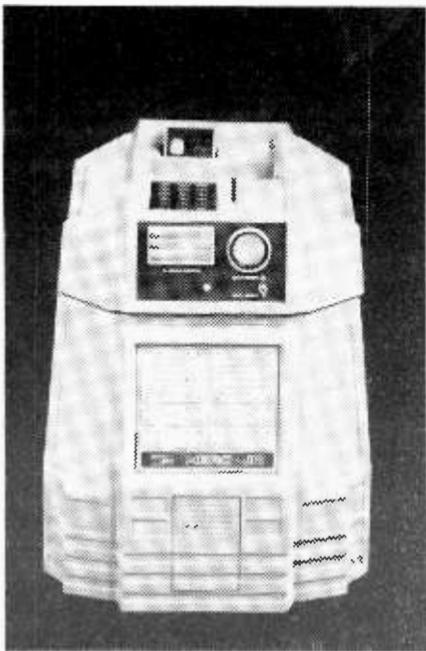
At prices between \$49-\$89 several models are available from Personal Peripherals, Merrick Park, 930 North Beltline, Suite 120, Irving, TX 75061.

HERO JR. ROBOT

Heath/Zenith's new personality may seem like an executive toy, but he is entertaining. He can sing songs, speak English phrases, play games, explore his surroundings, gab in "Roblish" (his native tongue) and tell nursery rhymes and poems.

At present 12 outside software houses are preparing cartridges to complement his present capabilities which include security guard, wake-up alarm, help the user with his programming and even provide a "demo" of his multi-faceted personality.

With 32K capability, HERO Jr. is available for \$1000 from Heath Company of Benton Harbor, Michigan or Heath outlets nationwide.



REGENCY MX-8000 COMPUTERIZED SCANNER

With the MX-7000 25-1200 MHz scanner barely ready for shipping, Regency announced the impending release of the MX-8000, a 200-channel scanning system with excellent graphic menu using the NEC PC8801 MK-II microcomputer.

While no price or availability was announced, the preliminary specifications are very impressive. A visual spectrum display is shown on the screen indicating the frequency, channel, bandwidth, mode and other characteristics programmed into the computer-controlled channel selection.

Watch for future announcements on this product in Monitoring Times.



SATOKI TALKING WATCH

An ideal gift for teens or the visually impaired, the Talking Watch features visual format as well. Additional features include day and date, lap timer/stopwatch and choice of colors.



Only \$59.95 from retailers or Z.I. Talking Technologies, 8619 Reseda Blvd, Suite 104, Northridge, CA 91324.

...WORTH NOTING COMPU-COVER COMPUTER PROTECTION

If you have one of the popular home computers and are worried about spills, dust and other intrusions into the keyboard, get in touch with a Compu-Cover dealer.

The clear acrylic hinged lid is available in several models, neatly folding back for use and rigidly supporting your copy for handy reference.

Approximately \$10 from your dealer or from Larry Jones, Insta-Ship, 1592 Eric Ct., Yuba City, CA 95991 (or call 1-800-523-2363).

SEIKO WRIST INFORMATION SYSTEM

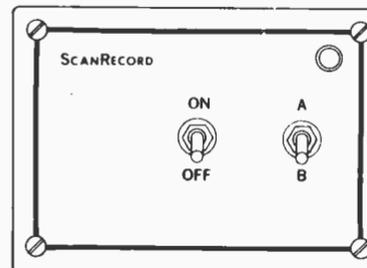
Consisting of a wrist module, pocket keyboard and controller, the wearer possesses a 2000 character RAM memory as an "electronic notebook."

Notes, calculations and other data are inputted and outputted by induction--there are no wires or connections. A Z-80 equivalent 4K RAM pack includes scheduling, BASIC, several elec-

Cont'd on p.32

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 Record recorder coupler will automatically turn on your tape recorder when your scanner is receiving 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 traffic on one tape. In addition to scanners, it will work with any receiver that has a squelch control.

The easy to use ScanRecord features user selectable drop-out delay, adjustable sensitivity, activity indicator and recorder control switch. The unit is all solid-state with no relays to stick or wear out. It operates on 9 to 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 ScanRecord is a tape recorder with a microphone jack and a remote control jack. The ScanRecord comes complete with all connecting cables.

Your complete satisfaction is guaranteed. Order your ScanRecord today for only \$35.75 plus \$2 shipping and handling.

Mail and phone orders are welcome. Send check or money order or we can ship via UPS COD. We also accept VISA and MASTERCARD. Please include your card number and expiration date.

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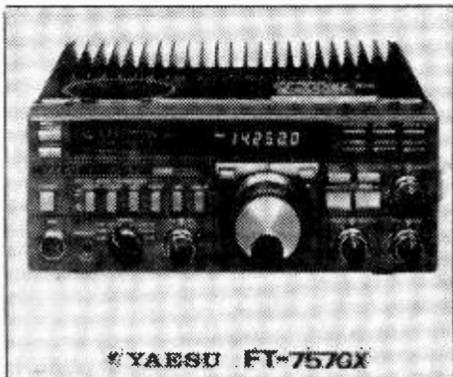
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BEHIND THE DIALS

YAESU FT-757GX TRANSCEIVER

A few months back, MT reviewed the Kenwood TS-430S, an outstanding amateur transceiver with a general-coverage receiver. Now Yaesu has released their competitive entry, the popular new FT-757GX.

MT advertiser Universal Amateur Radio of Reynoldsburg, Ohio loaned our offices an evaluation sample of the transceiver along with the matching AC power supply and desk microphone. Our findings are reported here.



COMPACT PACKAGE

The transceiver is compact, handsome and flexible. The lightweight (11-1/2 pound) unit measures only 9-1/2" x 3-1/2" x 9-1/2" making it an ideal tote-along field day rig, emergency radio, mobile or fixed operating position.

The matching FP-757GX AC power supply (actually a 120/240 VAC to 12 VDC converter) is the smallest yet, about the thickness of a book; the transceiver fits snugly on top without raising it awkwardly off the operating desk.

While we did note some power supply switching noise in this close configuration, it was virtually eliminated by common-grounding the two units together.

GOOD SELECTIVITY

The 757 features 8 channel memory and an effective adjustable IF shift for continuous selectivity contouring; nominal selectivity specifications (-6 and -60 dB points) are: 2.7/4.5 kHz SSB, FSK and CW wide; 600 Hz/1.3 kHz CW narrow; 6/18 kHz AM and 15/30 kHz FM (included).

A dynamic range better than 100 dB assures virtually intermod-free reception even under the strongest overload conditions.

Power consumption for 13.5 volt mobile or fixed operation is 2 amps receive and 19 amps transmit (full output).

A built-in speaker provides crisp, clean audio; image and IF rejection are

better than 70 dB down in the triple-conversion receiver.

Sensitivity is excellent, generally better than 0.25 microvolt for 10 dB S+N/N above 1.5 MHz. The receiver is tunable continuously from 500 kHz-30 MHz and offers fluorescent digital frequency display to 100 Hz with automatic offset to show center carrier frequency on LSB/USB without retuning.

THE TRANSMITTER

Emission modes of upper/lower sideband, CW, AM and NBFM at 100 watts PEP (25W AM) with carrier suppression of better than 40 dB at peak output are available in 500 kHz increments at 1.5, 3.5, 7.0, 10.0, 14.0, 18.0, 21.0, 24.5 and 28.0 (28.0-30.0) MHz.

The little transceiver offers a bevy of features including adjustable noise blanker, 20 dB attenuator, RF preamplifier, switchable AGC, full break-in CW, dual VFOs, speech processor, 10 Hz tuning increments, memory scan (search) with automatic stop on signals and a lithium-battery memory backup.

The (optional) MD-1 desk mike is a handsome brushed-chrome finish featuring remote up/down frequency tuning, voice tone control and high-low impedance switching.

The transceiver is very easy to operate and comes with an excellent manual, well-written and informative.

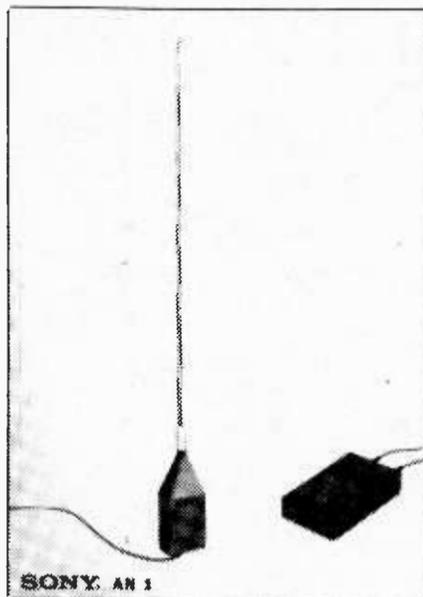
(Yaesu FT-757GX transceiver, suggested retail \$829; FP-757GX \$169; (FP-757HD heavy duty supply \$195); MD-1 \$69).

THE SONY AN-1 ACTIVE

ANTENNA: A Critique by Ralph W. Burhans

(ED.NOTE: It is a pleasure to welcome author Ralph Burhans into the pages of MT. His recent series on active antennas published in *Radio Electronics* magazine strengthened his acknowledged reputation as one of the country's leading authorities on this subject.)

My main interest is in longwave reception below 500 kHz, and I have worked on some 124 different circuit designs for active antennas at last count. Has Sony discovered something really new?



I inquired as to the possibility of using the AN-1 at 100 kHz to receive Loran-C, then ordered one from Bob Grove and gave it a thorough evaluation.

The AN-1 is usable down to 100 kHz at -6 dB down although the specs say 150 kHz to 30 MHz. It has some very good mechanical engineering features and a few electronic improvements. But the task of developing a wideband active antenna with no interference problems at a low retail price has yet to be realized.

GENERAL OBSERVATIONS

In my opinion the biggest single problem with wide-range-coverage, short-whip, active antenna systems is that of intermodulation

distortion from strong signals not on the desired received frequency. These signals cross-modulate (produce undesired harmonic products) because of the non-linearity of the active antenna preamplifier. The SONY AN-1 appears to be no better or worse than other competitive products made by MFJ, McKay-Dymek and some of my own designs.

Consumer-grade active antennas cannot compare with high-quality systems made for government services by firms such as Rohde & Schwartz or Collins-Rockwell. Unfortunately, those systems are costly and not generally available to the average SWL.

What the big boys do is to fabricate wideband power amplifiers with over 1 watt output capability driving a 50-75 ohm line. Then they add input-impedance-conversion stages and switched filters to handle very large signals without distortion.

LINEARITY

When you consider the facts of life (for example, a strong local BC band transmitter a mile away that puts 0.5V of RF on your antenna) an antenna preamplifier with only unity voltage gain (but with power gain or impedance conver-

Cont'd on p.28

Don't be "Left In The Dark"

Turn On

to

"What's Happening"

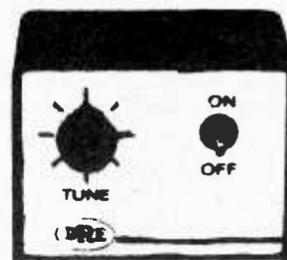
Give "DNE" a call

501-623-6027



UNSCRAMBLERS

which let you hear the coded messages of police, fire, medical or emergency channels, shortwave, etc.



3 Models to choose from

D-12 Base

D-12 Deluxe Base

P-20 Hand held or mobile

Fits All Scanners*

or write for literature

DNE, INC.

Rt. 7, Box 257-D

Hot Springs, AR 71901

Don Nobles Electronics, Inc.

*Not For TV

NEW ARRIVALS

DGM RTTY/CW COMPUTER INTER-FACE



The new DGM-1 RTTY/CW COMPUTER INTERFACE connects between your transceiver (or receiver) and computer and will work with almost any RTTY/CW software on the market.

A sensitive mark and space active filter demodulator provides outstanding performance even on the weakest, noisiest signals that can be found. This unit copies both mark and space tones. The demodulator section is preceded by a bandpass filter to provide adjacent signal rejection. A three pole post detection filter provides optimum signal to noise reception of the RTTY signal. An LED bargraph and mark/space LED indicators provide a positive tuning indication. Scope outputs are also provided.

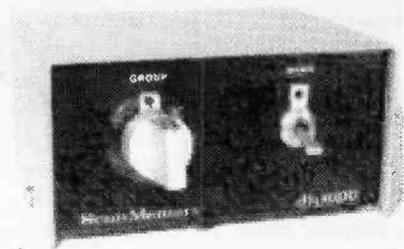
The bandpass-filtered CW demodulator is centered around 800 Hz. The rear panel contains a standard 5 pin I/O connector for TTL level interfacing. An RS 232 connection is also included.

The DGM-1 RTTY/CW Computer Interface is housed in an attractive, compact 1-1/2" x 7" x 7" aluminum enclosure to provide excellent RF immunity. The unit is powered by a 120 VAC wall transformer (included).

(\$149.00 from DGM Electronics, Inc., Dept. MT, 787 Briar Lane, Beloit, WI 53511; ph.608-362-0410)

SCANMEMORY DH-1000 MEMORY EXPANDER

A clever addition for users of programmable scanners is the new "ScanMemory" from The Dog House, P.O. Box 511, Fairfax, VA 22030 (ph.703-280-5072).

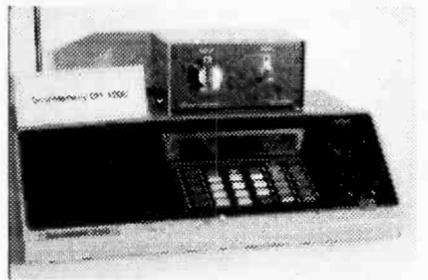


Presently available for Electra Bearcat models BC-250, BC-300 and BC-350 these compact and inexpensive add-ons are capable of providing 1000 memory channels when installed as directed.

While installation is simple, some understanding of electronics or prior experience is recommended. The project involves the removal of a plug-in memory chip and the insertion of the cable from the DH-1000 containing a non-volatile RAM (random access memory chip).

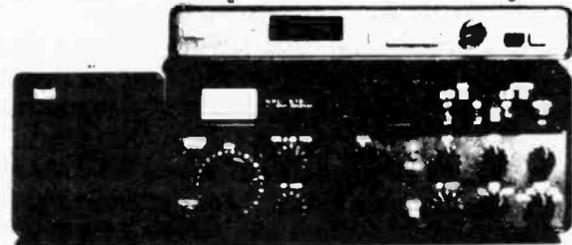
Increments of 10, 20, 30, 40 or 50 frequencies may be selected for scanning with switchable access to any channel for manual monitoring and programming.

The DH-1000 is introductory-priced at \$142.95, postpaid in the U.S. Future models are planned for J.I.L., Radio Shack and Regency products.



NRD-515

JRC Japan Radio Co., Ltd.



The JRC NRD-515 offers more features and performance than any other receiver in its class. Exceptional selectivity and stability make this an excellent radio for RTTY and FAX reception. Designed for the serious DXer who demands the best!



NRD-515 Receiver .1-30 MHz.

\$995.00

NDH-518 96 Channel Memory

\$224.00

NCM-515 Keypad Controller

\$149.00

NVA-515 External Speaker

\$ 39.95

Call or write:

Universal Amateur Radio
Fred Osterman - SWL Dept.
1280 Aida Drive
Reynoldsburg, Ohio 43068
Phone: 614 866-4267



WHO DECIDED AND WHY?

by D.K. deNeuf WA1SPM

What was the rationale behind deciding on sixty cycles (Hertz) as a frequency for commercial AC power? Why not sixty-five, or eighty or a hundred? Some years ago parts of the Los Angeles area employed fifty cycles. There were AC "Telechron" clocks then in existence. What happened to them when the frequency was eventually standardized at 50 Hz? Did everybody simply have to buy new clocks, or did the utility company replace them, maybe free?

For many years the lights in the New York City subways operated from a 25 cycle source - and visibly flickered. And, there used to be a lot of DC in the city. Presumably this harked

back to Edison's early power plants, and since most of the old elevators were DC operated the source was probably continued for a rather long period of time.

But why 110 volts as a national power standard? Why not 100 or 150 volts? Incidentally, most commercial aircraft today employ 400 Hertz power for lighter weight.

On audio disc records, why was a speed of 78 RPM adopted? Why not 70 or 80 RPM? Why the 33-1/3 RPM speed for modern LP records? Why not 30 or 40 RPM? Was there some reason related to such speed as one third of 100 RPM or something?

Why was 35 mm chosen for commercial motion picture film? 8 and 16 mm for home?

On TV standards worldwide there are several different systems - our NTSC, BBC, PAL, and SECAM. There used to be a joke amongst TV engineers that PAL stood for "Pay and Learn," and that SECAM really meant "Supreme Effort to Counter American Methods." They said our NTSC signified "Never Twice the Same Color."

What an electronic nightmare on inter-country

EDISON PLAQUE

This bronze plaque was commonly mounted in hotel rooms at the turn of the century. Would MT readers be interested in replicas for mounting in your radio rooms? Let us know. (Photo is slightly reduced.)

This Room Is Equipped With

Edison Electric Light.

Do not attempt to light with

match. Simply turn key

on wall by the door.

The use of Electricity for lighting is in no way harmful to health, nor does it affect the soundness of sleep.

Cont'd on p.15

RTTY/FAX

FACSIMILE DIRECTORY
by Bill Grant

(ED.NOTE: In a recent issue we appealed for contributions of up-to-date facsimile listings for the benefit of MT readers. Bill Grant, a former US Air Force meteorologist has prepared an exhaustive list; below are those frequencies which supplement Mike McCloskey's

listings [See April & May issues].

Presently Bill uses an Alden Marinefax III recorder and a JRC NRD-515 receiver, a fine combination. We would like to express our gratitude to Bill for his thoughtful gesture in sharing his coveted records with fellow MT listening enthusiasts...Bob)

WEATHER RADIOFACSIMILE STATIONS

FREQ	CALL	LOCATION	SCAN/MIN	OP TIMES
2122	NPM	HAWAII(USN)	120	
2618.5	GFE 25	BRACKNELL,G BRITAIN	120	1800-0600
2815		MOSCOW,USSR #1	60/90/120	1800-0510
3253	VRC 3	FROBISHER NWT,CANADA	120	6/1-10/15
3289.5	GFA 21	BRACKNELL,G BRITAIN	120	H24
3357	NSS	NORFOLK,VA (USN)	120	
3365	JMJ	TOKYO, JAPAN	120	
3622.5	JMH	TOKYO, JAPAN	120	
3650	AOK	ROTA, SPAIN	60/120	2100-0700
4014	ZRO 5	PRETORIA, S.AFRICA	120	1730-0300
4047.5	FTE 4	PARIS, FRANCE	60/120	1930-0600
4247.85		NORTHWOOD, G BRITAIN		
4268	CKN	ESQUIMALT,BC,CANADA	120	
4271	CFH	HALIFAX,NS,CANADA	120	0316-2300
4298		KODIAK,ALASKA	120	0100-1500
4610	GFA 22	BRACKNELL,G BRITAIN #2	120	1800-0600
4975	NPN	GUAM,MARIANNAS IS		0900-2200
5100	AXM 32	MELBOURNE/CANBERRA,AUST	120	
5185	LRO 69	BUENOS AIRES,ARGENTINA	120	0425
5206		ROTA, SPAIN		
5285		TASHKENT,USSR #1	60/90/120	H24
5355		NOVOSIBIRSK,USSR	90/120	H24
5405	JMJ 2	TOKYO, JAPAN #2	120	1215
5525	BAF 6	BEIJING, CHINA	120	
5755	AXI 32	DARWIN,AUSTRALIA	120	1300,1115
5765		NOVOSIBIRSK, USSR	60/90/120	1215
5850	OXT	COPENHAGEN,DENMARK	120	0030-1005
6330	CFH	HALIFAX,NS,CANADA	120	H24
6435.55	MHU	NORTHWOOD, G BRITAIN#1	120	0300
6918.5		MADRID, SPAIN	60,120	0410-1715
7305	JMH-2	TOKYO, JAPAN #1	120	1200
7405		NEW DELHI,INDIA		
7475		KHABAROVSK,USSR	90,120	H24
7508	ZRO-2	PRETORIA,S AFRICA	120	H24
7535	AXI 33	DARWIN,AUSTRALIA	120	1300
7710	VRC 3	FROBISHER NWT,CANADA	120	6/1-10/1:
		(ICE RECON)		1815
7750		MOSCOW,USSR #1	60,90,120	H24
7995	NPM	HAWAII(USN)		
8000		THURSO, U.K.	120	0000
8040	GFA 23	BRACKNELL,G BRITAIN #2	120	H24
8080	NSS,NAM	NORFOLK,VA		H24
8120	BAF 36	BEIJING,CHINA	120	
8146	IMB55	ROME, ITALY	120	
8185	FTI8/B	PARIS,FRANCE		0230-2145
8459		KODIAK,ALASKA	120	
8494		ADAK, ALASKA	120	
8494.85		NORTHWOOD,G BRITAIN #1	120	0300
8502	NIK	BOSTON,MASS	120	1600
8506		KATO SOLI, GREECE	120	
9060		NOVOSIBIRSK,USSR #1	60/90/120	H24
9112		INDIAN OCEAN AREA	120	0000
9150		TASHKENT, USSR	60/90/120	0300,1245
9157		MOBILE, AL		EVERY 3HR
9203	GFE 22	BRACKNELL,G BRITAIN #1	120	H24
9230		KHABAROVSK,USSR #1	90,120	H24
9290	WFA 29	BRENTWOOD, NY	120	0705-1212
9360	OXT	COPENHAGEN,DENMARK	120	0000-0025
				1010-1215
				1245-1305
				1830-1850
9389.5	WFH 29	BRENTWOOD,NY	120	0712-1212
9438	JMJ 3	TOKYO,JAPAN #2	120	000,1200
9459	ZKLF	WELLINGTON/AUCKLAND,NZ	120	0600-1800
9890	CFH	HALIFAX,NS,CANADA	120	1000-2200
9970	JMH 3	TOKYO,JAPAN	120	1200

9982.5	KVM 70	HONOLULU,HI	120	0643-0843
				1230
10115		NAIROBI, KENYA	120	0230
10250		MADRID,SPAIN	60,90,120	0410-1715
10255	NPN	GUAM,MARIANNAS IS	120	0900-2200
10387		NAIROBI,KENYA	120	0200,2345
10555	AXI 34	DARWIN,AUSTRALIA	120	H24
10720	LRB 22	BUENOS AIRES,ARGENTINA	120	0425,2100
10865	NSS,NAM	NORFOLK,VA	120	H24
10980	RDD 78	MOSCOW,USSR #1	60,90,120	H24
11030	AXM 34	MELBOURNE/CANBERRA,NZ	120	0138-2218
11035	WFL 51	BRENTWOOD,NY	120	0712-1212
11086.5	GFA 24	BRACKNELL,G BRITAIN #2	120	H24
11090	KVM 70	HONOLULU,HI	120	1140-1340
11145		MOBILE,AL	120	EVERY 3HR
12125	CKN	ESQUIMALT,BC,CANADA	120	0230,2100
12165		MOSCOW, USSR #1	60/90/120	1300
12230		NOVOSIBIRSK,USSR #1	90,120	0000-2230
12305	FTM 30	PARIS,FRANCE	120	0600-1900
12759		ROTA, SPAIN	120	1215
12829		MOSCOW,USSR (NEWS)	60	0430,1700
13510	CFH	HALIFAX,NS,CANADA	120	1000-2200
13550	ZKLF	WELLINGTON/AUCKLAND,NZ	120	H24
13597	JMH 4	TOKYO,JAPAN #1	120	2100
13600		ROME, ITALY		1245
13773	ZRO 3	PRETORIA,S AFRICA		0300-1730
13920	AXM 35	MELBOURNE/CANBERRA,AUS		
14367		BEIJING, CHINA	120	0000
14436	GFE 23	BRACKNELL,G BRITAIN #1	120	H24
14582	GFA 25	BRACKNELL, U.K. #2	120	0600-1800
14842		NEW DELHI,INDIA	120	1445,2020
15615	AXI 35	DARWIN,AUSTRALIA	120	2100-0800
16135	KVM 70	HONOLULU,HI	120	1900-2045
16220	ZKLF	WELLINGTON/AUCKLAND,NZ	120	1800-0600
16410	NSS,NAM	NORFOLK,VA	120	
17140.3	NMC	SAN FRANCISCO,CA	120	1700-2300
17151.2		SAN FRANCISCO,CA	120	
17365	5YE 3	NAIROBI,KENYA	120	1400, 2150
17410.5		LA JOLLA,CA	120	1700
17436.5	WFK 67	BRENTWOOD,NY	120	1900-2350
17510	OXT	COPENHAGEN,DENMARK	120	1335-1255
18060	AXI 36	DARWIN,AUSTRALIA	120	2100-0800
18093	LRO 84	BUENOS AIRES,ARGENTINA	120	0400,2000
18130	JMJ 5	TOKYO,JAPAN #2	120	1400,2200
18220	JMH 5	TOKYO,JAPAN #1	120	2340
18227		NEW DELHI, INDIA		
18235	BAF 33	BEIJING, CHINA	120	2330
18238	ZRO 4	PRETORIA, S AFRICA	120	0540-1745
18261	GFE 24	BRACKNELL,G BRITAIN #1	120	0500-1900
18365.5		MADRID, SPAIN	60/120	1420
18620	NPN	GUAM,MARIANNAS IS		0900-2200
19275		KHABAROVSK,USSR #1	90,120	H24
19690		CANBERRA, AUSTRALIA	120	0030,2230
19750		DAKAR,SENEGAL	60/120	
20016	NSS	COM NAV OPS(NORFOLK,VA)	120	H24
21837		PEARL HARBOR, HI	120	0000,2230
22770	JMH 6	TOKYO,JAPAN #1	120	0145,2200
22865	NPN	GUAM,MARIANNAS IS	120	0900-2200
23331.5	KVM 70	HONOLULU, HI	120	1900-2045
23880	NPN	GUAM,MARIANNAS IS	120	0900-2200

NON-WEATHER RADIOFACSIMILE STATIONS

FREQ	CALL	LOCATION	SCAN/MIN	OP TIMES
7656		TOKYO, JAPAN (NEWS)	60/120	1245
7930		BUENOS AIRES #1(PHOTO)	60	0120
8166		BUENOS AIRES #2(PHOTO)	60	0125
8472	JJC	KYODO-NEWSFAC TOKYO	60	
9241.5		RIO DE JANEIRO,B(PHOTO)	60	0030,2300
9324.5		TOKYO, JAPAN (NEWS)	60/120	0030,1200
9430		TAIPEI, TAIWAN (NEWS)	60/120	1150,1300
9980		OSLO, NORWAY(NEWS)	240	1300
10340		NEW YORK,NY #1(PHOTO)	60	0055,0120
10727		UNKNOWN(EUROPE)(PHOTO)	60	1740
10928.5		LONDON, U.K. (PHOTO)	60	1745
11005		UNKNOWN (PHOTO)	60	1230
11451.5		BUENOS AIRES,AR(PHOTO)	60	0100
11461.2		UNKNOWN (PHOTO)	60	0100
11475.7		PYONGYAN,N KOREA(PHOTO)	60	0000
11480		BUENOS AIRES,AR(PHOTO)	60	0120
12175		PYONGYAN,N.KOREA(PHOTO)	60	2350
12322		TOKYO, JAPAN (NEWS)	120	0030
12745		TOKYO,JAPAN #1 (NEWS)	60/120	1330,0000
12750		USSR(EASTERN)(NEWS)	60	1200

HAWKER and the OSS

A True Tale of Counterespionage in WW II

(Author's name withheld by request)

After being with SI/London where I was a trainer of OSS W/T agents (see Glossary), I went into France, arriving in Paris on August 25th, 1944.

The Germans had not completely cleared out of the city; Skorzeny, Chief of German Intelligence (Abwehr II), had left behind several "sleeper" agents and would soon be parachuting in many more W/T agents.

By the end of September, X-2/Paris had six enemy W/T agents operating as playbacks under our control.

In October, I was sent to the Delta Base Section (DBS) in southern France to set up a detachment near Lyon, in the Rhone Valley, for OSS/X-2, reporting to headquarters in Paris.

I arrived in Lyon shortly after Operation Anvil (Invasion of Southern France) where we set up our operation in a chateau near Collonges-au-Mont-D'or on October 15, 1944. Our mission was to capture German agents and set them up as playback agents.

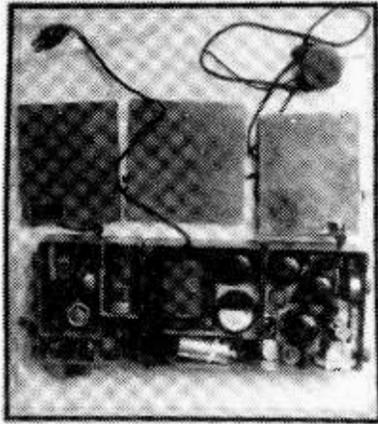
Our first job was to contact the Chief of Police and French Intelligence. During our first meeting at the Fort Montluc Prison we found that they had already captured four sleeper agents within the last two weeks. Our hopes faded, however, when we were told that they had been given "le traitement"—a bathtub filled with icewater and the use of lead pipes.

They agreed to let us have any other agents they might capture and to share tips regarding German agents provided any captured agents would be turned back after the war was over.

We then contacted the media. We requested anyone knowing of a German spy, or even a rumor of such, or anyone observing lights in an apartment or house flickering in rhythm, or anyone hearing key clicks over the radio, etc., to contact us or the police at once. We had a special unlisted phone number for this purpose.

Additionally, we monitored the shortwave bands for any signals that sounded like a possible clandestine operation, using DF equipment, very sensitive amplified field strength meters and other equipment.

When the phone rang with news from our friend, the Inspector, that a Nazi



'Eagle's captured spy radio sympathizer was now eating in a local restaurant, we immediately passed our code, "THE BABY HAS ARRIVED" to the members of our unit.

Shortly, four of us rushed into the restaurant carrying various weapons (I had a British Sten 9mm sub-machine gun). We saw the agent at once; he was sitting at the counter and looked just as he was described.

He looked up, reached into his jacket pocket, pulled out his poison pill and gulped it down with wine, then fell off the stool onto the floor. I screamed, "THERE GOES OUR BABY." The owner of the restaurant, a woman who had experience in both wars cried, "Un enfant - ce n'est pas un enfant - c'est un Nazi... tuez-le.." ("Baby - he's no baby - he's a Nazi... kill him...!")

Rushing him to the hospital, we had his stomach pumped. The doctor said that what saved him was that he had just finished eating a very large meal. The pill had enough arsenic and other poisons in it to kill two horses! But our patient would be laid up for at least a week.

We gave our first German W/T agent the code name "Eagle." I visited him every day, sometimes twice a day. We had around-the-clock guards, one in his room and one outside the door. Eagle was starting to recover. When he was back on his feet we approached him about working for us. He was a citizen of France and didn't want "le traitement" so he agreed at once to work for us as a playback.

We secured a nice, small house up on a hill and put up a long wire antenna for his use. We also requisitioned MP guards for around-the-clock watch.

On the day we took Eagle out of the hospital we recovered his two chutes, his radio, money, etc. which he had buried when he landed. He had his cipher and frequency chart on microfilm in the back of his watch.

His radio equipment worked fine when I made contact with both Paris and London for a test. With Eagle's help we figured out his simple cipher and made up his first message.

The Abwehr frequency was just above the 6 MHz (49 meter) shortwave broadcast band (see glossary). The evening of his first contact was very exciting for all concerned. As the time approached we were all listening, including Eagle. I was using an AR-88 (RCA Receiver) and they were also monitoring back at our chateau HQ. "There they are," said Eagle.

I heard a very rough 200 Hz modulated CW signal calling Eagle: "CNX CNX CNX DE CNV K." The signal was very strong and Eagle responded with his first message telling Abwehr that he had injured his ankle upon landing and that it had taken him some time to get set up. They congratulated him and sent his first instructions (His cipher is shown in Table 2).

Through Eagle, we were able to capture three more German W/T agents (one a paymaster agent), thus furthering our counterespionage. We were able to operate

Eagle without the Germans' knowledge until May 2, 1945, virtually the end of the war.

A la prochaine fois
(Until the next time)
HAWKER

GLOSSARY

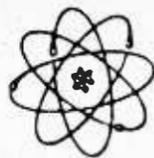
- HAWKER—Code name of OSS Agnt
OSS —Office of Strategic Services
X-2 —Super secret counter-espionage branch of OSS
ETO —European Theater of Operations
SI —Secret Intelligence
W/T —Wireless Telegraph
DF —Direction finding radio receiver
DBS —Delta Base Section (Lyon, Marseille and Nice, France)
EAGLE —Code name for German W/T agent
PLAYBACK
AGENT —A captured enemy agnt set up to deceive the enemy
AR-88 —RCA Receiver
VIGENERE
TABLE —A well-known table used in conjunction with code or cipher books to encipher & decipher messages between OSS stations & Agents (Table II)

☞ Much more on p.29

GALAXY ELECTRONICS

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KENWOOD R-2000

R-2000...

10 memories, scanning...state of the art features! Maximum flexibility and ease of operation.

499.50



BC 100

8 band, 16 channel, programmable pocket scanner, ac adapter/battery charger, case, rubber antenna earplug and [6] AA nicad batteries included, jacks for earphone, ac adapter/battery charger

279.50

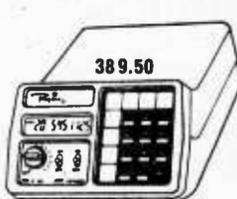
- Keyboard entry
- 32 memories
- 100 KHz-30MHz
- Scanning
- Pass band & notch tuning



NEW ICOM ICR-71-A \$699.50



Regency



MODEL MX5000

Introducing the all new Regency MX5000, a 20 channel, no-crystal scanner that receives continuously from 25 MHz to 550 MHz. That's right! Continuous coverage that includes CB, VHF and UHF television audio, FM Broadcast, and civil and military aircraft bands. Plus a host of other features like keyboard entry, a multifunction liquid crystal display that's sidelit for night use, selectable search frequency increments, and a digital clock.

SHORTWAVE RADIO

KENWOOD

R-2000 150 khz-30 mhz, Digital, 10 Memories. 499.50

R-1000 200 khz-30 mhz, Digital Receiver. . . . 409.50

R-600 150 khz-30 mhz, Digital Receiver. . . . 339.50

YAESU

FRG-7700 150 khz-30 mhz, Digital Receiver. . . 449.50

SPECIAL Purchase a FRG-7700 with memory unit & get FREE installation—Memory unit. . . . 137.50

ICOM

IC-R70 100 khz-30 mhz, Digital Receiver. . . . 599.50

NRD-515 1 khz-30 mhz, Digital Receiver. . . . 949.50

NVA-515 Speaker for the NRD-515. . . . 48.50

PANASONIC

RF-2200 8 Band Portable AM/FM/SW Receiver. 179.50

RF-3100 31 Band, Digital, *SPECIAL* . . . 266.50

RF-8300 1.6 khz-30 mhz, Digital Receiver. . . *CALL*

RF-8600 1.6 khz-30 mhz, Digital, Mem/Scans. *CALL*

BEARCAT DX-1000 10 khz-30 mhz, Mem/Digital. 489.50

UNIDEN-CR-2021 AM/FM/SW, Digital/Memories. 199.50

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SONY-7600-A Portable Shortwave Receiver. . . 144.50

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CLUB CORNER

Paul Swearingen
7310 Ensign Ave
Sun Valley, CA 91352

A popular club wanes-- and others achieve new success. This edition of MT's Club Corner examines the rise and--well, we hope not fall, of IDXCSD. Don't forget--send news of your club's activities to the above address, not directly to MT.

"The club's kind of in limbo." That's how Ward Brookwell described the status of the INTERNATIONAL DXer's CLUB OF SAN DIEGO, founded by his father, Larry Brookwell, who died December 23, 1983 at the age of 80.

Larry Brookwell had been a one-man publisher of the monthly club bulletin and various equipment reviews for the club through 67 issues. He had started the club as an alternative to restful retirement, hoping that a couple dozen DXers around San Diego would join over coffee periodically and chat about DX, only to see IDXCSD mushroom to 514 members living in 21 countries.

Although his equipment reviews were crisp and non-sense (Sony ICF-2002: "As a portable for major SW stations tiz OK. A DXing machine it's not. Sensitivity inferior."), his personality infused the contents of the club bulletin (which once included instructions on how to shrink heads in a microwave oven), and eventually he skimmed the best of his reminiscences and published them in a book entitled, "Tail Gunner on a Superheterodyne" ENTERTAINMENT WEEKLY.

The last issue of the

bulletin was actually at the printers when Brookwell died of congestive heart failure, and it was not mailed until February. His son, Ward, who was named executor of his estate, was faced with the task of finding someone who would take over the club and continue the publications. "Volunteers have been conspicuous by their absence," he commented, but he added that he had received three tentative offers from individuals, although he had not been able to get a definite commitment from any of them as of mid-May.

Ward Brookwell wasn't sure what would happen to the club if no one took over the reins. "Right now there's not enough money in the club treasury to pay off all the members' remaining subscriptions in full," he added. He mentioned the possibility of additional sales of club publications and his father's remaining equipment as methods of sufficient revenue. About 400 copies of "Tailgunner" are still available, and a list of prices for it and other publications would be mailed out for an SASE.

The club also published extensive equipment reviews and updaters covering items for all DXers, including side-by-side comparisons of various receivers. These are still available. For more information, contact Ward Brookwell at 110 Ashland Avenue, Medford, OR 97504 and be sure to include an SASE.

CRACKDOWN ON CREDIT CROOKS

Increased awareness of credit fraud has led to the unchallenged introduction of legislation setting stiffer penalties for criminals convicted of credit crimes. Senator Strom Thurmond (Rep.-S.Carolina) called for laws that would make such crimes a federal offense, with sentences of up to 20 years in jail and fines of \$100,000.

Justifications are apparent. In 1974-75, Thurmond reported, counterfeit VISA cards amounted to about \$10,000 worth of fraud. That amount soared in 1982-83 to \$1.1 million. Worldwide figures are even more startling: The figure for all cards jumped from \$15 million in 1981 to \$50 million in 1982. The senator said 94 percent of that theft takes place in the United States.

FOX Unveils New Scanner Concept

Fox Marketing has revealed to Monitoring Times their intention to produce a new series of scanners under the "Tracer" label. Progressively more sophisticated, the models 200, 500 and 1000 will feature 20, 50 and 100 channels of memory.

Additionally, frequency range will extend from below 30 MHz to above 800 MHz, assisted by user-specified plug-in converter modules.

The same size as the compact BMP-10/60, the "Tracer" series will be compatible with all accessories of that other model and will feature an LDC display and full-stroke keypad.

A fall 1984 preliminary release is planned with a formal showing at the January 1985 Consumer Electronic Show in Las Vegas.

THE WORLDWIDE TV-FM DX ASSOCIATION has been swamped recently with requests for information recently after articles on TV and FM DXing were published in Radio World, TV Guide, and Popular Communications. After mailing problems in 1982 when the club was based near Chicago (The USPS lost all but a few copies of the December, 1982 issue) operations were transferred to Buffalo and the club has been expanding its offerings. Both commercial and utility stations are covered in WTFDA's monthly publication, VHF-UHF Digest. Send requests for information to **WTFDA, P.O. Box 514, Buffalo, NY 14205** Their annual convention will be held August 3-5 in Jamestown, NY.

THE NATIONAL RADIO CLUB'S 51st convention promises to be eventful and scenic, as it will take place in the shadow of Pike's Peak in Colorado Springs.

August 31-September 2. Contact **Wayne Heinen, 1642-C South Idalia Circle, Aurora, CO 80017** for details

(ED.NOTE: Club officers are invited to send happenings, bulletins and newsletter to Club Corner editor Paul Swearingen at the address shown in his masthead.)

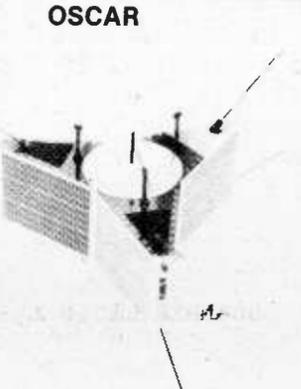
As announced last month, **The ASSOCIATION OF NORTH AMERICAN RADIO CLUBS (ANARC)** will hold its 20th annual convention in Toronto, Ontario July 20-22. **Bob Grove, editor of MT and president of Grove Enterprises will be one of the featured speakers.**

For registration information, send a business-size SASE and a loose first-class 20¢ stamp IN the envelope OR 3 IRC's to **ANARCON '84, Ontario DX Association, P.O.Box 232, Station Z, Toronto, ON M5N 2Z4 Canada.**



AMSAT

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OSCAR

Do you know that *amateurs* have launched over a dozen satellites into earth orbit? Some of these spacecraft have achieved orbits over 20,000 miles high! Signals from these satellites can be received using relatively small antennas and a preamplifier and/or converter connected to your present shortwave receiver. If you are a licensed Radio Amateur with at least a Technician Class license, you can communicate through most of these satellites to obtain reliable international ssb, cw, RTTY or SSTV communications. * Special bulletins and other informational messages are available on satellite beacons. Informal conferences regarding space activities are conducted on these satellites and on various shortwave frequencies.

Here is your opportunity to take an active part in the space frontier. Whether your interest is in building future spacecraft, space communications, computer applications, space studies, satellite tracking, or just keeping informed regarding the exciting developments of the space age, here is your chance to get involved in the new frontier. By joining the AMSAT team you will receive regular news on the various amateur space projects, the latest home station equipment for receiving or transmitting via satellites, membership discounts on space shuttle/satellite tracking software for your home computer, plus much more. Further, your membership helps support the Amateur Space Program and ensures its continued success.

- Please send additional free information on the Amateur Space Program and AMSAT membership. Enclosed is a business-sized, self-addressed, stamped envelope.
- Please send free information on home computer programs and other software for tracking the space shuttle, satellites, and other objects in earth orbit. Enclosed is a business-sized, self-addressed, stamped envelope.
- Yes, I want to become a member of AMSAT and receive *ORBIT* Magazine! Enclosed are my annual dues of \$24 (\$26 overseas - surface. Special rates are available if you desire air mail delivery service).

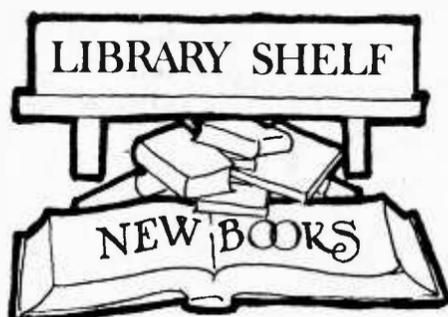
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- Please send me a sample issue of *ORBIT* Magazine. Enclosed is my personal check, money order, or appropriate credit card information, for \$2.
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*Although an Amateur Radio license is required for two-way communications via OSCAR satellites, you do not have to hold such a license to be a full voting member of the AMSAT team



INTERNATIONAL SHORTWAVE LISTENER'S PROGRAM GUIDE edited and published by Lawrence J. Miller (Monthly newsprint magazine, 8-1/2" x 11", 32 pages; \$19.95 for 12 issues from Miller Publishing, 424 W. Jefferson St., Media, PA 19063).

Editor Larry Miller is a conscientious researcher and his new monthly guide reflects his competence. Shortwave listeners will recognize top names in the bylines: Richard Wood, Clayton Howard and Larry Miller himself, a recognized author of several SW books.

The inaugural (April) issue contains no less than two dozen articles relating to international broadcasting monitoring. It look like Miller might really have something by the tail here! For your free sample send 37¢ postage (U.S.), 70¢ or 2 IRC's (Canadian) or 7 IRC's (foreign air mail).

SCANNER RADIO LISTINGS by Norm Schrein (Louisville and Lexington Areas; Chicago Area; \$9.95 from Fox dealers of add \$1 postage from Execumail Services Co., Dept. A, P.O. Box 61, Dayton, OH 45404).

Author Norm Schrein is a familiar name to MT readers; his "Tune in Canada" column is a regular feature each month. Schrein's profession would be a dream to most of us--he is paid to travel around the country listening to his scanner to confirm activity! The results are published in the Fox frequencies directories.

His two new directories--Louisville/Lexington and Chicago (129 and 189 pages respectively)--reflect his usual thoroughness, cross-referenced by user, callsign, frequency and type of service.

As a bonus, Schrein's directories include a reference section on nationwide frequencies, VHF/UHF allocation bandplan, ten codes for the area covered by the book and even a list of English language shortwave stations!

SCANNING THE THREE RIVERS by R.W. Newbould (8-1/2" x 11", 45 pages, softbound; available from the author at 3179 Churchview Avenue, Pittsburgh, PA 15227).

Concentrating on scanner monitoring in Allegheny County and surrounding areas, the THREE RIVERS directory is a computer printout of public safety and business frequencies heard in western Pennsylvania.

Lists of frequency allocations for other services are included as are on-air identifiers for fire and police units.

COMMODORE 64 COMPUTING by Ian Sinclair (133 pages, 6" x 9", softbound; #152306, \$12.95 from Prentice-Hall, Inc., Englewood Cliffs, NJ 07632).

No one will deny that the Commodore 64 home computer is one of the best values on the market. Similarly, no one will deny that the owner's manual is one of the worst.

Sinclair's new book is intended as a supplement for the manual, providing explanations, illustrations and corrections so sadly lacking in the Commodore manual.

COMPUTING is written in the manner of an easy-to-read textbook, beginning with BASIC language, showing interface hookups with peripheral equipment, gradually advancing into data processing, graphics and sound.

Commodore users will find Sinclair's insights enlightening.

VIDEO SCRAMBLING TECHNIQUES published by Elephant Electronics, Inc., Box 41770, Phoenix, AZ 85080 (8-1/2" x 11", 56 pages, paperbound).

Not intended as a "how to" guide for pay TV pirates, Elephant's publication is a technical manual written for technicians and engineers to more fully understand the two most common methods of scrambling TV signals, sine wave and gated pulse.

Beginning with encoding techniques used at the studio, the work progresses to decoding techniques with schematics of commercial decoders shown and explained.

Alignment and adjustment procedures are included in this excellent technical overview of TV scrambling technology.

SHORTWAVE LOG by Fred Osterman (8-1/2" x 11", 170 pages, softbound; \$9.95 plus \$1.55 book rate from Universal Shortwave Radio Research, 1280 Aida Drive, Reynoldsburg, OH 43068).

Many shortwave listeners would love to get a glimpse of the actual monitoring log of a consummate SWL. Now's your chance.

Author Fred Osterman is a well-known listener whose monitoring covers all aspects of shortwave including both international broadcasting and utilities.

SHORTWAVE LOG is a reprint of Osterman's catches, computer-sorted by frequency, country, mode and time. An additional "spectrum analysis" section shows user density by frequency.

Unexpurgated, SHORTWAVE LOG includes many sensitive entries of government agencies.

QSL ADDRESS BOOK by Gerry L. Dexter (4th edition, 6" x 9", 104 pages, \$6.95 from Gilfer Associates, P.O. Box 239, Park Ridge, NJ 07656).

Gerry Dexter is well-known to shortwave DX'ers; his byline appears regularly in Popular Communications magazine.

Obtaining colorful QSLs from foreign broadcasting stations is a popular hobby among many SWLs; Dexter's new book provides detailed instructions on how to maximize responses from some 960 broadcasters worldwide. Certainly a handy reference for the consummate SWL.



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WHO DECIDED? from p.11

program exchanges! As bad as the old Australian railroads with three different gauges!

TV and FM broadcasting in the UK utilizes (or did use) vertical polarization (the vertical antennae on homes displayed this), whereas in the U.S. and many other places horizontal polarization is employed. I seem to vaguely recall that in the early FM/TV days the FCC decreed horizontal polarization because, they said, it was less vulnerable than vertical to man-made noise - automobile ignition, brush motors, etc.

The international standard of 500 kHz (600 meters) for marine distress calls has been in existence for many years. I never knew why this particular frequency was chosen until I read somewhere that in the early days of spark 600 meters came close to resonance matching for the length of an antenna stretched between the masts of the average sized seagoing vessel.

No doubt there are good answers to the foregoing questions hidden somewhere. Comments from readers are solicited - as well as remarks on other possible enigmas. ?

BROADCASTING...

HANK BENNETT ON SHORTWAVE

We respectfully dedicate this column to the memory of two DX'er friends of many years, Carlton Lord of Corning, NY and Matt Zahner of Baltimore, MD, both of whom passed on recently. They had been, for many years, on the Board of Directors of the Newark News Radio Club.

Back in the April issue, we discussed a Scott receiver that had been made in Chicago at 4424 Ravenswood Avenue, and we wondered what might be at that location nowadays. Ken Greenberg, of Skokie, Illinois, decided to check this for us and he found that the Glynn-Johnson Corporation is now at that location.

He called them and inquired as to how long they have been there and if they could supply any details on the previous occupants, Scott Radio. The receptionist was too busy to be bothered by questions and hung up on Mr. Greenberg. That takes care of that. Good try, Ken, and thanks for your efforts!

Frank Evenden of Ulster, PA wrote in with a response to some of our brain-teasers of recent issues. He stated that the schedule for super-powered W8XO, Cincinnati, on 700 kHz was midnight to 6 AM and that otherwise it operated at WLW with 50,000 watts (as opposed to 500,000 watts as W8XO).

Frank also asks if we ever heard of WHAP who allegedly used a slogan of We Hold America Protestant. He says they often had anti-Catholic speeches and may, in later years, have become WPAT in Paterson, NJ.

Nope, Frank, I never recall hearing of WHAP. Does it ring a bell with anyone? Frank also posed the question "What program always began with the claim that 'It's a Beautiful Day in Chicago?'" And he replied in answer that it was The National Farm and Home Hour with Chief Red Cloud. He may be right but I would have said that it was "The Breakfast Club." Thanks, Frank, for your letter.

Last month, in speaking of Field Day, we mentioned that all of your equipment should be adequately protected against lightning by a suitable lightning arrestor. We should have enlarged a bit more on the subject of

lightning. Whether you are out on a field day site or operating from your own home, ALL equipment should be properly protected against lightning.

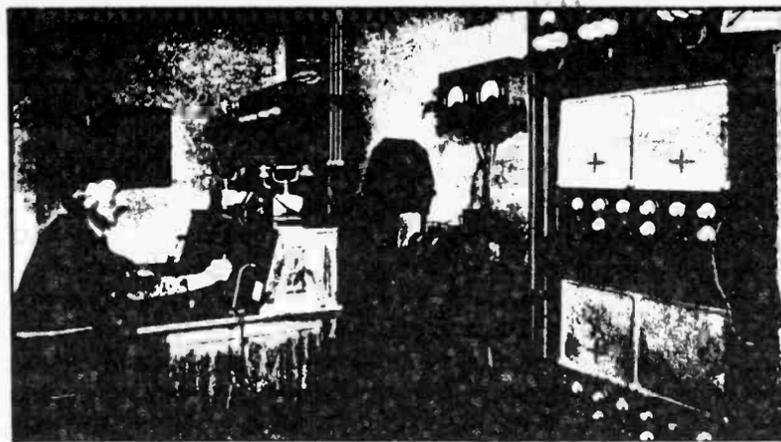
You may feel safe and secure in your home with a good tight roof over your head but if you have your antenna feeders tied directly to your equipment without a lightning arrestor, nothing is going to protect the equipment in the event of a lightning strike. For that matter, a direct strike on your antenna, unlikely but always possible, probably will cause some equipment damage even with a lightning arrestor.

There is an equal chance that lightning could hit your equipment through the electrical system of your home. The very wisest advice that we can offer is to close down completely during the time that a lightning storm is in your area (i.e., within ten to fifteen miles) and, as a double protection, pull all electrical AC plugs. You aren't going to miss much during the few minutes that it takes that thunderstorm to pass out of your area.

You've probably already heard of the new International Shortwave Listener's Program Guide named, aptly enough, "The Guide" which is being published by Miller Publishing, 424 West Jefferson Street, Media, Pennsylvania 19063. They intend to have this publication become a monthly event in the near future.

If you'd like to see a sample copy of The Guide, send 37¢ postage to the address given above and

☞ Cont'd on p.29



RADIO NETHERLANDS: The old and the new

BONAIRE RELAY STATION: The North American Voice of Radio Nederland

by Brian Rogers

Twelve hundred miles southeast of Miami, on a Caribbean island called Bonaire, powerful relay transmitters belonging to Radio Nederland broadcast programming nightly to North America at 9:30 p.m. EST (0230 GMT).

Opened in 1969, the Bonaire relay programs originating in Radio Nederland's Hilversum, Holland, studios. Frequencies used for the North American programming are 6,165 and 9,590 kHz.

Each weekday evening's 55-minute transmission begins with 20 minutes of news; a bulletin of current world events followed by an analysis program called "Newline." Newline features in-depth reporting by Radio Nederland correspondents in various parts of the world.

Of special interest to shortwave listeners is "Media Network," a communications program heard following Newline on Thursdays.

Use of the 300,000 watt Bonaire transmitters makes these nightly Radio Nederland programs very easily heard even on simple receivers.



Also known as the Dutch International Service, Radio Nederland first went on the air in 1947. Its purpose then was to serve as a link with Dutch nationals abroad and to promote Dutch interests in other parts of the world.

The broadcaster's roots, however, go back to the late 1920's when experimental transmissions on the shortwave bands began at the Philips electrical factory at Eindhoven. These transmissions were received in the Dutch East Indies, now called Indonesia.

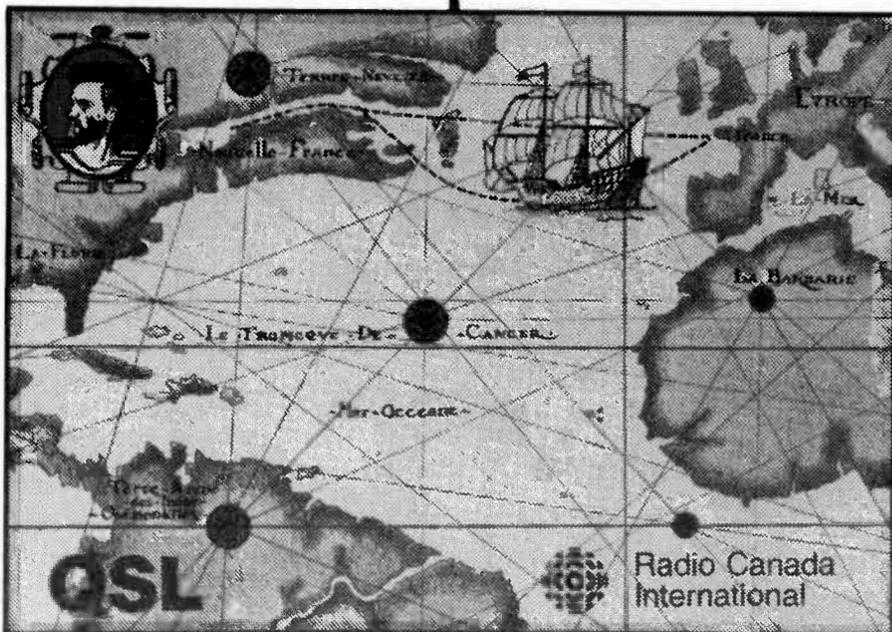
Later, a transmitter site was found near Hilversum (call letters: PCJ) and an antenna consisting of the modern electronically slewable shortwave antennas which beam broadcasts to specific target areas.

Besides English and, of course, Dutch, Radio Nederland's current program schedule lists programs in Spanish, French, Arabic, and Portuguese.

Copies of the schedule can be obtained free by writing Radio Nederland at P.O. Box 222, 1200JG Hilversum, Holland. Especially appreciated is feedback on program content.

Radio Nederland issues attractive QSL cards in response to correct reception reports but asks that no more than one card per listener be requested.

Also available free of charge are pamphlets on such topics as antenna construction and choosing a shortwave receiver. Readers interested in such publications can write the station at the above address and ask for the Listener Services Catalogue.



The current QSL Card being offered by Radio Canada International to commemorate the 450th anniversary of the discovery of Canada by Jacques Cartier (see High Seas, p 8).

BROADCASTING...

ENGLISH LANGUAGE BROADCASTS

by Tom Williamson

RADIO MOSCOW: THE SOVIET VOICE

This month we will continue our look at news analysis in terms of world output of commentaries and propaganda.

After considering the programming of the BBC and VOA, it seems only logical to look to the other half of the world, namely the Communist part of the globe.

Since historically and statistically the Soviet Union is the center of this political system and philosophy, we will concentrate on the broadcasting of Radio Moscow in this article.

As most shortwave listeners know, the Soviet output in terms of hours and multiplicity of languages on the air is phenomenal! With respect to ENGLISH broadcasts Moscow can be heard in two main programs - the World Service, and the North American service.

Some time ago Radio Moscow remodeled their broadcasts into a World Ser-

vice resembling the BBC in some respects. It comprises a frequent "News" segment, followed by many news analyses type of programs. These presently include "News-reel," "The Way We See It," "Disarmament," "Europe - Is There a Threat," "Focus on Asia"--and so on.

It should be of interest to North Americans to observe and understand the way in which news is presented and used. A casual listening session will quickly reveal a selection of items about happenings in the Soviet Union (naturally), usually including important Soviet leaders in politics or military spheres along with their comments on world relations, and items from countries under Soviet influence (Afghanistan, Vietnam, Cuba, etc.) with comments favorable to the achievements of Communism in their regions.

Another popular type is an event in Europe relating to protest marches, etc. against US/NATO military defenses. The attempt is to

convince the world's listeners that the majority of world opinion is against the U.S. Events or statements from Europe or Third World countries which are NOT favorable to Communism are either not reported, or singled out for a clever and in-depth denunciation. Radio Moscow's news analyses have, over the years, become very professional and much less blatant in anti-capitalist bias.

It is interesting to note the countries in Europe which figure so prominently in their news: Holland, West Germany, Greece and Denmark for example. These are sources of anti-US statements or events connected with NATO or nuclear weapons. By contrast Britain and France rate only occasional (and usually negative) comments.

In the Third World, Cuba, Nicaragua and "Democratic" Afghanistan are much reported--and with sympathetic remarks. In contrast countries which are dubiously "neutral" are often given "kid-glove" treatment. A recent example which I monitored was the arrival of King Carlos of Spain in Moscow; an event producing such remarkable comments

Page 17
such as "despite different systems (of government)...we see no obstacle to peaceful co-operation...", and "Spain is interested in stable peace" (who isn't?!).

Radio Moscow must expect Spaniards and others to have short memories! Not so long ago Moscow's reference would likely have been to "Fascist thugs" (in the time of Franco!)

PEACE is the current theme, at least as seen from the Soviet mind. No effort is made to disguise the fact that the Soviets believe time is on their side and that ultimate "Peace" will be a totally-Communist world. However, this is balanced by the frequent suggestion that it will be possibly preceded by a "nuclear holocaust"!

Peace programs are punctuated by many comments on the warlike efforts of Reagan and the terror of U.S. missiles in Europe (apparently Soviet missiles are not terrifying). Programs such as "As We See It" can be entirely devoted to such a propaganda line.

Cont'd on p.30

DEUTSCHE WELLE The Voice of Germany

WUNDERBAR!

Considering that this is one of the "newer" shortwave stations on the air (It began broadcasting in 1953) as compared to the BBC and Radio Netherlands which were in business long before the start of World War II, Deutsche Welle has come a long way in a comparatively short time to become one of the big powerhouses in shortwave broadcasting today.

Programs emerge from a large and thoroughly-modern broadcasting center in Cologne with a staff of 1400 people. It sends out some 93 programs in 34 different languages around the clock - a package of news, views, information and entertainment to listeners all over the world.

Here in the U.S. reception is excellent, due in part to a relay station in Antigua in the Caribbean. Also due to eight transmitters of 500 KW and nine of 100 KW!

Those of you who have heard Deutsche Welle before are familiar with the bell-like tones of the music they play just prior to going on the air. Believe it or not, this comes from an instrument called the Celesta



LISTENING TO THE WORLD

by Roger N Peterson

lent programs - first rate productions.

During the weekends, the Germans vary their programming a bit. On Saturdays, after the initial ten minutes of news, they come in with a program called "Focus on Bonn," a weekly review of what the government has been doing. This is followed by a "Mailbox" program - letters from listeners.

Lastly, for the final half-hour, they have a German language course. So if you want some free lessons in German, here is your chance!

On Sundays, they start with the news and then go into a ten-minute commentary followed by an excellent program called "Letter from Berlin." If you really want to get the feeling of what is going on in Germany today, this is the program to hear. The final 35 minutes are devoted to a Sunday feature selected from a multitude of diverse subjects. Recently, they had a "History of Glass" and "The Workhorse Returns" - all about how farmers are finding that there are advantages to going back to using the horse for plowing!

which has a keyboard and metal plates that are struck by a hammer. There is nothing else like it on the air for station identification.

Deutsche Welle programs are directed to the U.S. at 0100 and 0500 GMT but there are others on the air during daytime that you can often pick up. All in English (See Chart on "How to Tune...")

What can you hear on these programs? First of all, they have a regular format: The first ten minutes is devoted to news concerning West Germany; then comes ten minutes of commentary about world affairs, followed by some German press reviews; next comes a sports report, lasting about five minutes.

The final twenty minutes is devoted to the feature program of the day. On Mondays, this is "Science Magazine," one of the best programs I've heard on the air. On Tuesdays and Thursdays it's "People and Places"; on Wednesdays it's "Arts on the Air" and on Friday it is "Spotlight on Modern Life." All are excel-



Deutsche Welle broadcasts from Cologne in West Germany from studios in this modern skyscraper.

To get on their mailing lists for free programs, write Deutsche Welle, Postfach 100444, D-50000 Koln 1, Federal Republic of Germany.

HOW TO TUNE TO DEUTSCHE WELLE

0100-0150 GMT: 6.040 6.085
6.145 9.545 9.565
11.785 Mhz
0500-0550 GMT: 5.960 6.120
9.545 9.690 MHz
1230-1315 GMT: 15.410 17.765
17.800 21.600 MHz*
1500-1550 GMT: 9.735 11.965
15.135 21.600 MHz*
1930-2020 GMT: 9.700 11.785
15.150 MHz*

*Not directed at North America but usually audible here.

PIRATE RADIO



by
John Santosuosso

ITALY: From Milan's Dario Monferini and the Italian DX club Play-DX comes this report on unlicensed radio in Italy. Two new stations have recently taken to the shortwaves. RADIO SPOLETO INTERNATIONAL is currently on 7165 kilohertz with 400 watts. Reports go to Piazza Garibaldi 17, 06049 Spoleto. RADIO IDEA MANILA can be heard on 7215 with 100 watts. You can reach it through Mr. Francesco Sacco, Via Cavour 38, 10123 Torino.

In a previous column we mentioned the elusive RADIO EUROPA INTERNATIONAL. Its new address is Via Privata Terzulli 10, 25100 Brescia. Its 250-watt signal is not easy to hear even in Europe, but you can try for it on 9426.

Several unlicensed Italian broadcasters are well established on shortwave and have been widely heard in North America, sometimes even outside the prime DX season. TELE RADIO PACE a station with a religious orientation, transmits on 15460 with 5 kilowatts. We are not sure about the current address, but you can try the one given above for Radio Europa International.

RADIO TIME uses the facilities of the Italian Broadcasting Corporation and transmits on both 7105 and 7140 with a power of 1 kilowatt. Reports can be sent to Post Office Box 79, 50018 Scandicci. RADIO MILANO INTERNATIONAL will be found on 7295 with 5 kilowatts. The address is Via Locatelli 6, 20124 Milano. It has been our experience that the Italian stations are good verifiers.

ITALIAN BROADCASTING CORPORATION
MILANO



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ON SHORT WAVES**

FIRENZE

WHAT'S LEGAL? There has been much confusion about the legality of unlicensed radio in Italy. In 1976 the country's Constitutional Court did hand down a ruling which ended the government monopoly on broadcasting. Hundreds of unlicensed, or private, radio and television stations soon began broadcasting and their numbers continue to increase.

The Court, and most likely the general public, thought the government would soon pass legislation to regulate the new stations. However, no such legislation was ever passed by the Italian parliament. The legality of Italian private radio rests entirely on the original court decision.

Further complicating the situation is the fact that the Constitutional Court intended its decision to apply only to local broadcasting on the FM band. No ruling was made on medium or shortwave broadcasting. Italian stations transmitting on these frequencies are still as illegal as they were in the past--the government simply tolerates them. They have never received official recognition.

BUT DO THEY RUN AMOK? This does not mean there are no restrictions. Stations must remain within the authorized broadcast bands or they are ordered to move. Medium wave stations are required to stay between 510 and 1602 kilohertz, while those on shortwave are limited to the 49, 41, 31, 25, 19, and 16 meter bands.

Broadcasts of a political nature are permitted. So far the Radical party is the only one which has established its own private stations; it operates at least nine local FM transmitters in the Lombardy regions of northcentral Italy and may have other stations as well.

The government will raid stations suspected of inciting rebellion or revolution. Two famous unlicensed broadcasters which met this fate were ONDAROSSA ROMA and Bologna's notorious RADIO ALICE.

RADIO ALICE played a major role in coordinating student riots by telephone. Its final 10-minute transmission was a live broadcast of the police breaking down the door to close it down in 1977. Clearly, even in Italy

there are limits on broadcasters!

CHILE: We have heard again from Holland's Michiel Schaay who always uncovers some interesting new developments. Michiel says in Amsterdam he recently came across a fund-raising announcement for a clandestine RADIO LIBERACION. The station will oppose the military dictatorship of Chile's General Pinochet.

ARAB CLANDESTINE: Michiel also notes that in February he logged an unidentified clandestine in Arabic on 11016 at 1815. The station used slogans which translate as "Voice of Arab Nations" and "no democracy without the people."

This writer sees a similarity between the second slogan and certain ones used in Libyan Muammar al Qathafi's "Green Book." If any readers have further information about this station or the Chilean clandestine please let Michiel and me know!

TANGERINE RADIO: We recently heard directly from Raunchy Rick and the gang at Tangerine Radio. They indicate that during the summer months you can look for them on 7415-7435, 14485, and 21495. Best times to try are Saturdays at 0100 and 1130, Sundays at 2000, Mondays at 0300, and Tuesdays at 2300. All times are GMT. They also say to look for them at "0330 on the night of the full moon!" AM power is 50 watts; some transmissions are USB.

John T. Arthur also suggests 6940 for this one. Reports can be sent to Box 5074, Hilo, HI 94720. Let us know if you hear it.

MORE PIRATE NEWS: Once again we are indebted to Hawaii's John T. Arthur for news about some interesting developments on the pirate scene. Rolling Thunder Radio is reported making occasional broadcasts on 7430. The Voice of the Rainbow is producing programs which will be relayed by other stations.

Secret Mountain Laboratory will relay KFAT and the Voice of Bob. It also offers to relay "truly creative, conceptual programs" for others. Those on the West Coast may want to look for KSOS, stereo 88 FM.

You can write to any of these stations by way of Box 5074, Hilo, HI 94720. Remember to enclose three 20-cent stamps with your letter if you expect a reply. Look for more news from John T. Arthur in future editions of

this column.

PIRATE ADDRESS DIRECTORY: We have run portions of this in past columns. John T. Arthur is the compiler of this useful directory and he is now revising it. Listeners and operators are invited to contribute addresses of free radio stations; send them via the Hilo address given above.

MOBILE OIL: Although it certainly was not their intention, one of the best justifications ever given for pirate radio is contained in Mobile Oil Corporation's brochure, "Are the Media Giving Us the Facts?" Among other things, the company states that "Mobile has often been denied the opportunity to rebut inaccurate television news broadcasts." It calls the concept of the "open airwaves" a myth and claims that other companies have met the same frustration it has.

If a large, powerful corporation such as this cannot gain access to the electronic media, then what chance has the average citizen? The answer far too often is virtually none at all unless, of course, he is a pirate!

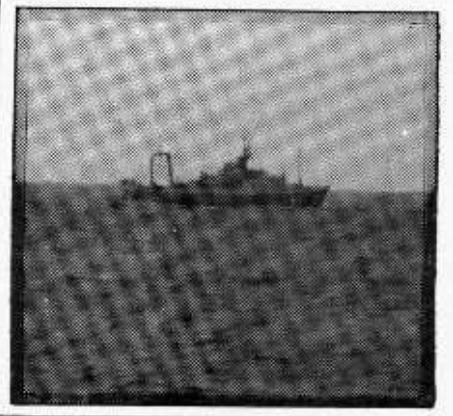
You can get a copy of the brochure by writing Mobile, 150 East 42nd St.--Box M, New York, NY 10017. Allow several months for delivery.

We have several additional items, but we will have to hang on to them until next month. As always, your contributions and comments are welcome!

Russian Trawler Sends and Receives

MT reader Bill Edwards sent in the enclosed photo along with an interesting note regarding this Russian intelligence - gathering trawler.

A strong carrier with at least two modulation rates was recently monitored on his Bearcat 300 as a wideband signal on 133.975 MHz. Anyone have any idea why the ship would be transmitting this constant signal?



"Los Numeros"

32444 69213 88816 52196 63811 94216

Havana Moon



REVELATIONS: Circa 1984 AD

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(Conclusion)

For John Demmitt who can only dream of the freedoms we take for granted

Opinions on the "numbers" subject vary, but one thing is certain: At least one 5-digit Spanish transmission was not one-way!

Long before the 3060/3090 kHz frequency shift, a Sunday 0500Z 15-group transmission was interrupted by a CW station using standard international procedures but no call. Seems this mystery station was having some difficulty in decryption (?) of the Spanish transmission! This CW station transmitted back to the Spanish station numerical groups as --apparently-- decrypted! Oddly, the retransmitted groups DID NOT match the groups as originally transmitted.

There was a lengthy pause before the Spanish numbers transmission was resumed. Once again-- A DIFFERENT SERIES OF GROUPS WAS TRANSMITTED! And some minutes later, on the repeat frequency of 3090 kHz, the latter series of groups was transmitted with a DIFFERENT 3-DIGIT IDENTIFIER than used on the 3060 kHz transmission!

Reach your own conclusion on that one!

FREQUENCY ALLOCATIONS

Ever wonder about Governmental usage of 3060 and 3090 kHz? Here's a small portion of allocations as extracted from an official U.S. Government frequency list:

3060 kHz	
CZW	Halifax, Nova Scotia
CHR	Trenton, Ontario
DVK21	Cebu, Philippine Is
AID2	Okinawa
AFH2	San Rafael, California
AFH3	Tacoma, Washington
RRK6	USSR
AIF8	Tokyo, Japan
AGB2	Johnston Island

3090 kHz	
NBA	Balboa, Panama Canal Zn
NDI	Okinawa
NQX	Key West, Florida
NGD	McMurdo Sound
NUD	Adak, Alaska
NHB	Kodiak, Alaska
NAW	Guantanamo Bay
NPN	Guam
JXA	Oslo, Norway

The frequencies above were taken from a list that was valid at the time of 3060/3090 "numbers" activity.

HOME COMPUTERS AND THE NUMBERS or DIM A\$(26,T(26), (100),C(100))

Don't sell your home or personal computer short! Traditional cryptographic techniques can be readily understood with your TI, Commodore or TRS (TI, Commodore and TRS are registered trademarks of Texas Instruments; VIC Commodore and Tandy, respectively).

Bruce Bosworth, writing in **Codes, Ciphers, and Computers** (Hayden Books) details an excellent program for a simple statistical technique on the relative frequency of occurrence of single letters in a cipher test. You'll find all the needed information in chapter 6.

Here's a hint: Instead of single characters, try two characters at a time. Bosworth's program can be easily modified for this application.

Example: 23441 59987
Input as: 23 44 15 99 87

You might be surprised at the high occurrence of some characters. This is one book that's a must for every serious "numbers" monitor.

Another must is **Crypt-analysis for Microcomputers**. It's by Caxton Foster and published by Hayden Books. A hearty "WELL DONE" to Mr. Bosworth and Mr. Foster.

Other programs that are easily modified for frequency lists and "numbers" applications are readily available in 3rd party publications for the more popular home or personal computers.

Keyword Article Search, Video Tape Finder and User Directory programs can easily be modified for numerous "numbers" applications as well as "wild-card" sorts. Large amounts of RAM

are not needed. Give it a try and be sure and let this column know of your results.

WHEN 007 TYPES CAN'T CALL HOME

In many cases they simply tune to pre-designated radio frequencies for their instructions.

Perhaps the best known use of 5-digit groups is the saga of Col. Rudolf Abel, KGB. Col. Abel, the highest-ranking Soviet spy ever captured in the United States, received his instructions via 5-digit groups on 17, 14, and 6 MHz frequencies from a CW station that used a 3-element numerical ID.

This 1961 "spy-station" (unlike our favorite YL) was unobtrusive; perhaps our present day Spanish(?) YL might learn from the nefarious Col. Abel. It wasn't his transmissions that resulted in his downfall. You might say that it was a mispent nickel that led to his detection.

If you wish to know more of Abel's activities, it might be possible to obtain transcripts of his trial from U.S. District Court for the eastern District of New York, Criminal Case 45094, USA vs. Col. Rudolf I. Abel. Also check your local library for any material dealing with espionage or Abel.

R.S.V.P.

Your letters and loggings of "numbers" and other related transmissions are eagerly solicited. Unless otherwise requested, names will be used from all correspondents.

All correspondence shall become the sole property of this column and MT. All rights are reserved to editing of any material.

If you have any questions or subjects you wish to see covered, please don't hesitate to contact me in care of MT.

ANOTHER WELL-DONE

Here's another big one for James Bamford of **Puzzle Palace** fame. Read this fantastic work very carefully! Mr. Bamford comes very close to identifying one particular "numbers" station at the end of the last chapter in the paperback edition. I'd rate this as the most definitive work on the NSA ever published. (Ed. Note: See letter from Mr. Bamford in "Viewpoint")

ATTENTION NAPA AND SONOMA, CALIFORNIA

You guys and gals in this magnificent area of California are urgently requested to contact me with

☞ Cont'd on p.29



PLAYING THE NUMBERS GAME?

One Listener Shares His Loggings

MT reader Dave Bush encountered his first "spy numbers" station in October of 1983; since then he has been listening intently to these mysterious broadcasts, logging his quarry as he intercepts their transmissions. Let's take a peek at that log! (All entries in the month of March, 1984.)

14 1130	5810	5/SS female
14 0200	4300	"201 40"
	repeated	
14 0200	9430	5/GG female
14 0200	6990	4/SS female
15 1200	8160	5/SS female
15 0300	4300	5/SS male
16 1200	6890	5/SS female
16 0200	4640	4/SS female
17	11950	also 13010
19 1130	7430	5/SS female
19 0100	9100	5/GG male
19 0130	4320	5/SS female
19 0200	6980	4/SS female
20 1132	8150	5/SS male
	(jammed)	
20 1230	9100	5/SS male
21 1030	6000	5/SS female
21 0200	6870	4/SS female
22 1130	7420	5/SS female
22 2330	4320	5/SS male
22 1230	4320	5/SS male
23 0130	6890	5/SS female
23 0200	4300	5/SS male
24 0300	7500	5/SS male
25 0500	6995	5/SS female
25 0530	8050	(rpt above)
26 0100	6890	4/SS female
26 0300	9075	5/GG female
27 1130	8150	5/SS male
27	7336	5/SS female
27 1230	9200	5/SS female
28 1030	5810	5/SS female
30 1030	10110	"54950" rpt
30 0200	4640	5/SS female

DAY/TIME	FREQ	COMMENTS
1 1235	9075	5/SS male
1 1700	13010	5/SS female
2 1230	8175	5/SS female
3 1800	12020	5/SS female
	(weekly; sometimes male)	
3 0200	11610	5/SS female
4 1700	13460	5/SS male
4 0200	4640	"545"female
	repeat 0300	
6 1130	8150	5/SS male
7 0200	4300	5/SS male
7 0300	4200	5/SS female
8 0100	7000	5/GG male
8 0200	8175	5/GG male
9 0200	4640	4/SS female
10 1200	9150	5/SS male
10 1700	12050	5/SS female
10 0200	10990	5/SS female
11 1700	11795	5/GG female
12 1130	7420	5/SS male
12 1200	8150	5/SS female
12 0300	7430	5/SS female
13 0300	9075	5/GG male



Listener's Log

Atlantic Coastal Scanning

by Kevin Johnson
P.O. Box 7464
Hampton, VA 23666

(ED.NOTE: The following list is part of an installment

series; MT readers wishing a computer printout of the entire series may send \$5 with your request to the author at the address above.)

FLORIDA	AGENCY	DESCRIPTION	FREQUENCY
DELAWARE	STATE PD		154.6500
DELAWARE	STATE PD		39.5000
DELAWARE	STATE PD		45.0200
DELAWARE	STATE PD		154.8600
DELAWARE	STATE PD		154.7700
DELAWARE	STATE PD		44.8600
DELAWARE	STATE PD	F1	154.6650
DELAWARE	STATE PD	F2	154.7550
DELAWARE	STATE PD	F3	154.6950
DELAWARE	STATE PD	F4	154.7100
DOVER	PD		155.3100
DOVER	PD		154.8600
LAUREL	PD		155.0100
LAUREL	PD		155.8500
LEWES	PD		155.9500
NEW CASTLE	PD		39.5400
NEW CASTLE	PD		39.8600
NEW CASTLE	PD		39.7000
NEW CASTLE	PD	AIRPORT	453.3250
NEWARK	PD	F1	155.2500
NEWARK	PD	F2	154.7550
NEWARK	PD	F3	156.0300
SEAFORD	PD		155.7150
WILMINGTON	FD	F1	154.9650
WILMINGTON	FD	F2-F3	155.0550
WILMINGTON	PD		155.3100
WILMINGTON	PD		155.1300
WILMINGTON	PD		155.6400
WILMINGTON	PD		155.6100
CAPE KENNEDY	AIRCOM	CHASE	264.8000
CAPE KENNEDY	AIRCOM	CHASE	121.7500
CAPE KENNEDY	AIRCOM	CIV. EMERG.	121.5000
CAPE KENNEDY	AIRCOM	GROUND CTRL	126.3000
CAPE KENNEDY	AIRCOM	GROUND CTRL	284.0000
CAPE KENNEDY	AIRCOM	MIL. EMERG.	243.0000
CAPE KENNEDY	AIRCOM	SHUTTLE BCST	171.1500
CAPE KENNEDY	AIRCOM	SHUTTLE EVA	259.7000
CAPE KENNEDY	AIRCOM	SHUTTLE PRI	2287.500
CAPE KENNEDY	AIRCOM	SHUTTLE ALT	296.8000
CAPE KENNEDY	AIRCOM	SHUTTLE ALT.	259.4000
CAPE KENNEDY	FD & MEDICAL		163.5625
CAPE KENNEDY	FD & MEDICAL		163.5125
CAPE KENNEDY	FD & MEDICAL		173.4375
CAPE KENNEDY	FD & MEDICAL	105 NET	173.6625
CAPE KENNEDY	FD & MEDICAL	116 NET	173.5625
CAPE KENNEDY	FD & MEDICAL	MUTUAL AID	154.1600
CAPE KENNEDY	FD & MEDICAL	TACTICAL-216	173.7875
CAPE KENNEDY	LG	LNCH SUP-104	162.6125
CAPE KENNEDY	LG	TLMTRY-102	156.1875
CAPE KENNEDY	LG	UTILITIES	171.0000
CAPE KENNEDY	LG	BASE CDR-102	170.1500
CAPE KENNEDY	LG	CIVIL DFNSE	155.7150
CAPE KENNEDY	LG	CVL DFNS-208	158.9400
CAPE KENNEDY	LG	GSA SPLY-106	170.4000
CAPE KENNEDY	LG	HGR CRNS-112	149.1750
CAPE KENNEDY	LG	HGR CRNS-114	149.4450
CAPE KENNEDY	LG	MAINT-201	171.1500
CAPE KENNEDY	LG	MARINE-306	162.0125
CAPE KENNEDY	LG	PBL AFRS-108	170.3500
CAPE KENNEDY	LG	RDLGCL MNTR	164.0000
CAPE KENNEDY	LG	TIMING	148.4855
CAPE KENNEDY	LG	TRAINS-206	170.1750
CAPE KENNEDY	OPS	CRANES	139.3000
CAPE KENNEDY	OPS	CRANES	142.8600
CAPE KENNEDY	OPS	CRANES	139.9000
CAPE KENNEDY	OPS	CRAWLERS	929.0000

LOCATION	AGENCY	DESCRIPTION	FREQUENCY
CAPE KENNEDY	OPS	CRAWLERS	916.0000
CAPE KENNEDY	OPS	CRANES	142.5000
CAPE KENNEDY	OPS	CRANES	143.0400
CAPE KENNEDY	OPS	LC39 OPS	409.1250
CAPE KENNEDY	OPS	LC39 OPS	408.8000
CAPE KENNEDY	OPS	LC39 OPS	409.0500
CAPE KENNEDY	OPS	LC39 OPS	408.1500
CAPE KENNEDY	OPS	LC39 OPS	407.3250
CAPE KENNEDY	OPS	LC39 OPS	409.1750
CAPE KENNEDY	OPS	LC39 OPS	408.1750
CAPE KENNEDY	OPS	LC39 OPS	407.4250
CAPE KENNEDY	PD		163.4625
CAPE KENNEDY	PD	MUTUAL AID	155.3700
CAPE KENNEDY	PD	SECURITY-103	173.6875
CAPE KENNEDY	PD	TAC-203 NET	173.1750
ORLANDO	DISNEY WORLD	CNSTRCTN.	151.6550
ORLANDO	DISNEY WORLD	ENTRTNMNT	463.9750
ORLANDO	DISNEY WORLD	FD	453.8250
ORLANDO	DISNEY WORLD	FD	154.4300
ORLANDO	DISNEY WORLD	FD F1	453.8750
ORLANDO	DISNEY WORLD	FD F2	453.9250
ORLANDO	DISNEY WORLD	HOTEL (PAGER)	157.7400
ORLANDO	DISNEY WORLD	MAINT. F1	462.6500
ORLANDO	DISNEY WORLD	MAINT. F2	462.6750
ORLANDO	DISNEY WORLD	OPS F2	462.5750
ORLANDO	DISNEY WORLD	OPS F3	462.6250
ORLANDO	DISNEY WORLD	OPS F1	462.5500
ORLANDO	DISNEY WORLD	PD F2	464.1250
ORLANDO	DISNEY WORLD	PD	155.3700
ORLANDO	DISNEY WORLD	PD F1	464.4000
ORLANDO	DISNEY WORLD	RESORTS	461.6000
ORLANDO	DISNEY WORLD	SUBS	151.8950
ORLANDO	DISNEY WORLD	TAXI	464.8000
ORLANDO	DISNEY WORLD	UTILITIES	464.6250

GEORGIA	AGENCY	DESCRIPTION	FREQUENCY
ATLANTA	FD		460.6000
ATLANTA	FD		460.6250
ATLANTA	FD		153.9500
ATLANTA	FD	DISPATCH	154.1900
ATLANTA	FD	DISPATCH	153.8900
ATLANTA	FD	F2	154.4450
ATLANTA	FD	FIREGROUND	153.8000
ATLANTA	FD	FIREGROUND	153.8000
ATLANTA	PD		460.4750
ATLANTA	PD		156.2100
ATLANTA	PD		155.8500
ATLANTA	PD	ADMIN	460.4250
ATLANTA	PD	ALT. DETECT.	156.4500
ATLANTA	PD	ARPRT POLICE	155.6250
ATLANTA	PD	DETECTIVES	155.7000
ATLANTA	PD	TACTICAL	460.4750
ATLANTA	PD	ZONE 3 SE	460.0750
ATLANTA	PD	ZONE 1_NW	460.3000
ATLANTA	PD	ZONE 4_SW	460.3500
ATLANTA	PD	ZONE 6_CTYWD	460.2000
ATLANTA	PD	ZONE 5_DWNTN	460.1500
ATLANTA	PD	ZONE 2_NE	460.0250

Cont'd on p.28

NASCAR FREQUENCIES	
464.125 ?	
464.500 SCORING STAND AT DAYTONA-DARLINGTON	464.337 #44 TERRY LABONTE
464.775 DAYTONA HQ & RACE TALADEGA SPEEDWAY	464.475 ?
464.900 SPORTSMAN DIVISION	464.550 #98 JOE RUTTMAN
151.625 DAYTONA MAINT	464.600 #47 RON BOUCHARD
154.515 DAYTONA SECURITY	464.725 ?
154.540 ROAD CH-SHORT TRKS GREENVILLE-PICKENS HICKORY SPEEDWAY NCMS ROCKINGHAM	466.437 ?
462.650 OPERATIONS	466.650 ?
462.500 OPERATIONS	466.812 ?
154.600 OPERATIONS	466.825 ?
151.895 PARKING	467.112 #48 TREVOR BOYS
42.82 +TRAFFIC-NC TROOPER	467.925 ?
42.50 TRAFFIC-NC TROOPER	468.900 ?
	468.975 #95 RAY MOCK
	469.125 ?
	469.200 ?
	469.312 #22 BOBBY ALLISON
	469.550 #84 JODY RIDLEY
	CARS VERIFIED DURING THE WORLD 600 WERE 01, #1, 11, 17, 22, 47, 48, 84 AND 98
	PERSONS WHO CAN VERIFY ANY FREQ MARKED (?) WILL BE SUPPLIED WITH AN UPDATED LIST AT NO CHARGE.
	PERSONS WHO ONLY REQUEST AN UPDATED LIST SHOULD SEND A BASE PLEASE. REPLY TO:
	LARRY E. WILLIAMS 10 ELF LANE GREENVILLE, S.C. 29611

TUNE IN CANADA



by

Norman H. Schrein

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

The mail bag has been pretty full of requests, and my schedule of new "Scanner Radio Listings" plus the necessary revision of existing editions has been keeping me pretty busy. Still, I will be answering specific requests for frequency information, although you should not expect an overnight response. Now, on to frequency information.

- GORE BAY, ONTARIO**
152.240 Bell Canada CGG 490
157.500 Paired Frequency
162.195 H&R Noble Construction/VCR 466
150.100 Min of Health Amb XLL 489
- HARROW, ONTARIO**
149.440 Min of Health XLL 332
416.538 P
150.100 Smith Funeral Home XNF 727
- KAGAWONG, ONTARIO**
49.700 Ont Hydro Electric Power Com/XOG 27
- MELDRUM BAY, ONTARIO**
151.715 ManitoulinDolomite VCM 328
156.925 " " /VCM 355
- SANDFIELD, ONTARIO**
46.700 Ont Dept of Nat Resources/XLR 68
46.720 same
46.740 same
- VANCOUVER, BC**
141.360 Western Radio Disp CFY 52
164.250 same
167.100 same
452.200 same
453.687 Paired
149.770 BC Telephone CGA 213
420.162 " " /CGF 923
409.162 Paired
454.450 same
459.450 Paired
160.365 Can Nat'l RR CHB 218
160.455 same
452.662 same
457.662 Paired
160.635 Can pacific RR CHB 260
160.725 same
453.475 Can Nat'l RR CHB 299
150.695 Pacific Com-Tel CHC 764
163.440 same
414.037 same
163.695 Paired
168.390 Neon Products CJL 323
164.370 Paired
162.120 Lafarge Concrete CJM 746

- 163.350 Ocean Construction Supplies/CJM 915
167.220 Paired
160.575 Northern Radio CJN 282
161.100 same
BURNABY, BC
165.990 BC Auto Assoc CZX 41
- DAWSON CREEK, BC**
138.945 RCMP/XJL 62
139.080 same
139.140 same
155.670 same
461.737 same
466.737 Paired
- ROBINSON, NB**
158.370 NB Telephone VCE 409
- 151.595 Paired
165.915 Dept of Fisheries & Oceans/XLK 415
167.985 Paired
414.188 NB Dept of Natural Resources/XML 310
419.188 Paired
CALGARY, ALBERTA
151.625 Alta.Gov.Telephone VE9 HU
151.925 same
158.310 same
163.350 Springer Const Co XNZ 906
- ATHABASCA, ALBERTA**
152.540 Alta.Gov.Telphones CGJ 25
157.800 same

- DUPLANTER, QUEBEC**
154.740 Soc.D'Energie de la Baie James CJJ 899
155.550 " " /CJK 674

That's all for this time. Keep the requests coming, and I will do the best to include your answer in one of the upcoming columns. Until next time --

Good Monitoring.



SWL HEADQUARTERS

NATIONS LEADING SHORTWAVE EQUIPMENT SUPPLIER

Designed for Serious DXing

ICOM R71

THE ULTIMATE RECEIVER

ICOM DID IT AGAIN

\$699



Sale Price
\$699

BUY FROM EEB WITH CONFIDENCE

- We are ICOM's #1 Receiver Dealer
- Our factory authorized service center and modification department know ICOM receiver in depth.
- You get (at no charge) our double extended warranty covering your receiver parts and labor for 6 months.

EEB Options installed -

1. Mechanical filter (Replaces SSB ceramic filter) \$85.00
2. FL44A 8 pole crystal filter replaces SSB ceramic filter \$159. Installed \$179
3. FM (Detection) 10 meter band \$39.50. Installed \$49.50
4. 12V DC Kit \$9.95. Installed \$15.00

- 100KHz-30MHz
- Keyboard entry
- 32 memories
- Remote control (optional)
- Scanning
- Pass band & notch tuning
- Memory back-up
- Wide dynamic range
- Voice synthesizer (optional)
- See ICOM's ad in this issue for more details.

* KENWOOD R-2000



- 100 KHz to 30 MHz
 - All mode AM-CW-SSB-FM
 - 10 memories (memorizes mode)
 - Memory backup
 - Memory scan
 - Programmable band scan
 - 24-hour clock-timer
 - VC-10 VHF converter 118-174 MHz \$139
- R-2000 \$599.95 SALE \$499
R-1000 \$499.95 SALE \$429
R-800 \$399.95 SALE \$329
ADD \$6.50 UPS

* PANASONIC RF-B600



Sale \$429
List \$595 (\$6.00 UPS)

- 1.6 to 30 MHz, FM/LW/MW/SW
 - Micro computer multi-tuning system
 - 9 memory stations, scan
 - Slow/Fast rotary tuning
 - 10 key direct access tuning
 - Universal voltage
- RF-9 \$99.95 SALE \$89.00
RF-B500 \$159.95 SALE \$129.00
RF-085 CLOSE OUT \$49.95
RF-B300 \$249.95 SALE \$209
RF-3100 \$379 SALE \$279
ADD \$4.00 UPS

* G.E. WORLD MONITOR



Sale \$169
List \$229.95 (\$4.00 UPS)

Digital readout, wide and narrow selectivity BFO for SSB & CW.

- 3.5 - 31 MHz SW/MW/FM
- 120V/220V or battery

* 1984 WORLD RADIO TV HANDBOOK



Sale \$17.50

- The shortwave listeners' Bible
- A reference guide for the beginner and serious DXer
- 145 pages devoted entirely to listings of SW, MW, LW, and TV stations around the world
- Listings of English SW broadcasts
- An annual review of shortwave receivers
- \$17.50 post paid USA book rate (add \$4 Air)

* YAESU FRG-7700



Sale \$399
SPECIAL PACKAGE DEAL 7700-MU7700 FRA-7700 \$499

- 150 KHz-30MHz
 - All mode AM-CW-SSB-FM
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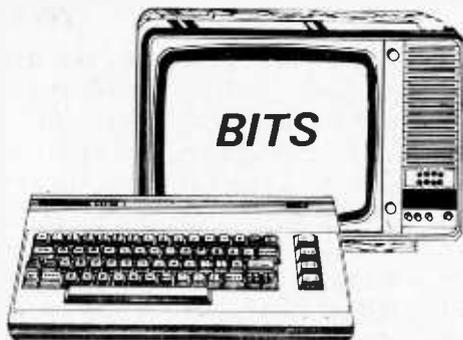
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by Mike Edelson
 P. O. BOX 203
 ROSELLE PARK, NJ 07204
BASIC's Basics

This month we'll look at INPUT and OUTPUT statements. To get the computer to do something we must give it input (data) to produce output (prints, displays, reports, etc.). The INPUT statement is used to receive data from the keyboard.

INPUT

In some BASICs a literal statement ("Prompt") is printed before data can be entered; it is enclosed in quotes and followed, in this case, by a SEMICOLON (BASIC dialect dependent). In some BASICs this is the mandatory format, in other the prompt is optional. Any number of variable names can follow the semicolon.

Remember, most BASICs require a line number (exception is CBASIC): some example of INPUT statements are:

```
1 INPUT A
2 INPUT "ENTER A NUMBER:";
  number
3 INPUT "ENTER THREE NUM-
  BER:"; #1 #2 #3
4 INPUT "ENTER A REAL OR
  INTEGER NUMBER, AN INTEGER
  NUMBER AND A STRING:";
  number A%,STR$
```

In the above example the % indicates that the variable is to accept an integer only; the \$ indicates that the variable will take string data only (refer to last month's article).

OUTPUT

To output data we use the PRINT statement. The syntax for PRINT is:

```
(line number) PRINT ("a
  literal") and/or(;) variable
  names
```

Thus, you can write

```
100 PRINT "THIS IS THE
  TOTAL"; TOTAL
  or
100 PRINT TOTAL
  or
100 PRINT "THIS IS THE
  TOTAL"; TOTAL; "FOR THE
  MONTH OF JANUARY"
```

When printing, be sure that you do not go over the page limit (page size) for

your machine's printer.

If you have more than one variable you can use a format like:

```
100 PRINT TOTAL, AVG
```

In this case there are two variables to be printed, TOTAL and AVG (average) which can be combined with literals.

Most print statements can begin on a certain point of your choosing by using the TAB function:

```
100 PRINT TAB(10); "TOTAL
  IS"; TAB(2);TOTAL
```

What this means is after the PRINT element moves over to position 10 it will print the literal "TOTAL IS" then it tabs to position 25 and prints the TOTAL. Again, watch your page size. Also, consider what would happen if the above statement was

```
100 PRINT TAB(10); "TOTAL
  IS"; TAB (15); TOTAL
```

Since we would first TAB over 10 spaces and the literal is 8 spaces long, when it came time to TAB to position 15 we would get an error; we're already past position 15.

There is also a variant of PRINT called PRINT USING; in this case you can format your output. Each system implements this differently but most specify a variable with the format for printing and the PRINT USING statement is elsewhere in the program. Thus we would implement MBASIC's PRINT USING as follows:

```
100 A=123.4567
200 B=-10.0
300 REM FMT$ SPECIFIES OUR
  FORMAT
400 FMT$="##### B B B #####"
  (NOTE: b means blank
  space)
  .
  .
  .
900 PRINT USING FMT$;A,B
```

This will produce the following output:
 B B B 123 B B B B B -10.0. Note that the real numbers are displayed as integers.

CBASIC (and MBASIC) implement this output system but it can be tricky at first. In the example above the format specifies a 6 digit number, but the number printed is shorter; therefore, CBASIC pads the leftmost digits with blanks.

In the format we specify three blanks between the two numbers since "B" can be up to five digits long, but the example is only three digits long. Another way around this is to place a

decimal point:

```
400 FMT$="#####.###B B B.###"
  .
  .
  .
900 PRINTS USING FMT$;A,B
```

produces: B 123.45 B B B -10.0 as output.

The formatting symbols follow in chart form:

- #= specifies numeric data
- = decimal point
- = minus sign
- b= blank space
- ,= a comma separates numbers according to accepted convention (caret) exponential (scientific) notation
- \$\$\$#= a floating dollar sign-floats to the position just before the first digit, it will not print for negative numbers
- *= (asterisks) used to fill numeric positions as with checks

- &= variable length string-length changes
- /= fixed string length-a character string of known length such as a name
- F L=fill characters
- != prints only the first character in a string. Thus if the string is A\$=MARY on output it would be M.

Any combination of these can be used but caution is the watchword: know what your machine does and how.

Next month we'll finish up with input and output. As always, I'm available by mail and on the air. My ham schedule is:

Sat 1700-1900	SSB 7250+5kHz
1900-2200	CW 7125+5kHz
Sun 0100-0200	CW 3725+5kHz
0200-0300	SSB 3970+5kHz

COMDEX/Spring '84:

Record Show Draws Record Crowds

by Bob Grove

The largest computer conference in the world presented Atlanta with the largest trade show ever held in that city, drawing some 60,000 visitors during the four-day event May 22-25, 1984.

Dealers showed their wares from 3,800 booths occupying several levels of three separate buildings--the Georgia World Congress Center, the Apparel Mart and the Merchandise Mart.

The widely-reported "shakeout" of competitors has apparently ended, reported Seldon G. Adelson, Comdex president, who continued, "I did a check of the 678 companies that exhibited last year and I found that only 21 (or three percent) are no longer in business." Adelson added, "There were 194 new ones to take their place this year."

A major thrust at the show is the lap-top portable, touted by a number of established and new computer manufacturers. But the need for a tiny portable has been overestimable according to John V. Roach, president and chairman of Tandy Corporation.

In his keynote speech Roach admitted that Tandy will spend \$75 million this year for promotion, about ten percent of the industry's total promotional thrust to the public and industry. Roach also admitted that the tiny Tandy lap-top computer has not fared well with the general public, although they have been

sold to businessmen and journalists.

Pervasive as well in the exhibit halls were software packages of every conceivable configuration for virtually all challenges of home and business.

Displays still largely depend upon conventional CRT (cathode ray tube) technology, although there was a representation of plasma displays and some LCD (liquid crystal display) representation on the lap-top units.



1. Hewlett-Packard offered conference reporters hands-on use of their new "The Portable" at their working press room; it features 3 built-in software packages including Lotus 1-2-3.



2. NEC offered its own lap-top portable with LCD display and full graphics capability.

Cont'd next page

GETTING STARTED

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AUDIO PROCESSING IN BROADCASTING

by John Dorsey

Does the announcer's voice on Radio Cairo sound like "Luddy-wud-dud?" Perhaps the problem is with the transmitter, not your receiver. Let's listen as John Dorsey tells us more.

We're all aware of the problems encountered in shortwave listening. With the proper equipment it's possible to receive a carrier from just about any of the stronger stations. Getting intelligible sound from them is quite another matter. It's almost impossible to hear any but the most powerful stations without narrowing the bandwidth of our receiver. Or on the bad days or weak stations, we have to start switching on the filters, all of which greatly affect audio quality.

I feed my own shortwave sets through a graphic equalizer into my stereo to have more range of tone control. I was equalizing up a storm trying to understand what was being said when a light flashed on in my old

tired head. All these equalizers are at the wrong end! They should be used at the transmitter, not tied to my receiver.

In AM broadcasting most of the audio information is in the sidebands. The more you cut down the bandwidth, the less audio there is. In AM broadcasting two thirds of the signal is wasted. You can't listen to carrier. Single sideband filters cut out almost all of the carrier and transmit almost all audio.

Even though the boys at WARC are talking about using sideband on the shortwave bands, they're talking twenty years before it's fully utilized, if at all. The problem is what to do now. The answer is sound processing.

A shining example of how audio processing at the transmitter can be used to solve receiver problems is found in FM. The first systems had a hiss problem which almost caused abandonment of the whole system.

Then some designer said, "Let's boost the highs all to hell in the transmitter and cut them in the receiver." They worked out the system known as pre-emphasis. An FM transmitter boosts the highs at 15 kHz a full 17 decibels. To balance this out the highs in the receiver are cut by an equal amount. Goodbye hiss.

It's not consistent with the nature of AM broadcasting to use this pre-emphasis system because

excess highs tend to splatter all over the band and also turn modulator tubes a sickening cherry-red. But it is practical to process audio in relation to its effect on the ear. We're talking about the Fletcher-Munson curves which all stereo buffs and producers of beer commercials know about.

Ever been listening to a ballgame on a distant AM station? The announcer sounds clear enough. But the station keeps fading. Then they switch back to the studio for the beer commercial and WHAM!...dishes rattle, the speaker cabinet starts smoking and as we dive for the volume control, we wonder what in the world happened.

The ad agency that recorded that commercial processed the audio so that the frequencies which we hear the loudest are emphasized way out of proportion to any other frequencies which might be present. They also compress it so that it maintains the highest level of modulation possible.

If we could persuade international broadcasters to do this, maybe we could understand what's being said. If they overdo it and make the sound too brilliant it's a very simple matter to tone it down. Like a photo

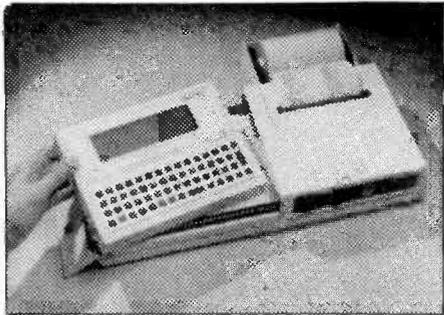
taken out of focus, if sound is flat and muffled when it hits the transmitter, all the processing in the house won't appreciably improve it.

Sound processing is a very simple matter. It's done in the studio and requires no transmitter modification whatever. We really do only two things: boost the devil out of the midrange sound where all the speech information is, and cut off completely the extreme ends of the audio spectrum which draw so much current in modulator stages.

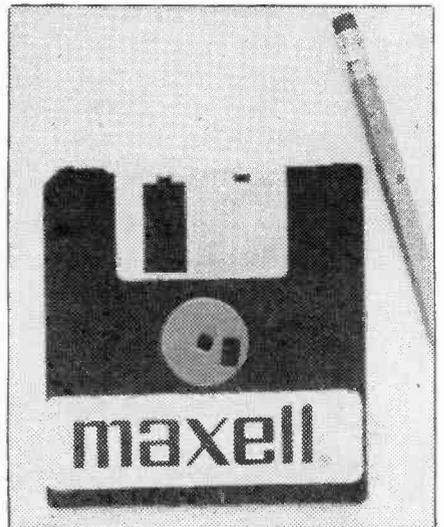
Processed audio can run 120-130% modulation with the same modulator current as when running 100% modulation with full range audio. When you're running a 500 KW transmitter that takes over 150 KW of audio to fully modulate, things of that nature get important in a hurry.

The broadcasters should know that with all the crowding on the bands and with interference from just about everything that runs on electricity, many receivers have to run narrow banded with filtering. They should also be aware that if they can't be understood nobody will listen.

COMDEX SHOW from p.22



3. The British "Husky," touted as the world's toughest, smallest large-memory (208K) portable computer, shown here with its matching 40-column printer.



4. As computer sizes scale down so do floppy disks, illustrated here by Maxell's new 3-1/2" entry.



5. In full array at COMDEX were displays of office and home computer furniture; shown here is Marvel's new desktop carrel with fluorescent task light.

FCC Monitoring Stations

The following list of Federal Communications Commission monitoring stations is presented as a service to our readers. If you are experiencing interference from a radioservice and are unable to get assistance, contact the nearest FCC monitoring station with your complaint and an engineer will assist you.

FCC MONITORING STATIONS AND ENGINEERS IN CHARGE

- ALLEGAN, MI
Melvyn H Hyman
P.O. Box 89
Allegan, MI 49010
Phone: (616) 673-2063/3055
- ANCHORAGE, AK
James E Sutherland
P.O. Box 2955
Anchorage, AK 99510
Phone: (907) 243-2153
- BELFAST, ME
Barry A Bohac
P.O. Box 470
Belfast, ME 04915
Phone: (207) 338-4088
- DOUGLAS, AZ
Stephen Y Tsuya, EIC
P.O. Box 6
Douglas, AZ 85607
Phone: (602) 364-2133

- FERNDALE, WA
Jack W Bazhaw
P.O. Box 1125
Ferndale, WA 98248
Phone: (206) 354-4892
- FORT LAUDERDALE, FL
Robert C McKinney
P.O. Box 16027
Ft Lauderdale, FL 33318
Phone: (305) 473-9845
- GRAND ISLAND, NE
James H Berrie, Jr
P.O. Box 1588
Grand Island, NE 68801
Phone: (308) 382-4296
- KINGSVILLE, TX
Oliver K Long
P.O. Box 632
Kingsville, TX 78363
Phone: (512) 592-2531
- LAUREL, MD
Robert J Douchis
P.O. Box 250
Columbia, MD 21045
Phone: (301) 725-3474
- LIVERMORE, CA
Thomas N VanStavern
P.O. Box 311
Livermore, CA 94550
Phone: (415) 447-3614
- POWDER SPRINGS, GA
Donald E Taylor
P.O. Box 85
Powder Springs, GA 30073
Phone: (404) 943-5420
- SABANA SECA, PR
William C Berry
P.O. Box FCC
Sabana Seca, PR 00749
Phone: (809) 784-3772
- WALPAHU, HI
Jack Shedletsky
P.O. Box 1035
Waipahu, HI 96797
Phone: (808) 677-3954

HELPFUL HINTS

VHF HAMMING IN EUROPE

by Julian Baldwin G3UHK &
Kris Partridge G8AUU

Channelized VHF-FM activity began in Europe around 1970 but not until 1972 was a system standardized. The channel system is now (almost) the same from the north of Norway to the south of Italy and is based on a 25kHz channel spacing.

Since 1980 a small number of additional channels have come into use on the 12.5kHz half-channels. The European 2m band, which carries the vast majority of the FM traffic, is only 2MHz wide (144-146MHz) and only the 145-145.775MHz sector is allocated to channelized FM (see table A & B). Note that repeaters are known by their channel number rather than their frequency; i.e., "R1" not "025/625."

TABLE A (Repeaters)

Ch#	INPUT	OUTPUT
R0	145.000	145.600
R1	145.025	145.625
R2	145.050	145.650
R3	145.075	145.675
R4	145.100	145.700
R5	145.125	145.725
R6	145.150	145.750
R7	145.175	145.775
(R8)	145.200	145.800
(R9)	145.225	145.825

TABLE B (Simplex)

S 8	145.200	Working Ch
S 9	145.225	Working Ch
S10	145.250	Working Ch
S11	145.275	Working Ch
S12	145.300	RTTY AFSK
S13	145.325	Working Ch
S14	145.350	Working Ch
S15	145.375	Working Ch
S16	145.400	Working Ch
S18	145.450	Working Ch
S19	145.475	Working Ch
S20	145.500	CALLING CH
S21	145.525	Working Ch
S22	145.550	Working Ch
S23	145.575	Working Ch

France and Austria use additional repeater channels (8 and 3 respectively) which have been devised unilaterally due to historic and geographic reasons. There are still a few repeaters operating on two channels (R8 & R9), whose outputs lie in what is now the satellite sub-band (145.8 - 148MHz), and are gradually having their channels changed.

The 70cms band differs from that in N. America--430 MHz, not 440 MHz. Different repeater offsets are used on this band (-1.6, +1.6, +7.0, & -7.6 MHz).

SPEAKING THE LANGUAGE

The North American visitor to Europe must appreciate that his home language will not be universally understood throughout a European tour. While English is widely understood in many countries, many amateurs with a limited knowledge of the language may be reluctant to demonstrate this on the air.

Your knowledge of French will be invaluable in France, Belgium, Monaco and Luxembourg. Visitors to Italy and the Iberian peninsula will find a knowledge of the local languages to be highly desirable. In central and eastern Europe if you do not speak the local language you may find that a knowledge of German and/or English will get you QSOs.

In Scandinavia and north west Europe you should find no problem in making QSOs in English if you do not speak the local language. Be tolerant of the "dialect" of English that you will meet on the air (even in England!).

WHAT ABOUT REPEATERS?

As a result of the limited number of repeater channels available and the high density of the amateur population the coverage area of most of the European repeaters is smaller than is common in N. America (Most repeaters run no more than the International Amateur Radio Union's recommended 25W ERP).

Many long distance QSOs take place on SSB using high gain antennas. SSB-VHF activity is almost exclusively on horizontal polarization whereas most FM activity uses vertical.

Generally, only one or two VHF repeaters serving a particular area, though large metropolitan areas may have three or four. There is, therefore, a much higher level of FM simplex activity than is experienced in N. America. This activity level also results partly from the fact that nearly all European countries have a VHF/UHF code-free license class. In the United Kingdom approximately half the amateurs hold this class of license.

European amateurs have established a single FM calling channel (145.500 MHz, known as S20). QSOing on this channel is frowned upon and in this way S20 is quite different from the N. Ameri-

can "52" National Simplex Frequency. An exchange of call signs and QSY arrangements is all the traffic that should take place on S20.

The use of CTCSS (PL) tone controlled squelch on European repeaters is almost unknown. On the other hand the use of Tone-burst access is very widespread and in many counties it is obligatory. The universally-used tone frequency is 1760 Hz and generally a 500ms burst length will suffice. All Belgian repeaters and a number of other individual machines require a minimum of 3 seconds of tone.

Use of ALL repeaters is open to ALL amateurs - there are NO closed private repeaters. Autopatch is not available through European repeaters, nor is any interface to the Public Telephone network permitted. Linking of repeaters is not common.

THIS HANDBOOK WILL HELP

To guide the visiting amateur through the "jungle" of paperwork and to provide comprehensive maps and lists of repeaters in most European countries (and beyond) the authors of this article publish a regularly updated book entitled "THE INTERNATIONAL VHF-FM GUIDE."

In it will be found details of the requirements of each of the individual countries that you will be

visiting, including the address of the country's Licensing Administration, details of the information required, the advance notice recommended, the fees and charges and the Customs formalities (where relevant). Maps show the position of each repeater and listings give call sign, channel, power, talkthrough time, etc.

The UK has a special domestic edition of the book which is recommended for visitors to the UK. This edition contains an additional section which gives expanded details of individual UK 2m repeaters. The book may be purchased directly by mail from:

Julian Baldwin, G3UHK
41, Castle Drive,
MAIDENHEAD,
Berks. SL6 6DB
England (Tel.(0628)
37837)

*The cost (by airmail to N. America) of the current 6th edition is:

Basic Overseas ed. US\$3.50=
Can\$4.00

UK Domestic ed. US\$5.50=
Can\$6.50

*Acceptable forms of payment are:

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as IRCs)

When Will MT. Become A Magazine?

A question which crosses our desk frequently is, "When will MT be printed in a magazine size?" Good question.

Unquestionably, the present format (32 page newsprint tabloid) is the most economical. We can provide faster reporting of news (watch for other publications to pick up on our announcement of the Regency MX-8000) at much less cost than a slick magazine with equal contents.

Naturally, there are advantages to a magazine format such as convenient size for mailing and sorting. But is the tradeoff worth it?

MT is in the mail within a week after our paste-up is taken to the printer. Compare that with three-month lead time for many magazines, making many late-breaking stories obso-

lete by the time you read them. This is one reason why some slick magazines utilize large numbers of "generic pieces," articles of no time value, to fill their pages.

Nonetheless, there is a happy--but slightly more expensive--alternative: A magazine-size monthly on newspaper stock. It would add about two dollars per year to your subscription cost (from \$10.50 to \$12.50 per year).

You would now receive the same quantity and quality of first-rate writing as you do now, but in an 8-1/2" x 11" standard bookshelf-size publication suitable for binding.

Our printer tells us that his press is ready to roll, so let us know your desires. As always, we are listening.

TECHNICAL TOPICS by Bob Grove

What is a good omni-directional scanner antenna? Where can I get a list of police ten codes? (Sammie Long, Gilmer, TX)

The Avanti 801 and Channel Master 5094 are both excellent low, high and UHF band antennas for scanners. For continuous coverage with the new 25-55 MHz scanners and converters, you would like the popular (and inexpensive) Grove ANT-5B"OMNI."

Police ten codes are often custom-written by and for different departments across the country. Nonetheless, the most common is the APCO ten code, commonly reprinted in such books as Grove's COMMUNICATIONS MONITORING, Gene Hughes' POLICE CALL DIRECTORY, Norm Schrein's (FOX) SCANNER RADIO LISTINGS and other frequency guides.

What antenna should I use with my JIL SX-100 scanner? Can I use a CB antenna? (Chris Thompson, Ft. Bragg, NC)

A CB antenna is good for one application: CB. It

will also work reasonably into the 30-50 MHz low band. But for best performance with the new breed of wide-frequency-coverage scanners, you need an antenna specifically designed for wide frequency coverage such as the Grove ANT-1B Scanner Beam and ANT-5B OMNI.

Most tri-band monitor antennas work well with standard low/high/UHF scanners; discones provide good continuous coverage from about 80-500 MHz but are limited in their low band performance.

I am hearing a pulse spark noise every few seconds in my Panasonic RF-2900 shortwave radio. I have checked local businesses but have been unable to locate the source. Can you help? (Peter Runfola, Buffalo, NY)

If you are in an industrial area, the problem could be difficult to locate. Consider the possibility of static spark discharge from a belt-driven pulley system (compressor, heating system, lightning

protector on a power line, etc.). Carry the receiver around with you looking for increased levels near power poles and businesses.

Stepping up to a better receiver with a good noise blanker may be the only alternative since there are no external noise blankers presently on the market which would be effective in your case.

Do you sell a voice descrambler for scanners? It must have an internal speaker. (James Holden, Austin, TX)

At one time Grove Enterprises manufactured the "Code Breaker," an excellent speech-inversion speech decoder. It was discontinued because too many disappointed customers returned them when they discovered that another type of scrambling was used in their area for which no speech decoders are available.

How about it, readers? Would you like to see an inexpensive speech-inversion decoder with speaker from Grove? Let us know.

I have a dipole (Grove Skywire) and would like to connect it to two receivers; what sort of lead-in should I use and how can I switch it? (M.F. Rockefeller, Lexington, KY)

While the Skywire can be fed with a single wire (any size or gauge), it is designed to accept coaxial cable for reduced electrical noise pickup and ability to run the lead-in anywhere--near metal and other wiring or even underground or through water. A single wire is not capable of that.

Use virtually any type of coax--RG-58/U, RG-59/U, RG-8/U and so on. The Grove CBL series RG-6/U is outstanding for both shortwave and scanner use and coupled with the CK-1 connector kit provides a very flexible installation.

So far as switching, at shortwave most inexpensive toggle or slide switches will work well to select receivers if you are using single wire feed; with coax it is better to use CB-type antenna switches since they are designed for standard PL-259 coax fittings.

Even video game switches work quite well if you don't mind installing F connectors on your coax; they are much cheaper and have excellent isolation.

What is the meaning of diversity reception in RTTY? Are there scopes available specifically for RTTY tuning? (Jordan Givens, Staten Is, NY)

Fading is always a problem in any mode; it causes distortion on AM broadcasts and lost copy on RTTY. Since fading is often a local phenomenon involving path changes of a few feet, two separate antennas are often employed to combine their signals, thus averaging out the change in propagation. This is called "dual diversity" reception.

Commonly, two receivers are also used, feeding their detected audio into a mixer, then into the RTTY demodulator.

While any inexpensive oscilloscope may be used to show the characteristic cross pattern for X and Y axis inputs (mark and space) of a RTTY signal, specialized "scopes for that purpose are available from DOVETRON (627 Fremont Avenue, South Pasadena, CA 91030) and HAL COMMUNICATIONS (Box 365, Urbana, IL 61801).

Cont'd on p.26

PROPAGATION REPORTS MADE EASY

by Dave Wentzel
3454 Washburn Ave.
Charlotte, NC 28205

Have you ever wondered what all of those numbers meant at 18 minutes past the hour on WWV time signals? Here is the key so that you can forecast band conditions.

Transmissions are made on 2.5, 5, 10, 15 and 20 MHz.

HAVE A TI99/4A OR SINCLAIR 1000? Dave has some neat programs to share with fellow MT readers. These include range/bearing of stations, antenna length computation and sunrise/sunset calculation. Send a diskette or cassette with return postage for a free copy.

Better yet, send a couple of programs on the media and Dave says he will pay the return postage!

0-1 0-3	Geomagnetic Fields Very Quiet	At Very Best	Good Signal; Competition from Polar Path Signals
2 3-7	Geomagnetic Fields Quiet	Good Signal	Good Signal
3 7-15	Unsettled Geomagnetic Fields	Fair, Some Fading around Dusk & Dawn	Good Signal
4 15-30	Active Geomagnetic Fields	Increase in Flutter, Fading; Loss of Reception at Dawn/Dusk. High Frequency Signals most affected!	Enhanced Reception from Signals to South, Possible to pick up Signals Blocked by Polar Path Signal
5 30-50	Minor Geomagnetic Storm	Loss of Signals at Dawn & Dusk; Daytime Signals weak, much fading	Most Dominant Signals
6 50-100	Major Geomagnetic	Most Signals inaudible; some Weak & distorted; may last 2-10 Hrs	Fair Reception!
7-9 100-400	Major Storm	ALL Signals Inaudible; may last 3-6 Hrs	Reception Possible

TECH TALK:

TESTING FOR DISTORTION EFFECTS

A dual channel oscilloscope and a stable, low-distortion 200 kHz audio generator can be used to provide a relative estimate of the IMD threshold for an active antenna.

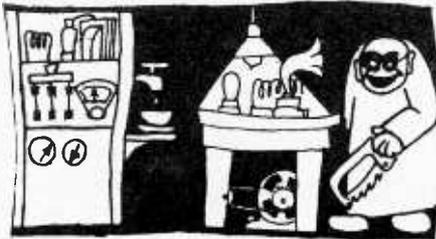
Couple the signal generator to the antenna input terminal through a small capacitor (20pF or so) to simulate the whip antenna input level. The signal generator output should also be connected directly to one channel of the scope; the other channel of the scope is connected to the output of the preamp system. The result will be some sort of Lissajou oval display.

As you increase the signal generator amplitude, carefully observe the symmetry of the display; when the figure starts to distort observe the signal voltage level. This will be an estimate of the overload or "gain compression" of the preamp. The higher the signal voltage required to reach this distortion point, the better the preamplifier.

Another trick is to measure the current from the power supply to the preamp by placing a milliammeter in series with the battery or AC adapter. The point where the steady current level (about 10ma for the SONY AN-1) starts to drop is also the gain compression threshold.

While Lissajou figures are not too good at the HF range, the current indicator works well up to 30 MHz.

EXPERIMENTER'S



WORKSHOP

Eliminate Hum When Recording From Your Scanner

by John P. Carlson

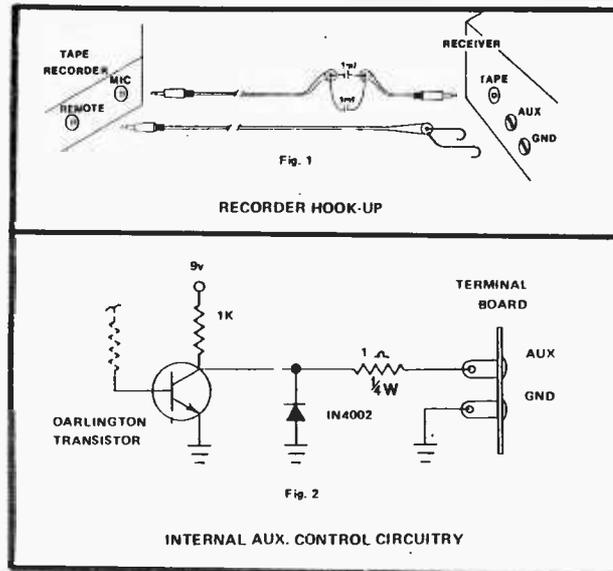
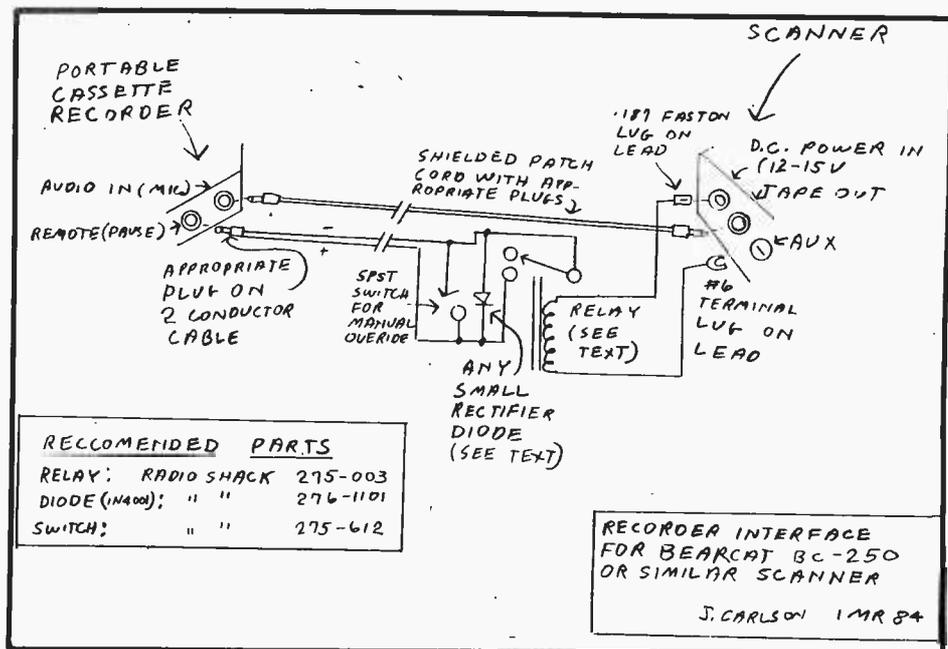
Scanners such as the Bearcat 250 with un-isolated recorder switching circuits often cause hum when a recorder is connected to them in the recommended manner. The commonly-used methods to eliminate this problem, mike/speaker coupling and transformer coupling, both have serious drawbacks.

The mike/speaker scheme seriously degrades the already-marginal audio quality as well as admitting background noise (and keeping the wife awake!)

The transformer coupling scheme works well if an expensive, bulky, high quality transformer is used, but low-priced transformers tend to degrade audio and may themselves be a serious source of hum pick-up.

The scheme described here provides direct audio connection with no degradation and prevents hum by relay--isolating the power control circuitry from the audio.

The toggle switch provides manual override for playback, fast forward, rewind, etc. If the recorder has no remote (pause) function the relay contacts may be placed in series with the motor leads (preferably), or in series with the battery, or in series with the output of the AC adaptor. Caution: in no case may you attempt to switch the AC line! If, after hooking up this circuit, the recorder goes continuously, reverse the polarity of the diode. Its anode (arrow) should go to the more-negative side of the contacts.



TECH TOPICS from p.25

Does the Grove ANT-2 Skywire require a tuner? Could I construct a similar antenna using 300 ohm twin-lead as a folded dipole? Where can I get information on loop antennas? (Charles Barnhart, Westminster, MD)

No tuner is required with the Grove Skywire for total 100 kHz-30 MHz coverage. While matching varies with frequency, it is not so far from a nominal 50 ohms to require a matcher for receiving purposes.

A folded dipole would have a nominal 300 ohm feed-point and represent a poor match to typical 50 ohm receiver antenna inputs.

For an excellent discussion on loops and long-wave reception techniques, send for Ken Cornell's "Low and Medium Frequency Scrapbook" (\$10 from the author: 225 Baltimore Avenue, Point Pleasant Beach, NJ 08742).

(Monitoring Times appreciates contributions from readers for the Experimenters' Workshop. Send your clever ideas to share with fellow listeners to Bob Grove in care of MT.)

I.F. FEEDTHROUGH...Cure This Scanner Malady

by Bob Grove

While scanner listeners are aware of intermodulation and image interference which often plagues metropolitan monitoring, an equally-insidious form of interference exists which has never been addressed before: I.F. feedthrough.

Scanner enthusiasts using outside antennas may recognize the symptoms: broadcasting stations, even single sideband or Morse code, coming through on many channel settings, especially low band, aircraft band and aero band (118-136 MHz) due to its AM detection.

The culprit is in the scanner itself, allowing extremely strong shortwave signals to force their way through the normally-frequency-selective circuitry into the intermediate frequency (IF) amplifier and detector stages.

Fortunately, there is a cure. Simply filter out the shortwave signals before they arrive at the scanner. Several techniques may be used to do this, the simplest being a shunt coil across the coax, either at the antenna or at the scanner.

The coil consists of approximately 6 turns of solid wire, small gauge (about #22) self-supporting on a 1/8" diameter. It may

be first wound around a small screwdriver or large nail and then removed. This coil is not critical, but should be tested in place before permanently soldering and sealing the enclosure for it.

If the coil does the job and doesn't seriously disturb low band (30-50 MHz) signal strengths, you're home free! More turns lowers the cutoff frequency in case too much low band effect is noted.

Another possibility is to insert a capacitor of low value in series with the coax to the scanner; this limits the low frequency response. A trimmer may be the best route to take because it can be adjusted to a point where the shortwave disappears, but the low band is not yet seriously degraded. Approximately 47 pF is a good starting point for a fixed capacitor, or a 3-30 pF trimmer.

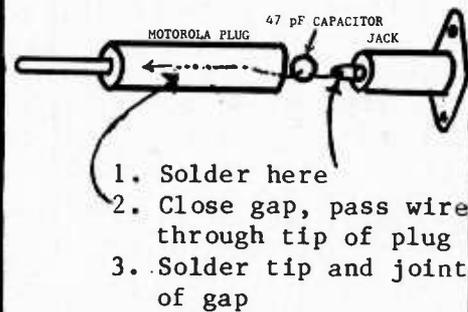
Remember: keep all leads shorter than 1/4" to avoid affecting UHF reception on your scanner.

A simple adaptor plug with the coil shunt may be made from a Radio Shack Y adaptor and a Motorola plug as shown in the illustration. Be sure that the turns of the coil do not touch the walls of the plug; paper or plastic insulation may be slid over the coil after it

is in place.

The Y adaptor may be used in combination with an outside antenna (plugged into the remaining hole), or with the scanner's own built-on antenna merely by plugging the unit into the rear external antenna jacket.

Simple filter to prevent shortwave IF feedthrough in scanners



RADIO SHACK PARTS 274-711 and 274-712 (plug and jack)

Shunt coil IF feedthrough trap

Y ADAPTOR
RADIO SHACK
12-1313



COIL MOUNTED IN MOTOROLA PLUG

VIEWPOINT from p.3

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The numbers thing (see "Los Numeros" column) still looks like a code table-- say, a nice, common book in Cuba. It cannot be the Bible, the Missale, nor the Confessions of St. Augustine. It won't be the Gettysburg Address, nor Washington's Farewell Address. It will not be Lee's surrender to Grant, nor FDR's third Fireside Chat. I doubt it is Bolivar's Collected Papers, nor Lady Chatterley's Lover. Spanish literature has deep, rich classics, but these, too, must be excluded--they would mark a man as counter-revolutionary...Mayhap a Russian novel by Dostoevsky might pass, like "Voices from the Underground," or Karamozov, with Ivan's "Grand Inquisitor" chapter heavily marked.

But you can't have too many marked chapters showing up. Even a Spanish/Russian dictionary would be a shade too blatant. A simple word count is the mechanism, so the right words would have to be there, often. Or, a page, column, word notation. This would limit message length. The key must be given with the message. If you did not have the correct book, the message would be pure garbage, no matter what hours you spent on it.

---Like the "Gold Mine" code, which finally proved to be based on the Declaration of Independence--a century after the code was written.

The only weak spot is to have the correct volume in the hands of the secret police--A catalog of the possessions of known spies would quickly give it away--unless it is so common that all would normally have it--like the NYC phone book, or the Communist Manifesto... both common in Havana.

Bob Russ
Walworth, WI

>>><<<

I enjoy Monitoring Times more than any other magazine I read. I would like to see articles on the following subjects:

1.Home brew projects (scanner pre-amps, RFI traps for computer and monitor and scanners in the same room)

2.Computer programs (Commodore 64) Maybe even putting parts of your magazine on floppy disks (such as frequency lists, spectrum allocations, etc. Maybe FCC and IRAC microfiche)

3.New product reviews

4.Old product reviews, such as any military surplus equipment relating to radios. For example, some of the old spectrum analyzers,

frequency converters (am 914/TRC) etc.

5.Exotic product reviews: for example, Tecom Industries' "electrically small antennas." Tecom makes a model 201191 that covers 20 Hz (not kHz) to 10001 MHz. An optional amplifier is available. Also, the new Watkins-Johnson WJ-1840 System radio covering 500 kHz to 18 GHz.

6.More military aviation frequencies and frequencies in the 225 to 400 MHz range in general. With the Regency MX5000 available now (I have one) many people will be interested in this information.

7. I'd like to see someone go to some air shows (Thunderbirds, etc.) with a spectrum analyzer and MX-5000 to obtain many new frequencies used).

John P. Avery
Indianapolis, IN
(Excellent ideas, John. How about it, writers?...Ed.)

NCS:2 VIEWPOINTS from p.3

from simple loops only confuse the issues with errors (which is why one such effort concluded that the 4-digit Spanish transmissions came from north of Indianapolis!).

One last word to the agencies operating the Warrenton Training Center NCS facilities: This article was not written to reveal any secrets but to solve a hobbyist mystery. No further efforts are planned.

>>><<<

While looking over my copy of Monitoring Times (May 1984) I noted the page 3 reference to our domestic numbers station's possible location and sponser. As a former Army Security Agency-type, I doubt if the numbers transmitter is associated with the National Cryptologic School for several reasons.

The Codebreaker, David Kahn's definitive work on the signal intelligence communities, makes reference to a National Communications System (p.713 of the hardbound edition) whose mission conforms to the suspected purpose of a numbers station.

The writer makes reference to James Bamford's The Puzzle Palace, and in that monumental work the National Cryptologic School is identified as being at NSA's Friendship Airport Annex. It hasn't been in Virginia since the early '50's.

Assuming that Vint Hill Farms Station is still a listening post, the last thing a couple of hundred ditty boppers (intercept operators) need is a high-

UTILITY INTRIGUE from p.6

The following transmissions were all monitored during April and are CW unless indicated otherwise.

LOGGINGS

KHZ	IDENTIFICATIONS
4184	YUR DE YTIF & YAS (YUR IS RIJEKA, YUGOSLAVIA)
4220	LZW (VARNA, BULGARIA)
4221	GYU (GIBRALTAR)
4352	LGB TLX (ROGOLAND, NORWAY)
6760	5F GRPS
8369	W7E
13031	FUF (FORT DE FRANCE NAVAL RDO, MARTINIQUE)
13215	FEMALE ENGLISH VOICE, GROUPS OF MIXED LTRS/NBRS
13246	MALE ENGLISH VOICE.GND TO AIR (MACDILL AFB)
13248	RFNV, COL (MOSCOW AND HAVANA)
13259	WX TFC, SPANISH
13350	NO CALLS (CUT NBR GRPS)(XMTR HAS THAT RDO HAVANA SOUND)
13350.5	MALE FRENCH VOICES (RCC)
13374	CW SHIFTS TO RTTY
13393	5F GRPS
13395	NO CALLS.6F GRPS, 5 GRPS IN MSG
13425	XIB83 DE XIA63 (MEXICAN)
13428	NBRS, 4F GRPS. XMTR HAS THAT RDO HAVANA SOUND
13430	MALE ENGLISH VOICE
13433/	NO CALLS, TWO SEC DASHES
13422	
13434	FEMALE FRENCH VOICE
13436	NO CALLS.5L GRPS
13437	NO CALLS.5L GRPS.PROB SOVIET (SPEC CHARAC IM OE OT AA)
13445	CALL BLVD DE XGCT (MEXICAN)
13446/	YLZN DE N29V
13454	
13454.2	OUJL DE 8PLW (BURUNDI/BARBADOS)
13464	VVH.CUT NBR GRPS.(SEE 13428 KHZ; SAME SOUND)
13537	MALE FRENCH/ENGLISH VOICE.TEST TAPE
13555	NO CALLS.SPEC CHARAC IM OE OT AA.PROB SOVIET
14880	MALE SPANISH VOICE (PROB DRUG SMUGGLER)
17174	NO CALLS.ENGLISH SHIPPING
17184	KFS (SAN FRANCISCO, CA)
17190	NO CALLS.PROB SOVIET.SPEC CHARAC IM AA OE OT
17235.6	MALE ENGLISH VOICE (MARITIME)
18236	CLP7 DE CLP1 (HAVANA, CUBA)
18510	TIMING SIGNAL
19060	CLP55 DE CLP1 (CUBAN MIN FOREIGN AFFAIRS?)
19360/	NO CALLS.FRENCH PT MSG.
19405	
22312	(CERRITO RDO, URUGUAY)
22352	(RIO DE JANEIRO, BRAZIL)
22544	FUM (PAPEETE NAVAL RDO.TAHITI)

powered transmitter nearby polluting their panoramic indicators.

The confusion over sites is excusable - you can't swing a dead cat in eastern Virginia without hitting three or four secret government installations!

SCANNING from p.7

operation is possible by using a pair of one-way channels separated by 45 MHz to connect the mobile units with the base stations. The RF range is 825-890 MHz and normal narrowband FM is used to transmit voice.

Handoff to adjacent cells is accomplished by monitoring signal strengths. When the central switching office determines that a new base station receives the mobile unit's signal better than a previous one, the switching office signals through the voice channel

for the mobile phone to switch to a new channel. Communications disruption in the switching process is only 50 milliseconds.

FINAL COMMENTS

Many regulatory and implementation issues remain unsolved. Modulation methods to be used are one of the biggest issues to be settled. Single sideband AM, narrowband FM, digital, and spread spectrum techniques are all being considered.

The implications of cellular technology for the listener are many. Present day scanners are hardly adequate to handle this sophisticated concept in communications. But with good equipment it is likely a knowledgeable monitor can obtain a great deal of listening pleasure out of what the future holds.

☞ Cont'd on p.28

SCANNING from p.27

For more information readers can refer to the publications listed in the bibliography. Ask your local librarian about inter-library loans if the publications are not available locally.

BIBLIOGRAPHY

1. "Cellular Mobile Technology: The Great Multiplier" by George Cooper and Ray Nettleton. IEEE Spectrum, Vol. 20 #6. June 83, pp. 30-37.
2. Mobile Communications Engineering by William C.Y. Lee. McGraw Hill, New York. 1982.
3. Special issue on AMPS. Bell System Technical Journal. Jan 79.

BEHIND THE DIALS from p.10

sion) must develop this same 0.5V rms at a 50 or 75 ohm load at its output. If this is not done linearly with perfection, the preamp will produce intermodulation distortion products on other frequencies where you may wish to receive signals.

My introductory papers in RADIO-ELECTRONICS (February and March 1983) attempted to explain some of the details of this problem for active antenna users. The wide band active antenna preamp has to respond to all signals within the passband including those you do not wish to receive.

One way to achieve high linearity is to make a good power amplifier with relatively high power output capability. Even if we do not use that power output which is theoretically available, the amplifier is quite linear for most signals and the IMD (intermodulation distortion) will be at an acceptable level.

The lower cost consumer active antennas still have not solved this problem; not even SONY.

AND NOW THE GOOD NEWS

The SONY AN-1 is quite usable with a very-well-engineered plastic weather-proof housing; the circuit board has silicone rubber encapsulation and the housing includes moisture drain holes. The antenna comes with a unique set of multi-purpose mounting brackets for attaching the antenna to most anything.

SONY recommends that you take the antenna down during a lightning storm for maximum protection. However,

some users might desire a more permanent mount with the added risk of burnout or damage in high winds or during lightning storms.

A lot of built-in protection against burnout has been provided in the SONY AN-1 package. The antenna input is protected with side-by-side and back-to-back zeners and silicon switching diodes. These should guard against many problems except possibly a very close lightning strike surge.

Similarly, the output of the preamplifier is protected with diode limiters from burnout due to a signal being fed back up the transmission line.

The active preamp JFET appears to be similar to a SILICONIX J308 or J309 operated in a grounded source configuration; the drain (output) drives the transmission line through a step-down impedance-matching transformer.

Current drain is 10ma over a wide range of power supply voltages from 5V to 12V; a 9V supply is strongly recommended by SONY for best linearity. This supply is built in if you use the 6 AA-cells inside the receiver coupler box or the SONY AC-12 AC adapter.

(NOTE: Do not use some other brand of adapter unless you check out the voltage and the fact that the center pin of the power connector is negative; this is opposite from most other power connector systems and gives SONY another market for their adapters.)

PREAMP DETAILS

A 2-pole low pass filter with a cutoff starting at about 25MHz (-6dB at 30 MHz) with an input impedance of about 20K ohms at 150 kHz is in the input to the JFET gate from the antenna; protective shunt diodes are right at the antenna terminal.

The JFET source bypass capacitor is chosen to increase the rolloff below 200 kHz. The output transformer is a stepdown toroid winding on a very-high-mu ferrite core with very low DC resistance designed to improve the low frequency rolloff below 150 kHz.

The amplifier is reasonably linear up to about 0.1V rms (100mV rms) input, but starts to distort at 0.3V rms. Long before that, however, the IMD problem shows up as interference signals (less than 50mV on some frequency ranges). We must stress that this is typical of most other active antenna preamplifiers that cover a wide frequency

range.

RECEIVER COUPLER UNIT

The receiver coupler has an RCA phono jack as the RF connector for the antenna preamp cable (40 feet provided). The coupler provides power to the preamp from built-in batteries or AC adapter described previously.

The coupler also provides high pass filtering for a rolloff below 150 kHz, and a switched additional highpass cutoff below 1.6 MHz for use of the antenna on SW ranges only. This high pass filter reduces IMD from strong local BC stations. Additionally, a switched 20 dB attenuator allows further reduction of strong signal overload.

The output from the coupler is a 3.5mm audio-type phone jack. The power supplied to the preamp is decoupled by a bifilar-wound toroid and two 10mF capacitors arranged as a pi-section filter offering 15 ohms impedance at 1000 Hz. This improves rejection of line noise below 150 kHz. Power line noise loops are avoided by the plastic preamp housing; the coupler box has metal shielding to further reduce noise pickup.

As with most receiving systems, the coupler box should be well grounded to earth at the receiver's common ground point through the short jumper cables supplied.

Adapters have been supplied by SONY so that the

AN-1 coupler output can be fed to receivers which have only a loop antenna or a whip antenna.

SUMMARY

For price, convenience and supplied accessories, the SONY AN-1 is a bargain. Its performance compared to others is no better or worse. One criticism I have of SONY is their choice of RF connectors; I sure wish manufacturers would get together and settle on something better such as type-F coax receptacles rather than the mix of RCA and phone jacks, alligator clips and push-in RF connections.

Overall, the SONY AN-1 should perform quite well for most users who understand the limitations of a single antenna covering the entire range of 150 kHz to 30 MHz.

NOTE:

For readers who need further information on active antenna fundamentals, including passive antenna couplers for VLF, VLF loop antennas and basics of Loran-C, a reprint is available of the 6 articles published in RADIO-ELECTRONICS magazine for February, March, April, May, June, and July 1983.

Cost is \$4 postpaid; make check or MO (no COD or credit cards) payable to:

BURHANS ELECTRONICS
161 GROSVENOR STREET
ATHENS, OHIO 45701

(Foreign orders total \$8 via 1st class airmail postage, in US dollars.)

LISTENER'S LOG from p.20

GEORGIA	STATE PD	155.4750
GEORGIA	STATE PD	42.1800
GEORGIA	STATE PD	42.0200
GEORGIA	STATE PD BASE RPTR	155.5800
GEORGIA	STATE PD BASE RPTR	155.9100
GEORGIA	STATE PD BASE/BASE	154.9350
GEORGIA	STATE PD BASE/MOB	154.6800
GEORGIA	STATE PD CAR/CAR	155.5050
GEORGIA	STATE PD MOBILE RPTR	155.1900
GEORGIA	STATE PD MOBILE	154.8000
GEORGIA	STATE PD MUTUAL AID	155.3700
GEORGIA	STATE PD SHERIFF	154.9050

RTTY/FAX from p.12

12829	MOSCOW, USSR (NEWS)	60	0430,1700
13686	UNKNOWN(ASIA)(PHOTO)	60	1335
13690	UNKNOWN(ASIA)(PHOTO)	60	0100
13766	TAIPEI, TAIWAN(NEWS)	60/120	1500
13780	PYONGYANG, N.KOREA(PHOTO)	60	0100
14685	TAIPEI, TAIWAN(NEWS)	60/120	1500
14890	TOKYO, JAPAN(NEWS)#2	60/120	0100,0215
14968	TOKYO, JAPAN(NEWS)#3	60	1330
14984.5	ROME, ITALY (PHOTO)	60	2000
15878	TAIPEI, TAIWAN (NEWS)	60/120	1300
16276	UNKNOWN (PHOTO)	60	1345
16971	TOKYO, JAPAN (NEWS) #1	60/120	2330,0045
18551	UNKNOWN (PHOTO)	60	1345
18664	ROME, ITALY (PHOTO)	60	1345
18987.5	OSLO, NORWAY(NEWS)	240	1300
19680	UNKNOWN(ASIA)(NEWS)	60	1500
19850	AP, NY, USA#1(PHOTO)	60	1345,0030
22542	TOKYO, JAPAN (NEWS)	60/120	1430
22925	NY, NY (PHOTO)#2	60	0120
23698	ROME, ITALY (PHOTO)	60	1940

HAWKER & THE OSS from p.13

CODE OR CIPHER

BOOKS -These books contained rows of 5-letter groups, letters in the alphabet picked at random.* Both sending and receiving station would be issued books exactly alike.

*Instead of using random numbers for code or cipher books, a reverse frequency of the language used is best: i.e., each book would contain many more Q's, X's and Z's, etc., so that the enciphered message would have almost an equal number of every letter in the alphabet. This would make it unbreakable.

Transmit Frequencies used by Eagle - 5462 7123 8166 kHz
Frequencies used by OSS - 3150 3180 3276 4099 4345 5572 6390 kHz

INSTRUCTIONS IN THE USE OF THE VIGENERE TABLE (See Table 1)

To encrypt a message using the Vigenere table simply write the clear text in five-letter groups over the letters in the code book (or a text in a published book can be used). Then, starting from the left vertical column, find the top letter; next, move horizontally to the right until you find the bottom letter. The letter located at the top of that column is the cipher. Decode the same way. Write th cipher over the code book letters and proceed as before. Example: "Travel to Lyon and report on petrol pipeline."*

Clear text: TRAVE LTOLY ONAND
Code Book: CGRET UJHIO LPQET
Msg in Code:JPRJP JQTXQ XCQRQ (ETC.)

Upon receipt, the procedure is simply reversed to decode.

A good cipher man would have the vigenere table memorized in a few weeks of operation and not have to refer to it very often. One radio man could easily handle an average of 1,000 groups a day, requiring three or four hours of cipher time along with one hour of transmitting and/or receiving time.

This method was used by the OSS in transmitting messages between bases and detachments and also in contacting W/T agents behind the lines.

*Actual message received by EAGLE. Later Eagle was dispatched to blow up the pipe-

Polyalphabetic Substitution System

Table with 26 columns (A-Z) and 26 rows (A-Z) showing a polyalphabetic substitution system. Each row is a shifted alphabet starting from the row letter.

TABLE 1

Vigenere Table

line along with another German agent.

TABLE 2

EAGLE'S SUBSTITUTION SYSTEM

Eagle had a schedule with Abwehr at 1600 GMT every day. He used the following easy-to-remember simple cipher:

Using the day of the week starting under A of the alphabet, complete the remainder of letters not in the spelling of the day. If the day is spelled with two identical letters use X and Z as substitutes for the second letter. Ex:

ABCDEFGHIJKLMNPOQRSTUVWXYZ
WEDNXSZAYBCFGHIJKLMPQRTUV
or
ABCDEFGHIJKLMNPOQRSTUVWXYZ
FRIDAYBCEGHJKLMNPOQRSTUVWXYZ

On a Wednesday Eagle sent the following message:

NEED EXPLOSIVES TO CARRY OUT MISSION

NEEDE XPLOS IVEST OCARR
HXXNX TJFIM YQXMO IDWLL

You can see how easy it was to set up and use. Most important Eagle did not have to darry or hide any codes,

ciphers or instructions. It was easily broken by the frequency method, however, if you had enough copy.

NUMBER CODES AND CIPHERS

Number codes and ciphers are used for many reasons: It is much more difficult to break, especially if enciphered by computer; the agent does not need to learn the letters in Morse code, just the numbers; no phonetics are used with numbers when transmitted by voice.

The Vigenere Table can be used with number codes as follows:

A B C D E F G H I
00 01 02 03 04 05 06 07 08

J K L M N O P Q R
09 10 11 12 13 14 15 16 17

S T U V W X Y Z
18 19 20 21 22 23 24 25

(Do not use these numbers; they are for example only)

The number's code is harder to break if the number groups under the letters were changed to random numbers of to more than two-number groups representing each letter.

HANK BENNETT from p.16

you'll get a copy. Canadians please send 75¢ and IRC's or stamps overseas airmail delivery. Send stamps, please; coins are OK but you'll send them at your risk. Full membership is expected to be \$19.99 for 12 months.

I've been writing columns since 1949. Most of them have been on a gratis bases for clubs, but some have been for various magazines on a pay basis. Nonetheless, at no time in those years has a Chief Editor ever taken the time to write to his columnists with a bit of praise. Not so with Bob Grove of MONITORING TIMES.

Bob took time out from his busy schedule the other day to write a short but fine letter of appreciation for past and present efforts and we'd like our readership to know that this publication is headed up by a really fine gentleman!

We were going to start this column out with a story on the trials and tribulations of getting a column together. Seems it got sidetracked a bit so we'll postpone this until next time.

We now have available a list of the top 150 DXers as based on WDX Monitor Service DX Awards. If you'd like a copy it will cost you the pitifully small sum of 50¢ and stamps are fine as long as they have stickum on the back and no postmarks on the front! Send your money and any comments that you'd like to make to your editor, Hank Bennett, P.O. Box 3333, Cherry Hill, NJ 08034.

LOS NUMEROS from p.19

your "numbers" loggings and other findings.

COMING ATTRACTIONS

That mysterious Cuban/Soviet Communications Center --The DGI, the 4th largest intelligence service in the world and its expansion in the U.S.--Missiles and deliberate telemetric encryption.

Time now for a Tecate and..

Adios,
Havana Moon

ENGLISH LANGUAGE from p.17

Many other types of programs, interesting in themselves, serve as an outlet for the Communist philosophy such as the arts, sports and historical celebrations. A recent broadcast on the celebrations of victory in the second world war included favorable references to the actions of U.S. and British forces, but was heavy on the Soviet desire for peace and the horrors of weapons killing people. But the same broadcasting session insisted that the USSR would maintain its military weapons at increasing levels to avoid being overshadowed by the West! They also attacked the "terrorists" who were resisting the Soviets in their native Afghanistan!

Many Radio Moscow programs on music, culture and science are very interest-

ing, especially when they deal with regional cultures; also of interest is the style of the mailbag program, especially the comments of Joe Adamov.

A new series on Soviet-American relations is planned and may be underway, with talks by Professor Nikolai Yakovlev, a Soviet historian. I feel sure this will be another "As THEY See It!" but may provide useful insight into the Soviet official view.

Radio Moscow can be heard over a multiplicity of frequencies during the 24 hours. I find the 17 and 15 MHz channels best until local midday, then the 11840 kHz Havana relay. Evenings give reliable reception usually on 9 and 7 MHz outlets. Below are the frequencies for the North American Service:

RADIO MOSCOW - NORTH AMERICAN SERVICE	
EAST COAST U.T.C.	FREQUENCIES
2200-0000	17700 15140 15240 15420 11730 11750 11770 11780 11790 11850 12050 12060 9530 9610 9640 9680 9720 9760 7190
0000-0100	17700 15140 15240 15420 11730 11750 11770 11780 12050 12060 9600 9610 9640 9680 9720 9760 7190 5980
0100-0300	17700 15140 15240 15420 11730 11750 11770 11780 12050 12060 9530 9600 9610 9640 9700 9720 9760 7150 5980
WEST COAST	
0300-0400	17700 15140 15180 15400 15420 12030 12050
0400-0700	15180 15400 15420 11710 11750 11870 12030 12050 9580
RADIO MOSCOW WORLD SERVICE Selected freqs to N.America	
Between:	From these channels:
1100-1700	17810 15450 15150 15130 15100 11840 11790 11770 11700 9790 9710 9600 9790 9710 9600 7290 7170 7150 6110 5900
1700-2300	21560 15450 15140 12050 12010 11860 11840 11790 11750 11700 9790 9710 9580 9500 7440 7290 7180 7170 7160 7110 5900

WEATHERWISE from p.5

the 30 to 45 minutes following the official synoptic observation times of 0000, 0600, 1200 and 1800 GMT. Thus, shortly after 0000 GMT, for example, you'll often hear a number of ships calling coast stations with "OBS" messages.

After his initial call--typically around 8364 kHz or 12545 kHz--is acknowledged by the coast station, the ship's radio operator then switches to a working frequency which he will have indicated with a QSS or QSW signal, up a little higher in the 8 or 12 MHz marine band; he then reestablishes contact with the coast station, and transmits his "OBS" message.

The whole QSO only lasts a couple of minutes or

so, but careful monitoring of these CW frequencies in those time slots can easily yield several such ship reports in half an hour or so. Decoding these messages is a lot of fun and quite informative.

What code is used for the transmission of these ships' weather messages?--In order to reduce transmission time and costs, "OBS" messages are coded in the International Meteorological Ship Code, also known as Code FM13-VII. As already mentioned, this code is made up of five-figure groups.

The position of numbers in a given group determines the element of weather which these numbers represent. For example, the last three numbers of the seventh group are always the temperature of the air in degrees and tenths, Celsius. Substitut-

ing letters for numbers, we can write the code symbolically as follows:

D...D YYGGi_w 99L_aL_aL_a
Q_cL_oL_oL_oL_o i_Ri_xhVV Nddff
ls_nTTT 2s_nT_dT_dT_d 4PPP 5appp
(7wwW₁W₂)(8N_nC_LC_MC_H) 222d_sv_s
Os_nT_wT_wT_w 2P_wP_wH_wH_w.

The groups shown in brackets may be omitted from a report if the phenomena they represent are not occurring or are not significant. One or more additional groups may occasionally follow the 2P_wP_wH_wH_w group; they represent additional sea swell and/or ice information, but for the sake of brevity we shall limit ourselves to the fifteen regularly used groups shown.

There is a lot of fascinating stuff to be covered here, but we'll try to be as concise as possible. For complete details of the International Meteorological Ship Code, the manual (MAN-MAR) referred to earlier should be consulted. The following is the meaning of symbols:

- D...D represents the ship's radio callsign (usually four letters)
- YY Day of the month (GMT)
- GG Time of observation (nearest hour, GMT)
- i_w Wind indicator; 3 indicates that the speed is estimated; 4 means that it is measured (with an anemometer)
- 99 Indicator for groups giving ship's position
- L_aL_aL_a Latitude, in degrees and tenths
- Q_c Quadrant of the globe, coded according to the following:
 - 1=N latitude, E long.
 - 3=S latitude, E long.
 - 5=S latitude, W long.
 - 7=N latitude, W long.
- L_oL_oL_oL_o Longitude, in degrees and tenths (hundreds included); for example, 0425=42.5 degrees, either east or west depending on Q_c; 1382=138.2 degrees
- i_R Precipitation data indicator; it is virtually always coded 4, indicating that no precipitation amount is reported, because most ships are not equipped to measure precipitation
- i_x Weather data indicator. Coded 1, it indicates that the 7wwW₁W₂ group is included in the message. In the absence of significant present and past weather, this group may be omitted;

- in this case, i_x is coded 2.
- h Height, above the sea, of the base of the lowest cloud seen, coded according to Table 14.
- VV Horizontal visibility, coded as per Table 15
- N The fraction of the sky covered by all clouds; reported in eights of sky covered. 0=cloudless; 9=sky obscured (by fog, snow, etc.)
- dd True direction, in tens of degrees, from which the wind is blowing, on a scale from 00 to 36. For example, 25=250 degrees. 00=calm; 99=light winds which are variable in that direction.
- ff Average wind speed, in knots. If the wind speed exceeds 99 knots, 50 is added to the coded figure for dd, and only the speed in excess of 100 knots is coded for ff.
- l Indicator for air temperature group
- s_n Sign of the air temperature. When s_n is reported as 0, the temperature is either 0 or above 0 degrees Celsius (positive). When s_n is coded 1, the temperature is negative (below 0 C)
- TTT Air temperature, in degrees and tenths, Celsius. Example: 11095 means that the air temperature is -9.5 degrees C. Some ships measure air temperature to the nearest degree only. In this case, the tenths figure is replaced by a slash; for example, 1014/ means a temperature of 14 degrees C.
- 2 Indicator for the dew point group
- s_n Sign of the dew point temperature (coded as shown above).
- T_dT_dT_d Dew point temperature, in degrees C. At sea, the tenths figure is frequently omitted for the dew point, and replaced by a slash.
- 4 Indicator for the pressure group.
- PPPP Sea level pressure, in millibars and tenths, with the thousands figure omitted. For example, a pressure of 1019.5 mb is coded 40195; 997.1 mb is coded 49971.
- 5 Indicator for the pressure tendency group.
- a Characteristic of the pressure tendency during the three hours preceding the time of observation. It is

WEATHERWISE from p.30

based on the zigs and zags of the barograph trace. Because "a" is coded according to a fairly lengthy table, we'll simplify the code here, for the sake of brevity.

- 0=Pressure decreasing now, but is still higher than or the same as three hours ago;
- 1,2,or 3=Pressure is higher now than 3 hours ago;
- 4=Pressure steady (same as 3 hours ago);
- 5=Pressure increasing now, but is still lower than or the same as 3 hours ago;
- 6,7,or 8=Pressure lower now than 3 hours ago.

ppp The net amount by which the atmospheric pressure has changed in the last three hours, expressed in tens, units and tenths of millibars. For example, 57029 means that the pressure has decreased by 2.9 mb in the last three hours.

7 Indicator for the weather group

ww Present weather; coded according to a table that is several pages long! We'll simplify things here with the following information which is, of necessity, oversimplified: when ww is coded from 00 to 39 there is no precipitation falling at the ship's location, and visibility is generally not reduced below 1/2 miles by such things as haze, smoke, etc.

- 40 to 49=visibility less than 1/2 mile in fog
- 50 to 59=drizzle
- 60 to 69=rain
- 70 to 79=snow or ice pellets
- 80 to 89=showers of rain, snow or hail
- 90 to 99=thunderstorm, with or without precipitation

W₁ Past weather (primary)

W₂ Past weather (secondary). Past weather refers to the weather which occurred during the past 6 hours. If there was only one kind of "past weather," W₁ and W₂ are both coded with the same number. However, if there was more than one type of weather in the past 6 hours, the type having the highest code figure (primary type) is reported by W₁ and the type having the second highest figure (secondary type) is reported by W₂. W₁ and W₂ are coded according to the following simplified data:

- 0,1,2=these refer to cloud conditions only (no significant weather)
- 3=sandstorm, duststorm or blowing snow (unlikely at sea!)
- 4=fog or thick haze (visibility less than 1/2 mile)
- 5=drizzle
- 6=rain
- 7=snow (or rain & snow mixed)
- 8=showers of rain, snow or hail
- 9=thunderstorm(s), with or without precipitation
- 8** Indicator for cloud group
- N_h** Fraction of the sky covered by all the C_L clouds present; if no C_L cloud is present, the fraction covered by all the C_M clouds present. It is coded in eighths. N_h is coded 0 when no C_L or C_M clouds are present. N_h=9 when the amount of C_L (or C_M) cloud cannot be estimated.
- C_L** Low clouds. Coded according to a lengthy table. Here is my abridged version:
 - 0=No C_L clouds
 - 1,2=cumulus
 - 3,9=cumulonimbus (thunderstorm clouds)
 - 4,5,=stratocumulus
 - 6=stratus
 - 7=ragged clouds of bad weather
 - 8=cumulus and stratocumulus at different levels
- C_M** Middle clouds. My abridged version of the code follows:
 - 0=no C_M clouds
 - 1=altostratus (semitransparent)
 - 2=dense altostratus or nimbostratus
 - 3-9=various forms of altocumulus
- C_H** High clouds. Again, a simplified version of the code:
 - 0=no C_H clouds
 - 1-4=cirrus
 - 5,6=cirrus and cirrostratus
 - 7,8=cirrostratus
 - 9=cirrocumulus
- 222** Indicator for ship's course/speed group
- D_s** Ship's course (true) made good during the three hours preceding the time of observation. Coded to eight points of the compass: 1=NE, 2=E, 3=SE, ...8=N. 0=ship hove to; 9=unknown.
- v_s** Ship's average speed made good during the three hours preceding the time of observation. Coded as per Table 16.
- 0** Indicator for sea temperature group
- s_n** Sign of the sea temperature. Coded as discussed earlier.
- T_wT_wT_w** Sea surface temperature, in degrees and tenths, Celsius.

- 2** Indicator for sea wave group.
- P_wP_w** Average period of the sea waves, in seconds.
- H_wH_w** Height of the sea waves, in units of half metres.

VGXX 29004 99315 70770 41598 41819 10235 2020/ 40215 54000 70264 83296 22213 00250 20205. Let's decode the highlights.

The time of observation was 0000 GMT, on the 29th of the month, and the ship's position at that time was 31.5 degrees north latitude, 77.0 degrees west longitude. The base of the low clouds is at a height of between 2000 and 3200 feet above the sea.

Visibility is between 11 and 27 nautical miles. Total cloud cover is 4 eighths of the sky. The wind is blowing from the south (180 degrees) at 19 knots. The temperature of the air is 23.5 degrees Celsius, and the dew point is 20 degrees C. Atmospheric pressure is 1021.5 mb, and has been steady in the past three hours. (no change in barometer).

Referring to the detailed code for the weather group, the present weather (coded 02) tells us that the weather is fair and the state of the sky as a whole has remained unchanged during the past hour. However, there was some rain and fog some time within the past 6 hours.

The cloud group tells us that 3/8 of the sky is covered by low clouds of the cumulus type. Middle clouds are of the altocumulus type, and high clouds are of the cirrocumulus type.

The ship has been moving in a northeasterly direction at a speed of between 11 and 15 knots. The water temperature is 25.0 degrees C, and the waves have a period of 2 seconds and a height of 2 1/2 metres.

So, there you have it--our abridged version of the International Meteorological Ship Code. Weatherwise SWLs will undoubtedly enjoy decoding these ship reports at any time, but particularly so when the reporting ships are in the vicinity of hurricanes or typhoons!

If you'd like to let me know how you make out with either the plotting of weather maps or the decoding of ship reports, feel free to write. Anyone who combines interest in meteorology and shortwave listening certainly speaks my language!...I'd be interested in hearing from you. If a reply is expected, please enclose an SASE.

My address is: 380 Watson Avenue, Windsor, ONT. Canada N8S 3S4.

Next Month: CONCLUSION: Low and Medium Frequency Weather Transmissions

TABLE 14.

h	- HEIGHT, ABOVE THE SEA, OF THE BASE OF THE LOWEST CLOUD SEEN (in feet)
0	100 or less
1	200 to 300
2	400 to 600
3	700 to 900
4	1000 to 1900
5	2000 to 3200
6	3300 to 4900
7	5000 to 6500
8	6600 to 8200
9	more than 8200, or no clouds
/	sky obscured by fog or snow

TABLE 15

VV - VISIBILITY

90	less than 55 yards
91	55 yards or more, but less than 200 yards
92	220 yards or more, but less than 550 yards
93	550 yards or more, but less than 1/2 nautical mile
94	1/2 nautical mile or more, but less than 1 nautical mile
95	1 nautical mile or more, but less than 2 nautical miles
96	2 nautical miles or more, but less than 5 nautical miles
97	5 nautical miles or more, but less than 11 nautical miles
98	11 nautical miles or more, but less than 27 nautical miles
99	27 nautical miles or greater

TABLE 16

v_s	- AVERAGE SPEED OF SHIP MADE GOOD DURING THE THREE HOURS PREVIOUS TO THE TIME OF OBSERVATION
0	ZERO
1	1 to 5 knots
2	6 to 10 knots
3	11 to 15 knots
4	16 to 20 knots
5	21 to 25 knots
6	26 to 30 knots
7	31 to 35 knots
8	36 to 40 knots
9	over 40 knots

To wrap things up, let's look at a typical "OBS" message from a Canadian ship (imaginary call-sign VGXX) in the Atlantic ocean, off the southeast coast of the USA. The message is transmitted in CW, and reads as follows:

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PERSONAL

NOTE: Monitoring Times assumes no responsibility for misrepresented merchandise.

SUBSCRIBER RATES: \$.10 per word, paid in advance. All merchandise must be non-commercial and radio-related. Ads for Stock Exchange must be received 45 days prior to publication date.

DRAKE R7 receiver \$850; RO-BOT 400 SSTV converter \$300; INFOTECH M200E RTTY/Morse Decoder \$250; YAESU FRG7 receiver \$100. You pay postage. John Washburn, 1020 Gilmore St., Fairbanks, AK 99701 (907) 452-4828.

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FR-7700 complete with memory, antenna tuner, manual, original cartons. Excellent condition in every respect. \$370 includes shipping, money order or certified check only. A.A.Wicks, 30646 Rigger Rd., Agoura, CA 91301.

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\$25 payment must accompany ad. Send 2 1/4" wide x 2" long camera-ready copy or we will type copy (35 words maximum).

NOSTALGIAPHILES:

We have approximately 35 hours of WW II sound nostalgia on excellent quality cassettes - material from both Axis and Allied sides. Fascinating listening!

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MT READER REPORTS

HEARING RUSSIAN SPACE STATION

Veteran listener Gilles Thibodeau of Lac Megantic, Quebec has been listening to activities aboard the Russian Salyut space station.

Transmissions are made in the FM mode on 142.417 MHz, receivable on many scanners by programming in 142.420 MHz.

INFORMATION PLEASE

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

I want books on the HISTORY OF RADIO; or old (pre-1930) books on radio theory and practice; operating, and antennas. Also want the book titled something like RADIO'S 100 MEN OF SCIENCE. Also antenna manuals, old or recent. W.Clem Small, 26530 Parkside Dr, Hayward, CA 94542 (415-886-1205)

FREQUENCY INFO WANTED: Information on frequencies used in your area, particularly IN, KY, OH, IL & MI. Also want lists of codes and signals, plus info on GMRS users, particularly REACT units. Will gladly reciprocate with info I have. Jeff Howell, P.O.Box 187, Milton, KY 40045.

WANTED-SHERIFF'S FREQUENCIES that are active in each county of Ohio. Please send to: Mike Day, 273 Willaston Drive, Dayton, OH 45431.

I need manuals or circuit diagrams for the following equipment:

1. Singer/Panoramic Telemetering Indicator Mod. TMI-2/L-200

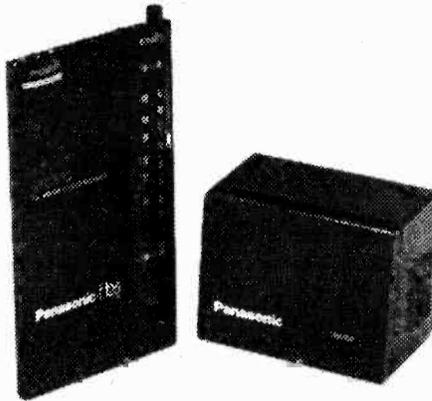
2. Singer/Panoramic Telemetering Indicator Mod. TMI-3/LI-200
3. Probescope Telemetry Analyzer Model LL-190
4. Defense Electronics Industries Telemetry Display Unit Model TDU-5
5. Nems-Clarke/Vitro Spectrum Display Unit Model 300-3-1
6. Electrac Diversity Combiner Model 215-C
7. Defense Electronics Tuning Units for TMR-5A Telemetry Receiver Models TMH K5B & TMH U5B
8. Defense Electronics Telemetry Receiver Model TMR-6
9. Defense Electronics Tuning Units TMH-A6A & TMH-D6 for TMR-6 Receiver
10. Nems-Clarke/Vitro Dual receiver Model 2074A-1
11. Nems-Clarke/Vitro Tuning Unit RFT-201D

All replies will be acknowledged. George Hunt, P.O.Box 1101 Empire, CA 95319.

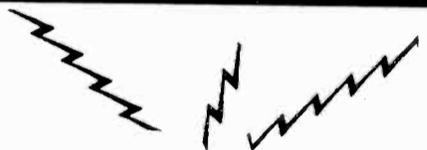
WANTED: Service Information for the following equipment. Will pay user's fee and postage. BRADFORD RANGER 505, black and white "5 TV, Model 90068; SIMPSON VHF Marine Radio Telephone, Model B; LAFAYETTE stereo tape player/recorder, Model RK 825; DRAKE receiver, Model R4B; and DRAKE transmitter Model TX4B. Contact Mike Adams, N4EVS, 6333 Hwy 2321, Panama City, FL 32404 (904)785-7824.

CONSUMER ELEC SHOW from p.9

tronic programs and a built-in dot matrix printer. \$340 from Seiko dealers.



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What Is That Weird Noise?!

A number of listeners have contacted MT recently regarding the strange sweep signals being monitored in the 6725-6740 kHz range. Various described as siren tones, sweep noise and "in-describable," the signals are certainly perplexing.

Since they do vary across a swath of frequencies well established as part of the spectrum inhabited by the US Navy and US Air Force, it is reasonable to suspect that they are military in origin.

But for what use? Are they ionosondes to test propagation? Are they part of the electronic countermeasures (ECM) war? Or could they be purely diversionary to confuse the unfriendly listeners?

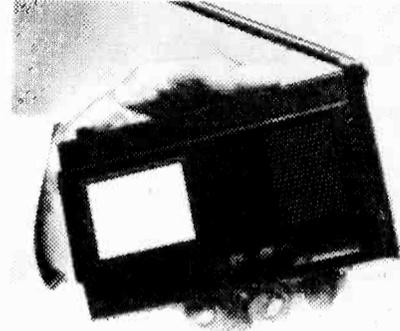
MT would be grateful for any insight which our knowledgeable listeners may wish to share with other readers.

THIN POCKET AM/FM FROM PANASONIC

Approximately the size of a credit card, this new RF-H25 features high-density components custom-designed for the product.

The dial mechanism uses worm-gear drive instead of the usual cord and a built-in NiCd cell provides up to 5 hours of playing time after a similar 5 hour rejuvenation by the companion charger.

\$99.95 from Panasonic dealers in September.

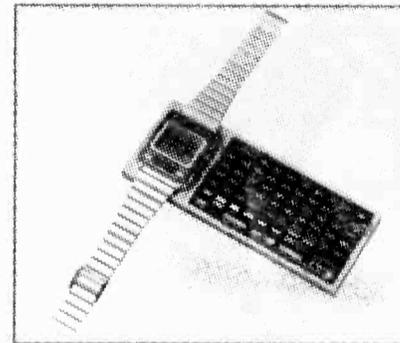


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SINCLAIR POCKET TV

Yes, it really works. And it is a cathode-ray tube, not an LCD display. And it's only \$100 from direct mail-order this fall in a national sales promotion.

Sinclair, a Cambridge, England innovative electronics manufacturer, has elected not to appoint a domestic sales force in the United States, passing the savings directly to customers. Featuring a single-chip circuit, full VHF/UHF coverage and a proprietary flat screen TV tube, the low-cost TV provides much brighter viewing than available on costlier liquid crystal (LCD) technology.



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