

POPULAR COMMUNICATIONS

MARCH 1983 \$1.75

Monitoring Ivan's Spy Submarines • Listening To The Middle East Powder Keg • Hands-Free Two-Way Radio Arrives • On Duty With Our Federal Research Vessels • Tuning In On International Weather Bulletins • "Army Calling Space Shuttle" • Scanner Hints • We Build: A GI Foxhole Receiver • Inside Automatic Telephone Dialers



Doomsday DX'ing

IC-R70

NEW!

The Commercial Grade Communications Receiver that everyone has been asking for..... at a price you can afford!



GENERAL COVERAGE RECEPTION AT ITS BEST

Listen to the world of HF with the R70, a 100KHz to 30MHz commercial grade receiver designed by ICOM Incorporated, the leader in advanced receiver design. Built from knowledge gained by designing receivers for commercial, marine, and amateur use, the R70 surpasses other receivers on the market...even receivers costing more than twice as much.

Utilizing ICOM's DFM (Direct Feed Mixer), the R70 is a receiver which in normal usage is virtually immune to intermodulation distortion or cross modulation, yet still maintains superior sensitivity. Whether you are a SWL (short wave listener), Ham (amateur radio operator), maritime operator or commercial user, the R70 provides the features you need.

DESIGN

The R70 incorporates an UP conversion system, utilizing a direct feed mixer proven to be the best design for minimizing interference from strong adjacent signals. A preamp is provided for making the weakest of signals readable. High grade filters in

conjunction with the built-in PBT (pass band tuning) system and notch filter, provide the ultimate in interference rejection. Selectable AGC (fast/slow/off), noise blanker (wide or narrow), and tone control improve readability under the worst conditions. An AGC derived squelch, operative in all modes, adds to operating ease.

Dual VFO's with three tuning rates provide quick QSY (frequency change), memory for an important station, or by equalizing the VFO's (A=B), a digital RIT. 13.8 VDC operation is provided as an option, 117 VAC is standard.

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PRICE

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
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Pop Comm

Listen to your planet on a short-wave receiver!

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Panasonic
RF-6300



RF-4900

Panasonic® RF-4900

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The Panasonic RF-3100 portable 31-Band portable radio has PLL Quartz-Synthesizer tuning that "locks" onto SW stations. Operates on AC or battery. SW frequencies from 1.6 to 30 MHz. are in 29 bands. All-band 5-digit frequency readout. Horizontal design with front mounted controls for shoulder strap operation. Double superheterodyne for clean SW reception. BFO pitch and RF gain controls. Separate bass and treble controls. Wide/Narrow bandwidth selector. Meter for tuning and battery strength. LED operation indicator. Meter light switch. 3 1/2" PM dynamic speaker. Comes with detachable shoulder belt. Battery power (8 "D" batteries not included). Made in Japan.

Panasonic® RF-2900

List price \$349.95/CE price \$249.00
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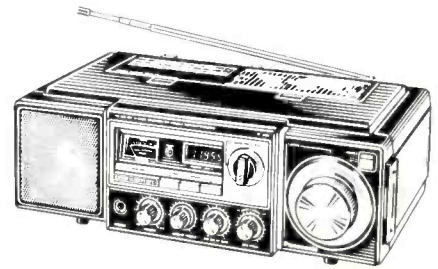
The Panasonic RF-2900 is a portable five-band shortwave radio with digital five digit fluorescent frequency display. Full coverage from 3.2 to 30 MHz. on SW. Covers SSB and CW. Double superheterodyne receiver. Fast/slow two speed tuning. AFC switch on FM, narrow/wide selectivity switch for AM and SW. FET RF circuit. BFO switch and pitch control. RF gain control. Tuning battery meter. Separate bass/treble tone control. SW calibration control. Dial light switch. Digital display on/off switch. Separate power switch. Detachable dial hood included. Rack type handle. Includes whip antenna and ferrite core antenna, speaker, earphone, recording output jacks, AC line and detachable adjustable shoulder belt. Made in Japan.



Command Series
RF-2900

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Panasonic Command Series



Panasonic
RF-3100

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854 Phoenix □ Box 1002 □ Ann Arbor, Michigan 48106 U.S.A.
Call TOLL-FREE (800) 521-4414 or outside U.S.A. (313) 994-4444

EDITORIAL STAFFTom Kneitel, K2AES
EditorAnita Hipius
Associate Editor**CONTRIBUTING EDITORS**Gerry L. Dexter
Shortwave BroadcastJoseph E. Jesson
RTTY MonitoringR.L. Slattery
Survivalist CommunicationsHarry L. Helms, KR2H
Utility CommunicationsAl Muick
Alternative RadioBill Cheek
Rick Maslau, KNY2GL
Special AssignmentsJanice Lee
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Telephone Accessories**BUSINESS STAFF**Richard A. Ross, K2MGA
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Associate PublisherHerb Pressman
Advertising ManagerDorothy Kehrwieler
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PhototypographerHal Keith
Technical Illustrator

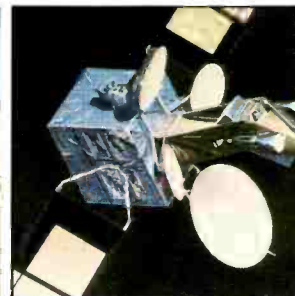
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BEAMING IN

BY TOM KNEITEL, K2AES

AN EDITORIAL

Environmental Impact

Not long ago, an enterprising group of businessmen thought it would be a dandy gesture to erect one of those multiplex movie theatres in my local community. No sooner had they drawn up the blueprints, when a general howl went up from various areas of the community. "Environmental Impact" was the battle cry that permeated the local newspaper and radio stations. How could anybody consider putting up a theatre complex with a 1,600 vehicle parking lot without making a major study of the impact upon the environment? Could the roadways handle the traffic? Could the local fire department be responsible for this complex? And what about security? There were dozens of valid questions brought up, and it appears that the theatre complex had to get put on *hold* until the impact upon the environment could be studied and answered.

This concern for how various things being built could have a negative impact upon the environment hasn't been restricted to this one isolated case I've mentioned. The potential hazards to an endangered species of fish held up construction of a major dam project not long ago; nukes can't be built without all sorts of questions about their impact upon the environment; and, in general, folks have begun demanding that those who would erect various structures and projects offer some assurances that these things will not adversely affect the quality of their environment, including the plant and wildlife in the area. Within the past couple of years, we've come to realize that the short and long term effects upon the environment of some of our brainstormings have not been all that pleasant to the ecological balance we try to maintain.

When this question begins to pop up in relation to national defense, it's twice as perplexing. For instance, when the Navy built the first test unit for ELF (extremely low frequency) communications at the Wisconsin Test Facility (WTF) in Clam Lake, Wisconsin, there was a loud outcry from environmentalists. The testing was preliminary to the construction of PROJECT SANGUINE, a transmitter for submarine communications which would have required about 6,000 square miles of woodlands be destroyed. Outraged Wisconsin residents cited studies which claimed that prolonged exposure to ELF signals could cause changes in blood pressure, tumors, mental stress, altered growth levels, etc. Such a clamor went up that the project was abandoned in 1973.

In 1975, the Navy thought that the project could be built in Michigan. They renamed it PROJECT SEAFARER, but in 1978, Jimmy Carter made a campaign promise to

Michigan Gov. Milliken to cancel the project. In 1979, the idea was renamed PROJECT ELF and again scheduled for 28 miles of antenna at the WTF and 130 miles of antenna at Marquette, Michigan. The \$490-million project would include a 3-million watt transmitter. The fur is still flying, and tests are being conducted in a remote area of Texas while things are being hashed over for a more permanent installation somewhere in the north central states. The environmental impact question just won't go away.

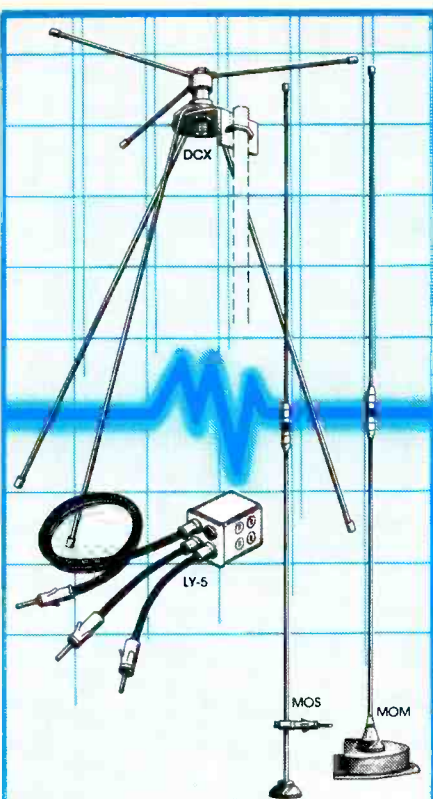
Again it has arisen concerning the use of the radio spectrum. Last August, the *Federal Register* announced that the U.S. Air Force is proposing to establish an Over-the-Horizon Backscatter (OTH-B) radar system on the west coast of the U.S., the purpose being "part of a continental system to provide improved atmospheric tactical warning to North America." The transmitter site would require 1,000 acres, the receiver site (100 miles away) would fill up another 700 acres. The transmitter site proposed is near Christmas Valley, Oregon. The receiving site would be near Alturas, California.

The Air Force wasn't so naive as to overlook the fact that environmentalists would bring up questions about this project and stated that "participation in the environmental analysis process by interested federal, state, and local agencies, as well as interested private organizations, is welcome." Public meetings were scheduled. The Air Force environmental analysis was proposed to include biophysical effects, electromagnetic emissions, land use compatibility, and the impact of locating the 450 military and civilian personnel in the communities near the sites.

The fact of the matter is that this system is going to raise an awful ruckus on the short-wave bands. In December of 1977, *SRI International* issued a report (Semiannual Technical Report 13: Technical Support for the CONUS OTH-B Experimental Radar System) which stated, "Unfortunately, at times (particularly winter nights) it will be impossible to avoid interference entirely . . ." Later in the report, it states that typical radar operations may involve channels already in use by 3 to 5 other licensees, "the typical RFI environment will consist of several (3 to 5) carrier sources, each having a 20 dB SNR."

In the April '80 issue of *QST*, SRI's Senior Scientific Advisor, O.G. Villard, Jr., commented that when the OTH-B radar is in operation adjacent to a Ham (or otherwise oc-

(Continued on page 74)



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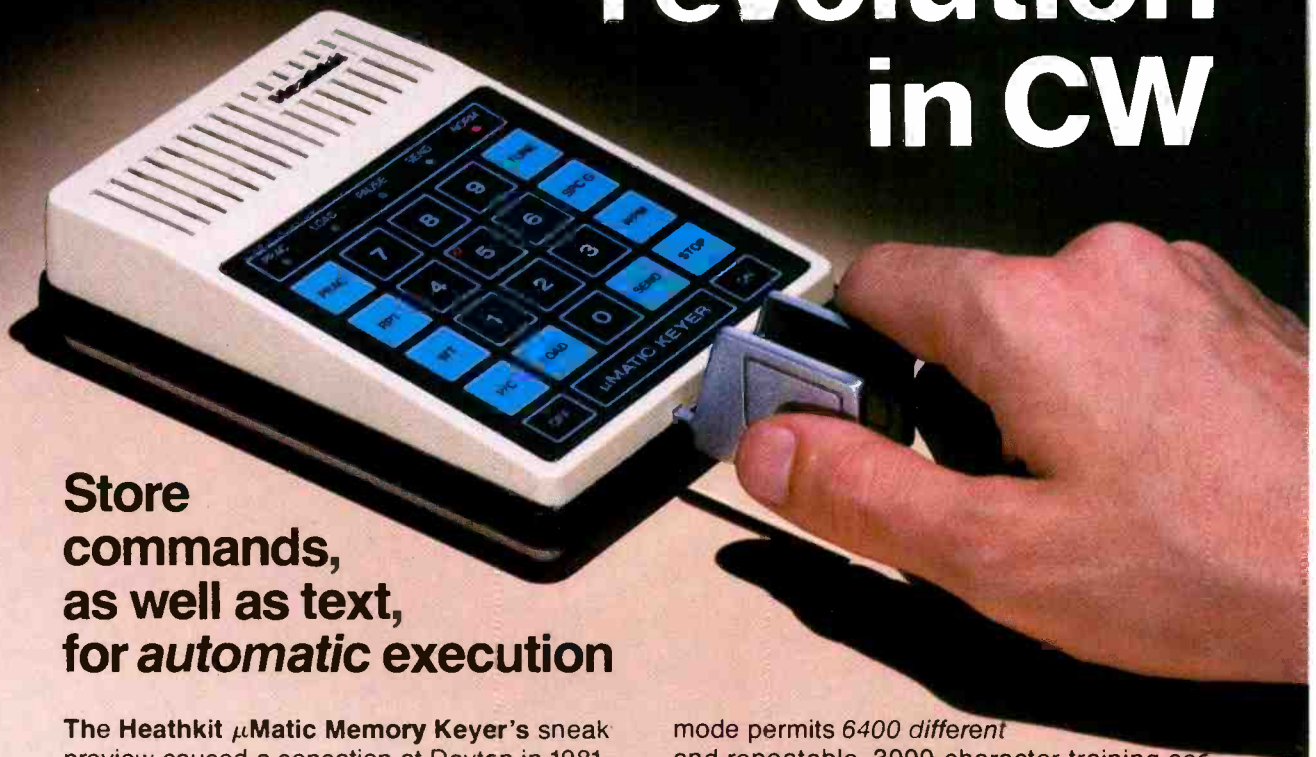
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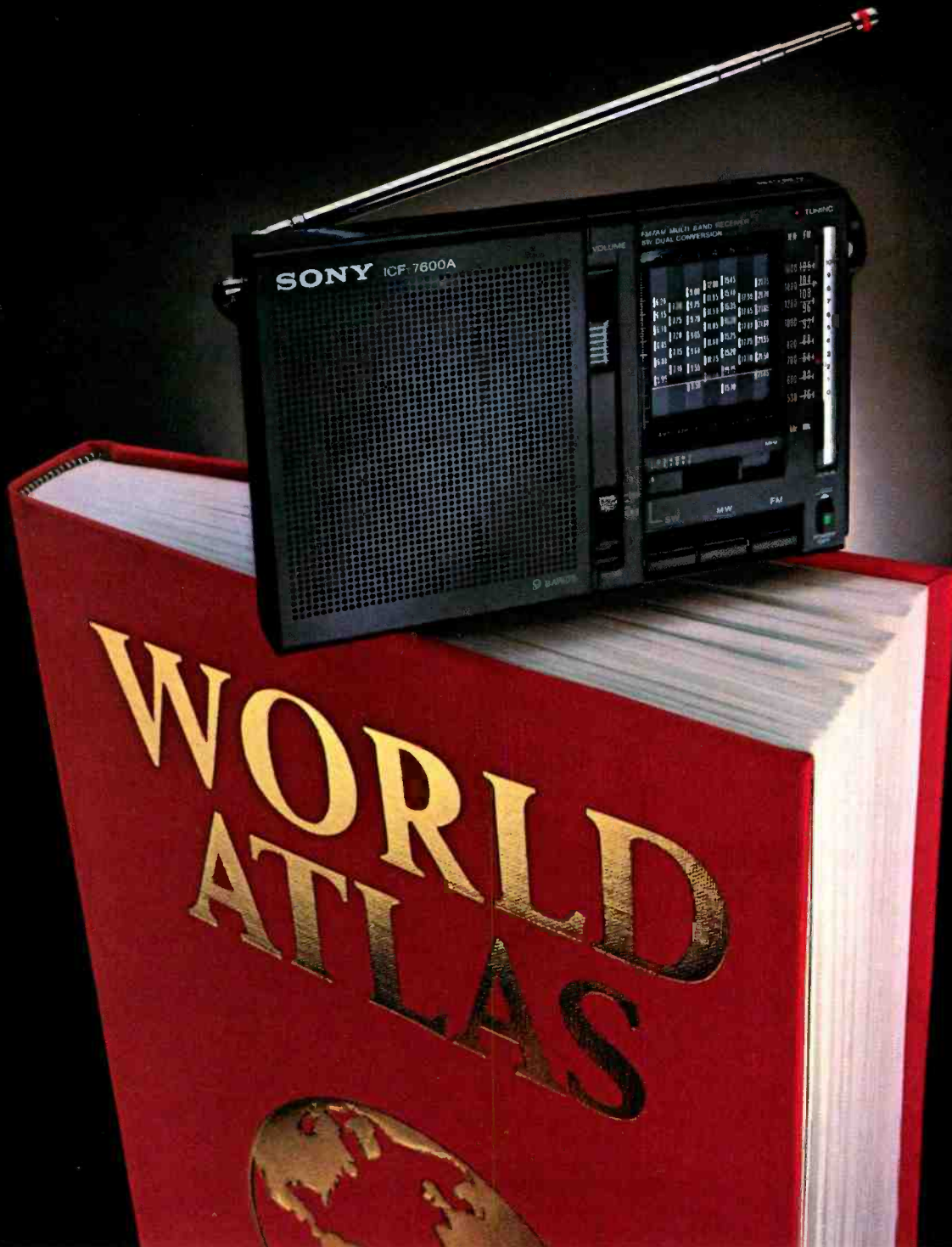


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MAILBAG

LETTERS TO THE EDITOR

The most interesting questions we receive will be answered here in each issue. Address your questions to: Tom Kneitel, Editor, Popular Communications magazine, 76 North Broadway, Hicksville, NY 11801.

Those Krazy K-K-K-K-Kallsigns

I noticed in a listing of international radio callsign prefixes that American radio stations can use the callsign prefixes K and W, AA through AL, and also the prefix letter N. None of the broadcasters in my area use anything but callsigns with the letter K at the beginning and I'm wondering why the other prefix letters aren't in use.

Warren Wolfe
Las Vegas, NV

You aren't taking into account that there are many types of FCC licensees, other than broadcasters, which are assigned callsigns. While it's true that the FCC presently assigns broadcast stations west of the Mississippi River callsigns commencing with the letter K (the starting letter W is used in the eastern states), you'll find that all of the other prefixes from the A and N series are given to military and ham stations (ham stations also are assigned W and K prefixes), public safety and industrial two-way stations are given K and (sometimes, of late) W prefixes, vessels receive K or W callsigns, etc.

Within each of these groups, the structure of the callsigns (that is, the arrangement of letters and numerals) is established on a distinctive basis to obtain maximum utilization of the available combinations that can be generated to accommodate the large number of licensees that the FCC has so that duplicate callsigns aren't issued. With the exception of a couple of computer goofs, the FCC has done a good job of giving all of its licensees individual callsigns. One notable exception, where the same callsigns are assigned to licensees in different radio services, would be relative to some aircraft licensees and some hams.

For instance, while the ham callsign N1AJ is assigned to an operator in Massachusetts, it's also assigned to a Piper Seneca aircraft which flies from Wisconsin; N2SB is a ham in New Jersey and also a Piper Aztec in South Carolina. These are only two examples of many hundreds of such duplications of ham and aeronautical callsigns.

Apparently no problems are caused by the duplications and it does relieve the pressure on the FCC to come up with a complex formula that takes into account that the aero callsigns are actually based upon the aircraft's registration numbers issued by the FAA and not by the FCC. What with the

FCC's recent opening up of the A and the N blocks of callsigns for the hams, it would be a treat if they would start using those prefixes in the broadcast services, or even start giving out the K and W prefixed callsigns on a total national basis rather than according to which side of the Mississippi river the stations are located. Other than by habit (or tradition), there seems to be no particular reason to continue the curious practice. —Editor.

Sleeper?

In your November "Listening Post" column, DX columnist Gerry Dexter suggested that his readers might check out several DX clubs. I'd like to back him up with my own vote of confidence for NASWA, ASWLC, and SPEEDX. It was Make Chabak's excellent shortwave "utilities" column in SPEEDX which enticed me into monitoring utility stations after long years concentrating my efforts on shortwave broadcasters. But surely Dexter must have had his tongue planted firmly in his cheek when he suggested sending for a sample copy of *The Review of International Broadcasting*. Despite its pretentious title, it's not a club. In my opinion, it's a fatuous little pamphlet which turns out to be about as interesting as a tepid glass of buttermilk, and equally efficient for inducing a sleep-like state. Please confirm that Dexter was only joking.

(name withheld by request)
California

OK, I'll grant you that *The Review of International Broadcasting* is not everybody's cup of buttermilk. It isn't easy to be in the midst of a broad and exciting hobby such as DX'ing, trying to whittle it down to a narrow little segment and still make it interesting. *The Review of International Broadcasting* has long been trying to make it work. I've found it pompous and self-indulgent, often containing unintentional chuckles, but essentially a harmless little effort. Some folks, however, do think it's worthwhile—what can I tell ya? Our readers can decide for themselves. As for Mike Chabak's column, I second your vote of confidence. —Editor

Not Geared To American Tastes

Your December story on propaganda broadcasting was muchly appreciated. Although I've spent nine years as an avid DX fan, until I read POP'COMM I hadn't realized the techniques and extent of propaganda broadcasting. Wouldn't you think that catching and keeping a radio audience could be accomplished by programming alone, without the need to ply listeners with decals, T-shirts, and the like? Thanks to your article, I now realize that hardcore propaganda broadcasters (despite the decals) are

probably the most fascinating broadcasters on the air. By comparison, those middle-of-the-road broadcasters who aren't into heavy propaganda (such as Radio Sweden) now appear to me to be rather bland and colorless.

Newell R. Wallace,
Springfield, MO

While Radio Sweden may not have the most lively programming for American tastes, their regular fare includes Sweden Calling DX'ers and that's certainly useful. The program has attracted a wide international audience. If you haven't heard it, give it a try! —Editor

Swan Song

You've made several recent references to Radio Americas (a/k/a Radio Swan) and that it was a CIA station located "in an American possession." I assume that you were taken in by the misleading information which stated that it was located on Swan Island in the Caribbean. If memory serves me correctly, wasn't it concluded that the station was actually located in Venezuela or Central America, and not on Swan Island (which was at that time a U.S. possession)? This station played an active part in the Bay of Pigs invasion, by the way.

Hector Martin
Opa Loca, FL

DX'ers suggested several possible "actual" sites for this station, which differed from the Swan Island location that the station always announced. In 1968, at the invitation of the Radio Swan/Americas management, I was invited to Swan Island to visit the station's studios, AM/SW transmitters, transmitting towers, and other facilities. The invitation was on the condition that I made my own travel arrangements, a factor that created a few problems. My only access to Swan Island was by chartered aircraft from Grand Cayman Island; Swan Island being a very tiny speck of mud and coral south of Cuba. I chartered a broken down DC-3 on Grand Cayman and when we arrived over Swan, the pilot decided that the grass runway was so short that we would probably never be able to take off to go back to Cayman. We did land there, in any event, and I spent an entire day at the station. It was really located on Swan Island!

Accompanying me on that trip was Bob Beason, Editor (at that time) of *Mechanix Illustrated Magazine*. We took some Super 8 films there and perhaps I'll get some blow-ups made from that film and run them in POP'COMM. As far as I know, they're the only films ever taken of Radio Americas—the infamous 50,000 unlicensed broadcaster that caused such an uproar in international broadcasting. —Editor

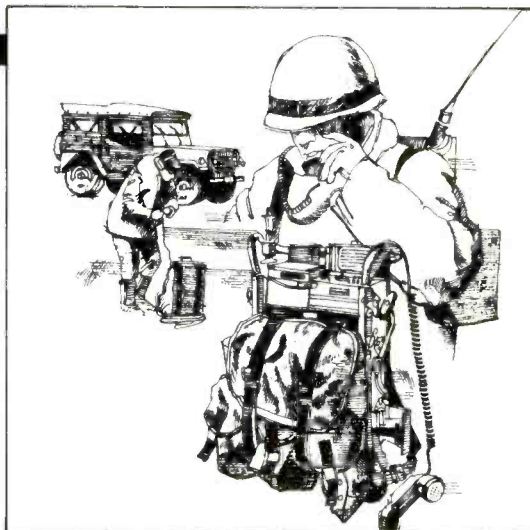
Listening During A National Military Emergency!

Doomsday DXing

BY HARRY HELMS, KR2H



Photo courtesy U.S. Army.



Nuclear war is a gruesome possibility to contemplate. Preventing such a war—or, if worse comes to pass, surviving it—requires communications. The U.S. government has developed several radio networks that will swing into operation if “doomsday” should arrive. Fortunately, you can eavesdrop on these during tests and routine operations!

One crucial agency (should the United States actually be subjected to a nuclear attack) would be the Defense Civil Preparedness Agency (DCPA). It maintains an extensive communications network organized around local radio systems that “feed” into regional centers linked together via short-wave. These regional centers regularly test their facilities using SSB, CW, and RTTY. Common frequencies are 10493, 20026 kHz, FM on 167.975 MHz. Here’s a list of DCPA stations by call letters and location:

KPA64	Battle Creek, MI
KPA65	Denton, TX
KPA66	Denver, CO
KPA67	Santa Rosa, CA
KPA68	Bothell, WA
KPA71	Maynard, MA
KPA72	Olney, MD
KPA73	Thomasville, GA

If a nuclear attack actually took place, the

United States Air Force would bear a large portion of the responsibility for defense of the United States against enemy aircraft and to retaliate if the enemy inflicted damage against the United States. The USAF’s Tactical Air Command (TAC) would defend the United States air space while the Strategic Air Command (SAC) would retaliate against enemy attackers. You can listen in to TAC and SAC conduct normal operations and test their communications networks.

TAC and SAC, like many other military stations, use so-called “tactical” call signs. Tactical call signs are often whimsical, sometimes bizarre names, such as Horsefly, Big Play, Kraut, Bamboo, Morphine, Pits, and Dizzy. Such tactical call signs are changed frequently and in a random manner. The purpose of tactical call signs is to confuse and mislead any unintended listeners, including SWLs and military enemies.

Certain tactical call signs don’t change with TAC and SAC. “Mainsail” is used to identify any TAC ground station, with “Tonight” used to refer to TAC headquarters at Langley Air Force Base in Virginia. All TAC communications are in SSB and can be heard on 3032, 4746, 5703, 6753, 8964, 13204, 15091, 18019, and 23206 kHz. TAC UHF is on 381.3 MHz.

SAC uses three unchanging tactical call signs. “Skyking” is a general call sign used for any SAC ground station, while “Skybird” is a general call sign for any airborne SAC bomber. “Looking Glass” is the tactical call sign used for SAC’s airborne command post which is aloft twenty-four hours a day. “Looking Glass” would take over as SAC command if its ground headquarters were to be destroyed. If you listen enough on the SAC channels, you’ll eventually hear it.

SAC frequencies are “named.” All SAC transmissions are in SSB, and you’ll hear SAC pilots being instructed to tune to channels such as “Bravo” and “Tango.” Here’s a list of channel names and frequencies:

Channel Names	Frequencies (kHz)
Echo Two	4493
Echo One	4495
Victor	4725
Bravo	5700
Foxtrot X-Ray	6680
Quebec	6761
Alfa Papa One	8101
Romeo	9027
Papa One	9057
Bravo	11220
Alfa One	11243
Lima	11494
Sierra	13241



An airborne assault exercise at Ft. Bragg. Photo courtesy U.S. Army.

Bravo	14717.5
Alfa Tango	14744
Charlie	14955
Charlie Quebec	15034.5
Mike	15041
Tango	17975
Zulu	18594
Whiskey	20631
Delta	20890
Zulu	21808
Uniform	23337
Papa	27870

SAC UHF is on 311.0 MHz.

Instructions to SAC to launch an attack against the enemy would be in code. Coded transmissions to airborne SAC bombers can be heard on SAC frequencies every 15 minutes beginning on the hour. These are known as "Foxtrot" broadcasts because this word opens each broadcast. All you'll hear are unintelligible groups of numbers and letters—but they could contain information needed to launch a nuclear attack!

There are other U.S. Air Force operations besides TAC and SAC, of course. Standard Air Force call signs consist of a letter from the phonetic alphabet plus two or three numbers, such as "Delta 86." Ground stations usually identify using the name of the base where they are located, such as "Elmen-

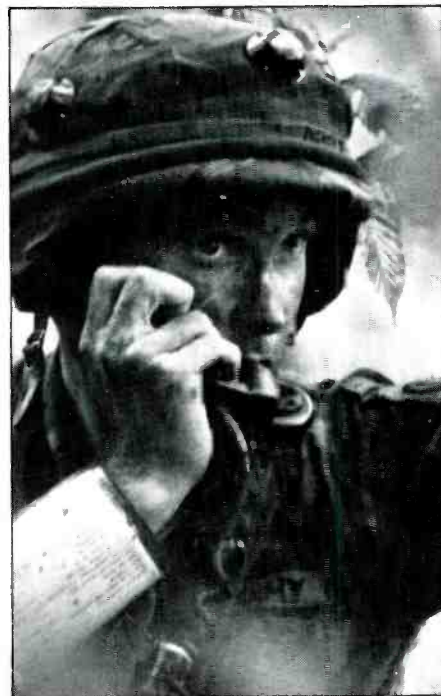
dorf." Among the more active USAF frequencies (kHz) are the following:

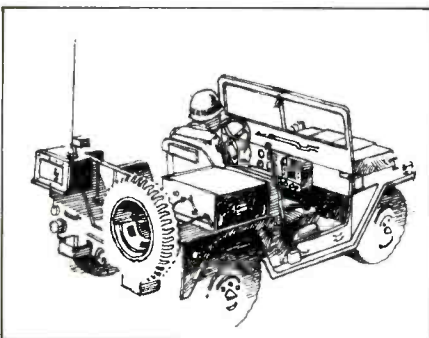
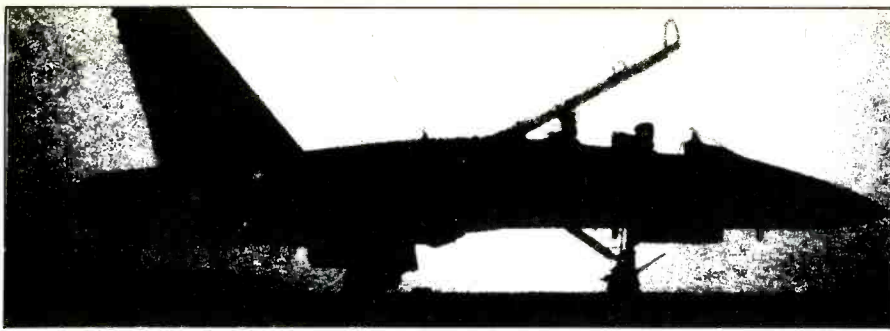
3046	7873
3078	7995
3137	8967
4477	8984
4724	9011
4742	9014
4747	9025
5025	9092
5688	10112
5703	10427
6305	11171
6670	11226
6683	11407
6715	13204
6727	13247
6735	15015
6753	15036
6760	15091

You can often find USAF activity a few kHz above or below these frequencies.

The U.S. Navy would also be heavily involved in a nuclear conflict, primarily through its fleet of missile-launching submarines. Unfortunately, most listeners won't be able to listen in to these communications since they use very low frequencies (10-60 kHz). These frequencies were selected be-

Capt. Purl Keen, Cmdr. Co. C 1st Bn. (Abn), 325th INF, during an exercise at Ft. A.P. Hill, VA. Photo courtesy U.S. Army.





station transmits for two seconds and then leaves the air, with no announcement that a casual listener can use to identify the station. However, nuclear submarines use these to navigate under the seas.

The 20 to 60 kHz range is used by land stations to communicate with submarines. Most traffic is passed by radio-teletype, in codes and cyphers, and transmitter powers in the *megawatt* range are common.

The U.S. Navy maintains its own aeronautical communications network. Like USAF stations, Navy communications are in SSB, use many tactical call signs, and otherwise identify like their Air Force cousins. However, Naval ground stations identify with the location preceded by the word

"Raspberry," as in "Raspberry Alameda." Navy aircraft frequencies (kHz) include the following:

5693	13212
6697.5	13222.5
6723	13251
8767	15036
8997	15054
11256	17993
11267	18010
11270	23442

cause they can reliably penetrate water. But, if you have the required equipment, you can listen to "Omega" navigation transmission in the 10 to 19.95 kHz range. Each Omega

A final group of stations can be found on 7880 kHz. These use U.S. government calls—such as KAE92, KAE95, etc.—but there's no clue as to which branch of the government they belong to. However, they're located in such places as Montana, Colorado, and the Dakotas—areas where Minuteman ICBMs are located.

The National Directory of Survival Radio Frequencies is a new book that contains 5,000 radio frequencies between 179 kHz and 470 MHz that would be in use during any major national emergency, in addition to various regional and local emergencies. These stations may also be monitored during normal conditions conducting regular operations and routine tests. This includes military, National Guards, severe weather warnings, state police and civil defense, forest fire, highway emergency, fish and game wardens, bridges and tunnels, flood control, etc. This book is available at many electronics dealers and survival supply shops or may be ordered for \$6.95 (postpaid by Book Rate Mail—add \$1 if First Class Mail is wanted). The publishers are CRB Research, P.O. Box 56, Commack NY 11725.

Thus far, none of these stations have had to be used for a major national emergency. Hopefully, they never will.



1982 DX Countries Chart

Large-size wall chart lists all the official DX Countries in the world with a host of valuable data about size, population, government, etc. No shack is complete without one! 23" x 35", two colors, on heavy poster stock. Mailed by First Class mail, folded in 9" x 12" envelope. Only \$2.95 each, postpaid.

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**Use Your Receiver To Get First Hand News
From The World's "Hottest" Spot!**

DX'ing The Middle East Powder Keg

BY GERRY L. DEXTER

In Cairo: assassination. In Beirut: death and destruction. In Tehran and Baghdad: councils of war. In Tripoli: the exportation of mayhem.

Virtually everywhere you turn in the Middle East, there is war, revolution, invasion, guerrillas, hate, envy, fear, and more potential trouble. Our newspapers and broadcasts are filled with key words like "Green Line", "West Bank", "Gaza", "PLO", "Phalangist", "Resolution 242", "Camp David", "OPEC", and many more—all directly tied to this volatile area of the world.

The majority of Americans must take their news of the latest Middle East crisis from their newspaper, radio, or TV news broadcast. But, as the owner of a shortwave radio, you can go beyond that, past the layer of domestically fed news and directly to the places involved. You can hear the broadcasts from the capitals of the Middle East—Jerusalem, Baghdad, Ridiyah, Doha, and all the rest.

Somewhat surprisingly, many of the countries of the Middle East do not broadcast in English to the United States, but you can often hear English programs directed to other areas. A few countries stick only to Arabic language broadcasts, but even then, for many listeners, the music of the area makes for enjoyable listening.

The Middle East is also a hotbed of clandestine broadcasting, with many of the political parties or representatives of ex-governments having their own shortwave stations. Others receive program time on the station of a sympathetic host country. Often, it just isn't possible to tell for certain just exactly where many of these broadcasts come from or who's behind them. But, it's fun to try and figure them out!

With the obvious exception of Israel, most of the countries of the Middle East are heavily Moslem in population. Shortwave broadcasting reflects this with many broadcasts devoted to Koran recitations, the several daily calls to prayer, and so on. During the Moslem holy month of Ramadan, broadcasts are often extended in length. In 1983, Ramadan begins on June 7.

When Ramadan arrives during the fall or winter in the United States, it also opens up possibilities for DX on the lower bands since some 60 and 90 meter stations normally sign off too early to be heard in the United



Radio Baghdad issues a colorful folder type QSL card.

States. With an extended Ramadan schedule, reception can be improved.

Many of the stations will also have variations in their schedules on Fridays, the day equivalent to Sundays in the Christian world or Saturdays for Jewish people.

Let's take a look at what's to be heard in the Middle East—and remember that shortwave time schedules and frequencies change all too often, so if you don't find a broadcast at the given time or frequencies, scout around for others.

Afghanistan A People's Democratic Republic was established in 1978 and the Soviet Union dominates. A fake "Radio Afghanistan", located in the Soviet Union, is said to have announced the fall of the government before it happened, aiding in the establishment of the current USSR-backed regime. A guerrilla war is being waged against Soviet and Afghan troops.

Radio Afghanistan has English scheduled at 1900 GMT daily. Frequencies are 15.225, 11.960, 11.805, and 9.665. Some of Radio Afghanistan's transmitters are actually located in the USSR.

Algeria Americans are still grateful to Al-

geria for its help in settling the Iranian hostage crisis. It's one of several countries to have accepted fighters of the Palestine Liberation Organization after they left Lebanon. Radio Television Algerienne, or Radio Algiers, is on the air virtually 24 hours a day in Arabic and French on 17.885, 17.765, 15.370, 15.260, 15.160, 11.715, 9.760, 9.685, 9.640, and 9.510 at various times. The station carries the Palestinian program daily at 1700 and, rather oddly, it broadcasts "La Voz de la Resistencia Chilena" (The Voice of the Chilean Resistance) at around 0000. This was logged recently in the midwest on 11715.

Bahrain We draw a blank here. This small island state in the Arabian gulf has no shortwave outlet. Perhaps someday.

Cyprus While not directly involved in the mainstream of Middle East problems, Cyprus has a long history of disputes between Greek and Turkish Cypriots on the island. These disputes led to an invasion by Turkey in 1974 and the eventual proclamation of a Turkish Cypriot Federated State, which still exists on a portion of the island.

The Cyprus Broadcasting Corporation



kol israel
קול ישראל

M-82 shortwave program schedule

7 March—2 May 1982
P.O.B. 1082
91010 Jerusalem
Israel

Israel Radio
External Service



Design & Layout: Norman Stepkov

Israeli radio issues regular program schedules to interested listeners.

has no shortwave transmitters of its own. It uses transmitters of the British Broadcasting Corporation on Cyprus and is on the air Fridays, Saturdays, and Sundays from 2215 to 2245 on 9.695, 9.585, and 7.230.

The BBC East Mediterranean Relay Station operates on a long, long list of frequencies at various times. Unfortunately, the only way to know whether you're listening to it or not is to catch a station identification just before the start or just at the end of the broadcast schedule on a given frequency.

From the Turkish Cypriot Federated Zone comes Radio Bayrak, widely heard in the U.S. a few years ago when the station strayed out of the crowded 49 meter band. Unfortunately, it's back on slightly variable 6.155, scheduled from 1000 to 1300 and 1600 to 1900 GMT.

Egypt Anwar Sadat made peace with Israel and died for it. Egypt continues to walk a tightrope between encouraging continued and growing peace with Israel and hoping to work its way back to fuller acceptance by fellow Arab states.

You can hear Radio Cairo on 21.465, 17.920, 15.375, 15.335, 15.255, 15.210, 15.175, 15.155, 12.000, 9.805, 9.740, 9.675, and 9.475. English is scheduled to North America from 0200 to 0330 GMT. Also heard well at this time are 12.000 and



Iran's broadcasting station is now called the Voice of the Islamic Republic of Iran, and even during the hostage crisis, verifications to Americans have never slacked off.

9.475, although Radio Cairo's soft-voiced lady announcer is difficult to understand.

Iran The Ayatollah Khomeini needs no introduction and the hostage story was lived by all of us. Iraq continues its war with Iran. There are many political factions who would like to regain power in Iran and, as an aid in those attempts, have their own shortwave voices. We'll get to them later. Meantime, the Voice of the Islamic Republic of Iran uses 15.315, 15.084, 11.930, 11.735, 11.670, 9.022, and 7.215. English to North America runs an hour from 1930 to 2030, most often heard on 15.084 and 9.022.

Iraq In addition to its war with Iran, the two countries have another feature in common—Kurdish people who want their own nation. There was a Kurdish revolt in Iraq in the early 1960s, which eventually led to the government's giving the Kurds more or less autonomous status. But the desire for complete independence is still there. Saudi Arabia and Jordan, fearful of Khomeini's fundamentalist brand of Islam, support Iraq in its war with Iran.

The Broadcasting Service of the Republic of Iraq (Radio Baghdad) is on the air virtually 24 hours a day, with English scheduled at 2130 and 0300. Frequencies to check are 21.585, 17.780, 15.400, 11.935, 11.780, 11.715, 9.745, 9.560, 9.555, 7.245, 7.180, 6.095, 3.960, and 3.367, although these latter two frequencies depend upon good propagation conditions and a path of darkness in order to be heard.

Israel Since its birth, Israel has been involved in a number of wars with its Arab neighbors and has been the target of continuing terrorist actions.

The Voice of Israel (Kol Yisrael) is scheduled to North America in English at 0000, 0100, 0200, 0500, 1200, 2000, and 2230. Check 21.760, 21.710, 17.815, 17.685, 15.585, 15.485, 15.105, 11.655, 11.640, 9.815, and 7.465.

The Israeli Defense Ministry operates a medium wave station, Galei Zahal, which is occasionally relayed on shortwave. Appear-

ances are usually quite sudden and run for a matter of weeks at most. Something to be on the look out for!

Jordan King Hussein tossed the PLO out of the Hashemite Kingdom of Jordan in 1970 for attempting his overthrow. Since the Lebanese crisis, he has let some of them return, but you can bet the King will keep a close eye on them. King Hussein, incidentally, is very familiar with shortwave as a Ham operator. His callsign is JY1.

You can listen for Radio Amman from 0330 to 2330, with English at 1500 on 11.920, 9.560, 9.530, and 7.155.

Kuwait This is one of the richest countries in the world thanks to oil. Kuwait's situation is a stable one but, like the other small gulf states, it is worried about Khomeini.

Radio Kuwait uses 21.685, 21.545, 17.850, 15.495, 15.345, 15.150, 15.110, 11.990, 11.675, 9.840, 9.750, and 6.055. Check for English to North America at 0500 to 0800 and 1800 to 2100. Don't be surprised if you hear some rock music!

Lebanon In the midst of Israelis, Syrians, Palestinians, Moslems, Christians, leftists, rightists, factions of every description, many with their own armies, Lebanon goes on.

The government station, Radio Lebanon, is not widely heard in this country, but it's scheduled from 0355 to 0805 on 5.980 and from 1000 to 1605 on 9.545.

The Voice of Lebanon, operated by the Christian Phalangists, operates from 0405 to 2130 on 6.550.

A United States religious group, High Adventure Broadcasting, operates the King of Hope station on 6.215. The station recently announced an expansion of its schedule to 24 hours a day and an increase in power to 50 kilowatts.

Libya This country also goes by the Socialist People's Libyan Arab Jamahiriyyah. Colonel Muammar Qadhafi's chief exports involve oil, green books, and revolution. He is not popular, even with his fellow Arab leaders, and several proposed mergers—with Egypt, with Syria, and with Tunisia var-



King Hussein's Broadcasting Service of the Hashemite Kingdom of Jordan is one of the tougher Mid-East stations to hear.



Bayarak Radio from the Turkish Federated Zone in Cyprus is a very good catch.

iously have been short-lived or were still-born. "Jamahiriyah", incidentally, means "state of the masses."

Although the full schedule of Libyan broadcasting compares favorably with other Arab states, most easily heard is "Radio Jamahiriyah" English broadcast to North America from 2130 to 2300 on 11.815.

Morocco Morocco was involved in the "disappearance" of two shortwave broadcasting countries; Tangier, when it lost its international status in the 1950s, and Spanish Sahara, which was divided between Morocco and Mauritania in 1979. Morocco is not involved in the Arab-Israeli conflict.

Radio Television Marocaine broadcasts mostly in Arabic on 17.815, 17.710, 17.705, 15.360, 15.335, 15.330, and 15.105. The station is on the air from 1000 to 0100 GMT on one or more of the above frequencies, mostly in French and Arabic.

The Voice of America operates a relay station at Tangiers. Like the BBC relays, the only way you can be sure you have it is to catch a sign on or sign off announcement. If you can latch onto a VOA frequency schedule showing times, frequencies, and sites, that can be a big help.

Oman Like Kuwait, oil-rich Oman is also worried about the spread of "Khomeinism." Oman is the oldest independent sovereign Arab nation in the world.

Radio Oman is on the air from 0345 to 0800 and again from 1100 to 2010 on 11.890. English is scheduled at 0900.

Another BBC relay station is located in Oman, on Masirah Island. The BBC Eastern Relay is listed to use 17.825, 17.770, 15.310, 11.955, 11.945, 11.850, 11.740, 9.605, 7.180, 7.140, and 6.030. Listen at the beginning and ending of transmissions for "BBC Eastern Relay" identifications.

Qatar Another state on the Arabian gulf. The Qatar Broadcasting Service is scheduled from 0245 to 2130, all in Arabic, on 17.910, 15.505, and 9.570.

Saudi Arabia Abdul Aziz ibn Abdar Rahman al Faisal al Sa'ud was the man who unified various desert tribes into one nation and

THE VOICE OF HOPE

AN OUTREACH OF HIGH ADVENTURE MINISTRIES, VAN NUYS, CALIFORNIA

Vol. 1 NOVEMBER-DECEMBER 1979 No. 1

Country Music Brings Peace To Weary Land

By KEN HOOPER

George K. Ochs, a steel banded trumpet player who lives at a well-kept home in a town of 100 people, is a man to watch on his accomplish-ments.

David that he has just completed construction of a radio station in Lebanon with the call letters WCHD, he is dreaming of a radio television station as a part of the world's peace work and which will be considered sophisticated.

For the bargain price of \$22,000 Ochs has already purchased a 100-watt transmitter owned by a local scrap dealer's radio television station.

The amateur media shipping entrepreneur, the recipient of a Middle East award, is one of 100 people to be included under the title of Free Lebanon Disarmament Front.

Why a steel banded trumpet player? "David, you mean, Damascus and it might be." "That was on March 7, the day the station called the Voice of Hope went on the air Sept. 7. A Christian is not only to speak across the country, as a successful businessman who has not lost any of his money, but he is responsible to his people, and he is responsible to his people that finally he formed High Adventure Ministries as a vehicle for organizing his speaking engagements, which now take him 100,000 miles a year.

He returned to his friendship even though he has not been free.

I had the privilege and experience of leading him to Christ in his 7th year, something to be proud of this side, because he was an unlikely candidate, a genuine but a rascal.

He said he cannot afford to own an airplane any more, but his fascination with aviation explains why his office is at Van Nuys Airport.

Ochs started with his audience plan for a radio station and the money poured in. From the 700 Club sponsor of a nationally syndicated television show, came \$100,000. From Valley Forge donors and political contribution from Bushkin, he received \$45,000. The Osborne Neighborhood Church in Atlanta gave \$24,000.

Ochs and his associates traveled five days of shelling when work began on the Voice of Hope, which carries country music and religious programming with its music through the Lebanon area called "The Christian Post" called "The Christian Post."

A NEW RADIO STATION FOR THE HOLY LAND

Major Haddad, George Ochs and other military leaders cut the ribbon at the grand opening of the VOICE OF HOPE Christian radio station.

Continued on page 2

Continued on page 3

Major Haddad and George Ochs program "He is Risen, and Jesus is coming" on the first broadcast over the new VOICE OF HOPE.

Continued on page 2

Gospel programs and country music are the fare on the High Adventure Ministries radio station operating from the Christian-held area of Lebanon.

most of the country's leaders today are his descendents. King Faisal, assassinated by a nephew at his "majlis," was followed by his brother Khalid, who died of a heart attack in 1982. He was succeeded by King Fahd.

Many of Islam's most holy places, such as Mecca and Medina, are in Saudi Arabia. The country is a moderating influence in the councils of OPEC. It also financially backs the Palestine Liberation Organization, helping keep the coffers full.

The Broadcasting Service of the Kingdom of Saudi Arabia operates on a large number of frequencies including 21.705, 21.545, 17.895, 17.720, 15.345, 15.245, 15.060, 11.915, 11.910, 11.855, 11.730, 11.685, 9.685, 9.520, 7.250, and 7.155. English is scheduled at 1100 GMT and again at 1700. The Holy Koran service is transmitted overseas from 0500 to 2100.

Syria The Syrians are deeply involved in the Lebanese crisis and Syria is one of the more radical Arab nations. It has seen a number of coups, leans toward the USSR, and dislikes the current governments in Iraq and Jordan. Syria was on shortwave for many years, but lately has lacked a short-wave service. There are plans to return the shortwave service to the air soon and, indeed, it may be in operation again as you read this.

Tunisia Yasir Arafat's new home, Tunisia, is one of the more stable states in the area and is more concerned with improving the lot of its people than getting involved in area-wide problems.

Radiodiffusion Television Tunisienne uses Arabic only on 15.225, 11.970, and 7.225 from 0430 to 2330.

Turkey Once the seat of the Byzantine Empire and later the Ottoman Empire. Turkey, while not directly involved in the usual Mid-East problems, has in the past been part of the other crises, most notably Cyprus.

The Voice of Turkey uses 15.220, 15.125, 11.955, 11.860, 11.900, 9.660, 9.615, 9.560, and 7.105 variously from 0000 to 2300. English to North America is scheduled at 1200 and again at 2200.

The United Arab Emirates Formerly the Trucial States of Trucial Coast, there are currently two stations operating from the U.A.E. The first station is the Voice of the United Arab Emirates on 9.696, from 1600 to 2130 with English from 0800 to 1100.

The other station is a fairly new, high-powered station, Radio and Color TV Dubai, which uses 21.700, 21.655, 21.625, 17.865, 17.815, 17.810, 17.725, 15.320, 11.940, and 7.105 from 0230 to 2100.

Yemen Arab Republic Commonly, North Yemen, it has seen internal strife off and on over the past decade with Saudi Arabia, the USSR, Syria, and South Yemen all playing cards.

Radio San'a is scheduled from 0230 to 2100 in Arabic. Try 11.770, 7.265, and 4.853. The latter outlet can occasionally be heard around 0300.

Yemen (People's Democratic Republic) South Yemen occasionally skirmishes with its sister state to the north and supports a small guerrilla movement in Oman—The Popular Front for the Libera-

tion of Oman. The Democratic Yemen Broadcasting Service uses 17.770, 7.190, 6.005, and 5.970 from 0300 to 0630 and 1100 to 2200. Your best bet is probably 7.190 around 0300.

So much for our country by country survey. As was mentioned earlier, there are a number of Middle East-based clandestine stations. Not a lot is known about many of them and some of them have yet to be heard in North America due to propagationally-poor schedules and frequencies.

Probably operating from North Yemen is the Voice of Free Sons of Yemini South, which uses 11.180. Try around 1400 or from 2000 to 2200.

The Voice of Iranian Kurdistan, probably transmitting from Iran, is on a widely varying frequency of 6.800 around 1330.

The anti-Iranian government "Voice of the Mujahedin-e-Khalq" uses 6.700 but, again, this is a widely varying frequency. The schedule is not an opportune one for North American listeners—between 1700 and 1900.

The Voice of Iran, operated by the National Resistance Movement of Iran, can be found on 11.640 around 2000. Another station, which has also used that name as well as Radio Iran operates on 15.315 from

0330 to 0400. This station, like the other one, opposes the Khomeini regime.

The Voice of Iraqi Kurdistan, probably backed by Iran, is reported on 6.400 variable at 1600 GMT, which makes it one of those unlikely to be heard here.

The Voice of the Iraqi Revolution (again probably Iranian-inspired) uses 6.900 variable around 1500. The Voice of the Iraqi People is on variable 7.860 around 1600.

The Voice of the Sudanese Popular Revolution, probably from Libya, has recently been noted at very good strength on 17.940 around 1300 GMT.

A long time clandestine is the Voice of the Communist Party of Turkey. Try 9.585 at 0355. This one probably comes from Eastern Europe.

Finally, the Palestinian Liberation Organization's programs are carried over Algerian frequencies from 1700 to 1800 daily.

New clandestines in the Middle East show up regularly, often in conjunction with some new crisis or shift in alliances.

With this Middle East scorecard you should be better equipped to follow the ins and outs of the area where three of the world's great religions were born and where, today, the war of words is rivaled only by the war of bullets and bombs.

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CIRCLE 21 ON READER SERVICE CARD



Aboard an ASW support aircraft carrier, accurate records are kept relating to all aircraft and vessels (surface and underwater) in the area. Navy photo.



Deck personnel on a Guided Missile Cruiser are in constant communication with the ship's communications center. Navy photo.



Crewmen aboard a destroyer stand ready at their duty stations. Navy photo.



Soviet subs operating in the North Atlantic operate from bases in Arctic waters. Keeping tabs on them means functioning under adverse weather conditions. Navy photo.

Monitor Ivan's Spy Submarines

New Communications Systems Keep Tabs On Russian Subs

BY HARRY CAUL

Looking odd and bizarre amidst the soaring sea birds circling for food, two military choppers went about their deadly serious business. Indeed, there were few fish still swimming in the cold waters of the Baltic Sea—the graceful swans would not find their snacks easy to locate.

The Swedish Navy's helicopters were hunting for fish, too—steel fish—in the form of one or more unidentified submarines thought to be spying on the super-secret Musko Naval Base not far from Stockholm. Dangling from the two choppers were steel cables supporting sensitive underwater monitoring devices dipped beneath the surface of the dark waters. Watching from the rocky shoreline were a handful of newspaper and TV reporters, becoming increasingly impatient as they viewed this strange sight and listened to the muffled sounds of exploding depth charges.

"These guys are chasing a will-o'-the-

wisp, there's nothing out there," sniffed one newsman. He was wrong. Last October there were two, maybe four, spy subs off the Musko Naval Base—probably Russians. There were also Swedish subs roaming beneath the murky waters; only a couple of hundred yards offshore several semi-submerged subs blocked the entrance to the enclosed fjord. While reporters discounted the possible realities of spy submarines, the Swedish government was convinced that their search was not without reason.

Despite the intensive search, which took several weeks, no mystery sub(s) appeared. The fact is that it has been practically impossible to track down an elusive submarine in the endlessness of the silent oceans. But recent secret developmental research would appear to be changing all of this. Intensive efforts in many technological areas are making the difference.

Right now, the veil which has so long ob-

scured the Soviet subs from view is being parted. Most likely, it will not be too far into the future when it will be ripped away to permit full surveillance of almost 200 Soviet subs. But it's taken about \$50-billion to do it, and some 16 years of tireless effort to assemble a worldwide system of monitoring and surveillance installations located in aircraft, aboard ships, in submarines, and even on the ocean's floor. The idea is to maintain careful watch on a 'round-the-clock basis, 365 days a year.

All of this has been made possible by advances in satellite technology, computer analysis, and underwater listening devices. And this year, the U.S. Navy will be putting into service a flotilla of (civilian staffed) vessels, which are to roam the seas searching out the Soviet submarines. The tools they are using might well be described as being "exciting and impressive."

Big Gains

These advances have come into play at the strategic arms conferences since they would seem to offer a possible threat to the Soviet strategic submarine fleet (69 subs), which are believed to each be carrying about 25 missiles armed with nuclear warheads. Our government has told the Soviets that we have no plans to use our detection capabilities to maintain surveillance on those particular submarines. There is a possibility that the entire wide-ranging question of submarine detection and anti-submarine warfare (ASW) will end up in lengthy negotiations. Inasmuch as the U.S. seeks to cause a re-allocation of the deployment of Soviet strategic weapons (moving more of the Soviet weapons from land bases to submarines), our newly developed ASW systems are all the more formidable and have a political as well as a tactical value. More than 70% of our own nuclear warheads are deployed beneath the surface of the world's seas.

More than 20 years ago, the major world powers decided that undersea deployment of weapons systems had definite advantages. The fact that there is so much more of the planet's surface covered by water than by land means that there are more places to hide the weapons beneath the waves. Also, the weapons systems can be moved to strategic positions in silence and secrecy. It's quite ominous, but (oddly enough) it's more of a deterrent to hostilities than it is a threat. This is because one nation's destruction of the land-deployed missiles of another nation means the other nation could nevertheless retaliate from weapons deployed beneath the sea. This makes the potentials of undersea deployment of missile systems all the more sensitive, and as more sophisticated weapons are developed (including more powerful warheads), the importance continues to increase. This must also be evaluated in respect to the fact that the locations of land-deployed ICBM's are plotted to within virtually inches by the military intelligence services of major world powers; that makes ICBM's somewhat vulnerable. At this point, however, missiles deployed on Soviet subs are becoming more vulnerable than they had been in the past.

Even though our government's position is that we do not propose to use our new detection methods against the Soviet missile subs, one high-ranking U.S. Navy officer has observed that the Russians are probably concerned since, "If the Russians were doing what we are—and they are not because they are far behind—there would be a lot of people running around screaming in Congress and the White House."

Those concerned with planning ASW point out that the geography of Russia has been made to work in favor of the NATO countries. Perhaps this has been some motivating factor in the intense efforts being made by the Soviets to obtain Western technologies. They just want to catch up to us in the field of ASW. Here are some of the ASW tools in the Western arsenal:

1. The Surveillance Towed Array System

(SURTASS). This year, the Navy will deploy the first of ten new ships equipped for SURTASS. This system calls for long strings of underwater microphones (called hydrophones) to be towed by these vessels. The hydrophones can pick up the reflected sounds produced by sonar-like systems. The Navy has kept classified the operational range of each SURTASS system. However, the fact that only ten such systems will be required to provide surveillance of the many millions of deep ocean area would indicate that the system is very sensitive.

2. Shore stations in Japan, the Philippines, Korea, the Aleutians, Canada, Iceland, Italy, Spain, Denmark, England, Turkey, and Norway are part of a new sound surveillance system. Code named BARRIER and BRONCO, this secret system deploys several thousand hydrophones along the floor of the oceans near entrance/exit points of Soviet submarines and also in their most probable operational zones.

3. Other secret systems bearing the code names COLUSSUS and CAESAR are similar to BARRIER and BRONCO but are located along the Atlantic, Pacific, and Gulf coasts. The detection range of these systems is 50 miles.

4. More than 200 U.S. Navy Orion (PC 3) aircraft will be flying 'round-the-clock missions looking for Soviet submarines. These Orions are packed wall-to-wall with sophisticated electronics hardware, which cost about five times as much as the aircraft in which they are installed. The equipment is capable of detecting magnetic variations which would reveal the presence of a submarine operating at a 1,000 foot depth. These planes will be able to survey about 50,000,000 square miles of ocean area.

5. The various ASW operations have instant two-way communications with one another for coordination of their activities.

6. The various ASW operations have their sensing equipment feeding data, via satellite, into a central ILLIAC IV computer. This powerful computer sorts through the large amount of incoming data being fed in to it and can quickly pick out the telltale sounds of a submarine which may be mixed in with the other noises from the sea.

7. All systems are supplemented by a large military intelligence network which operates in many areas. This includes monitoring of Soviet radio communications.

8. Some of the sophisticated electronics systems are also installed aboard the majority of our 90 attack submarines, aboard surface vessels, and even in helicopters. In total, the new ASW appears to be a versatile, potent, as well as costly project; it's been a major ingredient in our defense budget.

Despite the secrecy that surrounds much of our ASW capabilities, the Russians have made a significant effort to learn as much as they can about them—and it does seem as though they've had some success. A NATO intelligence official reports that the Soviets put together a nautical chart indicating the probable locations of the BRONCO and

BARRIER monitoring devices—and when NATO officials saw the chart, they found it surprisingly accurate. Obviously, the Soviets feel threatened by these systems and are doing more than sitting around making up charts in order to escape surveillance. In one instance, the Icelandic monitoring station reported more direct action. That station operates a 600-mile long string of monitoring devices along the ocean floor, which terminates at the Shetland Islands, an area which crosses the main route of Soviet submarines traversing between the North Atlantic and the sub bases on the Barents Sea coast. Someone (thought to have been a Soviet landing party) came ashore in Iceland and cut the monitoring cable, probably with a hacksaw!

It appeared to be an attempt to terminate (with extreme prejudice) the efforts to keep tabs on the deployment of Soviet missile subs based in Polyarnyy. Soviet missile subs are also stations at Petropavlovsk-Kamchatskiy for operation in the Pacific Ocean. NATO Intelligence believes that for about eight years now the majority of the Soviet Delta, Hotel, and Yankee Class submarines have had their operational areas considerably limited by NATO electronic barriers.

There are about 33 Delta Class subs which carry a total of 224 missiles, each having the capability to hit American targets from within the waters surrounding the Soviet Union; these missiles have an operational range of 4,000 to 5,000 miles (nautical miles, that is). The 29 Yankee Class subs are armed with 443 missiles that can reach out to about 1,300 to 1,700 nautical miles. These can also get to American targets without the subs leaving waters adjacent to the Soviet Union. On the other hand, the Hotel Class subs, which carry 21 missiles, do not have any tactical value more than 700 miles from a target area; they cannot reach American targets from waters contiguous to the Soviet Union.

While the operational range of the missiles deployed in the Soviet subs is a vital factor in estimating their strategic value, there are other important considerations. Of equal significance are the sub's speed, diving depth, operating range, silence, propulsion, and the listening equipment it carries. Knowing these factors can enable NATO naval forces to use them against the Soviets.

For instance, every time one of our nuclear subs equipped with Polaris/Poseidon missiles embarks from Holy Loch (Scotland) into the Firth of Clyde, it is generally assumed that at least one Soviet attack sub is waiting on the sidelines to follow it. It is not alone, for an American attack sub presently joins it and, using its own speed and sound, confuses the Soviet sub by being a decoy. The Poseidon sub can then slip silently off to go about its business. It's almost like a game. Main areas for the curious game include the Dardinelles (between Greece and Turkey), the area between North Cape (Norway) and Bear Island, the Kuril Islands (Japan), and the Skagerrak Strait (between Denmark and Norway). These are main traverse areas for the Soviet subs.

Run Silent, Run Deep

Very few surface vessels that leave port escape NATO's surveillance. Using visual observations (naked eye), radar, spy satellites, or underwater listening devices, monitors can tell from the sounds they hear underwater the type and class of a vessel. Sometimes they can even identify individual surface or underwater vessels by name because of the sounds they produce.

Listening to the underwater sounds, while fascinating and informative, is also subject to the highest amount of secrecy within ASW. Certainly the oceans are alive with sounds; everything from underwater earthquakes and volcanos. Certain whales also add to the confusion by sending out peculiar pinging noises which are, at times, difficult to distinguish from the sonar used by submarines. Separating that which is desired to hear from that which is either confusing, or which masks other sounds, is not always easy.

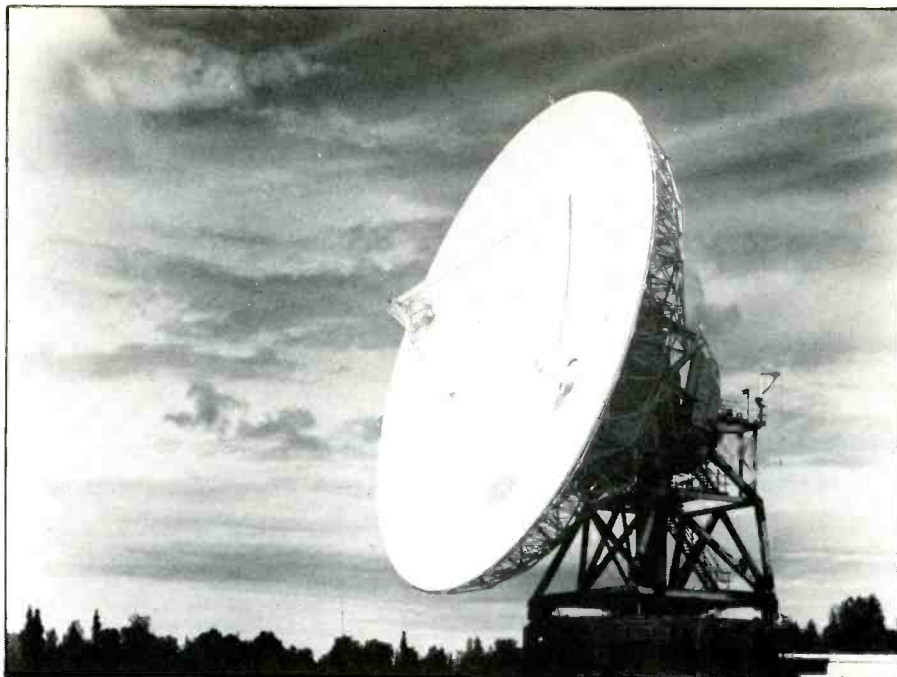
Sound moves at almost a mile per second in sea water—that's five times the speed it travels through the air. However, it is affected by a number of factors, such as salinity, water temperature, depth, and obstructions. Moreover, sound is affected by the ruts and ravines on the ocean floor; a trench between 3,000 and 4,000 feet under the surface can act as a waveguide and send sounds on a 12,000 mile trip.

The sounds peculiar to submarines when they are submerged relate to the rumbling of the propellers, no matter how slowly they are turning. Small bubbles, caused by cavitation, emerge from the tips of the screws and subsequently collapse, producing a hiss. Portions of the hull will vibrate as water slithers over them, and various pumps, generators, compressors, and other devices produce distinctive sounds. Curiously, Soviet subs are notoriously noisy, so noisy in fact that ASW experts are baffled by the seeming lack of interest the Russians have in getting them to operate more quietly. They clatter and rattle through the oceans as if the Soviets simply didn't give a damn. American subs are far more quiet, but not as silent as the Vickers-made British subs.

The collective assortment of sounds produced by a Russian sub is its calling card, and it leaves that card every time it gets within range of a hydrophone. When it gets within range of a second hydrophone, observers can plot its speed and course. This data is then fed to a satellite and thence relayed to the Illiac IV computer for analysis.

Sonar? The Old Standby

Ever since the 1940's, sonar pings have been employed to determine the course and speed of submarines. It's similar to radar in that it utilizes a sharply focused beam or wave which strikes its target and is then reflected back to the sending point. While radar uses radio waves, sonar uses sound waves. The sonar beam is sent out in various directions seeking a target. When it returns a signal, the operator can determine the bearing from the sending point. Distance can also be determined by the time it takes for



A land based super-computer collects data, via satellite, from Naval ships and aircraft around the world. The information is collated to form accurate information on Soviet subs.

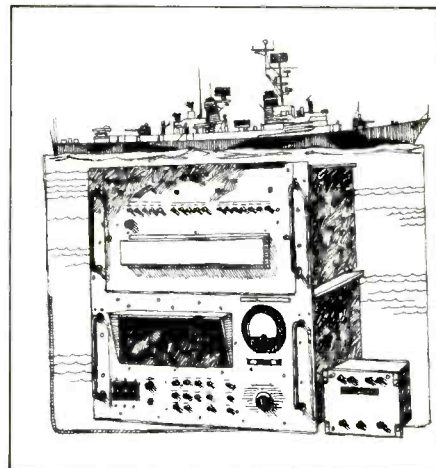
the return ping to arrive; increasing pings reveal movement towards the sending point; pings which are slowing in speed show that a vessel is moving away.

The problem with the old and reliable sonar system is its relative sluggishness in getting a signal to and from a target. While radar operates at the speed of light (186,000 feet per second), sound waves used by the sonar units are quaintly slow at their rate of about 5,000 feet per second. Modern developments in sonar have employed more powerful sound sources and lower audio frequencies, which have made these systems operate more rapidly. Another new technique in sonar technology utilizes the ability of sonar waves to ricochet off the floor of the ocean before they arrive at their target. However, sonar can search out only to about 30 miles with any effectiveness.

"SURTASS"

SURTASS is a giant step in overcoming some of the limitations of basic sonar but still employing some of the same audio concepts, especially in filtering out unwanted surface sounds, which has been a problem in developing a longrange sonar. Anonymous looking vessels equipped with SURTASS will be trailing a very long cable after themselves equipped with sensitive hydrophones located at more than 500 feet below the surface. From secret locations off into the distance, certain sounds will intentionally be generated—sounds with millions of watts of power behind them. The SURTASS equipped vessels will be listening for these low frequency echoes, and their sound will provide the tactical information. This data will be sent via satellite to the ILLIAC IV computer.

Zeroing in on the locations of subs anywhere in the world are the Orion aircraft, directed by information obtained by SUR-



TASS and similar underwater listening systems. The Orions also utilize magnetometers which detect magnetic field anomalies caused by subs. Once in the general area of a suspected sub, Orions drop sonar units into the ocean depths which will add to the information being gathered. Other types of naval aircraft and vessels are also equipped for similar operation.

This technology created somewhat of an uproar within military circles in 1969 when Melvin Laird, the Secretary of Defense, made a grave warning that vague "developments" could jeopardize the safety of the American fleet of strategic subs. That comment, shortly thereafter, was refuted by Navy and defense officials who denied the existence of any such projects. From that time on, the idea that by evolving new technologies to peer beneath the ocean's surface to locate submarines we would eventually make subs vulnerable has been debated in various journals.

On the one hand, ten years ago, more than 25 American authorities in the areas of ASW, oceanography, sound, and weapons decided that systems such as SURTASS and those related to it don't offer a "serious danger" to strategic submarines. Taking the opposition, others who have made an evaluation of the total impact potential of our ASW efforts concluded that it "has evolved to the point where it is becoming a potential threat to Russian ballistic missile submarines." This was the opinion expressed by Joel Wit in his 1980 *Scientific American* article.

An expert on defense consideration, Kosta Tsipis (of MIT), counters this by stating, "If you look at our ASW today, the most important thing is collecting and analyzing all of the information from literally thousands of sources." He feels that we are "a long way from locating, tracking, and threatening Soviet submarines on a real-time basis."



Many ASW experts (including Tsipis) feel that it's a long way from locating the area in which a sub is operating to the point where it can be destroyed before it can commence

launching its ballistic weapons. They feel that the only way that can be accomplished is for an attack sub to shadow the missile sub for a lengthy period, and in close proximity. Communications, it turns out, is the problem with that concept.

The Communications Problem

At the present time, American subs have to ascend to above or just below the surface to utilize various antennas to communicate with satellites or communications relay aircraft. This places them in a position where they are very easily spotted by Soviet ASW units. This is one of the reasons our government has been forging ahead with the controversial ELF (extremely low frequency) radio system, which can get signals to subs located far beneath the surface. The ELF transmitter was supposed to be built in a remote area of Wisconsin, but for the past ten years, many persons living in the area have kept it from materializing. They argue that the high powered station utilizing such low frequencies would pose a serious environmental threat. The system is nevertheless being developed in a remote area of Texas.

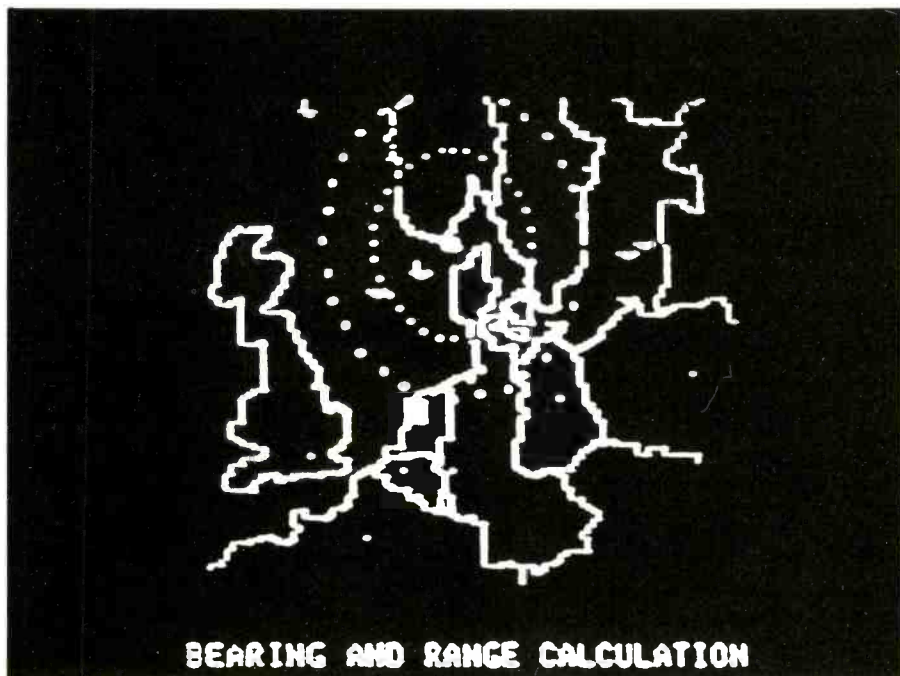
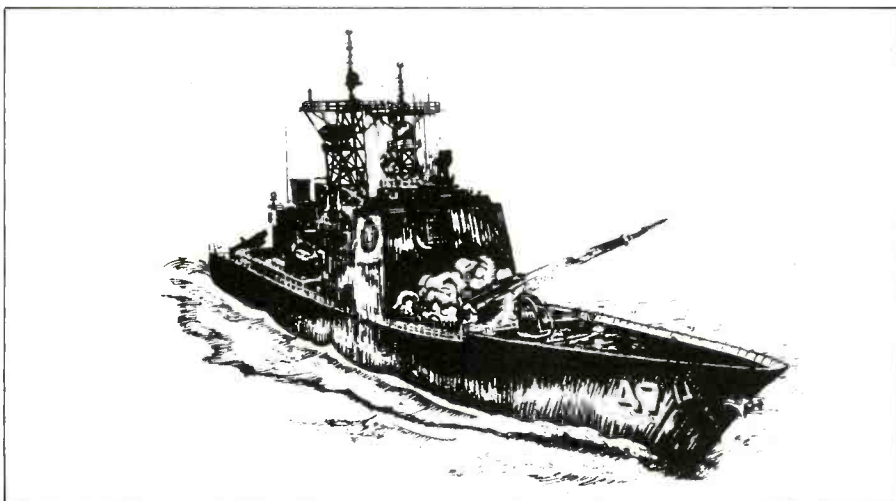
Keeping The Balance

NATO feels that perhaps there are between eight and ten Soviet strategic subs operating at any given time. Most of these are in the Okhotsk and Barents Seas so as to avoid our various ASW detection systems. At the same time, about half of our own fleet of 37 Polaris-Poseidon subs are roaming throughout the oceans around the clock.

Although the locations of our own strategic subs constantly change and their patrol routes are classified, it is known that at least some of these subs, such as the Los Angeles Class, can enter areas such as the Okhotsk and Barents Seas without being detected. In those waters, they could easily plant acoustic detection devices that are capable of transmitting data upon a command signal.

Soviet ASW Efforts

Yes, the Soviets have made efforts to construct systems similar to SURTASS and others like it, but they are thought to be rather primitive and not nearly as sophisticated or successful as our own systems. They've poured lots of rubles into these efforts, in fact, but the Soviets have never been known



Soviet subs like to follow U.S. attack subs from the American base in Scotland. Keeping close track of their activities is part of the business of our electronics information systems.

for any special expertise in electronics know-how. And one NATO intelligence officer once noted that the Russians "can't make cables worth a damn."

However, the Soviets are extremely innovative in submarine design and they are international leaders in coming up with new approaches and designs. The six new Alfa Class strategic subs can do 42 knots and can dive to below 3,000 feet. Our own subs can do 32 knots and get down to about 1,400 feet. Such a capability would permit the Soviets to go faster and deeper than any sub we now have, thus escaping any attack sub sent out to pursue a Soviet ballistic missile sub.

The Soviets have also built two Typhoon Class missile subs. The giant boats are considerably larger than our own Trident subs, and they have a double hull which some say could sustain a direct hit with a conventional torpedo and continue to launch its missiles.

Presently, the Soviet ASW efforts would seem to be intensive, and built around many attack subs and surface vessels deployed to offer protection to missile subs. Insufficient information is available on these efforts, outside of military intelligence circles, to assess the potency of this concept.

What is of considerable concern, however, is that the Soviets may well have obtained detailed information on one or more of our computer controlled ASW systems. There is reason to believe that this data may have been obtained by the Soviets (and other nations) from American Intelligence agents presently being investigated (or even

prosecuted) for selling tens of billions of dollars in defense technology illegally to foreign governments.

And what of Sweden and its poor luck in locating the mystery submarines? Sweden is neutral and therefore doesn't have access to American or NATO electronic ASW developments. Even so, they do have access to extremely fine ASW equipment. Yes, it's good—but apparently it wasn't good enough to prevent two to four spy subs from sneaking into, operating within, and then escaping from a body of water which was little more than a small cove. Our own ASW equipment is charged with covering almost 130-million square miles of deep ocean, thus pointing up the need for a highly advanced detection system, and the global communications needed to coordinate it and permit it to operate.

Frequencies To Monitor For Possible ASW Communications

U.S. NAVY: 3052, 3087, 4700, 4702, 4706, 4730, 6720, 6742, 7884, 7893, 8972, 8976, 11191, 11252, 13250, 15067, 17094 kHz (SSB).

SOVIET NAVY: (All transmissions are CW)
 RCV Moscow 12723, 21765, 23525 kHz
 RIW Khiva(?) 9236, 10508, 10798, 11048, 12055, 14405, 14468, 14505, 14510, 14540.5, 14555, 14792, 16397, 17504 kHz
 RLO Leningrad 16847 kHz
 UMS Moscow 11430 kHz
 UXR ? 11114 kHz
 Ship to ship 6765, 10795, 14495 kHz

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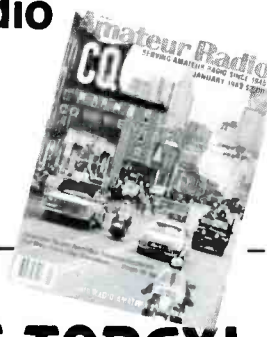
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Build The

Foxhole Radio Receiver

No-Power Receiver Made From Scraps Traces Its Roots To A WWII Foxhole

BY ANSON MACFARLAND, KVA4EX

After my story on the WWI spy receiver ran in the October '82 POP'COMM, I received some interesting mail. One of the more enthusiastic letters came from Barry J. Fairwood of Plainville, CT. Barry asked if I had ever heard of a "razor blade radio such as used by American troops in World War II."

Barry briefly described it as a receiver used to listen to programs from within prison camps and from foxholes. The only component that was difficult to obtain at the time was a pair of 1,000 to 2,000 ohm headphones. He said he had made one of these himself many years ago and that it actually worked pretty well.

Fact is that the central component of this curious little receiver, Barry said, was a double edged razor blade! The rest of the components were paper clips and assorted bits of non-electronic junk.

He wasn't putting me on. I knew just what he was describing! We used to call it a Razor Blade Radio, and (come to think of it) the set would seem to have some current survivalist applications. It's simple to build, and providing you're not using it from a foxhole or a prison camp, fun to use.

I dug back into my old duffle bag and found this little gem, a receiver which even the most inexperienced novice can build. My original notes show that reception was good and, depending upon the complexity of the antenna/ground systems, it could really pull in stations. The components were a razor blade, a piece of pencil lead (carbon), nails, thumb tacks, paper clips, a little wire, and a few scraps of wood.

Details

The schematic for this receiver is shown in Figure 1. It will be recognized as that of a simple diode detector connected to a pair of headphones.

The actual design of this receiver is shown in Figure 2. If you follow its simple layout, you should have no trouble in getting it fired up in an hour or so.

The longest antenna possible and a cold water pipe ground should really pull 'em in for you. The wire on a fence could be the antenna. You could also use the finger stop on a rotary dial telephone.

The detector is the piece of pencil lead wrapped with a piece of copper wire, resting lightly on the razor blade. Some adjustment

of the location and pressure of the pencil lead on the blade may be required. We always used a double edged blade, and in his letter to us, Barry Fairwood suggested the use of a "blued" type razor blade (such as a Gillette). I don't know if this radio will work with a single-edged blade or one of the slim "injector" types; somehow, I suspect that the double-edged blade is the only type that will work. Barry suggests that the selenium used in the blueing process is a component in the detection circuitry.

There really isn't much else to say except that I understand that these radios were used by GI's even after WWII and were well known in Korean foxholes. There is apparently no basis to believe that a single edged blade will let you copy single sideband, as suggested by one of the wags on the POP' COMM staff when I mentioned presenting this interesting little circuit in these pages.

This little project will show you how easy it is to assemble a couple of doodads and get them to function as an emergency makeshift broadcast receiver. I don't know who first invented or designed it, but he sure made a lot of GI's happy!

Parts List & Instructions

A—This is a nail which is used as the antenna terminal, and also for holding the coil form to the baseboard.

B—The baseboard, a piece of wood (plywood or soft pine is okay) 1/4" thick, 4" square.

C—Coil form, 1/4" wood, 3 3/4" long, 2" wide.

D—Area of coil which will be touched by "SA," this should be scraped clean of insulation along the movement area at the tip of "SA."

G—This nail is used for the ground connection and to fasten the coil form to the baseboard. It is also connected to "S."

J—Two copper paperclips which are used as jacks for the headphones. They are held in place by thumb tacks.

P—Pointed piece of pencil lead, wrapped with copper wire which is attached to J₂. The wire should be resilient enough to hold the lead in place on the blade (see text).

R—Razor blade held down by a thumb tack. Also attached to the tack is a wire which runs to the antenna terminal, "A."

S—Screw or nail which is used as the pivot for "SA," the switch arm.

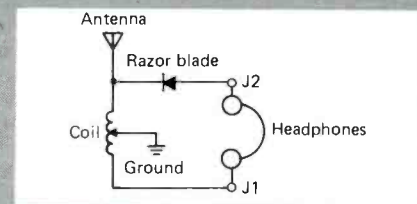
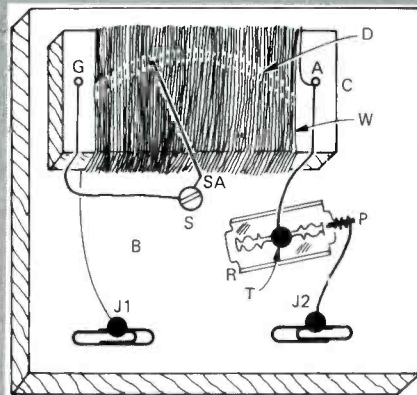


Fig. 1. Schematic of the Razor Blade Radio.



SA—The switch arm, which is made from an opened up paper clip. Moving "SA" back and forth along "D" will enable you to change stations. Tune slowly and adjust "P" as described in the text for maximum results.

T—Thumb tack to hold razor blade to baseboard.

W—Coil winding on "C." This is approximately 175 turns of #26 insulated wire. One side is connected to the antenna terminal, the other side is connected to J₁.

Misc.—Wire; pair of 1,000 to 2,000 ohm headphones.

Monitor Our Government's Research Ships!

Many Will QSL Too! BY P.E. RENNER, KCT1GK



The U.S. Government Research Vessel HECK is a beautiful white 90-footer. In this shot, the ship is docked during time out from a recent survey of Long Island Sound, NY.

Here's your chance to add some nifty stations to your galaxy of "catches;" U.S. Government stations that seem to be willing to QSL reception reports! It's the interesting and active network of National Oceanic & Atmospheric Administration's (NOAA) research vessels and other associated units.

The NOAA is part of the Department of Commerce. Its mission is "to explore, map, and chart the global ocean and its living resources; to manage, use, and conserve those resources; to describe, monitor, and predict conditions in the atmosphere, ocean, Sun, and space environment; issue warnings against impending destructive natural events; develop beneficial methods of environmental modification; and assess the consequences of inadvertent environmental modification over several scales of time."

The National Weather Service is part of the NOAA, and all of us are familiar with those operations of the agency. Scanner owners are especially familiar with the NOAA weather forecasts on 162 MHz channels, while those with communications receivers may have tuned in some of the National Weather Service's SSB operations on HF. But NOAA is more than the National Weather Service! You can monitor that too!

NOAA conducts an integrated program

of management, research, and services related to the protection and rational use of living marine resources and protects marine mammals. The agency prepares and issues nautical and aero charts, provides geodetic surveys, conducts extensive research programs in marine and atmospheric sciences, solar-terrestrial physics, and experimental meteorology (including weather modification). It's the NOAA that predicts tides, currents, and the state of the oceans, conducts research and development aimed at providing alternatives to ocean dumping. That's only part of the NOAA activity schedule, but it's the part that has caught the interest of many communications monitors.

NOAA research vessels can turn up on lots of frequencies and doing as many interesting and unusual jobs and tasks as their wide-ranging mission requires. Just recently we happened, for example, to come across the NOAA vessels HECK and RUDE. These twin vessels operate as a team, cruising a slow, parallel course with a string of buoys between them. Sometimes they stop, the buoys bouncing on the water's surface. Underwater, something had snagged a thin stainless steel cable linking the ships and the incident was carefully recorded by one of the officers aboard one of the ships. What they were doing was making a detailed examination of the sea floor. Each vessel carries a crew of about 25 to carry out this work.

In an age of sonar and other sophisticated devices incorporating computers, NOAA feels that this 80-year-old system is still the best way to verify and update their charts. It's just about foolproof, in fact. The ships drag the cable behind them at a predeter-

Closeup of the ship's bow reveals the nameplate on the railing, plus the vessel's official number "NOAA S-591" in large lettering. At first glance, this gives the ship the appearance of a military craft.





The HECK's cabin displays the NOAA seal while the life preserver carries the ship's name and official number.

mined depth, and compare the location of any wreck or blockage they encounter with markings on existing charts. They also determine the depth of various channels in their operating areas, and when they're through with surveying one area, they move on to another. Last Autumn, the RUDE and HECK were surveying the Long Island Sound, but by the time you read this, they will have gone to perform the same task off the Florida and Texas coasts. This is only

one example of what some of these government vessels tackle in their work.

In order to conduct their various operations, the NOAA has a large fleet of research vessels operating along the Atlantic, Pacific, Gulf, and Alaskan coasts, as well as in international waters. Listeners have reported voice transmissions being rather commonly monitored on many frequencies in the HF bands (CW and SSB is used) and on VHF (where FM is used). Those who knew where

to send a reception report have often been rewarded with a verification, generally by means of a prepared return card which the radio operator can sign and send back.

The vessels are often heard while contacting U.S. Coast Guard shore stations, but they also operate on certain NOAA frequencies for communicating with NOAA shore-based stations and also other NOAA vessels. The general call a shore station uses when broadcasting traffic intended for reception by all research vessels of the NOAA is WCGS.

Each individual vessel has its own assigned callsign, and there are also "WZ" series callsigns given to various small unnamed craft which are associated with some of the shore installations and vessels. Some shore stations and offices also have mobile units bearing callsigns beginning with KA, KE, etc. prefixes.

We have compiled a roster of the various vessels, callsigns, and shore stations associated with the NOAA's research activities in coastal waters and on the high seas. Drawing from several official sources, as well as monitoring reports in the news publications of DX clubs such as the *American Short Wave Listeners' Club* and *SPEEDX*, we came up with as much information as possible, including the NOAA vessel serial numbers. We don't claim the listing to be either complete or 100% accurate, and it does seem that at least some of the vessels which at one time were on active duty with NOAA may well be out of service at this time (these are shown separately towards the end of the listings). Readers having additional data are invited to pass it along to *POP'COMM*.

Station Roster

Anchorage, AK

Anchorage Port, NOAA, 701 "C" Street, P.O. Box 38, Anchorage, AK 99510

Vessel: OREGON (R-332) Callsign: KNBH

Atlantic Highlands, NJ

Base station call: KAF

Beaufort, SC

Base station call: KBR

Boston, MA

Misc. small vessel calls: WZ2513 & WZ2514

College, AK

Base station call: KAW53

Mobile unit calls: KD7992 & KD7993

Detroit, MI

Base station call: KVR

Vessels: JOHNSON Callsign WDA

LAILY Callsign WDAJ

SHENEHON Callsign WDAG

Fredericksburg, VA

Base station call: KAW56

Guam

Base station call: KAW58

Honolulu, HI

Honolulu Marine Center, National Marine Fisheries Service, 2750 Dole St., Honolulu, HI 96822

Base station callsigns: KAB & KAW52

Vessel: TOWNSEND CROMWELL (R-443) Callsigns: WTDF & WQ4000 (152 ft. vessel)

Misc. small vessel calls: WZ2593 & WZ2594

Mobile unit calls: KD7994 & KD7995

Juneau, AK

Juneau Station, National Marine Fisheries Service, 709 West 9th St., Juneau, AK 99510

Vessel: MURRE II (R-663) Callsign: KJLM

Kings Point, NY

Kings Point Merchant Marine Academy, Kings Point, NY

Base call: KJS

La Jolla, CA

La Jolla Port, National Marine Fisheries Service, P.O. Box 271, La Jolla, CA 92038

Vessel: DAVID S. JORDAN (R-444) Callsign: WTDK

Los Angeles, CA

Misc. small vessel calls: WZ2553 & WZ2554

Miami, FL

Atlantic Oceanographic & Meteorological Labs, 15 Rickenbacker Causeway, Virginia Key, Miami, FL 33149

Vessel: VIRGINIA KEY (R-680) Callsign WTAV

Miami, FL

Southeast Marine Support Facility, National Ocean Survey, 1600 Port Blvd., Dodge Island, Miami, FL 33132

Base station call: KVK

Vessel: RESEARCHER (R-103) Callsign WTER

New Orleans, LA

Misc. small vessel calls: WZ2538 & WZ2539

New York, NY

Misc. small vessel calls: WZ2518 & WZ2519

Norfolk, VA

Norfolk Port, Atlantic Marine Center, National Ocean Survey, 439 West York St., Norfolk, VA 23510

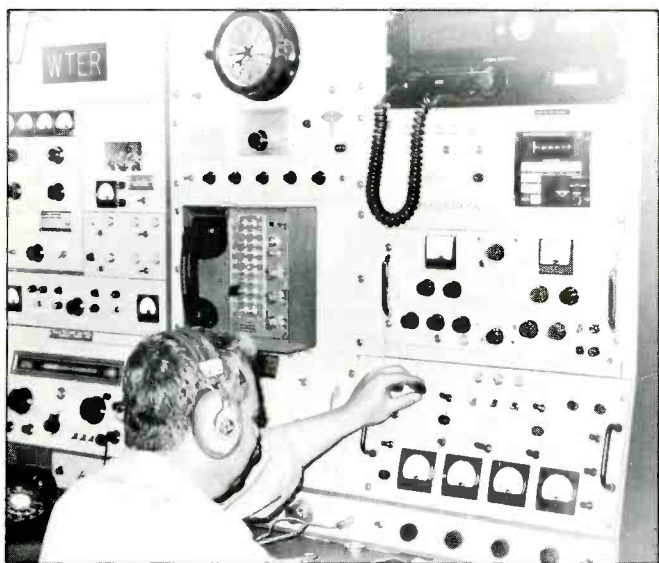
Base station calls: KVD, KVH & KAW60



The WHITING, NOAA vessel number S-329, operates out of the Atlantic Marine Center, National Ocean Survey, Norfolk, VA. Many listeners have reported hearing it. (NOAA photo).



Superstructure of the HECK shows lots of antennas for communicating over a wide range of frequencies. The dual mast shown is misleading since the ship has only a single mast. One of them seen in the photo actually is located atop another NOAA vessel docked on the far side of the HECK.



Here's the radio shack aboard the NOAA vessel RESEARCHER (R-103); note the callsign plaque at the upper left. The vessel operates on a wide variety of frequencies extending into the VHF spectrum. (NOAA photo).



The MT. MITCHELL (S-222) is a 231 foot vessel built in 1968. It carries a crew of 61 plus 12 commissioned officers. It's callsign, WTEG, is familiar to many listeners. (NOAA photo).

- Misc. small vessel calls: WZ2533 & WZ2534
- Vessels: DELAWARE II (R-445) Callsign: KNBD
- FERREL (S-492) Callsign: WTEZ
- GEORGE B. KELEZ (R-441) Callsign: KNBG
- HECK (S-591) Callsign: WTEY (90 ft.)
- MT. MITCHELL (S-222) Callsign: WTEG
- PIERCE (S-328) Callsign: WTEQ (WZ2598 to WZ2602)
- RUDE (S-590) Callsign: WTET (90 ft.)
- WHITING (S-329) Callsign: WTEW (WZ2603 to WZ2607)

Pascagoula, MS

Pascagoula Port, National Ocean Survey, P.O. Box 1207, Pascagoula, MS 39567

Vessel: OREGON II (R-332) Callsign: WTDO

Pensacola, FL

Base station call: KHW

Point Barrow, AK

Base station call: KAW54

Portland, OR

Misc. small vessel callsigns: WZ2573 & WZ2574

San Francisco, CA

Misc. small vessel callsigns: WZ2558 & WZ2559

San Juan, PR

Base station call: KAI

Seattle, WA

Pacific Marine Center, National Ocean Survey, 1801 Fairview Ave., Seattle, WA 98102

Base station calls: KVJ & KAW55

Misc. small vessel callsigns: WZ2578 & WZ2579

Vessels: CHAPMAN (R-446) Callsign: WTDL

DAVIDSON (S-331) Callsign: WTEK

DISCOVERER (R-102) Callsign: WTEA (WZ2608-9, WZ2611-19)

FAIRWEATHER (S-220) Callsign: WTEB (WZ2521-9, WZ2643-50)

JOHN N. COBB (R-552) Callsign: WMVC
 McARTHUR (S-330) Callsign: WTEJ
 MILLER FREEMAN (R-223) Callsign: WTDM (193 ft.)
 OCEANOGRAPHER (R-101) Callsign: WTEP (WZ2633-42)
 RAINIER (S-221) Callsign: WTEF (WZ2516-7, WZ2555-7,
 WZ2571-1, WZ2575-7)
 SURVEYOR (S-132) Callsign: WTES (WZ2560-9)

Sitka, AK

Base station call: KAW57

Tuscon, AZ

Base station call: KAW51
 Mobile unit calls: KD7996-7

Washington, DC

Mobile unit calls: KA8129-34, KD8004-5

Woods Hole, MA

Woods Hole Port, Northeast Marine Facility, National Ocean Survey, Woods Hole, MA 02543

Vessel: ALBATROSS IV (R-342) Callsign: WMVF
 Portable base calls: KAW59, KCU727-36

Other vessels (may be perm. out of service):

BOWIE Callsign: WTEC (WZ2630-2)

CHARLES A. GILBERT Callsign: WTDA

EIDER Callsign: WTDD

EXPLORER Callsign: WTED (WZ2500-9)

HODGSON Callsign: WTEX (WZ2510-2)

HYDROGRAPHER Callsign: WTEI (WZ2580-9)

LESTER JONES Callsign: WTEH (WZ2590-2)

MARMER Callsign: WTEE (WZ2628-9)

PATHFINDER (OSS-30) Callsign: WTEO (WZ2521-9)

PATTON Callsign: WTEM (WZ2595-7)

HILGARD (WZ2625-7)

Other offices with small craft and/or mobiles:

East Coast Field Party: WZ2535-7

Geodesy Division: KD7986-91, KE8200-6, KF3712-31, KF3733-42

Marine Data Info.: KD8000-3

Oceanography: KF3732

Photogrammetry: KD7998-9, KE8227-34, KF3700-11, WZ2530-2

Research & Development: KF3643-6

Operational Frequencies

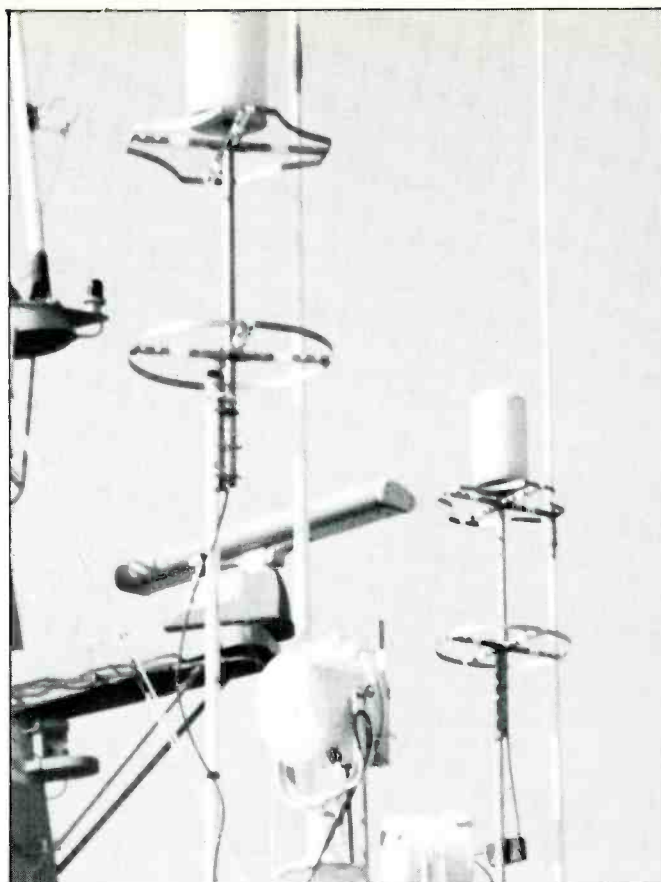
To U.S. Coast Guard

Vessel	Shore Station
4134.3 kHz	4428.7 kHz
6200	6506.4
8241.5	8765.4
12342.4	13113.2
16534.4	16307.3

NOAA Operations

2614.4 kHz	13142.5 kHz
2617.4	13158
3333	17175.2
4223	17208.5
4380.5	17268.4
4433.2	17271.5
4436.3	22696.6
6379.5	22702.8
6393.5	34.98 MHz
6394.4	36.22
6505.5	38.22
6510.9	41.71
8645.5	157.075
8716	164.025
8754.4	164.075
	170.20
	171.80
	172.025

(Ships also operate on VHF maritime channels as well as maritime public correspondence frequencies.)



These interesting looking antennas are aboard the HECK and its sister ship, the RUDE.

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Please send all reader inquiries directly.

RADAR REFLECTIONS

RADAR DETECTORS AND THEIR USE

BY JANICE LEE

New Hampshire Court Upholds Use of Radar

The New Hampshire Supreme Court recently approved the use of radar to catch those who exceed the federally mandated 55 mph speed limit.

In a decision handed down on August 17, 1982, the court upheld the speeding conviction of Patricia Ahern of Charlestown, NH, who was clocked on radar driving 74 mph in a 55 mph zone. Ms. Ahern appealed her conviction to the high court claiming that the radar device may not have been accurate and may not have been operated by a qualified individual.

In a unanimous decision, the court ruled that the radar had been tested by the state in accordance with the manufacturer's specifications. Two tuning forks, set at different speeds, were used to test the accuracy of the radar unit, the court said. The justices said it was highly unlikely that both the tuning forks could have been inaccurate. They also ruled that the state trooper had been sufficiently trained in the use of radar.

Wonder if the judges were properly trained in the use of radar?

PA Representative Says Give Warning First

The following letter to the editor recently appeared in many Pennsylvania papers:

"I am writing to express my concern about the 'local electronic speed devices.'

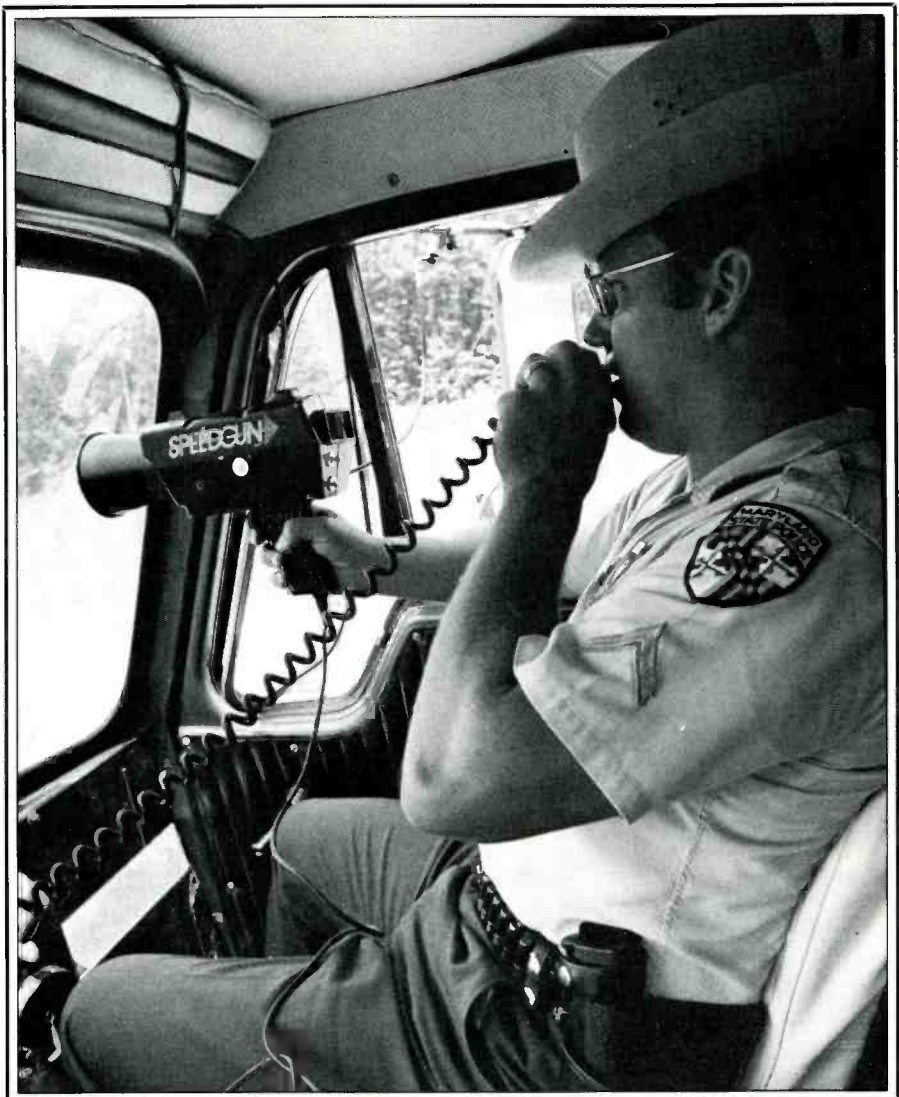
"First of all, the speed devices are successful in slowing traffic speed and slowing down drivers. I also understand where children are abundant in busy streets, these 'speed devices' have slowed down traffic.

"However, I do have some concern about the fines many must pay who are unemployed or just plain folks plugging along to meet their bills at the end of the month. I do hope that our local police officers use their discretion wisely and I do hope the warning cards are used abundantly. The warnings do have a direct impact on the drivers and slow them down.

"I hope the local borough and township police departments understand my feelings on this concern regarding fines and the feelings that the Legislature may have on these electronic speed devices in the future."

Sincerely,
George C. Hasay,
117th Legislative District

Shickshinny's Police Chief Jack Wall took exception to the statement by Hasay. Wall said he feels Hasay's comments were uncalled for, since fines for speeding and other violations are set by the state legislators.



"I realize Mr. Hasay is looking for the support of the voters, but we (police) are also looking for the support of the people we serve," Wall said.

"Mr. Hasay said he was concerned with the fines some people who are caught speeding by electronic devices have to pay. He should know these fines are set and approved by the legislators in Harrisburg . . . not locally."

Wall explained that fines paid by people going a certain number of miles over the speed limit are already set. The arresting officer, he said, had no control over the amount of the fine.

In response to the hope expressed by Hasay that police are using their discretion and issuing many "warning cards" to motorists, Wall said, "We give out a lot of warning cards to drivers who are only a few miles over the speed limit."

Pisgah's Deputy Police Chief Is A Real Dummy

Pisgah, Iowa—Yes, Pisgah's deputy police chief is a real dummy!

Nonetheless, in the nearly 12 months that Elmer has been on duty, he has slowed speeders, fooled lost motorists, and generally been the biggest hit in Pisgah since Mavis left the Old Home Fill'r Up and Keep on Truckin' Cafe.

Elmer was made from pantyhose, pillow stuffing, and crumpled newspapers by Joyce Ballantyne of Moorhead, sister of Pisgah Police Chief Gordon Solberg, 46. He's named after Elmer Seibels, who runs the grocery store across the street from the Skelly gas station here. Seibels helped Solberg "recruit" Elmer.

Realism is added by the old military cap that replaced the baseball cap Elmer wore

SWL HEADQUARTERS

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Converts Morse & RTTY (Baudot & ASCII) to Video, and serial

Morse Reception: 8-55 wpm standard (simple user adjustment for higher speeds) Automatic speed tracking & word space adjustment

RTTY/ASCII Operation: Decodes RTTY (45 to 174 100 Baud) and ASCII (110 & 300 Baud). Auto C.R.T. automatic (theatrical control), selectable unblank on space, timer & switch selectable, solid state tuning "meter". Demodulator has 3 fixed shifts and 1 tunable shift, user selectable printer outputs in ASCII or Baudot for all modes with crystal controlled baud rate generator, RS232, TTL, & related loop outputs. User adjustable auto-timer.

Now you can also enjoy shortwave listening to RTTY and Morse code transmissions with a unit designed for that purpose. The CWR-6700 offers many advanced features, previously available only in more expensive transmit/receive terminals. Some of these features are:

- Receive ASCII, Baudot, or Morse code transmissions and see the decoded characters on the TV monitor or screen
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- Printer prints received ASCII, Baudot, or Morse signals
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List \$495.00 SALE \$449.00

RTTY - and CW

Optional AC-1 800 MA 12V Adapter \$14.95

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CABLES: RG-58 With PL-259

20 ft. \$ 8.99 50 ft. \$12.99 100 ft. \$19.99

The McKay Dymek DA 1000 All Wave Receiving Antenna

Frequency Coverage: 50 kHz to 30 MHz, continuous

Antenna Height: 4 feet 8" (142 cm)

Output Impedance: Switch selectable 50, 100, 500 ohms

Amplifier Compression Point: 30 Vpp (+13.5 dBm) delivered to a 50 ohm load

Power Required: 110-120 or 220-240 VAC switch selectable, 50-60 Hz, 4 watts or 12 VDC 0.4 Amp

Active antenna — works better than 100 ft. long wire, easy to install, low noise pre amp at antenna base. The answer for apartment dwellers & travellers.

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 CW-N RTTY N — 500Hz
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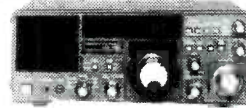
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- Three AM bandwidths for changing interference conditions on crowded shortwave broadcast bands.
- Tape recorder output jack on front panel.

Record while you're away using the built-in on/off timer.

- Noise blanker, AGC selection, and RF attenuation level controlled from front panel.
- Optional memory unit allows storage and recall of up to twelve frequencies — no more frantic dial twisting at I.D. time! A backup feature holds memory channels while the FRG-7700 is turned off.
- Optional accessories: FRV-7700 VHF Converter, FRT-7700 Antenna Tuner, FRA-7700 Active Antenna, FF-5 500 kHz Low-Pass Filter, DC-7700 DC Kit, YH-77 Headphones.

KENWOOD R-1000



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Frequency range 200 kHz-30.0 MHz. AM, SSB, and CW modes. Built-in noise blanker. PLL synthesizer covers 30 bands between 200 kHz to 30 MHz. Ideal 3-stage IF filters for receive mode. Built-in quartz digital clock with timer. Power requirements 100, 120, 220, 240 VAC, 50/60 Hz, 12 VDC option.

KENWOOD R-600

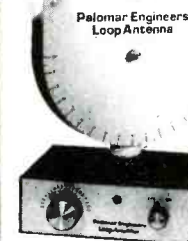


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- 10-40 KHz plug-in loop (Omega)
- 5-15 MHz plug-in loop (HF-1)

\$147.90

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during his first few months on duty, and by the sunglasses and a short straw that's used when Elmer wants to smoke.

Elmer frequently can be spotted in the town's police car, parked beside Iowa Highway 183 at the edge of town. An old spotlight on the dash impersonates a radar gun.

It's not uncommon for drivers to brake when spotting Elmer, or to stop to ask directions to say, Little Sioux. Elmer doesn't say much, but the drivers mumble a lot after their close-up look at him.

"We had one guy say how does a town like this (Pisgah's population was 307 in 1980) afford a cop sitting out there all the time and a radar set up? I told him we lease the radar," Solberg quipped.

But seriously, Solberg says, Elmer is a valuable peace-keeping device, one that's been emulated in at least one other Iowa town. (Danbury has a dummy, but it's inflatable and not as good as Pisgah's, Solberg said.)

Elmer controls speeders, and he occupies the car when Solberg is elsewhere. "He rides shotgun, and when I go off duty, Elmer gets behind the wheel," Solberg said.

The Elmer/Solberg shell game has worked so well that Solberg sometimes reverses it—instead of a dummy impersonating a police officer, Solberg sometimes impersonates a dummy. Local residents who have gotten used to seeing Elmer monitoring traffic and go zooming past the parked car are chagrined to see Solberg spring into action.

"I sit real still and slump down and people say, 'That's got to be Elmer,' and I get 'em," Solberg said with satisfaction.

CHP May Be Asked To Use Radar In Jurupa Area

A Riverside County supervisor announced that he wants to ask the California Highway Patrol to use radar to patrol roads in his western Riverside County district.

At first glance, it sounds like a proposal that is doomed to failure. Everyone knows the CHP never uses radar. Right?

Wrong.

That long-standing tradition has already been broken, in a small way. The CHP is using radar to patrol a few roads in Orinda, an unincorporated Bay Area community.

When all the conditions were met, the Orinda project was kicked off with a big publicity drive. The project worked so well that it is still operating, more than six months beyond the planned cut-off point, said Dave Daniel, public affairs officer for the CHP's Inland Division in San Bernardino.

Riverside County Supervisor, Donald L. Schroeder, has submitted his proposal on radar to the Riverside County Road Department, the county administrative office, and county counsel for opinions.

"Right now, we're trying to work out who would pay for it," he said.

The CHP seems to be taking a firm stand on that point. If Orinda's case is any indication, the community that wants the radar enforcement is the one that will foot the bill.

New York Obstruction of Vision Law Ruled Unconstitutional

Greene County, NY motorists with Fuzzbusters® may rest easy now, since police can no longer charge them with a related traffic infraction.

County Court Judge John J. Fromer ruled unconstitutional an application of Section 375.30 of the state Vehicle and Traffic Law that pertains to obstruction of the driver's view of the road.

Since radar detection devices are not illegal by state law, police have been citing drivers with Section 375.30, claiming the placement of the units on the dashboard or windshield obstructs their vision. But a Long Island man found guilty of the infraction in Catskill Town Justice Court appealed the decision and won!

"You might call it the case of 'the mouse that roared'," quipped Charles Surrano, the Athens attorney who prepared the appeal for Roger Lew.

Lew lives in Merrick, LI, and often commutes to work in Athens. Last October, he was stopped on the N.Y.S. Thruway in Catskill and ticketed by Trooper D.J. Buckbee for Section 375.30 because he had a radar detection unit attached to his windshield.

Lew retained attorney James Steenburgh, a partner of Surrano, to defend him in justice court before the Honorable Charles Crommie. Steenburgh initially moved to have the charges dismissed because, he claimed, there was no standard to define how much the radar unit had to obstruct the driver's vision. Crommie denied the motion.

Under direct examination, Tpr. Buckbee of the Thruway State Police, said he routinely operated radar guns on the highway. Of the estimated 5,000 or so tickets he issues annually, Buckbee testified that perhaps 100 were for objects obstructing vision; 75 of those violations were radar detection units, he said.

Crommie found Lew guilty and fined him \$25.00.

In the appeal, Surrano claimed that "no standard at all is prescribed for the degree of visibility required" and that the statute was "guilty of overbreadth." Further, he said the judge's speculation was "wholly improper."

Judge Fromer agreed that the statute contained no defining standard.

"The radar detector clearly obstructs only the driver's vision of an area of the automobile's hood," he wrote in the decision. "The clear intent here was to arrest the defendant because he had a radar detection unit. The officer didn't use that charge, however . . . clearly such contortions shall not be supported by a court of law."

Surrano said he wouldn't speculate on whether local and state police often cite the infraction as retaliation for drivers using radar detection units. But he emphasized that the citations would no longer hold up in Greene County justice courts.

"This is the first time the statute has been

ruled unconstitutional in any county in the state," Surrano noted, adding that he hoped the District Attorney's office would appeal Judge Fromer's ruling to the state's highest court, the Court of Appeals. "The Court of Appeals would certainly have an interest in making certain that the statute was uniformly applied through the state."

Nathan Hamm, an assistant district attorney who prepared a brief supporting Lew's original conviction, said they expect to appeal the Fromer ruling—either through the Appellate Court or the Court of Appeals. The state Attorney General's office in Albany would likely assist the district attorney in preparing arguments.

Millville, PA Businessman Orders Police Off Property

Woodrow "Woody" Kindt, proprietor of a lawnmower sales and service shop on State Street, PA recently posted a sign informing John Benson to keep off his property in foot-high letters:

"NOTICE—THIS PARKING LOT IS OFF LIMITS TO MILLVILLE POLICE CHIEF"

Kindt, a Millville resident not known for being outspoken, explained that Benson parks his police cruiser on his property waiting to nab speeders.

"It's hurting my business," he said.

Kindt said his customers have been complaining to him about the police in the borough, saying they won't come to Millville anymore as long as they're out there catching speeders.

"It seems like he does one thing and one thing only and that's speed traps. It's the very petty things he goes after."

Borough officials said that they were not pleased with Kindt's sign and the chief considered it a personal slap in the face.

Plastic Police Set Slower Pace

Gary Gleason may have the world's slowest police car, but it doesn't matter to speeding motorists. By the time that they realize it's a fake, they've already slowed down.

Gleason, a sign builder in Hedville, KS, was upset because people coming through his small town rarely slowed to the 30 mph speed limit.

Hedville doesn't have a police department. So with the consent of the Kansas Highway Patrol and the County Sheriff, Gleason built a full-sized plastic squad car.

It has the standard black-and-white paint job, a red light on top, and even a profile of a man's head in the side window.

He placed his creation, which has a "Hedville Police" sign on its door, near the railroad tracks at the edge of town.

"When they see it, they slow down," he said. "When they get to the tracks, they're usually doing 5 mph. It seems to be working real well."

It fools non-speeders, too. One man stopped at the phony car to ask directions.

Man's Life Worth More Than \$33 Fine, Judge Rules

A DuPage, IL, County judge set aside a \$33 speeding fine to save the life of an unemployed man who threatened to jump to his death because he couldn't afford to pay the penalty.

Judge Duane Walter recently talked Ivan L. Flynn out of jumping from the third floor of the DuPage County courthouse. Flynn, 40, was fined \$11 plus court costs by Associate Judge Charles Spencer for a speeding violation in Naperville.

Observers said Flynn ran out of the courtroom after the verdict, climbed a banister railing on the third floor of the courthouse and began screaming.

"He was screaming he was unemployed and that an \$11 fine was a lot of money to him," Walter said.

Walter said he went upstairs where police and a psychologist with the DuPage County sheriff's department were trying to talk Flynn into climbing down. Walter offered to give him a new trial but, as he approached, Flynn crawled over the banister and threatened again to jump.

Walter left but returned 10 minutes later. This time, Flynn came down willingly.

The judge later found Flynn innocent and set aside the first conviction.

"Why not?" Walter said later. "I don't think Judge Spencer will mind. I think a human life is worth 30 minutes, even if it's my lunch hour."

Driver Abandons His Bus

A Phoenix, AZ school bus driver, stopped for speeding by police, abandoned his busload of 60 high school students, saying: "I'll just live off food stamps," officers said.

The Washington High School driver, identified by police as Robert A. McNiece, walked away from his part time job and the estimated 60 homeward-bound students, Officer Steve Clack said.

Clack said he was operating radar in a neighborhood where residents had complained of motorists speeding. He said he planned only to issue a warning ticket to the driver, as he had done with others caught driving up to 10 mph over the limit.

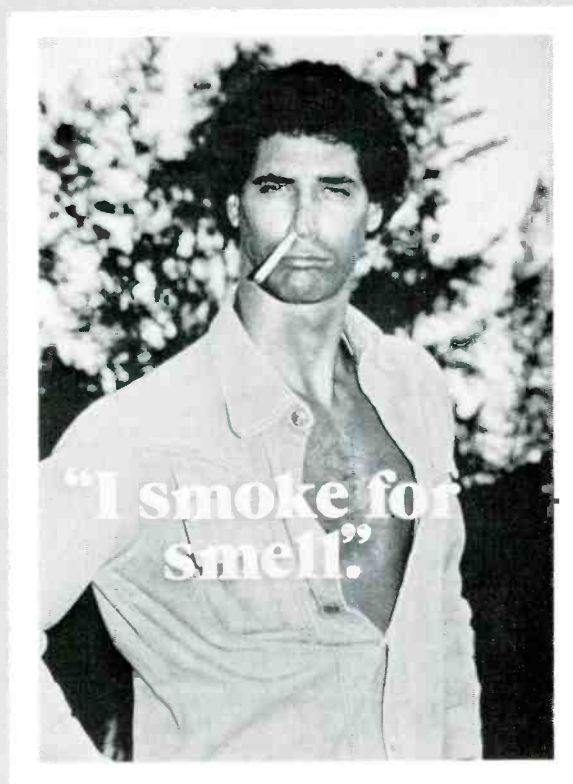
But the middle-aged driver, whose exact age and address were unavailable, "seemed a little irritated" at being stopped, he said.

"He just said, 'That's it. Do what you want to do, I quit. Get somebody else out here to drive the bus. I can't put up with working three hours a day. I'll just live off (of) food stamps,'" Clack said.

Police dispatcher Kelly Wicker notified school officials, and another driver arrived after half an hour to finish the route.

"I'm in my eighth year in the department," Clack said. "I've never seen anything like that."

Janice Lee is the Editor of Monday, A.M., the newsletter of Electrolert, Inc.



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March 1983 / POPULAR COMMUNICATIONS / 31

Hands Free Communicating

BY GORDON WEST, WB6NOA

Hanging from your antenna tower by one hand while talking on a microphone with the other is downright dangerous! However, how else would you communicate with your partner in the radio shack as you make tuning adjustments to that new five element beam?

A hands-off communications device might be just the answer, and they are now available. They also work surprisingly well!

It was over three years ago that Don Thomas at Standard Communications Corporation introduced a new, unique type of communicating device. A small 49 MHz transceiver is worn on your belt. The transceiver is connected to a light-weight headset that contains a speaker and a boom microphone. Turn on a couple switches, and you are ready to talk to a companion unit worn by your helper.

Your voice does all the work. Some old technology combined with new micro-chip sized circuitry allows the transmitter to automatically "key up" when it senses your voice. This is commonly called a VOX circuit—voice operated relay. In these sets, there is no relay, but rather a tiny switching diode that turns on the transmitter when you talk, and drops it back to receive when you stop talking.

On receive, your set is absolutely silent, with the squelch circuit eliminating background hiss. As soon as your companion begins to talk, his signals come over loud and clear. When he stops talking, his set drops back to receive, and each of you is ready to communicate again.

Equipment And Pricing

Standard Communications Corporation began importing a device called the "Talkman™." Looking similar to the Sony "Walkman™" personal stereo system, the Standard Communications "Talkman™" was a similar looking communicator, not a stereo system.

After a few bugs were worked out of the circuit, the Standard Communicators using VOX were a limited hit. At \$125 a piece, with two units required, hands-free talking really had to be worth it for someone to make this big expenditure.

The Standard units are now priced a bit more competitively at \$99 a piece, with two units or more required to make up a system. After all, how would you communicate with only one unit?

Several Korean units are now popping up on the market place, priced below \$50 a piece. This makes a \$100 system of two



New 49 MHz transceivers are perfect for backpackers, hikers, and Survival uses.

units more palatable for the thin pocket-book. Although some of the more expensive will transmit further, these lower priced Korean units indeed do a nice job up to 1,000 feet away.

Frequency And Power

These tiny communicators operate on the Part 15 license-free radio band, between 49.83 to 49.89 MHz. This is the same band that cordless telephones operate on, as well as small "kiddie talkies." The band is intended for low power devices with no guarantee of an interference-free channel. You simply take a chance that the guy next door doesn't have a cordless phone, or some kids using cheap toy walkie-talkies aren't on the same frequency!

The FCC limits the maximum power radi-

ated on this band to 10,000 uV/m at 3 meters. Checking with our Bird watt meter, we found that the typical output to the head-top antenna was around 40 mW to 80 mW. That is less than one-tenth of a watt output. Don't expect to stay in touch with someone going down to the store when he walks away. It simply won't happen with this power level.

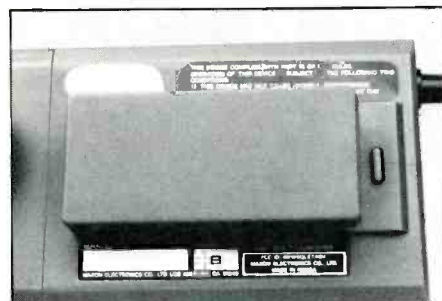
Another technical note on these products that you should be familiar with—they all work on the common 9 volt battery.

Here are the technical specifications found on four different brands of communication devices:

Current drain, standby	13.5 mA
Current drain, receive	40-70 mA
Current drain, transmit	40-80 mA
Typical battery life	8 hours
Receiver—dual conversion	



Standard's TALKMAN offers 1/2-mile two-way communications without the need for an FCC license.



Some of these "hands-free" rigs offer a sturdy belt-clip for your convenience.



Close-up look at the simple controls.

Superhet	FM
Sensitivity (20 db quieting)	0.5 uV
Sensitivity without squelch	0.25 uV
Frequency stability	± 2 kHz
Modulation bandwidth	± 7 kHz
Antenna impedance	50 ohms
Headphone impedance	32 ohms
Microphone impedance	600 ohms, electret condenser
Range	1/4 mile maximum

Hands Free Operating

Once you turn on your individual unit and pre-set some switches, you are ready to communicate. The headset easily adjusts for comfortable wearing. The boom microphone is easily molded into shape so it rests approximately 1/2 inch away from your lips. The headset metal antenna for close range is

Hands Free FM Transceiver

The clarity and convenience of short range, interference free FM Communications.

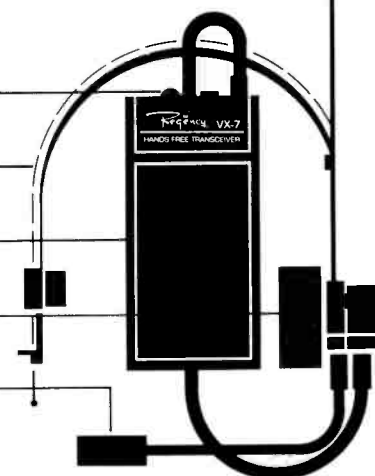
Top panel houses on/off volume control plus switch to adjust voice activated mic sensitivity for outside noise conditions.

Wire antenna can be clipped around headpiece for private, short range conversations. Unhook the antenna to realize the full range of the unit.

Pager style clip lets you wear the unit on your belt or detach the clip to carry the VX-7 in your shirt pocket.

Foam cushion earphone lets you communicate yet leaves one ear free to hear the sounds around you.

Miniature electret boom microphone activates the transmitter when you speak then returns unit to receive when your message is completed. Flexible boom can be adjusted as you desire.



Mike adjustments permit use in noisy areas.



Lightweight headset has built-in microphone.

left clipped down and concealed. For longer range, unclip the antenna so that it springs up. You instantly look like a single antennae grasshopper, but your range increases dramatically. A word of caution—you must be especially careful when bending over not to poke someone's eye out with the protruding antenna. We judged the antenna on these units as being *extremely unsafe* when opened up and flying about your head. Even though they have a small loop on the end, it is still dangerous when leaning over and an unsuspecting face gets too near.

A lightweight cord connects the headset to the transceiver worn on your belt. We are only talking about 9 ounces, so you don't even know you are wearing the communications device. On the transceiver are several switches that allow you to adjust the vol-

ume of your earpiece. Another switch allows you to adjust the sensitivity of the microphone. You may wish to keep the mike gain low while riding a motorcycle so that the VOX circuit does not trip on non-voice sounds.

You also have a switch to put you into the push-to-talk mode rather than the automatic VOX mode. This is ideal if you don't want your spoken words to automatically trip the transmit circuitry. If you are prone to swearing out loud without warning, keep the switch in the manual mode!

A belt clip securely holds the unit on your body. It's also small enough to conceal in your shirt and the cord is long enough between the electronics and the mike to place the unit anywhere above your waist.

The squelch control is preset on the inside

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MFJ-104

Two independent 24 hour LCD displays! Read both GMT and local times at a glance.

Six digit main display has seconds readout. Four digit auxiliary. Switch reverses main/aux.

Alarm plays 4 selectable melodies. Alarm "ON" indicator. Snooze button.

Quartz timing. Synchronizable to WWV.

Flip-top cover serves as stand.

Night light. Forward/reverse, fast/slow set buttons. Lock function prevents mis-setting. Display main time only, main/auxiliary or main/ alarm time. Includes battery. 4x2x1/2 inches.



24/12 HOUR, ID TIMER **\$32.95**
MFJ-102

Switchable 24 hour GMT or 12 hour format. ID timer sounds every 9 minutes after reset.

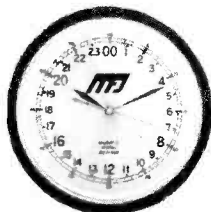
Switchable seconds readout.

Observed timer. Just start clock from zero and note time of event up to 24 hours.

Bright blue 0.6" vacuum fluorescent digits.

Alarm with snooze function. Synchronizable with WWV. Fast/slow set buttons. Lock function prevents mis-setting. Power out, alarm "ON" indicators. 110 VAC, 60 Hz (50 Hz with simple modification). UL approved.

Black, brushed aluminum top/front. 6x2x3".



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of the set. Seldom would you ever need to readjust this inside pot. Same thing with the VOX delay control—it is also preset for approximately a 1 second dropout, which we found ideal—not too short to cut off words, but not too long to have to wait for a reply. By the way, as you talk, you can also hear yourself to ensure you have all the switches set correctly.

We've Used It Many Times

We've operated the Standard Communications product as well as the Maxon "Easy Talk™" and a President "APX-215™." The more expensive Standard gave us slightly further range, but everything else was about equal on performance. The new Regency VX-7 was tested and outperformed both the Standard and the President unit!

We found that high noise levels could easily be compensated for by proper mike switch settings. We operated the units successfully on motorcycles, dune buggies, and in loud crowds where the noise level was quite high. We found that even a whisper is picked up and transmitted when we have the mike set to its most sensitive position and the mike element pressed up against our lips or throat. That's right—you can even operate the mike with the element touching your voice box for a slightly lower pitched, less-clear sound.

One unit was dropped accidentally on concrete, but survived well. There is not much to break on the single circuit board that is crammed with electronics.

We found only minor instances of interference on our frequency. Our units would render a cordless telephone inoperative when used in the house. But since you don't talk on a cordless phone and this at the same time, it doesn't really matter.

Spark plugs from a motorcycle will also generate noise over a person's voice while receiving them 500 yards away. This is normal for weak signal FM work.

Applications

There are simply too many to list. Any time two people are separated out of easy earshot, these units will work fine. Hiking, jogging, bicycling, horseback riding, and Survivalist communications are naturals for these headset communicators. These units will easily talk further than anyone would care to shout.

I can now use both hands while adjusting my tower-mounted antenna with someone at my radio telling me that the SWR is getting better or worse!

At last you may receive skiing instructions live and direct as you are catapulting down the hill. Who knows? Maybe these units will even work in an avalanche, trying to locate a downed skier.

Around the office you can work with both hands and talk at the same time. These units are great for counting inventory.

Going outside and don't want to miss a single call on your base scanner? Leave one unit resting on the scanner speaker, turn your set on, and go about your business.



Over-water range is usually better than when using these 49 MHz rigs on land.



Both hands are free for safety.

Every time the scanner transmits something, you will hear it loud and clear over your headset. All it needs is a little voice to activate the mike circuit.

These tiny communicators are here to stay. The range gets better as the price gets higher. All the communications are crystal clear, and it's about time that we can communicate over the airwaves without having to lift a finger!

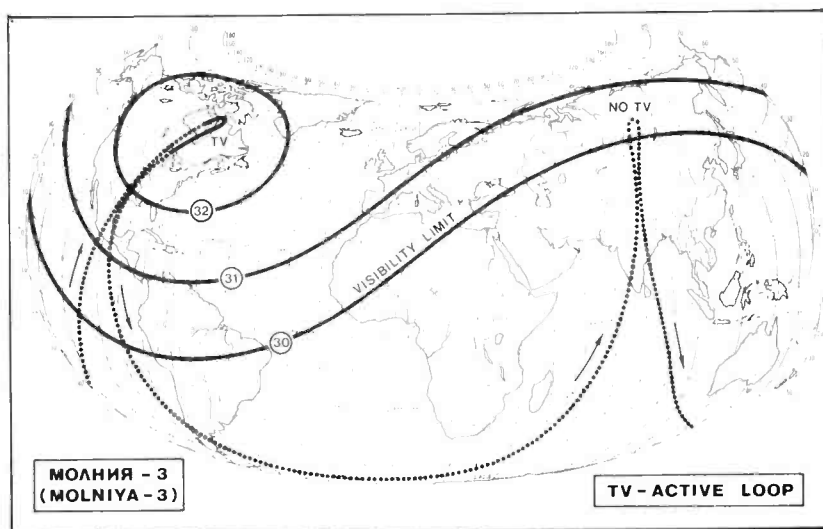
POP'COMM BOOK REVIEW:

STTI's International Satellite Television Reception Guidebook

BY STEPHEN J. BIRKILL

Back in 1975, BBC technician and Amateur Radio enthusiast Stephen Birkill, G8AKQ, received experimental satellite TV transmissions from India in his backyard in Sheffield, England (See POP'COMM November, 1982). From well outside the ATS-6 satellite's footprint, using a five foot wire mesh dish antenna, he proved that private individuals with limited resources could still bring satellite television into their own homes. Since then, Birkill has been exploring and investigating satellite systems the world over, often utilizing novel electronic reception techniques to pull in a plethora of exotic television programs.

In his new *International Satellite TV Reception Guidebook*, Birkill provides a comprehensive discussion of the INTELSAT, SOVIET, EUROPEAN, and INDONESIAN satellite systems, complete with footprint maps, rare photos, television transponder listings, and diagrams of specialized electronic circuits that are necessary for adapting American TVRO equipment for overseas operation. This book provides a detailed listing of English language TV services now regularly available on international satellites in various parts of the globe. Future satellite



EIRP contours and satellite visibility limits for the Molniya series birds.
(Courtesy STTI, Inc.)

systems for a number of developing nations, as well as the DBS plans for the major European countries, are also outlined.

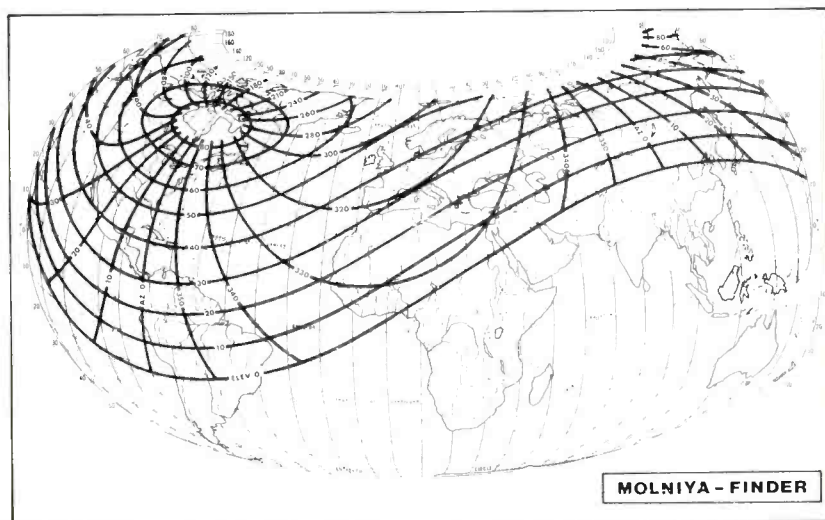
The *International Satellite Television Re-*

ception Guidebook is not written for the beginner, but rather is directed toward those who are involved in the growing market in international TVRO systems. Technicians will find a wealth of information here available from no other source. Entrepreneurs at locations around the world can find out how to bring satellite TV services into their areas. This book should also be of great interest to the DX enthusiast who wishes to pull in TV transmissions from around the planet.

Those who wonder about the \$40.00 price tag should understand that Stephen Birkill's book represents eight years of intensive research. For anyone planning satellite reception outside of the North American continent, this instructive technical manual can answer any question and can direct readers at just about any location on earth toward some kind of television viewing.

Birkill's new book is available from Satellite Television Technology International, Inc., Department PC., P.O. Box G, Arcadia, OK 73007. The price is \$40.

Reviewed by Mark Long, WA4LXC



Molniya finder map shows the azimuth and elevation coordinates to the center of Molniya's active zone. (Courtesy STTI, Inc.)



***You Can Hear
International Aviation Weather
Broadcasts From 30 Nations***

Monitoring VOLMET

Here's a fascinating way to add some interesting new stations and even some new countries to your DX accomplishments. These are VOLMET broadcasts—essential weather transmissions for the benefit of military and civilian pilots. VOLMET broadcasts are generally in the English Language, usually in standard AM mode.

Each broadcast takes about 5 to 10 minutes, although some stations transmit virtually on a continuous basis, covering many specific areas within their general geographic region. Broadcasts are usually scheduled to take place hourly at a specified number of minutes past each hour, and contain weather data for airports, with information on general weather trends in their respective areas.

Besides offering the listener new stations to hear, VOLMET broadcasts are doubly worthwhile to monitor during periods of severe weather in the transmitting area. The temperatures reported in Alaska are often bone chilling just to hear reported, and the typhoons that sweep across Japan are no less interesting to follow by radio. Broadcasts from the Middle East have even been affected to one extent or another by the various military and political factors that exist in that troubled portion of the globe.

In addition, some listeners have also had success with obtaining QSL's from VOLMET stations. All in all, it is a thoroughly interesting, informative, and rewarding aspect of DX'ing—a mid-way point between SWBC and "utility" station monitoring. If you're a shortwave broadcast fan, here's a way of expanding your horizons into the field of utility stations; and if you're a utility fan, these stations are "sort-of" shortwave broadcasters. And you may even add a few new countries to your credit—such as Uruguay, Madagascar, Congo People's Republic, Hong Kong, Singapore, and others.

Our listing indicates the broadcast schedules of VOLMET stations, showing the time after each hour when the transmissions commence. Try VOLMET's, they're great!

The heaviest users of VOLMET transmissions are operators of commercial aircarriers on international routes. (upper left)

Ground stations transmit these so-called VOLMET broadcasts on regular schedules. That puts them half-way between being classified as "utility" stations and as shortwave broadcasters. (lower right)

VOLMET Broadcasts (Voice)

Location	Frequencies (kHz)	Minutes after each hour
Anchorage, Alaska	2980, 5519, 8903, 13344	20 to 30, 55 to 60
Antananarivo, Madagascar	6617, 10073	25 and 55 (French language)
Antofagasta, Chile	3167.5, 7465.5	20 (between 1120 and 2320 GMT)
Auckland, New Zealand	2980, 5519, 8903, 13344	20 and 50
Baghdad, Iraq	3001, 5561, 8819	On the hour
Bangkok, Thailand	3432	10 to 15, 40 to 45 (1210 to 2245 GMT)
	6680	40 to 45
	10017	10 to 15, 40 to 45 (2310 to 1145 GMT)
Basrah, Saudi Arabia	3001, 5561, 8819	30
Beirut, Lebanon	3001, 5561, 8819	15 and 45
Belem, Brazil	10057, 13352	Continuous
Bombay, India	6676, 11387	25 and 55
Brasilia, Brazil	13352	Continuous 0800 to 0200 GMT
Brazzaville, Congo (P.R.)	3495, 6617	30 and 55 (2000 to 0700 GMT) (French Lang.)
	6617, 10073	On the hour and 25 (0700 to 2000 GMT)
Cairo, Egypt	3001, 5561, 8819	20 and 50
Calcutta, India	3432, 6676, 11387	5 and 35
Comodoro Rivadavia, Arg.	4468, 8938	30
Cordoba, Spain	3425.5, 5498, 8952	25
Edmonton, Alta.	6753	20 (SSB) (2300 to 1200 GMT)
	15035	20 (SSB) (1200 to 2300 GMT)
Ezeiza, Argentina	2960, 5477, 11319	15
Gander, Nfld.	3001, 5652, 8868, 13272	20 to 30, 50 to 60
Hong Kong	5519, 8903, 13344	15 and 45
Honolulu, Hawaii	2980, 5519, 8903, 13344	On the hour & half hour
Jeddah, Saudi Arabia	4570	9 (0000 to 0330 GMT)
	10215	9 (0400 to 2030 GMT)
Johannesburg, Rep. S. Afr.	3047, 6716, 9026	Continuous
Karachi, Pakistan	6680, 10017	15 and 45
Lahr, W. Germany	5690	16 (SSB) (2000 to 0800 GMT)
	13231	16 (SSB) (0800 to 2000 GMT)
Montevideo, Uruguay	3474.5, 6582, 13294.5	On the hour
	5445.5	10 (0700 to 2200 GMT)
New York, N.Y.	3001, 5652, 8868, 13272	00 to 20, 30 to 50
Oakland, California	2980, 5519, 8903, 13344	5 and 35
Palegre, Brazil	6603, 10057, 13352	Continuous
Puerto Montt, Chile	5280	20 (1120 to 2320 GMT)
Recife, Brazil	10057, 13352	Continuous
Resistencia, Argentina	4668	50
Rio de Janeiro, Brazil	10057, 13352	Continuous
Salta, Argentina	5498	15
Sao Paulo, Brazil	6603, 10057, 13352	Continuous (0900 to 0300 GMT)
St. Johns, Nfld.	6753	40 (SSB) (2300 to 1500 GMT)
	15035	40 (SSB) (1200 to 2300 GMT)
Shannon, Rep. Ireland	2889, 5533, 8833, 13312	Continuous (DSB)
Singapore, Singapore	6680	20 and 50 (1230 to 2230 GMT)
	10017	20 and 50 (2230 to 1230 GMT)
Sydney, Australia	3432, 6676, 11387	On the hour & half hour
Tegucigalpa, Hond.	4710	50 (1200 to 2400 GMT)
Trenton, Ontario	6753	30 (2300 to 1200 GMT)
	15035	30 (1000 to 0100 GMT)
Tel Aviv, Israel	5575	5 and 35
	2980, 11391	5 and 35 (Approx. 0400 to 1400 GMT)
Tokyo, Japan	2980, 5519, 8903, 13334	10 and 40
West Drayton, England	4722, 11200	Continuous

LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

One station that enjoys a special appreciation by both shortwave listeners and hardcore DX'ers alike is Radio New Zealand. This station has waged a multi-year fight to save its own life. It's a smaller broadcaster fighting for attention in the land of the giants.

The Radio New Zealand external service did, in fact, close down following a budget cut and upon orders from the foreign ministry back in 1976. Fortunately, the interruption was brief, lasting only about a month. In 1982, there was another "this is the end" scare. Again, budget problems were the culprit and again, protests from listeners have staved off a loss of the service, at least for the time being.

Another aspect of Radio New Zealand's problem (also related to money) is outmoded equipment. The two 7.5 kilowatt transmitters at Tihahi Bay a short distance north of the capital, Wellington, are now some 40 years old. At the moment, they still put out a very nice signal thanks to the continued high sunspot level, thus allowing the station to use efficient frequencies. The result is that currently, Radio New Zealand can be heard at very good strength. But, once the sunspot levels begin to drop, the station's low power voice may well be lost in the noise of poorer band conditions and competing broadcasts from countries with transmitters of far higher power. With its tight budget restrictions, Radio New Zealand is not in the position to improve its facilities in order to better cope with changing reception patterns.

Radio New Zealand is actually just the shortwave aspect of government broadcasting in the country. It's a division of the Broadcasting Corporation of New Zealand, which also operates the national program network, commercial and concert-sporting networks on local medium wave, as well as two television networks. Most of New Zealand's broadcasts on shortwave are actually just relays of the domestic medium wave service, and this is one of the appealing things about Radio New Zealand.



Listening Post headquarters features a JRC/ NRD 515 receiver with 24 channel memory, a Drake R4B receiver, a cassette tape recorder, and an old Hallicrafters S-38B receiver.

Programs in vernacular are broadcast for listeners in many parts of the Pacific Islands and news broadcasts including a special Pacific News Bulletin are aired for rebroadcast by other Pacific Island stations. In addition, special event programs of interest to listeners in the islands are carried on shortwave when the occasion warrants.

Currently, Radio New Zealand is scheduled from 1700 to 2000 on 11.960 and 15.485, 2015 to 0715 on 17.705 and 15.485, and 0730 to 1115 on 11.960.

Radio New Zealand welcomes reception reports which may be sent to Radio New Zealand External Service, P.O. Box 2092, Wellington, New Zealand. Please include three International Reply Coupons to cover return postage. Cassette recordings of Radio New Zealand's broadcasts as received in your area are welcome too. Include six IRC's if you want your tape returned.

Give Radio New Zealand a listen, a reception report, and your encouragement!

Ooops!

Ever forget your wife's birthday? Well, we've goofed in nearly as serious a fashion.

In our article on "DX'ing The Soviets" a few months ago, we neglected to point out the best source around for news of USSR broadcasting activity and transmitter site information. That source is the *USSR High Frequency Broadcast Newsletter*, compiled and edited by our friend, Roger Legge. It's issued eight times per year and contains the very latest information on which Radio Moscow or other USSR broadcast service is where, along with what sites have been identified or QSL'd and on what frequencies. With all that and a \$3 per year subscription (\$4 overseas), you can't go wrong. For more information or to subscribe, write to Roger Legge, Box 232, McLean, VA 22101.

1983 WRTVH

You'd hardly set out for a trip across the country without a map—you'd end up *somewhere*, but probably not where you intended. The same thing is true on the shortwave broadcasting bands where the *Radio TV Handbook* is sort of a "Fodor's Guide" to finding your way around. The 1983 edition of this invaluable book is available now. A popular feature of the WRTVH over the past several years has been the extensive equipment reviews by Larry Magne. This year's section covers receiver models in the \$100 to \$750 range.

Name Your Favorite

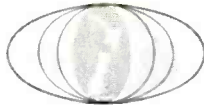
Every three years, the German World Radio Club (Deutsche Welt-Radioclub) holds its Worldwide Shortwave Listeners' Popularity Poll, wherein listeners are invited to vote for their favorite shortwave broadcaster. To cast a vote for your favorite, send a letter or postcard stating in thirty words or less which is your favorite station and why. You should vote in the same manner for your second through fifth choices. Five points will be awarded for every first place vote a station receives, four points for second place, three points for third place, two points for fourth place, and one point for fifth place.



Occasionally, stations issue QSL cards in a series, such as these two depicting Australian cities Perth and Sydney, issued by Radio Australia.

RADIO NEW ZEALAND

external services



P.O. Box 2092, Wellington, New Zealand. Telex No. 31031 Cable: Radiomat

SCHEDULE OF SHORTWAVE FREQUENCIES
31 OCTOBER 1982 - 5 MARCH 1983
(NEW ZEALAND TIME IS 13 HOURS AHEAD OF UTC) WP4/D

PACIFIC SERVICE		AUSTRALIAN & N.W. PACIFIC SERVICE	
1700-2000UTC	11960 kHz	2015-1115UTC	15485 kHz
2015-0715UTC	17705 kHz		
0730-1115UTC	11960 kHz		
1700-2000UTC	15485 kHz		

Frequency and closedown times may vary when broadcasting sport.

NEWS

Broadcast on the hour daily from 1700-0500UTC except 2100UTC. Additional daily bulletins are broadcast at 0730UTC, 0900UTC and 1100UTC.

From 0600-0630UTC Monday-Friday the news is broadcast in Maori, Samoan, Cook Island Maori, Niuean, Tokelauan and Tongan languages. This is followed by a magazine programme in the vernacular as follows; Monday-Samoan; Tuesday-Maori; Wednesday-Tongan; Thursday-Niuean; and Friday-Cook Island Maori.

SPORTS

The Sportscall programme may be heard at 0545UTC Saturday and Sunday. Other sporting events and results are covered in the Morning and Midday Reports at approximately 1835 and 1215UTC and also at 0945UTC daily.

GENERAL INFORMATION

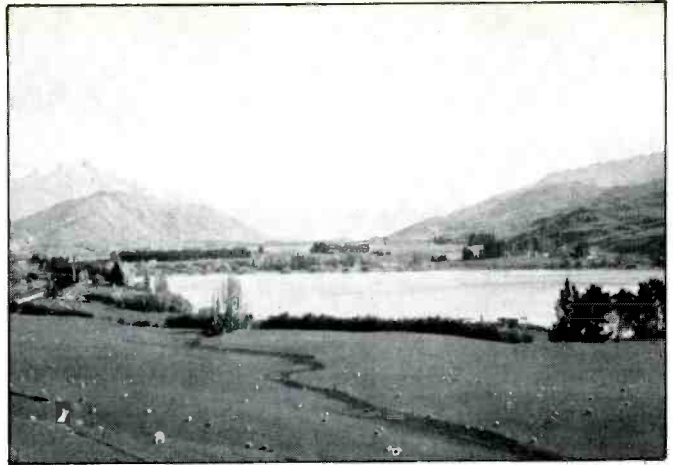
All changes to times and frequencies and any additional broadcasts will be notified during transmission.

DX Reports must be accompanied by four International Reply Coupons if QSL Verification Cards are required. Interesting information about the areas in which we are received and the people who listen is also appreciated.

Although cassettes are accepted as proof of reception, they will only be returned if requested and sufficient (6) IRC's are enclosed with the report. This is to cover handling and return postage.

Unless otherwise stated all programmes are in English.

Radio New Zealand does not operate a general mailing list but requests for frequency and programme details are welcomed.



Fact sheet, paper pennant, and QSL card from Radio New Zealand.

Deadline for entries is March 31, 1983. Cards or letters should be sent to: Deutsche Welt-Radioclub - DWRC, Bonner Strave 328, D-5000 Koln 51, West Germany (Federal Republic of Germany).

Mail Call

North, to Alaska, goes *POP'COMM*, and to Captain Walter Gerwin in Kenai who's in the Italian Merchant Marine and likes to listen to the stations of the Pacific Islands. Capt. Gerwin responded to our Radio New Zealand item back in October and sent his comments to the station. Hope you found our Radio New Zealand feature this month interesting.

Michael Hobbs of Golden Valley, Minnesota, notes a "mistake" in the October Radio Korea schedule we carried and forwards a current schedule. Thanks Michael. As we've pointed out often, things can change very fast on the shortwave bands, and while a mistake may creep into the typewriter now and again, it's more likely a change in schedules between compilation and publishing is the culprit. Mike goes on to note that he has been a DXer for some 20 years off and on and currently uses a Drake R4C receiver.

Incidentally, we've had some feedback in the general vein of "how come such and such country wasn't included?" We unfortunately can't cover the whole dial every month. If we did, there wouldn't be room for much else in *POP'COMM*! We try to vary things and eventually touch all the bases.

Larry Rempala of Lisle, Illinois, notes that the Voice of Free China from Taiwan, which we mentioned back in November, actually has many of its segments pre-recorded and aired over WYFR from Okeechobee, Florida. He notes it on 5.980 at 0357 loud and clear. Right you are, Larry. Signal strength will be a giveaway as to whether you're hearing the Voice of Free China direct from Taiwan or through the WYFR relay.

Erastus Kipkirui from Odessa, Texas, is a native of Kenya and asks whether Kenya has shortwave broadcasts and, if so, how to hear them. Indeed, Kenya is represented on shortwaves, but logging The Voice of Kenya isn't too easy. Best times are around 0300 GMT sign on on 4.934. But the good news is that Kenya is planning a major increase in power, so eventually they should be better heard, although it may well be sometime before those plans are realized. Sorry we can't give receiver recommendations as to which would be best to pull out the Voice of Kenya for you. Check the 1983 *WRTVH* for Larry Magne's equipment reviews.

John Sill of Swampscott, Massachusetts, checks in with a question about Radio Tibet. Well, John, this can be another toughie. Tibet is loggable in the mornings on 4.035, 5.935, and 9.490, but you won't find them in English. The Tibet radio is part of the Chinese broadcasting system. Try around 1200 GMT. John notes that he's brand new to the monitoring hobby and uses a Realistic DX-100 receiver.

Good to hear from all of you! And before we close the mailbag, let's put in our usual reminder that we welcome your letters and we look forward to featuring a photo of you in your shack. So let's hear from you! Good, clear copies of your QSLs and program schedules from stations are welcome!

What's On

All times and dates are in GMT.

Afghanistan Try Radio Afghanistan from 1530 to 1600 to South Asia on 6.230, from 1900 to 1930 on 7.280, 9.665, and 15.077 (the later time period and frequency most likely to be heard). Both time periods are English broadcasts. (Dampier/SPEEDX)

Antarctica The Argentine Antarctic station, Radio Nacional Arcangel San Gabriel, was noted on 15.475 at 2351 with identification in Spanish by a woman, followed by ballad style music; another identification and sign off at 0036. (Stewart MacKenzie, Huntington Beach, CA)

Argentina Radiodiffusion Argentina al Exterior (RAE) has English from 0100 to 0130, 0230 to 0300, 0430 to 0500, 1100 to 1130, 1930 to 2000, and 2230 to 2300 on 6.060, 6.180, 9.690, 11.710, and 15.345. (Chinsky/SPEEDX)

Australia Radio Australia to North America is currently scheduled from 0200 to 0400 on 17.795 and 21.470 and from 1100 to 1300 on 9.580. (Chinsky, Smith, Yajko/SPEEDX)

Belgium Belgian Radio transmits to

North America from 0030 to 0115 on 9.870 and 1400 to 1445 (Monday through Friday) on 17.915. Yajko/SPEEDX)

Bulgaria Larry Rempala of Illinois forwards this Radio Sofia schedule: 0000 to 0100 on 9.700 and 11.720; 0400 to 0500 on 7.115; 0730 to 0800 on 9.700 and 15.110; 1930 to 2000 on 9.700 and 11.720; 2130 to 2200 on 9.700, 7.115, and 9.665; and 2230 to 2330 on 9.700 and 11.720. Larry notes the station has a new series of QSLs. Two reception reports within a two week period gets you one of the new verie versions and with regular reporting, you can earn the entire series over a 12 week period, along with an honorary listener certificate. The station has monitor cards available, too. The address is Radio Sofia, Bul. Dragan Crankov 4, 1421 Sofia 21, Bulgaria.

Cameroon There are several targets in this country. Try the main station Radiodiffusion Nationale Cameroun on 4.972 from Libreville, Radio Garoua from Garoua on 5.010 (0445 sign on); Radio Buea at Buea on 3.970; Radio Bertoua in Bertoua on 4.750; and Radio Bafoussam on 4.000. Except where indicated, sign on time is 0430. Programs are mostly in French.

China Radio Peking was logged at 0030 in Spanish on 15.600 and in English at 0420 on 15.120. (Stewart MacKenzie, California)

Clandestine Some fun listening awaits you in the area from 6.710 to 6.730 between 0300 and 0500 right now as the anti-El Salvador clandestine Radio Venceremos is chased around the area by a jammer playing mostly Latin American music. The music station tries to move in on Radio Venceremos, which will hop up or down a few kilohertz until the jammer gets close again. The jammer is rather inept at his job! This game is being noted regularly now at Listening Post headquarters.

Congo Radiodiffusion Television Congolaise operates on 3.232, 3.264, and 4.765 from 0400 to 0700 and from 1700 to 2300 on the same frequencies. It is also on 6.155, 7.105, 7.175, 9.610, and 9.715 from 0700 to 1700 and from 1100 to 2300 on 15.190. (Reefer/ASWLC)

Cyprus The BBC East Mediterranean relay station from Cyprus was noted carrying the BBC World Service at 0405 on 15.420. (Stewart MacKenzie, California)

Dominican Republic Radio Clarin can be heard with an English identification at 0048 on 11.700 just before beginning a program by the anti-Cuban group, Cuba Independiente y Democratica, which is aimed at Cuba. (Stewart MacKenzie, CA)

Greece The Voice of Greece with English news from 1844 to 1850 followed by Greek programs on 15.050. Also heard in Greek at 0335 on 9.865. (Stewart MacKenzie, CA)

Guyana The Guyana Broadcasting Corporation heard on 5.950 from 2315 tune in, identifying as "GBC-2" by Mike Barraclough, England (WDXC). A better time in the United States would be around 0800 GMT. (Editor)

India A new station in the All India Radio

line up is located at Aizwal. Scheduled on 5.050 from 1230 to 1630 and on 7.295 from 0215 to 0345, 0800 to 1100, and 1130 to 1215. (several sources)

Italy RAI in Rome is scheduled from 1935 to 1955 to Europe on 11.800, 9.710, and 7.275; from 0425 to 0440 to the Mediterranean on 7.275 and 5.990; from 2025 to 2045 to the Near East on 11.800, 9.575, and 7.235; 0350 to 0410 to South Asia on 17.795, 15.330, and 11.905; 2200 to 2225 to Japan on 15.330, 11.800, and 9.710; and to North America from 0100 to 0120 on 11.800 and 9.575. (Southwell/DSWCI)

Kampuchea The Radio Voice of the People of Kampuchea is scheduled from 0000 to 0015 and 1200 to 1215 in English using 9.696 and 11.940. (Lobdell/SPEEDX)

Korea Radio Korea from Seoul beams to North America daily at 0200 GMT on 11.810, at 0530 on 11.810, at 1000 on 9.570, 1330 on 9.750, and 1600 on 11.830. (Hobbs, Minnesota) He also notes that 1330 is a good time to choose for better quality reception, or at 0200 in Radio Korea's General Service on 15.575. Hobbs notes that Radio Korea's distinctive interval signal is worth tuning in for a few minutes prior to listed starting times. And he notes the station has a DX program on Saturdays and Sundays.

Liberia ELWA from Monrovia broadcasts in English from 0555 to 0815 weekdays on 4.765, and at 0615 to 0745 on weekends on 11.830. Also from 1655 to 2300 weekdays on 4.765 and 0825 to 1735 weekends on 6.135. (Tatter/WDXC)

Malawi From Blayntre, the Malawi Broadcasting Corporation is scheduled for 3.380 from 0245 to 0520 and 1750 to 2215, and from 0400 to 2110 on 5.995. (WRTH via DSWCI)

Monaco Trans World Radio Monaco's DX Program is scheduled for the third Saturday of each month at 0745 on 9.665 and again at 1500. The regular schedule is 0625 to 0840 on 9.495. (Hollis/WDXC)

Nicaragua La Voz de Nicaragua can be heard in the evenings in Spanish on 5.955, although that frequency may vary a bit. (Bursell/DSWCI)

Oman Look for Radio Oman in English, scheduled from 0800 to 1100 on 11.890 and 9.735. (Dean/WDXC)

Poland Radio Warsaw beams to North America from 0200 to 0230 on 6.095, 6.135, 7.145, 7.270, 9.525, 11.815, and 15.120, and again from 0300 to 0330 on those same frequencies. Also, from 1130 to 1200 on 9.525, 11.840, and 17.865. (Ulmer/SPEEDX)

Portugal Radio Portugal uses English to North America from 0300 to 0330 on 9.520 and 11.925 and from 0530 to 0600 on 6.075 and 9.520. (Smith/SPEEDX)

Pakistan Radio Pakistan transmits in slow speed English at 1600 on 17.640, 17.660, 16.565, 15.530, and 21.845. English is also aired at 1700 on 11.670 and 15.545. (Arrington/ASWLC)

Philippines Radio Veritas Asia was noted in English by Stewart MacKenzie in California from 0300 to 0330 on 17.815.

Saipan (Mariana Islands) KYOI, although not on the air as this is written, almost certainly will be when you read this. The station will be playing rock music programs produced in California and is scheduled to operate from 1800 to 2100 on 9.696; from 2100 to 0700 on 17.795; and 0700 to 1800 on 11.900. It's a new one for country hunters. Reports can be sent to MARCOM, P.O. Box 795, Saipan, CM 96950.

Solomon Islands The Solomon Islands Broadcasting Service is scheduled from 1900 to 1130 on 5.020 and 2030 to 0730 on 9.545. (WRTH Newsletter/DSWCI)

Sri Lanka If you'd like to hear this country, try the Sri Lanka Broadcasting Corporation, noted in English with the "Radio Monitors International" DX program from 1100 to 1132 by D'Angelo in NASWA/Update. He notes that reception was poor.

Surinam SRS (Stichting Radio Omroep Suriname) is being heard around 1000 on 4.850 (Klein/NASWA Update). And Radio Apinte noted on 5.005 (or 4.995—they seem to switch back and forth every few months!) in local evenings up to 0630 sign off. (Alexander/NASWA Update)

Sweden Radio Sweden International's current schedule to North America is from 0230 to 0300 on 9.695 and 11.705; 1400 to 1430 on 21.615 and 21.700; and 2300 to 2330 on 9.695 and 11.705. Radio Sweden, would you believe, has T-shirts for sale! Why not? The inscription is "Keep In Touch—Radio Sweden."

Taiwan The Voice of Free China's programs for North America are currently aired from 0100 to 0200 on 11.825 and 15.345; 0300 to 0350 on 11.825, 15.345, 17.800, and 5.985; and from 2140 to 2240 on 11.825, 15.345, and 17.800. Most, if not all, of these broadcasts are via the WYFR relay agreement. (McCants/SPEEDX)

United Arab Emirates Radio Color TV Dubai was heard in English at 1630 on 21.465 by Larry Rempala in Illinois.

Vatican City The Vatican Radio noted in English from 0200 sign on, followed by news in English on 11.965. (Stewart MacKenzie, CA)

Vietnam The Voice of Vietnam with English at 1800 to 1830 when they began a French program on 15.010. (Stewart MacKenzie, CA)

West Germany The Voice of Germany is on the air to North America from 0100 to 0150 on 6.040, 6.085, 6.145, 9.545, 9.565, 9.590, 11.865, and 15.105 and from 0500 to 0550 on 5.960, 9.545, 9.650, 9.690, 11.705, and 11.905. (ASWLC)

Thanks to: SPEEDX, Lake Elsinore, California; Stewart MacKenzie and ASWLC, The American Shortwave Listener's Club, Huntington Beach, California; Larry Rempala, Lisle, Illinois; DSWCI, The Danish Shortwave Clubs International, Denmark; WDXC, the World DX Club, England; NASWA, The North American Shortwave Association, Levittown, PA; Michael Hobbs, Golden Valley, MN.

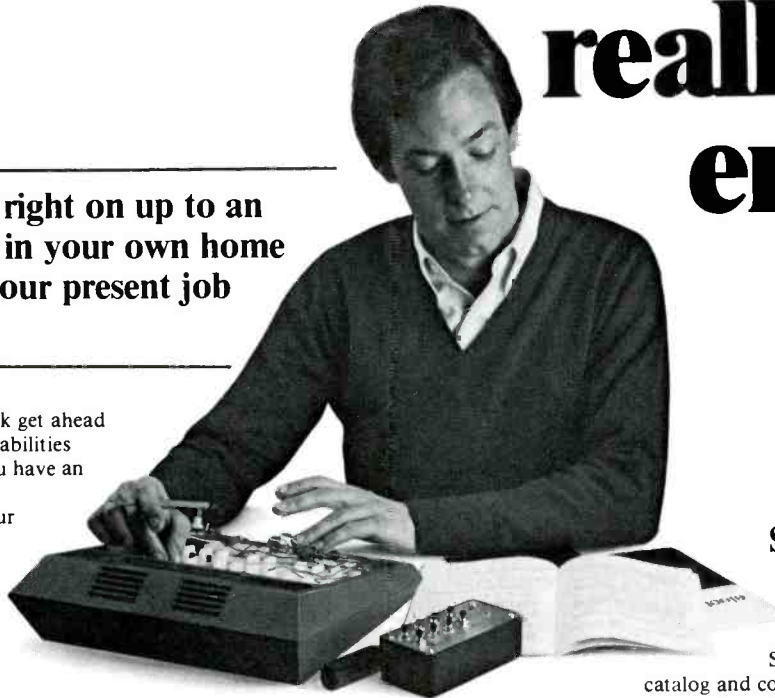
Hope you'll be with us again next month!

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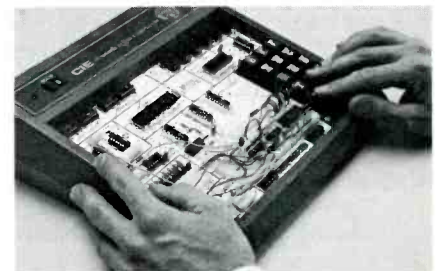
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27 MHz Survival Communications? Well, Maybe!

Of the various approaches to short-range communications for survival applications, the 27 MHz band should be regarded as an inexpensive way to get set up for two-way operation. It's simple to install and operate the equipment, and actually quite efficient for your needs.

It can be used for communications between a base and various perimeter units and for an almost unlimited number of other applications. Furthermore, should the government ever put into effect its curious Crisis Relocation Program, which seeks to move large populations from one area to another, it will certainly be a necessary tool to have at hand. I hesitate to refer to the 27 MHz band under its common monicker of "CB" because I am definitely not suggesting that hooking into the general AM "goodbuddy" party line is going to be of any substantial use to you in a survival situation. I am, however, suggesting that AM and SSB transceivers are of value; that they are plentiful and inexpensive for operation on 27 MHz is one more reason to put them to your own uses.

I've been especially intrigued by the possibilities of the many applications that can be found for the several emergency 27 MHz portable AM transceivers now on the market. These come in their own storage cases, can be powered by a quick plug-in to a vehicle cigarette lighter, and don't require a permanent antenna installation. As such, they can be placed in operation on the spur of the moment, or just as quickly can be removed to another vehicle. Using batteries or a power supply, plus a standard ground plane type antenna, they can also be made to easily operate as a fixed "base" station.

General Electric pioneered this field with their HELP! transceiver, and at the present time, there are a number of different emergency portable 27 MHz AM transceivers on the market. These include:

1. The Radio Shack "Road Emergency" transceiver (Cat. #21-205).
2. The Cobra S.O.S. transceiver.
3. The Midland International #77-810 "Ready Rescue" transceiver.
4. The Kraco MAYDAY I and MAYDAY II transceivers.
5. The General Electric HELP! transceiver, Model 3-5900.

These units all sell for \$100 or less, have built-in microphones, squelch controls, operate on 40 frequencies, have magnetic-mount mobile whip antennas, and are small and compact. What's more, they are designed for full power operation. In short, they



The small 27 MHz AM transceivers use a base loaded magnetic mounted antenna. Some units are designed with telescoping metal whips while others use "rubber duck" types. (Photo courtesy G.E.)

comprise handy and fully portable radio communications stations. They are *not* intended for goodbuddy type hobby use, but for emergency communications.

Aside from their many survival applications, these units are fine just for tossing into the trunk or glove compartment of any vehicle and left there—semi-forgotten—until such time as a road emergency arises during the normal course of your driving. They can, when needed, be unpacked to get you road, fuel, or travel information and to summon police, ambulance, or tow-truck. And you don't have to have a full time transceiver installed 'neath your dashboard if you don't want one. This has definite advantages, not the least of which is giving you peace of mind that your communications equipment isn't going to be ripped off while you're away from the vehicle. I've had the opportunity of working with a General Electric HELP! transceiver, which is the emergency transceiver that was the very first such unit available to the public.

This unit weighs 4 lbs., and that includes the transceiver, antenna, and carrying/storage case. The case is 3 inches wide, 7 inches high, and 12 inches long. The whole thing goes from the glove box to ready-for-communicating in only a minute or so, and can be put away in about the same amount of time.

In use, the HELP! transceiver is placed on the vehicle's seat. The controls and large red LED's, which give you the frequency read-out information, are all on the top of the unit so you can easily see them while you're driving. The loudspeaker and built-in condenser microphone are also located facing upwards when the transceiver is lying on the vehicle's seat. To talk over the HELP! unit, you pick up the entire set and key up the push-to-talk bar which is on the front of the rig and easily accessible from either side (you *southpaws* should like that feature). It's a nice looking transceiver, with its orange, black, and subdued metallic grey color scheme.

The HELP! transceiver also has a metering feature, which shows the relative strength of incoming signals (S-units), as well as relative RF power output level.

The two connections consist of the antenna and the power input. The HELP! unit connects to the power source by means of a plug at the end of 5 feet of power cord—long enough to permit you to optionally stand outside the vehicle when using the unit. The antenna has a 10 foot cable attaching it to the transceiver, and the cable is connected to the unit by means of a small plug. An adapter is optionally available for using a type PL-259 connector as is found normally in use with 27 MHz base station antennas. This set also has an ANL (automatic noise limiter) to filter out ignition noises.

The antenna itself is a telescoping type



G.E.'s "HELP!" unit (Model 3-5900) was the first unit of its genre to reach the public.



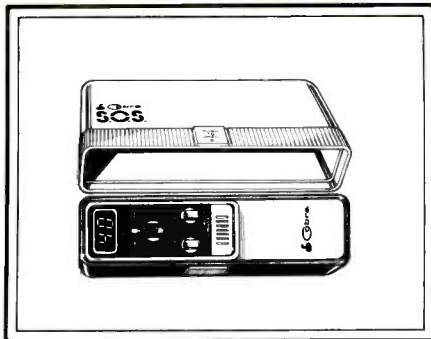
Here's the Midland International Model 77-810 "Ready Rescue" transceiver.



The Realistic "Road Emergency" (Model 21-1505) transceiver is Radio Shack's entry in the mini transceiver market.

with a base loading coil, terminated in a strong magnet intended to keep the antenna attached to a flat point on the vehicle. My own use of this antenna has permitted use of the unit without it falling off while being driven at the speed limit on Interstates, or while driving off the road in a 4WD vehicle. Naturally, if you should score a direct hit on the antenna with a tree branch, it will disturb it or knock it over, as with any mag-mount antenna. For off-road use, it would probably be a good idea not to mount the antenna on the roof, as you might otherwise do for highway driving. I've used it mounted on the vehicle's hood and also just behind the cab of a pickup truck with pretty good results.

Actually, given the fact that it's intended for emergency use and not for general "CB type hobbying," I'd have to say that it per-



This is Cobra's "S.O.S." unit.

forms surprisingly well. The transmitter has nice modulation and it puts out a pretty healthy signal—in fact, easily equal to a standard AM "hobby" type transceiver. The receiver pulls in stations off into the distance with ease, and has selectivity which I'd rate as being equal to most "full size" rigs.

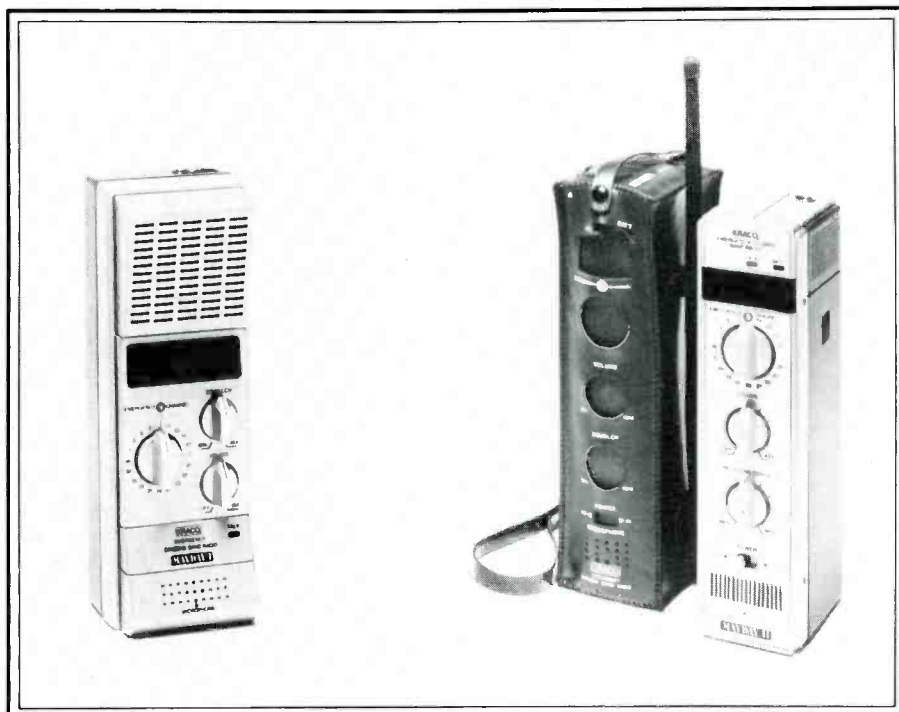
The HELP! transceiver has an optional portable power pack available. However, the unit draws so little power that you can use it for a very long period of time from your vehicle's power supply without draining your battery (engine off). I tested the HELP! on a car battery so dilapidated it wouldn't turn over the vehicle's engine and barely had enough Moxie to blow the horn, and yet I had the transceiver operational. I've used this set, perched on the hood of the vehicle, as a portable command post—obtaining good solid coverage to other mobile units 4 to 6 miles away.

What really sold me on the potentials of these little transceivers was the time I was 4-wheeling in the Humboldt National Forest

of Nevada. This area is in the White Pine Mountains and not particularly close to civilization. A problem with my vehicle arose which couldn't be corrected without help, and the availability of the HELP! transceiver saved the day. From my high location, I was able to contact a base station located 30 miles away in Ely, and it wasn't long before help was on the way. Survival? You betcha!

Subsequent to that episode, I decided to incorporate several of these little emergency transceivers into survival communications systems used by groups with which I'm personally affiliated, as well as systems I've designed for others. They are used in conjunction with various other communications equipment, including scanners, HF, VHF, and even UHF transceivers.

I'd like to point out here that since many RV's (recreational vehicles) have long used 27.115 MHz (Channel 13) as their operational frequency, it has been unofficially adopted by many survivalists, since lots of RV owners are active as survivalists. You may wish to either adopt or avoid this frequency because of this; I'll pass along the information for whatever value it may be to you. In any event, it would be best to avoid using Channels 9, 16, 19, and those from 31 through 40 for your AM drills and general communications, as those channels are generally in use for various special purposes and by special interests which will result in interference, either to your operations or because of your operations. Of course, Channel 9 is an emergency frequency and you'll certainly want to keep that in mind. Channel 19 is an in-transit mobile frequency in heavy use throughout the United States and Cana-



The most recent unit introduced consists of two devices from Kraco. The "Mayday" is the basic transceiver (shown on the left), while the "Mayday II" (on the right) includes a battery pack of its own.

POP'COMM Brain Busters

Think you're so smart? Let's see if you can figure these out, Bunky!

BY HARRY CAUL

1. Fred decided to sell off some of his old radio equipment in order to save up money towards a new communications receiver. After his trip to the flea market, he decided to put half of his receipts into the bank. His banking completed, he was amused to note that he had left just as many cents as he had dollars, and half as many dollars as there were cents before he went to the bank. How much money did he make at the flea market?

2. A military communications specialist is told to send out a certain number of pieces of traffic to four other stations in his network. Because of heavy channel crowding, he only delivers half of his messages and half a message to Station #1. To Station #2, he sends half the messages he has left plus another half of a message. To Station #3, he transmits half the remaining messages and half a message. Taking count, he finds he has 36 messages left to transmit to Station #4. How many messages did he start out with?

3. An FCC monitoring station is in operation night and day. The monitors change shifts every time the two hands of the station clock coincide. At what times, within 24 hours, will the monitors change watch. If no monitor is on duty there more than once a week, how many monitors will serve at that station from a minute before Monday noon to a minute after Sunday noon.

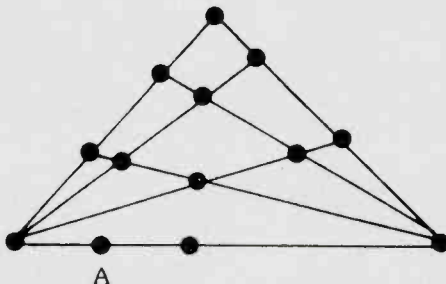
4. FCC monitoring stations are told that a concerted effort is to be made to catch pirate broadcasters. Monitoring Station A turns up half a dozen dozen illegal stations and is given a dozen commendations the half-dozen caught. Monitoring Station B locates a dozen dozen unlicensed stations and receives half a dozen commendations the dozen caught. Which Monitoring Station receives more commendations?

5. As a backup to a satellite communications system, it's decided to establish a row of microwave towers to girdle the earth at the equator. As a secondary backup, some bright engineer suggests stringing communications cable between each of these towers just in case the microwave system fails. Sup-

pose the earth is a perfect and even-surfaced sphere of exactly 25,000 miles circumference. The poles are strung with cable which is 100 feet longer than the circumference of the earth, so that when it is in use there is a globe-circling cable strung 'round the earth concentric with the equator. Could a man pass under this cable at the equator without touching it? Could a ship pass under it?

6. It's been decided to replace the communications equipment located in an underground bunker. Survivalists A, B, and C are carrying the new equipment into the tunnel and at mid-point meet Survivalists D, E, and F carrying out the old equipment. It's a very long and narrow tunnel, too long for any of the group to trek all of the way back carrying the heavy equipment; too narrow for them to fit side-by-side in the tunnel as they pass one another. Luckily, they discover a small alcove which will admit any one of the men carrying equipment. How can they pass?

7. A Survivalist group establishes a field of sentries to watch for intruders. Member A, whose secret passion is design, is considerably upset by the fact that his position, "A," plays no essential part in the design created by the other sentries. How might the Commander have laid out the field to place all 13 sentries in a similar pattern, but also satisfy Member A's aesthetic sense?



See page 75 for answers. No peeking!

da. Channels 16 and 31 to 40 are heavily used for single sideband (SSB) operations and AM communications are incompatible with SSB operations on the same channel. It's not only courtesy, but good communications practice, to stay clear of these frequencies unless you are operating within their respective operational scopes.

Reader Question

Reader Allen W. of Sims, Arkansas, wrote and asked for my thoughts on the possibilities of putting camouflage colors on communications equipment to be used in the field. Certainly it would make such equipment less easy to see, especially since commercial equipment invariably has lots of shiny reflective surfaces. Military equipment intended to be used in the field is generally painted with khaki color, and anything that isn't khaki is usually flat black (like the control knobs).

Painting on commercial equipment can be done by the user with either khaki or dark brown, if not with actual camouflage colors. It will, of course, ruin any resale value of the gear unless you're selling it to another survivalist. You would also want to consider masking over any control description lettering and meters with masking tape so that these things will remain paint-free when you're through having fun with the spray can. Also, remove any knobs and controls prior to painting and tape over the shafts to which they had been attached. Tape over any switches, antenna and power sockets, and vents and other openings in the cabinet.

Camouflaging for maximum effectiveness will also mean leaving covers (such as flaps) over any LED's and other lights that are showing when the set is in operation. Best bet is to also think about hooking up headphones so that the sound from the loudspeaker won't give away your location.

Addresses of Manufacturers

General Electric
Audio Electronics Dept.
Electronics Park
Syracuse, NY 13221

Radio Shack
1800 One Tandy Center
Ft. Worth, TX 76102

Kraco Enterprises
505 East Euclid Ave.
Compton, CA 90224

Midland International
1690 N. Topping
Kansas City, MO 64120

Cobra Communications
6460 W. Cortland
Chicago, IL 60635

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

A few years ago, in a three-way conversation about RTTY transmissions and its future, arose the agreed concept of the tremendous growth of satellite data relays at the expense of HF (3-30 MHz) RTTY transmissions. Well, what we have seen is an exponential growth of not only satellite data but also HF RTTY data! Doom continuously is forecast for commercial shortwave RTTY transmissions, but new stations keep cropping up as if to defy logic. Why is this, if satellite is the optimum data relay?

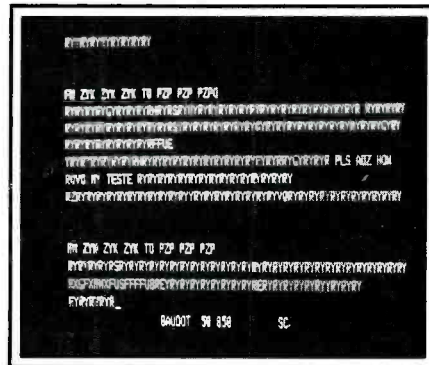
Well, several reasons: First of all, the amount of data, including video, has been growing at a faster rate than the available bandwidth, with new services developing every month. Secondly, the expense of transponder space is extremely high. Imagine a recent transponder that sold for \$14,000,000! However, the number of slow speed 50 baud channels that can be sent over 30 MHz (40 MHz actual minus guard band), the practicality of using all of this for FSK is dubious. Thirdly, the access of satellite for Third World countries is not as readily available as HF for an uplink service. HF RTTY is a low cost, reliable way of moving data when compared to the alternatives. By the way, satellite transponders are positively loaded with RTTY signals!

It seems that while some RTTY transmissions migrate to satellite, many more will crop up between 3 to 30 MHz. Let's face it, any spectrum space is rapidly becoming a scarce resource. Anyway, the response has not only been positive, but serious equipment questions have come up as well. Specific equipment is best covered in equipment reviews and in subsequent issues; we will try to offer a technical glimpse of the various products offered.

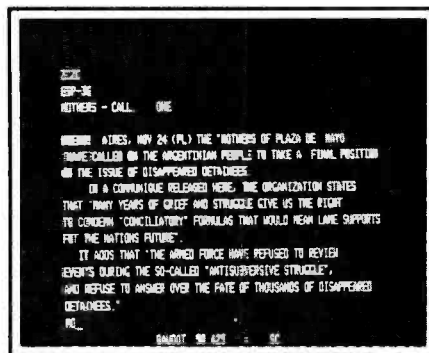
In conjunction with separate equipment reviews, we will expand our coverage of transmission frequencies and times. Most of our readers simply want more of both equipment reviews and listings! We would like our readers to submit their favorite RTTY loggings to POP'COMM for publication.

One of my favorite RTTY frequency lists has been updated and is now available from Gilfer Shortwave, Park Ridge, New Jersey, 07656-0239 for \$9.95, plus \$1.50 for delivery. This expanded second edition of the *Guide to RTTY Frequencies* includes 5,500 RTTY stations in two separate lists, a most valuable guide. An introduction reviews tips on reading Cyrillic text, a text used especially by the Soviet Union. A must for a complete RTTY collection, this book will unlock the world press networks with complete up-to-date schedules.

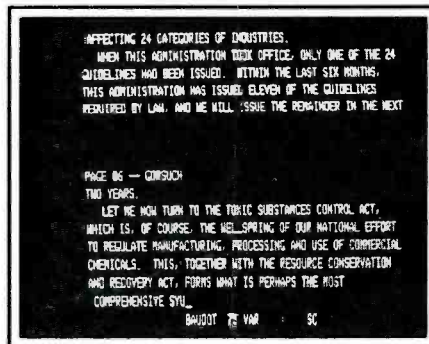
Lately, I've enjoyed logging the strongest



Test slip from station PZP, Zanderij Air, Surinam, on 18470 kHz. Photo taken by the author from CRT connected to a Universal M-600 terminal.



The official Latin Press from Cuba, logged at 2234 GMT on 18193.5 kHz.



A Voice of America RTTY transmission monitored at 0045 GMT on 12223.5 kHz, 75 baud.

RTTY signals received in the Midwest. These include the third world countries either sending out news transmissions or having news beamed to them.

Either way, listeners in the United States are fortunate, as they are directly in the path of third world signals. The third world, or "non aligned" countries, has an obviously contrasting viewpoint on current events, with the venerable AP or UPI and the bal-

anced viewpoint achieved by the RTTY hobbyist monitoring both groups. The real expansion of mass communications by means of the printed word began in eighteenth-century England, with the availability of low cost text. A quantum jump in mass communications has again been possible with the advance of low cost electronics, specifically the microcomputer and the new paperless age that this ushers.

An anonymous writer to the *Edinburgh Review* wrote in 1837 that the key to an informed person was balanced news:

"Books, how cheap soever, and however popularly written, are not likely to be read by the uninformed . . . But all men will read the news; and even peasants, farm servants, country day labourers, will look at, nay pore over the paper that chronicles the occurrences of the neighbouring market town. Here then is a channel through which, alongst with political intelligence and the occurrences of the day, the friends of human improvement the judicious promoters of general education, may diffuse the best information, and may easily allure all classes, even the humblest, into the paths of general knowledge."

This quote sums up well the allure of RTTY DX'ing with the fantastic access of the world's news networks and resultant "knowledge". Even though we know that certain transmissions from the third world countries is propaganda, the real test of knowledge is the ability to distinguish between true facts and simple propaganda.

I have been both pleased and surprised by the number of readers who have written and expressed their interest in commercial RTTY monitoring. All responses have been very enthusiastic and positive toward the overall format of technical equipment requirements and actual loggings. We will continue in this vein, establishing a balance of confirmed news transmissions and specific hardware additions.

Most of the questions asked by readers revolved around matching receivers with demodulators and accessories. For example, one reader wanted to know what display monitor he could use on his INFO-TECH M200F demodulator. Display monitor? A most useful accessory, the display monitor is really a cathode ray tube (CRT) used to show the relationship of mark and space frequencies simultaneously.

Commonly called an X-Y monitor, the Y axis, or vertical CRT trace, represents mark (2125 Hz); and the X axis, or horizontal trace, is the space (2550 Hz for a 425 Hz shift, and 2975 Hz for an 850 Hz shift.) The mark and space signals are correspondingly

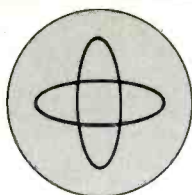


Figure 1

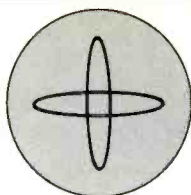


Figure 2

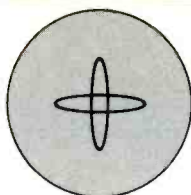


Figure 3

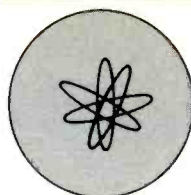


Figure 4

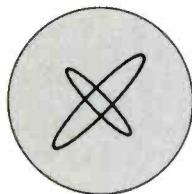


Figure 5

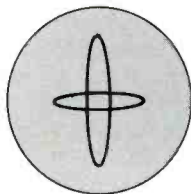


Figure 6

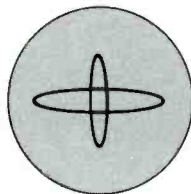


Figure 7

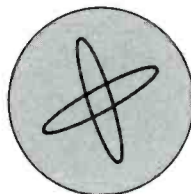


Figure 8

filtered and then displayed. Many different devices have been used for optimally tuning the FSK signal. Just a few are noted:

- LED's for mark and space
- Zero-center meters
- X-Y cross pattern
- Spectrum analysis

These techniques are more or less in order of increasing cost, with LED's as the most popular and lowest cost tuning aid. The idea is to quickly and correctly tune the receiver so the mark and space frequency is positioned equally (symmetrically) about the IF center frequency. The IF bandpass should be just wide enough to pass the entire FSK generated spectrum. This will then be

optimally tuned and errors will be minimized. Keep in mind that FSK is very critical to any receiver drifts, considering drifts of 200 Hz or more are very common. A good indicator will visibly show drift and selective fading occurrences and allow for compensation through fine tuning or switching antennas.

Selective fading is a troublesome fact of life on HF. This is where one frequency fades and the other frequency (such as space) does not fade. A visible cross pattern will easily show selective fading clearly on the CRT. Several examples of the cross pattern are shown in Figures 1 through 8. Figures 1 and 2 show a correctly tuned RTTY signal with mark and space equal in height

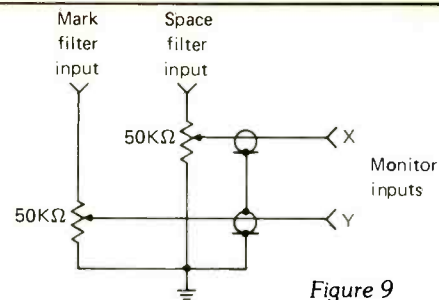


Figure 9



This is the HAL RS2100 RTTY Tuning Scope that shows an accurate display of a received signal.

(Y) and width (X). But Figure 1 has broad filtering with few tuned filters, while Figure 2 is ideal. Figure 3 represents a weak signal, a signal not in limit. Figure 4 is simply noise—no coherent pattern shown. Figures 5 and 8 indicate excess drift or receiver mistuning since the ideal cross hatch is angled. Selective fading can be quickly identified in Figure 7 since the mark frequency has dropped sub-

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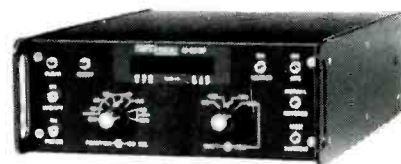
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stantially below detection threshold. A character "hit" will be apparent from this radical drop in signal level. As you tune through an RTTY signal, the cross will grow larger and larger until a perfect cross is obtained—Figure 8, Figure 1, and finally Figure 5 as the receiver is tuned past the center frequency.

However, many times only a pattern similar to Figure 6 will be obtained, indicating a wrongly selected shift. For example, if a 425 Hz shift is selected and the incoming signal is an 850 Hz, the perfect cross hatch will not be obtained. Mark will then be centered and peaked, while the alternate shifts will be selected until space is maximized.

The entire tuning process can be accomplished in two seconds—confident that perfect tuning is achieved. A standard X-Y monitor can be used as a cross pattern tuning indicator can be easily used if the voltage range available on the output of the demodulator matches that on the monitor. A circuit in Figure 9 shows a way of reducing the peak voltage to match the monitor's peak requirement. A strong RTTY signal is tuned in and then each 50k potentiometer is adjusted to

display a full frame trace. Each should be equivalent widths. A standard oscilloscope can be used if X and Y inputs are provided with the time base switchable to off. After all, an X-Y monitor is equivalent to an oscilloscope without a time base!

LED's are not as precise and fast as tuning using a cross-pattern; and it usually requires some training time to interpret the variance in LED brightness. The goal is the same, maximizing mark and space outputs and reducing off tuning errors. I'm currently building an audio frequency spectrum analyzer to observe if this technique will provide even faster tuning, I will report in a future issue the results of this home project.

In response to much interest in our monthly loggings, we are going to broaden our scope to include weather and military loggings. We will restrict military frequency listings to foreign military forces since the vast majority of the United States military RTTY is securely encrypted. Also, occasional loggings may overlap from month to month due to these transmissions being currently active.

Frequency	Location	Time (GMT)	Language	Shift	Baudot Rate	Normal/Reverse Phase
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Reuter - Reuters Ltd.

18334.0 kHz	London, Great Britain	1800	English	425 Hz	50 baud	Reverse
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Arabic news is transmitted on the above frequency at 1730 GMT. This is a good opportunity to observe the characteristic arabic format.

14513.5 kHz	London, Great Britain	0645	English	425 Hz	50 baud	Reverse
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French news logged at 0515 GMT on 14513.5 kHz

14514.4 kHz	London, Great Britain	1500	English	425 Hz	50 baud	Reverse
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10959.0 kHz	London, Great Britain	1815	English	425 Hz	50 baud	Reverse
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10959.5 kHz	London, Great Britain	0400	English	425 Hz	50 baud	Reverse
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9119.4 kHz	London, Great Britain	1615	English	425 Hz	50 baud	Reverse
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9120.6 kHz	London, Great Britain	0312	English	425 Hz	50 baud	Reverse
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French is also transmitted on 9120.6 kHz at various times between 0200 and 0515 GMT.

KCNA - Korean Central News Agency

11170.0 kHz	Pyongyang, Korea	0427	English	425 Hz	50 baud	Normal
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8152.0 kHz	Pyongyang, Korea	1150	French	425 Hz	50 baud	Normal
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9395.0 kHz	"	1530	English	425 Hz	50 baud	Normal
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10579.7 kHz	"	0900	English	425 Hz	50 baud	Normal
-------------	---	------	---------	--------	---------	--------

11230.2 kHz	"	1200	French	425 Hz	50 baud	Normal
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11431.5 kHz	"	1100	English	425 Hz	50 baud	Normal
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13511.5 kHz	"	0200	Spanish	425 Hz	50 baud	Normal
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13582.5 kHz	"	0930	Spanish	425 Hz	50 baud	Normal
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13780.3 kHz	"	1307	Russian	425 Hz	50 baud	Normal
-------------	---	------	---------	--------	---------	--------

14568.0 kHz	"	0330	English	425 Hz	50 baud	Normal
-------------	---	------	---------	--------	---------	--------

15633.5 kHz	"	0630	Russian	425 Hz	50 baud	Normal
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Here are some unknowns—let's have your input on these strange RTTY signals.

7920.0 kHz	?	0550	Russian	425 Hz	50 baud	Normal
17122.7 kHz	?	2343	Test Message	850 Hz	50 baud	Reverse

The 17122.7 kHz signal has a test transmission signed on with PWZ-33 call letters. Possibly Brazilian Navy stations at Rio de Janeiro?

Don't Be Left Out in the Cold with the Russian Woodpecker

GET A MOSCOW MUFFLER™

Another first from AEA. The Woodpecker Blanker, WB-1 really works. This unit effectively blanks the pulsing interference of the Russian Woodpecker. Two versions are available, the WB-1 for use with communication receivers and WB-1C for use with all popular transceivers.



This extremely useful accessory is designed for direct insertion between your receiver (or transceiver) and the antenna. It is both MORE EFFECTIVE than I.F. type blankers and requires NO MODIFICATIONS to your receiver! The unit operates from a 13 VDC ± 2 VDC power source at less than 575 mA. (AEA AC wall unit AC-1 will operate the blanker.)

The blanker works well on both CW and SSB modes that are being interfered with by a woodpecker. Controls on the front panel include; four push button switches, a synchronize control and a width control. The WB-1 also features a low-noise untuned broadbanded 6 db gain pre-amp which can be selected with or without the blanker enabled. The WB-1C uses the same circuitry but includes a carrier operated relay (COR). This provides protection to the receiver section during transmissions from the attached transceiver.

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NEW AND EXCITING TELEPHONE TECHNOLOGY

Automatic Dialers

This month, let's look at the increasingly popular automatic telephone dialer. There are some new innovations in this type of equipment, and this very well may be the year for you to add an auto dialer to your present telephone equipment.

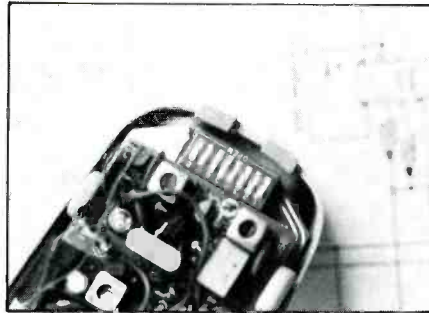
It's not against the law to add private phone equipment to your telephone line. The Federal Communications Commission, in 1977, deregulated rules that formerly forbid the telephone user from adding peripheral equipment. Now you can stack on as many dialers, cordless phones, and additional telephones to your heart's content. Just make sure that any device you add to your present telephone line has an FCC registration number that "approves" a piece of equipment for installation on regular telephone lines. Look for this registration number in the sales brochures or on the bottom of the actual piece of telephone equipment.

The automatic telephone dialer is fast becoming a necessity for the busy business person who wants to save time in looking up numbers and dialing. It's also a tremendous time saver when dialing unusually long numbers associated with the new private microwave networks—SPRINT, MCI, ITT, etc. These services usually require a series of 3 to 7 additional numbers in front of the actual telephone number you wish to call. Automatic dialers make calling a breeze!

I have a hard time remembering my own phone number! If you are like this, the automatic dialer for your private telephone is just as handy as for business systems. Your personal automatic dialer may instantly call for help, remember the number for the Poison Control Center, and will instantly recall the phone number of your brother-in-law that lives in France. Instead of going to your handy black book to look up a number, simply find the name on your auto dialer index and push a single button.

In an emergency, the automatic dialer may be a life saver. Many areas of the country still require lengthy phone numbers to place a call to the police, fire department, or paramedics. Instead of dialing 911, you are still required to dial a different number for each service in an emergency. With an automatic dialer, simply push fire, police, or medical for immediate assistance.

Another use for automatic dialers may apply to our readers with older rotary dial phone systems. An automatic telephone dialer converts your rotary dial phone to fast touch dial systems. The automatic dialer instantly converts the tone back to dial pulses for your older system. It does all the work.



Dialing pulse speed selector.

How To Select The Best Dialer

The innovation of the electronic chip (LSI circuitry) has led many manufacturers into the lucrative automatic telephone dialer market. Three years ago, there were only four manufacturers of automatic telephone dialing equipment. Now there are over 50!

Let's take a look at some popular features of these dialers to assist you in making your best decision on which one to select.

Memory Size. How many phone numbers do you want remembered? A minimum of 10 memories should be selected. There is little expense in developing the automatic dialer with up to 60 memories! A happy medium might be 20 to 40 memories. About the highest we know of is 100 memories. It takes about 30 to 40 seconds to initially program and accurately dial in a phone number for each memory slot. Save some extra memory positions for future phone numbers. After all numbers have been programmed, it is only a single button push to dial them up from the memory.

Digits In Memory. A 12 digit memory may only allow you to dial a regular long distance number. A 16 digit memory may also allow you to, with a single push of the button, dial long distance numbers superseded by special access numbers for private microwave systems. The better automatic dialer will even allow you to program pauses in between your private interconnect number and the regular long distance number—all this accomplished with only a single push button stroke.

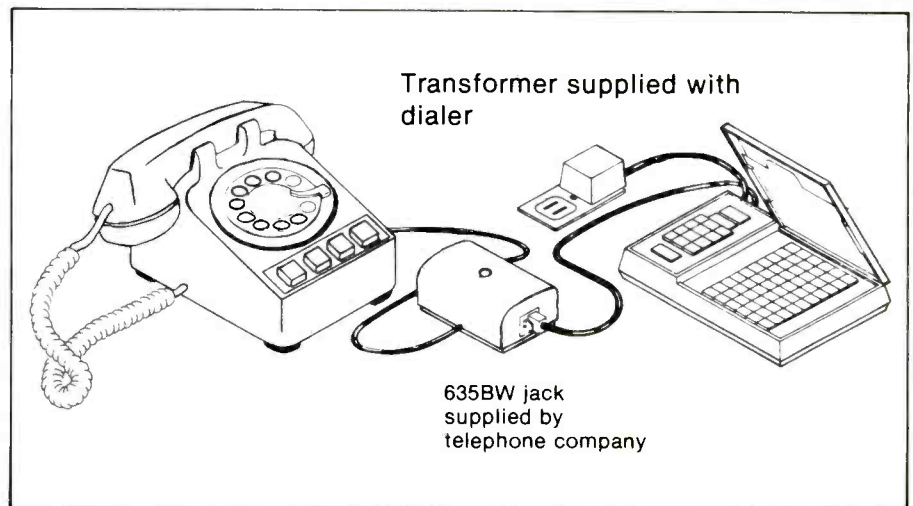
It's possible to access extra long numbers with regular 12 digit equipment by using two memory spots. However, this wastes time, requires two separate key strokes, and uses up twice as much memory. Go for a system with 16 digits of memory if you have private long distance telephone service with extra access numbers.

Touch Or Pulse Dialing. If you live in an area with strictly touch dialing, rather than mechanical rotary dialing, a straight push button to tone dialer is fine. However, if you live in an area that still requires pulse rotary dialing, better select a model that allows you to push buttons but end up with pulse dialing out. Many models offer both features built in with a single flick of a buried switch in its innards.

Pulse Dialing Speeds. If you do have a rotary dial pulse system, many times a faster speed will increase the rate of dialing. A 10/20 pulse speed control is advantageous.

With keyboard tone dialing, there is virtually no maximum upper speed limit, and most automatic dialers spit out the number, in its entirety, in tone, in less than a second!

Pause Control. Yes! Make sure the



Transformer supplied with dialer

635BW jack supplied by telephone company

Complete assembly showing dialer hook up.



Telephone dialers are great time savers.



A dialer is built right into this phone.

equipment you select has a pause control function built in. Certain office installation requires you to first dial 9, then pause for another dial tone, and then dial out. A pause control that is programmable allows the equipment to wait for that second dial tone.

Last Number Redial. Without having to go down your list, simply push "last number redial" to call up the person you just spoke with. It will instantly recall the last number you selected—even five days ago, if that was the last time you used your equipment. A very important feature!

No Answer Redial. This is a handy feature not found in many pieces of equipment. If you should happen to reach a busy number, your equipment will automatically hang up, and then redial that number again after 15 seconds. It will do this up to 20 times before giving up completely. Automatically, without any command, a busy tone will turn on a very persistent circuit that keeps redialing the number!

Now, the bad news. Not all busy signals sound the same. Only the most popular busy signal will trigger this equipment to automatically try again. Let's hope, soon, that everyone in the United States standardizes their busy signal tone frequencies.

Monitor-Speaker. This is a handy fea-

ture that lets you push a single button to dial a number without even having to take the phone off the hook. When the called party picks up the phone, you pick up your phone and automatically the speaker is disconnected. You can even reconnect the speaker to let everyone else in the room listen in on your conversation.

This speaker system is also important in verifying your telephone dialing a busy number. It's also handy if you are put on hold. You may continue to work at your desk with your phone put down until you hear someone come back to your conversation. This prevents long waits of dead silence with the phone on your shoulder!

Numeric Display. Little numbers will verify the number you are calling. They also reconfirm the number you have programmed into the memory. Some numeric outputs also allow you to recall a certain phone number without actually dialing it. So far, no one has come up with a display that shows both the phone number as well as the name of the person you are calling!

Take a look at the numeric display and make sure that you can read it easily. Some are red, some LCD, and some blue with a bright readout. Can you see the numbers easily? This is very important for those of us that are far-sighted!

Clock. Some auto dialers also feature a clock. When you are not using your equipment, you can see what time of day it is. Some auto dialers automatically go from clock to interval timer to let you know how long you have been on the phone. Some auto dialers have a built-in push button timer that allows you to time certain segments of a phone call in hours and minutes. Who knows? There is probably *someone* with a piece of equipment that automatically terminates the phone call after 10 minutes, to keep long-winded children off the line!

Battery Backup. Absolutely necessary! If your automatic dialer is momentarily or accidentally disconnected from the AC power source, backup batteries will keep alive all the memories. Make sure to change your batteries when the unit is plugged in, at least once each year. Imagine "dumping" 100 memorized telephone numbers because you neglected to put in a battery!

Additional Features. We have just listed the most important feature to analyze when selecting automatic dialers. Styling may be very important to you. Since most units plug into 110 VAC, the power cord assembly might be of importance also. Does your unit have a protective cover that will keep your cats from automatically calling home, as mine many times do, with my cover open? (A three month investigation to a constant erroneous phone bill finally led phone officials to suspect that my seven cats were either sitting on my automatic telephone dialer equipment, or "pawing" out numbers at random in the middle of the night. Upon checking at 2 in the morning, the warmth of the dialer attracted my cats, and the best place to stay warm was smack dab on top of the keys. Case closed!)

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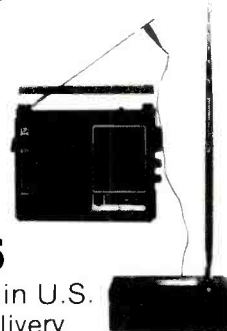
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The Capri Electronics RF Notch Filter can be used with any scanner that has a Motorola type external antenna jack. No modifications to your scanner are necessary. Works with outside antenna systems as well as with the whip that comes with your scanner.

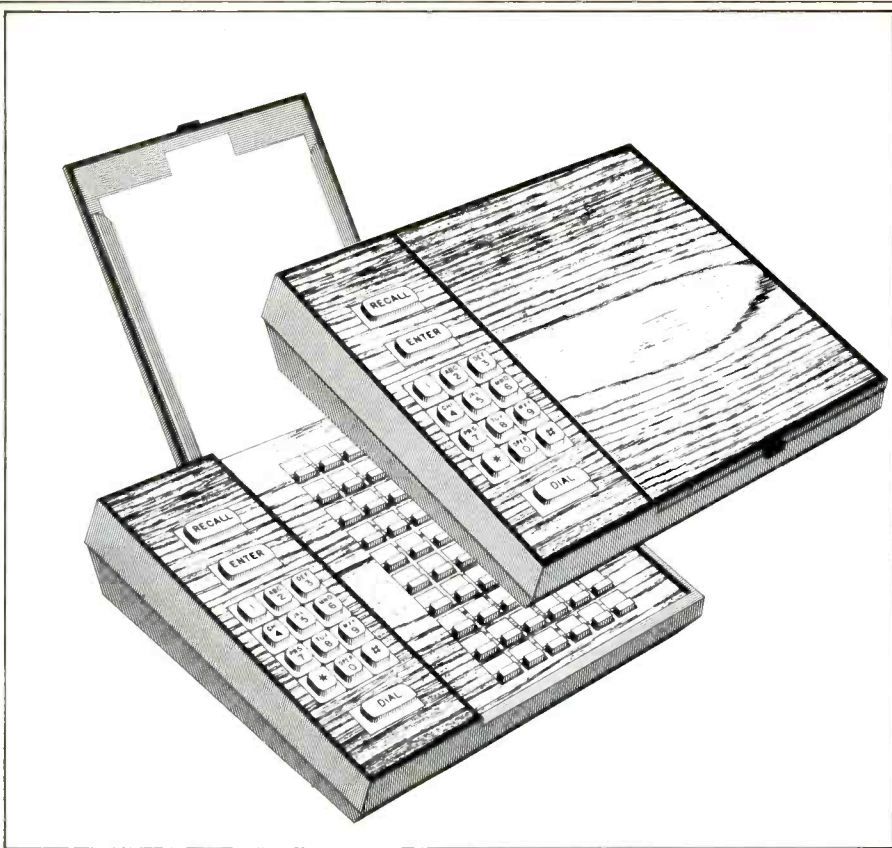
The easy tune, calibrated dial lets you move the notch to any interfering signal from 70 MHz to 200 MHz. The notch depth is 40 dB at 162 MHz and the VHF insertion loss is less than 1 dB (0.5 dB typical).

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CIRCLE 24 ON READER SERVICE CARD



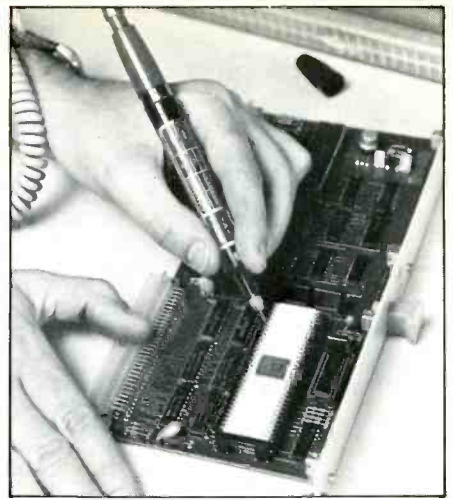
The automatic dialing controls can be hidden away under the lid of this HI-TEK unit.

Interference Problems. Another area to explore before purchasing an automatic dialer is whether or not it will create a tremendous amount of interference to your television or radio monitoring setup. That's right. Most automatic dialers use memory chips that transmit small amounts of energy over RF frequencies. Make sure that where you buy it will take it back for an exchange in case the dialer puts out a dead carrier on one of your favorite scanner or shortwave frequencies. Although FCC specs require this stray RF interference to be kept to a minimum, some dialers create havoc with shortwave, Amateur Radio, and monitor radio

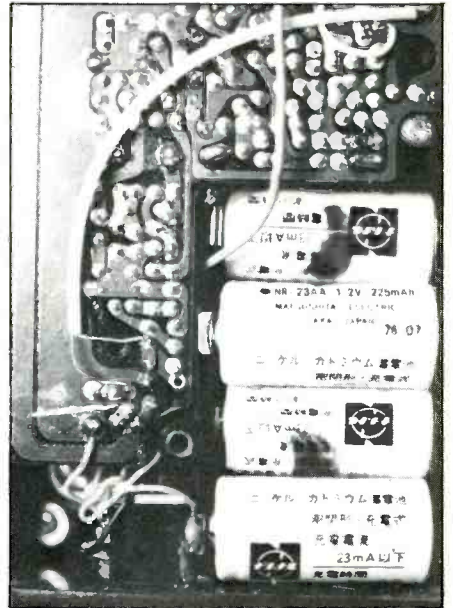
setups. The only way to see whether or not yours is causing a problem is to turn it on with your other equipment running.

Also, make sure that your automatic dialer has transient protection to protect it from nearby lightning strike. Some dialers lose their memory with a close lightning strike. Some auto dialers also dump their memories in dry weather when contacted by someone moving across a carpet.

Pricing. Automatic telephone dialers have constantly been coming down in price, thanks to microprocessor circuitry advances. In several tests, it has been found that the less expensive equipment tends to



Checking the unit for RF noise.



4.8 volt battery backup.

have either less memory or less features. The more expensive equipment has generally more features and/or better reliability under adverse conditions.

Explore the features that are most important to you. Next, shop around for catalogs on the different types of equipment. Finally, deal with a sales source that will allow you to exchange the equipment in case it causes RFI to your hobby radio equipment.

Installation. Some units are installed in parallel with your existing telephone apparatus. Some dialers are installed in series. Both are simple plug-in connections, but you must consult your owners' manual for the right connection for your system. It's all done with plugs—there is no extra wiring.

Finally, read over the information and select the automatic dialer that best suits your needs. Choose a reliable store from which to make your purchase. Look for stray RFI after the simple installation.

Your automatic dialer is the perfect answer to phone home with just the push of a single button. After that first call, you will never phone home without it.

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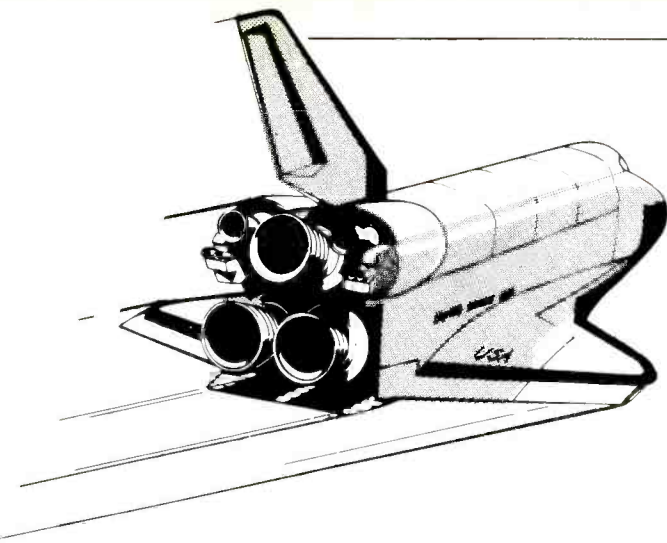
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CIRCLE 57 ON READER SERVICE CARD

The Army's Role In Space Shuttle Communications

Army Calling "Challenger"



The East Coast Telecommunications Center (ECTC), Fort Detrick, MD, continued to play a vital role in the recent mission of the Space Shuttle, as it had done for the previous missions. As the Shuttle lifted off the launch pad, ECTC provided the communication linkup between the Cape and Johnson Space Center in Houston.

Chief Warrant Officer Stephen Dill, Officer in Charge of the Fort Detrick Ground Terminal Division, said ships down range were also fed information from Cape Canaveral. As the Shuttle moved into orbit, the Fort Detrick team provided the vital communications and telemetry between Columbia and its ground control centers.

When the Shuttle crosses into the Indian Ocean portion of the orbit, a Defense Department earth station on Mahe Island is the sole earth station to carry the shuttle's communications and telemetry information. That information is then sent to the satellite orbiting 22,300 miles above the Atlantic Ocean—higher than the spacecraft itself. The signal is picked up by ECTC and transfers the boosted information to Sunnyvale, California. Sunnyvale is responsible for "blocking" the data to meet NASA specifications. It then transmits the information to the Goddard Space Flight Center in Houston.

Reentry and landing are another critical communications point. ECTC personnel ensure the communications lines are functioning well.

The signals are picked up by one of the four white dish antennae located outside ECTC. The two 60-foot antennae nearest the Center headquarters provide long-haul communications channels to locations in Europe and Asia Minor, as well as the East Pacific region.

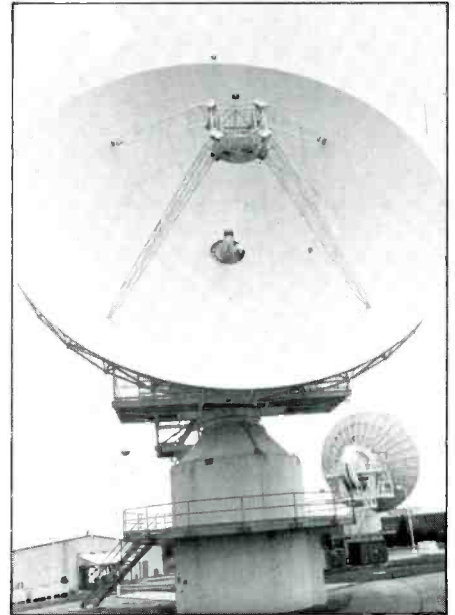
Two other antennae across the street are devoted exclusively to the Direct Communications Link between President Reagan and the Soviet Union.

This procedure will continue to be used with all shuttles, including the present one, the Challenger. According to Dill, the Center is looking forward to a future Space Shuttle mission that will replace a Defense Satellite Communications System satellite with a more up-to-date "Phase III" version.



Chief Warrant Officer Stephen Dill makes an adjustment to a Spectrum Analyzer used to measure power. The East Coast Telecommunications Center is part of a worldwide satellite communications network.

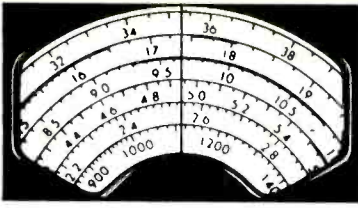
Mark DeWoody makes an adjustment to a Spectrum Analyzer, at The East Coast Telecommunications Center. The Center has a key role in the Space Shuttle program.



The signals from the Shuttle passed through the 109-ton 60-foot diameter antennas at Fort Detrick.

Jane Douglas and Jim Prince check a reading on a modem. When the Shuttle roared through its path on this side of the globe, the transmissions were reached at Fort Detrick.





COMMUNICATIONS CONFIDENTIAL

BY HARRY L. HELMS

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

What was the first station you heard on shortwave? It may well have been standard time and frequency station WWV (or its sister station WWVH). Even if it wasn't the first, it was probably one of the first. And if you're like most DXers, you are probably an active user of WWV/WWVH's time and propagation announcements. To a lesser extent, you probably use the similar services provided by Canada's CHU as well.

But there are numerous other standard time and frequency stations scattered throughout the world, and many of them make good DX targets. Some of the most commonly heard are located in South America. One is HDA210A, operated by the Instituto Oceanografico in Guayaquil, Ecuador. This station transmits pulses each second and gives a time announcement in Spanish each minute using a man's voice. Listen for them on 3810 kHz during the evening and night hours; they can also be found on 7600 kHz.

A more challenging target is YVTO, the Observatorio Naval Cagigal, in Caracas, Venezuela. YVTO operates continuously on 6100 kHz and also transmits second pulses and has Spanish announcements each minute using a man's voice. Because of the heavy interference around 6100 kHz, you'll probably find the best reception from late night until around your local sunrise.

An easily heard station that many SWLs are unaware of is VNG, operated by Telecom Australia from Lyndhurst, Australia. They transmit on 4500, 7500, and 12000 kHz. Their format is second pulses with a voice identification each 15 minutes beginning on the hour. Your best bets for this station are from 0500 GMT until around your local sunrise.

In Japan, JJJ is as widely used as WWV/WWVH is here. Your best chance to hear them here is on 8000 kHz, where they operate continuously except for 35 to 39 minutes past the hour. Each ten minutes they transmit their call sign and local time in CW and give a voice announcement in Japanese. This station will force you to really burn the midnight oil; try from 0900 to around your local sunrise.

The Soviet Union has several time and frequency stations. One often heard in North America is RWM in Moscow, operating on 4996, 9996, and 14996 kHz. It operates continuously and identifies in Morse code. A similar station is RID in Irkutsk, which operates on 5004, 10004, and 15004 kHz.

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Signed: Richard F. Clark

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AND TIME SIGNAL

JJJ

RADIO RESEARCH LABORATORIES
STANDARD FREQUENCY SECTION
HONGKONG TOKYO JAPAN

The system are:
(1) Standard Radio and
audio frequencies
(2) Time signals
(3) Radio propagation
disturbance warning

3000 2.5, 4.5, 8.8, 10
 3100 1.8, 3.6, 5.4, 7.2
 3200 1.8, 3.6, 5.4, 7.2
 3300 1.8, 3.6, 5.4, 7.2
 3400 1.8, 3.6, 5.4, 7.2
 3500 1.8, 3.6, 5.4, 7.2
 3600 1.8, 3.6, 5.4, 7.2
 3700 1.8, 3.6, 5.4, 7.2
 3800 1.8, 3.6, 5.4, 7.2
 3900 1.8, 3.6, 5.4, 7.2
 4000 1.8, 3.6, 5.4, 7.2
 4100 1.8, 3.6, 5.4, 7.2
 4200 1.8, 3.6, 5.4, 7.2
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 6200 1.8, 3.6, 5.4, 7.2
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 8800 1.8, 3.6, 5.4, 7.2
 8900 1.8, 3.6, 5.4, 7.2
 9000 1.8, 3.6, 5.4, 7.2
 9100 1.8, 3.6, 5.4, 7.2
 9200 1.8, 3.6, 5.4, 7.2
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 9400 1.8, 3.6, 5.4, 7.2
 9500 1.8, 3.6, 5.4, 7.2
 9600 1.8, 3.6, 5.4, 7.2
 9700 1.8, 3.6, 5.4, 7.2
 9800 1.8, 3.6, 5.4, 7.2
 9900 1.8, 3.6, 5.4, 7.2
 10000 1.8, 3.6, 5.4, 7.2

Europe has several interesting targets to shoot for. One good test of your DXing skill is Y3S in Nauen, East Germany. It operates continuously on 4525 kHz with pulses each second. There is no CW or voice identification. This station often has good signals but interference tends to be heavy. West Germany has a challenging target of its own in DAM, the German Hydrographic Institute, at Elmshorn. They operate from 2355 to 0006 (that's right . . . only eleven minutes!) on 4265 and 8638 kHz from late October through late March and on 6475.5 and 12763.5 kHz from late March through late October.

Some European stations operate on the same frequencies as WWV/WWVH. However, they are heard in North America from time to time during disturbed reception conditions. One such station is MSF, operated by the National Physical Laboratory in Teddington, Middlesex, England. They operate on 2500, 5000, and 10000 kHz with Morse code identifications at ten minute intervals. Another one to try for is IBF, Turin, Italy on 5000 kHz. They identify in voice using Italian, French, and English.

A toughie—but still quite possible—is ZUO at Olifantsfontein, South Africa on 2500 kHz. They have been heard by a few DXers on the East Coast during the winter months around local sunset. They identify in Morse code every five minutes.

If you manage to catch any of these, be sure to report the results to Communications Confidential!

Listening Reports

Here are this month's listening reports. Your reports are welcome; send them to Communications Confidential, POPULAR COMMUNICATIONS, 76 North Broadway, Hicksville, NY 11801. Be sure to include the time in GMT and frequency for each item you report.

The loggings this month are contributed by members of the American Shortwave Listeners Club. Their monthly bulletin,

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(8-17-61)

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WWV **WWVH**

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Thank you for your report on reception of WWV on 5 Mc on Nov. 11

Address inquiries to:
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Boulder, Colorado
Comm-DC 35049

SWL, has a column on some of the topics covered in this section. For a sample copy of their bulletin, send \$1 to 16182 Ballad Lane, Huntington Beach, CA 92649.

3080: "URG DW" in CW repeated 0430. (Lani Pettit, Iowa)

3257.2: Five digit Spanish "numbers" station in German with woman announcer 0356. (Charles Keilholz, APO New York)

3347: Network of Soviet "fishing ships" in SSB with Russian traffic 0819. (Spence Naylor, California)

3382: Unidentified continuous multiple tones 0819. (Naylor)

4011.5: Five digit German "numbers" station with woman announcer 1941; used SSB. (Keilholz)

4255.4: PZN25, Paramaribo, Surinam, "CQ DE PZN QRU" marker in CW 0625. (James Andrews, Missouri)

4310: MTI, Plymouth, England, "V" marker in CW 0118. (Andrews)

4560: Unidentified network, perhaps Australian police, English traffic in SSB 1154. (Naylor)

4575: Russian language numbers read by man 1132. (Naylor)

4670: Four digit Spanish "numbers" station with woman announcer 0310. (Pettit)

5112: Five digit Spanish "numbers" station with woman announcer 0203. (Naylor)

5135: Five digit Spanish "numbers" station with woman announcer 0118. (Naylor)

5217: WAR, U.S. Army, Washington, DC, "V" marker 0315. (Naylor)

5223.9: Unidentified marker "S9TD S9TD

S9TD DE UPHA UPHA UPHA V" in CW 1152. (Naylor)

5810: Four digit Spanish "numbers" station with woman announcer 0200, parallel to 8418 kHz; also on 5812 kHz at 0400 parallel to 8419 kHz. (Pettit)

6502.2: Unidentified marker "TSPE TSPE TSPE DE 5UKC 5UKC 5UKC V" in CW 1027. (Naylor)

6821 to 6830: This has been an active range for five digit Spanish "numbers" stations of late in the 0500-0700 time period. (several ASWLC reporters)

7885: Five digit Spanish "numbers" station with woman announcer 0500. (Pettit)

8000: JJY, Tokyo, Japan, time signals 1145. (Stewart MacKenzie, California)

8216.3: Five digit Spanish "numbers" station with woman announcer 0437. (Naylor)

8301.3: Unidentified "3T9" with CQ marker 0124. (Naylor)

8461: ZSC4, Cape Radio, Capetown, South Africa, CQ marker in CW 0630. (Joe Woodlock, Illinois)

8505: XFK, La Paz, Baja California, Mexico, CQ marker in CW 1420. (Woodlock)

8875: Four digit Spanish "numbers" station with woman announcer 0458. (MacKenzie)

9050: Five digit German "numbers" station with woman announcer 0125. (Pettit)

9073: Four digit Spanish "numbers" station 0415; possibly with Radio Havana Cuba in background. (Pettit)

10141: CW traffic net passing messages in Russian, high speed CW, 0115. (Naylor)

12729: UFL, Vladivostok, USSR, "CQ" marker 1501. (Woodlock)

14727: Five digit English "numbers" station with male announcer 2203. (Naylor)

16925: URL, Sevastopol, USSR, CW traffic 0035. (Arch Dawson, California)

17170: Female repeating "Mike India Whiskey Zulu" in SSB 1615. (Naylor)

19050: Russian traffic net, apparently military, in SSB 1130. (Keilholz)

Those of you who like chasing satellite DX, particularly from manned space missions, should be aware that the Soviet Union is now using 19994 and 20007 kHz for telemetry transmissions.

See you next month!

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76-033

Wireless Headphones

Achieve Private Listening As You Roam About The House!

BY TONY EARLL, KNY2AE

Maybe it's late night DX'ing that's keeping the family awake and annoyed. Possibly they don't enjoy hearing Big Ben chiming at 3 AM, or the latest *Sky King* messages from the Air Force. Possibly you've got some chores to do that cannot be accomplished by sitting glued to the receiver. Best way I can think of to handle all of this would involve headphones, but on the other hand they do keep you pretty well anchored to the equipment. A long connecting cord, of course, will permit you to wander around as you listen, but then you could drift off too far and yank the receiver to the floor (ugh), or create a monumental trip-over hazard for yourself and all who traverse your path.

The solution? Wireless headphones. All you need to do is string a loop of wire around the room and hook it to the output of your receiver or amplifier. It will even work with a scanner. You'll hear everything just as you would with a direct connection.

The idea behind this is really pretty simple. The loop wire around the room can be tacked to the ceiling or along the floor molding. It acts as a transformer primary. A high inductance, ferrite rod antenna on the receiver you carry on your headphones acts as the transformer secondary. The receiver's transistor amplifier boosts the signal level to drive the phones.

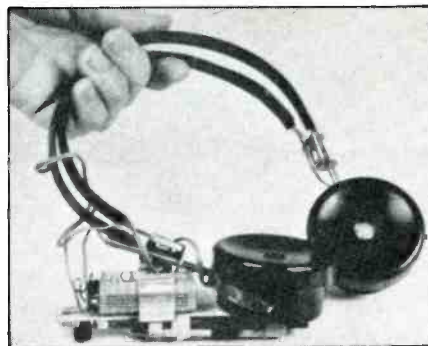
You'd think that you'd hear the 60 Hz hum from the house wiring, but this doesn't happen because that hum is electrostatic. The headphone receiver picks up only the inductive field set up by the loop of wire.

Building It

We show plans for two receivers, one for high impedance phones and one for a low impedance phone. But let's get the loop of wire out of the way first. It consists of ordinary enameled or insulated wire wound around the molding of the listening room.

For best results, the resistance of the loop should be the same as that of the speaker now connected to your receiver. Our table shows wire and room sizes and the number of turns required for output impedances of 4, 8, and 16 ohms. For special applications, keep in mind that the resistance of #26 wire is 0.04081 ohm per foot and the resistance of #22 wire is 0.01614 ohm per foot.

The high-impedance headphone receiver is built on a 3/4" wide by 5" long piece of perforated board. The board can be bolted directly to one of the phones as shown in the pictorial. If you choose this mounting meth-

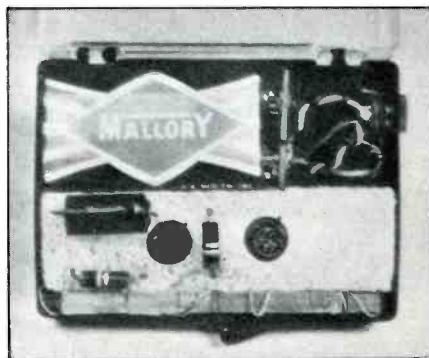


Receiver for high-impedance headphones is built on perforated board which can be either bolted or cemented with epoxy to either of the phones.

Room Size (ft.)	Number of Turns in Loop		
	Receiver Output Impedance		
	4 ohms	8 ohms	16 ohms
6 X 8	3	7	13
8 X 8	3	6	12
9 X 12	2	5	10
10 X 10			
12 X 12	2	4	8
15 X 15	4*	8*	6
15 X 20	4*	8*	6
20 X 20	3*	6*	5
25 X 25	2*	4*	4

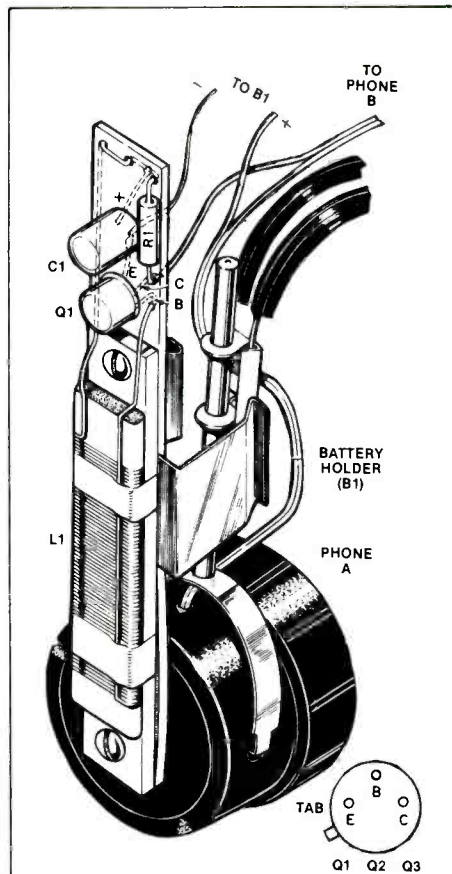
All wire No. 26 except (*) which is No. 22

Author built his two transistor receiver on a piece of styrofoam. Leads pass through easily but may come out in surprising places.

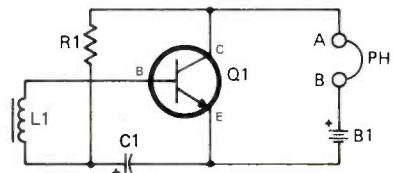


od, remove the phone's cover plate and diaphragm and look for a clear spot before you drill through the case.

Or, you can glue the perforated board to the back of the phone with epoxy cement. After the board is attached, mount the ferrite-rod antenna. Mount the transistor (Q1), resistor (R1), and capacitor (C1) by threading their leads through holes in the board.

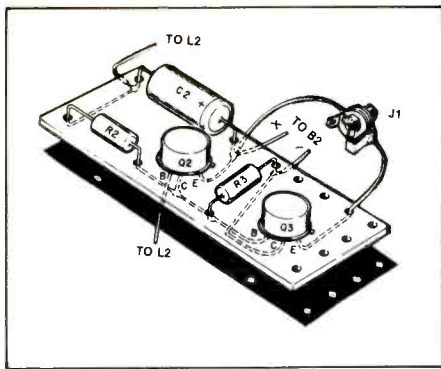


One-transistor receiver is built on a 3/4-inch wide by 5-inch long piece of perforated board. Examine inside of phone before drilling to find a clear area for mounting screw. Phones should be connected in series.

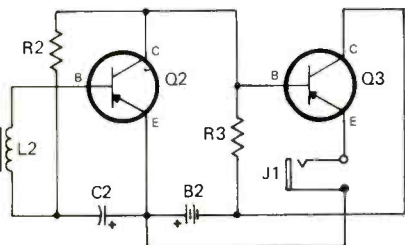


Don't cut the antenna's leads since they are litz wire, which is difficult to strip and solder to. Thread excess antenna wire through holes in the board to get it out of the way. Wrap the tap lead around the rod and tape it out of the way.

Remove the existing cord from the headphones and install a new one just long enough to reach over the headband from



Two-transistor receiver for low-impedance phones is shown built on a 3/4" x 2 7/8" piece of perforated board. Put spaghetti insulation on all leads that cross each other on back.



Schematic of two-transistor, low impedance phone receiver. Because phone is less sensitive, Q2 is required to provide extra gain. Disconnect battery when receiver isn't in use.

one phone to the other. Wire the two phones in series and connect one lead to Q1's collector and the other to the positive battery terminal. A switch is not included—just disconnect the battery clip to turn off the headphones.

The receiver for a low impedance (8 ohm) earplug phone has an extra transistor to provide additional gain. The receiver can be built in the 1" x 2" x 3" plastic box in which the phone is packaged. Our receiver is built on a small piece of styrofoam, but you could use a perforated board. Again, wrap the excess length lead around the antenna.

Operation

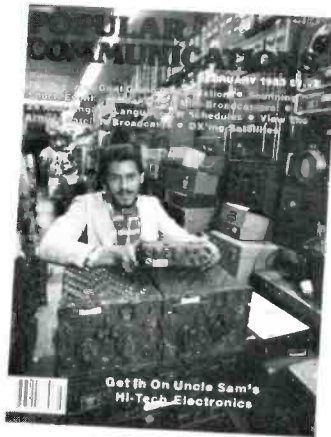
Connect the loop to the audio output of the equipment you'll be monitoring; the use of the set's headphone jack will disconnect the receiver's loudspeaker. Adjust the volume with the volume control, which will probably have to be set higher than for speaker listening. The loop gives best results when about 1.5 to 2 watts of power is pumped into it.

Volume will be loudest when the antenna rod is at right angles to the plane of the loop (that is when the rod is vertical). The closer the rod to the loop, the louder the volume, except when you're directly under the loop, when you won't hear anything. Signal strength falls off rapidly as you move out of the room.

Parts List

- B1, B2 9 volt transistor radio battery.
- C1 30 μ f, 15 volt electrolytic capacitor.
- C2 50 μ f, 15 volt electrolytic capacitor.
- J1 Miniature phone jack.
- L1, L2 700 microhenry ferrite rod (J.W. Miller #2005 or equivalent).
- Q1 2N1302 or equivalent such as 2N439, 2N439A, 2N440, 2N440A, 2N635A, 2N1304, 2N1391, 2N1730, 2N1732, 2N1891, 2N1892, GE-5, DS-72, DS-75, Archer 276-2001, Archer 276-2002, etc.
- Q2, Q3 2N1346 or equivalent such as 2N484, 2N485, 2N486, 2N522, 2N580, 2N1272, 2N1281, 2N1282, 2N1317, 2N1344, DS-26, GE-2, Archer 276-2007.
- R1 200k 1/2-watt resistor.
- R2, R3 100k 1/2-watt resistor.
- PH1 2k ohm dual headphones.
- Misc. #26 enameled wire (about 650 ft. per 1/2 lb.) or #22 enameled wire (about 250 ft. per 1/2-lb.), battery holder, battery clips, plastic box, perforated board, 8-ohm earplug phone.

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PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS

COVERT TECHNIQUES FOR INTERCEPTING COMMUNICATIONS

BY WINSTON SMITH



Inside Communications Interception

Winston Smith's book, *Covert Techniques for Intercepting Communications*, delves into the practices of many federal agencies (including some you may have never heard of) which regularly "screen" telephone, Telex, and other apparently private communications of citizens and businesses. There's a good possibility that your own "private" communications have been noted, or even checked or analyzed by one or another intelligence agency. Maybe you were included in "Operation Shamrock," a secret federal surveillance project which generated almost 80,000 "intelligence profiles" of telephone subscribers. Smith tells exactly who "they" monitor; how, why, and where they intercept communications; he tells who "they" are, and how the government has gone to the Supreme Court in order to be permitted to keep doing it.

The second portion of Smith's book consists of a "how to" manual of simple and advanced methods of surreptitious interceptions of personal and business systems by means of wire and radio. It reveals just how vulnerable all such systems really are and how easily they might be invaded by intelligence gathering operatives and practically anybody else who might take a notion to do it. Methods are spelled out in detail in non-technical language.

In actuality, the second portion of Smith's book was originally produced as a secret government handbook which was supposed to be destroyed because it was too explicit and revealing; instead, it somehow became declassified. A few copies leaked out before they could be suppressed. This is an actual reprint with nothing left out.

Covert Techniques For Intercepting Communications, by Winston Smith, is available at many electronics stores. If you can't locate it locally, it may be ordered by mail from CRB Research, P.O. Box 56, Commack, NY 11725. The price is \$8.95, postpaid by Book Rate Mail. If speedier First Class mailing is desired, add \$1.



Fuzzbuster Super 2

Electrolert, Inc., introduced a new super-het radar detector, appropriately named the Fuzzbuster Super 2.

The new Fuzzbuster Super 2 contains advanced superheterodyne circuitry, which enables the unit to detect all bands of radar at far greater distances than conventional radar detectors. The Fuzzbuster Super 2 is claimed to be 100 times more sensitive than a conventional radar detector.

The Fuzzbuster Super 2 comes equipped with pulsating LED warning lights, a variable beep rate (audio warning signal), and a power on light. The unit plugs into a vehicle's cigarette lighter for easy operation.

The new Fuzzbuster Super 2 will retail for \$249.95. For further information, contact Electrolert, Inc., 4949 S. 25A, Tipp City, Ohio, 45371, or circle number 101 on the reader service card.

The New MFJ-1500 Room Expander

Big screen TV in an average size room adds visual realism of a theater, but the sound you hear is unmistakably small room sound. The aural equivalent to big screen TV is big theater sound with all its thundering reverberation of reflected sound.

The unique new MFJ-1500 Room Expander electronically simulates these reverberations of reflected sounds and makes your entire room seem several times larger than its actual size. You'll hear a difference in sound quality so dramatic and feel so surrounded by sound you'll think you are sitting in a huge theater.

Of course, you don't have to own a big screen TV to enjoy impressive big theater



sound. It adds just as much expansion to TV, VCR, and stereo sound.

This new unit has an ambience control for reverberation, an expand control for time delay, volume control, and an input control.

The Room Expander connects to the audio or earphone jack or the speaker of your TV or VCR. An auxiliary speaker is connected to the Room Expander.

The MFJ-1500 can be used with the MFJ-1501 Stereo Synthesizer for super you-are-there realism.

The cabinet is eggshell white with walnut grain sides and measures 10" x 2" x 6". It operates on 110 VAC or 12 VDC for portable use.

MFJ provides a 30 day money back trial period. If you are not satisfied, you may return it for a full refund (less shipping). MFJ also provides a one year unconditional guarantee.

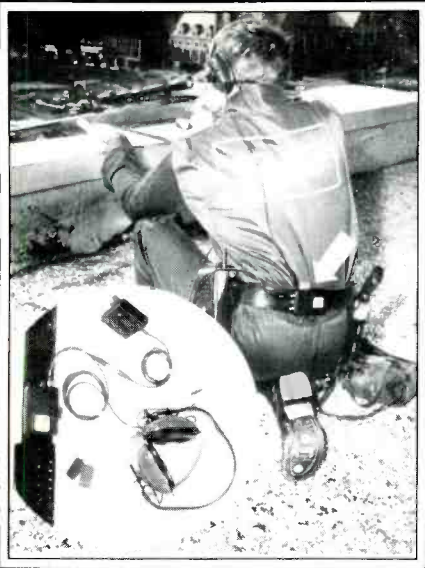
The MFJ-1500 Room Expander is available from MFJ Enterprises, Inc. for \$179.95 plus \$4.00 for shipping and handling. To order, call toll free 800-647-1800 and charge it to your VISA or Master Card account, or mail your order to MFJ Enterprises, Inc., 921A Louisville Road, Starkville, MS 39759. For more information, circle number 102 on the reader service card.

Hands-Free Switching System Activates on First Speech Syllable

Controlonics Corporation introduces Unex brand TOX, automatic hands-free, voice-activated switching system for two-way radios. TOX is designed for use in public safety and industrial work environments.

TOX, talk-activated rather than sound-operated, solves two major problems which plagued users of VOX (voice-operated systems). VOX could be activated by ambient noise while TOX cannot. VOX often missed the first part of a message while TOX picks up even the first syllable of speech. And, as an added bonus, TOX delivers near-broadcast quality audio.

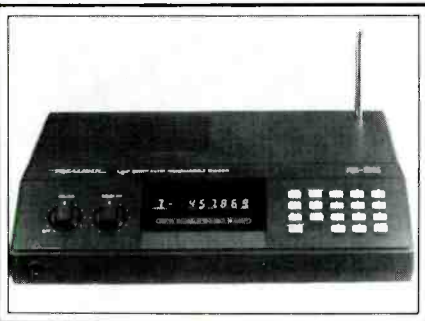
A key factor in TOX's success is the use of Unex headsets, which feature noise-cancel-



ling. microphones. A unique filtering technique tailored to the noise-cancelling microphone isolates the talk or voice component of a signal, discriminating between noise and voice, eliminating false activation.

TOX offers hands-free two-way communication for radio users in applications such as public safety, construction, logging, nuclear facilities, petroleum, and many other industries. In a recent application, TOX permitted crane operators to help comply with OSHA requirements for hands-free communications.

Adaptable to most makes and models of personal, portable, and mobile two-way radios, TOX is sold with Unex lightweight single muff and dual muff headsets. For full specifications, write to: Controlonics Corporation, 5 Lyberty Way, Westford, MA 01886, or circle number 103 on the reader service card.



PRO-2009 Direct Entry Programmable Scanner

Radio Shack offers popular features at a low-cost in a new 8-channel Realistic® PRO-2009 Direct Entry Programmable Scanner (20-109), available at participating Radio Shack stores and dealers.

The PRO-2009 allows direct entry access to 18,160 VHF and UHF frequencies including police, fire, mobile telephones, railroad, Ham, and weather transmissions. A digital readout displays channels and frequencies being scanned, monitored continuously or programmed plus channel status.

The PRO-2009 features a search function

that seeks out new or unpublicized channels; a two-second delay circuit to prevent missing return calls; a lock-out key to temporarily bypass unwanted channels; and a manual key to allow full-time monitoring of a single channel. PLL circuitry with an auto-tune front-end function allows peak sensitivity on all bands. Noise and signal interference are reduced by a variable squelch control and crystal and ceramic filters.

Six band frequency coverage: VHF-Lo—30-50 MHz; Ham—144-148 MHz; VHF-Hi—148-174 MHz; Ham/Government—410-450 MHz; VHF-Lo—450-470 MHz; and UHF-Hi ("T")—470-512 MHz.

The Pro-2009 uses a built-in 9V battery (not included) backup to save programmed frequencies in the event of power failure or if the unit is unplugged. A 1/4-inch headphone jack, detachable whip antenna, and external antenna jack are also included. The scanner measures 2 3/4" x 10 1/2" x 8" and is U.L. listed for AC operation.



Microphone For Radio-Telephone Interconnect

The combined efforts of two companies, The Astatic Corporation working with Electronic Circuit and Design, have launched a new line of microphones, the T²M-900 Series. Designed for the rapidly expanding field of radio-telephone interconnect, this new line of microphones incorporates a dual tone multi-frequency (DTMF) generator and features automatic keying of the transmitter for keyboard entry, field programmable ANI (automatic number identification), and full control of the balance between the level of the high tones and low tones. They will match virtually any transmitter and meet any DTMF signaling requirement.

Astatic Corporation, with 50 years experience in microphone design and production, has joined with ECD Corporation, a specialist in mobile communication systems, to produce and market these "Human-Engineered" T²M-900 Series microphones.

For further information, contact Astatic/ECD Inc., Box 120, Conneaut, Ohio 44030, or circle number 106 on the reader service card.



New Video Switcher

Channel Master has introduced a new video component switching device that permits the connection of four signal sources to two television sets and one VCR. Called the Channel Master Video Control Center, the attractive compact wood-grained unit operates with pushbutton simplicity.

The completely passive switcher (i.e., no power required) replaces bunches of cables, multiple switches, splitters, and worn-out "F" fittings and provides important technical advantages over typical switching systems. Basically, the Video Control Center enhances signal isolation while eliminating excessive cable loss, interference pickup, and excessive splitter loss.

"We designed it to professional MATV/CATV specifications" says Stan Stedner, Channel Master's Electronics Product Manager. "The same labs designed this unit that designed our complex strip amplifiers and other signal processing equipment. This is not just another TV signal-splitting gadget. It's a sophisticated piece of electronic gear, tailor-made for the serious videophile."

Stedner cites some of the typical problems created by many splitters now on the market—double images, herringbones, seeing an adjacent channel's picture superimposed over the desired one. The Video Control Center avoids these problems by using the latest high-isolation broadband circuitry, thereby maintaining a continuously clear, strong signal. Unused lines are internally terminated, which prevents interference from stray impulses. Each switch is completely shielded and impedance-matched to ensure virtual isolation between all ports.

The video switcher allows any combination of four of the following components: outdoor antenna, pay TV, VCR, video games, satellite earth station, cable TV, video disc, and home computer. The user simply plugs in the components to produce a home video system comparable to those used by professionals.

"This unit is a solution to problems" concludes Stedner. "The consumer won't be getting a signal problem when he solves the problem of messy cables and cheap switches."

The Channel Master Model 0770 Video Control Center's suggested retail is \$49.95. For more information, contact Channel Master, Ellenville, NY 12428, or circle number 107 on the reader service card.



Professional Communications Line VHF Transceivers

Spectrum Communications Corporation has released its Professional Communications Line Base Station and Mobile transceivers for production, it was announced by Joseph deCourcelle, president. Commenting on the announcement, Mr. deCourcelle stated, "The new line is Spec Comm's response to our customers' increasing demands for a commercial line of transceivers which are very rugged, yet attractive and low cost. These transceivers have been in operation for our international customers with exceptional results for several months, and we are now pleased to offer these recently FCC Type Accepted units for use in the U.S."

The PCL250 Mobile unit and the PCL300 Base Station are 30 Watt (nominal) transceivers with a 136-174 MHz range. Features include: excellent receiver sensitivity (0.3 μ V.), very wide receiver dynamic range for superior intermod rejection, 8 pole crystal filter and 4 pole ceramic filter, "super rugged" housing (1/8" aircraft aluminum), 6 channels and the highest quality designs, components and workmanship throughout.

The PCL300 Base Station has a built-in AC power supply with optional auto-switch-over to DC battery power, front panel status indicator lights, optional receiver scanning function, pre-amp desk or hand-held microphone, and attractive wood grain housing.

For more information, contact Spectrum Communications Corp., 1055 W. Germantown Pk., Norristown, PA 19401 or circle number 105 on the reader service card.

Learning Code In Stereo

Radio School© stereo code cassettes are a fresh new approach to learning the International Morse Code. Developed by Gordon West, WB6NOA, nationally-known writer and instructor, these stereo code cassettes are the first on the market to make code learning easier and fun.

One stereo channel contains the computer-generated code which meets the latest FCC code tape speed specifications. The second channel contains the voice. Separating the code and voice channels allows the student to practice the code with or without voice help. Turning down the code channel allows students to practice code letters and words in unison with the tape with their own



code oscillators. Playing both channels simultaneously in a car allows students to practice the code without having to write down any letters. All Radio School cassettes play both channels on portable monaural tape players.

The Radio School beginning/novice code course contains four 1½ hour stereo tape cassettes. All instructions are given on the Radio School cassettes. There is no paperwork to lose. The Radio School code course is intended for students having no previous background in code sending or receiving. By the end of the fourth Radio School tape cassette, students will be able to send and receive code at 6 WPM and pass a novice class Amateur Radio code examination. They will know enough code for short-wave listening as well. Each Radio School code tape meets published FCC code tape specifications. The code generated is identical to typical FCC code test tapes. This familiarizes students with the tone, speed, and dit-dah ratio sent by the FCC or volunteer Amateur Radio examiners.

The new Radio School novice stereo code course is \$39.95. Add \$3.00 for shipping. California residents, add 6% sales tax. All orders shipped out first class mail or UPS. Save time and pick up the course at your local radio dealer.

Radio School also offers code courses for upgrading to FCC general class, and to extra class. Code test cassettes for instructors are also available. Theory cassettes are available for students wishing to pass any grade of Amateur Radio license.

For more information and a complete catalog on stereo Radio School code and theory courses, write to: Radio School, 2414 College Drive, Costa Mesa, California 92626. Phone (714) 549-5000.

Telephone Privacy Devices

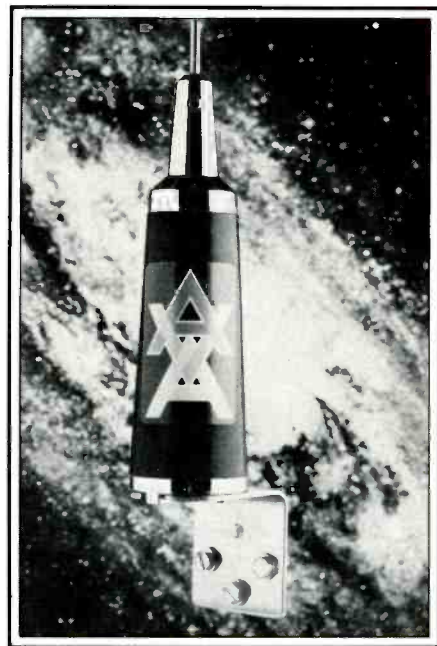
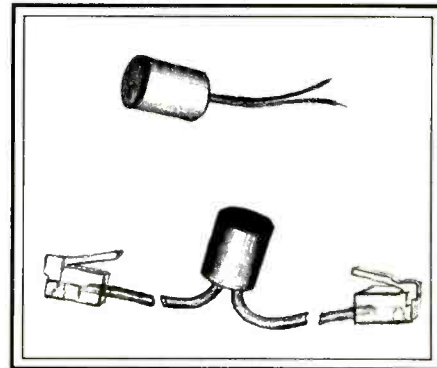
The new PCI and PCM telephone privacy devices solve one of the most frequent problems affecting telephone privacy: the eavesdropper on an extension telephone.

The PCI module is easily installed inside every telephone on the same line. Which-

ever telephone is first off-hook automatically establishes a priority-condition and makes all extension phones appear "dead." If desired, an extension phone can be admitted to the conversation by flashing the hook-switch of the "master" telephone.

The PCM privacy-cord is equipped with modular connectors and replaces the standard modular cord between telephone and wall-jack.

For additional information, contact Viking International, P.O. Box 632, Newhall, CA 91322, or circle number 110 on the reader service card.



Mobile Antennas

A mobile whip designed for 27 MHz communications has been made available by Childs Corp., under their AVA brand. The whip is 17-7 pH stainless steel while the loading coil is cased in General Electric's Noryl plastic. All-weather use is assured by the use of neoprene boots. A 12 foot length of coaxial cable with solderless connectors comes with this whip. Designed and built in the U.S.A., the AVA mobile whip covers 26.965 to 27.405 MHz with very low SWR throughout its operational range.

For more information, contact Gailand Childs Corp., Rt. 1, Box 155, Janesville, MN 56048, or circle 111 on the reader service card.

FREE RADIO FOCUS

BY AL MUICK

ACTIVITIES OF UNDERGROUND BROADCASTERS

We'll start off this month with good news for Radio Clandestine fans—it now has a mailing address. You can reach this elusive station by writing to R. F. Burns, P.O. Box 982, Battle Creek, MI 49016.

Aside from that, a monumental achievement was made by Voice of the Pyramids. They were heard testing on 15020 by Mark Warner in England. These higher frequencies are good for long-haul pirating!

A new station is CRN, the Children's Radio Network, which operates on about 1612 kHz around 2230 GMT or thereabouts. They actually have children behind the mic! 'Twas quite a treat to hear and everything was professionally done.

Radio Clandestine was heard recently on 9590 kHz at 1500 GMT. The usually great audio and music were there and they had an advertisement for salesman repellent!

SYNCOM Radio's stereo test programs have gotten underway, but they are not yet sure how successful they have been. During the transmissions, they had some technical problems, but have pretty well worked the bugs out now. They were noted using 7375 and 7391 kHz for their programs. Radio SYNCOM has also been heard relaying Radio Alpha Corona, but Corona's audio quality left something to be desired.

Radio Northstar is still heard now and again on 13787 kHz around 1600 GMT. WOIS is still being heard but on a new frequency of 7408 kHz about 0600 GMT. They use the Battle Creek address mentioned earlier.

WROX is a new station, but you won't hear them unless you live very close to the campus side of Washington, DC, for they are a carrier-current station. But, they do have harmonics up into the 4 MHz band! They use 680, 690, and 700 kHz as fundamentals, depending upon the mood they're in. Thanks to Gregg Bares and Selectivity for that information.

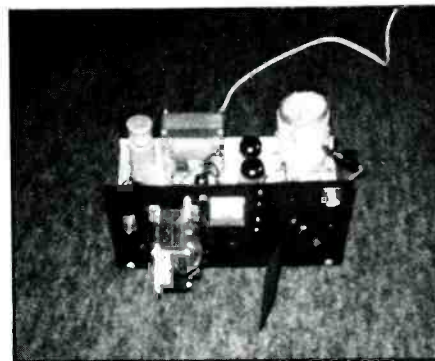
The Voice of Free America has tentatively scheduled its transmissions at 0500 GMT on 7425 kHz, Sundays. And, according to John Santosuosso of Lakeland, Florida, there is a pirate station operating in the Los Angeles area, running 250 watts on 1210 kHz. He says there is no further info yet.

If you have been fortunate enough to hear the now-defunct Radio Free Toronto, you can still get a QSL out of them through the Battle Creek address above. This station apparently operated in the 1610 to 1630 kHz range, but shut down due to lack of interest.

For the record and from the bad news department, the Voice of the Voyager's appeal regarding their fines and punishments has been denied! They have been ordered to pay their fines (\$1000 and \$2000) within 30 days. If you're interested in reading the VoV



Clandestine Broadcasting Network studio in Sydney, Australia.



The large transmitter, which has a frequency range from 1 to 9 MHz. Power on 6 MHz: 30W. Tubes: ECL 86, 2x EL 34 (push pull). (Radio Quadro, German Free Radio.)

file, simply file a Freedom of Information Act request with the FCC for the complete file of the Voice of the Voyager. Scott Blixt is very much in need of assistance in ideas for presenting his case. If you'd like to help, please write to Scott at 4841 Hampshire N., Crystal, MN 55428. On the better side of the news, the long-rumored reception of the VoV in New Zealand is true. They were heard there by John Campbell in May of 1978 while he was on a DXpedition.

A reader in New York State, John Skelter, sends along some of his most recent pirate loggings and observations. Says Skelter, "During the month of September, I've heard PRN twice, on Saturday midnights on 1620 kHz with a lot of QSB. Their audio is generally weak but it does pick up on a few songs. They like to play Captain Midnight a lot. Overall, their modulation percentage and quality is low.

"Three times in September, we've had WFUN on with S3 to S7 signal strength and some QSB. I called him on the phone and he gave his QTH as Manhattan. WFUN usually comes on around 2230 local time and their audio is normally quite good, with good intelligibility and a high modulation percentage. They play music and take calls on the phone loops. Their announced frequency is 1620 kHz 'give or take a bit.' Their

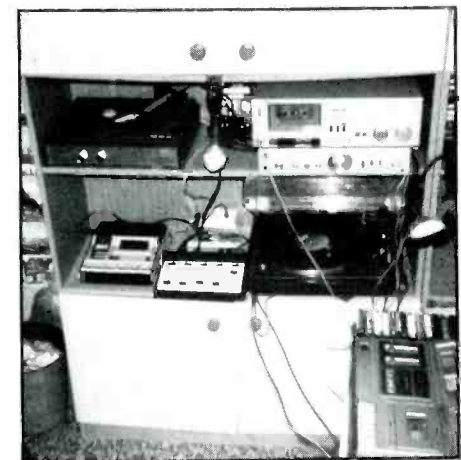
actual frequency is 1632.2 kHz and they drift upwards about 200 Hz per hour. Their antenna is apparently a vertical Ham tower that is shunt-fed.

"WART or WART RADIO has been heard about five times on 1620 kHz on week or weekend nights. Sometimes they are heard on weekend days. They are very strong and have solidly processed audio, but they're definitely not hi-fi quality."

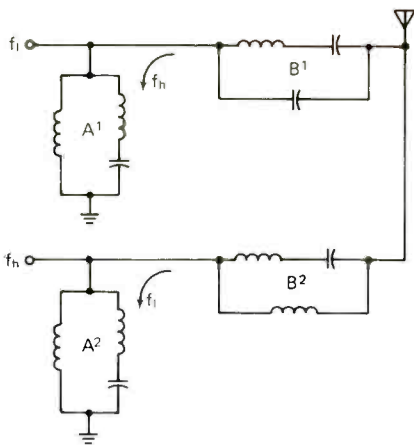
"On October 3, at 0315 GMT, I heard a new shortwave pirate ID'ing as the Crystal Ship with DJ's 'The Poet' and 'The Radical' on 7431 kHz. They are in the Midwest and are running 50 watts out from a Knightkit transmitter to an inverted V antenna. They announced a phone loop number and I called and talked to 'The Poet,' who said that their inverted V points eastward. They plan to be on the air Sunday and Saturday between 0300 and 0600 GMT. Unfortunately, their audio was distorted and the intelligibility was poor."

Thanks for the info, John! If anyone else has info to contribute, please feel free to send it along and we'll use it as best we can!

A very slick sound in the New York City area has been KW Radio on 1618 kHz. The station claimed to be running "little more than a CB station insofar as power goes, but we have a high location in Manhattan with a good antenna." From the way the stories go from those who have reported hearing the signals from distant points, it would appear that they are probably running a minimum of 100 watts. One source heard from offers some doubt as to the announced location actually being in Manhattan. When noted one evening last November (0300 to 0530 GMT), they were taking phone calls via loop phone line, playing lots of record requests, and had a number of very clever musical spot announcements for the station. One re-



The RQ1-studio in March, 1982. (Radio Quadro International, German Free Radio.)



porter to this column reports hearing POP'COMM's Editor, Tom Kneitel, calling in to the station and being interviewed (via telephone) over the air! The station's personnel sound like folks who've had professional radio broadcasting experience, and the one guy who does the Nixon impressions is easily as good as Rich Little. Unfortunately, KW Radio doesn't appear to be interested in QSL'ing; several readers heard from say that it may be a lost cause to try to obtain a verification from this one.

A reader in New Hampshire advises that he was monitoring his scanner one night and overheard them trying to locate a pirate on 1620 kHz, which they said was probably in the area of Providence, RI. The fellow in New Hampshire said that he couldn't copy any signals on 1620 kHz at the time, and neither could a friend of his in New York City. Very strange! Has anybody in Southern New England ever copied this one?

French Pirates Take To The Air

Turning on the radio has become an adventure in France since the Mitterrand government ended the state monopoly on broadcasting, thus giving every citizen the right to set up an FM station.

The many new stations encompass a broad array of styles, from basement hobbyists operating two or three hours a day to slick 24-hour-day American style rockers. Political stations left, right, and center, artistic stations from kitsch to avant-garde, music stations and community-based stations all are competing now for listeners.

The origins of independent radio lie in many years of French pirate broadcasting. The pirates, often disenchanted with what they believed to be the drabness of the official media—the endless musicology and lack of music on France Musique—and the political control exercised by the government, built unlicensed transmitters. Often these were experimental and absurd. "I saw a transmitter in a kitchen that disappeared into the table and chairs," says Jean Ducaroir, a longtime pirate who is now leader of the National Federal for Free Radio, known as FNRL from its initials in French.

The pirates, often faced with police raids and intense jamming, regularly changed their studio locations and frequencies. No

more. Since the election in May '81 of the Social governmental—which was rumored to support a pirate radio itself during the campaign—independent broadcasters simply must meet certain basic requirements. These include having a service area with a radius no greater than 17 miles, being operated by a non-profit organization, and broadcasting no commercials. Of the three, the ban on commercials is the only controversial restriction.

France was among the last countries in western Europe to end the state broadcasting monopoly. Britain has long had independent radio and television operating under a governmental regulatory commission, which allocates frequencies and sets standards. Italy freed both radio and television several years ago; independent initiative has left Rome with 24-hour-a-day B-movies on television.

At least in the early months of liberation in France, stations were polite with each other, avoiding frequencies that interfered with another station in the same service area. Three independent radio federations foster communication between operators.

Still, competition can be fierce. Some stations broadcast a tone signal or a continuous jingle when they are not on the air lest they find that a new station searching for a free

channel has taken over their frequency. These channel guardians also tantalize a prospective listener into tuning in later. Arc-en-Ciel FM (Rainbow FM) in Paris has a changing assortment of continuous-loop tapes to protect its frequency; hearing this well-produced montage, the listener doesn't realize until about the third go-round that the music is not changing.

In Paris alone, there are some 120 stations on the air or in the works, with dozens more in the provinces. A good tinkerer can set up a station built from used parts for as little as 1,000 francs (about \$190). A neighborhood station with all-new equipment could cost 20,000 francs, and a regional station covering a medium-sized city might cost about 50,000 francs with new equipment. The majority of the new stations are low-powered, broadcasting with 100 to 200 watts of power, enough to cover several Paris neighborhoods or a small city. Government stations broadcast on FM with more than 10,000 watts, covering the country with a network of relay transmitters.

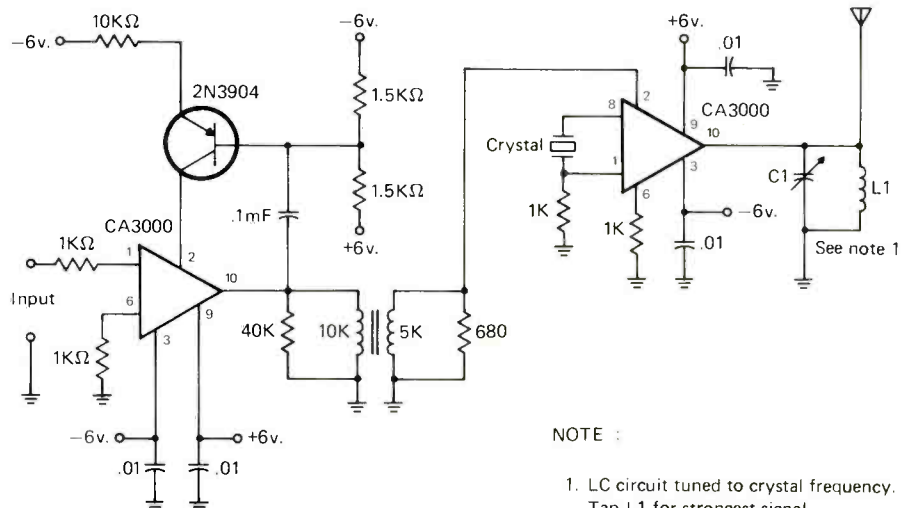
The French have launched radio stations for a variety of reasons: political, cultural, and social. Some are hobbyists, actors, or musicians who simply want a place to play. Still others are egoists who want to fill the world with their words.



George Strong in his studio. (Radio Quadro, German Free Radio.)



Dipole for 48m. FM high. (Radio Quadro, German Free Radio.)



Styles differ enormously. A somber-voiced woman, speaker over martial music, proclaims one station the laborer's voice in Paris. Radio Soleil—or Sun Radio—broadcasts in Arabic to the large North African immigrant community in Paris. Other stations transmit in Chinese, Italian, and Spanish. Provincial stations broadcast in such minority languages as Breton and Basque. Radio Pom, an avant-garde arts and music station, has a soft-spoken Californian doing a blues program in English.

Radio Tomate (Tomato Radio) is a typical community station in Paris, operating in a rundown commercial building that it occupies as a squatter. The station's leaders hope to construct a full-scale community center, with a cafe-restaurant, meeting room, and theater alongside the studio. The building has been christened the Radio Tomate Centre. Friends and neighbors come by to help with the construction and many have donated bags of cement, carpet, toilets: whatever is needed.

"I think people in our society are over-industrialized," says Bertrand Figuer, a founder of the station. "People need some space to be a bit free. The century before in France, there was the Commune of Paris. We are not revolutionaries, but we are trying to build a new Commune."

"We know that information will be the only power in the future. If we are not able to get into the system . . . we will be completely out of it for many, many years."

Although there is no shortage of ideology among the independent radio operators, money is the key issue.

"No to the power of the state, no to the power of big money," said Yves Daudy, organizer of a radical station, Radio Gavroche, as he condemned commercial broadcasts at a recent congress of the National Federation for Free Radio. The arguments against commercials "are not only humanist," said Ducarrior, a leader of the federation.

Commercials on the liberated radios would challenge local newspapers, say many independent radio operators, particularly the political ones. They fear that newspapers would then open stations to make up for lost advertising revenues, noting that Le Monde is already participating in the construction of a station in Paris.

On the other hand, supporters of commercial radio regard advertising as the best means to assure independence of new stations. Without commercials, "a lot of stations will have to be swallowed by political powers or financial groups," says Jean-Louis Pelot, a DJ at Paris FM, an entertainment station that hoped to go commercial.

Stations that planned to air commercials are now looking for other ways to raise money. Many are considering the methods of public broadcasters in the United States; selling memberships and novelty items and organizing concerts and auctions.

The government has promised to review the new radio laws. Many station operators will be lobbying hard to get the commercial ban reversed.

One station has continued to run com-

mercials despite the ban. RFM, the most powerful independent station in France—transmitting 10 kilowatts in stereo, with an American-style soft rock format—has vowed to fight.

The majority of French pirate stations operate out of closets and basements, but RFM has the latest equipment in a plush headquarters at a suburban shopping mall. "We would really like to continue with advertisements because it is becoming successful and it's the only way to be independent . . . from any political or financial groups," says an RFM director, Patrick Meyer.

Threatening to use 10 kilowatts to pressure the government to change the law, he adds: "We are not a political radio station. We are not against the government . . . but if they oblige us to stop, then we will fight."

Technical Tips

This month's technical section has a few curiosities for you. Our first one is an LC circuit that will permit the use of the same antenna for two different frequencies at the same time! The idea here is for both transmitters to feed the antenna but not each other. The best approach is through a resonant circuit. In figure A, we have such a circuit.

Figure A contains LC circuits that have two inductors and one capacitor. Branch one is inductive at all frequencies and branch two is capacitive at frequencies below its series-resonant frequency and inductive at frequencies above its resonance. Therefore, there will be one frequency below the resonant frequency of branch two where its capacitance resonates with the inductance of branch one to form a parallel-resonant circuit, which has, assuming no losses, infinite impedance. At a higher frequency (near f_H in the drawing), branch two will be a series-resonant circuit, and its impedance will be zero, again, assuming no losses. In actuality, the impedances will be neither infinite nor zero, but they will be very high at f_L and low at f_H . So, we can see that circuit A will shunt any signal at frequency f_H fed back from the tower, but won't hinder the signal f_L going into the tower. In the arrangement in circuit A, the parallel-resonant frequency will always be lower than the series-resonant frequency.

At circuit B in figure A, there are two other circuits with both series and parallel resonances, except that the parallel-resonant frequency will always be higher than the series-resonant frequency. As such, B will let f_L energy reach the tower but reject f_H energy. Therefore, circuits A¹ & B¹ will pass f_L energy and bypass any f_H energy that may be fed back. Circuits A² & B² will pass f_H energy and bypass f_L energy. From circuit paths, you can see that energy from both transmitters is fed to the antenna, but neither of the transmitters feeds the energy to the other. The user must work out the particular LC formula for a specific frequency (ies).

Well, that one was really technical, so here's one for beginners! From the fine people at RCA, I received RCA publication ICAN5030, and it showed a practical application for their CA3000 IC. One of them

was a QRP amplitude-modulated transmitter. This can be used as the base for a higher-powered transmitter without bothering with exotic modulation techniques. In Figure B you find the circuit. It is simple and straightforward and should not present much of a problem to the newcomer or expert alike. Just remember to always use a heat sink and keep component leads as short as possible. IC and transistor sockets might also be advisable. The circuit can be built on a perfboard, or you can design your own printed circuit board. The CA3000 is a hardy little IC and its applications extend up to about 10 MHz. With a little tender loving care, you may even be able to extend the operating characteristics up to 15 MHz!

I hope this has been of use to you. Don't forget, if you have any questions that require a personal answer, please enclose an SASE for a reply. If you have any news or technical hints of any kind, please send them along, as our readers are eager to try new things. The address to write to is: SP/4 Al Muick, 3rd Opns Bn USAFSA, CMR Box 1912, APO NY 09458. See ya next month!

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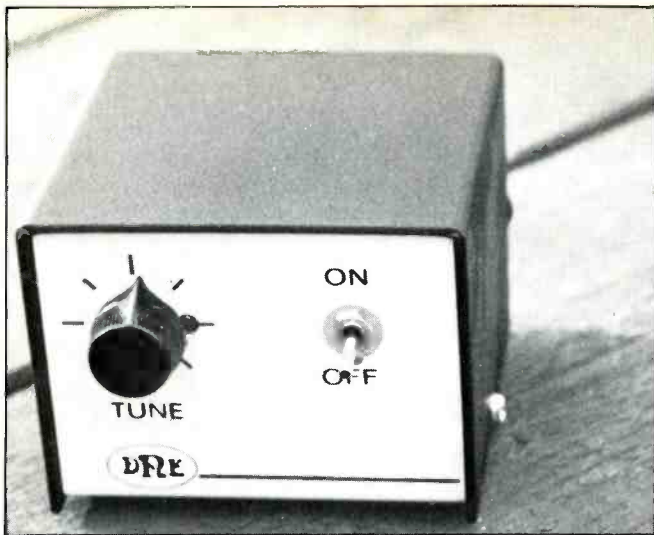


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Here's what the DNE unit looks like.

The DNE unit is small enough to mount atop your scanner.



The DNE Scanner Unscrambler: Model D-12 Deluxe

Don Nobles Electronics, Inc., Rt. 7 Box 257, Hot Springs, AR 71901—known to scanner owners as DNE, Inc.—was probably the first company to produce an unscrambling unit back when scramblers went into popular use by various agencies. We therefore thought it would be interesting to take a look at DNE's top-of-the line unit, the *D-12 Deluxe*, and see exactly what it is and what it does. This is a \$42.50 unit which will unscramble any scrambled communication of the single inversion type with an audio frequency range up to 5 MHz (most of the communications scramblers in use today are of this type). What with business and industrial users now permitted to use scrambling, in addition to public safety agencies, the ability to root out messages from the babble caused by scrambling could well be something which will face many scanner enthusiasts.

The D-12 Deluxe unscrambler will work on all base station scramblers or tunable receivers covering the VHF hi/low or UHF bands. The unit connects to the external speaker jack and internally to the speaker, or to the external speaker terminal strip of the scanner.

DNE's D-12 Deluxe models have low pass filters, voltage regulation, diode protection, and sensitivity and gain control.

However, the Deluxe model has an external speaker jack, will accommodate the external power supply, and can operate from the external power supply or from a standard 9-volt transistor battery.

If the unit is to be used with an external speaker or earphone jack, a plug must be installed into the red and black unscrambler wires to plug into your scanner (complete illustrated details are furnished with the D-12 Deluxe). Because different brands of scanners have various types of external speaker jacks, the plug isn't supplied with the unscrambler. In addition to wiring the plug, the white unscrambler wire must be connected to the "positive" (or ungrounded) side of the speaker inside the scanner. This is determined by visually tracing the wire to ground or by using an ohmmeter or continuity checker. Some scanners have a 100 ohm (or similar value) resistor between the grounded side of the external speaker or earphone jack and an actual chassis ground. This resistor needs to be bypassed with a jumper wire for the D-12 Deluxe to operate properly.

For scanners having a screw type terminal strip for external speaker connection, the manufacturer provides detailed pictorials showing typical D-12 connections for different model scanners. Usual installation calls

for removing the metal or wire link connecting two of the screws. You then have to identify which of the 3 unscrambler wires (red, white, black) goes to each of the screws. It makes things a lot easier if your scanner is labeled or at least is one of those included in the selection of wiring pictorials provided by DNE (these include Regency and Tennelec models). However, it can still be done with a little extra effort, and DNE tells you how in their literature. The red wire goes to the audio output circuit of the scanner, the black wire is the ground, and the white wire goes to the positive (ungrounded) side of the speaker. None of this takes very long or requires any special expertise or fancy tools (a screwdriver pretty much does it all). The unit is now ready to operate.

Operation is very simple. When you happen upon a scrambled transmission, you turn the D-12 Deluxe "ON" (switch on the front panel) and then adjust the "TUNE" control until the message becomes intelligible. It's similar to tuning the "CLARIFIER" control on a communications receiver in order to receive a single sideband signal. Once a particular station is thus unscrambled, it isn't necessary to retune it for that station, although should that station switch over to normal (unscrambled) speech, the D-12

Deluxe must be switched "OFF" for copying the traffic. When turned off, the D-12 Deluxe has no effect on the incoming signals and the scanner will function as usual.

We found that the adjustment, although somewhat critical, is accomplished very rapidly, and the unscrambled message comes into clarification (if that's the correct word) almost instantly. However, the point on the tuning control at which this takes place is very narrow, and you've got to be careful not to knock it out of adjustment while

you're monitoring, or you'll miss a couple of words until you readjust the control.

The DNE D-12 Deluxe brought in the traffic with good clarity, tone, and amplitude. The slightly unnatural sound of the unscrambled voice would appear to be more a factor of the scrambling process than of the unscrambling and, after all, you aren't seeking high fidelity—only to discern the nature of a message. The DNE D-12 Deluxe unscrambler is small and sturdily constructed, styled in black and off-white, and housed in

an all-metal case equipped with four rubber feet so as to prevent the unit from marring the cabinet of your scanner.

We were pleased with the simplicity of this device and its quality of construction (it is not a kit), as well as its efficient operation. If you're facing the possibilities of unscrambling transmissions that are scrambled by the popular single inversion system, here's a viable approach to solving the problem.

Reviewed by Rick Maslau, KNY2GL

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CIRCLE 10 ON READER SERVICE CARD

SATELLITE VIEW

INSIDE THE WORLD OF TVRO EARTH STATIONS

DXing Those International Satellites ***Part Two: INTELSAT***

In last month's column, I explained how Soviet TV could be viewed via satellite in the United States. In the Western Hemisphere, there are a number of other countries using satellites to provide domestic TV services to their own rural areas. These services can be viewed by home TVRO enthusiasts from North America. From my location in Middle Tennessee, I can watch channels of TV from Argentina, Venezuela, Peru, and Columbia, three channels of Brazilian TV, and four channels of TV from Mexico. Although there is plenty of American programming on satellite to view, I enjoy being able to watch news programs from our neighbors to the south as well as my favorite American programs dubbed into Spanish and Portuguese. Also, as one who enjoys traveling, I find watching international television the next best thing to being there!

All this satellite TV programming is made possible by The International Telecommunications Satellite Organization (INTELSAT), which cooperatively owns and operates a global satellite system on behalf of its membership. INTELSAT relays a wide variety of telephone, data, and TV communications between most countries of the world. INTELSAT began service in 1965 with a single satellite over the Atlantic Ocean relaying communications between Europe and North America. Today, INTELSAT satellites handle two thirds of the world's overseas telephone calls and most transoceanic TV. With over a dozen INTELSAT IV, IV-A, & V series satellites at their disposal, INTELSAT can supply communications to just about any spot on the globe.

There are two types of INTELSAT TV services available to the 107 member countries. Occasional video news and sporting events can be supplied to the international community whenever the occasion arises. The inauguration of President Reagan and the marriage of Prince Charles and Lady Diana were transmitted worldwide via INTELSAT. World crisis, like the Falkland/Malvinas conflict or the Israeli invasion of Lebanon, generate news coverage that is relayed by INTELSAT to national news services throughout the world, and sporting events like the Olympics or the World Cup Soccer games are transmitted by several INTELSAT satellites simultaneously to provide live coverage worldwide. The 1982 World Cup Soccer games consumed over 4000 hours of INTELSAT TV time, providing coverage to over two billion people for part of the satellite-delivered tournament.



INTELSAT IV in orbit. Photo courtesy COMSAT.



INTELSAT V; it's a totally different design than earlier INTELSATs. Photo courtesy COMSAT.

INTELSAT satellite transponders are also leased to member countries to provide domestic TV services to rural or remote areas within their own borders. Many developing countries are realizing that a single satellite channel can directly provide TV and broadcast radio signals to any number of low powered community transmitting sites at a cost considerably less than that of a country-wide terrestrial microwave system. More than 18 countries world-wide are now leasing IN-

TELSAT transponders to provide domestic telephone, radio, and TV coverage.

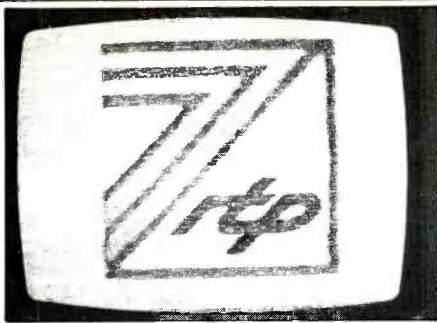
INTELSAT, in coordination with the telecommunications authorities of each member country, licenses the earth stations that participate in the program. Their standard A and B terminals use 100 or 30 foot diameter dish antennas and may cost hundreds of thousands or even millions of dollars to construct. In addition to the regular uplinking of TV, telephony, and data transmissions, INTELSAT must also maintain control and monitoring facilities around the world to track existing satellites and to assist in the launching and deployment of new satellites.

Considering the large size of the antennas used by INTELSAT, it is a wonder that we can watch their programming at all with our 11 foot dish here in Tennessee. Indeed, some of the international programming is too weak for viewing on a small home TVRO terminal, while others are quite watchable. In order to understand the reason for this wide range of reception possibilities, we need to take a look at the INTELSAT satellites themselves and the onboard dish antennas responsible for delivering the TV signals.

Global, Hemispheric, Zone, And Spot Beams

There are four types of beam antennas used by the INTELSAT satellites: global, hemispheric, zone, and spot. On many of the transponders, the type of beam can be selected via ground control for maximum versatility.

Global Beams: This type of footprint pattern is transmitted via a horn type antenna and can cover up to a 40% area of the earth's surface. It is used extensively by INTELSAT, particularly when sending TV feeds out to the international community like the news and sporting events coverage previously mentioned. These occasional video feeds can last from only a few minutes to several hours in length, and they typically show up on transponder 24 on your TVRO receiver. Because of their widespread coverage, however, their global beam signals are quite weak and require 20 to 30 foot or larger dishes for watchable reception. When a six-watt transponder signal is sprayed over such a large area, footprint signals in the 18-23 dBW* EIRP (Effective Isotropic Radiated Power) range can be expected. *dBW stands for decibels above 1 Watt of power



Logo of RTP Peru National Television, INTELSAT V F2 27.5° West, 1/2 TR (4), Hemispheric Beam.



ATC Argentina Televisore Color via INTELSAT V F2 27.5° West, Full TR (24), Global Beam.

Argentina Televisora Color (ATC) uses a global beam pattern to transmit its domestic TV service. The accompanying photo shows what kind of reception you can get on a home TVRO earth station with 11 foot dish and 100 degree LNA. It may look fairly noisy to you, but I should point out that this global beam is fairly strong in comparison to what some of the other global transponders look like on my 11 footer! Because of its wide coverage area, this Argentine satellite service is not only visible in North and South America, but also Europe and Africa as well.

Hemispheric Beams: In order to expand the coverage of the INTELSAT IV-A & V series satellites, paraboloid shaped antennas capable of covering a single hemisphere of the earth were incorporated into the design. Because of the isolation between the eastern and western hemispheric beams, the same transponder frequency can be used to downlink one domestic TV or telephone service to the west and another to the east. The larger size of the hemispheric satellite antenna limits the coverage to a 20% view of the earth and provides increased footprint strength to 26-27 dBW for the IV-A birds and 29-30 dBW for the V series satellites. Clear reception of hemispheric TV transmissions requires dishes in the 16 to 20 foot range, although watchable video can be obtained from more modest equipment.

Hemispheric beams are used by most of the domestic lease services on INTELSAT viewable from my location. The photos of Venezuelan and Brazilian TV below typify the kind of reception possible on an 11 foot dish with 100 degree Kelvin LNA. The hemispheric beam is widely used by domestic services because the size and cost of the remote satellite receiving stations are con-

siderably reduced from that of the Standard A or B INTELSAT earth stations. INTELSAT has recently adopted a "Z" Standard for the smaller receive-only terminals used in many of these domestic lease programs.

Zone Beams: The INTELSAT V series of satellites have, in addition to their standard global and hemispheric antennas, a zone beam antenna that can be used on a few of its transponders. The zone beam restricts coverage to slightly more than half of that of a hemispheric beam. This increases the EIRP of its footprint to a maximum of 32 to 34 dBW. INTELSAT has not extensively used its zone beam capabilities, but in the future they could provide excellent domestic coverage for the TV services of developing countries. Their coverage would be slightly less than that of our American and Canadian satellites, allowing small dishes to provide excellent sparkle-free reception.

Spot Beams: The older INTELSAT IV and IV-A satellites, as well as the upcoming INTELSAT VI series, have steerable spot beam antennas incorporated into their overall design. Currently, The Republic of Mexico is leasing INTELSAT IV F7 at 53 degrees West to supply several channels of TV and telephony into 171 earth stations throughout Mexico. Over 60 low powered television stations are directly receiving their programming from this satellite. Reports from Mexico City indicate that experimental antennas as small as 12 feet are being used with excellent results. A theoretical 37 dBW can be obtained with INTELSAT spot beam technology, which would allow dishes as small as 8 feet in diameter to be used at the center of the footprint pattern. In practice however, the power is often backed off from maximum capability. INTELSAT in general is a very conservative organization and its engineers try to operate with minimum power levels in order to extend the operational life of their satellites. My Tennessee location is considerably off of boresight, which accounts for weaker signal levels here in the neighborhood of 27-29 dBW, depending on the particular transponder being viewed.

INTELSAT Satellite Location Chart

INTELSAT IV

(F2, 3, & 5 have been retired, and F6 failed to achieve orbit following launch)

F1 Status: Pacific Ocean spare with leased services

Location: 186 degrees West

F4 Status: Atlantic Ocean spare

Location: 27.5 degrees West

F7 Status: Mexican leased services

Location: 53 degrees West

F8 Status: Pacific contingency satellite

Location: 181 degrees West

INTELSAT IV-A

(F5 failed to achieve orbit following launch)

F1 Status: A Major Path Atlantic Ocean region

Location: 18.5 degrees West

F2 Status: A Major Path contingency spare, Atlantic Ocean region

Location: 21.5 degrees West

F3 Status: Leased services and contingency spare, Indian Ocean region

Location: 300 degrees West



CTM Television Cultural de Mexico, INTELSAT IV F7 53° West, 1/2 TR (1, 5, 7, and 9), Spot, and Hemispheric Beams.

F4 Status: Leased services and spare Atlantic Ocean region

Location: 34.5 degrees West

F6 Status: Primary Indian Ocean region

Location: 297.2 degrees West

INTELSAT V

F1 Status: Indian Ocean Major Path with leased services

Location: 300 degrees West

F2 Status: Atlantic Ocean region Major Path I

Location: 34.5 degrees West

F3 Status: Atlantic Ocean Major Path with leased services

Location: 24.5 degrees West

F4 Status: Atlantic Ocean Region spare with leased services

Location: 27.5 degrees West

F5 Status: Indian Ocean Primary Path

Location: 297 degrees West

* As of October 1982. INTELSAT moves its satellites to various locations depending on their ever changing coverage needs.

INTELSAT Reception By Home Earth Stations

INTELSAT, in its efforts to supply communications throughout the world, by and large uses the global and hemispheric antenna patterns. Although they are not as powerful as the North American domestic satellites, they allow spill-over reception of foreign television in areas far removed from their intended destinations. Many readers may want to try their hand at receiving some of the more exotic international programming within view of their dishes. INTELSAT reception by TVRO terminals in the U.S. and Canada does require some minor modifications of the equipment in order to obtain high quality performance. Briefly, these modifications are listed below.

Circular Polarization: All INTELSAT signals are circularly polarized. Your standard feedhorn can be easily modified. Full instructions for this were supplied in last month's column.

INTELSAT Transponder Bandwidth: Because of the high demand for satellite time, INTELSAT often squeezes two television signals onto a single transponder, or perhaps puts one TV signal and a number of telephony signals on the same transponder. When receiving 1/2 transponder TV on your regular TVRO receiver, you will lose several dB of signal strength. The wide bandwidth allows noise above and below the 1/2 transponder signal to degrade the receiver's per-

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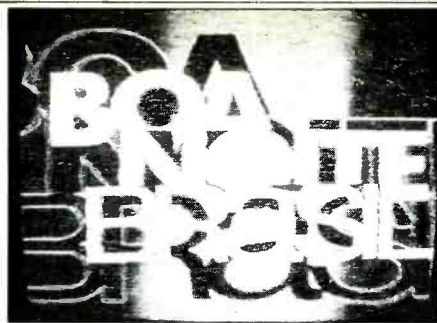
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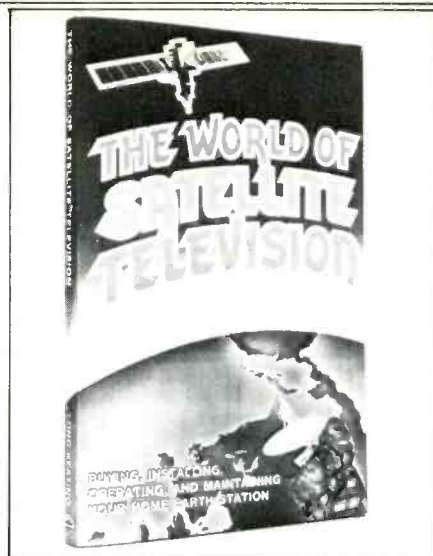


Venezolana de Television via INTELSAT V F2, 27.5° West, Full TR (5), Hemispheric Beam.

formance. For those with the proper test equipment, it is possible to realign some receivers for 1/2 transponder reception. There are also filters available for receivers with a 70 MHz IF that will narrow the passband from 30 MHz down to 16 MHz. These filters can be inserted into the receiver by any skilled technician. Filters are available from the address at the end of the column.

Frequencies. INTELSAT transponder frequencies differ slightly from those used by the American and Canadian domsats. Additionally, when 1/2 transponder format is used, the video signal may be somewhat removed from the center frequency of many channelized TVRO receivers. I would recommend a receiver with a continuously tuneable channel control over detent or channelized tuning for those readers interested in viewing all the international satellite TV transponders.

INTELSAT Audio Encoding. INTELSAT uses a number of different means of transmitting the audio portion of each TV program. Although many of the South and Central American leased transponders use an audio subcarrier, others like Columbia and Peru do not. Audio may be transmitted by SCPC (Single Channel Per Carrier) techniques within the same transponder or on a different transponder entirely. Stable SCPC reception is no minor fix and is beyond the scope of the minor modifications presented here. However, companies like Hero Communications of S. Florida can provide the necessary electronics at a price. Argentina, Mexico, Venezuela, and Brazil all use subcarriers in the 5-7 MHz range. Your TVRO receiver must have a tuneable subcarrier audio control for reception of these audio subcarriers.



New book by the author of POP'COMM's "Satellite View" column.

Video Standards: Argentina and Brazil both use the PAL method of color encoding. This will result in limiting your regular NTSC TV or monitor to black and white reception only. For full color display, a PAL or multi-standard monitor would be necessary. Additionally, Argentina uses a 625 line PAL standard which will require an adjustment of the TV's vertical linearity as outlined in this column last issue. All other South and Central American countries mentioned use the same NTSC standard as we do.

With a properly modified TVRO system, it should be no problem for the satellite experimenter to start looking at the INTELSAT satellite nearest them. Those stations east of the Mississippi will find the Central and South American services over their southeastern horizon. INT V F4 transmits the domestic programming of Peru, Columbia, Venezuela, and Argentina. Other Atlantic INTELSATs carry international TV news and sports exchanges as well as three channels of Brazilian television. The INTELSAT IV-F7 at 53 degrees west carries four channels of Mexican programming and is viewable all the way West to Utah and Nevada. Those readers on the West coast will have access to the Pacific INTELSATs, which cannot be seen from my location. By the time this article reaches you, there will probably be even more transponders of INTELSAT domestic leased services available. Those readers who get involved in international TV reception are encouraged to send their own photos and reception experiences to me via POP'COMM for future inclusion in this column.

For those of you who want to learn more about satellite TV, *The World of Satellite Television* by Mark Long and Jeffrey Keating is available for \$8.95 from Solar Electronics, Department PC, 156 Drakes Lane, Summertown, TN 38483. Also available: Dielectric insert for circular polarization: \$17.95 16 MHz 1/2 Transponder bandpass filter @ 70 MHz IF: \$29.95; International Satellite Locator Computer Printout: \$3.00.

WASHINGTON PULSE

FCC ACTIONS AFFECTING COMMUNICATIONS

Additional Spectrum Provided For Radio Control Of Model Aircraft, Boats, Cars

The Commission provided additional spectrum in the 72-76 MHz band for the radio control of model aircraft, boats, cars, and other similar devices.

At the request of the Academy of Model Aeronautics, Inc., on April 1, 1982, the Commission proposed amending Parts 2, 21, 22, 81, 90, and 95 to allot additional spectrum for the radio control of models. The Academy had pointed out that the additional frequencies were needed to cope with anticipated expansion in model activities in future years and to compensate for diminished use of six existing frequencies allocated to radio control between 26.96 and 27.41 MHz, which it claimed were nearly useless for radio control operations because of interference from the Citizens Band Radio Service, which also uses this band.

In granting the Academy's request, the Commission noted that allocation of additional spectrum in the 72-76 MHz band would have no impact on other licensed users since the frequencies would be used on a secondary basis.

Local Units No Longer Need Separate License For Speed Detectors

The FCC eliminated a requirement for local governmental entities licensed in the Public Safety Radio Services to obtain a separate authorization for radar speed detection devices. This change will reduce paperwork for the Commission's licensing staff and for police and other local government units, which will no longer have to apply for new radar authorizations or modify or renew existing licenses and may operate speed detection devices as part of their base/mobile communications systems.

To provide the Commission with a record of the number of such units in use, licensees will be required to list the number of speed detection units and the frequencies on which they operate at the time of the renewal of their land mobile authorizations. Ordinarily, this would be once every five years and would not be a significant addition to the renewal process, the Commission noted.

State Regulation of Public Coast Stations

In response to a request for a declaratory ruling, the FCC has affirmed the right of state public utility commissions to assert jurisdiction (i.e., entry and tariff regulation)

over maritime public coast stations. Public coast stations are land stations in the common carrier maritime mobile service that provide the public with communications services of various kinds, such as telegraphy, telephony, and narrow-band direct-printing, to and from ships at sea.

Public coast stations are open to the general public and charge for their services on tariffed terms. These tariffs are filed with the FCC and with state regulatory commissions, where required. There are three classes of public coast stations: Class I provides service over distances up to several thousand miles, Class II provides regional service, and Class III provides local service.

The request for declaratory ruling came from RadioCall Corporation, licensee of Public Coast Class III-B station KUF847, San Pedro Hill, CA. (The B designator indicates the station offers telephone service.)

The state of California, through its Public Utilities Commission (CPUC), requires public coast III-B stations to obtain a certificate of public convenience before they begin operating. In addition, the CPUC requires the filing of tariffs but asserts rate jurisdiction only as to service involving communications with vessels within three miles of its coast and with vessels on its inland lakes.

RadioCall asked the Commission to determine that California (and Hawaii, where RadioCall also has stations) either lacks jurisdiction or that, even if it does not, its regulation of these coast stations has been federally preempted.

The Commission said that in regulating class III-B public coast stations, it has not thwarted the state regulation of common carriers doing business within their borders. Accordingly, it has conditioned grants on the licensee's obtaining necessary authority from the state regulatory commission. It said that while such action by the FCC may not constitute an express recognition of state jurisdiction, the issuance of conditional grants reflected the Commission's reluctance to oust states from their regulatory roles, except where a strong showing has been made.

RadioCall argued that even if concurrent jurisdiction is legally permissible, the Commission should preempt tariff regulation by the states. The Commission said it was persuaded that California's offering to provide a tariff conforming to FCC rates, on request, was sufficiently responsive to RadioCall's complaint to provide complete relief without the need for federal preemption.

RadioCall asserted that the administrative burden of complying with state, as well as federal, regulatory requirements might hinder the rapid and efficient regulation of the Maritime Mobile Service in the interest of safety as the FCC has been mandated by

Congress. The Commission, however, noted that thus far concurrent assertions of jurisdiction by states have not had such effect and if, in the future, this changes, it would reconsider the matter.

Emergency Broadcast System (EBS) Used 1,070 Times In Twelve Months

The Commission received 1,070 reports from November, 1981 to October, 1982, from broadcast stations who have activated the EBS. This brings to 3,162, the total number of activations since 1976, when the FCC, the Federal Emergency Management Agency (FEMA), the National Weather Service (NWS), and the National Industry Advisory Committee (NIAC) launched the EBS State and Local Planning Program. The Commission has also received 101 reports since July, 1981, from stations who have activated the EBS at the request of State and local officials for nuclear power plant public notification tests. Copies of all reports are placed in the Commission's broadcast station license file for the appropriate station.

The Commission commends broadcasters for their use of the EBS to disseminate emergency information and will issue News Releases updating the reports received. Broadcast stations, as the holders of a valuable public franchise, have an obligation to serve in the public interest and use of the EBS is an excellent example of fulfilling that obligation.

The 1,070 reports were for activations for such situations as: Mt. St. Helens eruptions, snowstorms, floods, flash floods, tornadoes, severe thunderstorms, power outages, landslides, high winds, a pipeline rupture, a natural gas shortage emergency, a telephone outage, and the Ginna nuclear power plant alert.

Fixed Use Of 72-76 MHz Approved For Automobile Emergency And Other Radio Services

The FCC authorized eligible operators in the Automobile Emergency, Taxicab, Manufacturers, and Telephone Maintenance Radio Services to use the 72-76 MHz band for fixed links for remote control of base stations. The action was in response to a 1981 petition by the American Automobile Association, which said licensees operating tow and repair vehicles must be able to communicate with their mobile units throughout service areas in order to assist motorists in need and alleviate traffic disruptions.

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quires multiple base stations, AAA said, but frequencies for fixed links in other services are limited and difficult to obtain. Control by telephone lines is often impractical because of cost or unavailability, it argued.

Use of 72-76 MHz band frequencies for fixed links is allowed in a number of other mobile radio services. The Commission's action expanded permission for such use to the Automobile Emergency Radio Service and also to the Taxicab, Manufacturers, and Telephone Maintenance Radio Services.

The Commission said the rule change was unlikely to result in a significant increase in the use of the band. It said adverse effects on users of auditory training devices, predicted by producers and distributors of those devices, were unlikely. There have been no reported instances of interference from operation in the 72-76 MHz band to those devices, which operate on a secondary basis and are not afforded protection against interference by FCC rules. The Commission made the newly authorized use subject to the same technical restrictions applying to use of the band by licensees in other mobile services.

Reconsideration Of Rules For Non-Licensed Radio Control And Security Alarm Devices

The Commission has partially granted a request by the American Radio Relay League (ARRL) seeking reconsideration and stay of a decision allowing more flexibility in the operation of non-licensed low-power transmitters for radio control and wireless security systems. It also rejected a request by ARF Products, Inc. and Pittway Corporation, security equipment manufacturers, to permit transmissions from radio control transmitters in wireless alarm systems up to a rate of one transmission per minute for a total transmission time not to exceed five seconds in any eight-hour period.

The FCC did, however, relax the testing provision to permit a one-second transmission per hour. In instances where a manufacturer desires a greater rate of testing time in a security system—i.e., at the rate requested by ARF and Pittway—the Commission gave the option of testing at approximately one half the power level.

On October 22, 1981, the Commission amended Part 15 of the rules, basically expanding the scope of the garage door opener rules to cover security alarm and other radio control devices by permitting them to operate above 70 MHz—except in certain sensitive frequency bands—at levels previously reserved for garage door control transmitters. Additional limitations were placed on bandwidth and spurious or harmonic emissions, and a new band of 40.66 to 40.7 MHz was provided. It also retained a provision in Part 15 for general purpose semi-continuous transmitters under which most radio control devices used in security and other applications had operated previously with reduced versatility.

ARRL contended that because Amateur stations operate at high power levels in residential areas close to homes having burglar alarms and other security systems, there is a high potential for Amateur stations to jam these systems or trigger a false alarm. Moreover, radio control and security devices could interfere with Amateur stations. Therefore, it asked that the 144-148, 220-225 and 420-450 MHz frequencies allocated to the Amateur Radio Service be excluded from use by radio control and security alarm devices.

In reply, the Commission noted that because of possible susceptibility and interference problems, which might occur between security alarm systems and/or high-power radio operations, it would expand Part 15 to alert manufacturers to consider, in designing equipment, susceptibility to Amateur Radio and other high-power operations and to avoid operation on frequencies used by high-power stations.

As for ARRL's contention that because the Commission's action did not follow the Administrative Procedure Act, it should issue a stay and further notice of proposed rulemaking, the Commission said this was unnecessary and contrary to the public interest since all requirements of the ACT had been followed and ARRL's unchanged concerns were considered before final rules were adopted.

FCC Radiotelegraph Exemption For 1600-Ton- Plus Coastal Cargo Ships

A federal appellate court has upheld an FCC action providing a general exemption from radiotelegraph requirements of the Communications Act to cargo ships over 1600 tons that sail within 150 miles of the 48 contiguous states, provided they meet specific alternative communications and operational criteria.

The American Radio Association and the Radio Officers Union had asked the U.S. Court of Appeals for the Second Circuit (New York City) to review the FCC's decision. They claimed it lacked statutory authority to grant such a broad exemption, acted irrationally in concluding the alternative communications equipment would be as effective as radiotelegraphic equipment, failed to comply with the Administrative Procedure Act notification requirements, and violated the Environmental Protection Act by not filing an Environmental Impact Statement on the exemption.

In its October 8 opinion denying review, the court concluded the Commission had acted within its statutory authority and proceeded in accordance with relevant procedural guidelines. It said the FCC was justified in relying on the fact that the Navy's elimination of radiotelegraph equipment has not affected the safety of ocean-going vessels. The court pointed out the U.S. Coast Guard had agreed with the FCC that alternative systems "would be an adequate substitute for the mandated radiotelegraph system."

FCC Warns Amateurs To Avoid Using Government Frequencies In 30-Meter Band

The Commission told Ham operators who use recently authorized frequencies in the 10.100 to 10.109 MHz and 10.115 to 10.150 MHz bands that they must stay off frequencies between those bands to avoid interfering with government operations.

Although a Commission Order adopted on October 28, 1982, made some frequencies in the 30-meter band—10.100 to 10.150 MHz—available temporarily to General, Advanced, and Amateur Extra Class operators, it excluded the portion of the band between 10.109 and 10.115 MHz. Those frequencies are still used for government operations, and they cannot tolerate interference.

Amateur operators who use any of the unauthorized frequencies in the 30-meter band will be in violation of Section 97.63 of FCC rules, and will therefore be subject to enforcement action.

Copies of the Order explaining the Commission's temporary authorization of 10 MHz frequencies in the Amateur Radio Service are available from the Downtown Copy Center, 1114 21st St., N.W., Washington, D.C. 20037, phone (202) 452-1422. Requests should specify the Order in RM-3855 released on October 28, 1982.

For more information about this subject

may call John Borkowski in the FCC's Private Radio Bureau, (202) 632-7197.

License Revocation Remanded To Review Board

In response to a Private Radio Bureau request for review, the FCC has remanded its Review Board's reversal of Administrative Law Judge Joseph Stirmer's revocation of Theodore E. Sousa's license for KEV-6939 at Dolton, Illinois, to the Board for consideration of the merits of Sousa's exceptions to the judge's initial decision.

On June 15, 1977, the Chicago monitoring unit of the Field Operations Bureau (FOB) discovered that Sousa's station was breaking the FCC's CB rules—communicating more than five minutes, at distances of over 150 miles, and not using the assigned call sign. On June 27, it sent Sousa a violation notice, receiving a response on July 15 which was then forwarded to FOB headquarters in Washington, D.C.

In the meantime, Sousa submitted a renewal application dated June 16, 1977, to the Private Radio Bureau's Gettysburg, PA, facility, which issued a routine computer renewal on July 31. A month later, FOB forwarded Sousa's file to the Private Radio Bureau, which ordered Sousa to show cause why his license should not be revoked.

On January 26, Judge Stirmer recommended revocation, having found that Sousa had committed repeated and willful viola-

tions not only in 1977, but also in 1973 and 1976, despite Sousa's claim that he had not been found guilty of these violations.

The Review Board, in overturning the judge's decision, held that it was established law that a renewed license could not be revoked solely because of licensee misconduct occurring in a previous license term and known by the Commission at the time the renewal was granted. It declared that a license grant must be considered final after a 30-day reconsideration period. Moreover, in this case, there was a two-and-a-half month period during which FOB could have notified the Private Radio Bureau that serious rule violations had been discovered which might have a bearing on Sousa's qualifications to remain a licensee.

Disagreeing with the Review Board's conclusions, the Commission noted that unknown to the Private Radio Bureau, FOB was still conducting its evaluation when Sousa's license was renewed by computer. Moreover, the Commission pointed out that under Congressional mandate it could revoke any station license because of new information coming to its attention which would warrant refusal to grant a license or permit on an original application.

As for the Board's proposal that applications be "flagged" when FOB discovers rule violations, the Commission said given the sheer volume of Private Radio Bureau applications, this would likely result in numerous unnecessary delays in granting licenses.

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SCANNER SCENE

BY RICHARD BARNETT

MONITORING THE 30 TO 512 MHz "ACTION" BANDS

Monitoring Hints

When I first received my programmable portable a number of months ago, I was, as so many others, a bit dismayed to find a good many problems with the unit. Probably the most salient of all of the problems is the seemingly enormous amount of "birdies" that the radio generates. I decided that as the unit was so novel, I would put up with all of the noise; that is, until I found out that there was a birdie on the main state police channel in my area. The most important frequency of them all, and I couldn't receive it. Should I return the radio and give up a lot of the pluses that did go along with it, or should I simply put up with not listening to the number one frequency in my area?

I found the solution to my problem was in the hands of Regency Electronics, which produces a little known unit called the RCD "Listen In" Professional FM Receiver. This is a tiny single channel receiver, not unlike the pocket transistor AM radios of old. It comes with a telescoping antenna and is tuned to any frequency you request within the low and high VHF range. The unit is powered by a regular 9-volt battery and it comes with a volume and squelch control and a fairly powerful little speaker (no external speaker jack is available). With a little work, you can install your own rubber-duckie antenna to make the unit easier to carry and less noticeable, as it will fit in either your back or shirt pocket. Regency claims that reception will vary from 15 to 45 miles, and although I can't verify this, I do know that overall it does have rather good sensitivity.

My unit receives the powerful state police transmitter (located 20 miles away) with the antenna fully closed inside of the house. This is a terrific radio for anyone who either would like to supplement their programmable unit, as I have done, or who just wishes to monitor one specific frequency such as their local police or fire department. It is not quite as reliable as those much more expensive single channel pager look-alike units that Motorola and others produce, but for the money, it is well worth it. For information or to order, write RCD Div. of Regency, 806 Custer Avenue, Norfolk, NE 68701, and ask about their "Listen In" Model MRP-1 radio.

More On The 800 MHz Radio Systems

A few months back, government use of the new 900 MHz frequency range was dis-



The RCD "Listen In" hand-held receiver.

cussed in this column. The possible use by federal agencies was for fixed station operations only, but as you may or may not know, the 800 MHz band is now being utilized by numerous agencies for business and public safety purposes. The range of these radios is generally limited, and you can spot a user by his extremely tiny three inch mobile whip antenna. But the new band does provide a great deal more freedom of operation as it is uncrowded and as much of the communications is "trunked."

Trunking is a two-way communications concept approved by the FCC to help alleviate the growing RF congestion in and around major metropolitan areas. A trunked radio system, by FCC definition, is a "method of operation in which a number of radio frequency channel pairs are assigned to mobile and base stations in the system for use as a trunk group." Trunking, then, is a

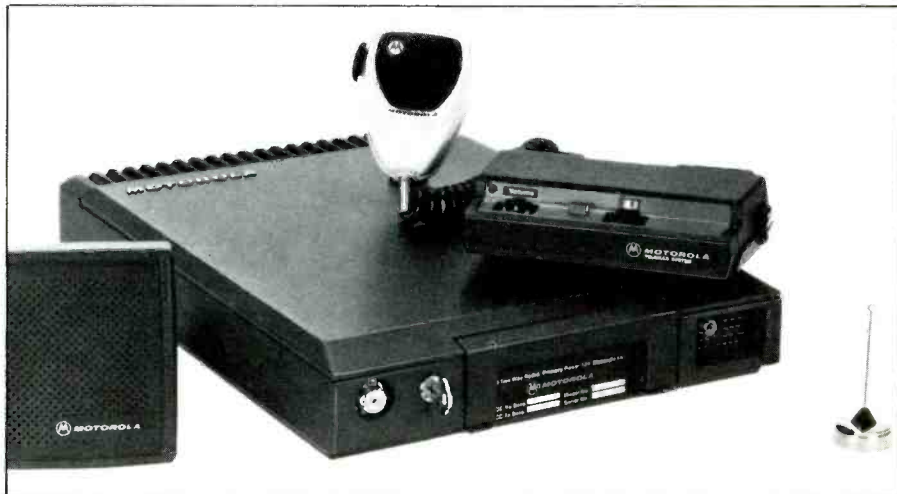
pooling of radio channels where all users have access to all channels.

Currently, the frequency band 816.0125 through to 865.9875 MHz is assigned to trunked operations. Typically, when a potential user applies to the FCC for an 800 MHz license, he will put down all the frequencies in the trunked system that the communications company he works through provides. Thus, you commonly will see the following frequencies on an application: 816.4875, 817.4875, 818.4875, 819.4875, 820.4875, and the same for, say, .0125.

In normal two-way business radio communications (police and fire departments will only license one or two frequencies as they are assured that no one in their area will share a channel with them), users have access to one or more frequencies, one frequency at a time. While there are a number of tone "private channel" devices (something we will take up another month) available for communications security, single frequencies are subject to congestion in areas of high RF usage, typically around major population centers. Also, without benefit of a private channel device, any transmission made on an available frequency may be monitored by another transceiver tuned to the same frequency. Scanner users, of course, have no problem whatsoever in monitoring any unscrambled tone encoded private channels. Transceiver users have to wait until a given frequency is clear before a transmission may be made.

In a trunked system, the user has access to several channels. Instead of waiting for a single channel to clear, a trunked system relies on a microprocessor to continuously search

Motorola's trunked "Syntor X-2" transceiver.



all available channels, waiting for an opening where all radios in a given "subfleet" (the call unit of a trunked radio system) are then switched on. At the close of a single transmission, the process repeats.

Each trunked system utilizes one of its channels for communications between microprocessors in its repeater transmitters and one or more mobile radios. Each subfleet is identified by means of a coded transmission on the data channel, which assures privacy. In effect, while several fleets may be sharing the same frequencies, only the mobile or control station radios in a given fleet may communicate with each other.

The system provides further operator flexibility through the assignment of "subfleets" (fleet subdivision) within a given fleet. To illustrate, presume a fleet is a company. Within the company, it is desirable for several departments each to have two-way communications capability, i.e. sales, service, etc. This can be accomplished also by utilizing individual coded information on the data channel. The net effect is that subfleets may communicate with one another, but not to be monitored by other subfleets. The fleet, however, may elect to monitor one or all of its subfleets.

Studies have confirmed the viability of trunking. Considering only one channel at a time, the case in normal two-way systems, a user has roughly a fifty percent chance of obtaining a clear channel at a given time. If that same user has simultaneous access to several channels, the probability of obtaining a channel at any given time is greatly increased. Also, studies have shown that the average individual transmission time is only five seconds, a factor contributing to reduction in delays in gaining channel access.

Individual radio features, such as those found on the Standard Communications Model 666TM, compatible with the Motorola trunking system (General Electric and E.F. Johnson are two other major systems presently available), assure optimum user convenience. Light and tone indications on the radio let the user know if a channel is busy. Should a busy condition exist, the user need not key the microphone a second time as the microprocessor has put his call on hold, waiting for access to a clear channel. When the channel is again open, the operator is alerted by means of a light and tones. In actual use, delays never exceed a few seconds, after which time a transmission is automatically terminated and the operator is informed by a continuous tone.

There is at least one company, Hamtronics, which manufactures a converter to bring your present scanner up to the 800 MHz range. If you live in a metropolitan area and an agency you enjoy monitoring suddenly abandons its frequency and you have no idea where they've gone, look into the 800 MHz range, as this new trunked system is providing either a great deal of privacy (and security as most of us have no immediate capability to listen in on the band), or freedom from interference and traffic on the more conventional VHF and UHF bands.

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Beaming In (from page 4)

cupied) band, it could cause sufficient side-frequency spillover to be bothersome. The authoritative publication, *Aviation Week & Space Technology* (August 16, 1982 issue) raised questions about the possible harmful harmonics that the OTH-B might generate, indicating that some might fall into the VHF aero band.

The Air Force's own Environmental Impact Statement (EIS), relating to an OTH-B test conducted in Maine, addressed itself to

heart pacemakers and electroexplosive devices alone. It did not comment on the havoc this system did (or might) cause to the various radio communications, navigational, or broadcast systems which operate where the primary frequency or the harmonics of that frequency will be appearing within the radio spectrum, and to radio users as far away as 1,800 miles from the transmitter who might be adversely affected by the OTH-B system.

Obviously, these are considerations which must be taken into account. Just how much interference is this system going to generate? Will stations in its path have to

change frequency to get out of its way? Will they have to increase power, change their antennas, operating schedules? Or will they have to wing it as well as they can within the limitations of their existing licenses and finances? The way it looks to us, much of the time communications from Alaska to California could well be victimized by the OTH-B, with skip conditions at times causing havoc to communications in other parts of the world.

On another level of consideration, the OTH-B experimental installation (which had a 7½-million watt transmitter and only about 60° coverage) ran up an electric bill of \$18,000 to \$22,000 per month. A complete 180° coverage system might well ring up \$54,000 to \$66,000 per month in electricity costs and, moreover, require the erection of new power utility substations and powerlines. One can but wonder if the environmental impact of these factors was brought into account; if so, it was not mentioned in the Maine test's EIS.

There also would appear to be some questions concerning the possible effects of long term exposure to these high powered pulse signals by those who live in the area of the transmitter. What affect would these signals have upon those who use tobacco, caffeine, alcohol, prescription or non-prescription medicines, or common street drugs? The Maine test's EIS was centered on those who work directly at the transmitter site and seemed little concerned with area citizens.

We can only look back upon the tragedy of how the Nevada tests of the atomic bomb in the 1950's—done without adequate environmental impact studies—have haunted those who lived downwind of ground zero; or, how our service personnel in Viet Nam were exposed to Agent Orange—also without benefit of environmental impact study, but in the name of national defense.

PROJECT ELF, and the OTH-B radar, may well be vital to our national defense. But we, as a nation, now wish to be assured that these (and other similar projects) are not going to harm those they seek to protect, or cause us serious inconvenience or expense. If it's important enough to do a good job of estimating the environmental impact of a movie theatre, then certainly projects such as these deserve as full and complete an environmental analysis as is possible. We don't want any more Russian Woodpecker signals on the shortwave bands, and we can't tolerate any more Agent Orange episodes. National defense? Fine. But let's go about it in a manner that weighs all of the various factors before we fire this thing up on the airwaves.

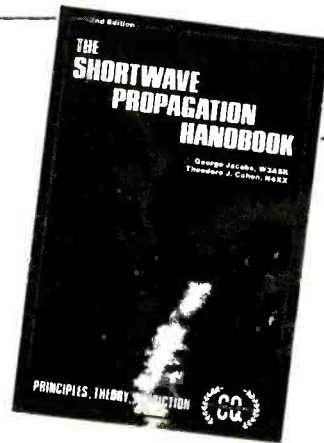
If you've got any questions about the possible impact of the Air Force's OTH-B radar project, or any suggestions on how they might adequately evaluate its impact on you or your use of communications, you can write to: Mr. R. Raffa, HQ ESD/SCU, Hanscom AFB, MA 01731.

I'm sincerely indebted to Bob Horvitz of Providence, RI, for offering me his valuable thoughts and assistance in the preparation of this month's "Beaming In."

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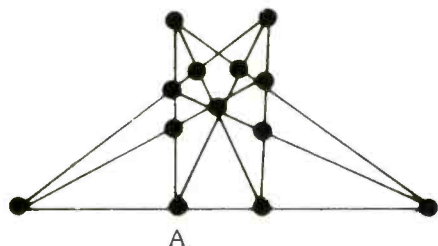
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2. 295 messages.
3. The two hands are together at 12 Noon; 1:05:30 AM & PM, 2:11 AM & PM, 3:16:30 AM & PM; 4:22 AM & PM, 5:27:15 AM & PM, 6:33 AM & PM, 7:38 AM & PM, 8:43:30 AM & PM; 9:49 AM & PM, 10:54:30 AM & PM, and 12 Midnight. It takes 134 monitors to stand watch.
4. Station A receives 144 commendations. Station B receives only 72.
5. A man could; but a ship might not be able to since the cable would be 16 feet above the surface of the earth.
6. Survivalist D enters the alcove. Survivalists A, B, and C pass the alcove. Survivalist D goes on his way. Survivalists A, B, and C return to the other side of the alcove and the operation is repeated for E and F.
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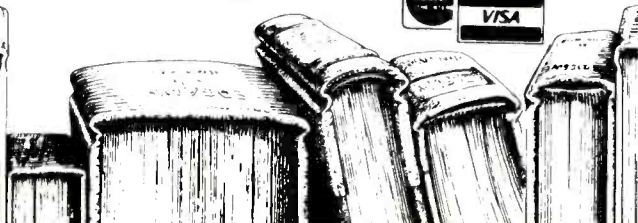
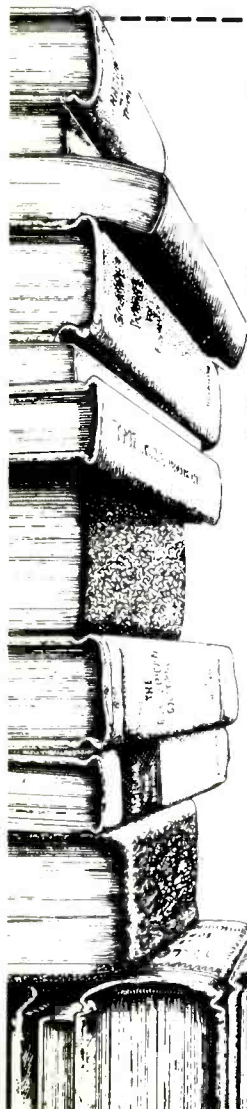
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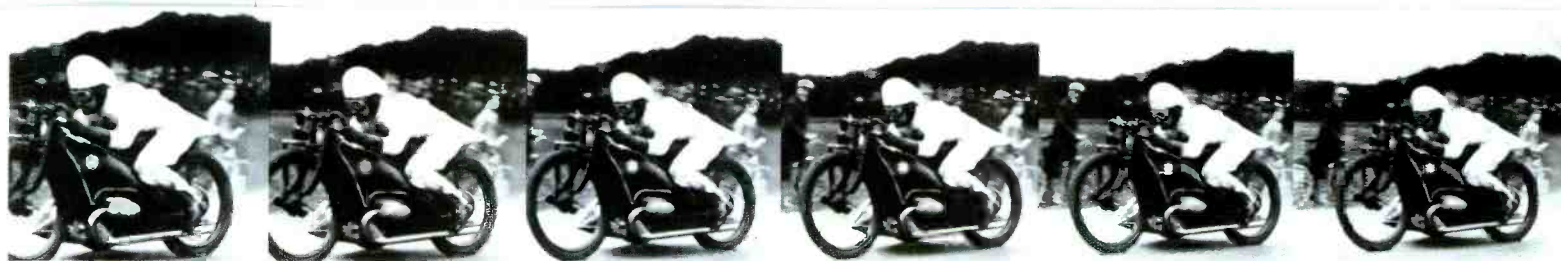
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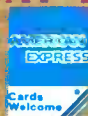
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