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MONITORING TIMES

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BRASSTOWN, NORTH CAROLINA 28902

March, 1986

STS MISSION 51-L



WITH DEDICATION AND HONOR

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MICHAEL J. SMITH, M.S.,
Commander; age 40
JUDITH A. RESNIK, Ph.D.,
Mission Specialist; age 36
RONALD E. McNAIR, Ph.D.,
Mission Specialist; age 35
ELLISON S. ONIZUKA, Lt.Col.,
Mission Specialist; age 39
GREGORY B. JARVIS, B.S.,
Payload Specialist; age 41
S. CHRISTA CORRIGAN McAULIFFE
B.A., Teacher; age 37

INSIDE THIS ISSUE

FROM THE EDITOR.....	2
VIEWPOINT	3
FORUM.....	3
FUTURE OF MONITOR LAWS.....	5
UTILITY INTRIGUE.....	6
SCANNING.....	7
SCANNING W/NORM SCHREIN....	8
VHF SKIP REPORT.....	9
HIGH SEAS.....	11
PLANE TALK.....	12
TV SCRAMBLING.....	14
BEHIND THE DIALS.....	17
NEW ARRIVALS.....	20
RTTY/FAX.....	20
CLUB CORNER.....	21
LIBRARY SHELF.....	22
BROADCASTING: H. Bennett...24	
SWL World Watch.....	25
English Language.....	26
TUNE IN WITH ED NOLL.....	27
TUNING IN THE OUTBACK.....	28
A SOUND EDUCATION.....	29
PIRATE RADIO.....	30
LISTENERS LOG.....	32
TECHNICAL TOPICS.....	32
COMPUTER CORNER.....	33
GETTING STARTED.....	34
ANTENNA TALK.....	35
HELPFUL HINTS.....	38
EXPERIMENTERS WORKSHOP...39	

The Grief and the Reality

by Bob Grove

At 11:39 am, January 28, 1986, the world was stunned into silence as a blinding fireball ripped an American space shuttle, killing its crew of seven in history's worst space disaster.

Americans watched their TV screens, hoping against the odds that lives might have been spared; radio monitors began searching the airwaves for tell-tale signals of search and rescue efforts.

A tragedy of this magnitude is far reaching; it affects our national pride, our dreams for reaching to the stars, our confidence in science and technology, our emotional involvement with education and with children.

Watching the seven member crew step proudly out to the shuttle that morning--teacher Chris McAuliffe being handed a symbolic apple by a member of the ground technical crew--is an image indelibly etched into our minds and our hearts.

But even as NASA and the Coast Guard continue to look for those elusive bits of wreckage that may provide an answer to the holocaust, a new feeling of commitment to space exploration has taken root.

Signals from Space

Special Edition

by Larry Van Horn

*Oh, I have slipped the surly bonds of earth,
And danced the skies on laughter-silvered wings...
...and put out my hand and touched the face of God.
High Flight - John Gillespie Magee, Jr.*

"Larry, it sure is cold this morning. Let's watch the shuttle go up from the radio room window," said Gayle, my wife, as I tuned up the radio rigs to listen to the launch of STS-51L.

"No problem, honey, I'd prefer to stay in here to listen to the shuttle downlink on 259.7 anyway."

As the countdown got closer my usual pre-launch tension increased. I've seen almost every manned launch by the U.S. but the butterflies never seem to go away.

Hugh Harris's announcements from the Cape quickened as the count reached its final moments.

Perhaps symbolically, as spring signals the rebirth of life after the desolation of winter, the vision of a new shuttle launch as early as June rekindles hope after the devastation of last January.

We know that as the next shuttle rises gracefully on a brilliant plume, the eyes and ears of the world will be watching and listening as never before.

The Panasonic RF-3100 set on WA3NAN's 40 meter frequency never sounded so clear.

As the countdown reached its final moments, I counted down with Harris, "10-9-8-7-6 we have main engine start, 4-3-2-1, and liftoff. Liftoff of the 25th space shuttle mission, and it has cleared the tower."

Gayle and I would not see the shuttle Challenger come into our view from the window for another 30 seconds. There is a large two-story bank that blocks our view behind the house to the southeast.

Like runners passing a baton, Harris handed off the public narration to Steve Nesbitt in Houston right in stride. I heard Dick Scobee call "Roll program." Mission Controllers responded "Roger roll program." I still couldn't hear Challenger direct because they weren't above my radio horizon.

On WA3NAN I heard Nesbitt's call for throttle down to 65%, and altitude and velocity calls, but still no 259.7 downlink.

Then the shuttle


cleared the bank and oh, what a marvelous sight! The binoculars instantly went up to my eyes to improve the view. The silence on the radios seemed like an eternity.

The silence was finally broken by Nesbitt, "Engines throttling up, three engines now 104%." Mission Capcom called, "Challenger, go at throttle-up."

Then 259.7 popped with Dick Scobee's voice, "Roger, go at throttle up."

The horror of the next few minutes is very hard to describe. I have watched enough of these launches to know that SRB's do not separate that early and I have never seen a mushroom cloud in any shuttle contrail. I knew something was wrong and kept staring wide-eyed in the binoculars for signs of the Challenger doing a return-to-launch-site abort. When I heard Nesbitt say, "Flight controllers are looking at the situation. Obviously a major malfunction," I knew it was all over.

After comforting my wife, I immediately went about the task of firing up

 Please turn to p.4

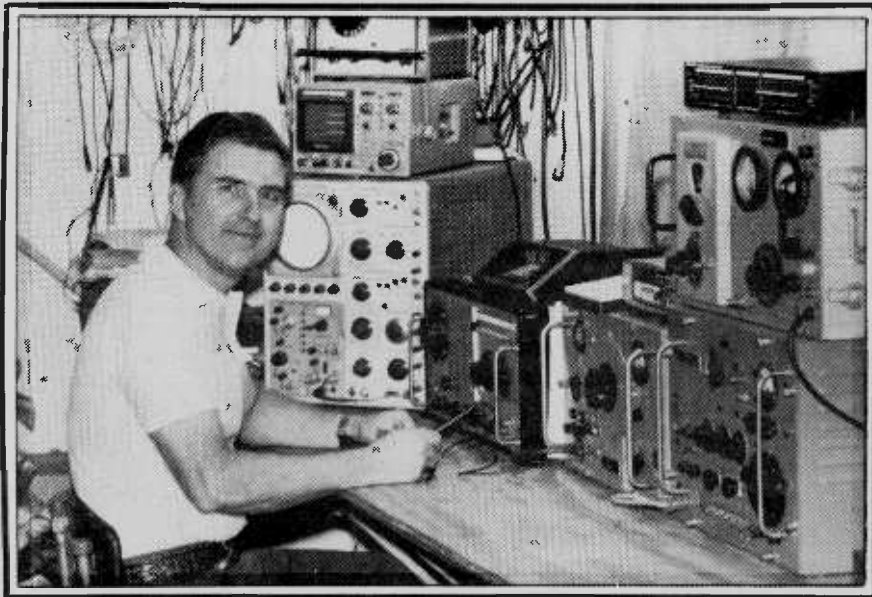


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FROM THE EDITOR



In Praise of ANARC

The Association of North American Radio Clubs has, for over two decades, enjoyed the well deserved reputation of providing cohesion to some 18 hobby radio clubs. Responding to the recent privacy act debacle, ANARC acted with extraordinary skill and professionalism, making it quite clear to Capitol Hill legislators that monitoring of the radio spectrum is shared by a large number of serious hobbyists.

Special thanks must go to Richard T. ("Terry") Colgan, Executive Secretary of ANARC who, with the able support of Robert Horvitz and Michael Peyton of RCMA (Radio Communications Monitoring Association) drafted their statement and made a formal presentation to the House subcommittee on January 30, 1986.

A number of witnesses have been allowed testimony representing the Department of Justice, Tandy Corporation, At&T, IEEE, ARRL, and ACLU. The fact that ANARC was permitted testimony last worked to their advantage since they were able to respond to previous testimony and were allowed to extend their five minute allotment to 20 minutes!

Written statements are also on file for legislators submitted by Monitoring Times, SPACE, Uniden, Regency, and other forces

throughout the communications industry.

In his oral and written presentation, Colgan elegantly pointed out the major factors of objection to the proposed legislation including hazy definitions of "readily accessible to the public" and "electronic communication." He continued by pointing out inconsistencies in exemptions under the stated bill, the attempt by the telephone industry to pass the responsibility of privacy to the listener, and the general unenforceability of the ill-drafted bill.

Colgan offered ANARC's assistance to a more reasonable wording of the bill, including recommendations, and then accepted questions from the floor.

In a related item, the ARRL (American Radio Relay League) departed from their intended ham-only testimony after meeting with ANARC officials and rallied to the support of SWL's and scanner listeners. We were very pleased that ARRL spokesman Perry Williams recognized that this aspect of the radio hobby is not an island unto itself and that large numbers of licensed amateurs come from the pool of listeners.

At this point in time it is vital that we continue to barrage our legislators with letters and postcards expressing our disapproval of HR3378 and S1667. It is a

THE LISTENFEST: Who Wants It?

Several months back, MT suggested that we could sponsor the world's first convention dedicated to learning more about monitoring all part of the spectrum, with seminars and demonstrations of equipment, modes and techniques.

We contacted several key experts and equipment dealers and manufacturers who would be willing to come.

We asked our readers to respond with their interests so that we could plan further and announce a time and place well in advance. Sadly, only about a dozen replies trickled in, hardly enough to get excited about and certainly not enough to plan a major event around.

Of those who did respond, the following suggestions were offered for themes and arrangements:

- SEASON: Spring or summer
- DURATION: Two days
- LODGING/MEALS: MT arrange
- REGISTRATION FEE: \$25
- LOCATION: Large city, near an airport or interstate
- EQUIPMENT DEMONSTRATIONS: Receivers, scanners, weather FAX, satellite reception, antennas, ideal antenna setup for participants to bring own receiver and hook up
- FORUM TOPICS: Interference

NEED TECHNICAL HELP?

We are always pleased to offer assistance to our readers who need more information about our products and services. All we ask is that you include a self-addressed stamped envelope to help offset the cost of return postage. Please add \$1.50 for article reprints.

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

reduction, best receiving equipment, antenna system design, computer interfacing with short-wave receivers, modern receiver design and specifications, antennas for apartment dwellers, grounding procedures, satellite monitoring, lesser known reception modes (RRTY, SSTV, FAX), equipment comparisons

OTHER COMMENTS: Special souvenir issue of MT with photoplay of event; T-shirts commemorating the event; theme name, "MONITOR '86"

So we're at the crossroads. If we receive a sizable number of letters quickly along with some solid suggestions, we might find a home early this summer in Atlanta. It's up to you.

ICOM R7000 UPDATE

Rumors continue to fly concerning the delayed introduction of ICOM's widely publicized R7000 VHF/UHF general coverage receiver.

Untrue were speculations that pending U.S. cellular legislation (Communications Privacy Act of 1985), Japanese customs problems and parts unavailability were holding up production of the revolutionary receiver.

The fact is that early prototypes did not come up to the high standards of performance that ICOM wanted and this required a complete

fact that senators and congressmen examine the volumes of mail supporting or disapproving of proposed legislation so that they know how to respond to their constituency when it is time to vote.

A complete list of your legislators and their common addresses was published in the January 1986 issue of MT. Keep those cards and letters coming, folks! ●

redesign of one circuit board with appropriate changes elsewhere in the receiver.

As of this writing ICOM expects "a very small trickle" of the new model to come into this country in the March/April time frame. They do not expect to catch up on the severe back order situation until this summer.

In spite of the delay, prospective customers recognize the wisdom of placing their orders now so that they can receive their radios in sequence as soon as they arrive in port.

Some dealers are requiring a down payment to reserve an R7000. Grove Enterprises requires only a charge card number or check on file; the order will not actually be processed until the customer has been notified that the receivers are in and ready for shipment.

Although ICOM suggests a retail price of \$899, most mail order companies are offering the receiver at a \$100 discount. ICOM has



Viewpoint

PRODUCT REVIEWS

I have just a few quick comments regarding your "review of the reviews" of the Sony ICF-2010. It's unfortunately the case that many, if not all, of the 2010's are improperly aligned/adjusted straight out of the box. Here at Radio Plus+, in fact, we've yet to see one that performs to its potential right from the factory.

The principal faulty adjustment seems to occur in the SSB/SYNC circuitry and is probably responsible for the occasional negative review of these modes of the 2010 for the past several months and have detected no unusual sounds (other than the normal "thwoop-thwoop" of the synthesizer during frequency changes); nor have I had any problems attaining natural-sounding SSB speech in the 100 Hz tuning mode.

In my personal opinion, the 2010 is obviously the most advanced portable ever produced, offers a level of performance unmatched by any other radio under \$500, and has features and flexibility unattainable at any price. These are strong statements, I know, but I remain in a state of awe of this radio (and not because I sell them; in fact, I make less on Sony products than any other brand).

I have found only two things about the 2010 that I don't like--Sony's continuing predilection for carrying straps instead of handles and Sony's now characteristic audio. Still, if faced with having to choose from among my many radios, I would be hard pressed to choose between the 2010 and my modified ICOM R-70. The 2010's portability, good battery life and synchronous detection circuitry would carry a lot of weight.

Incidentally, if any MT readers who have the 2010 would like a copy of the procedure for adjusting the SSB/SYNC circuit, an SASE to me will get one to them.

Gerry Thomas

Radio Plus+ Electronics
3635 Chastain Way
Pensacola, FL 32503

I noticed a recent MT review of the Realistic PRO-
Please turn to p.37

ICOM R7000 cont'd

announced an across-the-board price hike due to devaluation of the dollar which will affect the resale figure of the R7000 when it finally arrives.

FORUM

User-Programmable 2-Way Radios: A New Threat to Communicators

The scheme of frequency synthesis matured during the heyday of CB; a small number of crystals could be used to produce a large number of channels. The concept has continued into scanners, short wave receivers, ham gear, and now into commercial two-way business radios as well.

But the convenience and luxury have proven to be a double-edged sword; while an advantage to the service shop and customer alike--no long wait for expensive crystals--the temptation to use these rigs on unauthorized frequencies is irresistible to many owners.

The rigs are showing up on channels throughout the land mobile services, without benefit of license, causing interference to legitimate users and considerable consternation to the FCC. Many industry leaders are calling for their removal from the marketplace.

This month MT reader Floyd H. Miltz, a licensed and certified electronics technician, shares the FORUM spotlight with some thoughts on the problem.

Congratulations and hats off to the communications publication who just recently has shown the guts to address an obviously sensitive topic, that being the uncontrolled proliferation of the "user-programmable" two-way radio.

Agreeably, there are two sides to the coin, but unbiased logic actually reveals the only opponents to the restriction of such units are the misusers, and the manufacturers who offer flimsy profit-motivated justifications to defend a small loss of their overall market.

Excuses that blame dealers for releasing technical information hold some validity due to the fact that many of the "dealers" are actually small-volume organizations and individuals who have discovered the minimal requirements imposed by certain manufacturers allowing easy access to their goods. They are not, surprisingly, the same individuals who enjoyed short but lucrative sales during the boom years of illegal CB modifications, sets and accessories.

Case in point: was the "radio" the problem then? If the FCC had held that philosophy, the solution would have been to enforce air violations, restrict and recall most CB radios. Their answer was to admit failure due to the incredible

enforcement conundrum and "deregulate" CB.

That word "deregulate" has been thoroughly saturating the bona-fide land mobile industry for the last three years, and if continued in its present financial headway, will surely lead to the unfortunate and irreversible degradation of a billion-dollar industry currently maintained by hard-working, honest professionals. The FCC, as well as the technical professional, has a duty to protect and preserve one of our rare remaining resources, the radio spectrum.

The solution is not just to allocate additional dwindling frequency space, but to insure also that radio designs will continue to restrict setup procedures to those who are technically and financially competent to do so. Denial of type-acceptance is definitely an easier alternative than adding enforcement responsibility to an already depleted Commission Bureau.

Let's not again allow profits to outweigh moral sensibilities. Since we all know who we are let's all do our part. Majority rules.

Floyd H. Miltz, C.E.T.
830 Arianna, N.W.

Grand Rapids, MI 49504
MT offers FORUM as space permits to allow exchange of philosophies which affect the communications industry.

Grove to be at Dayton

Each year in Dayton, Ohio, over 20,000 amateur radio operators and electronics enthusiasts meet at the world's largest hamfest, the Dayton Hamvention.

Again this year, Bob Grove will be there conducting a forum on listening to the spectrum as well as representing Grove Enterprises and Monitoring. Times in an exhibitor's booth for the three day affair.

- ★ TECHNICAL FORUMS
- ★ ARRL AND FCC FORUMS
- ★ GIANT 3-DAY FLEA MARKET
Starting Noon Friday
All Day Saturday and Sunday
- ★ LICENSE EXAMINATIONS
- ★ NEW PRODUCTS AND EXHIBITS
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- ★ ALTERNATIVE ACTIVITIES
- ★ SPECIAL GROUP MEETINGS
- ★ YL FORUM
- ★ PERSONAL COMPUTER FORUM
- ★ CW PROFICIENCY AWARDS
- ★ AMATEUR OF YEAR AWARD
- ★ SPECIAL ACHIEVEMENT AWARDS

ADMISSION

\$8 in advance, \$10 at door.
(Valid for all 3 days)

BANQUET

\$14 in advance, \$16 at door.

FLEA MARKET SPACE

\$20 in advance.
(Valid for all 3 days)

Checks for advance registration to
Dayton HAMVENTION
Box 2205, Dayton, OH 45401.

Registration processing
starts Jan. 1, 1986.

(Admission tickets must be ordered
with Flea Market spaces.)

DAYTON Hamvention®

April 25, 26, 27, 1986

Hara Arena and Exhibition Center — Dayton, Ohio

Meet your amateur radio friends from all over the world at the internationally famous Dayton HAMVENTION.

Seating will be limited for Grand Banquet and Entertainment on Saturday evening so please make reservations early.

If you have registered within the last 3 years you will receive a brochure in January. If not, write Box 44, Dayton, OH 45401.

Nominations are requested for Radio Amateur of the Year and Special Achievement Awards. Nomination forms are available from Awards Chairman, Box 44, Dayton, OH 45401.

For motel rates and reservations write to Hamvention Housing, 1980 Kettering Tower, Dayton, OH 45423-1980. Housing information phone, (513) 223-2612.
NO RESERVATIONS WILL BE ACCEPTED BY TELEPHONE.

All other inquiries write Box 44, Dayton, OH 45401 or phone (513) 433-7720.

ALL Flea Market spaces will be sold in advance ONLY. NO spaces sold at gate. Entrance for set-up available starting Wednesday. Special Flea Market telephone (513) 223-0923.

Bring your family and enjoy a great weekend in Dayton.

Sponsored by the Dayton Amateur Radio Association, Inc.

SIGNALS FROM SPACE from p.1

new frequencies in the radios to find out as much as I could. Shortwave frequencies normally quiet came alive with activity. Scanner frequencies used by chase aircraft and rescue teams buzzed almost constantly with activity.

My main concern was the health of the crew, so I immediately turned to several references on the bookshelf for a possible HF frequency where I could hear recovery forces. The Search and Rescue frequency 5.680 proved to be the correct choice as Cape Leader was already here coordinating ships and aircraft to stay out of the area because of falling debris.

After the range safety officer gave the all clear, ships and aircraft were vectored into the impact area to commence what turned out to be an eleven day search in the Atlantic.

During those next eleven days I was working the night shift, so I could be home during the day when search efforts were underway. 5.680 MHz was used as the primary day search frequency and 3.023 MHz was used at night.

A lot of information was passed on these frequencies including other frequencies that were being used by the search group. The U.S. Coast Guard Cutter Dallas, On Scene Commander, and Cape Leader at the Cape comprised the hub for the operations. Usually, one of the on-scene C-130 aircraft was used each day to be in charge of aircraft assets involved in the search.

I have included in this article all the ships and aircraft that were used during the eleven days of monitoring the search effort. I have also included all the frequencies that were noted with shuttle-related traffic during the eleven days.

On January 31, Friday, I spent a frantic two hours searching for the shuttle SAR group. They had now shifted to a new daytime frequency. After consulting with my frequency library a check was made of 4.376 MHz. The whole group was there and I settled back in the listening groove once more.

Each day of the search brought more information on what was being found, new frequencies, and call signs. It seemed like a whole new spectrum of shuttle frequencies never before active now become the central focus for the drama being played out on the Atlantic.

Thursday, February 6,

CALL SIGNS NOTED DURING SAR OPERATION FOR MISSION STS-51L

Ship Call Signs

- CGC Alert (WMEC 630)
- CGC Bear (WMEC 901)
- CGC Cherokee (WMEC 165)
- CGC Dallas (WHEC 716)
- CGC Dauntless (WMEC 624)
- CGC Harriet Lane (WMEC 903)
- CGC Pt. Roberts (WPB 82332)
- CGC Sweetgum (WLB 309)
- CGC Tampa (WMEC 902)
- Navy Patrol Boat 758
- Navy Patrol Boat 778
- USS Aubrey Fitch (FFG 34)
- USS Koelsch (FF 1049)
- USS Preserver (ARS 8)
- USS Sampson (DDG-10)
- USS Simpson (FFG 56)
- USS Underwood (FFG 36)
- USS W.S. Sims (FF 1059)
- UTC Freedom Star (NASA)
- UTC Independence (NASA)
- UTC Liberty Star (NASA)

Aircraft Call Signs

- CG 1377 (H-52A)
- CG 1424 (H-3)

saw still another shift in the daytime primary frequency. The SAR group was conducting its search farther north off the South and North Carolina coasts. Propagation dictated that a better long-range frequency was needed so that units could still talk to the Cape. Again after a lengthy search, I found the SAR group on a NASA frequency 7.412 MHz. This frequency was later shifted to 2.103 MHz but Cape Radio couldn't tune their transmitters that low so a move back to 4.376 was made late in the afternoon.

On Friday, February 7, late in the morning I again tuned into the SAR net but much to my surprise all I heard was scrambled voice. All the units in the group, surface and air, were using some form of blindsplitting or rolling code encryption to disguise their activities. The surface search was called off that Friday evening.

Even as this is being written, I am still listening to Navy and NASA surface vessels conduct the subsurface phase of operations in the Atlantic. This will probably go on for some time.

In the meantime, the nation still mourns the death of seven brave heroes. It's a cold day in January that Gayle and I will always remember.

- * * * -

Dick, Mike, Judy, El, Ron, Greg and Christa, your families and your country mourn your passing. We bid you goodbye, but we will never forget you.

- CG 1476 (H-3)
- CG 1488 (H-3F)
- CG 1494 (H-3F)
- CG 1704 (HC-130)
- CG 1710 (HC-130)
- CG 1711 (HC-130)
- CG 1714 (HC-130)
- CG 1715 (HC-130)
- CG 2111 (HU-25A)
- CG 2118 (HU-25A)
- CG 2122 (HU-25A)
- CG 2123 (HU-25A)
- CG 2131 (HU-25A)
- CG 2133 (HU-25A)
- CG 2135 (HU-25A)
- AF-819 (??)
- Angel 01 Marine (EH-46 Helo)
- Gull 20 USAF (WC-130)
- Jolly 88 USAF (SH-3 Helo)
- Jolly 97 USAF (SH-3 Helo)
- Navy India Charlie (P-3)
- Navy LA015 (P-3)
- Navy LR243 (P-3)
- Navy Rescue 322 (P-3)
- Navy SAR 247 (P-3)
- Navy U52C (P-3)
- Navy XE4E (P-3)
- Peapod 01-03 USAF (AC-130)
- Proud Warrior 421-426,433, 435 (SH-60 Helos)
- Vidar 92 (Navy S-3)
- Vidar 98 (Navy S-3)

Other Call Signs

- Canaveral Control
- Cape Radio
- Cape Leader (individual in charge SAR)
- CG Group Key West
- CG Group Mayport
- COMSTA Miami (NMA)
- Miami Ops (CG Operations)
- Patrick ACO (Air Coordination Officer)
- Patrick Rescue Ops
- RCC Miami (Miami CG)
- Sealord (Navy JAX FACSAC)
- Thinker 1 (Person in charge of surface/air SAR ops)
- Thinker 1 Romeo (replacement for Thinker)

FREQUENCIES USED FOLLOWING STS-51L DISASTER 1/28/1986

- 2.622 NASA SRB recovery vessels (undersea search)
- 2.764 NASA SRB recovery vessels (undersea search)
- 2.716 NASA SAR ch. (SRB recovery vessels)
- 3.023 Pri SAR nighttime
- 3.130 Navy JAX
- 3.187 Navy
- 4.376 Pri SAR day 1/31-2/5
- 4.400 CG Cutter Dallas to Miami COMSTA
- 4.704 Navy
- 4.900 Air Force/NASA
- 5.680 Pri SAR day 1/28-30
- 5.692 CG SAR aircraft
- 6.696 CG SAR aircraft
- 5.710 NASA channel
- 5.810 NASA calling ch nighttime primary
- 6.518 CG Cutter Dallas to Miami COMSTA
- 6.720 Navy SAR
- 6.742 Navy JAX
- 7.412 Pri SAR day 2/6-7
- 7.461 NASA SAR in impact area
- 8.876 NOAA weather info KJY-74 Miami

- 8.964 NASA
- 8.972 Navy
- 8.984 CG Miami Ops working SAR units
- 8.984 CG SAR aircraft
- 9.023 USAF ch (admin)
- 10.780 NASA calling ch. day primary
- 11.201 CG SAR aircraft
- 11.252 Navy JAX
- 20.186 NASA Ascension Is. tracking station
- 120.950 CG SAR air working Navy JAX FACSAC
- 122.9-
- 123.9 Numerous SAR aircraft
- 123.100 Cape-Air/surface SAR
- 157.025 Marine ch 81--CG surface/air SAR
- 157.100 Marine ch 22--CG SAR
- 163.0 Data marker buoy paired w/326.0 MHz
- 164.5 Data marker buoy paired w/329.0 MHz
- 172.750 SAR drop buoy (72 hr lifetime)
- 240.6 Data marker buoys (DMB)
- 259.7 STS spacecraft primary UHF downlink
- 260.0 Navy surface to aircraft (SAR)
- 261.5 "Hammer Ace"-emergency satellite network (Fleetsatcom)
- 264.8 Cape ("Thinker 1") to aircraft (SAR/Chase)
- 267.5 Navy JAX FACSAC Air Traffic Control ("Sealord")
- 270.0 Navy surface to aircraft (SAR)
- 275.1 CG rescue beacons
- 282.8 SAR ship/air and ship/ship
- 284.0 Shuttle Landing Facility Tower
- 284.5 SAR aircraft to Navy JAX FACSAC
- 289.4 Patrick AFB Clearance Delivery
- 294.6 "Variety" net(recovery vessels & chase aircraft)
- 297.2 Patrick AFB GCA Discrete channel
- 313.7 Navy Fleet Secure (Scrambling)
- 326.0 Data marker buoy paired w/163.0
- 329.0 Data marker buoy paired w/164.5 MHz
- 335.8 Patrick Ground Cntrl
- 338.1 SAR Helos working surface units
- 340.9 Patrick Approach/Departure Ctrl (So)
- 344.6 Patrick Metro (Weather info)
- 348.4 Patrick Tower
- 358.3 Patrick Approach/Departure Control
- 369.9 SAR Aircraft to Navy JAX FACSAC (Patrick AFB remote)
- 372.2 Patrick pilot to dispatcher at Base Ops
- 381.8 SAR ship/air coord
- 383.0 Patrick Consolidated Command Post ("Raymond 20")
- 393.0 Cape Canaveral skid strip tower



The Future Course of Monitoring Laws



by Bob McGovern

Most of us have read or have been otherwise told of the efforts made in California to "infringe" on our monitoring activities. Unless some of us take a more active interest in the protection and advancement of our hobby activities, we may find ourselves in real trouble or "out in the cold" depending upon what transpires during the next twelve months. Let's examine where we are at the present time.

California and its population of twenty million plus has the greatest number of monitor radio listeners. It also features State Senate Bill 1431. Several changes were made in the bill before its passage.

Originally, the bill called for it to be unlawful to manufacture, sell or use any radio capable of receiving mobile telephone calls. This was later modified to prohibit only the use of "special devices" designed to specifically receive the 800 MHz signals allocated to cellular mobile phones, and finally watered down to prevent malicious eavesdropping for criminal purposes.

Major supporters of this bill included telephone companies and the American Civil Liberties Union! Opponents of this bill felt very strongly that it conflicts with the Communications Act of 1934 which permits anyone the right to monitor any frequency for private use only.

S.B. 1431 may present several problems. Envision the owner of a Regency MX-5000 (not capable of receiving 800 MHz without external support), mounted in his vehicle, driving through any California county which does not have a county ordinance prohibiting mobile monitoring receivers. Perhaps the operator of the vehicle is not listening to mobile phone conversations, but to some business band activity.

All of a sudden he is stopped by an average police officer for a minor traffic violation and is questioned about the radio by the police officer who probably has read a very short paragraph on a legislative advance sheet which presents the law along with other newly enacted laws. Let's assume that the officer knows little about scanners and feels that the owner is in violation of the newly enacted law (to the officer, all scanners are illegal).

What happens?

Whatever course of action that the officer takes will probably be decided upon (1) the officer's knowledge of scanners and radio frequency allocations (probably very limited), and (2) the attitude of the violator towards the officer. Most serious listeners know that the MX-5000 won't cover the 800-950 MHz band, but what does the police officer know or, even worse, what does he think he knows?

Can you imagine the situation where the officer feels that he must uphold the law and take action against anything that is "against the peace and dignity of the State of California and contrary to the form, force, and effect of cases, made and provided."

If the officer feels that the subject has violated the law, what happens next? Is the driver arrested, his vehicle impounded (not to mention the scanner)? If the driver tries to convince the officer via a demonstration that his MX-5000 cannot receive cellular mobile phone calls and includes an explanation of frequency band allocations, all of this may sound "Greek" to the officer and he simply ignores the driver, now his prisoner. This could happen to you.

The point is very simple. Serious problems will surface and we as law-abiding monitor radio listeners will suffer one way or another. Banning the sale of such receivers is a form of "channel withdrawal" and would hurt many of us who are "addicted" to this wonderful hobby.

Consider another situation. You are a home owner, like myself, who possess nine scanners in a radio room atmosphere along with other unrelated radio and computer gear. A visitor to your residence might feel that anyone who owns a scanner is a "criminal" and informs the local law enforcement agency of what he has seen.

Is there sufficient probable cause to have a search warrant prepared and signed by a judge? I'd like to see the average detective try to prepare one. It would probably contain many inaccuracies, but would it "satisfy" a court of law? A legal answer to this question could fill this edition of MT and the editor won't

bore you with the 4th amendment of the U.S. Constitution and case law relating to search and seizure.

Again, the problem relates to interpretation of the law and its enforcement. The constitutionality of it will probably be tested and will take lots of time and money. Needless to say, some people will suffer from this legislation.

ENTER HR-3375

Not too long ago, a bill began in Congress and was sponsored by Representative Robert W. Kastenmeier (Democrat from Wisconsin) and is sometimes referred to as the "Electronic Communications Privacy Act of 1985" (see Jan 86 MT). A related Senate bill was introduced by Senator Patrick Leahy (Democrat from Vermont).

In general terms, H.R. 3378 may seriously impact those of us who monitor any radio activity other than standard broadcast band transmissions (common AM-FM radio), ordinary police and fire traffic, citizens band, amateur radio service, and certain other specified types of traffic. In other words, you as a hobbyist and law abiding citizen would be prohibited by law from listening to radio transmissions that do not fall into any of those categories.

This probably means the end to federal government law enforcement monitoring even though most federal agencies use or have access to digital voice protection scrambling, U.S. military traffic (aircraft in flight, ships at sea, ground operations, coded messages, etc), all mobile telephone traffic, business band communications, railroad activity, and probably commercial aviation transmissions as well.

I wonder what short-wave radio listeners may or may not monitor, without breaking the law? Can we monitor the local road department? Routine administrative communications in our community? Aside from restricting what we can and cannot listen to as is done in police states in some eastern bloc European countries, economic impact will be felt by radio equipment manufacturers and those engaged in the sales of such equipment.

Will continuous coverage receivers like the Regency MX-5000, MX-7000 or the ICOM R-7000 become illegal to produce and market? Imagine the loss of profits, not to mention jobs, for people in the commerce of these radios.

You might ask, "Will it

be unlawful for us to possess equipment acquired long before the enactment of such a law? Could you legally resell this used equipment? Must we surrender our "illegal eavesdropping equipment" like a community which adopts a municipal ordinance banning handguns for home owners? Even though H.R. 3378 might not outlaw possession of the equipment, the banning of these receivers could come next.

If two-way radio users such as the federal government, state and local governments, businesses, and others who fall under the "Privacy Provisions" feel that there is a compelling need for communications security, why don't they use scrambling techniques and equipment that is readily available? This would prevent nearly all of us from "eavesdropping" on these transmissions, not to mention the criminal element that might otherwise monitor, for example, federal law enforcement agencies while conducting illicit activity such as drug smuggling. Obviously, even if H.R. 3378 is enacted into law, many hobbyists will continue to listen to these "illegal frequencies" in a low profile manner.

I hope that every reader of this article is incensed by these unwarranted intrusions into our liberties by the cellular mobile phone industry and other groups who purvey H.R. 3378. If we are to prevail in our monitoring activities, our collective viewpoint MUST be made known to EVERY member of Congress, in both the House and Senate, BEFORE the bill passes both Houses of Congress.

Write your U.S. Congressman and U.S. Senator and tell him or her of your viewpoint. Suggest that if the users are really concerned about privacy in the airwaves, a bill permitting all users of communications to use scrambling equipment would be more appropriate. This would almost insure their privacy and free us to monitor whatever was not scrambled without breaking any law.

Such a revised bill would benefit the manufacturers of scrambling equipment in the form of more sales and, at the same time, manufacturers of scanner equipment would probably not see a significant drop in their own sales.

If you really care about your monitoring future, write your legislators NOW. A complete list appeared in the January 1986 issue of MT.



by
Don Schimmel

**516 Kingsley Rd SW
Vienna, VA 22180**

I have mailed a packet of information concerning HR3378 and S1667 to my Senator and my Congressman. I hope that all readers will take the time to write their respective legislators and

express your concern regarding the companion bills. If you want to continue to enjoy your SWL activities, please voice your disapproval of the proposal currently being discussed.

* The mailbag offers some interesting comments from various readers. One letter will state that I should discontinue voice loggings and concentrate on CW items. Along comes another letter and this one says that CW and RTTY should be discontinued and to concentrate on voice intercepts!

When Bob Grove and I first discussed the undertaking of the UTILITY INTRIGUE column, it was the intention to devote the

major effort to CW transmissions. As various readers wrote in indicating their preferences, I increased somewhat the voice items and added RTTY material. In the near future I hope to be able to add facsimile transmissions as well.

The only way to try to satisfy everyone is to attempt to balance the various modes and devote equal time to all of them. Of course, it is impossible to do this precisely each and every month but I do try and I think a good example of this is a previous month where there were 17 RTTY, 16 CW/MCW and 19 USB/AM items.

* A very strange transmission was seen on 7660 kHz at 141014Z. This CW signal consisted of dits being sent very slowly at first, then increasing speed to a rapid rate and stopping. Then dashes commenced very slowly, increasing speed to a rapid rate and stopping. Then dashes commenced very slowly, increased in speed to a rapid rate and then back to dits again. I stayed with this for over 15 minutes but no identification was obtained.

* I added two more books to my bookshelf this month. U.S. MILITARY RADIO COMMUNICATIONS by Michiel Schaay is the first of a series of scheduled books dealing with US Military/Government communications. The just released volume covers point-to-point frequencies utilized by the US Military in various regions of the world. The price is \$12.95 (plus \$1.00 shipping) and it is available from Universal Shortwave Radio, 1280 Aida Drive, Reynoldsburg, Ohio 43068 and from other MT advertisers also.

The next book, INTELLIGENCE WARFARE, is a very informative treatment of the subject of Intelligence. You can get this one from Publishers Central Bureau, One Champion Ave., Avenel, NJ 07001 and it is priced at \$9.98 (plus \$2.95 shipping/

handling). The PCB catalog number for the book is 412640.

The various phases of the Intelligence process are thoroughly discussed and chapter five, "Intelligence and the Electronic Battlefield," will be of particular interest to SWLers.

* Reader Orman Darby of Bellingham, WA, shared an interesting item with us. The RTTY signal was at 60 wpm on 14088 kHz. Amateur radio station K1MAN was handling a list of 1500 survivors who were known to be alive and in hospitals in Colombia following the volcano eruption and the mud slide on Nevado del Ruiz near Amero, Colombia. Thanks for the info, Orman.

Below is a photo of the screen of his video monitor showing the names being listed. Orman uses an AEA CP-1 demodulator, Panasonic RF-3100, SWL Text with Commodore 64, and a Zenith 13 inch TV for his monitor.

* Former Secretary of State Alexander M. Haig, Jr., was the featured speaker at the Winter Luncheon of the Association of Former Intelligence Officers. His remarks were very interesting and he made several references to the technical collection of Signals Intelligence (SIGINT). I got the distinct impression this man will be heard from frequently in the future as it certainly seems likely Mr. Haig will be seeking political office.

* It was approximately 140 years ago that Samuel Morse, inventor of the telegraph, sent the first telegraphic message. Morse had demonstrated his communication method to President Van Buren in 1838, and finally in 1843 Congress appropriated \$30,000 to construct a 40 mile, Washington, D.C., to Baltimore, MD, experimental telegraph line. One year later Morse sent the famous telegram, "What Hath God Wrought!", beginning the

WHO HAS CELLULAR?

The development of cellular mobile radio has been so meteoric that many listeners are unaware of the use of cellular telephone in their areas. Not only that, but the inclusion of the 806-960 MHz range on scanners is still in its infancy.

The following list of cities reflects those cities in the U.S. in which cellu-

lar is presently in use or is due for implementation within the next few months.

The use of cellular techniques in Canada is still in its embryonic state, but we have included a short list of those cities in which it is in use as well.

We would like to thank Personal Communications for the information presented below.

UNITED STATES

Akron, OH
Albany, NY
Albuquerque, NM
Allentown, PA
Atlanta, GA
Austin, TX
Baltimore, MD
Baton Rouge, LA
Birmingham, AL
Boston, MA
Bridgeport/Stamford, CT
Buffalo, NY
Canton, OH
Charleston, SC
Charlotte, NC
Chattanooga, TN
Chicago, IL
Cincinnati, OH
Cleveland, OH
Columbus, OH
Dallas, TX
Dayton, OH
Denver, CO
Detroit, MI
El Paso, TX
Flint, MI
Fresno, CA
Gary, IN
Grand Rapids, MI
Greensboro, NC
Greenville/Spartanburg, SC
Gulf of Mexico
Hartford, CT

Harrisburg, PA
Honolulu, HI
Houston, TX
Indianapolis, IN
Jacksonville, FL
Johnson City, TN
Kansas City, MO
Knoxville, TN
Lansing/E. Lansing, MI
Las Vegas, NV
Long Branch, NJ
Los Angeles, CA
Louisville, KY
Memphis, TN
Miami/Ft. Lauderdale, FL
Milwaukee, WI
Minneapolis/St. Paul, MN
Mobile, AL
Nashville, TN
New Bedford, MA
New Brunswick, NJ
New Haven, CT
New Orleans, LA
New York, NY
Norfolk, VA
Oklahoma City, OK
Omaha, NB
Orlando, FL
Oxnard/Ventura, CA
Philadelphia, PA
Phoenix, AZ
Pittsburgh, PA
Portland, OR
Providence, RI
Raleigh-Durham, NC
Richmond, VA
Rochester, NY

Sacramento, CA
Salt Lake City, UT
San Antonio, TX
San Diego, CA
San Francisco, CA
San Jose, CA
Seattle, WA
Shawnee-Tecumseh, OK
St. Louis, MO
Springfield, MA
Syracuse, NY
Tacoma, WA
Tampa/St Petersburg, FL
Toledo, OH
Tucson, AZ
Tulsa, OK
Washington, DC
West Palm Beach, FL
Wilmington, DE
Wichita, KS
Worcester, MA
Youngstown, OH

CITY/MARKET AREA

CANADA

Hamilton, Ontario
Kitchener, Ontario
London, Ontario
Montreal, Quebec
Oshawa, Ontario
Ottawa, Ontario
Quebec City, Quebec
Toronto, Ontario
Vancouver, B.C.

Where Do You Get Cellular Frequency Lists?

Keeping track of the enormous number of cellular frequencies (over 600) available for mobile radio-telephone is a staggering bookkeeping task for FCC clerks. As a result, the licensee files are kept only in Washington. There is no point in contacting your local FCC office for these.

If you are interested in examining licenses for the cellular service in order to extract frequency assignments for your area, call the FCC in advance for an appointment and to check for available office hours.

The FCC License Facility is on the sixth floor of the FCC building at 1919 M Street in Washington, D.C.



UTILITY INTRIGUE cont'd

vast communications field which exists today.

The changes taking place in the years since those early days are aptly described in a pamphlet I

ran across which was published by the Western Union Corporation entitled, "From Wire to Westar" and I assume one could obtain a copy of the pamphlet by writing to WU at One Lake Street, Upper Saddle River, NJ 07458. ●

SCANNING

Antennas for Scanners

by Jim Dantin

Now that I've built and used the "coaxial-collinear" antenna described in my November 1985 MT article ("Build This High Performance Indoor Scanner Antenna"), it's time for a discussion of other antenna choices and a comparison test to evaluate their relative performances.

Soon after purchasing the Bearcat 100 scanner in June 1982, I began experimenting with ways to improve reception. I quickly realized that the original equipment rubber duckie offered very little other than compact size. It was replaced with a Centurion International (Box 82846, Lincoln, NE 68501) "A-TRI-BC."

Since I have one of the early model scanners, I also purchased one of Centurion's adapters, the "BN-BC," which gave my scanner a BNC antenna connector.

The dramatic improvement in reception offered by the Centurion duckie can probably be attributed to its increased size; at 11"

long, it almost doubles the 6" of the original Bearcat unit. This added length does not significantly hurt the scanner's portability--it still rides in its belt holster fine--but it's a little top heavy if you stand it on a table.

AN OUTSIDE ANTENNA

The addition of the BNC antenna connector gave me the opportunity to easily connect a wide variety of other antennas. I purchased a Channel Master Monitenna to mount on my rooftop. This monster is 126" end-to-end and resembles a pair of pitchforks--this "decoration" was not well received by my wife!

Beauty comes second to performance, however, and the rooftop antenna brought in a massive increase of new stations--making me rather reluctant to go back to duckies! Since I bought the Bearcat mainly for its portability, I had become accustomed to carrying it around the house--the rooftop antenna spoiled that habit right away. Once you

LOGGED DECEMBER 1985		
KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
194	230228	MCW/TUK (NANTUCKET MEMORIAL AIRPORT MA)
198	230055	MCW/DIW (DIXON, NC) BEACON
216	230038	MCW/CLB (CAROLINA BEACH, NEW HANOVER COUNTY, NC) BEACON
219	230040	MCW/BA (BALTIMORE-WASHINGTON INT. AIRPORT, MD) BEACON
219	230041	MCW/DA (DAVISON ARMY AIRFIELD, FORT BELVOIR, VA) BEACON
227	230044	MCW/GDX (UPPERVILLE, VA) BEACON
232	230048	MCW/MX (JENKINS, ANDREWS AFB, CAMP SPRINGS, MD) BEACON
323	200349	MCW/GTN (GEORGETOWN, WASHINGTON DC)
332	200329	MCW/DC (NATIONAL AIRPORT, WASH, DC)
378	241025	CW/GFG (LEESBURG, (GODFREY), VA
396	200337	CW/ZBB (BIMINI, BAHAMAS) BEACON
404	200334	CW/IUB (BALTIMORE, MD) BEACON
432	200343	CW/MHP (METTER MUNICIPAL AIRPORT, GA)
435	241030	CW/XMAS GREETINGS SENT TO EXXON SHIP FROM EXXON MANAGEMENT.
3457.8	140938	CW/NCO DE KCU & GUT DE KCU (UNIDEN)
3485.7	140945	USE/NY TERMINAL FORECAST/WX IN EE
4545	200102	CW/NO CALLS/SPANISH PT
6351	141002	CW/DE WMH (BALTIMORE, MD) CALLTAPE
6604.6	141005	USE/WX IN EE, MIDWESTERN LOCATIONS
7514	192329	RTTY 75-425/MSG HEADINGS SENT IN CLEAR FOLLOWED BY MULTIRPTD LETTER D THEN INTO ENCIIPHERED TRANSMISSION.
7540	192352	CW/NO CALLS/POSSIBLE LA NAVAL NET
7840	141019	RTTY 50-425/MAP (MAGHREB ARABE PRESSE) PRESS ITEMS IN FRENCH.
10136.6	211916	RTTY 50-850/DE TNL96-TNL97 (BRAZZAVILLE CONGO) RY'S
10598.3	291232	CW/LVT LVT (ARGENTINE ALLOC)
10950	302204	RTTY 75-850/WBR70 MIAMI, FLA) CODED WX
13167	132207	USE/SS-OM, MILITARY SOUNDING TFC
13170	221958	USE/WOM (MIAMI, FL) HIGH SEAS RADIO WORKING ROYAL VIKING CRUISE SHIP WITH PHONE PATCH.
13185.1	201851	USE/YL IN CONVERSATION IN PORTUGUESE
13188.3	301509	USE/CONVERSATION IN FRENCH, SOUNDS LIKE ONE STN IS SENDING A LIST AND RPTNG WORDS TWICE.
13244.6	201853	USE/UNIDEN STN REQUEST NORFOLK WX
13390.6	211458	CW/DE K1D8 (UNIDEN) SHIFTS TO RTTY 75-425 BUT IT APPARENTLY ENCIIPHERED
13440.7	211509	CW/822 822 822 1 (NBRS BRDCST UPCOMING) THEN SENDS 508 68 AND INTO 5F GRPS, CUTS ZERO AS T.
13470	211705	AM/SS-YL WITH 5F GRPS
13624	202107	RTTY 75-850/WBR70 (MIAMI, FL) CODED WX
14472	222011	USE/MARS PHONE PATCH
14874	231915	RTTY 50-850/NO IDENT SENT, QUICK BROWN FOX TAPE REPEATS OVER & OVER
14900	231912	RTTY 50-425/TASS (SOVIET NEWS AGENCY) PRESS ITEMS IN ENGLISH
16346	211736	RTTY 50-425/TASS (SOVIET NEWS AGENCY) PRESS ITEMS IN ENGLISH
16448	211726	CW/SRK (UNIDEN) 5F GRPS SENT VERY FAST ZERO CUT AS T.
16728	202110	CW/JCU (CHOSI, JAPAN)
17104	132058	CW/FAAN DE FUF (FRENCH SHIP FROM FRENCH NAVY STN, FORT DE FRANCE, MARTINIQUE, WX IN FRENCH
17122	132105	RTTY 50-850/DE PWZ33 (BRAZILIAN NAVY, FIO DE JANEIRO) RY'S
18126	201847	RTTY 50-425/NO CALLS/5F GROUPS
19068.4	301523	RTTY 50-425/MAP (MAGHREB ARABE PRESSE) CNB CALLSIGNS (MOROCCO ALLOC) SENDING FREQUENCY/TIMES SCHEDULE
19446	201839	RTTY 50-425/TASS (SOVIET NEWS AGENCY) PRESS ITEMS IN ENGLISH
23168.3	211407	CW/DE CLP12 (UNLOCATED), CLP1 (HAVANA) TELLS CLP12 TO QSY 18000.

MONITOR

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SCANNING cont'd

get used to listening to a set of channels that come in fine with the rooftop, you don't want to give up half of them when you use the duckie!

About that time, an article in Monitoring times described the construction of a collapsible whip antenna for portable scanners. I built one and found that it worked significantly better than the duckies, but the added length was awkward to handle. Grove is producing a commercial product based on that design--the ANT-8. If you have need for improved performance and can put up with the length, it's a good buy.

My "coaxial-collinear" performs better than any other indoor antenna that I have tried but it still didn't equal the pull of the rooftop monster. I decided to try some electronic assistance and ordered the Grove Power Ant (ANT-4C).

The combination of the ANT-4C preamp and the "coaxial-collinear" virtually equalled the rooftop's performance! This was surprising, since I felt that the added height should give the edge to the rooftop. Now that I had equal performance from both antennas, I had

the uncomfortable feeling that something was "wrong" with my rooftop installation!

After three years of exposure to the elements, maybe it was time to re-do the rooftop installation--nice rationalization, right? Anyhow, a few days later, the U.P.S. man delivered a brand new Grove OMNI antenna and 200 feet of RG-6/U cable. It was time for the Great Antenna Showdown!

I pulled down the Channel Master Monitenna and mounted it a few feet away from the OMNI on a wooden tower in my back yard. With both the old cable and the new cable available, I was able to cut a piece of RG-6/U the same length as the old, and then swap between the antennas. It was quickly obvious that the old cable gave significantly weaker reception than the new. Three years ago, I didn't know better than to splice coax--oh, well, at least I was able to salvage some of the old cable to use for a feedline to my short wave receiver!

The antenna comparison between the OMNI and the Monitenna was almost a tie. The Monitenna appeared to give a very slight improvement in reception at times, but the promise of wider

band coverage, and a MUCH more attractive appearance, gave the final edge to the OMNI.

Hooking up the Power Ant to the new cable and OMNI resulted in severe front-end overload in the Bearcat. A call to Bob Grove solved the problem when he suggested attaching the internal filter option in the Power Ant that blocks all frequencies below 30 MHz.

Bob also suggested that I add a notch filter; it was built out of scraps--5 turns of 16 ga. wire wound around a 1/2" rod, removed and then stretched to 2" long, and a 3-30 pF trimmer capacitor. The coil was connected to the center conductor of the ANT-4C antenna input connector, and the trimmer was then connected in series to ground. This type of filter offers a very sharp notch and may be tuned anywhere in VHF high band. Careful adjustment resulted in a significant improvement in performance.

For the faint of heart not comfortable with soldering irons, Bob Grove offers a commercial unit--in this case, the Scanner Filter FTR-3 with two separate notch circuits.

SO, HOW DO THEY COMPARE?

First, antennas with no auxiliary amplification, listed best first:

1. Grove OMNI - fine reception, inconspicuous on the roof.
2. Channel Master Monitenna - fine reception but ugly
3. The Coaxial-collinear - best indoor reception but you must build it yourself
4. Extendable whip (ANT-8) - best true portable, but length is a bother
5. Centurion A-TRI - good compromise for reception and portability
6. Original equipment duckie - most compact, good only for strong local signals

Now what happens when we add the Power Ant?

1. OMNI or Monitenna - by far, the best reception, but watch out for intermod!
2. The coaxial-collinear - performance equals the OMNI used without the Power Ant.
3. Extendable whip (in this case, the Grove ANT-3) - just slightly weaker than the Coaxial-collinear and you don't have to build it!

I hope that this article will help you attain the elusive "best reception possible." You can improve

SCANNING

with **NORM SCHREIN**

Fox Marketing, Inc.

4518 Taylorsville Rd.

Dayton, Ohio 45424

Scanning Down Under

Some time ago I received a sheet titled "Aircraft Band Frequencies 108-136 MHz AM Mode." What was interesting was that this sheet was for Australia. Since Australia is an English-speaking country, there should be no problem in understanding what is being said. So if you take a trip down under, take your scanner with you and listen to some of the following:

- 115.300 FTH Fentons Hill (beacon) 10.5 miles to Melbourne Int'l
- 114.300 YWE Yarrawee (beacon) 37/44.4 S 143/45.2 E
- 114.100 ML Melbourne Airport (beacon)
- 115.900 WON Wonthaggi (beacon) 38/28.4 S 145/37.3 E
- 113.900 EN Essendon (ATIS) Near Melbourn Int'l

Melbourne-Essendon Airport-AMEN

- 119.800 ATIS
- 124.700 Approach Control
- 319.200 "
- 125.100 Tower
- 121.900 Ground Control
- 118.900 Departure Control
- 129.400 "
- 360.700 "
- 125.700 West Routes
- 127.400 "
- 269.300 "
- 126.600 North & East Routes
- 128.500 "
- 279.600 "
- 317.700 "
- 127.000 Tasmania Route

Sydney Center - ADDA

- 118.400 Melbourne-Sydney
- 127.300 "
- 269.100 "
- 381.400 "
- 118.500 Western



your portable (or table-top) with inexpensive enhancements like an outdoor antenna, new coax (with no splices!) or a homebuilt coaxial-collinear.

For those with a slightly fatter back pocket, the Grove Power Ant and accessory ANT-3 whip can give performance close to that of a rooftop. And finally, for the serious listener, team up a rooftop antenna like the Grove OMNI with the Power Ant and Scanner Filter--it's a combination hard to beat! ●

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NORM SCHREIN cont'd

Melbourne Int'l Airport-AMML

- 114.100 ATIS
- 124.700 Approach Control
- 319.200 "
- 120.500 Tower
- 322.400 "
- 121.200 Ground Control
- 121.700 "
- 118.900 Departure Control
- 129.400 "
- 360.700 "

Melbourne Center - ADDA

- 123.600 30-80 Nautical miles of Melbourne
- 130.500 "
- 338.200 "
- 131.300 "
- 306.100 "
- 342.900 "
- 119.700 Richmond Restricted Areas

Brisbane-Sydney

- 130.900 "
- 335.500 "
- 385.500 "
- 126.500 North Routes
- 130.100 "
- 319.800 "
- 360.600 "
- 129.200 Williamstown Restricted Areas
- 269.000 "
- 306.000 "
- 128.200 North Western Route

Sydney Int'l Airport-ASSY

- 115.400 ATIS
- 124.400 Approach Control
- 281.500 "
- 126.100 Approach Control
- 307.800 "
- 120.500 Tower
- 279.500 "
- 121.700 Departure Control
- 122.300 "
- 123.000 "
- 263.600 "
- 125.300 "
- 285.600 "
- 121.700 Clearance Delivery
- 127.500 "

If you get to Sydney, you will find a scanner directory sold by Dick Smith Electronics. Although as a matter of policy they leave out the police frequencies, many other interesting frequencies are listed. An example of some of their listings include:

- ABC TV 463.300 463.475
- Air India 497.200
- Ambulance 76.640 76.685
- 76.700 76.730 76.760
- 76.670 76.790 76.550
- Blacktown Bush Fire Brigade
- 78.040 78.070 78.130
- 78.160 78.176 159.220
- 78.055
- Daily Mirror 82.980
- Health Commission 453.925
- 468.925
- Main Roads Dept. 167.770
- Olympic Airways 469.975
- Pan AM 465.300
- Raillex 455.200
- Rangers 159.430
- Singapore Airlines 463.400
- Wales Rescue Helicopter
- 484.950 485.000

Some broadcast stations in the Sydney area include:

Call Sign	Frequency
2BL	702 kHz
2CH	1170
2EA	801
2FC	576
2GB	873
2KY	1017
2UE	954
2UW	1107
2WS	1224
2ABC	92.9 MHz
2CBA	103.2
2DAY	104.1
2JJJ	105.7
2MBS	102.5
2MMM	104.9
2SER	107.5

Australia Television operates on a different band plan than does the U.S. and you may be able to pick up some of the lower channels on your scanner.

Chan	Video Carrier	Frequency Limits	MHz
0	46.250	45 - 52	
1	57.250	56 - 63	
2	64.250	63 - 70	
3	86.250	85 - 92	
4	95.250	94 - 101	
5	102.250	101 - 108	
5A	138.250	137 - 144	
6	175.250	174 - 181	
7	182.250	181 - 188	
8	189.250	188 - 195	
9	196.250	195 - 202	
10	209.250	208 - 215	
11	216.250	215 - 222	

Here is a look at some police frequencies in Victoria.

Chan	Frequency	Location
1	168.220	(North)
2	168.340	(Dandenong-Penninsular)
3	168.280	(Country Area)
4	168.160	(East)
5	168.400	(Car to Car)
6	168.190	(Car to Car)
7	168.250	(City, Prahran, Richmond)
8	168.310	(West)
9	168.370	(South East)
10	168.520	(Geelong, Ocean Grove, Lorne)

Police Hand Helds (Victoria)
468.400, 468.425, 468.450, 468.475, 468.925

- Airwing 131.600
- Victorian Railways
- 77.240 468.300 488.925
- 82.860
- Victoria State Electricity Commission
- 162.220 168.100 72.600
- 165.580 72.500 72.590
- 72.650 72.710 166.060
- 168.100

- Ambulance (Victoria)
- 76.250 76.550 76.675
- 76.430 76.700 76.685
- 76.490 76.730 76.715
- 76.730 76.760 76.775
- 76.670 76.790 76.805
- Victorian E.P.A 463.450
- Esso Oil Rigs
- 71.510 167.770 429.000

VHF SKIP REPORT

by
Chuck Robertson
RR 2 Box 850
Creal Springs, IL 62922

FINAL INSTALLMENT

NEW YORK, NEW YORK

New York City is truly a skip beacon! There's something about those kinetic NYC taxis that brings their comms into the Midwest as though the cabbies were

- Wodonga Border Rescue 84.480
- Oil Rigs Helicopter 71.162
- RAAF Sonobouys 163.750
- State Rivers 83.700
- Ballarat Ambulance 76.670
- Melbourne City Council 73.700

Most scanner frequencies are short range--line of sight (35 to 75 miles). While some may be controlled by skip, the majority will require your presence in Australia to hear them. If you do get down under, take your scanner along and take a listen. Then be sure to let us know what you hear. Until next time--

waiting impatiently outside my door to take me across Manhattan to Hong Fat's for noodles!

NYC PIRATE UPDATE

A pirate bus service is operating in the New York City area on the state conservation/transportation FM frequency 31.10 MHz. And--get this--the emissions are AM!

The FCC files show no license to 31.10 within 700 miles of New York, and absolutely none using AM!

This winter's sporadic E skip also brought the return of the NYC taxi and trucking pirates reported in the August 1985 MT:

- 31.30 Parcel Service;English
- 32.00 Taxi; Spanish
- 34.98 Taxi;Spanish & English

A completely new NYC taxi service has been found on the state conservation/transportation frequency 30.98 MHz, NBFM. Pirates or a legal business not yet listed in the FCC files? The only 30.98 MHz license I can find for New York is Schenck Tours (buses). In fact, most of the 30 to 32 MHz transportation allocations are used by buses, not taxis. However, any common or contract carrier within a single urban area may use

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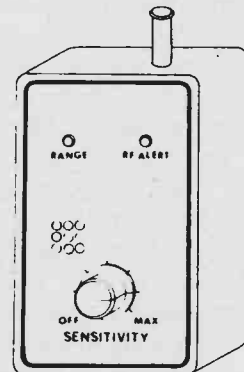
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VHF SKIP cont'd

these allocations, and that seems to include taxis.

Case in point: check the transportation frequencies 30.66 and 30.74 in the "NYC Panorama" list. Apparently there are taxi services under contract to airports:

30.66	Petroleum/Trans
30.74	Petroleum/Trans
30.82	Petroleum/Trans
30.86	Conservation/Trans
30.90	Conservation/Trans
30.94	Conservation/Trans
30.98	Conservation/Trans
31.02	Conservation/Trans
31.06	Conservation/Trans
31.08	Transportation
31.10	Conservation/Trans
31.12	Transportation
31.14	Conservation/Trans

Most of the 30-32 MHz transportation frequencies are shared with other services.

It's interesting to note how often the 30.86 to 31.98 MHz conservation and transportation channels end up being used for unlicensed operations. A look through the FCC files reveals that these frequencies are among the least used of the entire 30 to 50 MHz band! This makes them perfect targets for pirates. Furthermore, an FCC master file check of the transportation frequencies 31.08 and 31.12 MHz reveals no licenses whatever! (The FCC frequency files can be purchased from Grove Enterprises.)

I've monitored security operations on 31.08, possibly originating from the southern U.S. Could these have been private investigators or industrial security personnel seeking a suitably obscure channel for their evening's activities? If so, they picked a good one!

That frequency is also used in the NYC area for brief instructional statements, possibly for buses. Again, this could be pirates or a legal business not yet listed in the FCC files.

Canadian businesses have also been logged on 31.08, notably pirate fishing fleets!

As for 31.12 MHz, an AM business in the NYC area has been heard using Spanish language on this channel! The exact nature of the operation is unknown, but it seems safe to say they're pirates!

U.S. federal low band frequencies are also favored by pirates. While U.S. military skip may turn up on most any frequency, there are few permanent base operations "out there." Here in southern Illinois only a couple dozen federal low

band frequencies are used out of the hundreds available!

I'm sure there must be many pirates on the standard FCC business and special industrial allocations, too. Since virtually no call signs are given by the NYC dispatchers, it's unlikely you'll be able to determine just who is legal and who is not!

Only when pirates use a frequency that is not allocated for the use they put it to will it be obvious you've located a pirate. What's that old saying about "hide in plain sight?"

THE AM BANDS

While virtually all North American users of the standard 30 to 50 MHz, 138 to 174 MHz and 406 to 512 MHz allocations have switched to narrow band FM, the FCC rules and regulations still allow the use of AM!

While most VHF-low band radio systems use NBFM, some exceptions include paging stations, tracking transmitters and industrial, medical and scientific telemetry.

In large metropolitan areas where the radio spectrum has become intolerably congested, the use of AM for two-way radio communications is still relatively commonplace. AM and FM radio systems can operate on the same frequency with relatively little interference.

I've logged several AM dispatch services originating from New York City and vicinity (see list below); both Spanish and English are used on most of the channels. The frequency 30.76 is very active and only Spanish seems to be spoken.

30.76	30.96	31.12
30.80	31.00	31.20
30.88	31.04	31.24
30.92	31.10	35.12

Most of these AM operations appear to be taxi services. AM paging has also been heard on 30.80, 31.00 and 31.04 MHz.

To monitor AM voice on a NBFM scanner, tune 10 kHz above or below the carrier frequency. For example, the 30.76 AM taxi service can be heard best on 30.75 or 30.77 MHz.

TAXI!

There are well over 30,000 licensed taxi drivers in NYC! The omnipresent taxicab can be found on each and every low band business channel with the possible exceptions of itinerant and low power frequencies.

Here are the active NYC taxi channels I've monitored at my Illinois QTH. Spanish

has been heard on all.

30.66	31.16	35.18
30.74	31.20	35.70
30.76	31.24	35.72
30.80	32.00	35.80
30.84	33.16	35.90
30.88	34.98	35.92
30.92	35.06	35.94
30.96	35.08	35.96
30.98	35.10	35.98
31.00	35.12	42.96
31.04	35.14	43.00

The taxi service on 30.84 is probably pirate. This is a low power (2 watt) allocation, yet these people are definitely running big watts! Language is Spanish.

These low power channels also bear watching: 33.12, 33.14, 33.40, 35.02, 42.98 MHz.

AM voice has been heard on 33.12 MHz. Could this have been low power industrial communications? It's hard to say.

An NBFM transit operation has turned up on 33.12 MHz. Statements like - "Who filed New York 2308?" - lead me to think it must be a bus line. There are only a dozen or so licenses listed to 33.12 MHz for the entire U.S. and possessions!

NYTA

The New York Transit Authority uses several low band channels for its bus operations. Most bases and buses run 500 watts.

30.82	31.02
30.86	31.06
30.90 Rptr in	31.14 out

The 30.86 channel appears to be out of use (Wonder if it's been replaced by 31.08 MHz?). The old 44 MHz NYTA bus frequencies also seem to have been dropped.

PHONIES

In last month's VHF Skip Report I presented a number of unusual frequencies used by Florida pirate mobile-telephone stations. This month we'll take a look at pirate radio-phone frequencies used in the New York area!

The most active channel I've discovered is 34.95 MHz, full-duplex, NBFM. This frequency has been monitored repeatedly over the last year.

The users of these radio-phones have an unmistakable "Brooklyn" accent. A lot of small talk plus shop talk concerning blueprints has been heard.

Although these people could be engineers contracting their services to the U.S. military with the radios provided by the federal government, I doubt it; there is too much small

talk!

Last fall another "federal band" mobile-phone operation was found on 30.05 MHz, NBFM. Only "kids" have been heard on this channel! They sound like teenagers to me--lots of silliness and partying. Both phone-patch and simplex modes are used.

I don't know where these kids are located exactly, but NYC skip is always heard when the 30.05 pirateers are on the air!

A full-duplex mobile-phone station on 30.18 MHz, NBFM, is also heard occasionally along with the 30.05 kids.

Many Canadian mobile-phone stations have been monitored on 30.10, 30.14, 30.16, 30.54 and 30.58 MHz. Is the 30.18 MHz station also Canadian, or could U.S. citizens be using Canadian equipment and frequencies?

NYC PANORAMA

Here are a few frequencies for New York City and vicinity. The AM businesses contained in this list represent only a fraction of the AM operations licensed to New York!

Most bases and mobiles are in the 100-300 watt range so they should be easy to hear when the skip is in. "B" means base and "M" means mobiles.

- 27.39 Bergen Investigative Services, KSJ652, Rutherford, NJ (Newark area) B/M
- 30.13 30.45 32.65 34.95 36.15
- U.S. Navy, NYC, B/M
- 30.66 Long Island Limo Service, Bases at Kennedy Airport and Glen Oaks; 120 taxis
- 30.74 Harborview Limo Service, Brooklyn; B/M
- 30.80 City of New York, AM paging
- 30.80 Denis Car Service, Brooklyn, B/M
- 30.86 NY State Conservation, Great Neck Park District
- 30.88 Winthrop Car Service, Brooklyn, B/M
- 30.92 Velotax Car Service, Bronx, B/M; AM
- 30.96 Equa Car Service, Brooklyn, B/M; AM
- 31.00 Iliama Private Car Service, NYC; B/M ; AM
- 31.04 The Post-Journal, Jamestown, AM paging
- 31.24 Hofstra University, Hempstead, 5 watt AM paging
- 31.46 (base) and 31.50 (mobile) Massachusetts State Conservation Police. Very active!
- 31.54 31.58 Rhode Island State Conservation
- 31.98 New York State Conservation, administrative
- 33.06 33.10 47.22 47.32 47.34 47.40
- New York Highway Dept., several bases
- 33.76 Fire dispatch, Spanish language, probably Spanish Harlem

VHF SKIP cont'd

- 34.79 Statue of Liberty, KID703, 45 watts; ferries 5 watts
- 34.83 Fish & Wildlife, Huntington (Long Island) KEC661, B/M
- 35.02 IBM Research & Development, Armonk, two 0.1 watt wireless microphones. IBM also has three 0.2 watt devices on 30.84 and two on 33.40 MHz
- 35.04 Schneller Security & Safety, Jamaica, mobile only
- 35.06 Caribbean Car Service, Bronx, B/M AM
(NOTE: The 35 MHz business band is loaded with AM voice licenses. I'll not attempt to list them all here!)
- 35.66 NYC mobile telephone; also Rochester and Troy
- 35.96 Backer Protective Service, Hempstead, B/M
- 36.90 Grumman Bethpage Airport, two flight test stations, WBFM
- 37.50 NYC Water Dept., several bases and mobiles. Also: 47.80, 47.96 & 48.04 MHz
- 38.83 38.91 46.79 Army Security Patrols in the NYC area; B/M
- 39.90 NYC Dept. of Corrections; B/M
- 40.17 40.19 NYC USAF Special Investigators (OSI); B/M
- 40.29 Commerce Dept., Kings Point, KAL765, B/M 2 watts
- 42.14 NY State Police, statewide
- 42.96 Disco Car Service, Bronx; B/M; AM
- 42.98 City of New York, six 2 watt mobiles
- 43.00 Danite Car Service, Bronx, B/M; AM
- 44.72 Finger Lakes State Park, Geneva area; B/M used at Allegheny State Park for base-to-base comms
- 45.68 Taxi and Limousine Commission, B/M
- 45.88 New York State Mutual Aid
- 46.75 Air Force, Westchester, 2 watt mobiles; WBFM
- 47.74 Consolidated Edison, NYC, several B/M
- 47.80 NYC Sewer Dept, several B/M
- 47.82 48.38 Brooklyn Union Gas Co, B/M
- 72 MHz Band**
- 72.02 (Repeater) NY State Highway Dept, Stamford
- 72.08 (Repeater) NY State Highway Dept, Albany, repeats standard VHF/UHF highway frequencies
- 72.10 (Repeater) NY State Highway Dept, Walton
- 72.10 (Repeater) Delaware County Mutual Aid Fire Radio System, Walton
- 72.22 (Repeater) NY State Highway Dept, Charleston
- 72.26 Seaboard Telemetry, Queens, 10 watt fixed station
- 72.46 (Repeater) Delaware Co, Mutual Aid Fire Radio System, Stamford
- 72.50 New Jersey Expressway Authority, Atlantic City, 228 fixed units at 2 watts, non-voice
- 72.50 Town of Southport Police, 30 watts
- 72.54 (Repeater) Delaware County Police, Stamford, 144 watts
- 73.14 (Repeater) Onondaga

- County Public Works, 500 watts
- 75.72 City of Rochester Public Works, 250 fixed units at 2-1/2 watts AM
- 75.86 Hamilton County Public Works
- 75.96 Village of Catskill, 2-1/2 watt fixed station
- 75.98 New York State Highway Dept., Fultonville

TRACKING TRANSMITTER ERRATA

Due to the length of the January column, Bob edited the tracking transmitter frequency list--but too much! Frequencies selected by the user do not have to fall on center channels as with higher powered licensed operations; thus, they do not have 20 and 25 kilohertz channel spacing as indicated in that column.

The following complete list is taken from the FCC Rules and Regulations (Part 90.19) and should replace the erroneous list on page 12 of the January 1986 issue:

30.85-30.87 MHz	31.93-31.95 MHz
30.89-30.91 MHz	31.97-32.00 MHz
30.93-30.95 MHz	33.00-33.03 MHz
30.97-30.99 MHz	33.05-33.07 MHz
31.01-31.03 MHz	33.41-34.00 MHz
31.05-31.07 MHz	37.00-37.43 MHz
31.09-31.11 MHz	37.89-38.00 MHz
31.13-31.15 MHz	39.00-40.00 MHz
31.17-31.19 MHz	42.00-42.91 MHz
31.21-31.23 MHz	44.61-45.91 MHz
31.25-31.27 MHz	45.93-45.95 MHz
31.29-31.31 MHz	45.97-45.99 MHz
31.33-31.35 MHz	46.01-46.03 MHz
31.37-31.39 MHz	46.05-46.60 MHz
31.41-31.43 MHz	47.00-47.41 MHz
31.45-31.47 MHz	150.995-151.490 MHz
31.49-31.51 MHz	153.740-154.445 MHz
31.53-31.55 MHz	154.635-155.195 MHz
31.57-31.59 MHz	155.415-156.250 MHz
31.61-31.63 MHz	158.715-159.465 MHz
31.65-31.67 MHz	453.0125-453.9875 MHz
31.69-31.71 MHz	458.0125-458.9875 MHz
31.73-31.75 MHz	460.5625-460.5125 MHz
31.77-31.79 MHz	460.5625-460.5375 MHz
31.81-31.83 MHz	462.9375-462.9875 MHz
31.85-31.87 MHz	465.0125-460.5125 MHz
31.89-31.91 MHz	465.5625-465.6375 MHz
	467.9375-467.9875 MHz

THE YEAR THAT WAS

November 1985 skip openings were somewhat fewer than in November '84. but December 1985 was a BIG disappointment!

Normally the winter sporadic-E peak comes in early December. This year it failed to materialize! Low solar activity was probably to blame.

Overall, 1985 was a poor year for E_s and F₂ skip, and there's every possibility 1986 will be even poorer!

MARCH FORECAST

March, April and early May will bring the return of Equinoctial F₂ skip. Openings to the Caribbean and Central and South America should be possible for most of the U.S.

The propagation pattern will be similar in Europe, with openings to Africa and Asia possible.

The Equinoctial skip of late April and early May will give way to the "summer E_s season," with the peak arriving around late June. At least I hope there will be a peak this spring!



by James R. Hay

Last month we looked at some of the stations around the eastern part of the Mediterranean; this month we will complete the circuit with stations along the western portion, some of which may be familiar to readers.

The first in this month's exploration is

EDITOR'S FINAL NOTE:

We are now at the lowest point of the sunspot cycle, a period during which we will experience minimum skip. We have decided to discontinue Chuck Robertson's VHF SKIP REPORT column until renewed loggings renew interest in monitoring this aspect of utilities DX'ing.

We would like to thank Chuck for the endless hours of careful research and judicious listening which have been necessary to prepare his column.

Libya, operating station 5AT, Tripoli Radio, on 8515 kHz in CW and on the following frequencies for SSB:

4368.0	8745.0
4383.8	8760.8
4434.9	8802.0
6500.0	13130.0
6512.6	13147.5
	13182.5

Tunisia would be next; however, their stations are all on VHF and MF and are not likely to be heard in North America. We move on, therefore, to Algeria. Alger Radio (7TA) operates on the following frequencies and channels:

CW (kHz)	SSB (Ch.*)
4288	410 802 1629
6415	413 809 1631
8437	424 813 1636
12662	426 825 1641
16932	601 1207 2205
22543	603 1215 2225
	605 1217 2227
	1232 2238

*Although we presented channel numbers along with their corresponding frequencies in an earlier article, readers may have missed that list. A comprehensive table of those allocations is found in Bob Grove's SHORTWAVE DIRECTORY, available for \$12.95 + \$1.50 from Grove Enterprises and from Grove dealers.

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HIGH SEAS cont'd

At Spain on the north side of the ocean, Aranjuez Radio is the first station. They can be found on the following frequencies with the listed call signs, all in CW.

EDF	4235.5	EDF44	12691.0
EDZ	4269.5	EAD44	12887.5
EAD	4349.0	EIZ5	12934.5
EFD2	6330.0	EDG4	13056.0
EDG2	6337.0	EAD4	13065.0
EAD2	6382.2	EDF5	16942.8
EDZ2	6400.5	EDZ6	17064.8
EDG3	8457.0	EDG5	17175.2
EDF3	8473.0	EAD5	17184.8
EDZ4	8618.0	EDF6	22384.0
EAD3	8682.0	EAD6	22446.0
EDF4	12673.5	EDZ7	22533.0

Next, moving toward the east again, is France; however, their only HF station is St. Lys which is on the Atlantic coast and thus is outside of the scope of this month's column.

In Italy there are several stations, the first of which is Genoa Radio which uses call sign ICB and can be found in CW on the following frequencies:

4235.0	16879.0
6425.0	16881.0
8649.5	16970.0
12978.0	17182.0

In voice the following SSB channels are in use identifying as "Genoa Radio":

408	1205
409	1211
806	1608
823	1614
	2216

The major Italian coast station is Rome Radio which can make interesting listening since the station handles some of the traffic destined for the Centre International Radio Medical (C.I.R.M.) which also has its own station located in Rome. On CW IAR can be found on the following frequencies:

4292.0	6435.5	16895.3
4320.0	8530.0	17005.0
6409.5	8669.9	17160.8
6418.2	13015.3	22372.4
		22378.0

Using SSB Rome Radio can be found on the following channels:

402	820	1603
412	826	1606
420	831	1616
423	1206	1624
602	1209	2202
604	1213	2211
814	1218	2223
819	1230	2237

The C.I.R.M.'s own coast station (IRM) can be found on the following fre-

quencies:

4342.5	6420.0	12760.0
4350.5	8685.0	17105.0
6365.0	12748.0	22525.0

CW:

4346.0	12907.5
8445.0	16942.0
8700.0	17045.0
12780.5	22443.0

All of these frequencies are CW; voice and telex messages are handled through Rome Radio (IAR).

East of Italy is Yugoslavia which has several stations starting with Bar Radio which uses the call sign YUW:

CW	SSB Ch.		
4355.0	13088.0	417	1207
6502.0	17220.0	601	1638
8712.0	22585.0	827	

The next Yugoslavian station is Rijeka Radio (YUR) which can be found on the following frequencies on

For telephone traffic, the following channels should be monitored by listeners:

408	606	1221	1627
419	810	1224	2204
421	811	1229	2206
602	821	1611	2221
605	830	1621	2239

Finally, we come to Split Radio (YUS) which operates on the following SSB channels:

401	822	1618
604	1227	

The last country is Albania, and their major station, Durres P.T. Radio (ZAD), can be found on:

CW	SSB
4220.0	402.0
4302.0	805.0
6434.0	1206.0
8696.0	1639.0
12690.0	2226.0
17173.0	

This concludes our tour of the Mediterranean area, and perhaps you might find some new listening from amongst these stations.

As always your comments and suggestions are welcome, please address them to: James R. Hay, 141 St. John's Blvd., Pointe Claire, P.Q., Canada, H9S 4Z2. Good listening until next month.



Indianapolis ARTCC

PART I

In the previous installment of our series, "Air Traffic Control - Yesterday and Today," we interviewed a former Air Traffic Controller who had worked in the system when it was mostly manual control, and radar systems were comparable to a baby just learning to crawl. This month's column will be devoted to the ATC System today, and how recent developments (those of the past 20 years) have affected its operations.

For an indepth look at the ATC System of the 1980's including a comprehensive discussion of terminology

used by controllers and pilots I interviewed Mr. Harold Hale, Assistant Air Traffic Manager of the Indianapolis Air Route Traffic Control Center. Within the text of this column, Mr. Hale will use the initials HH, and Plane Talk will be PT.

PT: Mr. Hale, would you give us some background information about yourself?

HH: I started out with the United States Air Force in 1956. During this time, one of the positions that I had was that of a GCA Controller at an Air Force Base in Madison, Wisconsin. When I left the service in 1960, I went to work at the Chicago Air Route Traffic Control Center. I progressed up through the ranks as a Controller; in 1968, I was selected as a Civil Aviation Advisor to the government in Viet Nam.

I returned to the United States and the FAA in 1970, resuming my duties at the Chicago Center as a Controller. In 1973, I was reassigned to the O'Hare Air Traffic Control Tower for a

year. Then I had a tour of duty at the Regional Office in Des Plaines, Illinois. In 1977, I was transferred to Indianapolis as what at that time was called an Assistant Chief. Then in 1983 I was selected to be the Assistant Air Traffic Manager of the Indianapolis ARTCC facility.

PT: Mr. Hale, we ended the first part of this series just as the ATC System and air travel were entering the jet age. What-- or which--would you say are the primary or key developments that have come about in regard to ATC's equipment since then?

HH: In a nutshell, I would have to say that it would be the computer. When we first started using it for air traffic control, it was in a very basic form compared to today's sophisticated equipment. It evolved around to the whole system being under the NAS (National Aerospace System) in 1975. This is the Radar Data Processing that we presently use.

PT: We've come a long way from the days of grease pencils, shrimp boats, and map tables. I imagine that no one would really like to have those days back again.

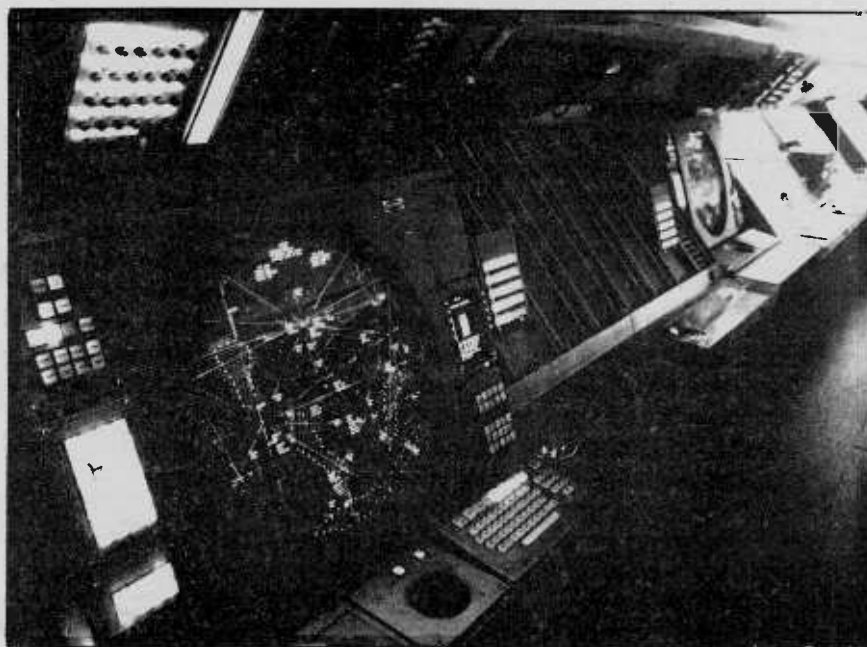
HH: That's for sure.

PT: I'd like to give our readers some information about ARTCC operations. For instance, what is the annual volume of traffic handles by the Indianapolis ARTCC?

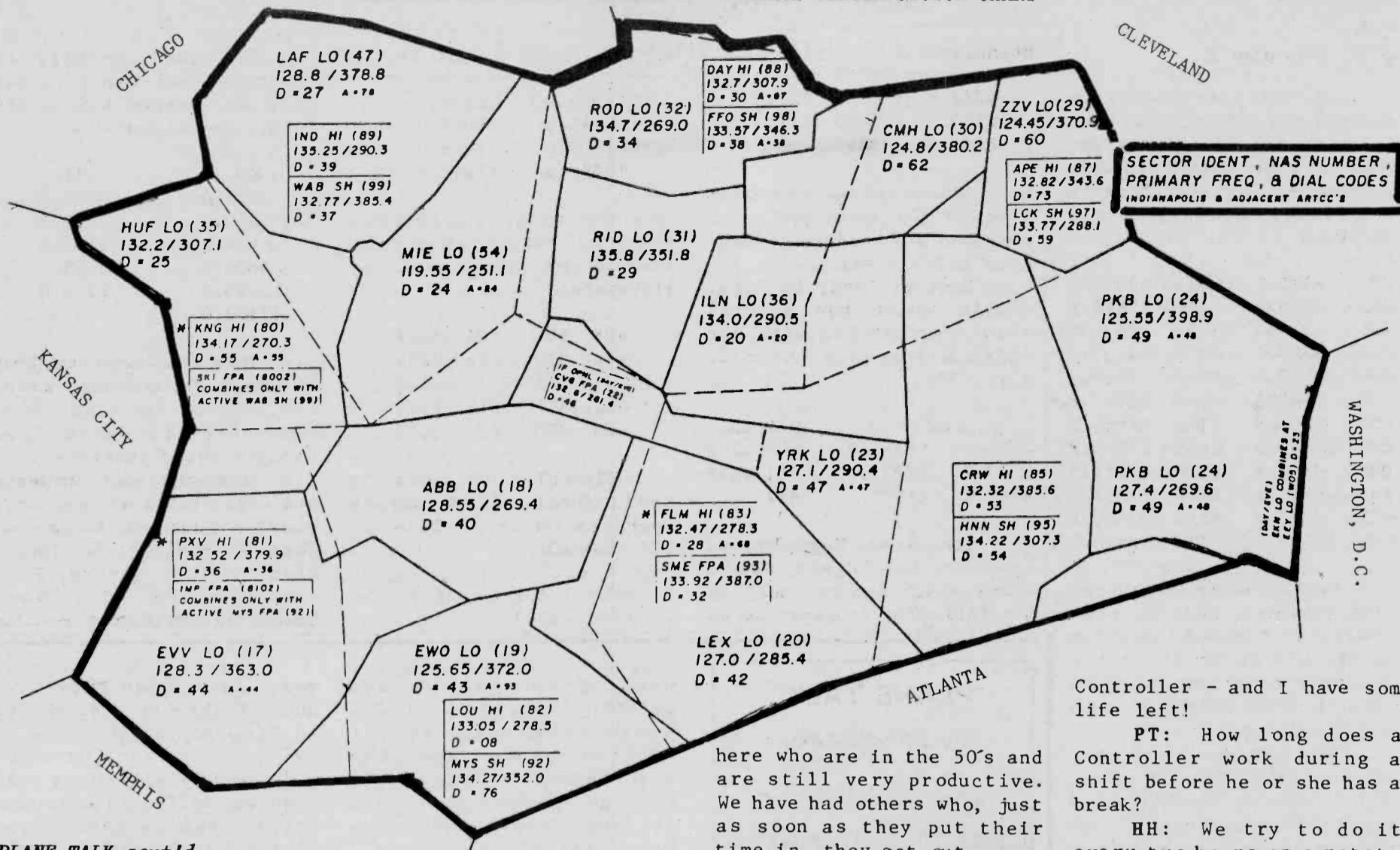
HH: Approximately 1,650,000. This is up, by the way, from last year.

PT: How many controllers on both a Full-Performance Level (Journeyman), and Developmental Level (Trainee) as well as auxiliary and support personnel are employed here at the Center?

HH: Presently on board,



Air controller position in a modern FAA tower.



PLANE TALK cont'd

we have 400 people involved with air traffic control. Ten percent of our controllers (in all different phases) are women. Operationally qualified to work airplanes as developmentals, at full performance level, or as supervisors, we have 234 employees. Then we have x number of people down at the Academy (the Air Traffic Control Academy in Oklahoma City); they just hired a new class.

PT: How long does the training period at the Oklahoma City Training facility last and what are they taught there?

HH: They stay there for 17 weeks. Basically, you can liken it to a ground school; they are taught phraseology, the different types of aircraft that we deal with, separation standards, and the terminology or "lingo" of air traffic control. Also, to a certain extent, the students see what kind of equipment that we use.

Then they go into a simulated environment - or laboratories as we call it - where they learn to run traffic problems, simulating situations that they would be faced with but on a synthetic area. When (or if) the student goes on and comes back here, we get more specialized. They learn the area where they're going to do some more problems, actual traffic problems that they would be faced with.

When they get through that phase of training, we

take them downstairs and put them with an instructor and they go o.j.t. (on the job training) until they become certified on all of the manual positions. When they are finished with this, we send them back to the academy where they go through our radar training facility.

Successfully completing this, they come back here where we put them into our radar training class - we call it DYSIM. It's actually a simulation-type situation which lasts 11 weeks. When they complete that part, we put them back down on the floor with a radar instructor until they become certified in the whole area.

PT: How long does it take before a Controller achieves Full-Performance status?

HH: Under the present guidelines that we are using (and it's an accelerated training program), it's approximately 2-1/2 years from the time that they enter on duty until they become certified. If we were not under this accelerated program, it would normally take five years.

PT: How long is the average working life of a controller?

HH: That's a rather difficult question to answer. If you have 20 years active control time and you're at age 50, you can take early retirement or, if you have 25 years of active duty, or as a first-line supervisor. We have people

here who are in the 50's and are still very productive. We have had others who, just as soon as they put their time in, they got out.

It's like with most pilots: The government has a 60-year age limit on them which the pilots are fighting to get moved up. It really depends on the individual and it just boils down to the fact that we don't have an "average working life." We have quite a few controllers here who work past the age of 50 because they enjoy it. I still consider myself as a

Controller - and I have some life left!

PT: How long does a Controller work during a shift before he or she has a break?

HH: We try to do it every two hours on a rotating basis; this is probably an average because some may work an hour, and some others may work a little more than two hours at a stretch.

COMMUNICATIONS

PT: Mr. Hale, how wide an area does the Indianapolis Air Route Traffic Control Center cover?

HH: Approximately

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75,000 square miles and encompasses parts of five different states. *(See Table 1. Indianapolis ARTCC Sector Chart). We're very strategically located in that our main mission here - although we have some quite busy airports within this area, we certainly don't have any the scope of O'Hare - is that we handle the aircraft which are climbing or descending, and that makes for a complex situation.

We set up traffic for O'Hare and St. Louis (in and out); also for Memphis, Atlanta, the Washington, D.C. area, Pittsburgh, Cleveland, and Detroit. We get aircraft en-trail and departures and we'll take them up to their altitude(s), wherever they're going.

PT: How many sectors does the Indy ARTCC have and how many frequencies?

HH: Right now we have 26 sectors authorized to us, and we have approximately 23 remote communication air to ground sites which use microwave, telephone line or computer.

PT: How many miles does the normal radar range cover?

HH: The radar range coverage is line-of-sight, it would be about 150 miles. This goes up in terms of altitudes, by the way. Within this we'd have five radar sites and, brought back through the computer, it would give us our base (minimum) coverage here in our area at about 5,000 feet.

PT: Can you give us a thumbnail sketch of how modern radar works?

HH: Radar actually sends out a beam which travels until it hits something; then it bounces back. We have specialized electronics that interrogate the aircraft's transponder and the signal comes back.

A further development is the MODE C which gives us the aircraft's altitude. (Note: "Mode", in this sense, means the letter or number assigned to a specific pulse spacing of radio signals transmitted or received by ground interrogator or airborne transponder components of the Air Traffic Control System. MODE A is military and MODE C is altitude reporting.)

PT: What is the maximum altitude for a low altitude sector, and what are the minimum and maximum altitudes for high altitude sectors?

HH: The maximum altitude for a low altitude sector is 23,000 ft.; for

TV SCRAMBLING: Its History and Techniques

by John Wilson

HISTORY OF CABLE TV

Today's cable TV systems trace their origins back to the late 1940's to a small hilly terrain section of eastern Pennsylvania. The small valley town of Panther Creek was effectively isolated from decent TV reception from the larger metro area stations such as Philadelphia because of the surrounding hills and mountains.

An enterprising individual decided to install several antennas on one of the surrounding mountaintops and ran a long antenna cable line down to his TV. It worked pretty well, even with the tremendous signal losses in the long cable run.

Soon he was asked by one and then more neighbors to hook up to it. Not long after he realized the marketing potential; a company was formed and an industry was born. Following soon thereafter were politics and regulations.

The Fifties and Sixties

As the cable TV industry grew during this period it was still basically an antenna service primarily retransmitting local off-air VHF/UHF TV stations to subscribers who, for whatever reason, could not get noise- or ghost-free reception.

Occasionally, a distant TV station not normally seen in the cable TV's service area would be brought in by high antennas with pre-amps or was microwaved in and rebroadcast on the system.

Politics dominated by over-regulation were imposed upon the industry by lobbying broadcasters who viewed cable TV as an economic threat.

The Seventies

The seventies were uneventful until around

high altitude sectors, it starts at 24,000 minimum and then the intermediate high goes up to 33,000. Then we have the ultra-high which goes from 35,000 ft. up (positive control) to 60,000 ft. For ATC altitude reporting, 23,000 feet is written as 23.0 and spoken as "two-three-zero"; the last zeros are dropped. Some military aircraft do not tell us their altitudes, but they fly above 60.0. We tell them if there's traffic up there, though.

NEXT MONTH: PART II--Frequencies and Radio Terminology

1975. A small New York area movie service being transmitted via MDS (multipoint distribution system) called Home Box Office (HBO), wished to microwave its signal to Philadelphia via the telephone company, but it was very expensive. RCA had launched SATCOM F1, the first domestic communications satellite. HBO figured that delivering their signal via satellite would not only be cost effective but would also open up untold new markets nationally via cable systems already in existence.

Ted Turner in Atlanta had recently acquired a UHF TV station, Channel 17; he envisioned providing WTGB via satellite to cable systems as "filler" programming, offering yet another station which would not normally be seen by the cable subscriber. Soon WTGB, now WTBS, was on the satellite as the first "superstation." The programming rush via satellite was on.

The cable systems carrying HBO as an extra pay service had a problem of how to protect their signal from unauthorized viewing (non-payers). Scrambling of the signal at the cable TV head-end was the answer.

CABLE TV FREQUENCY ASSIGNMENTS

The FCC has allocated the following TV channels for cable TV use:

a.2-13: Regular VHF-TV channels and special equipment is not needed to receive them. Channels 2-6 (54-88 MHz) are referred to as "Low VHF" because channel 6 ends at the beginning of the commercial FM band (88-108 MHz). Channels 7-13 (174-216 MHz), "High VHF", begins just above the "High VHF Business Band (police, gov't, press, weather, railroad, etc. from 152-174 MHz).

b.A-I(Mid-Band): In effect a cable TV system is allowed to "carve out" 9 TV channels from 108-174 MHz; however, channels A through C cover the frequency range of 120-138 MHz which is assigned to the Aeronautical Service. RF leakage in this frequency range interfering with aircraft navigation and communication buys a cable TV company big trouble from the FCC as some cable TV systems have discovered; they get to pay fines for such occurrences. So the smart cable TV systems do not use

channels A, B and C. However, these channels are used in certain sections of the country. Channels D through I are more commonly used for premium programming.

c.J-W(Super Band): A cable TV system in need of more TV channels may elect the Super-Band, 216-300 MHz, but the signal losses are very high at these UHF frequencies.

d.AA-QQ(Hyper-Band): Hyper-Band, 300-402 MHz, sees little use nationwide. It appears to exist for the cable TV systems which promised the world to the larger urban areas in order to obtain franchises and now have to deliver it.

TYPES OF SERVICE

A cable TV system is free to determine how it will provide its basic and premium (pay) services.

a.Basic: The most simple and common system is to provide unscrambled service on VHF-TV channels 2-13 at a basic monthly charge. No special equipment is required to receive these signals; however, one channel may be used to deliver a premium (pay) service in which case a piece of special equipment such as a Mid-band converter would be installed to receive the service.

b.Premium (Pay): The most common method employed in delivering a premium service is to transmit the signal on one of the Mid-Band TV channels D, E, F, G, H, or I. Reception security is afforded in that the subscriber's TV does not tune that frequency range (Occasionally a set with a flexible fine tune control can receive Mid-Band channel I near TV channel 6 with varying degrees of success. If the signal were scrambled on channel I then the video would be unviewable but the audio would be ok).

A Mid-Band converter is supplied to the pay subscriber which will allow the subscriber to view the basic service and the premium channel(s). For premium signals scrambled at Mid-Band the converter will additionally have the appropriate descrambler circuitry built in.

SCRAMBLING SCHEMES

Currently five different encoding schemes have been approved by the FCC; three are quite popular. All generally use the same basic

TV SCRAMBLING cont'd

approach. Either the audio is removed from the VHF-TV channel being used and put on a separate subcarrier, or another audio subcarrier is added in the composite signal.

The video is scrambled by either removing, suppressing or masking the vertical and horizontal signal information which the TV must have in order to properly process the signal.

In order to produce a TV picture, the entire picture tube is scanned line by line for 525 lines per second from top left to right and downward; this is called a raster scan.

In reality only about 500 lines comprise the picture we view. Some lines contain signal technical control information and some lines are unused for the overscan area so the technical signal information would not normally be seen as part of the picture.

To observe these signals slowly adjust the vertical hold control on the TV until the picture begins a slight downward roll. This black area with a changing dot/bar pattern then can be seen.

Additionally, a blanking pulse is transmitted to "wipe out" the frame which has just been scanned completely so a new frame can begin. Television is a form of optical illusion and all this action happens so fast our brains register the video as a continuous action when, in reality, each picture frame is a unique entity--just as in motion picture film.

Gated Sync

This scheme is the most secure of the processes. The scrambler at the cable TV origination point (head-end) generates timed periodic pulses which suppress or weaken the vertical and horizontal synchronization pulses normally found on the

TV signal which tells the TV when a "frame" has been completed.

To restore the video the sync pulse signals are inverted and transmitted on a separate RF frequency called a "pilot" frequency. Some commonly used pilot frequencies are 50.5, 93, 99, 108, 110.5, and 114 MHz. The pulses are detected by the descrambler and contain the video sync information.

To determine if this scheme is being used look at the scrambled video when it is "static," i.e., no moving scenes. The pulses should appear on the screen with the blanking pulses being light and the sync pulses dark, configured in a vertical bar display, and the video may have a "flippy floppy" look.

In-Band Gated Sync

Some cable TV systems used this scheme without transmitting the scrambling pulses on a separate RF pilot frequency; instead, the pulses are amplitude modulated on the audio carrier of the premium (pay) channel. This variation of gated sync requires the use of filtering and restoration circuitry to provide the necessary sync information to the TV. The scrambled video would look similar to the gated sync scrambled picture. A scope pattern of the signal would look similar to those shown in Fig.1.

Sine Wave Sync Suppression

This process is similar to gated sync suppression except a sine wave is transmitted by the cable TV head-end to suppress the sync pulses. A scope pattern would be similar to those shown in Figure 2.

As with the In-Band Gated Sync method the scrambling sine wave is transmitted on the audio carrier of the premium (pay) channel. Descrambling the signal involves extracting the sine wave, inverting it

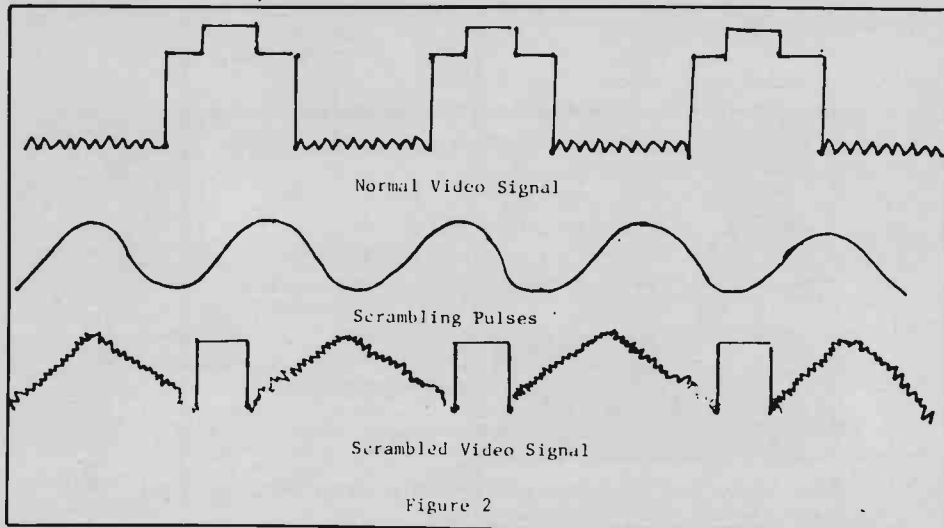


Figure 2

180 degrees out of phase and applying it as Automatic Gain Control (AGC) to the signal path.

The scrambled video appears similar to the gated sync except the blanking and sync pulses are closer to the center of the screen. The picture is brightest near the center of the screen and sometimes the vertical bar will drift right to left and begin again. No pilot frequency is used in this process.

Other Cable TV Schemes

a. Interference Signal Scrambling: In this method an FM signal is transmitted on top of the audio portion of the signal on the premium (pay) channel. Often a continual annoying whine or warbling sound accompanies the picture audio. Descrambling involves the installation of a high Q notch filter on the scrambling audio frequency.

b. Inverted Video: This outmoded method simply inverts the video and audio frequencies so that the audio, which is normally found at the high end of the channel, is now transmitted in what is normally the video portion of the signal and vice versa. Descrambling involves inverting the pair back for proper reception.

SATELLITE TV SCHEMES

Satellite TV signal scrambling must not be confused with cable TV system scrambling; Satellite TV scrambling schemes are related to manufacturer's processes whereas cable TV scrambling methods are popular industry process schemes with a number of manufacturers making the same type of scrambling equipment.

Oak Orion C

This very popular process is used full time on the ANIK D CanCom transmissions. It has had its problems, but appears to be a viable industry "player." The audio is digitized and then, using a National Bureau of Standards (NBS) algorithm, is placed in the

baseband video at the location where the horizontal sync pulse normally would be.

Also embedded in the video is channel-specific encrypted digital information which is required to decode the particular channel. This information is carried in the first few lines of each field where the vertical sync pulse information would normally be.

General authorization control commands, which are (FSK) modulated, are transmitted globally on a carrier at 104.75 or 112.7 MHz. Both channel-specific and FSK information sent to the decoders includes "digital signatures" which authenticate that the information has been transmitted to the appropriate decoder.

Oak claims to have up to 49 tier levels of such programmable security incorporated, but it is doubtful that Oak Orion C programmers go above tier 1.

Multiple Application Adressable Secure Television (MAAST)

MAAST employs two modes of video and audio scrambling. The highest security is achieved by operating the video in the sync removal mode. Here all vertical and horizontal sync is removed and the blanking level is moved to the grey level. The video is inverted.

The audio is quadrature modulated with suppressed carrier and randomly time-multiplexed between audio channels in a form of frequency hopping. Lower security is attained by inverting the video and sync and offsetting the program audio.

MAAST claims to be able to transmit up to five channels of audio for each TV channel, but typically only one is transmitted.

The MAAST system, as with all satellite TV schemes, is unforgiving of out-of-tolerance equipment. If the transmitter scrambling frequency and audio frequency are not "dead-on,"

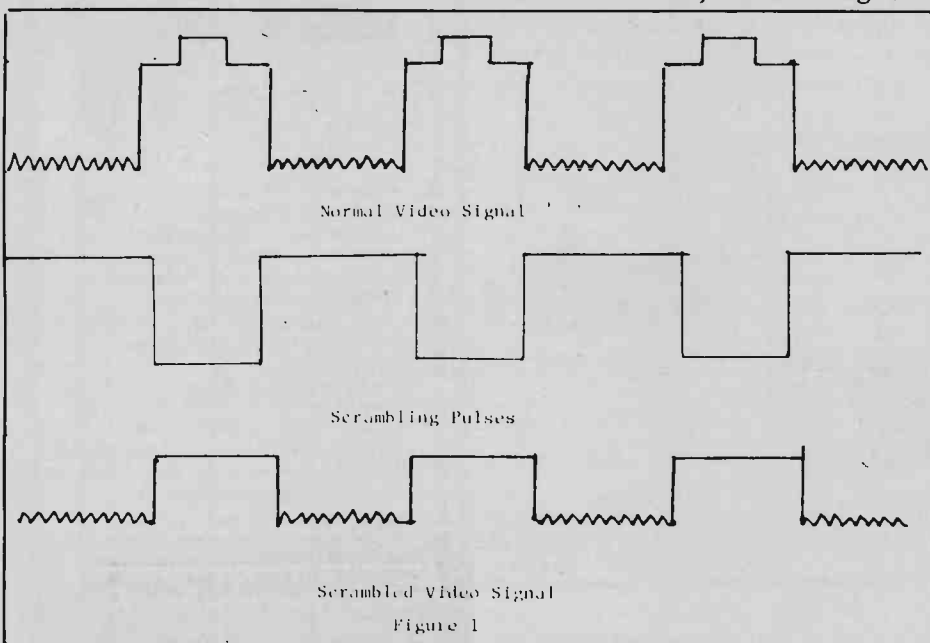


Figure 1

TV SCRAMBLING cont'd

then inundating wavy lines may appear on the video and, if the audio transmitter is off-tuned, then the audio will be mushy to unintelligible. The same holds true if the decoder is off frequency or performing out of tolerance.

Presently on the Fantasy Channel, (now called the Fantasy Unrestricted Network [FUN] Channel), uses the MAAST system for regular programming. The FUN Channel uses Oak Orion C for pay per view event programming.

RCA's 1 for 1

Still an experimental prototype system which basically involves interleaving lines of video from one and the other to form a double image system. The cost of decoding is quite high since the video must be put back together at base-band on the receive end by simulating alternate missing lines in each picture through an above and below comparison.

MACOM LinkaBit (Videocipher II)

Like the Oak system the video is basically sync-suppressed inverted with some additional unique suppression applications with the audio being digital. All addressing and control functions are contained in a high speed control channel which is protected by a sophisticated NBS Data Encryption Standard (DES) algorithm. This digital control channel is also transmitted during the horizontal sync interval, along with two digital audio channels.

MACOM claims the Linka-Bit process will support up to 64,000 different tiers. HBO, Showtime, and the Movie Channel have chosen the Linkabit scheme.

Inverted Video

Process the same as discussed earlier and was a very popular method used from 1978 through 1983. This method is rarely used for satellite TV transmissions today as most satellite TV receivers have built in video invert switch capability and the picture is easily restored.

CABLE TV SYSTEM THEFT OF SERVICE

Cable TV systems discovered from the beginning that if a means exists to encode then a means exists to decode. Presently there are approximately 30 million cable TV subscribers in the country. The trade industry estimates as many as 10



The BC-800XLT... an owner's report

by Bob Parnass, AJ9S

Manufactured in Taiwan, the 800XLT is the first programmable Uniden/Bearcat scanner to cover a portion of the 800 MHz band. Covering 40 channels in 2 banks the 800XLT is specified to receive in the following ranges:

TABLE 1. 800XLT Frequency Coverage

Table with 4 columns: Frequency 1, Frequency 2, Band, and Mode. Rows include 29-54 fm, 118-135.975 am, 136-174 fm, 406-512 fm, and 806-912 fm.

Note that only a portion of the new 902-928 MHz ham band is covered.

million subscribers are receiving premium services illegally. Since decoders are basically passive in nature one almost has to have been seen in operation to know it exists.

In desperation some cable systems have offered a reward system for information. To say the least, an interesting conversation should result after a child has turned in his parents to the cable company for having an illegal decoder and the parents have to cash the reward check for the child because he or she is a minor!

Federal legislation passed in 1984 as part of the Satellite TV Viewing Rights Act now makes it a federal crime to sell or use any decoder for unauthorized reception of a transmission regardless of the media used whether it be cable TV, satellite, fiber optics, MDS, etc. With the enactment of the legislation most of the previous private sector sources of such clandestine equipment went out of business. However, there still is a tremendous volume of such equipment out and in use and such items will probably show up at hamfests and flea markets for many years to come.

A FEW COMPARISONS

There are several differences between this scanner and its Bearcat predecessors:

- There is only a single scan/search speed: fast!
--800XLT channel banks contain 20 channels, not 10 as in previous models. Doubling the number of channels in a bank is a step backwards.
--Scan delay, channel lock-out and priority are indicated by separate colored LEDs rather than the numeric display, making a colorful light show.
--Both the selectable scan delay and the priority sampling period are 3 seconds vs. 2 seconds in the older scanners. I like the 3 second scan delay, but would opt for a 1 or 2 second priority sampling period.
--Despite claims on the 800XLT box to the contrary, a 2 digit channel counter is displayed which scanning, as in the BC350, rather than "rolling zeroes" of the BC 210/220/250/300. This is unfortunate, as rolling zeroes make it easier to discern what channels are locked out from scanning without having to step through each one manually.
--The keyboard has a good feel, although quite different from the "chicklet" keyboards on Bearcat 250 and 300 scanners. Keys travel further with less of a positive click. The 800XLT keyboard is much easier to read, as each key has its function printed right on the key-top rather than labeled above it on an inlay.
--The 800XLT seems to lack "window detection" circuitry, so the scanner may stop prematurely (off frequency) in the SEARCH mode.
--There is no date of manufacture stamped on the cabinet.
--Mobile DC power cord is optional, but is supplied as standard equipment with other Bearcat scanners.

INSIDE APPEARANCE PLEASING

The inside of the 800XLT consists of three circuit boards:

- 1.a main receiver board containing VHF/UHF front ends, IF stages and audio amplifier;
2.a feature board containing microprocessor and keyboard logic; and
3.an 800 MHz front end board which uses surface mount components.

The boards appear very

neat and it is obvious that computer aided design and automated component insertion techniques were used. What a welcome change from the chaos inside a hand assembled BC250!

No schematic diagram is furnished. Whereas the identity of many of the ICs in earlier Bearcat scanners was obscured by the use of "house numbers," the ICs in my 800XLT are clearly marked with their original designations (e.g., "National LM382"). This makes repair easier, as one may obtain parts from several sources rather than being forced to buy from Uniden.

SIDE-BY-SIDE COMPARISON

Side-by-side tests were performed, switching a

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More on the Infotech M6000

Last month we reported our preliminary findings on the new Infotech M6000 multimode demodulator, including its ability, when combined with a printer or video display, to present text from received messages in RTTY, Morse, ASCII, TOR, and even TDM (time division multiplex).

In a nutshell, we criticized the difficulty we found in initially setting up the instrument and following the instruction manual. We pointed out that the M6000 is a fine performer and packed with features found on no other consumer demodulator.

A letter just received from Fred Osterman, Short Wave Manager of Universal Radio, distributor for the M6000, pointed out several errors of omission (and a few of inclusion!). We respect Fred's judgment and offer some of the high points of his letter for our readers.

"You claim the unit is 'too feature-packed'. What features would you want to leave out? With the exception of the high-speed ASCII speeds/shifts everything else is found on short wave.

"You refer to the 'bevy of front panel switches which require constant

attention.' For 'normal' RTTY reception you only have to 'watch' one toggle switch...the Normal/Reverse switch.

"Your closing remark is 'the new owner should brace himself for an intense breaking-in period while he digests the convoluted manual from cover to cover.' I think this is unfair. It is true that it would take a long time to learn all the capabilities of such a unit, but it is not difficult for the new user to get started. In fact for the regular Baudot RTTY this unit is by far, the easiest RTTY demodulator ever made.

"Because of its high-powered microprocessor, it is almost 100% automatic. To tune a Baudot station all you have to do is tune your radio near a RTTY signal and press <*>. The M-6000 goes out and tunes the mark, tunes the space, and sets and displays the shift. Not sure of speed? Just press <1> for speed readout! The only thing the user has to do is try Normal/Reverse switch! For regular RTTY how could it be any simpler?

This unit offers some revolutionary features, never before available to the listener:

- * It is the first unit to have microprocessor controlled filters that among other things can automatically tune the unit and

display a calculated shift.

- * It is the first unit where the user can set his/her own power-up settings.
- * It is the first unit to display on the status-line variable shift values.
- * It is the first unit where the user can program in his own 'keywords' (Sel-Cals) to activate his printer.
- * It is the first unit to offer three selectable alphabets.
- * It is the first unit to be completely remote controllable by a computer or terminal.

You don't mention low-tone/hi-tone select on RTTY, the new LED indicators, 4 video formats, scope out, variable voltage/cycle select, etc., etc. These innovative features are in the features/specification table but the reader could easily overlook them.

Monitoring Times has built a reputation for accurate, comprehensive and balanced equipment reviews. Your M-6000 review is not accurate, not comprehensive and not balanced. I hope you will reissue an appropriate review of this product immediately."

The M6000 is now available from Grove Enterprises for \$849 including UPS shipping anywhere in the U.S.

The Spectrum Monitor as a Wide Range Receiver

by Bob Grove

As we become more familiar with listening equipment on the market, dreaming of the day when we can afford that luxurious receiver that will answer all our prayers, our imaginations soar as we read the manufacturers' literature. One class of equipment which stands out above the rest is the spectrum analyzer and its cousin, the communications monitor.

THE SPECTRUM ANALYZER

Featuring an oscilloscope screen and a blur of knobs and switches, the spectrum analyzer is an electronic instrument

No further memory problems have been encountered (see also p.37 of Feb 1986 MT).

SQUELCH HYSTERESIS

There is too much "free play" in the stock 800XLT squelch control, the same affliction designed into Radio Shack scanners. The remedy consists of replacing the 860K ohm resistor on pin 14 of the MC3359P IC with a 2.2M ohm resistor.

NOT AS SELECTIVE AS OLDER BEARCATS

At -55 dB @ ±25 kHz, the 800XLT IF selectivity is not quite as good as the BC350 and BC300 which are rated at -60 dB @ ±25 kHz. The wider selectivity causes the scanner to stop prematurely in the SEARCH mode and makes it difficult to determine, for example, if a station is transmitting on 855.2500 as opposed to 855.0125 MHz.

Since the 800XLT tunes in 12.5 kHz steps on the 800 MHz band, the wider selectivity is handy when scanning telephone cell sites which are on channels spaced on 30 kHz apart.

OVERALL EVALUATION

The 800XLT is the most conventional and easiest to operate of the new 800 MHz-capable scanners. It is plagued neither with the slow scan/search rate of the Regency MX7000, the low audio output of the MX4000, nor the unfriendliness of the Yaesu scanning algorithms.

The 800XLT's tendency to overload on strong signals and awkward squelch action detract from an otherwise good performance.

alkaline AA batteries. The problem was traced to a metal contact, installed backwards in the battery

holder. Repair required desoldering a red wire, repositioning the contact, then resoldering the wire.

TABLE 2. Performance of Bearcat 800XLT vs. 260 vs. 300

Band	Bearcat 800XLT	Bearcat 260	Bearcat 300
30-37 MHz	more sensitive	more sensitive	less sensitive
	weak birdies	moderate birdies	moderate birdies
	overloaded by paging, police mobile phones	no overload detected	no overload detected
37-50 MHz	equally sensitive	equally sensitive	equally sensitive
	overloaded by paging, police mobile phones	no overload detected	no overload detected
vhf aircraft	more sensitive	N/A	less sensitive
vhf-hi	slightly more sensitive	slightly more sensitive	slightly less sensitive
	overloaded by paging heard 162.55 wx on 147.19 and elsewhere	no overload detected	no overload detected
uhf	more sensitive	less sensitive	less sensitive
	overloaded by paging	no overload detected	no overload detected

BC-800XLT cont'd

Butternut SC3000 tri-band antenna at 20 feet among three scanners: the 800XLT, a new Bearcat 260 and an old Bearcat 300 workhorse. The test equipment used was a pair of human ears which we all use when scanning.

As is shown in Table 2, the 800XLT was more sensitive on some frequencies but suffered much more overload from strong signals. This is important if the 800XLT will be used with an outdoor antenna. The 800XLT had fewer annoying birdies than the other models tested.

On the 800 MHz band, several police, business and cellular telephone stations were received using the supplied 3" antenna. Clear reception of a repeater used to dispatch Chicago Tribune photographers was possible from 50 miles distant.

The 800XLT audio output is clean and strong with little synthesizer whine.

EARLY PROBLEM FIXED: Memory Loss

My 800XLT lost its memory contents when unplugged from 117VAC, even though loaded with a fresh pair of

SPECTRUM MONITOR cont'd

designed to visually display a portion of the radio spectrum and the signals occupying it.

A base line traced across the bottom of the display symbolizes the portion of the spectrum, left to right, by increasing frequency. A "pip," or rise in that line, indicates the presence of a signal.

For example, if we imagine the scope trace to represent 150-170 MHz, then a signal appearing at 160 MHz would make a pip rise at the middle of the baseline; the stronger the signal, the higher the pip.

True spectrum analyzers cannot be used for receiving because they have no audio detection, although some models include simple detection to monitor modulation which may be present on the signal at the center of the display.

The intended application of the spectrum analyzer is, as the name implies, to analyze the characteristic waveform of the radio signal being studied. Other uses include identifying interference, analyzing unwanted radiation from electronic equipment, doing spectrum usage studies in metropolitan areas, and searching for "bugs."

THE COMMUNICATIONS MONITOR

A very powerful tool for the communications service shop is the communications service monitor, a combination instrument which may include a spectrum display, internal signal generator and other test functions and, most important of all to us, a full receiver with audio detection.

Although intended for the servicing of two-way transmitters and receivers, the service monitor can be used as a wide-spectrum receiver in its own right. Let's take a closer look at one of the newest communications service monitors on the market, the IFR FM/AM-1200.

ENTER: THE FM/AM-1200

The 1200 is an extremely powerful piece of test equipment for the serious technician. It can be battery or AC operated, portable, mobile or fixed. The 1200 can be externally computer controlled through an RS-232 port provided.

Functions include: spectrum analyzer, AF/RF signal generator, tone encoder/decoder with memory, RF power meter, modulation/deviation meter, duplex/simplex transmit/receive

with microphone input, 250 kHz-1000 MHz continuous coverage reception and transmission, AM/FM/SSB modes, keyboard frequency entry to 100 Hz accuracy, SINAD meter, signal strength meter, programmable tone generator, 1 MHz oscilloscope, frequency error meter, and calibrated attenuator!

But let's confine our discussion to using the 1200 as a general coverage, wide frequency range receiver. And remember, it was not designed to be used strictly in this fashion, so some disadvantages can be expected.

Sensitivity is rated at 2 microvolts; compared to typical scanner ratings of better than 0.5 microvolts, this may seem less sensitive but, in fact, it proved virtually indistinguishable from scanner sensitivity in actual on-the-air tests.

Full-stroke keyboard frequency entry to 100 Hz is quite a luxury; the scanner user who has to round off 163.2625 can enter all the digits on the 1200. And the monitor has 16 memory channels which can be scanned as well. However, trying to change frequency quickly to catch a signal which pops up some distance away on the spectrum display is virtually impossible. The user must rely on a fixed choice of digitized frequency increments and steps.

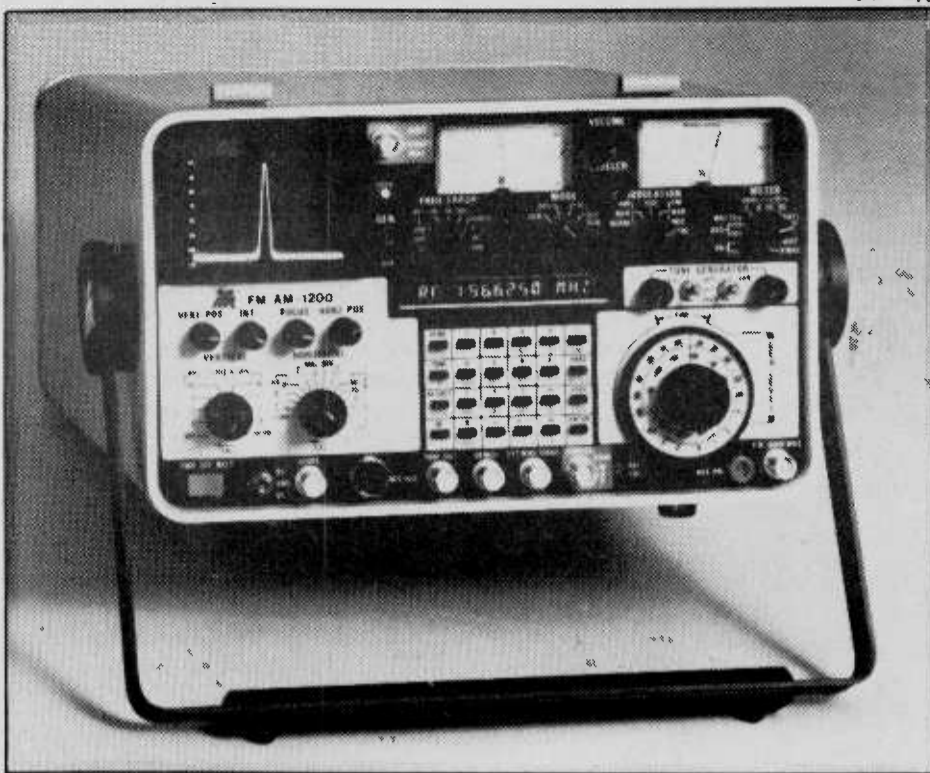
Audio quality and sound level from the internal speaker is excellent and squelch sensitivity is certainly acceptable.

The 2-1/2" CRT spectrum display may be adjusted to allow presentation of a bandwidth from 10 kHz to 10 MHz, permitting instant recognition of signal presence on a band as well as examining a modulation envelope for mode, subcarriers, distortion, and other characteristics.

The receiver utilizes triple conversion superheterodyne principles with up-conversion, leaving the display nearly devoid of spurious signals.

Selectivity is adequate for VHF/UHF monitoring, but too broad for short wave use: IF bandwidths are 200, 15 and 6 kHz. Strong signal breakthrough on many short wave ranges is quite apparent with an external antenna in use (a rubber duckie is supplied for bench testing, attached by a BNC connector).

Although the 1200 is specified as having a low frequency range of 250 kHz, we were able to use it down to 100 kHz with an external



Grove TUN-3 Minituner to provide better RF selectivity.

Measuring 13"W x 7"H x 18"D and weighing 32 pounds without battery option, the 1200 is pretty sizable to carry around or use in a mobile situation, but that was not its primary intent.

At a cost of about \$8000, the IFR 1200 is not likely to turn up on the benches of many weekend experimenters, but considering the instrument's enormous capabilities, quality of construction and accuracy

of readout, it is a serious contender in the mobile radio service field.

To point out shortcomings of the 1200 as a dedicated receiver is like complaining that a piano doesn't sound like a violin—it wasn't intended to!

Prospective customers of this fine service instrument who desire further information are invited to contact the distributor, TESSCO, 101 Lakefront, Hunt Valley, MD 21030 (ph. 800-638-7666; MD only 800-492-7666).

GOOD NEWS

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NEW ARRIVALS

The Ultimate in Secure Speech

Scanner enthusiasts are encountering growing numbers of scrambled speech channels, especially in metropolitan areas where major offices of federal government agencies are located.

Motorola, a leading pioneer in digitized speech, has released another in their series of "SECURENET" products designed to thwart casual interception by prying ears.

The new "SECURENET EXPO" is touted to be one of the world's smallest two way radios and will be heard by non-equipped eavesdroppers as random white noise on a scanner.

Shirt pocket size, the encoder is capable of providing it with security of such a degree that if an



Motorola's SECURENET EXPO portable radio provides maximum security after being programmed by the SECURENET code inserter.

interceptor could try one million codes every second, it would take him 75 million years to exhaust all the possibilities!

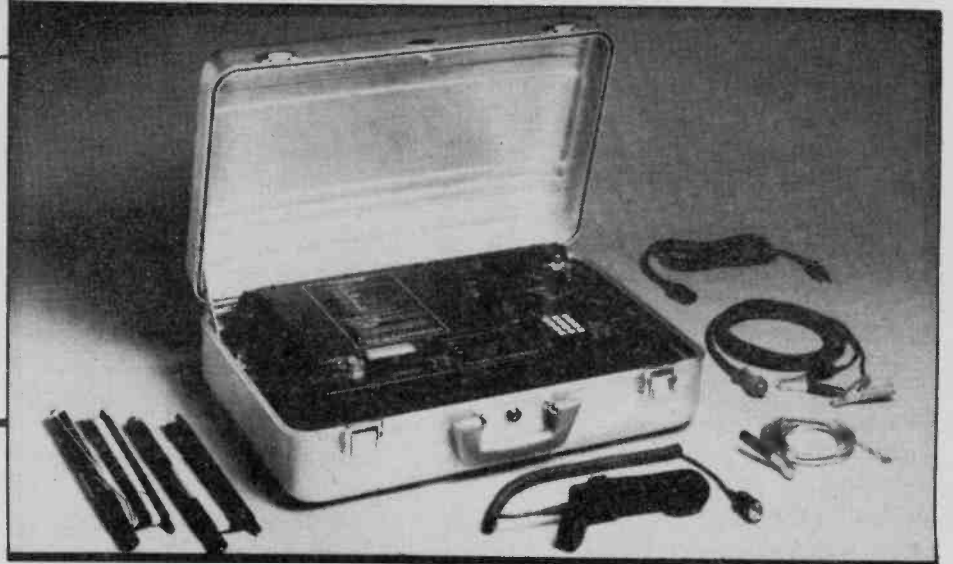
Spies...May We Have Your Attention?

The new TW100F "Fly-away" radio from Trans World Communications (240 Pauma Place Dept MT, Escondido, CA 92025 ph. 619-747-1079) is a field agent's dream. A portable 1.6-30 MHz, 125 watt SSB/CW transceiver in a rugged aluminum attache case may be powered by its built-in universal AC power supply or an external source of 12 VDC.

100 memory channels permit half-duplex and channel scanning. A built-in

antenna tuner allows efficient matching to a variety of leads, including the wire antenna kit supplied.

While the \$6000 price tag might seem a bit steep, I'm sure that every undercover operative can have one under his Christmas tree next year if he puts in his requisition now! And, naturally, I'll expect Trans World to have one under my tree after this nice product release in MT!



RTTY/FAX

MORE ON WEFAX

There seems to be a growing awareness among MT readers of the potential for direct monitoring of weather facsimile (WEFAX) transmissions using reasonably priced equipment. This month we share a few comments from veteran FAX monitor Bill Tyrrel of East Northport, NY.

The October 1985 issue of Monitoring Times has an item on page 34 entitled "Weatherfax and MX-7000."

Someone apparently jumped to the conclusion that the WEFAX signal in the APT service on 137.50 and 137.62 is a frequency modulated carrier. If this were the case, a BFO would be required for carrier

reinsertion, as stated in the article. However, the signal is double sideband, amplitude modulated, with a carrier of 2400 cycles per second. For this reason, the signal is processed the same as any other AM voice signal.

Some scanners make a programmed change from the AM mode to FM at 136 MHz. This would seem to split the difference, wouldn't it? Get one but not the other!

Why 2400 cycles per second? Simple. In remote areas without stable equipment and without a frequency standard to drive the synchronous motor, the 2400 Hz carrier could be stripped of modulation, then amplified and used to drive a binary divider down to 60 cycles per second, then power-amplified and used to

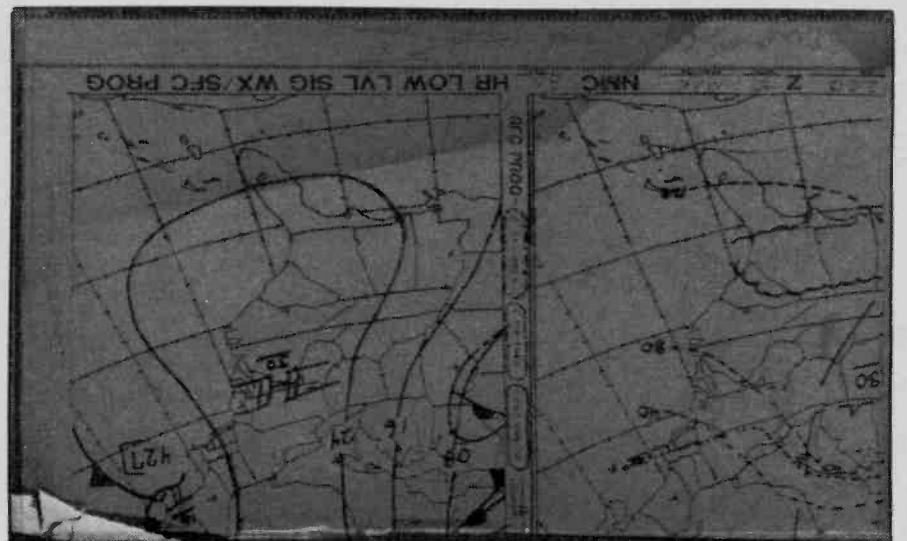
drive the motor synchronously with the transmitter.

Fax is without a doubt the most unglamorous and least publicized service on the airwaves today. It was invented by Alexander Bain in 1829 and the signals have been just cranking along with no real changes ever since. Nobody writes a column...nobody writes articles...nobody publishes frequency/schedule information...no technical information worth a damn is available. The technology has a mystique that would put Havana Moon to shame! Glow lamps...photo-multipliers...baseband...phasing...index of cooperation...light choppers, etc.

Anyone who has not toyed with fax is missing a lot of fun. There's a lot of stuff out there, night and day.



Associated Press news photos and weather maps are a small sampling of FAX in the short wave bands.



CLUB CORNER

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

Legitimacy for License-Free Radio?

Ten months ago in the May 1985 issue of *Monitoring Times*, columnist Hank Bennett made an interesting proposal involving legalizing pirate broadcasters who operate in a very specific band and with certain strictures. My "Why not" response kicked in and, in the November, 1985, issue of "RadioPhiles," I made a similar proposal.

The other evening I had an opportunity to listen to a local FM pirate operating on 108.2 MHz. Not only was he posing potential interference to local aircraft by operating on that frequency, but the pirate, who used the call letters KDUL, presented nothing new...just more rock music and inane commentary in a city whose airwaves are saturated with the same. In short, he needed to rearrange his call letters to KDUL to reflect his programming!

Now, the FCC is putting machinery into operation which probably will result in the expansion of the broadcast band through 1705 kHz in the next decade. If you're a fan of FM radio, you'll probably snicker a little and remind us that FM has now taken over the major portion of the listening audience...and who cares if AM will have ten more frequencies?

Will manufacturers hold back (as they have with AM stereo) in providing the consumer with inexpensive radios which tune to 1700 kHz? Will the public actually tune to the new frequencies? More important, what kinds of programming will AM broadcasters turn to in their effort to quiet those who prophesy the doom of AM radio by 1999?

First, there are the technical problems to consider. Daytime coverage is going to be limited; according to the FCC (R&R, April 5, 1985) primary groundwave coverage will reach out to 24 miles during the day and 4.1 miles at night for a 1 kW station at 1655 kHz; a 5 kW'er will cover a radius of only 34.3 miles days and 4.4 miles nights. Boost the power to the maximum 50 kW? You get only 58.2/4.8 miles.

So much for groundwave. However, skywave interference between competing stations could be severe, according to WLS chief engineer Al Resnick. For example, 10 kW Caribbean

Radio Lighthouse on 1610 can easily be heard on the west coast and even in Hawaii, and quasi-legal KPF-941, operating from Yonkers on 1622 kHz with 100 watts, could be heard in Canada at night. But without actual experience, we won't be able to determine how severe the interference problems at night will be.

To encourage listeners to tune up to the top of the band, the FCC will probably allow dual operation (one station on its original frequency, the other on the new one, until expanded radios are widely available and the public is "programmed" to tune up to the top of the band) for stations who wish to switch frequencies to improve their night coverage.

Wouldn't it be great to hear an ID such as "You're listening to the Nation's Station, WLW Cincinnati, at 700 and 1700 on your radio dial..." with nation-wide coverage at night?

Think of the cultural implications of blanketing the nation with WSM's Grand Ole Opry...WGN's unique bland of talk and music...WLS's rock...WAQI's Spanish-language programming...KOMO's cosmopolitan format...KHJ's "Car Radio," for night travelers...as opposed to the bland programming found on most feeds taken right from the satellite. We might actually start LISTENING to the radio!

But until big-bucks broadcasters settle forever into those frequencies between 1605-1705 kHz, why not allow local, low-budget stations to test the waves, so to speak, with the blessing of the FCC and the know-how of local groups, perhaps even established radio clubs? At the same time, operating within certain simple rules and regulations, they could provide some community service programming.

THE GAME PLAN

Here's my suggestions for rules:

Technical: (1) An initial 6-month permit, with one-year renewals until the band was to be opened to the new stations. At that time, the operator would have to vacate to a pre-determined frequency, say 1710, or get off the air. (2) The FCC would not choose frequencies for the broadcaster; disputes would have to be arbitrated by the concerned parties who should be prepared to share times,

frequencies and even facilities. The licensee would have to maintain technical standards and keep transmitter and program logs, whether he homebrewed his own transmitter or purchased one from a commercial manufacturer. (3) Power would be limited to 1 kW daytime and 500 nighttime. (4) Gross and deliberate violations (such as operating at a high power, causing spurious emissions, broadcasting obscenities, libel, or advocacy of violent overthrow of the government) would be subject to immediate termination of operation by the FCC.

Programming: (1) NO USE OF PROFESSIONAL PRE-RECORDED MUSIC of over 60 seconds in duration would be permitted - to prevent wall-to-wall non-programming. Taping of "live" events for rebroadcast would be permitted. (2) Commercials and paid blocks of time would be permitted,

as long as both were broadcast live (with drop-ins, doughnuts and background music permitted during the commercials). (3) No audio network affiliation (except for transcribed non-sponsored, non-paid programs) would be permitted, although remote or telephone feeds would be allowed.

Finally, the station would be accountable to its local audience. Deliberate technical violations would be handled by the FCC, other problems by the local courts if necessary. Obviously, the emphasis would be on local programming aimed at a local audience.

Each station could be sponsored by a club, and even a small community could host up to ten such stations. In sprawling Los Angeles, two or three stations, even at maximum power, could operate on each

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frequency without undue interference to each other.

The initial cost to get a transmitter on the air would be somewhere in the \$1,000-\$5,000 range, even cheaper if talents and equipment were donated. Individuals would learn more about the responsibilities of free speech on the air, and communities would benefit from the unique programming.

Perhaps no one would bother to listen to the dull pirates any more, and they'd die a natural death. So much for my proposals--let's take a look at what some clubs have been doing recently.

THE CLUB SCENE

THE NATIONAL RADIO CLUB is raising money to support its other activities and publications by offering computer-generated stick-on labels at \$2.00 for 100. For information, send an SASE to the NRC Publication Center, P.O. Box 164, Mannsville, NY 13661. Add 50 cents for a catalog of all NRC products, while you're at it.

NRC Publisher Mike Knitter tells me that he's been working on the next edition of the popular Domestic Log, and that new information not previously available will be included in the log. Best of all, he hopes to avoid an increase in price by continuing to use the computer in arranging the material.

NRC's 1986 annual Labor Day convention will be held in Delaware, and the 1987 convention is slated for Lima, Ohio.

THE GATEWAY DX CLUB has converted to a monitor service and will also offer awards in such categories as short wave, medium wave, long wave, FM, TV, and airchecks. Send Chief Monitor Eric Bueneman an SASE for more info at 836 Lamplight Lane, Hazelwood, MO 63042.

THE ONTARIO DX ASSOCIATION sent me a page and a half listing of their accomplishments for 1985 and a third page listing their goals for 1986. Frankly, I've always been impressed by ODXA's bulletin and accomplishments, and it's goal-setting like this that will keep ODXA in the vanguard of effective clubs.

A few accomplishments: a membership increase from 230 to 400 members; advertising increase from one or two pages a month to five; ANARCON '87 awarded to ODXA; 84 in attendance at their convention; credit vouchers for signing up new members; and a new ODXA logo.

For 1986, ODXA plans to

increase the number of retail outlets carrying their bulletin; to begin meeting in other cities besides Toronto; and to publish several reference books. Most important, non-Ontarians who formerly could only be considered as subscribers will now become "associate members" and will be able to receive most of the privileges accorded residents of the province of Ontario.

I would suggest that any club which would emulate ODXA's accomplishments and goals would do well to send an SASE to Stephen Canny, 2952 Bayview Ave., Willowdale, ON M2N 5K6 and request ODXA's goals and accomplishments. Include three IRC's if you do not live in Canada, of course.

THE ALL-OHIO SCANNER CLUB now offers MRE's to their members; in other words, if a person recommended by a current member joins the club, the current member will receive a two-month extension on his membership, with no limits on members (as long as no former members are signed up).

ODXA pioneered this concept among DX clubs, but the concept of rewarding members for recruitment among such clubs as the Jaycees is widespread and very successful.

Ken Stryker's "Aero/Marine Beacon Guide" (160-1745 kHz) is hot off the press. Longwave DX'ers will find over 6100 beacons listed and more information included than in the original "Beacon Guide." It's issued in looseleaf format.

Although not strictly a club project, many listings were obtained through observations of LWCA members. For more information, send an SASE to Ken at 6350 N. Hoyne Ave., Chicago, IL 60659.

NASWA members will be heard on KCBI in the near future. They're being asked to record up to three minutes of equipment reviews, program reviews, station broadcast profiles, or anything broadcast related for shortwave outlet KCBI. More information? Write Nick Pappas, 8570 Cedar Cove Drive, Orlando, FL 32819.

According to ANARC News Editor Dave Browne, **THE UNION OF ASIAN DX'ERS** is sponsoring a membership drive. For details, send three IRC's to UADX, 32/4a Malwatte Road, Dehiwale, Sri Lanka.

And that's about all we have room for this time around. I'll be with you next month...until then, 73's.



...Three Excellent Books on Antennas written by William I. Orr and Stuart D. Cowan, available from Radio Publications, Inc., Box 149 Dept MT, Wilton, CT 06897.

THE RADIO AMATEUR ANTENNA HANDBOOK (\$7.95) Quads, verticals, Yagis, longwires--they're all here in this excellent 190-page pocket compendium of antennas for communications. From HF through VHF the informative theory and construction articles are of value to hams and listeners alike.

Discussions on coax cable, SWR, compact antennas, towers and rotors, balun transformers, and gain. A very handy reference for the experimenter who wants to get the most signal for the money.

SIMPLE, LOW-COST WIRE ANTENNAS FOR RADIO AMATEURS (\$7.95) The miracle of throwing a wire over a tree and hearing the world is still with us. Nonetheless, there are correct ways and incorrect ways to do it. Orr and Cowan tell us the correct ways in the 192-page guide to wire antennas for transmitting and receiving signals on the short wave bands and VHF as well.

Some great background chapters present electromagnetic theory in very readable terms. Multiband and trap dipoles, inverted vees, the twin T, random and end fed wires, and other assorted wire antennas are discussed in depth along with actual projects, well illustrated.

BEAM ANTENNA HANDBOOK (\$9.95) The term "beam" antenna has a magical connotation. High gain, directivity, distant reception--all seem to be guaranteed by these rotatable antennas. This handbook really takes the inquisitive antenna designer through his paces. It is hard to imagine that there is any aspect of directional arrays which is not covered in depth in this publication with its 271 information-packed, well-illustrated pages.

The basic Yagi array is featured throughout the handbook; log periodic designs, stacked arrays, matching devices, transmission lines, trapped elements, and measuring instrumentation are examined.

As with the two books discussed above, the **BEAM ANTENNA HANDBOOK** is liberally illustrated and packed with useful information for those readers curious about how directional antennas work.

RADIO RECEIVERS--Chance or Choice, by Rainer Lichte (223 pages, 6" x 9", paperback; \$18.50 plus \$1 shipping from Gilfer Associates, 52 Park Avenue, Dept. MT, Park Ridge, NJ 07656)

Planning on buying a short wave receiver? Like to know what is on the market, new or used, that might fit the bill? Lichte's new book describes the primary specifications of some 80 receivers and two dozen accessories manufactured over the last several years.

SECRETS OF SUCCESSFUL QSL'ing by Gerry L. Dexter (Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147. \$9.95 plus \$1 shipping, \$2 shipping foreign orders, U.S. funds)

The book, which includes a foreword by Ian McFarland, host of "SWL Digest" on Radio Canada International, carries the subtitle "the complete guide to reception reporting and QSL collecting" and that seems a very accurate summary of what's inside.

The book's 128 pages start with some basic stuff on QSLs and continue through basic reception reports, follow-ups, tentative reports, forms and letters, postage, foreign languages, designing prepared cards, sources for mint stamps, enclosures and a lot more.

Ever thought of sending reports simultaneously to all the department heads of a station which has previously ignored you? Dexter calls it "shotgunning" and it's just one of a number of esoteric techniques he explains.

The beginning listener will find this book packed with valuable information; even old hands should find several nuggets which they can put to use.

If you are serious about QSL collecting this book is highly recommended.

THE SKEPTICAL INQUIRER or, Want to Know the Real Facts?

Whether you are interested in UFO's, firewalking, spoon bending, poltergeists, astrology, witchcraft, or other paranormal phenomena, **THE SKEPTICAL INQUIRER** will provide a scientific perspective.

SI is a quarterly news magazine published by the

Committee for the Scientific Investigation of Claims of the Paranormal (CSICOPS), a nucleus of several dozen top investigators with excellent scientific credentials which includes magician James ("The Amazing") Randi, whose exposés of charlatan psychics are legend.

If you find the scientific evaluation of modern myths refreshing, subscribe now to the *Scientific Inquirer*; you won't find more rational discussion anywhere.

Editorial contributions by such respected names as Isaac Asimov, Kendrick Frazier, James Oberg, Martin Gardner, Paul Kurtz, and Philip Klass gild the legitimacy of the publication.

This is the group which strikes fear in the hearts of hucksters like the perpetrator of the Columbus, OH; "poltergeist" case a couple of years ago.

(94 pages, 6" x 9"; \$18 per year from *The Skeptical Inquirer*, Box 229, Buffalo, NY 14215-0229.)

Gardner: A master of mathematical puzzles, he is not fooled by scientific hoaxers.



U.S. MILITARY RADIO COMMUNICATIONS by Michiel Schaay (3 volumes, 261 pages, 8" x 11-1/2", paperbound; write for price and availability to Michiel Schaay Radio Publications, Sparrenlaan 42, 3941 GM Doorn, Holland)

Michiel Schaay is a tireless researcher and his latest compendium of worldwide U.S. military installations, capabilities and radio frequencies is an example. But prospective buyers should be aware that it is sprinkled with criticism of U.S. involvement in the business of other countries.

In no way does this observation detract from the accuracy or usefulness of Schaay's book; it is mentioned merely to safeguard the American reader from an unexpected assailing of his country's character. While short wave broadcasters frequently criticize U.S. foreign operations, radio hobbyists generally don't expect to find the barrage continue in their purchased frequency manuals.

For balance, Schaay states that he intends to

AN INSTITUTION REACHES 40 *The World Radio TV Handbook*

by Ken Wood

Forty. Now there's a word that carries with it some heavy psychological baggage. To a teenager, anyone who is forty or older might as well be dead. To someone at or fast approaching that age it may be looked upon as the time life really begins. Or it may be anticipated with varying degrees of dread. For many it is depressing, a passing through.

Often, 40 is a time to take stock of where one has been and where one is

release a future book on Russian military communications with the same editorial slant. Regardless of our personal feelings concerning his editorializations, let's take a close look at the contents of his book(s).

While considerable extracting from Bob Grove's Short Wave Frequency Directory is present (and approved before publication), the majority of the remaining frequency records appear to have come from the ITU (International telecommunications Union), a multinational repository of radio frequency assignments funded by the U.N. and headquartered in Geneva, Switzerland.

Most of these frequency records are point to point and unclassified; modes of emission vary but include RTTY and data, mostly encrypted. Some voice will be heard on single sideband.

Additional information from other sources has also been pooled, making the three volume set quite a valuable collection of frequencies and details about the American military presence worldwide.

Non-military agencies which have some military involvement are also included such as Department of Energy, Federal Emergency Management Agency, NASA, FCC, and others as well.

At the time of our granting republication rights to the military portion of our Short Wave Directory to Michiel Schaay we were unaware that credit would be given along with the anti-U.S. military bias; nonetheless, we must admit with total objectivity that U.S. MILITARY RADIO COMMUNICATIONS is well researched and we recommend it to short wave utilities monitors with an interest in tuning in military communications. ●

headed. This sort of thing has been defined by modern man as the "mid life crisis" though one may have trouble recalling whether one's parents ever went through such difficulties. Maybe they didn't. Maybe the affliction as well as the name are peculiarities of the modern age.

Be that as it may we now have proof that this time of potential crisis, change and renewal isn't something restricted only to people. It strikes companies as well and it has descended upon a short-wave institution - *The World Radio TV Handbook*.

1986 is the Handbook's 40th anniversary and the evidence is plain for all to see: The Handbook's staff took edition forty as a time to make a fresh start, to look at what went before and rededicate themselves to making changes and improvements in the SWL's old reliable.

Have they achieved their goal? Pretty much so. The first thing that strikes the eye as you leaf through the 1986 edition is the new graphics style. The pages are bordered top and sides with an additional line down the center of each page.

Section headings at the

top of the pages are in red and the country names in the radio listings are lettered in white on narrow red rectangular backgrounds. Better use is made of "white space" so overall effect is something easier to read and use. We haven't quite decided if we like the red block country headings, though; the idea of color here is good, but our personal choice might have been light blue.

At attempt also seems to have been made to clean up some of the more complex country listings which have caused user trouble in the past. Nigeria, the USSR, China, and others seem to have been clarified, although some of this is also the result of the new format and graphic design. The Indonesian listing, criticized in last year's edition for omitting the non-RRI stations, has had them reinserted.

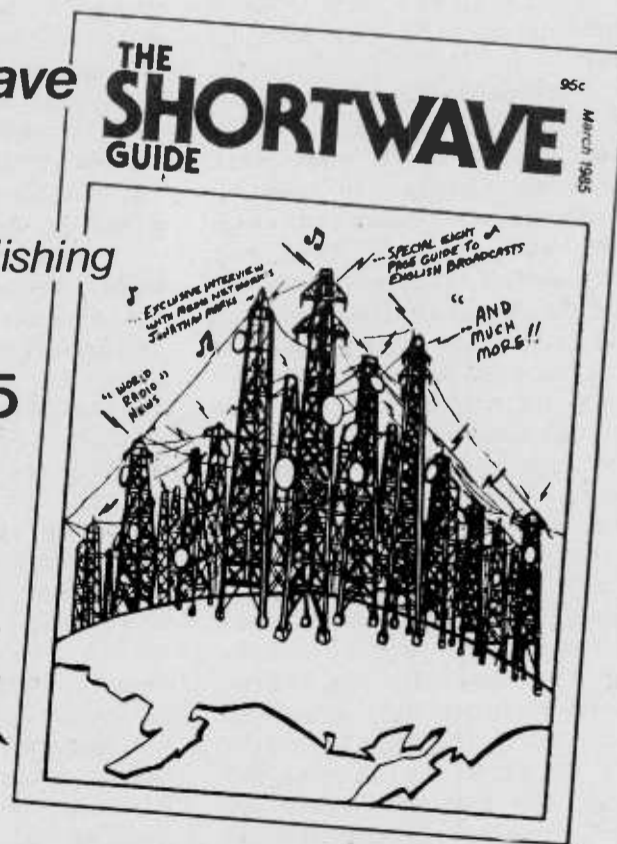
It is always fun to look at the advertisements in the Handbook and the new edition has a lot of fresh, color advertising, including a full page from not-yet-on-the-air NDXE which also has a bound-in card stock insert with a tear-out postcard questionnaire.

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If you're into shortwave listening, *The Shortwave Guide* is for you. Each year you'll get twelve monthly issues packed with the latest news from stations around the world, DX tips, interviews with your favorite shortwave personalities, articles, equipment reviews, do-it-yourself projects, a TV Guide-style program list, the latest frequencies for English broadcasts to North America and much, much more!

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"What are those noises above the BC band?"

Many newcomers to short wave listening (and a few old timers alike, I would venture!) are puzzled to hear the strange array of noises which populate the region 1600-1800 kHz, just above the standard AM broadcast band.

The vast majority of the signals (outside of the cordless telephone base units which are obvious by the voices on them) belong to the radio navigation service. These coastal transmissions are intended to provide data to suitably equipped maritime receivers for positioning purposes.

Recently, Craig Healy, our "TOP END" editor, submitted a list of loggings which he made of the past few months which will help listeners identify the various sounds which they hear in this small piece of spectrum at the lowest end of the high frequency range.

- 1609.5 Cubic Argo
- 1617.5 Cubic Argo
- 1628 Cubic Argo
- 1632 Cubic Argo
- 1645 Cubic Argo

- 1655.8 Teledyne
- 1679 Cubic Argo
- 1682 Cubic Argo
- 1705 Cubic Argo
- 1714 Cubic Argo
- 1716 Cubic Argo
- 1721.5 Cubic Argo
- 1725 Cubic Argo
- 1728.5 Cubic Argo
- 1746 Decca HiFix
- 1747 Decca HiFix
- 1748 Decca HiFix
- 1750 Cubic Argo
- 1759 Cubic Argo
- 1762.5 Cubic Argo
- 1763.9 Cubic Argo
- 1764.9 Cubic Argo
- 1765.5 Cubic Argo
- 1771 Cubic Argo
- 1779.5 Cubic Argo
- 1782 Cubic Argo

Craig monitored all of these on his Drake R7A receiver using either a 125 foot wire antenna or 25 foot vertical. He would like to receive additional loggings from other listeners who may write him at 66 Cove St., Pawtucket, RI 02861.

A comprehensive collection of these signals is included in Bob Grove's SHORTWAVE DIRECTORY, available from Grove Enterprises and Grove dealerships.

WRTVH cont'd

Among the black and white ads you'll see your first picture of the mysterious new Japan Radio Company NRD-525 receiver and you'll spot the Christian Science Monitor already advertising its short-wave service due on the air in 1987.

A special and especially interesting feature is a look back through some past editions. Changes in country listings are sampled from the 1948, 1956, 1966, and 1976 editions. Even in 1948 the Gold Coast (Ghana) was using 4.915. There was a station called Radio Elizabeth in the Belgian Congo (Zaire) and we're told about broadcasts from Goa, Radio Monte Carlo, Andorra, and many more. Sigh.

Larry Magne is on board again with his always-anticipated receiver reviews. This year he covers the ESKA RX99PL, the Heathkit/Zenith SW7800, the Sony 2001/2010, Yaesu RFG8800, and what's so far known about the NRD 525. There are also reviews of four Sangean portable sets made in Taiwan. Companion pieces discuss testing procedures used and the best and worst receivers ever tested.

Radio Sweden International's George Wood is present with an article entitled "The DX'ers Guide

to the Future" in which he takes a look at what telecommunications might be like forty years hence. Hopefully the Handbook will then be celebrating its 80th.

Otherwise, this 40th edition hasn't many changes. Frankly, we'd gotten the impression there were to be more but perhaps those are yet to come. All 608 pages (compared to last year's 600) are available at last year's price - \$19.50 - in stock at a discount (\$17.95 including book rate shipping) at Grove Enterprises.

The changes which were made in the 40th anniversary edition can be chalked up as changes for the better. The book is without question easier to read and easier to use. Things can be looked up more quickly than in the past.

The Handbook remains one of perhaps half a dozen books on short-wave broadcast listening subjects which can be called "must haves" even for the casual listener. It is and always has been an amazing piece of work, especially when one pauses to consider the vast amount of information it contains and the relatively few people involved in collecting and editing that information.

So, let us say to the editors of the 40th edition, "Congratulations and well done!" And to you, "Order your copy now!"

BROADCASTING...

Reflections on Radio

by Hank Bennett

As many of you probably are aware, columns such as mine are prepared upwards of several weeks in advance of actual publication. This happens not only with Monitoring Times, but with other newsstand magazines and hobby publications other than the radio club bulletins. As a result, you'll be reading in this March issue about the new receiver that Santa Claus (in the disguise of my wife, Mea) gave me for Christmas.

It's a shiny new Panasonic SA-121 AM-FM receiver and, other than for the scanner that I bought last year, is the first new piece of receiving equipment that I've had in years. This receiver is actually the first of several pieces that we're going to be obtaining for the main purpose of getting into recording. It's doing a great job, too, in spite of the fact that we're still temporarily in an all-steel apartment building with no outside antenna!

We were very sorry, as I'm sure many of our readers were, to learn of the discontinuance of the column by Havana Moon. His column was among the first that we'd read. We certainly wish him well in his future endeavors.

Back in the November and December issues we presented another series of trivia questions for which we are now going to give you the answers. As in the past, if you spot any errors, please let me know about them. We've had many fine comments from readers about this type of column but, unfortunately, we're running out of questions.

- 56-The concert pianist/comedian to whom we referred is Victor Borge.
- 57-That station that was owned by "The World's Largest Newspaper" is Chicago's WGN.
- 58-WLS, Chicago, was the station that was owned by "The World's Largest Store." Anyone know the name of the store?
- 59-We asked for the call sign and slogan of WLS before it was WLS and not many had this one correct. It was WES, for "World's Economy Stores."
- 60-The call letters of WQXR, New York City's so-called "High Fidelity Station," before it was WQXR was W2XR. There were other stations in the 1510-1550 kHz segment of the broadcast band with experimental call signs as well.
- 61-For Philadelphia-area readers and listeners, Uncle Wip was the host of a children's show during early evening hours.



Weather Service Discontinues HF Net

Dennis Brown of Arlington, Virginia, informed us that the radioteletype Caribbean meteorological (CARMET) weather transmissions are to be discontinued by the operating agencies, the National Weather Service and the Federal Aviation Administration.

Confirmed by Phil Dales, Chief, Communications Standards and Procedures Branch (NWS), the final shutdown is expected by spring, 1986. The net had been maintained for many years to assist the National Oceanic and Atmospheric Administration (NOAA) to provide weather information to Region 4 (U.S., western Atlantic, Gulf of Mexico, Mexico, Central America, northern South America, and the islands) of the World Meteorological Organization (WMO).

Citing the high cost of maintenance and unavailability of parts for the ancient transmitters, Dales says that future weather information will be passed via satellite, microwave and wireline.

In the meantime, listeners may briefly tune into the final transmissions of another closing era on the following long-standing frequencies:

- WBR70 (Miami) 3235, 4061.5, 5295, 8105, 8140, 10950, 12175, 13624, 16440, 18765 kHz;
- WWSY70 (New York) 8130, 10757 kHz.

We appreciate reader Dennis Brown sending this interesting item to MT to share with other listeners and encourage other readers to do the same.

HANK BENNETT cont'd

- There were two that I can recall - Wayne Cody and Chris Graham; perhaps others in the passage of time.
- 62-The opening of the "Drag-net" series always showed a badge #714.
- 63-Officers Gunther and Muldoon played in the series of "Car 54, Where Are You?"
- 64-The real name of Tonto on the "Lone Ranger" show was Jay Silverheels. I'm told that there was another at one time.
- 65-Uncle Fester was one of the characters on "The Addams Family."
- 66-The show featuring three people, two of whom were ghosts, was "Topper."
- 67-That six-foot tall invisible rabbit was named Harvey.
- 68-The horse that talked - Mr. Ed, of course.
- 69-Only one person gave us the correct answer as to who it was that tied our car bumper to a tree and hoped we wouldn't notice it when we drove away - Eugene Orowitz, better known professionally as Michael Landon--Little Joe from the "Bonanza" series! (PS - the rope broke and our bumper was spared the parting of the ways).
- 70-It was Tiny Tim who tiptoed through the tulips. And he was another entertainer that at one time was another across-town neighbor of ours.
- 71-"First he whispers, then he shouts" - Big Ben alarm clocks.
- 72-The theme music for "Cook's Travelogue" on Sunday afternoons many years ago was, "Beyond the Blue Horizon." (A few years ago a male vocalist came out with another version of that tune and we'd like to get a copy. I cannot remember his name. Any help?)
- 73-The "Yowsuh, yowsuh" bandleader was the Old Maestro, Ben Bernie.
- 74-Marion and Jim Jordan played the parts of Fibber McGee and Molly. They also played the parts of everyone else on the show as well.
- 75-"And now to beat that red hand around the clock..." was one of Walter Winchell's statements made as his program was coming to a close each Sunday evening.
- 76-Rosedale's powerful little five watter, call sign E Z R A, belonged to Uncle Ezra.
- 77-"I have a lady in the balcony, Doctor" was "Doctor I.Q." and, if

- memory serves me correctly, I believe they handed out silver dollars for correct answers--it was a quiz show.
- 78-"And around and around she goes..." was a trademark of Major Edwin Bowes of "The Original Amateur Hour."
- 79-The now-famous singer who once appeared on the above show as a member of the "Hoboken Four" was Frank Sinatra.
- 80-Barbasol shaving cream was the sponsor for "Singin' Sam."
- 81-George Burns' female counterpart was Gracie Allen.
- 82-I asked at this point about Captain Tim and implied that this show was heard on WGY in Schenectady, New York. He was Captain Tim Healy and he had a most fascinating stamp show in which he advised his young listeners to wash their hands before listening to him. He was sponsored by Ivory Soap. However, my sister tells me that this was a network program and that WGY had a news announcer named Jim Healy.
- 83-"Little Orphan Annie's" famous sponsor for years was Ovaltine.
- 84-"Music Fair, Music Foul, Music Played by Teddy Powell."
- 85-Portland Hoffa was Fred Allen's female counterpart.
- 86-Jack Benny's announcer was Don Wilson; his male vocalist was Dennis Day.
- 87-"You Bet Your Life" featured Groucho Marx and his cigars.
- 88-Pepsodent toothpaste for years carried the "Amos 'n' Andy" program.
- 89-Their real names: Freeman Gosden (who was an amateur radio operator) and Charles Correll.
- 90-The Maguire Sisters and the Chordettes were helped along the pathway to fame by that famous redhead, Arthur Godfrey.
- 91-Swing and Sway with Sammy Kaye.
- 92-The comedian who tried vainly to play the violin was Jack Benny. His female counterpart was his wife Mary Livingston. Mr. Benny really was, incidentally, an accomplished violinist who gave benefit concerts with symphony orchestras.
- 93-The Chief Woodchopper was Woody Herman.
- 94-The late afternoon show for kids, sponsored by Ralston, was "Tom Mix."
- 95-From "I Love Lucy," in addition to Lucy and Desi, the chief parts were played by characters known in the show as Fred

- and Ethel Mertz.
- 96-From very old radio days, it was "Lum and Abner."
- 97-"I Love Irma" was played by Marie Wilson.
- 98-"Our Miss Brooks" was played by Eve Arden.
- 99-The "All American Boy" and his sponsor - Jack Armstrong and Wheaties.
- 100-The original Long Ranger - and correct me if I'm wrong - William Conrad. Others in due time: Clayton Moore and Bruce Beamer.
- 101-Another western show for the young set, sponsored by H-O Oats was "Bobby Benson and the H-Bar-O Ranch."
- 102-Two people who have played Riley in "The Life of Riley" were William Bendix and Jackie Gleason.
- 103-Sergeant Bilko was played by Phil Silvers who recently passed away.
- 104-The "Pennsylvanians" was

- headed up by another person who passed away recently, Fred Waring.
- 105-Another very old radio program was "Myrt and Marge."
- 106-Charlie McCarthy was hand operated by Edgar Bergen.
- 107-Joe McCauley of WIP in Philadelphia had a very distinctive feature on his all-night musical show during World War II years. He played the Jan Peerce version of "The Bluebird of Happiness" every morning at 1:00 a.m. I've since learned that he played it also at 3:00 and 5:00 as well while another source claims he played it every hour on the hour.
- 108-"Kids Say the Darndest Things" was made famous by Art Linkletter.

Tune in next month for the balance of the answers.

SWL WORLD WATCH

by Ken Wood

NEW RELIGIOUS BROADCASTERS

The long-awaited arrival of "World Harvest Radio," a religious station in Nobelsville, Indiana, has finally been signalled by a test transmission heard December 8, 1985, on 15.355 MHz. At this writing additional transmissions were expected on Christmas Day on any of the following frequencies: 5.990, 6.000, 6.155, 7.355, 9.615, 9.720, 11.780, 11.865, and 11.970 MHz.

For further information on this new unlicensed broadcaster, write World Harvest Radio, P.O. Box 50250, Indianapolis, IN 46250.

KVOH, the High Adventure Ministries station in California, had hoped to be on the air on a test basis, at least, by Thanksgiving and almost certainly by Christmas.

Another religious broadcaster, Radio Lira International, was to have started testing their new station in Costa Rica as early as last October but that one hasn't shown. We keep checking since one never knows whether this may be the day.

Many stations are opening up or adding additional frequencies in the 49 meter band for their broadcasts during our evening

hours and, as one might describe a teenager's room, "it's a mess!" And it's made worse by the fact that stations such as Moscow, Havana, Deutsche Welle, and others are using two or more frequencies in this band at the same time. That, of course, isn't unusual but it does contribute to making a bad situation even worse.

As Jeeves notes, conditions have been - well, "weird" is the best word I can find to describe them. But keep tuning and monitoring and let us know what you pick up. We'll be glad to include your logs with the results of our own monitoring here.

Here are some of the things we've noted during the past month. Times are UTC.

AFRICA

BENIN - La Voix du Revolution, Contonou on 4.870 from 0600 sign-on and ID in French.

CHAD - Radio National Tchadienne, 4.904 caught at 0500 in French.

EQUATORIAL GUINEA - Radio Malabo, 6.250 at 2230 with high life music and announcements in Spanish.

GUINEA - Radiodiffusion National, Conakry, with their international service, in French, on 15.309, slightly variable, at 1845.

MALI - Radiodiffusion TV du Mali, Bamako, heard with sign-on in French at 0600 on both 4.783 and parallel 4.835, although the latter had some QRM from Radio Reloj - 4.832.

MOROCCO - Radiodiffusion Television Marocaine,

Rabat, on 15.335 in Arabic at 1948. Arabic singing, man announcer.

NIGERIA- Plateau Broadcasting Corporation at Jos, heard briefly up to 2306 sign-off on 5.965. End of local news, ID and some sort of prayer.

RWANDA - Radiodiffusion Rwandaise, 3.330, noted a couple of evenings from around 0340 fade in in French and local languages. Lasts about an hour.

TOGO - Radio Kara, 3.222 heard in French at poor to fair level at 0540.

UGANDA - Radio Uganda, on 5.026 at 0400 sign-on with anthem, station identification in English followed by news in English.

ASIA - MIDEAST - OCEANA

GUAM - KTRW heard with a religious program in English at 1510 tune-in on 9.870.

IRAQ - Voice of the Masses service from Baghdad in Arabic now on 9.635 in addition to several other frequencies. Well heard around 0100. They should run their North American service at this time.

ISRAEL - Kol Israel on 9.815 at 0000 with opening of English segment.

LEBANON - The Voice of Hope/King of Hope High Adventure Ministries station which suffered the suicide bomb attack last year, has moved from 6.215 to 6.280.

PAPUA NEW GUINEA - Radio West Sepik at Vanimo noted on 3.205 at 1250 in seeming Pidgin.

Radio Madang, Madang on 3.260 at 1235 with pop music by disc jockey.

Radio Eastern Highlands, Goroka, on 3.395 around 1220 with country-western music.

SAUDI ARABIA - Broadcasting Service of the Kingdom of Saudi Arabia heard at 2140 in English on 9.720. News, sports and weather.

UNITED ARAB EMIRATES - Radio Dubai heard with English programming at 1335 on 15.320. Good level.

EUROPE

AUSTRIA - Radio Austria International on 12.015 at 1505 in English with press review.

GREECE - Voice of Greece on 7.430 in Greek at 0110. Interference from Radio Moscow.

IRELAND - Radio Dublin on 6.910 at 0217, pop music, man disc jockey in English. Never better than fair.

POLAND - Radio Polonia, heard with talk in English at 2340 on 7.125.

NORTH AMERICA

CANADA - CBC Northern Quebec Service on 11.720 in English at 1625 with "Sunday Morning."

COSTA RICA - Bob Dott, Jr, of Triangle, PA, reports Faro del Caribe in English between 0300 and 0400 on 5.055 with "solid signals" and religious programming. Into Spanish at 0400.

Bob also notes that Radio Reloj on 4.832 is a regular in the later evenings.

GUATEMALA - Radio Mam on their usual 4.825 at 2350 tune-in. Sign-off at 0000. Used to run later.

NETHERLANDS ANTILLES - Trans World Radio, Bonaire with "Caribbean Night Call" at 0435 tune in on 9.535. This show is on only a couple of evenings per week.

SOUTH AMERICA

ARGENTINA - RAE heard with the start of their hour-long English segment at 0100 on 9.690 and 11.710.

BRAZIL - Radio Aparecida at 0130 in Portuguese with Brazilian music, announcements.

Several of the Brazilians noted on their new frequency assignments around 0900 tune-in. Radio Guaiba on 6.000, Radio Inconfidencia on 6.010, Radio Tupi on 6.030 and Radio Club Paranaense on 6.040.

BOLIVIA - Radio Santa Cruz, 6.135 with talks, music in Spanish from 0945 tune-in.

COLOMBIA - Radio Sutatenza, heard regularly on 5.095 around 0400. (Dott, PA)

Radio Macarena, 5.975 noted at 1045 with Latin music, ID in Spanish.

ECUADOR - Radio Pastaza, 3.316 heard to 0402 when had "Exodus" theme and into sign-off format.

Radio Centinela del Sur, 4.890, heard to sign-off at 0203 with ID in Spanish.

Radio Baha'i on 4.990 noted at 0445 tune-in on through to sign-off at 0500. Music and ID.

GALAPAGOS - La Voz de Galapagos, 4.810, showing up again although the several stations occupying this area often result in QRM problems. Heard in Spanish to sign-off which varies by ten minutes or more, sometime after 0200.

PERU - Radio Amistad, believed to be in the Moyabamba area, still heard on 8.515 perhaps one day out of three, to varying sign-off around 0400.

Radio Atlantida, ex-4.790 now on variable 4.805

ENGLISH LANGUAGE BROADCASTS

by Tom Williamson

We will take a look this month at English broadcasts coming to us from the region of LATIN AMERICA; I use this term to include Central and South America since there is a common cultural and historical background to many of these nations.

This is quite a scant area of English programs because of the common heritage of the Spanish and Portuguese languages combined with a relative lack of understanding and interest between the Anglo-Saxon and Latin peoples.

A pity it is, especially because of the importance of these areas to North Americans in terms of people, natural resources and potential future markets and development. So let us see what is available in the

and heard to sign-off around 0400.

Radio Mundo, 5.120 good levels occasionally around 0200. All Spanish.

Radio Andina, 4.996 heard to past 0500 with lots of huayno music.

VENEZUELA - Ecos del Torbes on 4.980 very good at 0405 sign-off. (Dott, PA)

Radio Valera, 4.840 to sign-off at 0400 after music and radio play.

JEEVES SAYS -

As fine as some of the openings on the various short-wave bands have been during the past month, the other end of the conditions-measuring stick registers terrible, terrible, terrible on the scale. We've checked 60 meters often in the evenings only to find a bare handful of stations and many of the regulars completely missing.

Ken has sent me outside on more than one occasion to check the antenna connections and that's no fun at night, particularly in snowy weather. I suppose we can expect this yo-yo effect (the conditions I mean, not Ken!) to continue for some time.

The key to DX'ing success in circumstances such as these is to simply keep checking. Often when the regulars are not in evidence it means some not-so-regular stations may be "in." It's not for the faint of heart but, as we've noted before, those who persevere will hear the good stuff, so, chin up!

Til next month, 73 from Ken and me.

way of news, informative programs and culture.

As you will understand, quite a few of the English broadcasts are from religious stations operated by English-speaking missionary organizations, including the famous HCJB. Much of the other type of programming is from government radio services intent on presenting their point of view; nevertheless, we can gain quite an insight into the Latin world from these sources.

ARGENTINA-

The government service operates RAE, Radiodiffusion Argentina al Exterior, with transmissions to N. America on 1710/9690 kHz in our evenings. Programs consist of news, political and cultural commentaries about the land, and the unique music of Argentina: the tango, milonga and waltz.

Many of these broadcasts are very informative, with the qualification of some political bias, naturally; however, under the democratic regime, I think the commentaries are more open and balanced. Dependent on propagation, you may find 9690 to offer the best signal.

BRAZIL-

Radio Nacional, Brasilia, continues to put out a fairly good signal on 11745 kHz with English transmissions to us at 0200-0250 with a mixture of world news, Brazilian news and economic data. Talks on diverse subjects such as football, coffee, music and other arts, form a very unique source of data about this huge country which is, in effect, a sub-continent in size and racial diversity.

Their musical presentations are quite varied and fascinating. You may find the style of the announcers somewhat "stilted" and occasionally difficult to follow, but this is a minor consideration. Having effectively only one frequency for us is a great drawback, and reception is highly sensitive to propagation conditions.

COSTA RICA-

This tiny country has sparse offerings, namely the religious station TIFC, the "Lighthouse of the Caribbean" as it styles itself. Here you may hear occasional English religious broadcasts, usually taped from

ENGLISH LANGUAGE BC cont'd

other organizations. A rare local English segment may be heard, though. I don't have any current schedule on this.

There are several American and Canadian missionaries down there in close contact with the station. Look for TIFC on 5055 kHz in the 60 meter band, after the Ecuadorian Radio Catolica goes off the air, probably after 0300. TIFC does have other channels available such as 6175/9645 but these are not often heard.

TIQ at Puerto Limon on the Caribbean Atlantic coast may be heard with difficulty on 5954 kHz due to interference from Colombia. They used to have English at 0500 but the current status of this is unknown; if you hear this one--let us know!

CUBA-

Radio Habana is too well known to need much explanation. Suffice to say they have revamped their programming in recent months to produce a "yankee-style" quick-fire snappy type of talking (complete with accent!) - and have broadened their type of music to include jazz. I note that their Cuban rhythms include quite a bit of electronic instrumentation (not to my liking, but perhaps that's not true for others).

News broadcasts are very anti-American and radical, as are some of the political commentaries. You are not left in doubt as to what the government thinks, and how the people are directed. In addition to this fare, they have some different programs such as the one heard from time to time on stamp collecting.

Apart from programming, the major development recently has been the way they are "taking over" the 49 meter band! With English broadcasts on 6060/6090/6100/6140, let alone other languages, they are very

dominant. Signals are usually powerhouse in strength, so they certainly mean to be heard; they also relay Moscow in English and other languages, on other frequencies, including the topical bands. Yours truly finds reception best on 6100/6140 around 0200, but see chart.

FRENCH GUYANA-

Not a true Latin channel, this, but if you want the best reception of Radio France International in English try 9800 kHz at 0300 and 6055 at 0400.

ECUADOR-

HCJB is too well known to need more comment except to draw your attention to the current frequencies (some changes here--try 6230 if you have difficulties). Remember that the Voice of the Andes has an excellent review of Latin American news events and that from time to time they are experimenting with an open-line talk-show on which you can converse with them on many subjects!

They have remained, over the years, one of the most popular stations with short-wave listeners the world over; programs like Music of Ecuador, Music in the Night, Today in Review, Passport, and of course DX Party Line, have a faithful audience. The evening broadcast is on 9870/6230, and the mornings are on 17890/15115/11740 kHz (see chart).

GUATEMALA-

Religious programs in English may be heard on 3300 kHz (90 meters).

HONDURAS-

More religious broadcasting: HRVC on 4820 kHz; HRLP Radio Luz y Vida on 3300 have occasional English in the evenings.

MEXICO-

A pale shadow of the past! Radio Mexico International is on 11770/9705 kHz these days, the latter 31 meter channel being the

best heard, sometimes after 0100, but irregular.

NETHERLANDS ANTILLES-

Trans World Radio at Bonaire is a well-known religious station with English programming on 9535/11816/15195 kHz.

NICARAGUA-


If you thought Cuba was anti-American, listen to these guys! The Voice of Nicaragua on 6015 kHz is beamed to N. America at 0100

and 0430 in English, and you won't be surprised to know that news and political commentaries are the main fare.

For political analysts these broadcasts are interesting, and you can make your own interpretation of the news reporting--the incidents and the manner of reporting them are quite different to our home media!!

See you next month! ●

TUNE IN



WITH Ed Noll

15-30 MHz Listening

Last month you visited the crowded, noisy but exciting 40/41 meter band with its intermingling of SWB and ham operations. If you wish peaceful tuning, especially during these years of sunspot weakness, tune over the frequency spectrum between 15 and 30 MHz. However, you'll find out that it is not all that quiet much of the time. There are ten key frequency ranges as follows:

15.1-15.6	19m SWB
16.0-17.4	Marine
17.55-17.9	16m SWB
21.0-21.45	15m Ham
21.45-21.85	13m SWB
22.0-22.7	Marine
24.89-24.99	12m Ham
25.67-26.1	11m SWB
26.695-27.405	CB
28.0-29.7	10m Ham

Of four short-wave broadcast bands, the 19 meter band is active most of the time. Signals tend to fade out early in the evening during the cold winter months of the low-sunspot period. By now you may have been caught up in its activities, especially its strong morning signals and those evenings when the band is open for signals from down yonder. Then South Pacific islands and even China may be heard early in the evening. It is a great band and you may wish to read more about it in the Dec '85 issue of *Monitoring Times*.

The next two higher-frequency SWB bands are 16 and 13 meters. The latter band performs much like 19 meters except that it is somewhat more susceptible to the poor propagation associated with low sunspot years.

Signals weaken early in the day and often the band is shut down completely at night. That is no excuse, however, not to listen. I remember one recent night there was only a single strong signal on the band--a walloping signal from Australia on 17795 with some fine music and chatter without any QRM or background noise and surprisingly steady.

More often you can catch Australia at strong signal level on 15320, especially during the warmer months of the year, with the listening quality and steady signal of a next door local AM station. On several occasions it has been such until after midnight.

When propagation is just right these bands provide much less QRM and more relaxing listening. I like DXing, too, but I believe I am a more avid listener. I get caught up being entertained and instructed and often forget I had planned to DX!

The highest frequency band, 11 meters, is most greatly troubled by the minimum sunspot years. Often dead day and night, the band should never be ignored. There can always be the unexpected openings to various parts of the world. These will begin again when the sunspot count begins to rise.

Unfortunately many short-wave broadcasters give up on this band completely during the rough years. What isn't on the air can't be heard even if there are openings. During the warmer half of the year early morning and evening results on 11 meters can occasionally be comparable to those of 13.

One should not overlook the fact that sideband is a superior mode of transmission when conditions are poor. We only need to look at radio amateur operations on the 10 and 15 meter bands and note how with very low power they take advantage of the infrequent openings during low sunspot years.

This would be an excel-

SELECTED LATIN AMERICAN STATION BROADCASTS IN ENGLISH

ARGENTINA	0100-0200	11710/9690
	12-1300/21-2200	15345
BRAZIL	0200-0250	11745
CUBA	0000-0500	6100 6140 9740
	0500-0800	9525
	2000-2130	11795
	0030-0200	15115 11910
ECUADOR (HCJB)	0200-0830	6230 9860 11910 variable
	0700-1100	6130 9745 11925
	1200-1530	11740 15115 17890
	0200-0400	9535
NETHERLANDS ANTILLES (T.W.R.)	1100-1400	11815
	1400-1600	15196
NICARAGUA	0100-0230	6015
	0430-0600	6015

(Acknowledgments to DX Ontario, Andy Reid for some data.)

lent band for broadcasters to check out sideband capability. Only a low-powered transmitter is needed. When this band is opened in a given direction and the channel is clear power is not of very great significance.

Keep monitoring all of these bands. Start now and you will be ready for the spring/summer improvement and for the beginning gradual rise in sunspot count that is but a year or so away.

HAM RADIO AND OTHER ACTIVITY

In the frequency spectrum between 15-30 MHz there are three radio amateur bands at 10, 12 and 15 meters. Two of them, 10 and 15, have been allocated for many years while ham radio operations on the 12 meter band began last year. Have you tuned across the new 12 meter band?

At present the band activity is much limited because of poor propagation and the limited number of ham transmitters in use that can be tuned up on this band. As the sunspot count begins to rise it is certain to become very active. CW allocations fall between 24890-24930; phone (USB) between 24930-24990.

The 15 meter band is the most active. There is CW operation from 21000 and 21200 while phone stations populate the region between 21200 and 21450. However, many foreign countries permit phone operations below 21200.

You can hear many Latin stations now because north/south propagation is sometimes excellent during much of the day and early evening during low sunspot years. When propagation is right there is often a morning path to Europe and on occasion to Australia and the South Pacific late in the afternoon or early evening.

Although 10 meters is deep in the sunspot doldrums just now it is really an exciting band when sunspot count is higher. There are occasional openings today so don't forget to give a listen now and again. Mostly it is stateside openings and

over the north/south path into the Latin countries. Often there are local contacts and networks to listen to especially during the evenings and over weekends.

CW activity extends between 28000 and 28300; phone operations, 28300 and 29700. Upper sideband is the most common mode of transmission although AM and FM can also be heard above 29 MHz.

If you are especially lucky you may hear the signals from ham satellites that operate uplink on two meters and downlink on 10 meters. Tune between 29400 and 29500 kHz. The secret is to know when to tune in for the brief time intervals of a passover which changes from day to day. Orbital locator information can be obtained from the ARRL in Newington, Connecticut. A packet is available for about \$10.

Below the 10 meter ham band you can drop in on CB operations (26.965-27.405 MHz). Set your receiver for regular AM demodulation at the low end, SSB at the high end of the CB spectrum.

The frequencies of the two marine bands are given in the table. The lower-frequency band is the more populated one and daytime activity, CW, phone, and radioteletype are at a peak. On upper sideband mode you can often hear long distance ship-to-shore radiophone conversations.

If you are trying to improve your code speed you can listen to some beautiful, crisp sending at moderate to high speeds. There are similar activities on the higher-frequency marine bands but more limited.

You don't need much of an antenna to pick up signals that are coming through over the 15-30 MHz spectrum. In fact a dipole cut to the high-frequency end of the 19 meter band also does quite well on the 16 meter band. Results are not too bad on 13 meters as well.

Actually the spectrum between 15 and 30 MHz is not a big bore despite low sunspot conditions. And it can only get better!

HIGH FREQUENCY RADIO SERVICE



TUNING IN THE "OUTBACK"

by Peter J. DeHart

Australia's Northern Territory--The "Outback"--desolate, fascinating and until recently unfamiliar and generally isolated from the world of even the one group of persons who have "access" to unknown regions of the globe--the short wave listeners. The Northern Territory--where modern communication can be as infrequently encountered as meeting another human being. The Northern Territory a vast and nearly empty land of 1-1/4 million square kilometers populated by just 140,000 people, claims three major centers of population.

The city of Catherine lies 300 or so kilometers south of Darwin. Tennant Creek, home to about 22,000 people, is centrally located and the last stop before the southernmost populated town, Alice Springs, where 3000 persons reside.

What fascinating glimpses of life I receive describing the existence of the Northern Territory population, originate from Radio Australia in Melbourne and the domestic service VLW9 in Perth on 9610 kHz. Both stations offer excellent news coverage and features which stir the imagination.

Envision a massive barren land of exotic wildlife ("dingos," wild dogs which have been known to attack humans and huge poisonous King Toads which recently pressed toward the outskirts of Darwin), a mix of rugged and creative ranchers and aboriginal people who cling to traditions which impede the laying of pipeline over "sacred" territory and a type of music vastly different from anything I'd ever heard which is played on clapsticks, boomerangs and a long, hollowed-out Eucalyptus branch called a "digeridoo."

not glean from the Perth and Melbourne transmissions about the Northern Territory may soon be learned from a new, much-needed and long-planned "Northern Territory High Frequency Radio Service" opening in late 1985 and early 1986. According to the ABC's excellent DX program, "Talkback," the need for establishing a radio communication service to meet the needs of those scattered throughout such a wide area has been evident for twenty years. After a long period of study, a high frequency service seemed ready for operation in 1975, but a lady named Hurricane Tracy changed a few minds with high winds and downed antennas.

It has long been evident that the six medium wave stations at Darwin, Jaberu, Cove, Tennant Creek, Alice Springs, and Catherine are not sufficient to reliably inform the local occupants about critical events affecting their lives. Reception ranges for these six medium wave outlets vary from 40-80 km during the day to double that at night. A long range service is a must.

Destined to serve some 50,000 persons currently without reliable radio service, the Northern Territory High Frequency Radio Service will be geared toward Aborigines, remote camps and stations and travelers entering the area with short wave receivers.

Three 100 kW American Continental transmitters will perform in the new service. Designed for "Simplicity of operation, reliability and unattended operation" (they will be operated remotely from Darwin), the transmitters will be located in Alice

What the listeners can-

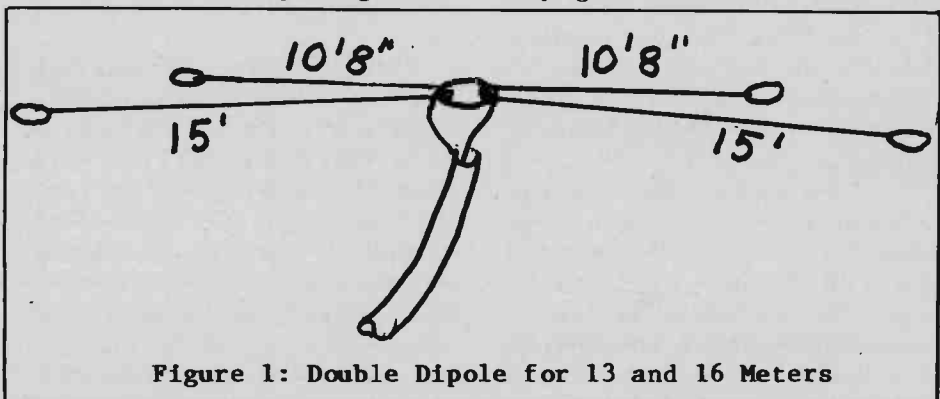
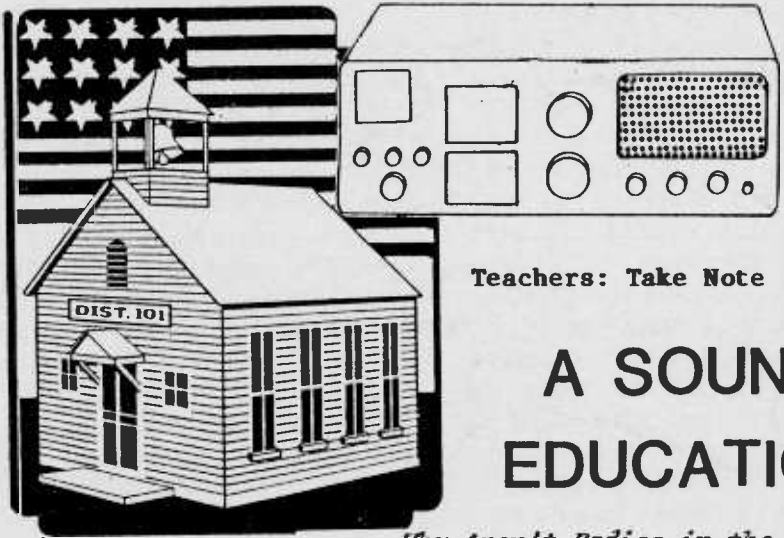


Figure 1: Double Dipole for 13 and 16 Meters



Teachers: Take Note

A SOUND EDUCATION

...Why Aren't Radios in the Schools?

by Peter J. DeHart

There are probably very few dedicated short wave listeners who do not consider radio listening a "fun" activity. The innumerable persons who spin the proverbial dial in search of new programs and rare catches attest to the thrill of the radio listening pursuit.

Even the founding fathers of radio, Marconi, Hertz, Fessenden, and a host of others who pursued radio development for personal gain, satisfaction and the need to fill a communication void, would no doubt smile at the masses of humanity who find daily satisfaction in monitoring broadcasts from Denver to New Delhi.

Although thoroughly engrossed as I am in a hobby which gives me equal satisfaction whether sitting quietly listening to Port Moresby or twisting the dials in search of rare

Venezuelan stations, I am aware of one aspect of the hobby which merits exposure and consideration.

It is ironic that such an entertaining pursuit as radio listening is in every sense just as educational as it is fun.

While its counterpart, television, has long been lauded as a learning and entertainment medium, radio, and especially international radio, has yet to find acceptance and in most cases, entrance into most educational settings. By far the century's oldest electronic medium, the educational potential for international broadcasting remains ripe for tapping.

Twenty years have passed since my high school experience. At that time, the only radio found in classrooms was the occasional transistor smuggled into study halls or played in vacant rooms during lunch breaks! International broad-

casts were alien to curriculum. The reasons for a basic lack of change in this situation are probably all related to a need for greater understanding about the potential for "learning" via short wave radio.

If you, as an educator or listener, have an opportunity to introduce international radio listening in a formal educational setting at home, or even to a home bound student, you have before you the chance to open the world to a student of any age. Your only limitations will be your creativity and imagination!

Here is a selection of educational ideas for introducing radio to the classroom, admittedly unproven in formal settings. I have found them beneficial as I have sought to learn about our world through International Radio. I hope that you will as well.

APPLYING INTERNATIONAL RADIO BROADCASTING IN THE CLASSROOM:

1. Use tape recorded programs to supplement studies about various cultures. How exciting it can be when studying life in Finland to tune to one of Radio Finland's excellent commentaries on that Scandinavian nation. The travelogue programs of many countries are brief enough to hold attention, excellent as supplements to life abroad and generally of fine reception quality.

2. Produce a slide show incorporating "travelogue" recordings and pictures obtained from various sources, i.e.: travel agencies, tourist bureaus, embassies, magazines. Students could be assigned to help gather information, take pictures and edit tape. It is a time consuming, yet interesting experience.

3. "Series programs" - Numerous international broadcasters present daily or weekly programs on various aspects of life in respective nations. Series programs teach and maintain an interest level in subject matter. A weekly "visit" to Portugal or Cairo's markets is a sure interest holder. China's "Land and the People" and Indonesia's "My Country and My People" are excellent. Also make use of:
a. "Window on Australia"
b. "Spanish Kaleidoscope"
c. "Round about the Soviet Union"
d. "This Week in Wales"

4. Map study - Teach an

appreciation of geography by associating broadcasts with specific geographical locations. Because short wave monitoring is so broad in its geographical scope, it is a medium which nearly requires the listener to acquire a sense of world location.

5. Music appreciation - The international broadcast band presents the opportunity for students to be exposed to dozens of types of music from foreign nations. Music "courses" even surface on occasion--Wide World of Arabic Music, Dubai Radio, United Arab Emirates was a fascinating discovery.

Exercises can be developed as well, relating types of music, national anthems and folk songs to culture. For example, why is the drum so prevalent on broadcasts from Africa and the Pacific? What makes the digeridoo and boomerang unique to Aboriginal music? What is significant about the interval signal theme of Radio Japan and dozens of other stations?

6. Incorporate a radio broadcast into a "listening skills" unit designed to test and increase listening comprehension. A portable short wave might be a fascinating addition to a classroom, too.

7. Expose students to new languages. What groups of people speak certain languages? Learn about language families and relationships. Language courses are an important aspect of international radio. Spanish Foreign Radio, Radio Sweden, Radio Korea, and Radio Japan offer language courses. These can serve to teach as well as interest the student in serious foreign language study.

8. Use the library to search out identifications and origins of broadcasts not in English. This is an excellent tool for developing research techniques and for familiarizing students with library resources such as maps, books and foreign language guides.

9. Use radio to teach about customs and holidays overseas. "National" days such as those covered by stations in places as diverse as Norway and the Solomon Islands are extremely educational and can be anticipated by the almanac.

10. Use the international broadcast to teach about a current news event. English

THE OUTBACK cont'd

Springs, Tennant Creek and Catherine.

Just as extreme care has gone into the selection of the transmitters and the "log periodic" TCI615 American Antenna configuration, nothing has been spared in terms of program planning. Programming will cater to the "widest possible audience": thus, local inhabitants or those who listen from afar can expect to hear a variety of programs from the ABC in Melbourne, CAMA programs (Community Aboriginal Media Association) and English and non-English features catering to local dialects aimed at very specific areas--a linguist's delight!

Current information on times and frequencies is as follows:

1. Alice Springs (VL8A) will operate on 2310 kHz during the Australian night and early morning. The daytime frequency is 4835 kHz. Tests began November

- 23, 1985.
- 2. Tennant Creek (VL8T) will operate on 2325 kHz during Australian night and early morning. Day frequency is 4910 kHz. Service is scheduled to begin April 26, 1986.
- 3. Catherine (VL8K) will operate on 2485 or 5025 kHz (times not confirmed). This service commences in late February, 1986.

"Talkback" reports that the switch from day to nighttime programs and frequencies is to be made at about 4 p.m. Australian Central Time (0700 GMT). Switch from nighttime to day programs occurs at 8 a.m. Australian Central Time (2300 GMT).

As is often the case in the world of short wave listening, a new service which answers a need on the part of one group of people provides an opportunity for us to explore and understand another portion of the world.

A SOUND EDUCATION cont'd

news and comment from overseas is abundant, generally well prepared and presented with extreme care for detail. It is "discussion applicable" material.

1. Use a short-wave newscast to compare our news coverage with that of a foreign nation.
12. Learn to appreciate literature through radio plays and stories. The BBC, Moscow and Papua New Guinea are regular presenters.
13. International radio presents frequent opportunity to enhance the writing skills of students through essay contests. Prizes vary from trips to special gifts from other nations.
14. International radio offers students the opportunity for personal telephone

contact and possibly conference calls with broadcasters. Encouragement for listener-broadcaster telephone contact seems to be on the up-swing; a class might gain valuable insight into another nation's culture via the conference call.

15. Student contact through written correspondence with foreign broadcasters is a useful educational activity.
16. International radio broadcasting can be taught as a unit or a portion of a unit in a study of communication.

No doubt there are many other possible classroom applications for short-wave programming. Your ideas and reactions are welcomed and may be shared with Bob Grove at Monitoring Times or with me, Peter J. DeHart, at 523 N. Wood Street, Middletown, Pennsylvania 17057. ●

be aware that it is in some ways not your typical clandestine. It is most professional both in program and technical quality, and it has been willing through this column to communicate with those of us outside its target audience.

Perhaps you may want to try to solve another puzzle surrounding this station. Why have some of the most influential of the DX radio clubs totally ignored the fact that Radio Caiman is sponsored by the organization Pro Libertad de Cuba? "Monitoring Times" readers have known about this for months and it was later reported in Gerry Dexter's excellent "Clandestine Confidential" newsletter.

Regardless of its ultimate purpose, we can be certain we have not heard the last of Radio Caiman.

WAQI RADIO MAMBI: Although this writer was unsuccessful in learning what problems jamming of Radio Mambi is causing WOR New York, Pennsylvania's John Demmitt has been more successful. John has been in contact with WOR's chief engineer who informed him that on Thanksgiving day during a trip to Pittsburgh he attempted to listen to his own station but could not hear it because of the powerful Cuban Radio Rebelde transmitter on 710 kHz.

John reports that he personally hears Radio Rebelde many nights from sunset to sunrise, and sometimes even a bit later. He has been doing some monitoring of 710 in order to assist WOR.

Of course Castro's target is not WOR but WAQI

Radio Mambi, Miami, on which we have reported previously. WAQI openly claims to be broadcasting to Cuba as well as South Florida and the Caribbean. It also tends to be more "hard line" than either Radio Marti or the other South Florida Spanish language stations.

Castro appears to have dropped the use of conventional jammers almost entirely, and is relying entirely on the Radio Rebelde relay to block Radio Mambi's signal. He seems to be having considerable success. Most nights only Radio Rebelde is audible here in Central Florida. During daylight it can be heard, quite audible, under the WAQI signal.

Florida's David Crawford has also uncovered some unusual factors surrounding the Cuban jamming efforts. He has at times also received the Rebelde signal on 703 and 705 kHz at the same time it was being transmitted on 710. This would indicate the Cubans are employing more than one transmitter in their jamming efforts.

Those who can monitor WAQI's medium wave signal may also want to watch this station closely in the days ahead. You may just possibly come across some most unusual developments. I do not know what is about to happen, but it would appear that we may be in Wonderland, and the Mad Hatter is on the loose!

MORE INTRIGUE: John Demmitt received a most interesting letter from religious short-wave broadcaster WYFR. It states: "In the summer of 1985 we were requested by the FCC not to broadcast on the frequency of 7400 kHz." That frequency has been used by both the VOA and Radio Moscow but is perhaps best known as one of those favored by anti-Castro clandestine, La Voz del CID.

CANADIAN PIRATE: We recently received word from a new pirate in Eastern Canada which plans to begin operations on 41 meters this spring. The station will identify as CF1P. It declares that its main objectives are "to play a variety of good music, and to broadcast anti-Soviet talks and propaganda." CF1P promises to keep us informed as to its activities. Readers' loggings of this station would be most welcomed.

PIRATE BUST: Both Ike Kerschner and Pete Carron of Pennsylvania have sent along details of a pirate closing in Emmaus, Pennsylvania. The FCC's activity was reported in several Pennsylvania

newspapers.

David Laudenslager, age 29, was the operator of the station, which began transmitting on December 2, 1985, with a format of stereo rock music. He called his operation WDIA-FM and transmitted on the frequency of 88.3 MHz. The station was shut down December 16, and Laudenslager has been fined \$750.

The FCC probably moved quickly in this case because of complaints received that WDIA-FM was causing interference in the reception of WPVI, channel 6 out of Philadelphia. Such complaints will usually bring a swift reaction from the FCC and Laudenslager, who had spent three years getting the station on the air, had a very brief career as a pirate broadcaster. Ike remarks that perhaps there should be a small license-free band set aside so that pirates do not have to be pirates nor cause interference. We agree (see "Club Corner" this month).

Again on the subject of pirate busts, someone was kind enough to send me a sample copy of the September issue of "DX Monitor," the excellent publication of the medium wave International Radio Club. In it I noticed a report that the FCC had shut down a medium wave pirate in Placentia, California, who was operating as KDX-AM on 540 kHz since 1983 with 250 watts. The 21 year old pirate, David Fluehe, was fined \$750. He had \$10,000 worth of records and equipment and claims to have been pirating for about ten years.

OTHER NEWS: From the state of New York Lee Kalinsky writes to let us know he logged pirate "Voice of Communism" December 22 from 2115 to 2130 sign-off on 7320 kHz. The station was broadcasting comedy news, a comparison of life between the United States and Russia, and offering one-way tickets to Russia. This station also transmits as "The Voice of Democracy." At present it does not verify.

From North Carolina R.D. Carter writes to express his concern over legislation which has been introduced in Congress. These are House bill 3378 and the companion Senate bill 1667. Bob Grove has reported extensively on these in the January and February issues of Monitoring Times.

R.D. Carter feels that these bills in their present form could ultimately lead to the outlawing of both scanners and short-wave

PIRATE RADIO



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

RADIO CAIMAN: Word was received directly from clandestine Radio Caiman of a change in frequency for their evening transmission. Beginning 0100 January 7 UTC (8:00 p.m. EST, January 6), Radio Caiman began utilizing 7470 kHz, although the frequency is announced as 7460.

Programs are about one hour and twenty minutes to an hour and a half in length. Signal strength is excellent and the programs are very professional.

Havana Moon reports that on January 6 UTC Radio Caiman broadcast what appeared to be a test transmission on 7470, although signal strength was not nearly as good. The station continues to use 9960 kHz for its morning broadcasts.

Careful monitoring of Radio Caiman may pay off with some very interesting listening in the days ahead. Those who have followed it closely in the past should

PIRATE RADIO cont'd

receivers, since they can be used to intercept private radio communications. Carter also feels that the registering of communications receivers with radio clubs could result in their ultimate confiscation.

We would urge readers to review Bob Grove's reports in Monitoring Times and reflect on Mr. Carter's views. If you share the concern that the above bills are dangerous legislation, then write your Senators and Representatives as soon as possible. A letter to the President would not hurt either!

A copy of the "CLS Bulletin" was recently received here from the Council for the Liberation of Suriname. The Council opposes the government of Suriname strongman Bouterse. At one time it operated its own clandestine transmitter, but more recently has obtained time of the facilities of La Voz del CID. Its broadcasts and publications are often quite interesting, and the Council does verify.

I do not have a current schedule, but if you manage to hear one of their broadcasts in the future or wish

to contact them, the address is P.O. Box 5517, 3008 AM Rotterdam, The Netherlands.

PUBLICATIONS: This writer has a brief chapter on monitoring clandestine broadcasters and the Soviet bloc in the new book "Who's Who in Terrorism - 1986" by terrorist expert Ryan Quade Emerson. Scheduled for January 1986 release, the book is an extensive work of over 300 pages and includes photographic documentation.

The cost is \$50.00, and it can be ordered from the publisher, The International Intelligence Center, P.O. Box 126, Purcellville, VA 22132. While this is not a low-price publication, there is in my opinion no one who knows terrorist activities any better than does Emerson. He is equally at home reporting on both domestic and foreign organizations. Readers will be highly enlightened by this volume.

Seldom have I come across a more moving book than that written by Radio Earth's Jeff White. Entitled, "Santo Domingo Journal," it is the account of the author's experiences while he lived in the Dominican Republic. White lived there for six months

TIS TIPS

On 1610 there is an apparent Travelers Information Service (TIS) station in operation from Saylorville Lake, just north of Des Moines that gives information on weather and depth

during the time when Radio Earth was transmitted via the facilities of Radio Clarin.

The book is a sensitive and honest look at life in a Third World country, a style of life about which Americans know very little. However, it is not a "tin cup" approach. White can write with both dignity and humor. I do wish he had said more about Radio Clarin, about which there are many rumors.

What little he does say is informative, but it is obvious he knows a good deal more. Still, this is a book everyone should read. The author has donated all royalties to assist humanitarian projects in the Dominican Republic. The book sells for only \$3.95 and can be obtained from Miller Publishing, P.O. Box 691, Thorndale, PA 19372.

and water flow, etc. The tape loop message begins and ends with greetings and well wishes for the listeners stay at the lake. They say they have a range of about five miles and identify as "KSAY". That call is assigned to 96.1 FM in Clinton, Iowa. Heard 3:00 pm local 11/29/85.

The Iowa State Highway Department is operating an AM "repeater" of the local WX bureau VHF information station WXL-57 on 1560. Location is the rest area just north of Ankeny, which is just north of Des Moines on I-35. I have picked it up in the car several times. I also understand that another is in operation at the rest area just west of Des Moines on I-80. I haven't been out that way to check it, though. Range of the north station is about 3/4 mile.

1610: Washington, Discovery Bay, 0141 10/7 KNHD262. Clearly readable with occasional fades. TIS with tape loop repeating each 23 seconds with clear KNDH262 call. "Department of Transportation Highway Advisory Radio. Hood Canal Bridge open, ferries at Port Townsend, Kingston, and Winslow all on schedule." TIS #5 on 1610.

1610: Washington, Tacoma. WNAN648 noted on business trips to Tacoma since last year, has given call sign since May. Usual operation is "City of Tacoma traffic information radio WNAN648." Sometimes "message #2" or "message #3" is heard. Located at exit 130 or I-5. A similar station on 530 kHz uses the same call sign but is not parallel. Only time heard with traffic information was during a concert at Tacoma Dome. Appears to be used for information only during events there.

Thanks to Dr. Tom Gruis and Bill Hardy for these loggings.

AN INSIDE VIEW OF A CG HELICOPTER

Many short wave utilities monitors have thrilled to search and rescue missions of the U.S. Coast Guard heard on the frequencies listed below. The inside view of the brand new helicopter shown below was taken recently at Lafayette Regional Airport in Louisiana by MT reporter Tom Marcotte.

Exciting HF monitoring awaits the listener who tunes in these Coast Guard air to ground frequencies (all upper sideband in kilohertz). (Courtesy Bob Grove's SHORT WAVE FREQUENCY DIRECTORY.)

Freq	Use
3120	Helicopter
3123	
5692	Helicopter
5696	
8980	Helicopter
8984	
11195	
11198	Helicopter
11201	
15081	
15084	Helicopter
15087	

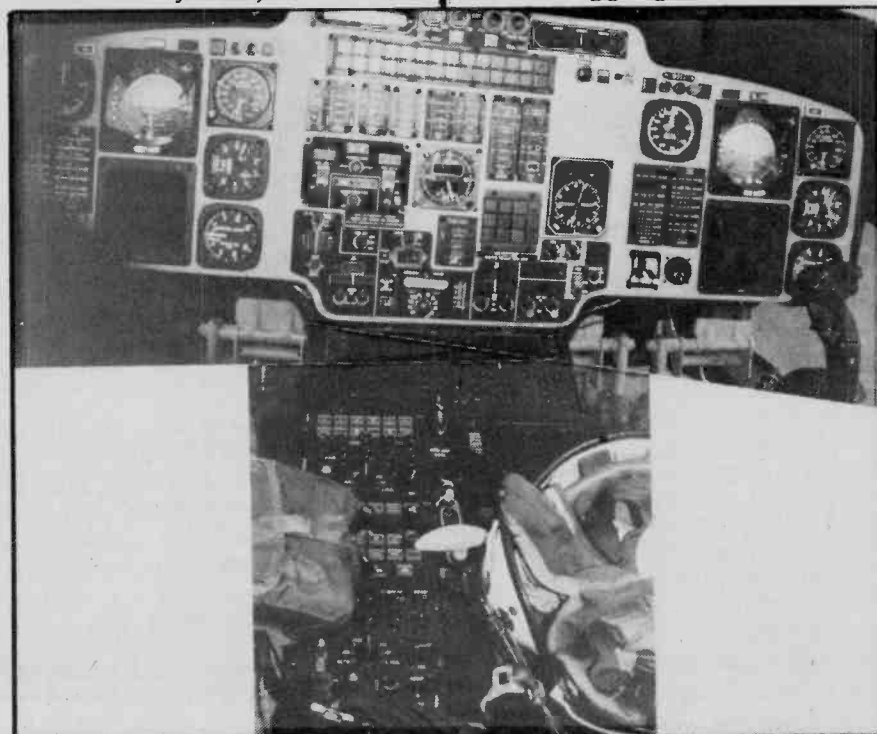
LIST OF AIR STATIONS

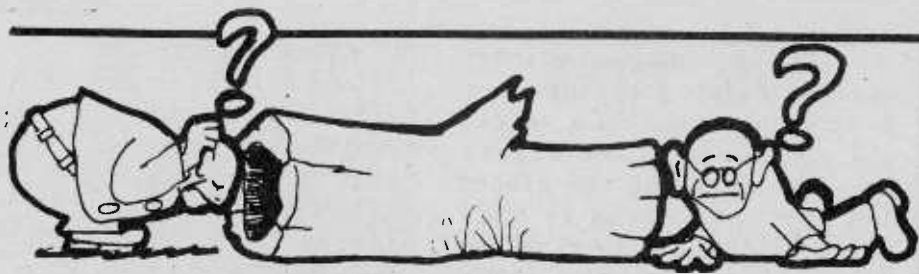
- Arcata Air, WA
- Astoria Air, OR
- Barbers Point Air, HI
- Boronquen Air, PR
- Brooklyn Air, NY

- Cape Cod Air, MA
- Cape May Air, NJ
- Chicago Air, IL
- Clearwater, FL
- Corpus Christi Air, TX
- Detroit, MI
- Elizabeth City Air, NC
- Houston, TX
- Humboldt Bay, CA
- Kodiak, AK
- Los Angeles, CA
- Miami Air, FL
- Mobile Air, AL
- New Orleans Air, LA
- North Bend Air, OR
- Sacramento, CA
- San Diego, CA
- San Francisco Air, CA
- Savannah, GA
- Sitka, AK
- Traverse City Air, MI



This brand new Coast Guard helicopter displays an impressive computerized console.





Listener's log

ALABAMA SCANNING
contributed by
Gary Moats, Steele, AL

- | | |
|--|--|
| 45.12 Trussville Street Dept. | 154.785 Shelby Co Sheriff PD |
| 45.74 Jefferson Co. Sheriff | 154.8 PD |
| 45.9 " | 154.815 Huntsville PD, South Division |
| 45.98 Odenville State Prison/ KNEZ 445 | 154.845 Anniston PD Ch. 2 |
| 120.05 Birmingham Air Traffic Control | 154.845 Decatur Co., GA, Sheriff Dept. |
| 122.8 UNICOM Gadsden Airtpt | 154.865 PD |
| 122.9 Nationwide Plane-Plane | 154.875 Madison Co. Sheriff |
| 133.5 Atlanta, GA, Air Traffic Control | 154.89 Anniston PD/KJH 238 |
| 133.8 " | 154.905 Small town, GA |
| 134.95 " | 154.92 Birmingham State Trooper base/KIB 507 |
| 134.95 " | 154.92 Huntsville State Trooper base/KIB 513 |
| 135.6 " | 154.935 Small town, GA |
| 141.08 Ft. McClellan Military Police | 155.01 Small town, N.AL, UNICOM |
| 150.995 Atlanta, GA, Public Works | 155.07 Morgan Co. Sheriff |
| 151.055 Highway Dept. State-wide | 155.1 Statewide Trooper Car-Car |
| 151.115 Huntsville Public Works | 155.115 Guntersville PD/ KIA 432 |
| 151.175 Etowah Co. input for 159.33/WAC 375 | 155.13 Jacksonville PD |
| 151.19 St. Clair Co. input for 159.345/WAC 373 | 155.19 Birmingham Hanks Ambulance |
| 153.62 Gadsden Water Board | 155.22 Forsyth Co, GA, Sheriff |
| 154.01 St. Clair Co. Fire Medics | 155.25 Leeds PD |
| 154.025 Jacksonville Univ. campus police | 155.25 Piedmont Ambulance |
| 154.025 Rainbow City Fire Medics | 155.295 Statewide Amb-Hosp UNICOM |
| 154.04 St. Clair Co. Sheriff Dept. | 155.34 Atlanta, GA, PD UNICOM |
| 154.115 Tarrent Street Dept | 155.37 Huntsville Detectivs |
| 154.13 Winston Co. Fire Dept/KDP 421 | 155.415 St. Trooper car-car |
| 154.145 Attalla Fire Medics KNBJ 58 | 155.475 " |
| 154.16 Fire Dept. | 155.49 Troop Co, GA, Sheriff KIB 567 |
| 154.19 Birmingham Fire Meds | 155.505 State Air Search |
| 154.205 Hokes Bluff Fire Med | 155.52 Small town, GA |
| 154.22 Hoover Fire Medics/ WZT 978 | 155.565 Dekalb Co. Sheriff |
| 154.25 Fire Medics/KIX 533 | 155.58 Talladega PD |
| 154.31 Gadsden Pager for PD & FD | 155.595 Centre PD |
| 154.325 Fulton Co, GA, Fire Medics | 155.625 Arab PD |
| 154.34 Anniston Fire Medics KDG 306 | 155.64 Clay Co. Sheriff |
| 154.37 Gadsden Fire Dept. Ch. 1/KGL 694 | 155.655 Cullman Co. Sheriff/ KTR 528 |
| 154.37 Rome, GA, Fire Dept/ KRL 288 | 155.67 Calhoun Co. Sheriff/ KBO 256 |
| 154.385 Madison Co. Fire & Rescue/KNCC 772 | 155.685 Blount Co. Sheriff/ KIA 532 |
| 154.4 Ft. Payne Fire Medics/KIV 596 | 155.7 Marshall Co. Sheriff |
| 154.415 Fire medics | 155.715 Gordon Co, GA, Sheriff |
| 154.43 Jacksonville Fire Medics/ WZJ 380 | 158.79 Gadsden St. Trooper base/ KIB 326 |
| 154.43 Scottsboro Fire Medics/ KDK 742 | 158.79 Jacksonville State Trooper base/KIB 506 |
| 154.445 Cahaba Hts. Fire Medics/ KIA 677 | 158.805 Atlanta, GA, Public Works |
| 154.445 Southside Fire Medics/ KIA 757 | 158.835 Bount Co. Fire Medics |
| 154.68 Georgia statewide State Trooper | 158.85 Rome, GA PD/KIC 422 |
| 154.725 Whitfield Co, GA, Sheriff Dept. | 158.895 Glencoe PD |
| 154.74 Cherokee Co. Sheriff Dept./ KTO 224 | 159.03 Gadsden St. Trooper mobile |
| 154.755 Cleveland, TN, PD | 159.09 Marietta, GA, PD |
| 154.785 Etowah Co. Sheriff/ KFC 484 | 159.135 Etowah Co. Street Dept. |
| | 159.15 Etowah Co. input for 154.785/KFC 484 |
| | 159.15 Hall Co., GA, Sheriff |
| | 159.21 East Point, GA, PD/ KIC 376 |
| | 159.24 Forestry |
| | 159.285 " |
| | 159.315 Talladega Co. Forestry/WAN 481 |
| | 159.33 Etowah Co Forestry/ WAC 375 |

- | | |
|--|---|
| 159.345 St. Clair Co. Forestry/ WAC 373 | 161.76 Anniston WDNG Remote Broadcast |
| 159.36 Forestry | 162.4 Huntsville NOAA weather/ KIH 20 |
| 159.42 N. AL. Forest Air Spotter | 162.475 Mt. Cheaha NOAA weather/KIH 58 |
| 159.465 St. Clair Co. game warden | 162.55 Atlanta, GA, NOAA weather/KEC 80 |
| 161.67 Gadsden, WAAX, WQEN Rem. Bcst/KIY 635 | 162.55 Birmingham NOAA weather/KIH 54 |
| 161.7 Gadsden WKFX Rem. Broadcast | 453.5 Floyd Co, GA, Sheriff |
| 161.73 Gadsden WGAD Remote Broadcast/KIV 828 | 460.4 Gadsden PD/WYB 262 |
| | 460.5 Gadsden PD Ch.3/ KZI 235 |

TECHNICAL TOPICS by Bob Grove

Q Are the beacons I hear in the 108-118 MHz VHF range similar to those I hear in the 200-400 kHz range? (Mario Filippi, Mt. Bethel, PA)

A Indeed they are. But there are differences. While both send Morse two- or three-letter identifiers and occasional voice weather broadcasts are heard on some of them, the low frequency transmissions are AM and the higher frequency broadcasts are FM, called "VOR" (VHF Omni Range).

Pilots frequently use the data present on the VOR transmissions, heard as a low frequency "flutter" on your receiver, to compute bearings.

Q How can I make a three band rooftop antenna for my scanner? (A.C. Hall, Wake Forest, NC)

A One of the easiest ways would be to copy the basic dimensions of the low cost, high performance Grove OMNI. It is a vertical dipole, 66" long, fed 18" from the bottom.

By salvaging an old TV antenna, you could probably fashion a comparable antenna using a 48" upper and 18" lower element, feeding the vertical with low loss coaxial cable like RG-6/U, RG-59/U or RG-8/U.

Q I am able to get only six hours of use from the recharged batteries on my Bearcat BC-50 scanner; are there any factory updates to increase charge life? (Terry Kerr, Wilmington, OH)

A None that I am aware of. The actual lifetime of the charge is largely dependent upon the number of times your scanner stops on a signal and how loud you have the audio set to hear that signal. For example, if you had your scanner set to respond only to one frequency and you had the audio set quite low, the charge life would be far greater than if you had the scanner loaded with frequencies and the volume set so everyone around you could hear the communications.

Professionals solve the problem by having a spare battery pack which can be swapped out with the spent pack. Another solution would be to have a second charger (or carry the first with you) to keep the unit operating from the AC line (or automotive lighter socket) when they are accessible.

Q What is the difference between narrow band FM and wideband FM; why do some scanners have both and some don't? (David Outman, Glen Burnie, MD)

A There are two basic ways to "modulate"--that is, apply information or intelligence to--a radio signal: vary the amplitude or vary the frequency. Thus, amplitude modulation (AM) and frequency modulation (FM) are the basic modulation methods employed in the radio services.

Theoretically, an unmodulated signal (often called a "carrier") occupies a razor-sharp notch in the spectrum; but the more audio signals that are imposed upon it (modulation), the wider that swath of occupied spectrum becomes.

Due to the breadth of audio present on entertainment radio, from the lowest drum roll to the highest overtones of a tinkling cymbal, that form of modulation is wide band. Voices, on the other hand, have a much more restricted range of frequencies and can be confined to a narrower bandwidth.

Conventional scanners cover only those frequencies over which voice communications are conducted; thus, their circuitry is designed around narrow band technology. Continuous coverage scanners, however, also cross those frequencies

CONFUSED?

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MONITORING TIMES AND
GROVE ENTERPRISES--
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TECHNICAL TOPICS cont'd

occupied by broadcasters and must be capable of detecting those wide band signals as well.

Q What converters are now available to change the Space Shuttle frequencies (259.7 and 296.8 MHz) to scanner frequency ranges? (John Harrison, Pojoaque, NM)

A Since the discontinuation of the Grove Scanverter some two years ago, about the only remaining converter that will do the job is the 240-270 MHz model from Hamtronics (65-K Moul Rd., Hilton, NY 14468-9535).

Q What does the "T" stand for in "T" band? (Steve Wills, Louisville, KY)

A The upper portion of the UHF land mobile band (450-512 MHz) was taken from the UHF television broadcast

band, 470-890 MHz. Thus, 470-512 MHz is called "T band" for television.

Q Why do programmable scanners like the BC-100XL pick up only certain parts of the spectrum omitting others? (Steve Wills, Louisville, KY)

A Simplistically stated, only a small percentage of a frequency band may be covered or tuned in a receiver (or transmitter) using the same components while retaining the desired stability and selectivity characteristics.

Each time a major jump in spectrum occurs, considerable numbers of additional components are required to do the job satisfactorily. Thus, tuning the 30-50 MHz low band requires an entirely different set of circuit components than when tuning 144-174 MHz high band.

The dot matrix printer head normally contains 7 or 9 wires arranged in a vertical column that are driven forward to strike the ribbon and paper; the head is then moved slightly more than the wire diameter to the right and the wires fire again. By selecting individual wires at the appropriate time, characters can be formed.

The daisy wheel printer has a revolving disk with the characters formed on fingers projecting from the outer edge of the disk. To print a character, the wheel revolves until the correct character is in the print position and it is then driven against the ribbon and paper to form the character.

The daisy wheel makes neat, crisp characters just like a typewriter and is referred to as "correspondence quality" printing. While it looks a lot nicer on paper, it is typically much slower printing than the matrix technique.

Another advantage of the matrix printer is graphics printing; the daisy wheel can only print characters. I am sure some readers have seen the pictures done with character combinations on RTTY. The dot matrix printer does a much better job with about a ten-fold improvement in resolution.

The plotter is usually a high priced device, starting in the \$500 range with \$2000 not uncommon. The plotter is also slow, but the resolution is consistent with the finest draftsman's output. Ideal for diagrams, drawings, etc., it has little place in the average setup due to cost.

THE EXPANSION CHASSIS

An expansion chassis is something you buy when the need becomes apparent, normally after the computer enthusiast has had the machine for awhile and the "hack bug" has taken a good sized bite (byte?)! Used to house accessories such as additional drives, extra memory cards and the like, it is the answer to the main chassis overflow problem. This is an area where the "roll your own" types can save a few bucks.

In summing up the options, adding a printer to last month's list makes the necessities complete; any other item is pretty much an option. "Nice to use, but expensive to own" neatly wraps it up.

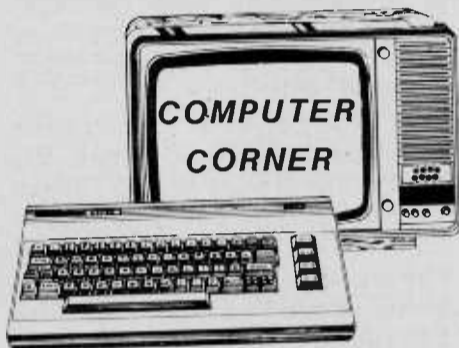
IN THE MAILBOX

Figure 1 shows the schematic of the Morse/RTTY adapter William "Bill" Brosius of Vestal, New York, uses in his pursuit of the news, rag chewing and other events on commercial and amateur frequencies. That's Bill (WA2HOJ) in the first photo pointing to the adapter undergoing testing.

The second photo provides a closer look at the adapter which is connected to a Hallicrafters SX-71 receiver using a half-wave dipole antenna. The adapter feeds an IBM PC. Reception to date includes VOA on 12 MHz; Havana, Cuba, on 11 MHz; and Buenos Aires on 7.4 MHz.

The original schematic came from an article by Lawrence Stark (K9ARZ) writing in CQ, November 1984 issue. This article, entitled "The TU][Revisited," described a computer interface for Morse/RTTY and ASCII reception. Bill did some experimenting with the original circuit and made some modifications to enhance performance somewhat.

For software, Bill uses a public domain package



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

Computers for Communications

PART II

Last month we discussed in detail the SYSTEM UNIT, MEMORY, DISK DRIVE, and the DISPLAY/KEYBOARD. This month I'd like to wrap up the two-part series with the EXPANSION CHASSIS, the PRINTER and the PLOTTER.

Once that's out of the way, we can take a look at a circuit for RTTY and Morse decoding along with a picture or two of the man and the shack responsible for much of the information presented here.

THE PRINTER

A printer is not a necessity, but once you've gotten used to one you won't want to give it up. Letter writing, mailing lists, label making, and so on now become possible. Up goes the price of the hobby for now you have to buy paper, ribbons and stamps.

On the other hand, I probably wouldn't be writing this column without the word processor that lets me see the whole article before any

ink hits the page! But that's a software tale for a later column!

Printers come in four basic types: dot matrix, daisy wheel and the exotic laser and ink jet machines. While the laser and ink jet machines do the same job as the matrix and daisy printers, they usually cost a lot more. Although they are faster, more versatile and multicolored, because of the increased cost we will not go into detail in this column.

Of the two remaining, the dot matrix is usually considered the cheaper type, although a good dot matrix printer can run a thousand dollars or more.

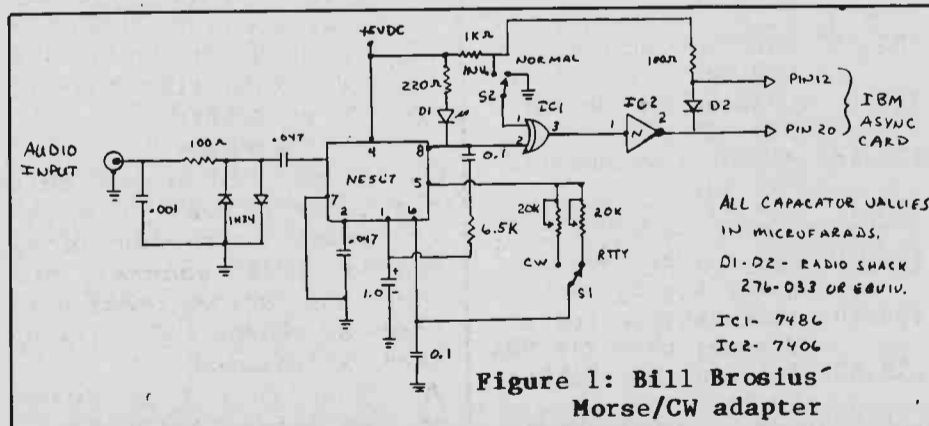
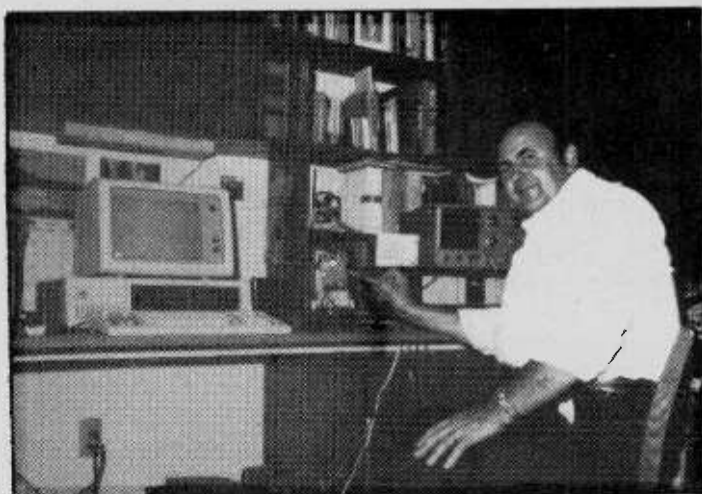
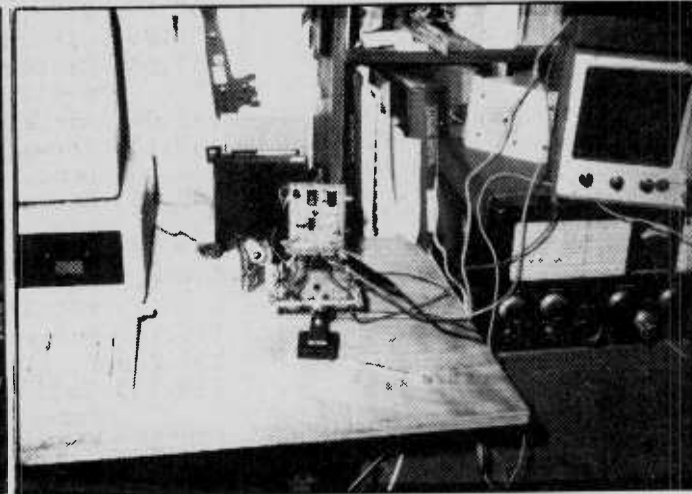


Figure 1: Bill Brosius' Morse/CW adapter



Bill makes some adjustments to his adapter.



A Closeup of Bill's RTTY/CW adapter.

COMPUTER CORNER cont'd

called MURRAY/TTY by Bob Johnson, AA4L. Most communications software of a communications nature is usually public domain, as very few commercial software publishers do much in communications. The exceptions are usually companies that sell interface adapters or are amateurs who wrote the software because there was none available.

I've played with MURRAY/TTL, and what little I saw of it looked good. I am trying to locate Bob Johnson to find out the particulars on distribution of this package. If you're listening, Bob, please drop me a line.

I am also trying to round up information on other software of interest to the computerized amateur and listener. Reader input is encouraged and will be shared with fellow hobbyists.

Ronnie Bratton (KA4YUY) of Roanoke, Virginia, was good enough to drop me a line to let me know about his interest in weather and facsimile. Ronnie is using a COCO II to receive and transmit SSTV, CW and facsimile. He adds two more names to our list of suppliers for computer communications goodies:

RT Circuit Boards
Robert H. Wilson
205 Elm Street
Van Horne, IA 52346-0400

Clay Abrams Software
1758 Comstock Lane
San Jose, CA 95124

Drop them a line to find out just what they offer.

Another mailbox stuffer this month came from The Association of North American Radio Clubs. ANARC has put on-line a computer bulletin board system devoted to short-wave listening. If you are a Commodore 64 or 128 owner, ANARC has a terminal program available for \$3.00 and a blank disk.

ANARC BBS
4347 29th St. SE
Rochester, MN 55904-6043

For those of you with other terminals and operating systems, the BB is at 1-507-289-7903. Protocol is 300 baud, full duplex, 8 data bits, no parity. Scheduled hours are 0500-2300 UTC weekdays and 0500-1400 UTC on weekends.

The BB carries Radio Canada International's monthly bulletin and Radio Nederland's Programme News

as well as 12 other public message bases.

Initial contact can be made with "NEW" for a password. At the prompt enter your name and "NEW". You will be allowed to leave your name, address, phone number, and a six digit password (your choice). Your password will be verified in 48 hours, allowing you full access to the BB.

Speaking of Radio Nederland, next month we take a look at how the computer department has set up a formal protocol for BASIC programs to allow their SW programs to run on virtually any computer.

In the meantime, let me know what subjects you would like me to cover in future columns. See you next month!

extremely interesting and lengthy discussions. Signals will be heard from all over the world.

It is not unusual to hear a grocery clerk in Kansas talking to a PhD in New Zealand; hams come from all walks of life. The main things they have in common are an interest in radio communication and a desire to know more about their world and fellow man (not necessarily in that order).

As you tune across the ham bands you will hear certain frequencies where there will be a large number of stations that are under the control of one main station; this will be one of the many nets (networks) that are active on the ham bands.

Some nets specialize in relaying messages from amateurs aboard small boats; others are set up with the idea of getting as many states, counties or countries as possible active so the members of the net can earn various awards. Still other nets are service oriented and you can hear messages being relayed like "have arrived safely" or "happy birthday."

Missionary, medical service and emergency nets are active daily. You can hear missionaries and doctors in the most remote parts of the world talking to family or associates on these nets.

During emergencies such as the earthquake in Mexico the public service nets move into action providing communications between the stricken area and the rest of the world. Lives will be saved and tragic news relayed.

Nets are established on specified frequencies and times so that the amateurs who want to use their services know where to look for them. Having a large number of stations on a given frequency will establish a clear channel so nets are easy to hear. The best way to locate a given net is to obtain a copy of the ARRL net directory; send an SASE to ARRL, 225 Main St., Newington, CT 06111. Ask for their NET DIRECTORY.

If you are interested in knowing more about ham radio, consider joining the ARRL (American Radio Relay League); it costs \$25.00 per year. They can also help you get your own amateur license. Membership includes a subscription to the magazine "QST" which is devoted entirely to ham radio.

It is easy to hear hams in foreign countries (most speak English); you may hear a dozen or more countries in

a single evening of casual listening. On a contest weekend it is possible to hear 100, to 200 countries.

If you are interested in earning awards the amateur bands offer many opportunities to do so. Clubs all over the world sponsor awards the SWL can earn. The award column of CQ magazine lists many certificates for the SWL.

Several Amateur Radio contests include SWL divisions. The contest columns in all the major amateur magazines will tell you when these contests take place and give full information on how to participate. This is an area of radio many of you will find to be great fun!

In addition to the awards and certificates you can earn, hams send out colorful QSL cards. Frequently, amateurs will write the SWL interesting letters describing their station, job, home, and family; many SWL's find excellent pen pals in this manner.

The majority of amateur radio signals you hear will be Morse code (CW) or single sideband radiotelephone (SSB). There are several other modes such as radioteletype (RTTY) and slow scan television (SSTV), which require special equipment to receive.

Amateur activity can be found in the following frequency bands--

160 meters (1.8 to 2.0 MHz):

CW, SSB and AM phone

80 meters (3.5 to 4.0 MHz):

CW only from 3.5 to 3.75 MHz; SSB from 3.75 to 4 MHz

40 meters (7.0 to 7.3 MHz):

7.0 to 7.15 CW; phone from 7.15 to 7.3 MHz.

NOTE: SWBC stations share much of this band with amateurs and many frequencies will be useless for amateur communication at night.

30 meters (10.1-10.15 MHz):

CW only

20 meters (14 to 14.35 MHz):

CW 14 to 14.35 MHz; SSB 14.15 to 14.35 MHz

15 meters (21 to 21.45 MHz):

CW from 21 to 21.2; phone from 21.2 to 21.45 MHz

12 meters (24.9 to 25 MHz):

CW 24.9 to 24.95; phone 24.95 to 25 MHz

10 meters (28 to 29.7 MHz):

CW from 28 to 28.3; SSB, AM and NBFM phone from 28.3 to 29.7. Most narrowband FM will be found from 29.5 to 29.7 MHz. 10 meter NBFM (narrowband FM) can be received on many VHF scanners.

HOW FAR WILL I HEAR?

Normal range on 160 and

GETTING STARTED



by

IKE KERSCHNER N3IK
Rd 1 Box 181A
Kunkletown, PA 18058

Continuing our discussion of the 2 to 30 MHz frequencies (short wave bands), we will take a look at the amateur radio (ham) and utility services and tell you how to use your receiver to hear some of the action.

AMATEUR RADIO

Amateur radio operators, or "hams" as they are popularly called, are private citizens who own and operate a licensed radio station to communicate with each other. Most ham stations are of a very modest nature with power outputs in the range of 100 to 200 watts, although some amateur stations are elaborately equipped and capable of 2000 watts of power.

While all amateur operators must pass examinations of electronic theory, radio law and Morse code before they can obtain a license to put their station on the air, they cannot under any circumstances use their station to earn money.

Hams discuss just about anything imaginable. On-the-air QSO's (conversations) range from ho-hum "signal report, name, QTH (location) and "73" (good-by) to

GETTING STARTED cont'd

80 meters will be 100 to 300 miles during daylight, but stations around the world will be heard at night. These two bands are most active after dark.

30 and 40 meters are medium range bands during daylight reaching to a maximum of about 1500 miles under normal conditions, but from sunset to sunrise great DX (long distance) is common.

20, 15 and 10 meters are daylight bands; DX is good on these bands throughout the day but at night they often close up and very few signals can be heard.

At present 20 meters is the best of these latter three bands with 15 and 10 frequently being devoid of signals due to the present sunspot cycle being at its low point. Things should pick up again in a year or two. Because of varying propagation conditions, though, any of these bands can explode with activity at any time, so it pays to check them out occasionally.

There are three other amateur radio publications that supply much useful information: CQ Magazine (76 North Broadway, Hicksville, NY 11801); Ham Radio Magazine (The Ham Radio Publishing Group, Greenville, New Hampshire 03048); and 73 Magazine (P.O. Box 931, Farmingdale, NY 11737).

CQ Magazine contains somewhat more information on awards and contests than the other two but all contain a lot of excellent information.

UTILITY STATIONS

Commercial interests and governments operate radio stations that facilitate those entities' interests; for example, governments have stations to communicate with their embassies, to keep military units in touch with each other, or send time signals and radio location beacons.

Commercial interests may be ship/shore stations, press services, marine radiotelephones and long range aircraft to ground communications. These are only a few of the utility ("ute") communications that you can hear. Utilities can be very exciting to listen to; for instance, you may hear Coast Guard comms during a rescue attempt or the DEA busting the bad guys, Army units on maneuvers, Air Force One, telephone conversations--it's all there!

Utes are sandwiched into every available slot in the SW bands. Excellent

places to look for information on the most active frequencies are in publications like Monitoring Times and Popular Communications (76 N. Broadway, Hicksville, NY 11801). Two excellent guides to short-wave utilities stations are Bob Grove's SHORTWAVE DIRECTORY (\$12.95 plus \$1.50 shipping) and GUIDE TO UTILITY STATIONS by Joerg Klingenfuss; both are available from Grove Enterprises, Box 98, Brasstown, NC 28902.

Equipment at a utility station can vary from simple low-power CW units to extremely sophisticated high-power stations capable of using the most advanced communications techniques. SSB, CW and radioteletype carry the bulk of ute traffic, hence the average SWL can tune into most of the action. Let's take a look at the modes used by amateurs and utility stations and discuss the methods and equipment required to receive them.

CW and SSB

CW (continuous wave) is simply Morse code. If you can copy Morse, all well and good; if not then you must either learn to do so or use one of the commercially available code readers.

SSB radiotelephone, unlike the AM phone of SWBC stations, requires some effort to receive. Both CW and SSB require a BFO (beat frequency oscillator) or product detector either built in or added on to your receiver in order for the signal to become intelligible. Without a BFO CW will be heard as a thump or hiss and SSB will be a good imitation of Donald Duck talking at super speed!

TUNING IN SSB

If you have a modern receiver capable of CW/SSB operation all you need to do is turn the mode selector to SSB and fine tune the dial for crystal clear voice. Most receivers made within the last 15 years or so have a sideband selector switch (upper or lower); if you cannot understand an SSB signal try switching to the other sideband.

To use a receiver that has only a BFO (especially an older receiver) requires a bit of juggling with the controls. With the BFO on, tune the receiver to an SSB station (watch your S-meter for maximum deflection). If the receiver has a BFO tune control, turn it until the signal is as clear as possible.

If the receiver has only an SSB/CW switch, fine tune the signal with the

tuning dial. Should the signal sound distorted reduce the level of the RF gain control. It takes a little practice to become proficient, but will become second nature after a short time.

If the SSB signal becomes distorted again after being clear for a short time it is probably because your receiver is drifting; heat causes components to change value and the frequency changes. In older receivers this can be a real problem.

Drifting can be corrected, but becomes expensive if you must pay someone to do the job. I usually suggest putting up with retuning the receiver until a more stable unit can be purchased.

RTTY

Radioteletype cannot be decoded unless you use a device specifically designed to convert the RTTY signals into an alpha-numeric display, either on a monitor screen or a teletype machine. RTTY can be a very frustrating experience for the beginner, so it is advisable to gain experience listening to CW and SSB communications before jumping into this mode. We will discuss RTTY in a future column.



ANTENNA TALK

W. Clem Small KR6A

WHICH ANTENNA IS BEST?

PART I

Persons setting up a VHF-UHF scanning-monitor station, short wave monitoring post, amateur radio station, or just about any type of radio communication system frequently ask the question, "What antenna is the best of all antennas?" It makes sense that we would want to use the best antenna possible for our installation in order to produce the best results that we can for our communication activity.

VERTICAL, HORIZONTAL OR LOOP?

Let's begin at the beginning, with the work of the man responsible for the first convincing demonstration of antennas in transmitting and receiving

FINDING A USED RECEIVER

Adequate receivers for the amateur and ute listener can be obtained for \$50.00 up on the used market; a new unit will cost about \$150.00 minimum. If your main interest is in ham radio, receivers that cover only the ham bands can be purchased quite reasonably at a hamfest (radio fleamarket). None of the older (3+ years) ham-band-only receivers will have the 30 or 12 meter bands on them--these bands were just recently given to the amateurs.

I recently bought an NC300 for \$30.00 (cost \$350.00 new in 1960) and I have seen other units going for \$20.00. At this price they are worth the investment if you have a friend who can help you get the unit working should there be a problem.

If at all possible, listen to the unit before you buy (frequently, power is not available at outdoor fleamarkets).

In a future column I will discuss antennas fully and show you how to build a good low-cost sky-wire.

That's all for this month. Don't forget to write and tell me what you would like discussed.

electromagnetic waves: Heinrich Hertz. In the mid 1880s, Hertz was responsible for the development of the dipole antenna, the loop antenna, and flat and parabolic antenna reflectors, and the use of dielectric devices to refract radio waves(1). This gave him a fair amount of choice for his antennas. Which did he think was the best antenna? Well, he seemed to think that the dipole was best for transmitting, as he always used that antenna to emit waves.

On the other hand, he seemed to think that the loop was best for exploring the electric field established by his dipole antennas. He usually used the loop, with a little spark-gap indicator, as his "field-strength indicator." When he wanted to cover maximum distance (a few meters at most in those days), he seemed to favor the dipole with a parabolic reflector for both transmitting and receiving. Hertz didn't seem to have one antenna which he thought was "best."

The next person to seek a better antenna was Marconi(2). He was not content with the antennas passed on to him by Hertz's

ANTENNA TALK cont'd

work, and so he developed several of his own in the late 1800's and early 1900's. The first antenna which Marconi invented still bears his name: the Marconi quarter-wave grounded vertical antenna. He felt this was the best antenna available, and convinced so many people of this that, for a couple of decades, almost every antenna constructed was some variant on the grounded vertical.

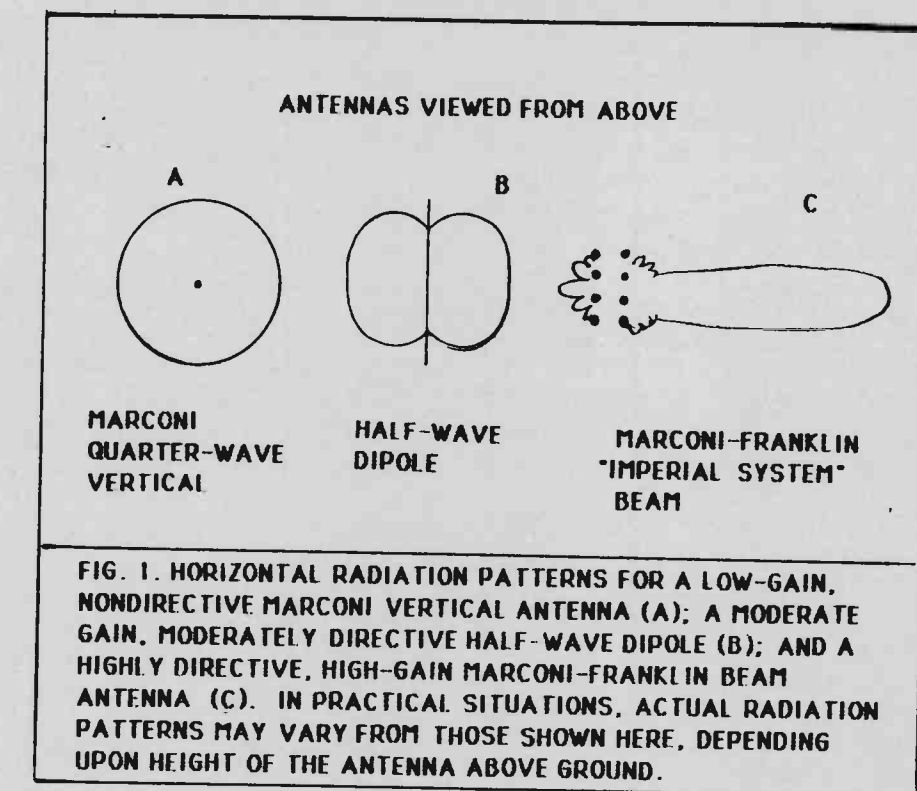
Old-time radio manuals show these variants, such as the T-antenna, the inverted-L antenna, the umbrella antenna, the birdcage antenna, and little else except for the frame or loop antenna(3,4). The grounded vertical antenna was about the best transmitting antenna at the time, because it was about the only transmitting antenna which could be utilized efficiently at the long wavelengths employed in those days. If, in your receiving, you wanted to eliminate static from specific directions, the frame, or loop antenna might have been your best choice, as it has a sharp directional null in its pattern.

Using Marconi's vertical antenna at the long wavelengths then employed, the early wireless pioneers were able to cover transoceanic distances with some degree of reliability. The vertically polarized signals provided by this antenna was said to travel "with their feet on the ground" and, compared to waves from dipole antennas, could survive at readable levels over tremendous distances.

On the other hand, the horizontally polarized waves produced by dipoles were quickly dissipated in the earth, as their horizontally-polarized electric field short-circuited itself by laying the "whole body" of their waves horizontally on the ground. It was easy to judge which antenna was "best" in those days.

At one point around 1920, the pioneer radio publisher Hugo Gernsback had a word to say about the "best" antenna available: "We wish again to point out here that for radio telephone reception a single-wire aerial of 100 to 150 feet long is always best...because with it there is less interference on account of its directional properties"(5). Gernsback was talking about receiving antennas here, and this was at a point in time when radio was still preoccupied with the low and the medium frequency bands.

It wasn't long, how-



ever, until Marconi led the world to explore the high frequency bands where the polarization problem mentioned earlier was not so important. This is because at high-frequencies skywaves rather than ground waves were the major paths of communication.

Another very important factor was that the dimensions of the short wavelengths were small enough that practical antennas could be made "long" in comparison to the wavelength employed. This allowed more ease in constructing the antenna in configurations which could produce directional "beams" of radiated waves. Thus, the Marconi-Franklin beam system(6) was soon providing reliable short-wave communication around the entire globe.

Figure one gives a comparative look at the highly directive radiation pattern of the early beam antenna versus the Hertzian dipole and the grounded vertical Marconi antenna. No one in his right mind doubted that the new beam system antenna, with its collinear elements and parasitic reflector curtain, was the "best" antenna around!

GAIN ANTENNAS

As history records, however, organizations like RCA, IT&T and Bell Labs got to work and produced wire-beams such as the Bruce array and the Sterba curtain. Comparable wire-beam antennas were also developed in other countries: the Chirex-Meseny array in France; the British T-W array; and the tannenbaum or pine-tree array used in Germany(7).

Now the Marconi-Franklin beam had serious competitors and the question of which was the "best" was not so clear. With enough tiers and bays (vertical and

horizontal duplications of the basic antenna into a bigger array) these monster-sized wire-beams gave gains on the order of 20dB.

There were some problems, however. Propagation of radio waves at the short wave lengths depends on their journey through, or reflection from, various layers of the ionosphere. Since the ionosphere is constantly changing, the action of the short waves was always changing, and the best frequency for communication varied from day to day, and even from hour to hour.

The wire-beam system antenna design just mentioned was such that an antenna was constructed for one specific frequency or wavelength. If the ionosphere caused the propagation to change, such that one antenna's design frequency was no longer usable, a different antenna with a different design frequency would be required if communication were to continue. This duplication of antennas was, of course, rather expensive with such very large antennas.

Not to worry, however; the engineers at companies like RCA and Bell Labs had not been idle and they now brought forth just what was needed to solve the problem: Their newly developed broadband antenna systems--the non-resonant vee and the diamond or rhombic antennas.(7)

These "folded-wire" beam antennas had high gain and the added advantage that their frequency response was so broad that a single antenna could be used to follow the optimum frequency for communication across very wide changes of wavelength. Now, if you wanted to have reliable 24-hour communication with stations in any one direction around

the world and to do it with just one antenna, the "best" antenna was the rhombic.

But what if you needed 24-hour communication with stations in various directions and could afford only one antenna? The rhombics and non-resonant vees are too large to rotate to a new direction when you wanted to work a new station. There was a definite need for a compact, rotatable beam which could be made in multi-band configurations to solve this dilemma.

The answer began with a Japanese team who produced the beam antenna which bears their name yet today. You may know their antenna simply as the "Yagi," although "Yagi-Uda" is more correct. Their beam, and others such as the famous W8JK "flat-top" wire beam, were further evolved to capitalize on the space-saving concept of close spacing of elements. Such beams were developed to the extent that beams small enough to rotate readily to any point of the compass could be made for multiple-band operation.

For many stations, especially smaller ones, these relatively small, rotatable beams with their useful levels of gain were the "best" antennas which had yet been developed. Later, a variant of the Yagi-Uda, the cubical-quad, provided another contender among the choices which one might consider as "best" for situations similar to those just described.

In time, the log-periodic beam antenna would come along to provide remarkable bandwidths in an antenna configuration small enough to challenge both the Yagi-Uda and the cubical-quad as the "best" rotatable beam antenna. The Grove "Scanner Beam" is an example of a VHF/UHF log-periodic beam antenna.

As the utilization of shorter wavelengths became more and more common, communications engineers and scientists began to exploit relatively unexplored higher frequency bands. Soon the frontier of radio communication had moved to the VHF region and was tapping on the front door of UHF as well.

Now researchers began to eye such long unused designs as Hertz's parabolic reflector(1). This antenna design, which had been unusable at long wavelengths and impractical even at the short-wave lengths, was now quite practical at the much shorter VHF and especially at the UHF wavelengths.

ANTENNA TALK cont'd

Using parabolic dishes, engineers obtained gain and directivity unheard of at the longer wavelengths.

Was this parabolic dish-antenna which has become the popular satellite-dish of today the ultimate "best" antenna?

By this point you have probably guessed that the question "What is the best antenna?" has no easy answer. It depends upon what you are asking the antenna to do. If you want it to handle low frequency transmission or reception, you will have a different set of antennas to choose from than if you are wanting a UHF satellite communications system. You just can't practically construct a parabolic-dish reflector of the size that would be required at long wavelengths.

On the other hand, wire beams are not used at VHF to microwave frequencies as their gain and directionality can't equal that of the dish or horn antennas used there. If you want to

receive high-frequency signals from South America, you will need an antenna quite different from one which you would use to monitor the utility action on the VHF band in your hometown.

We may see now that it would actually be better to rephrase our question and ask, "What is the best antenna for my specific application?" As a matter of fact, to be even more realistic, we should probably re-phrase our question one more time: "What are the best antenna choices for my specific application?" With the large number of antenna designs available today, often there are several antennas which could fill your needs almost equally well.

As you have probably noticed, the "tour-de-force" which we have just taken through the development of antennas has pointed out a number of factors of importance in antenna selection: gain, directionality, polarization, bandwidth, and physical size. Next month, in the conclusion of this

article, we will define these terms more completely. Then, with these definitions in mind, we will explore some basic antenna configurations.

RADIO RIDDLES

Answers to last month's thought teasers:

1. Question: Who was the first person to use a dipole antenna for electromagnetic wave radiation and reception? Hint: It was not Heinrich Hertz!

Answer: in 1879, David Hughes developed a radio communication system complete with dipole antennas. Important scientists of his day convinced him that his system was working by induction rather than radiation, so he became discouraged and gave up on the idea. Today we realize that he actually had a working radio system!

2. Question: Why is a dipole sometimes said to have 0 dB gain?

Answer: Often the dipole is used as a basis of comparison for rating antenna gain. When it is used for this purpose, its gain is the starting point of the scale used, and thus is "0" gain.

This month's Radio Riddle:

What is the difference between an antenna and an aerial? (answer next month)

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MONITORING POST

Harry H. Abery, Jr., of Hartford, CT, is an avid SWL and scanner enthusiast. Let's listen as Harry describes in his own words his monitoring post.

The console was constructed several years ago and features a tilt back-lighted world map and is equipped with the following: three J.I.L. SX100 16-channel digital scanners for police, fire, news media, etc.; one J.I.L. SX200 16-channel scanner for the 108-136 aircraft frequencies; also a Bearcat DX1000 digital direct access communications receiver, a Genave business band base-station (Hi-band), a Robyn AM/SSB 40-channel CB base station and a Bearcat Weather-alert

radio (not shown).

In the opposite corner of the room is a TRS-80 double disk drive computer with a MFJ RRTY/CW computer interface for the DX1000.

I have the capabilities of scan-record all receivers, tape-recording of the house telephone system and several remote positions for the business band base and CB, the outboard-mounted TV screen serves to monitor either the computer or cable TV and there are four digital clocks for the world time zones plus a local and U.T.C. readout.

I work as a radio dispatcher for the local police department, but spend many many hours in my communications shack and my hobby.



VIEWPOINT from p.3

31 scanner (DEC 85).

Last year I purchased the PRO-30 and PRO-2003 scanners from Radio Shack; the PRO-30 has better sensitivity than the PRO-2003. While it should last six or seven hours on alkaline batteries, it does not work at all on rechargeables!

The battery warning is set to 7.25 VDC. With brand new, charged nicads you have 7.5V, not 9V. At first this is an hour of use that eventually degrades to 15 minutes.

Next, my PRO-30 has a loud floating birdie like a Russian jammer, not mentioning the numerous fixed birdies that mess up the search feature. Its sensitivity does not compare to the Regency HX-1000.

I have had to personally repair it three times, such as a broken keyboard, memory backup failure (not due to batteries), and a replaced battery holder (it melted while trickle charging).

Remember that the employees only receive training on how to write a sales slip, calculate tax and commission, not on advice. Before you buy anything from any company, seek out the advice of MT or someone who owns similar equipment. Check your warranty and compare costs, especially when it comes to the purchase of expensive electronic equipment.

Chester West
Chadds Ford, PA

FAN MAIL

I would like to report after running the ad for my HQ-180 receiver in Monitoring Times that it sold quickly. Your magazine is the finest forum for short wave information and equipment info that is available.

Ray Thompson
Birmingham, AL

After your survey of several months back, what is the probability of MT going to 8-1/2" x 11" format? I realize that it requires more difficult editing and expense but would really be easier to read and keep! Good stuff like you print shouldn't be so hard to keep or easy to trash. I already pay up to \$20 per year for magazines of lesser keeping value and would gladly pay that for MT if it got more "classy." Thanks for a good publication.

Thanks for the kind comments, Sam. The input from our respondents persuaded us to stay with the newsprint format for now. We are constantly evaluating new formats as they come to our attention, but nothing beats the present system for low cost, speed of reporting and printing control...Bob)

I have been receiving your paper for about one year now and needless to say I am very impressed with it. I have gained much from it and thought I should return the favor.

About three months ago the Kansas City, Kansas, Police Department discontinued the use of their VHF frequencies of 155.61-

VIEWPOINT cont'd

155.43-155.19 MHz. Knowing this was going to happen and that they were going to the 800 MHz cellular bands, I purchased my new radio, the MX-7000.

The problem now is where do I begin to look? With the help of your July 85 issue of MT I knew where to start. An article called "800 MHz: The New Frontier" told me right where to go.

I have found five of their eight frequencies: 856.7625-857.7625-878.7625-859.7625-860.7625.

John Cooper
Kansas City, KS

As a faithful supporter and subscriber to Monitoring Times from the very first issue (I have every edition), I would like you to know that I think Jean Baker's column PLANE TALK gets better all the time. It is always interesting and informative.

Having personally spent about 40 years in aviation which included aircraft maintenance and avionics repair and calibration, flight inspection of radio and navigational aids civil and military, logistics flight operations and flight procedures in the Pacific, Hawaii and the Far East, I truly appreciate PLANE TALK.

LF, HF VHF & UHF communications went hand in hand with most every aspect of our operations. And of course we were also deeply involved with all phases of Air Traffic Control (ATC), both U.S. and foreign, civil and military. In this connection, I believe the wide range of aviation communications and ATC activities covered by Jean Baker is totally professional both in technical content and in writing style...A plus for MT.

I realize that not all of the readers of MT are aviation buffs; however, I suspect that even those who are not interested in aviation communications and ATC activities are finding PLANE TALK catching their interest and stimulating as well as educational. Jean Baker's column has filled a long standing void in MT. Her latest column in the Jan 1986 edition of MT; ATC, Part I "The Good Old Days" is a very comprehensive job and exceptionally well done.

It is a difficult task to please all of the readers all of the time, which is of course not new to you. However I am quite sure that a large portion of the readers of MT look forward to PLANE TALK and would even like to see it more frequently. Here is to the continuing of PLANE TALK.

Herbert G. Gardiner
Honolulu, HI

WEATHER BROADCAST AIDS

In the January '86 issue of MT was a brief note on using the new wide frequency coverage scanners to copy weather satellite broadcasts and a query on reader

HELPFUL HINTS

Grove Omni, MiniTuner and Power Ant as a High Performance, Compact, Antenna System

Apartment dwellers are constantly on the prowl for good, low profile antenna systems. With this in mind we recently ran a series of experiments to see whether several popular Grove products could be fashioned into a useful system.

THE EXPERIMENT

An ANT-5B OMNI, intended for VHF/UHF reception, was mounted on the roof of a house. Grove RG-6/U coax was run to the radio room and fed into a TUN-3 MiniTuner (a passive preselector). An ANT-4C Power Ant (broadband preamplifier) was connected between the MiniTuner and an ICOM R71A receiver. An antenna switch was installed to select between the compact experimental antenna system and a 135 foot dipole reference antenna.

It was necessary to change one Motorola plug to a PL-259 UHF connector on the Power Ant for connection to the receiver. A Motorola/

UHF adaptor was used to couple the MiniTuner to the Power Ant, and the antenna coax required a PL-259 UHF connector to be installed to mate with the input to the MiniTuner.

THE RESULTS

The results were astounding; the compact system equalled or outperformed the huge dipole antenna on virtually every frequency! Where there was a noticeable increase in background hiss, signal strengths were substantially above the noise. The MiniTuner totally eliminated intermod, a common complaint with other amplified antenna systems.

With the TUN-3 MiniTuner removed, the remaining system can be plugged into a VHF/UHF scanner for improved reception in that range as well.

SO, WHAT'S THE BAD NEWS?

There isn't any. We did notice occasional AC hum on

the loudest shortwave broadcast signals, possibly due to poor grounding. Experiments with different grounding procedures did reduce the hum.

The use of the TUN-3 MiniTuner between the antenna and the Power Ant is mandatory to eliminate intermod; with the tuner removed, spurious products from loud broadcasters could be heard peppered throughout the spectrum.

If you are looking for compact antenna system, this combination can't be beat!

SEARCH ON THE HX1200

While the new Regency HX1200 hand-held programmable scanner is the hottest thing going, the instruction manual left out one important statement--how to properly program the search mode!

The sequence is actually quite simple, pressing in order: SEARCH PROGRAM, FREQUENCY (lower), ENTER, LOWER, FREQUENCY (upper) ENTER, UPPER, SEARCH SCAN.

For example, if you wish to search for signals between 460.0 and 460.6 MHz, you would press sequentially: SEARCH PROGRAM, 460.0 ENTER, LOWER, 460.6 ENTER, UPPER, SEARCH SCAN. ●

section, which is near to the antenna terminals, and then cut the tracks as described in the following section.

1630 MHz Filter: Find R04 and L04, cut the copper track that connects them and then solder a miniature 27pF capacitor across this cut on the p.c.b. Carefully remove capacitor C10 (12pF) and replace it with a 4.7pF one.

816 MHz Filter: Cut the track between C17 and L09 and solder a 39pF capacitor across the cut.

48 MHz Filter: Cut the track between C26 and L14 and solder a 68pF capacitor across the cut.

24 MHz Filter: Cut the track between C35 and L19 and solder a 100pF capacitor across the cut.

0.151 MHz Filter: Remove the two 120pF capacitors C51 and C54 and replace them with 1000pF ones. Solder two more 1000pF capacitors onto the underside of the board, one in parallel with C52 and the other in parallel with C53.

These mods help to prevent crossmodulation. George says that he lives just 3 km from a BBC medium wave station and even with his

MODIFICATIONS FOR THE FRG-7700

One of the best hobby radio publications going is a British monthly called "Practical Wireless" (Room 204B, Hatfield House, Stanford Street, London, England SE1 9LS). Their issues are constantly packed with solid information on equipment and techniques for communicators throughout the spectrum. Send 4 IRC's for a sample and let them know that you heard about them in Monitoring Times.

The January 1986 issue had an excellent article by Roger Hall, G4TNT, on improvements for the popular Yaesu FRG7700 general coverage receiver. It is reprinted herein with grateful acknowledgment to Practical Wireless.

interest. Please add my name to the list of those who would like to see more information on this subject. With receivers such as the ICOM R7000 capable of receiving up to 2.0 GHz it may even be possible to construct a relatively inexpensive system for GOES satellite picture reception.

As a meteorologist who has worked in weather data acquisition a little, there is a publication readers may be interested in. This is World Meteorological Organization (WMO) Publication Number 9, "Weather Report-

YAESU FRG7700

George G4RNI has sent in a selection of interesting mods for this very popular receiver. He is on his second one and has found that both suffered from various image and crossmodulation problems. However, he has managed to greatly reduce these problems on all but the 12MHz range and all for a total cost of approximately 50p.

To carry out the mods it is necessary to completely remove the main p.c.b. but this is quite a simple job. Start by disconnecting the mains supply and then remove the six screws securing the top cover. Loosen the screws that hold the handle and take off the top cover.

Now take off all the flying leads from the main board and from the FM board. These should all be marked with code numbers, which match the humbers on the boards, so it should not be too difficult to replace them later. Undo the two screws that hold the screen behind the digital display and remove this screen.

Next, remove the nine screws that hold in the main p.c.b. and take the board out, taking care not to damage the digital display. Locate the bandpass filter

☞ Please turn to p.40

EXPERIMENTER'S



WORKSHOP

BUILD A REPEATER FOR YOUR SCANNER

by Jim Dantin

PROBLEM: Your scanner or short-wave receiver is a tabletop model or is connected to an outside antenna and you want to listen in another room.

FRG-7700 cont'd

long wire antenna he experiences no breakthrough at all now.

IMPROVED FM SELECTIVITY

Start by removing the two plastic pins holding the FM board metal cover to the back panel of the set and then withdraw the panel and the board. Remove the two screws that hold the panel to the board and then unsolder and take out the CFU455E ceramic filter. Replace it with a CFU455H (for 6kHz bandwidth) or a CFU455G (for 8kHz bandwidth).

BRIGHTER FM AUDIO

While the FM board is out of the set, remove capacitor C13 (0.22uF) and replace it with 0.1uF or 0.01 uF, depending on the quality of audio that you prefer.

IMPROVED BANDWIDTH (AM WIDE)

George thinks that the manufacturer has made this setting too wide for serious use on the broadcast bands so he suggest the following change.

With the main board out of the set, remove CF04 (LFH12) and replace it with an LFH8, which is available from Cirkit. A CFW455G could be used instead but if it is, it will have to have its third earth lead bent over and soldered to the second one before installation.

After modification, the bandwidths will be: NARROW <3 kHz @ 6dB, 8 kHz 2 50dB; MEDIUM 6 kHz @ 6dB, 15 kHz @ >50dB; WIDE 8 kHz @ 6dB, 18 kHz @ <50dB.

I have not yet tried out these mods on my own FRG7700 but I certainly intend to and I'll pass on my comments when I do. Meanwhile, thanks for sending them in, George.

SOLUTION: Connect your receiver to a transmitter and rebroadcast to a portable radio! Read on and find out how to build a low power repeater out of junk (or at least with inexpensive Radio Shack components).

This project began when I became the proud owner of a barely-second-hand ICOM IC-R71 receiver. This jewel is capable of scanning the short-wave bands just like a conventional scanner searches the VHF and UHF bands. With its built-in squelch and recorder controls, it can operate unattended while creating a permanent recording of radio activity.

While listening to a recording of previous events is nice, I wanted to keep up with what was happening RIGHT NOW! Family harmony precluded installing the R71 in the den, so short-wave listening became possible only when I could isolate myself in my "communications center / computer room" (better known as the spare bedroom!).

Isolation does breed creative thought, however, and I came up with the idea of building a transmitter that would connect to the recorder output of the receiver and would be switched on by the receiver's recorder control relay. This concept should work with any receiver equipped with recorder control--including many scanners!

LOCATING THE PARTS

My first attempt was based on my son's toy walkie-talkie. Operating in the 49 MHz band, it could be heard with my Bearcat 100 scanner. The quality was horrible, however, since the walkie-talkie operated in AM rather than FM mode.

A trip to my local Radio Shack store yielded a number of possible transmitters. The most obvious were

the small FM wireless microphones--the model number 33-1076 is a decent quality unit at \$19.95 and the 60-2109 at \$6.95 is a lower quality possibility.

Both of these units transmit on the FM broadcast band--not receivable by most scanners, but they might be just the thing for your application. All you need is a standard FM radio and you're in business!

A pair of CB radios would be another possibility if you did not have either a suitable transmitter or receiver.

Looking for something in the 49 MHz band that would work with my scanner narrowed the selection. The toy walkie-talkies are priced right, but all operate in AM mode. One possibility is the 43-208 wireless monitoring system which operates as FM. A final possibility is a cordless telephone--FM plus quality sound!

I don't think anyone is going to buy a \$30 wireless monitoring system or a \$100 telephone and then scavenge it for this project, but there are "broken" units available at yard sales and at Radio Shack's clearance sales! That's exactly where I acquired my transmitter--an obsolete, inoperative wireless telephone!

ASSEMBLING THE "REPEATER"

Now that you have located a suitable transmitter, how do you make it work? Believe it or not, this is the easy part! All you need is a coupling transformer to connect your receiver's recorder output to the microphone input of the transmitter. Some experimentation may be necessary but either the Radio Shack 273-1380 (1000 ohm to 8 ohm at \$1.29) or the 273-1375 (1:1 ratio, 600 ohm transformer at \$2.49) should do the trick. I got lucky and the 273-1380 worked fine.

After disassembling the telephone handset, I removed the small PC board that connected to the microphone. This PC board houses the FM transmitter and also has connectors for the battery pack, the receiver PC board and the antenna. This particular handset had a small antenna constructed out of ribbon cable and attached to the inside of the housing--not very efficient!

I unsoldered the microphone and replaced it with the 8 ohm side of the transformer. The 1000 ohm winding was connected to a plug that mated with the recorder output jack of the short-wave receiver. The plus (positive +) side of the battery connector was cut and wired to another plug that mated with the recorder control on the receiver (your receiver might use screw connectors). A spare telescoping whip antenna was connected to the PC board where the original antenna was removed.

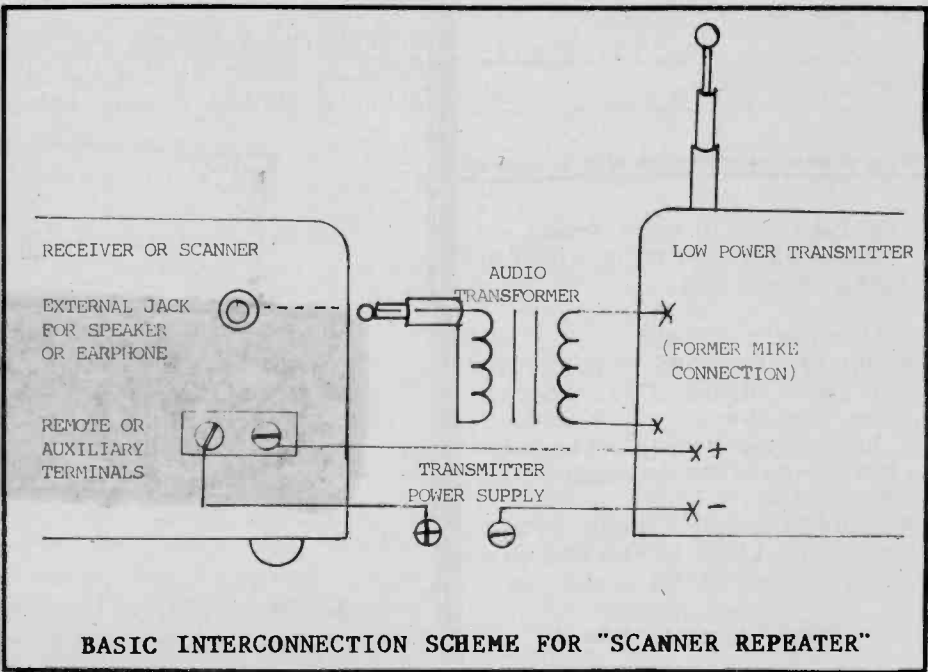
Whenever the ICOM R71 broke squelch, the recorder control was activated, powering up the transmitter (the recorder control is a normally open relay contact). After searching out the proper frequency with the Bearcat, the transmitter was tuned up for best performance (using the classic "fiddle-with-all-of-the-parts-that-move-until-it-sounds-right" method!).

Some refinements are needed in the power supply area. The telephone used 3 AA nicads which I replaced with standard alkaline cells (the nicads were the reason the phone was "broken"!). A more permanent arrangement will be made with the power supply scavenged out of the base unit.

Another possibility is to use a small 4-5 volt plug-in transformer scavenged from some other "broken" toy.

An enclosure of some type will finish out the project and allow it to sit with dignity on top of the R71. Neatness does count, even with a project resurrected from the junkbox!

So, now I can sit in the den with my Bearcat 100 scanning the local frequencies and listen to Mexico 450 as he checks in with New York ARINC on 6.577 MHz USB! Only one channel of the Bearcat is tied up with the repeater frequency, leaving the other 15 for normal scanner use. It would be quite feasible to build additional repeaters for use with other receivers--let your imagination run wild!!



STOCK EXCHANGE

NOTE: Monitoring Times assumes no responsibility for misrepresented merchandise.

PERSONAL--SUBSCRIBER RATES: \$1.00 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 the publication date.

FOR SALE: YAESU FRG-7 with GILFER GAR-7 digital frequency display. Both perfect; all manuals. \$225 plus shipping. Write: 412 Briarwood Dr., Thomasville, GA 31792.

FOR SALE: PRO-2009 programmable scanner with scanner recording device for tape recording infrequent transmissions: \$160.00 (803)723-5061.

WANTED to buy shortwave radio that will pick up all the upper bands and Air Force, space shuttle and so on. AND WANTED to buy an antenna that will pick up all shortwave bands from top to bottom even satellites. Send price of both to Gene Perryman, Box 1104 Rt. 2, Kendrick, Idaho 83537.

HAL RS-2100 RTTY Tuning Scope. Excellent condition. \$175. Call Bob Ahern (603) 432-4158.

Scanner REGENCY MX7000 \$295; RTTY ASCII, CW dedicated system MICROLOG-ACT ONE with MONITOR green screen just plug into shortwave receiver and copy \$195.00; KEN ARAUJO, P.O. Box 2696, Marathon Shores, FL 33052 evenings (305)872-9106.

WANTED: Cassette tapes of New York City police freqs (Queens, Brooklyn, Bronx, etc.). Will reimburse cost of tapes. Al Quader, 5822 Brookside Drive, Cleveland, OH 44144.

JOIN A LISTENING CLUB. Complete information on major North American clubs and sample Newsletter \$1.00. Association of North American Radio Clubs, 1500 Bunbury Drive, Whittier, CA 90601.

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INFORMATION PLEASE

Monitoring Times will print at no charge (as space permits) announcements and questions of a non-commercial service nature.

WANTED: Owners or operators manual for National model HRO-60 receiver. Send to Ray Thompson, 8228 10th Ave. S., Birmingham, AL 35206.

WANTED: Swap frequencies for Louisiana; also information on how to start a computer bulletin board. David Fuller, Rt. 2 Box 156-A, Bogalusa, LA 70427 (phone 504-732-9903)

WANTED: Hewlett-Packard 803 RF impedance bridge. Bob Grove, P.O. Box 98, Brass-town, NC 28902.

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- * BAUSCH & LOMB FILM STRIP PROJECTOR LENS ASSEMBLY (in carrying case) \$8

Bob Grove
P.O. Box 98
Brasstown, NC 28902

ing, Volume C, Transmissions." This publication is available from the American Meteorological Society at the following address:

WMO Publication Center
American Meteorological Society
45 Beacon Street
Boston, MA 02108

Residents of other countries should write:

World Meteorological Organization
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For U.S. and Canadian residents the cost is \$125.00 (U.S.) for the basic volume. Subscription to the bimonthly Supplement Service is \$132.00 by surface mail or \$160.00 by airmail. Covers run \$16.00 each, of which four are required. This publication lists all civilian and some military telegraph, teletype, and facsimile weather broadcasts. It gives the frequency, time of transmissions, baud or scan

rate, what products are transmitted (by WMO heading), and type and power of transmission.

There is also a Volume D, "Information for Shipping" to this same publication that has nearly the same type of information as Volume C. However, it is designed for maritime interests and does not list broadcasts that are strictly of interest to the meteorological community. On the other hand, there is more information of a general nature in Vol. D. It too is available from the above address. Its price is \$150.00 (U.S.) for the basic volume, \$96.00 for surface delivery of the bi-monthly Supplement Service subscription, \$120.00 for airmail. A catalog of all WMO publications may be available, too.
Nicolas Powell
Colorado Springs, CO

SHORTWAVE BEAM ANTENNAS

I may have a partial answer to Craig Rocha of San Diego in the December '85 MT with regard to his question about shortwave beam antennas.

In the July 1981 issue of QST magazine, the late Ansy Eckols, YV5DLT, describes a 13 to 30 MHz log-periodic antenna compact and light enough to be mounted on conventional ham/CB antenna towers. With additional elements, response could be extended as far down as 7 MHz and still be practical. Below that, one could resort to loop antennas for reasonably directional reception.

I have a copy of the article before me, and neither the courage nor the space to try building it myself. However, in a receive-only application, one might be able to do things (lighter gauge wire, less concern for impedance matching) that one would not do otherwise to simplify construction.

Frank Glover, KA2WQA
139 Hawley St
Rochester, NY 14608

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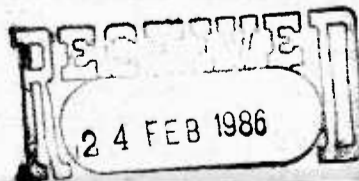
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