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JUNE 1983 $1.75

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IC-R70

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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.

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HAM'ING

The R70 is an ideal general coverage receiver to complement any ham shack. Use it with your existing tramsmitter or transceiver to provide dual receiver capability.

The R70's built-in monitor system lets you listen to your own transmitted audio and a mute input automatically protects the R70's receiver from your signal.

An option for FM allows listening to the 10 meter FM activity.

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SWL'ING

For the short wave listener, the readout section of the R70 gives all the information for logging a station to be returned to at a later time. Frequency, mode, VFO, signal strength are all displayed. A dial lock prevents accidental loss of a signal.

A front mounted speaker provides 3 watts of crisp clear audio. A record jack allows easy attachment of a tape recorder.

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Like all ICOM HF products, the R70 fits into the ICOM system concept of accessories allowing you to use previously purchased accessories such as the HP1 headphone, SP3 external speaker, and AH1 auto bandswitching antenna.

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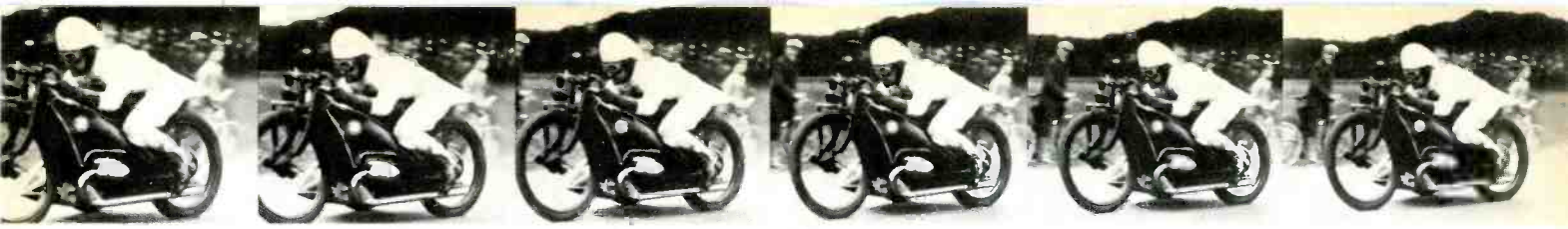

INTRODUCING THE LATEST HEIR TO 59 YEARS OF GERMAN ENGINEERING.

While the fine lines and sculpted features of most sport bikes spring from the drawing tables of stylists, those of the BMW R65LS had a different birthplace.

The drafting tables of German engineers.

As a result, they are the recipients of the same pragmatic consideration and evolutionary refinement as the legendary engine that powers this 650cc machine.

The shapely sport fairing, for example, provides much more than cosmetic appeal. It helps reduce front-wheel lift by over 30%.

The LS handlebars are low, compact, and help to provide a seating position that "is sporting in a way that Japanese bikes, even with red paint, have not discovered" (Cycle World). (High bars are also available.)

The bike's slender tail, artful as it too appears, was created in one of the most aesthetically indifferent environments known to man: the massive BMW wind tunnel in Ismaning, Germany.

Even the wheels of the LS possess a beauty that goes far deeper than their gleaming enamel. Each rim section is made of a highly rigid aluminum alloy; each hub and spoke assembly is separately cast from a far more elastic aluminum alloy to provide added flexibility. And then everything—hubs, spokes and rims—is cast as a single unit. Culminating in an exceedingly resilient "composite" wheel that not only helps increase handling prowess but decreases unsprung weight.

In the end, the BMW R65LS is one sports bike whose graceful lines do not serve as camouflage for weak engineering. For it is a machine as adept at slicing through the wind and rounding corners as it is at turning heads.

Its price? A lofty $3,790.*

But as a motorcycle columnist of AutoWeek observed, "a bad motorcycle is worthless; a good motorcycle is worth whatever it costs... By that standard, the R65LS is a bargain."

*Manufacturer's suggested retail price, $3,790. Actual price will depend upon dealer. Price excludes state and local taxes, dealer prep, destination and handling charges. © 1982 BMW of North America, Inc. The BMW trademark and logo are registered trademarks of Bayerische Motoren Werke, A.G.

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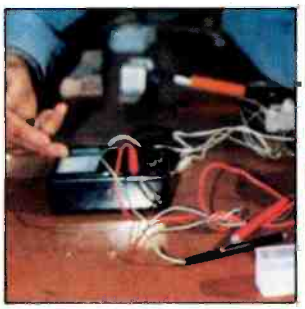
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FEATURES

This month's cover: *Photo taken by Larry Mulvehill in the People's Republic of China.*

DEPARTMENTS

BEAMING IN

BY TOM KNEITEL, K2AES

AN EDITORIAL

Hear Here

Those interested in radio communications are regularly reminded of our federal statutes governing secrecy of communications (Section 605 of The Communications Act of 1934). A recap of Section 605 is often included in various frequency directories to remind those who would tune non-broadcast stations on the HF or scanner bands that, even though such communications may be "in the clear" (that is, not scrambled), they are considered to be the private property of those persons sending the messages and those to whom the messages are addressed. Fact is that, with the exception of broadcasting and amateur stations, almost any American station transmission comes under the protection of the secrecy of communications laws (even CB radio!).

Of course, Section 605 isn't the only thing that seeks to govern the monitoring of communications; there are anti-wiretap laws, and efforts are being made by operators of cable TV, MDC, and entertainment satellites to dissuade those who would watch their movies and sports events without their permission. This is to say nothing of users of SCA (such as *Muzak*), who definitely do not look with favor upon those who tap into their programming without authorization.

When you stop to think about it, the public is confronted with a rather formidable array of restrictions relating to the why's and wherefore's of listening to what others are saying, and it does give one a certain sense of security to know that attention is being paid to assuring communications privacy. It's part of our old "mind your own business" ethic. As once stated by an American Secretary of State, Henry L. Stimson, upon the discontinuance of a pre-WWII U.S. decoding operation, "Gentlemen do not read each other's mail."

Unfortunately, all of these communications privacy laws would appear to be little more than window-dressing. Lest such statutes lull you into a false sense of security, do not forget that (for instance) the Federal Communications Commission reserves the right to monitor the communications of its licensees for enforcement purposes. Also, it is possible for all manner of federal investigative agencies to get permission (from a judge or the highly secret Foreign Intelligence Surveillance Court established in 1978) to establish a wiretap. It's even possible for your local police to get a court order to permit your phone to be tapped for any number of reasons. Still, once in a while, one of the federal or local agencies is caught running a wiretap without having gone through the formalities of getting the necessary permission—and the newspapers and TV news programs react in horror at the invasion of the public's privacy (remember that we do not read each other's mail). After all, there is the Fourth Amendment to our Constitution, which protects individuals from unreasonable searches and seizures.

Interestingly, the media (and the public) has not paid very much attention to the fact that for the past 30 years, the National Security Agency has been wiretapping and otherwise monitoring the supposedly private communications of Americans, and doing it in grand style. As pointed out in two recent books, first in *Covert Techniques For Intercepting Communications* by Winston Smith (CRB Research), and later in *The Puzzle Palace: A Report on NSA, America's Most Secret Agency* by James Bamford (Houghton Mifflin Co.), NSA is engaged in the wholesale activity of eavesdropping on the private communications of the world's citizens for the purpose of detecting a word here or there that might possibly have some bearing upon "national security." This isn't a matter of monitoring only for information about H-bombs and missiles; they've also included in their target area messages relating to politics, the economy, industry, and even personal information—the type of stuff that only the most paranoid mentality could consider to be legitimately encompassed in a surveillance relating to "national security."

The NSA has long hidden its basic activities from the public, for certainly it has been operating in violation of the Constitution as well as many federal laws. Unfortunately, it does not seem that there are to be any restraints put upon this super-Big Brother agency. Last October 21, a federal appeals court ruled that the NSA is lawfully allowed

(Continued on page 76)

A POINT WELL TAKEN...

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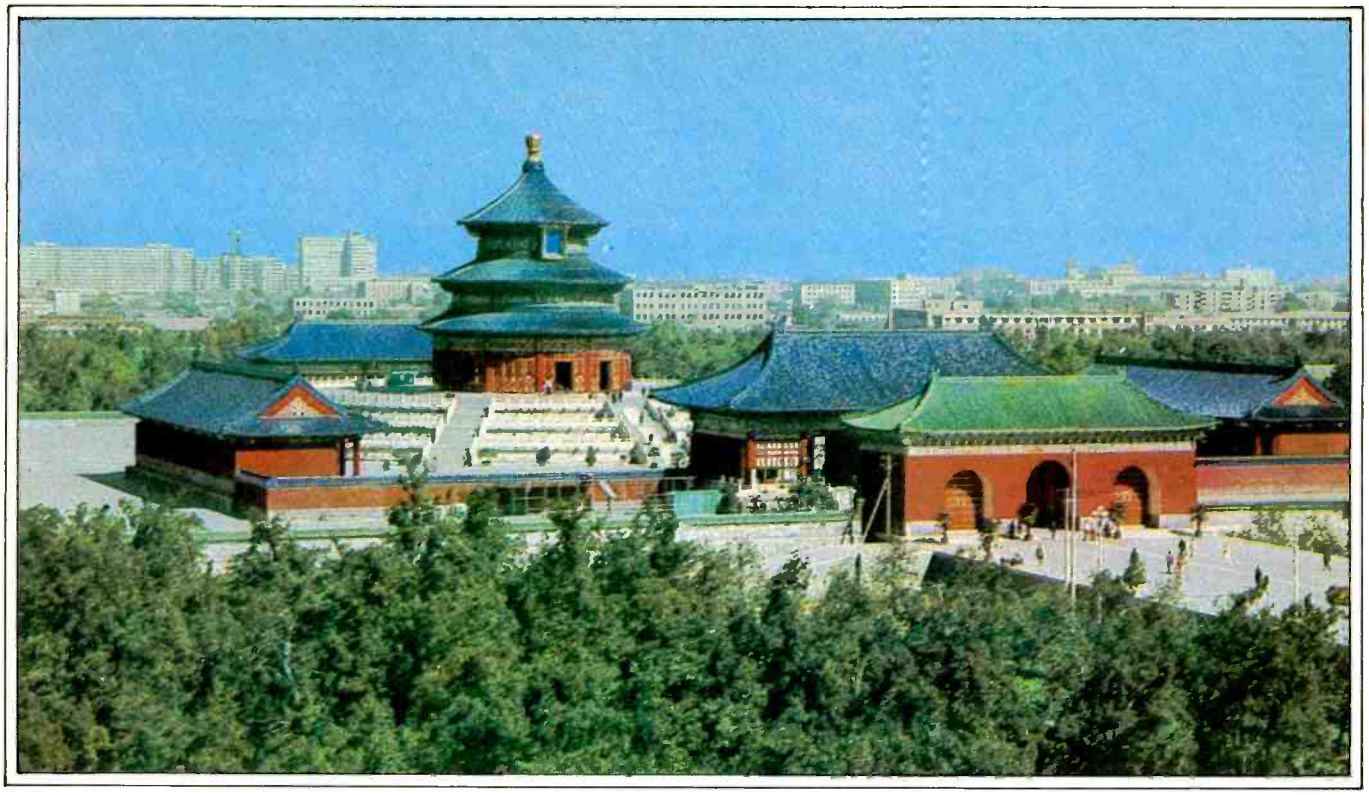


DXing The Bamboo Curtain

BY GERRY L. DEXTER

"Strive to do broadcasting work well and serve the people of China and the world." So said Chairman Mao Tse Tung in 1965 on the twentieth anniversary of the People's Broadcasting Service.

From our perspective, we are unable to tell if the broadcasters of China have reached the goals Chairman Mao set for them. And since the "Great Helmsman" is no longer part of the scene and has lost some of his official lustre, perhaps it doesn't matter very much anyway.

Good, bad, or indifferent, radio in China captures the interest of many shortwave listeners and DXers. So it's worth taking a look at the Chinese broadcasting scene.

Broadcasting in China dates back to 1928, when a station of the China Broadcasting Corporation went on the air from Nanking with a 500 watt transmitter. Subsequently, both government and private stations were in operation. The famous XGOY, which operated as a foreign service in the 1930's and 1940's, was a call actually used by several stations in different locations. Some old-timers in the DX game have highly prized QSLs from this well-known but long-vanished station.

The first Communist-controlled station in China, New China Radio, came on the air during World War II. Due to the flow of territorial control between the Chinese and Japanese, and between Chinese Nationalists and Chinese Communists, the station was moved to Yenan where the Communists had their headquarters. By 1948, the Communists had 16 stations in various locations under their control.

With the gradual Communist takeover of China from 1945 to 1949 and eventual victory (except for Taiwan), radio rapidly became completely controlled by the government. However, there was a period of a year or two where some private stations were allowed to remain on the air, albeit under the extremely watchful eye of Beijing. By 1950, some 83 transmitters had been added and Chinese broadcasting was well on its way to becoming the highly complex and very extensive system it is today.

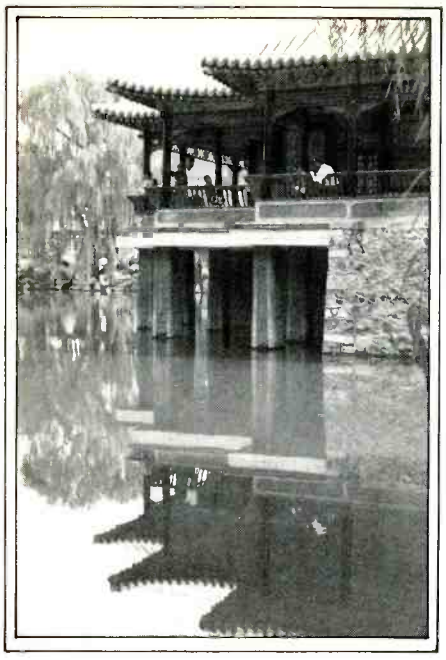
Radio Peking is, of course, the most widely-known and easily heard of the several forms of radio in China. Effective January 1 of this year, Radio Peking became Radio Beijing, reflecting spelling changes in romanticizing the Chinese language, which has been in progress for some years. We'll use "Beijing" from now on.

Radio Beijing got its official start in 1950, with a foreign service on shortwave using nine languages. Today, things are a little different—different to the tune of 39 languages aimed at all corners of the world and a sum total of 140 hours per week on the air.

A sampling of the tongues with which Radio Beijing speaks would include: Burmese, English, Portuguese, Spanish, Tagalog, Quechua, Indonesian, Esperanto, Lao, French, Thai, Vietnamese, Cambodian, Tamil, Mongolian, Korean, Sinhalese, Turkish, Pushto, Hindi, Bengali, Swahili, Urdu, Arabic, Bulgarian, Czech, Italian, Polish, Serbo-Croatian and, as you'd expect, Russian and several Chinese dialects.

There are over 60 transmitters located in the Beijing area alone and Radio Beijing's programs are also aired over relay facilities at Urumqi, Kunming, Xian, and Shanghai. Many of the transmitters were built and installed by the Russians when the two countries were getting along better than is the case now. Altogether, Chinese broadcasting occupies over 400 frequencies at one time or another!

Radio Beijing's English programming runs to some 18 hours per day to various parts of the world. To North America, the schedule is 0000 to 0300 and 1200 to 1300 GMT to the East Coast and 0300 to 0500 to the West Coast.



Colorful scenes, sometimes with a revolutionary flavor, are the subjects for Radio Beijing QSL cards.

Typical Radio Beijing programs include *Culture in China, China in Construction, Listener's Letterbox, Learn to Speak Chinese,* as well as news, large doses of Chinese music, and official propaganda.

The English department occupies several rooms in the west wing of the second floor of the Broadcasting Building in Beijing. There are about 50 people on the English staff, including some from the United States. English section announcers include Wu Zhenchang, a Beijing University graduate who returned to China from Jamaica; Wei Lin, who has been with the department through thick and thin since before Radio Beijing's official beginning; Zhou Hong, a host of musical programs; Dang Bing, who does mostly cultural programs; and Liu Hui, host of *Magazine Digest.*

Broadcasters in China enjoy above average salaries, regular raises, and other special advantages.

Most transmitters for the Radio Beijing foreign service run 120 or 240 kilowatts and the frequencies used are mainly "out of band." That is, they are outside the normally agreed-upon international broadcasting bands. As a result, Radio Beijing enjoys clear frequencies for its broadcasts much of the time.

Until a few years ago, it was very easy to hear Radio Beijing via Europe! Back when China and Albania were good friends, the Chinese installed high-power transmitters in Albania on the condition they could be used for the relay of Beijing's programs. With the breakup of the relationship, Albania ended the agreement. Beijing's broadcasts are restricted to coming only from within China and the Albanians have some hefty voices to use for their own purposes.

Radio Beijing is an excellent verifier, sending colorful QSL cards in response to reception reports. In addition, you are likely to receive copies of Chinese hard-sell political propaganda magazines, such as *China Reconstructs* and *China Today*, along with pennants, pins, postcards, notebooks, and the famous Radio Beijing wall calendar. The address is: Radio Beijing, Beijing, People's Republic of China.

But the shortwave listener needn't restrict himself to the big time overseas service known as Radio Beijing. There's a lot more waiting to be heard!

Chinese broadcasting is divided into several programs or services under the overall flag of the Central People's Broadcasting Station. The first program *(CPBS-1)* operates on both medium and shortwaves and is on the air in Mandarin Chinese from 2000 to 1735 GMT on a variety of frequencies. The service opens with "The East Is Red" and closes with "The Internationale." The second program *(CPBS-2)* is also on in Mandarin, also on both medium and shortwaves and signs on and off in the same fashion. It operates from 2100 to 1600 GMT. The difference between the two is mainly in program content, little noticed by someone who doesn't speak the language.

The third program, more accurately known as the *Taiwan Program*, is beamed in Mandarin, Amoy, and Hakka from 2000 to 0610 and 0830 to 1900 GMT on several shortwave frequencies. As you might have guessed, the service is aimed at listeners in Taiwan, which China considers an errant state, rightfully a part of the mainland.

Domestic services make up the fourth program from Beijing, but it's also aired from transmitters in Urumqi, Hohhot, and Lhasa. Programs are broadcast in Kazakh, Korean, Mongolian, Tibetan, and Uighur. Art and literature comprise 53% of the airtime; special features for workers, young people, and so on take 22%; news 21.5%; and announcements and radio calisthenics 3.5% of the broadcasts.

It is very difficult for the average listener or DXer to tell one service from the other, and services on given frequencies are not completely reliable. The listener who wants to know if he's hearing *CPBS-1, CPBS-2,* or the *Taiwan Program* would be advised to check the *World Radio TV Handbook*'s China section, although it's a good idea to keep in mind that no list is fully accurate.

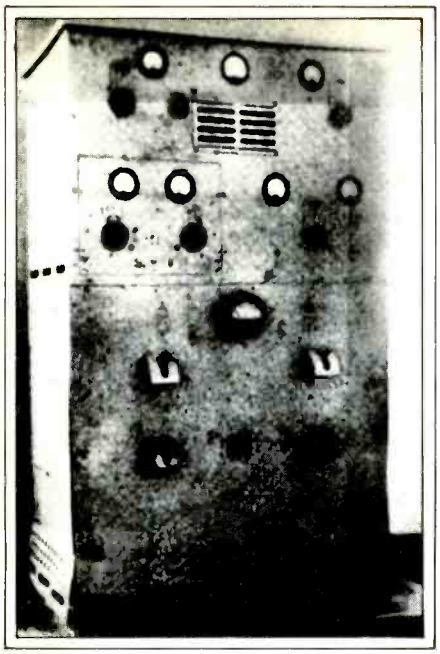
All provinces, municipalities, autonomous regions, as well as some of the cities have their own station or stations, a number of which operate on shortwave in addition to medium wave. Again, these broadcasters operate under the direct control of local broadcasting administrations which, in turn, are under the control of local revolutionary committees. Broadcasts include relays of programs from the various services out of Beijing, but some local programs as well.

Many of the provinces can be found broadcasting on shortwave—some of them relatively easy to log, some extremely difficult, and a few even in doubtful status insofar as shortwave activity is concerned. See our chart for a complete list of the Chinese regionals and their frequencies.

One of the more interesting of the regionals is a station at Beihai in Guangzi-Zhuang Province, which has been popularly known as the Beihai Fisheries Station. It is occasionally logged on a variable frequency of 8.747 MHz in the early morning hours, U.S. time. It is basically a relay of the main station in Guangzi-Zhuang Province (at Nanning) but has some of its own programs as well. It's scheduled from 2100 to 1600 GMT.

Lhasa, the forbidden city, is also on the list of regionals. Some shortwave broadcast country lists count Tibet as a separate country, as well as Manchuria—where stations in Harbin and Hailar are represented on shortwave. A word of warning: if you report these stations directly or in care of Radio Beijing, don't refer to them as "countries." That term is a matter of convenience used by some clubs and the Chinese would very likely find it offensive!

Until just a few years ago, it seemed that the Great Wall of China ran not only along the western border of the country but completely surrounded it, preventing regional verifications from leaving the country. Only Radio Beijing would respond and then only for reports on reception of Radio Beijing.



Original transmitter of New China Radio, at Yenan, about 1945.

Editing a program at Radio Beijing.

English announcers for Radio Beijing (left to right): Wu Zhenchang, Li Dan, Fang Ling, Xiao Li, Yang Qing, Tong Zhanwu, Su Ming, and Zhang Jiaping.

DXers rejoiced when China began to open up and look westward under its post-Mao leadership, a turn that eventually resulted in QSLs for the regional stations, too! Today, Radio Beijing will usually confirm reception of regional outlets with a printed QSL card, although the card will only indicate the Station/Province name. More recently, some of the regionals have been replying directly and, though reporting to the provincial stations directly is more of a hit and miss affair, the reply is certainly more exotic and fun to have in your collection. Reports can be addressed to: Province name, People's Broadcasting Station, City, Province, People's Republic of China. Reports in English are accepted and return postage isn't necessary. Regional stations identify with the province name followed by "Jen Min Kwang Po Tien Tai" or "People's Broadcasting Station."

Another broadcasting organization in China is the Fujian Front Station, operated by the People's Liberation Army (and also known as People's Liberation Army Radio). Transmitters are in Fujian province, probably near the capital of Fouzhou. China has extensive military installations in the province which, combined with its nearness to Taiwan, is the reason for the station's location in Fujian Province.

The station has two main purposes: first, to act as a propaganda tool *of* the armed forces *to* the armed forces, feeding the current party line on what is "correct." Airtime is also devoted to beaming programs at Taiwan and the offshore islands.

The Fujian Front station has two programs or services. The first program goes out from 1000 to 0500 in Mandarin and the second from 0400 to 2100 in Amoy and Mandarin and includes relays of Beijing's Taiwan service. The station identifies as "Chungku Jen Min Fan Chou Fujien Chien Hsien Kwangpo Tien Tai."

A few verifications, in Chinese, have been received from this station over the years, but the station is by no means a 100% verifier. Try writing to the Fujian Front Station or, People's Liberation Army Radio, Fouzhou, Fujian, People's Republic of China. And don't hold your breath waiting for an answer. It may not come!

Another station that might be classified as a semi-broadcaster is that operated by Hsin-Hua, the New China News Agency. It transmits slow-speed official news intended for newspaper editors across China and certainly it's monitored by Western correspondents based in Hong Kong, too. It identifies as "Chungko Hsinwen Kwangpo Tien Tai." It is occasionally heard in the United States and can be readily identified by its use of a woman announcer speaking slowly in Chinese. Periods of music make up the balance of the broadcasts. QSLs from this one are even rarer than from the People's Liberation Army Station, but you might try a report to Hsin-Hua, P.O. Box 54, Beijing, if you hear the station.

China has its versions of WWV, too. BPV, operated from the Za-Ka-wei Observatory in Shanghai, is listed to operate on 5.000, 10.000, and 15.000 MHz 24 hours a day and on 5.430 and 9.351 on a more restricted basis, with time signals and identification in Morse code and by a woman in Chinese. If you hear it, write to the Chinese Academy of Sciences, Shanghai Observatory, Shanghai.

BPM, another Chinese time station, operates from 1600 to 2200 and 0300 to 0600 on 10.000 and 15.000 MHz, again identifying in morse code and with woman in Chinese. This one can be reached by writing the Shaanxi Astronomical Observatory, Chinese Academy of Sciences, P.O. Box 18, Lintong (near Xian), People's Republic of China. Include the "near Xian" phrase as part of the address. Apparently, the Chinese mailmen can't find the town otherwise!

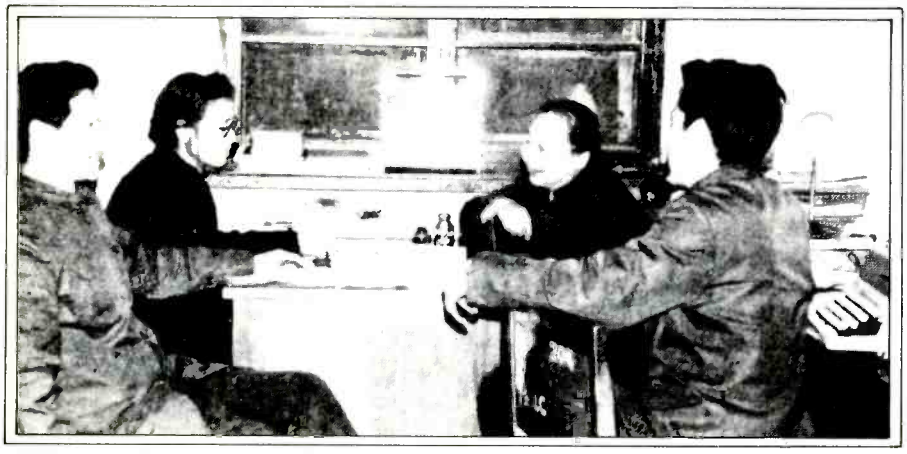
There have been recent reports that BPM is replacing all or part of the BPV service, so it's possible that the latter station (BPV) may have discontinued operations.

Finally, although there's no possibility of hearing such a thing at present, DXers were able to verify the first Chinese space satellite, "Chi-Com One," as it jingled its way around the globe back in 1970, playing a sort of music box rendition of "The East Is Red." If this should occur again and you're lucky enough to hear it, you can send a report to the Chinese Academy of Sciences in Beijing and it's likely you'll receive a reply.

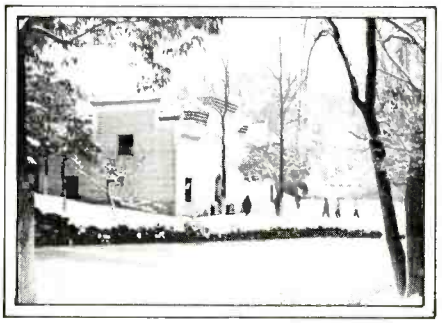
The Westerner has been fascinated with China since contact was first made with the Chinese centuries ago, and it has continued through various dynasties, war, revolution, occupation, Communist revolution, civil war, cultural revolution, and now a new opening towards the West.

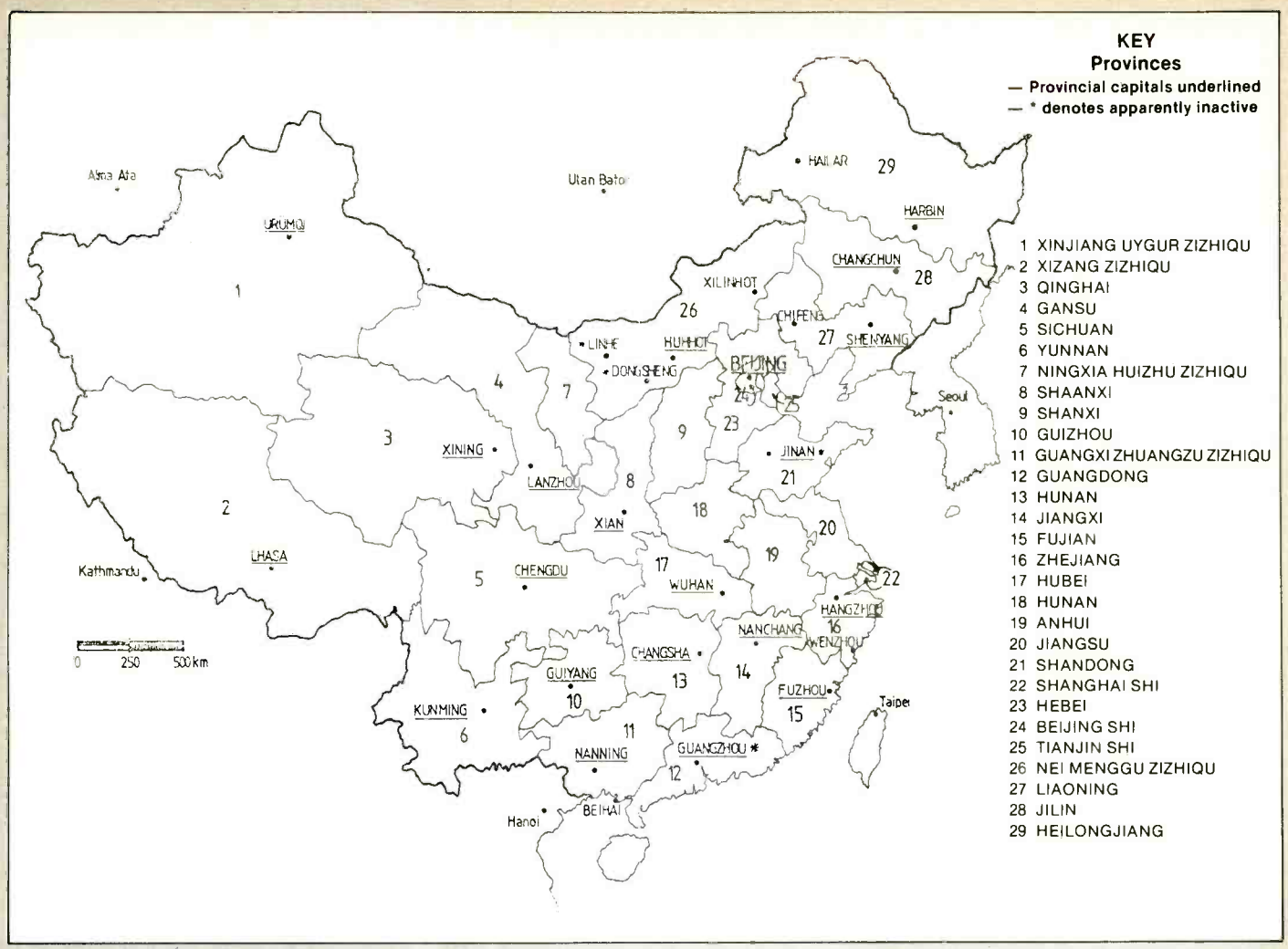
Whether you're a shortwave listener wishing to get the Chinese slant of things on Radio Beijing's English service or a DXer seeking a log on a regional down on 120 meters, for most of us, the fascination with China will always exist.

The folks who answer the listener mail at Radio Beijing.



QSLs from Radio Beijing's English service and from a provincial station, sent out via Radio Beijing.





Chinese Regional Stations

Province/Station Name	City	Frequencies (MHz)
Fujian PBS	Fuzhou	4.975, 5.040, 7.165
Gansu PBS	Lanzhou	4.865, 5.970, 6.005, 6.115, 7.235
Guangdong PBS	Guangzhou	3.900
Guangzi Zhuang PBS	Nanning	4.915, 5.010
	BeiHai	8.747 variable
Guizhou PBS	Guiyang	3.260, 7.272
Heilongjiang PBS	Hailar	3.900, 4.750, 6.800
	Harbin	4.840, 4.925, 5.950, 6.150
Hubei PBS	Wuhan	3.940
Hunan PBS	Changsha	4.990
Jiangxi PBS	Nanchang	5.020
Jilin PBS	Changchun	3.310, 6.070
Liaoning PBS	Shenyang	4.832
Nei Menggu PBS	Hohhot	3.970, 4.068, 4.896, 6.840, 6.974
	Xilinhot	4.525, 4.952, 6.045, 7.200
Qinghai PBS	Xining	3.950, 4.940, 6.260, 6.500
Shanxxi PBS	Xian	6.176
Shandong PBS	Jinan	2.376
Sichuan PBS	Chengdu	3.245, 5.900
Yunnan PBS	Kunming	2.310, 4.759, 5.960, 6.937, 7.208
Xinjiang PBS	Wulumqi*	4.110, 4.195, 4.500, 4.970, 5.057, 5.440, 5.925, 7.050, 7.385, 6.280
Xizang PBS	Lhasa	4.035, 5.935, 9.490
Zhejiang PBS	Wenzhou	2.415
	Hangzhou	2.475, 6.600 variable

* "Urumqi" in text
PBS - People's Broadcasting Station

Central People's Broadcasting Station

(from Peking)
(various languages and target areas)
(all frequencies MHz)

3.360	7.190	10.260
4.250	7.335	11.040
4.460	7.440	11.100
4.770	7.504	11.290
4.905	7.516	11.330
5.075	7.770	11.375
5.163	7.935	11.505
5.320	8.007	11.575
5.880	8.320	11.610
6.200	8.566	11.710
6.225	9.020	11.735
6.430	9.064	12.200
6.665	9.080	15.030
6.750	9.670	15.510
6.795	9.775	15.500
6.890	9.900	15.590
7.095	10.245	15.670

Radio Beijing—English Language Frequencies

(all frequencies MHz)

5.420	11.600
6.520	15.120
6.995	15.125
8.240	15.165
8.345	15.280
8.525	15.435
9.440	15.520
9.860	17.680
10.865	17.700
11.445	17.765
11.500	17.800
11.515	17.855

New China News Agency (Hsin-Hua) Frequencies

(all frequencies MHz)

5.525	11.413
7.425	12.074
7.526	13.700
7.540	13.845
7.560	14.820
7.920	15.574
9.150	16.105
9.266	16.270
9.330	17.505
11.120	

Fujian Front Station

People's Liberation Army
(Foochou, Fujian Province)
(all frequencies MHz)

2.490	5.240
3.000	5.265
3.200	5.770
3.300	5.900
3.400	6.000
3.535	6.400
3.640	6.715
3.900	7.025
4.130	7.165
4.330	7.280
4.380	7.850
4.840	9.505
5.170	9.540

Chinese Provincial Stations

(People's Broadcasting Stations)
(all frequencies MHz)

Frequency	Province	City	Frequency	Province	City
2.310	Yunnan PBS	Kunming	5.900	Sichuan PBS	Chengdu
2.340	Fujian PBS	Fuzhou	5.935	Xizang PBS	Lhasa
2.350	Shandong PBS	Jinan	5.950	Heilongjiang PBS	Harbin
2.415	Zhejiang PBS	Wenzhou	5.955	Xizang PBS	Lhasa
2.460	Yunnan PBS	Kunming	5.960	Yunnan PBS	Kunming
2.475	Zhejiang PBS	Hangzhou	5.970	Gansu PBS	Lanzhou
3.235	Xinjiang PBS	Urumqi	5.980	Nei Menggu PBS	Hohhot
3.245	Sichuan PBS	Chengdu	5.995	Xizang PBS	Lhasa
3.260	Guizhou PBS	Guiyang	6.000	Zhejiang PBS	Hangzhou
3.310	Jilin PBS	Changchun	6.005	Gansu PBS	Lanchou
3.340	Heilongjiang PBS	Harbin	6.045	Nei Menggu PBS	Yih Ju
3.900	Guangdong PBS	Guangzhou	6.070	Jilin PBS	Changchun
3.900	Heilongjiang PBS	Hailar	6.080	Heilongjiang PBS	Hailar
3.930	Liaoning PBS	Ju'Ud	6.100	Xinjiang PBS	Urumqi
3.940	Hubei PBS	Wuhan	6.150	Heilongjiang PBS	Harbin
3.950	Qinghai PBS	Xining	6.155	Gansu PBS	Langzhou
3.970	Nei Menggu PBS	Hohhot	6.176	Shanxxi PBS	Xian
4.010	Nei Menggu PBS	Xilinhot	6.260	Qinghai PBS	Xining
4.035	Xizang PBS	Lhasa	6.500	Qinghai PBS	Xining
4.220	Xinjiang PBS	Urumqi	6.620	Zhejiang PBS	Hangzhou
4.500	Xinjiang PBS	Urumqi	6.800	Heilongjiang PBS	Hailar
4.735	Xinjiang PBS	Urumqi	6.840	Nei Menggu PBS	Hohhot
4.750	Heilongjiang PBS	Hailar	6.937	Yunnan PBS	Kunming
4.750	Xizang PBS	Lhasa	6.974	Nei Menggu PBS	Hohhot
4.760	Yunnan PBS	Kunming	7.050	Nei Menggu PBS	Hohhot
4.785	Zhejiang PBS	Hangzhou	7.050	Xinjiang PBS	Urumqi
4.832	Lioniang PBS	Shenyang	7.090	Jilin PBS	Changchun
4.840	Heilongjiang PBS	Harbin	7.105	Nei Menggu PBS	Hohhot
4.865	Gansu PBS	Lanzhou	7.100	Xizang PBS	Lhasa
4.895	Nei Menggu PBS	Hohhot	7.200	Nei Menggu PBS	Hohhot
4.915	Guangxi PBS	Nanning	7.210	Yunnan PBS	Kunming
4.925	Heilongjiang PBS	Harbin	7.275	Guizhou PBS	Guiyang
4.940	Qinghai PBS	Xining	7.300	Nei Menggu PBS	Hohhot
4.950	Nei Menggu PBS	Xilinhot	7.325	Gansu PBS	Lanzhou
4.970	Xinjiang PBS	Urumqi	7.384	Xinjiang PBS	Urumqi
4.980	Hubei PBS	Wuhan	8.747	Guangxi PBS	Beihai
4.990	Hunan PBS	Changsha	9.490	Xizang PBS	Lhasa
5.010	Guangxi PBS	Nanning	9.520	Nei Menggu PBS	Hohhot
5.020	Jiangxi PBS	Nanchang	9.654	Xizang PBS	Lhasa
5.240	Xizang PBS	Lhasa	9.754	Nei Menggu PBS	Hohhot
5.440	Xingjiang PBS	Urumqi	9.780	Quinghai PBS	Xining
5.800	Xingjiang PBS	Urumqi	11.787	Xizang PBS	Lhasa

Red Chinese Tactical Radio Gear

Photo taken by Larry Mulvehill in People's Republic of China.

An Inside Look At The People's Republic's Two-Way Equipment

BY TOM KNEITEL, K2AES

For all of their emphasis on education and technology, the tactical ground radio equipment used within the People's Republic of China is pretty tacky. Some of the pieces of equipment are copies of American military gear from almost 50 years ago! Emphasis is on the use of AM and CW, and primarily on frequencies below 22 MHz. VHF equipment means operation below 50 MHz. All in all, it is surprising to note that the Chinese People's Republic is still steeped in the "dark ages" of communications.

A popular receiver in use by the Army is called the Type 435, which offers diversity reception between the low frequency end of the standard AM broadcasting band and 32 MHz (WS-430 version). A less versatile version is called the WS-30A and tunes only to 25 MHz, although either set covers most of the communications bands in use for ground tactical purposes.

Other popular military receivers include the Type A-148, which tunes 1 to 15 MHz and can be installed in a vehicle or carried on the back, and the Type 7512 receiver, which tunes 1.5 to 25 MHz and, like the A-148, is incapable of SSB reception.

The mainstays in the area of two-way communications are the Type 63 transceiver, the "Mercury Talk" transceiver, and a small manpack of unknown nomenclature. All of this equipment operates between 1.5 or 1.7 and 6 MHz, the extremely limited frequency range making them very vulnerable to electronic warfare (jamming).

In use by platoons and companies, the Type 63 puts out 1.3 watts on CW and promises a range of 15 to 30 miles depending upon the antenna type employed. Voice transmission covers a lesser range.

The "Mercury Talk" unit is similar in many ways, but puts out more power (2 watts voice and 3½ watts CW). This gives it an operational range of up to 100 miles (CW).

The manpack unit operating in this same frequency range is of more modern design and is transistorized, offering the same power output as the "Mercury Talk" unit.

Another transceiver, the Type 71-B, operates voice and CW over a similar but slightly higher frequency range (approximately 2 to 7.2 MHz), putting out 2 watts on CW and 1½ watts voice.

Covering a similar range are the Type 102-E transceiver and the combination of the Type 139 receiver and XF-D2 transmitter. The 102-E runs 15 watts voice and CW between 2 and 12 MHz and appears to be a copy of the American AN/GRC-9 set. The Type 139 receiver and Type XF-D2 transmitter may be combined to form a communications station operating in the 1 to 12.3 MHz band, 75 watts output AM or CW. The XF-D2 transmitter is a newer version (although does not actually replace) two other similar transmitters of older design, the Type 81 (15 watts) and the Type 601 (75 watts).

Higher power and even higher frequency usage was incorporated into the Type 91 transceiver, a Division level mobile rig running 400 watts voice and CW, 2 to 16 MHz.

Other miscellaneous HF equipment in use includes the Type A-222 transceiver, which is a 90 watt mobile unit operational between 2.8 to 4.9 MHz; and also the bulky Type 103, running 17 watts voice and CW from 3 to 8.6 MHz. Although considered to be for mobile or manpack use, it seems improbable that it could easily be transported on the back of a single person. It is, in fact, a copy of the old American SCR-694 rig.

Getting into higher frequency ranges, the Type A-220 is a mobile transceiver which puts out 17 watts from 20 to 22 MHz.

There are several pieces of low band VHF equipment in use; these generally put out 1.3 watts AM and CW and go by the Type names 71-A, 71-C, 130-B, 211-B, and 702. A slight variation on the theme is the very low power (½-watt) Type 883 voice transceiver. Transistorized, this unit is about on a par with what today passes as a child's 49 MHz hand-held toy transceiver in the West.

Equipment not copied from American designs are usually copies of Soviet equipment. It turns out that the Type 63 transceiver, which was first built about 1965, was the first tactical low-power communications equipment fully designed and constructed within China.

Somehow, you would have thought that they would be using the latest state-of-the-art communications equipment, with SSB on the lower frequencies and lots of emphasis on VHF. Just isn't so!

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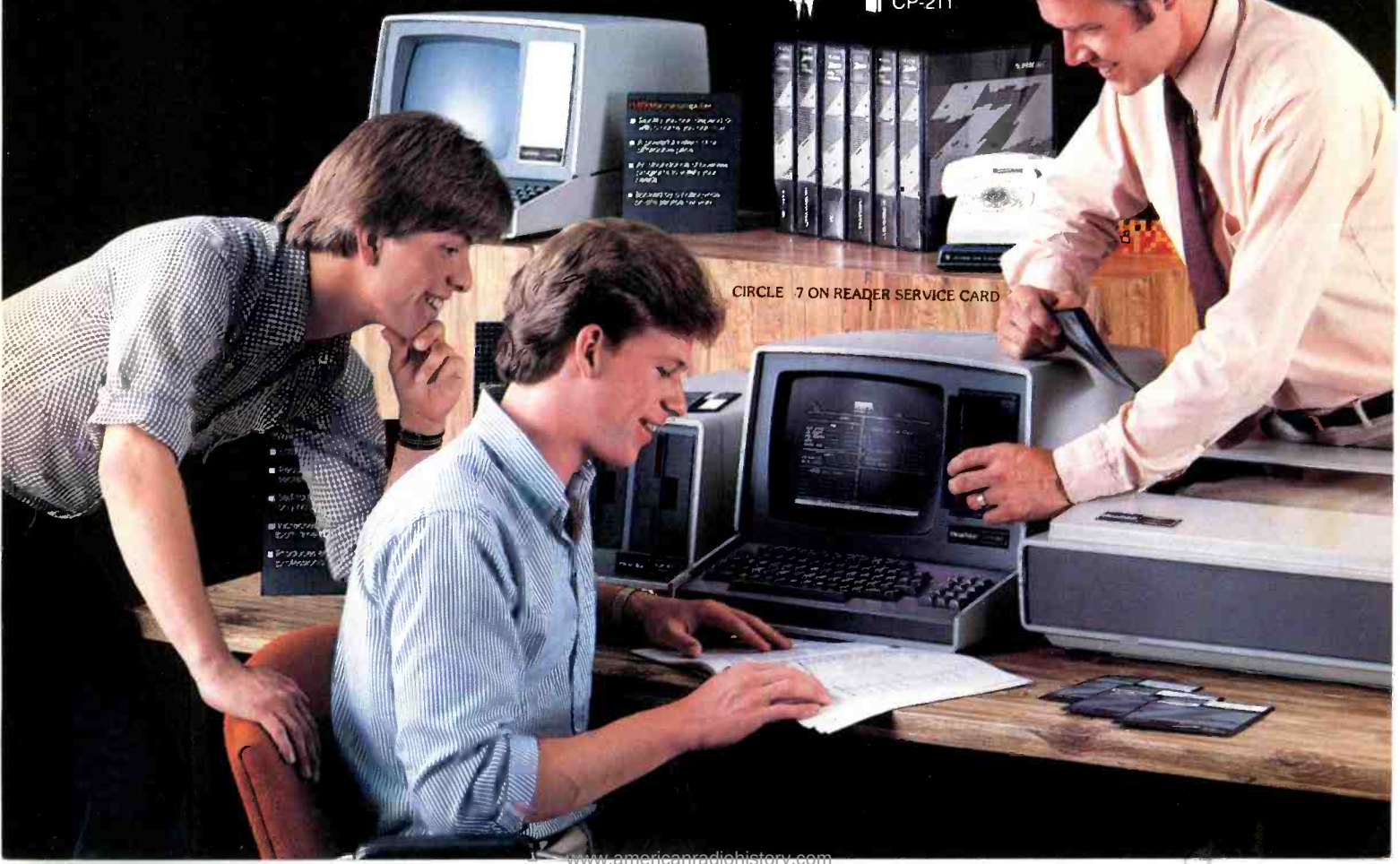


CIRCLE 7 ON READER SERVICE CARD

The Desert Fox:

General Irwin Rommel during inspection trip in June, 1941. (Photo: Bettmann Archive Inc.)

Outfoxed By Shortwave

The Day Rommel's Panzers Had The Tables Turned

BY TOM KNEITEL, K2AES, EDITOR

One of the most talked-about battles of WWII may well have been decided by a hobbyist seated at the controls of a shortwave receiver in Massachusetts. By chance of fate, he appears to have caused the defeat of General Erwin Rommel, *The Desert Fox*—one of Germany's cleverest field commanders!

Back in the 1930's, frequencies above 25 MHz were the stomping ground of only the most rugged individualists—a few ham operators, arctic explorers, and several curious experimental broadcasters. The status of those frequencies was what one might today consider the EHF or SHF bands—except that in the 1930's they didn't have semiconductors, and all but a very few of the vacuum tubes available would function efficiently above 25 MHz. They used to say that the tubes were "skittish" on those frequencies, and the higher in frequency one went, the more ornery they'd become.

By the late 1930's, there were many new developments in technology to behold and the practical uses of radio began inching slowly higher and higher in frequency as the bands opened for general use by hams and others. Their interests were spurred on by a late-1930's peak in the sunspot cycle (Solar Cycle #18), which provided "ultra high frequency" fans their first dazzling taste of *skip*.

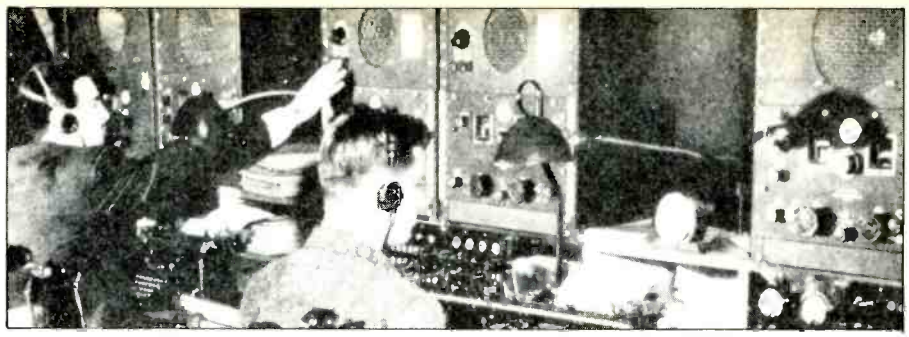
This coincided with the first rumblings of war in Europe, and when the war turned into widespread hostilities, there were many new factors relevant to the use of communications above 25 MHz. Ham operators were forbidden to transmit, but since many were called to serve in the armed forces, the prohibition was more or less to exercise control over the possibility that ham-type gear might be pressed into use by espionage agents wanting to send messages overseas.

Even though ham radio was in a state of suspended animation, communications technology was moving forward at a rapid rate. Allied as well as Axis forces were quick to realize that the world above 25 MHz was excellent for use by the massive assortment of military vehicles the war required. A huge array of military communications equipment was designed for these frequencies during WWII; some of the better known sets include the TBY, BC-604, BC-684, BC-794, BC-603, BC-683, SCR-508, SCR-528, SCR-522, SCR-542, BC-624, BC-625, and BC-1335. Even today, frequencies between 25 and 28 MHz are heavily relied upon for military mobile communications, especially armored vehicles (tanks).

The Germans certainly kept pace with our own development in this area, producing transportable, lightweight, and efficient communications gear for their highly mobile military forces. They also liked the 26 to 28 MHz bands and found that they well suited a multitude of requirements.

The Status Of The War

The world-wide scope of the war was quite apparent in 1942 and had progressed to a high pitch. If the situation in the Pacific was dismal, the war in Europe was even worse. By 1942, the Germans had deployed a very powerful and well trained force of Panzer and *Afrika Korps* troops and equipment to North Africa. The Allies were observing these developments and gathering intelligence for the future (and inevitable) invasion that would be mounted at the proper moment.



This is a typical American monitoring station of the WWII era.

This monitor is using a Hallicrafters SX-28A communications receiver.

Rommel's radio operators didn't know they were being heard so well stateside.

The North African forces sent by Germany were under the direction of General (later Field Marshal) Erwin Rommel, a tough career officer who eventually became known as *The Desert Fox*.

The American intelligence gathering effort was being conducted by Col. William J. "Wild Bill" Donovan, who headed up a shadowy group called the COI (Coordinator of Information). The COI later became the famed OSS (Office of Strategic Services), and ultimately evolved into the present-day CIA. Donovan's mission was to collect intelligence information to prepare for OPERATION TORCH, the secret code name for the Allied invasion of North Africa.

In May and June of 1942, the German war effort in North Africa was forging ahead—propelled by lethal tanks such as the PZKW Mk. 1-VG (which was fitted out with 75 mm guns), and the PZKW Mk. 2-Special. The Germans had also started to receive PZKW Mk. 3-Specials, a particularly devastating machine equipped with a long-barrelled 5-cm gun and two 7.9 mm machine guns, plus extra armor plating throughout. Carrying its crew of five men, it had a 100 mile range while running at 25 mph. Rommel's assortment of killer tanks had routed the British 8th Army from their position at Tobruk all the way back to El Alamein in Egypt—a feat that resulted in a British loss of 75,000 men (killed, wounded, and captured), and a loss of equipment so severe that the British were left with only 60 tanks. The battle cost Rommel 40,000 men, but Tobruk was an important seaport which was vital to the German war effort.

Meanwhile, Back On The Farm

While all of this was taking place, several thousand miles away at a farmhouse in Scituate, Massachusetts, a young ham operator was spending a quiet afternoon tuning his communications receiver across what at one time was a band filled with DX signals from all over the world. The 10 meter ham band was quiet; all of the stations had been removed from the air. From time to time, other nearby frequencies would crackle with terse messages from military installations in the area such as Camp Edwards or the Boston Navy Yard. But the sunspot peak had passed and DX was pretty much a thing of the past—it would hit rock bottom in two years time at the end of the sunspot cycle. Local transmissions were about the best that might be expected, perhaps a bit of "short skip" (Sporadic E).

At one point, he did catch the tail end of a weak transmission which sounded nothing at all like a local station. So, he did what any curious monitor would do. He parked his receiver on the frequency, near 27 MHz, and waited to see what might develop. Within a short time, he was surprised to hear additional transmissions, although they weren't in English. The fact is they were in what appeared to be German, and they weren't from only one station. They seemed to be exchanges of communications from several stations, although he did not have the foggiest notion what was being said, or who was saying it, or where the stations might be located. He decided to make a recording of

the transmissions. In those days, folks didn't have cassette recorders; those few who had any ability to make home recordings did so by means of 12-inch coated aluminum discs called transcriptions. He filled several transcriptions with his curious monitoring "find." Were they offshore German U-boats? Were they from German spies? He didn't know, but he decided to pursue his curiosity.

Within a few days, he located a friend who could understand German and asked him to listen to his mystery stations. Were these of interest? The friend felt that they were, having determined that they were most definitely German military communications. The next step was to take the transcriptions to the Office of Naval Intelligence in Boston where a number of intelligence experts quickly realized that the signals appeared to be the command communications from Rommel's *Afrika Korps*. This was absolutely astonishing to our military intelligence people!

Baffling

Communications experts were quickly called in to explain how it was possible for these signals to make a 3,000 mile trans-Atlantic hop under declining sunspot conditions, especially on frequencies in this band.

Subsequent monitoring efforts from other locations in the U.S. could not duplicate the reception. Checks with monitoring stations in North Africa determined that even those stations could hardly expect to receive signals from Rommel's tanks by ground (direct) wave from more than 30 to 35 miles away from the transmitters. And yet, the signals continued to be received in Scituate. Some radio propagation experts of the day suggested that the freak reception might possibly have been caused by strange geological formations underground (a theory that one modern-day propagation authority described to me as being "quaint but totally preposterous"). Another expert of the 1940's said that it might have been caused by a phenomenon called "ducting."

Frankly, it's still somewhat of a mystery as to what might have permitted this reception, all things considered. If it hadn't been for the fact that the signals were heard on a regular basis for so long a period of time (more than six months), it might have been a lot easier to explain or at least speculate upon. Certainly there have been some rather bizarre things that have taken place in the field of radio signal propagation. But unless there had been a chance to check this reception out on-the-spot with modern techniques and equipment, from a vantage point of more than 40 years later, it's anybody's guess as to what caused this to take place. Today's propagation experts are reticent to even guess at possible causes for the reception.

A Boon

It didn't take very long for Donovan's people to ascertain the potential value of these signals in respect to OPERATION TORCH, regardless of whether or not the reception could be scientifically explained. Donovan's X-2 (Counterintelligence) technicians, in conjunction with other federal agencies, wasted no time at all in moving loads of fancy receiving equipment into the small community of Scituate, Massachusetts.

The Scituate monitoring installation was just about completed by the time Rommel was regrouping for further action, and the summer of 1942 seemed to be a time for both sides to get a break for planning and regrouping. Rommel's troops freely exchanged information and instructions via radio and there was also much personal chatter exchanged over the air by the Panzer crews. All was secretly recorded, written out, and carefully analyzed by military intelligence for distribution to the Allies.

One thing determined by the Scituate installation was that Rommel was hardly resting on his laurels; he was busily planning a most active campaign. They also learned that the Desert Fox had both the British and American top-secret codes and that at least some of his famous ability to dodge and weave so brilliantly was based upon the fact that he could decode our messages.

On our side of the fence, the Allies had cracked the complex and vexing ULTRA code used by the Germans and much of the traffic going back and forth between Rommel and Berlin was understood by our forces. Of course, that information was only amplified by the messages picked up in Scituate since they were in plain language and didn't require any decoding. They contained a great wealth of exclusive information relating to troop movements and deployment, troop morale, the effectiveness of bombings and commando raids, the status of supplies at individual locations, the number of personnel at specific posts, and lots more.

By mid-1942, when we realized that

Rumor had it that Rommel himself was an avid radio hobbyist, an ironic twist to the fate that befell him.

Rommel was able to decode our messages, the Allies halted their copious flow of data. It was a definite blow to German strategy.

By August of 1942, the British sent Lt. General (later Field Marshal) Bernard L. "Monty" Montgomery to command the North African operations for the Allied Forces. His mission was to counter the attack that Rommel was preparing. This effort was given the code name OPERATION ZIP. When Rommel finally did attack, thanks to the Scituate monitors, the British were hardly as surprised by the Desert Fox as they might otherwise have been. On Sept. 30th, when Rommel moved in to surround the British 8th Army at El Alemein, they were waiting for him. After three days of fierce battle, Rommel had to pull back his forces!

Scituate had assembled a large amount of data about Rommel's operation and situation, so that when their data was combined with data from other intelligence sources it was determined that there was good reason to believe that the Allies might be able to bring about a successful campaign against Rommel. The Allies were facing a German force consisting of 96,000 German and Italian troops and no less than 600 tanks.

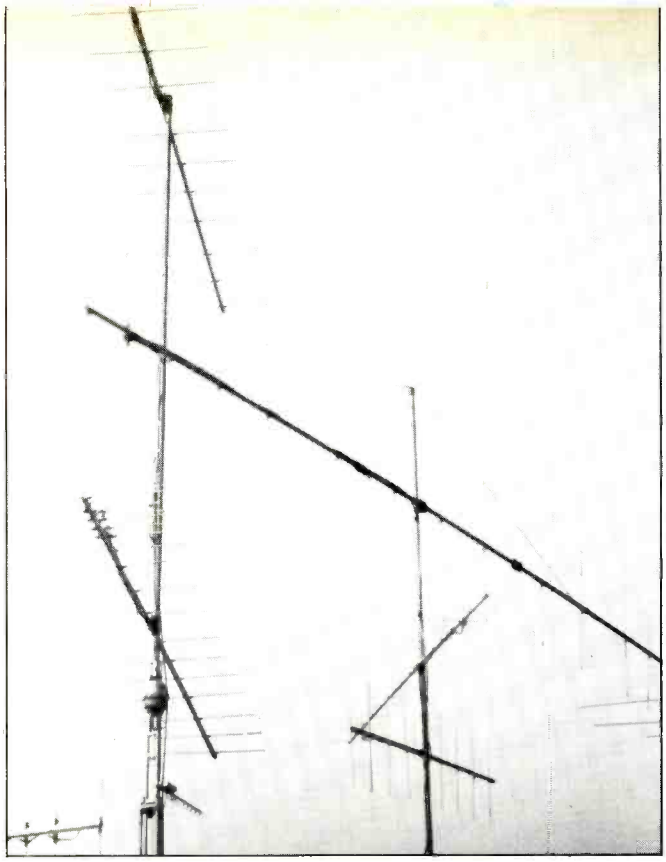
Fed by an almost unending flow of communications intelligence from X-2, Monty decided to make his move. On October 23, he launched OPERATION ZIP. Only 13 days later, on November 4, Monty had broken through Rommel's lines; by the following day, he again had Rommel's forces in retreat. While this was taking place, it was decided that the time was right for the second half of the 1-2 punch—OPERATION TORCH. On November 8, Allied Forces stormed ashore in North Africa.

January of 1943 saw the British take Tripoli and shove the Axis forces all of the way back to the borders of Tunisia. Eisenhower's forces, on the western front, were set for the final push.

When May rolled around, the British and American forces had combined and trapped the Afrika Korps, who were still pinned down in Tunisia. It was the final blow for the once mighty Afrika Korps; they suffered 59,000 casualties and prisoners, had lost 500 tanks and 400 large guns. The Afrika Korps ceased to exist, the Axis was swept out of North Africa—a stunning victory for the Allies. It was not only a vital military victory, it was a spectacular boost to the morale of the Allies—a boost that was badly needed. Certainly, the ability to cause the mighty Afrika Korps to run in defeat and panic was indeed needed in 1943. It was the beginning of a trend which was to eventually lead to the defeat of the Germans. As Churchill observed, "Before Alamein we never had a victory. After Alamein we never had a defeat."

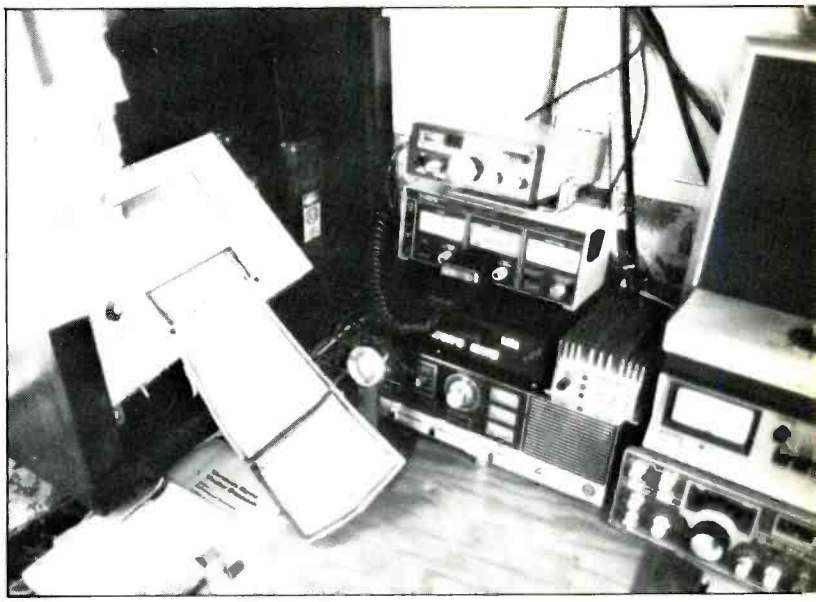
Erwin Rommel fled from North Africa by air, going to Germany. Eventually, in July of 1944, he was implicated in the attempt to kill Hitler with a bomb. Even though Rommel himself was in the hospital at the time of the attempted assassination, it had been one of his former Afrika Korps Colonels who had placed the explosive device under the table at a General Staff meeting. The German General Staff felt that Germany had been beaten and it seemed to them that the only way to save anything at all of Germany before it was reduced to rubble and dust was to kill Hitler. In October of 1944, Rommel committed suicide rather than face public execution for his involvement in the plot.

Certainly there were many interesting and unusual stories concerning the use of radio during WWII, but the eerie tale of the mystery shortwave propagation which helped to defeat The Desert Fox remains one of the most baffling.



These are what 137 MHz satellite antennas look like.

Weather FAX is ideal for tropo tracking.



FAX: Tune In Weather Maps

BY GORDON WEST, WB6NOA

Imagine the excitement of tuning into weather map broadcast services and watching weather charts and satellite imagery appear right before your eyes. A simple shortwave receiver or VHF scanner can easily pick up these radio broadcasts. A weather facsimile chart recorder ties easily into a receiver and will bring you detailed weather charts every time you tune into a weather broadcast station. It's like watching the weather before it actually occurs!

Weather Maps

The U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, is in charge of the making up and radio dissemination of weather maps and charts. They are also the same agency that collects satellite imagery and presents it on your evening television weather show.

Weather radio broadcasts are offered in telegraphy, radio-telephone, radioteleprinter, and finally, radiofacsimile on shortwave frequencies between 2 and 30 MHz. Radiofacsimile (FAX) broadcasts deliver crisp weather chart pictures and satellite imagery through a simple shortwave receiver that is tied into a weather facsimile chart recorder. The recorder only needs a connection to your shortwave receiver's speaker to deliver crystal clear weather charts.

These detailed weather charts are prepared by world-wide governmental agencies listed in Table 1 (courtesy Alden Electronics). Here in the United States, National Weather Service forecast offices prepare the weather charts. These charts are then broadcast over world-wide shortwave frequencies by cooperating governmental agencies that have world-wide transmitting capabilities. For instance, the U.S. Navy does weather chart broadcasting for the East Coast. On the West Coast of the United States, the United States Coast Guard carries out the actual broadcasting from their megawatt transmitting facilities. One thing for sure is that their signals are easily heard above the normal din of radio noise throughout the high frequency band. The transmitter sites, as well as frequencies in kHz and the areas covered by the weather maps, are also listed in Table 1.

Tuning In

It is easy to tune in and identify the sound of radiofacsimile weather map broadcasts. Consult Table 1 again and look up a frequency near 8,000 kHz, 10,000 kHz, 12,000 kHz, or 17,000 kHz. Try several different stations in case you happen to tune in when they might not be on the air. Here in the United States, there are always three or four stations on the air at one time.

Your receiver should be set in the upper sideband mode (USB). You can also pick up this mysterious sound on CW, and AM. USB offers the best selectivity in most cases.

You can identify a weather chart broadcast by the repetitive twice-a-second sweep sound that produces the actual weather chart on a weather chart recorder. The actual transmission type is F4, frequency modulated radiofacsimile. The transmission speed is 120 scans per minute, or 2 scans per second. Simply time it with a stopwatch and you will see that you have tuned into a weather chart broadcast.

These signals are so strong that they should just about knock you out of your shack. Normal ionospheric fading will take place on the lower frequencies, depending on how close or how far away you are from the transmitter. You will find it easier to pick up a weather transmitting station several thousand miles away than trying to pick up a weather transmitter just 100 miles away! Most signals are bounced off of the F layer for maximum range throughout the world.

Remember, the signals are transmitted from ground stations that have specially prepared the weather charts.

Satellite Direct

If you have a good scanner installation, you might want to try picking up the weather broadcasts direct from low altitude satellites as they pass overhead. Both the USA and USSR have low altitude orbiting satellites

NORTH ATLANTIC

Frobisher, Canada
Area: Hudson Strait, Hudson Bay, East Coast Baffin Island, Foxe Basin, Lancaster Sound, Queen Elizabeth Islands
Freq: 3253, 7710, 15644

Halifax, N.S. Canada
Area: Western North Atlantic
Freq: 4271, 6330, 9890, 13510, 122.5

Boston, MA
Area: Western North Atlantic
Freq: 8502, 12750

Brentwood, NY
Area: Western North Atlantic (Transmissions beamed toward Caribbean, Central and South America)
Freq: 9290, 9389.5, 11035, 17436.5

Norfolk, VA
(U.S. Navy Fleet Broadcast)
Area: North Atlantic Ocean
Freq: 3357, 4975, 8080, 10865, 16410, 20015

Washington, D.C.
(U.S. Air Force Broadcast)
Area: North Atlantic Ocean
Freq: 4793.5, 6912.5, 10185, 12201, 13472.5, 14671.5, 15620.5, 17670.5, 19955, 23068.5

Bracknell, England
Area: Eastern North Atlantic
Freq: 3289.5, 4610, 8040, 11086.5, 14582.5

Bracknell, England
Area: Eastern North Atlantic
Freq: 4782, 9203, 14436, 2618.5, 18261

Northwood, England
Area: Northeast Atlantic
Freq: 4247.85, 6492.35, 8494.85

Norrkoping, Sweden
Area: Northeast Atlantic and Baltic Sea
Freq: 119.85, 4037.5, 6901, 8077.5

Helsinki, Finland
Area: Baltic Sea
Freq: 83.1, 8018

Copenhagen, Denmark
Area: North Sea, North Atlantic, Greenland

Moscow, U.S.S.R.
Area: Eastern North Atlantic
Freq: 5355, 7750, 10980, 15950, 2815

Offenbach, Germany
Area: Northeastern North Atlantic and Mediterranean Sea
Freq: 134.2

Hamburg, Germany
Area: Northeastern North Atlantic
Freq: 3855, 7880, 13657

Paris, France
Area: North Atlantic Ocean and Mediterranean Sea
Freq: 4047.5, 8185, 12305, 131.8

MEDITERRANEAN

Rota, Spain
(U.S. Navy KFAX Broadcast)
Area: Eastern North Atlantic and Mediterranean Sea
Freq: 8100, 3713, 5206, 12903, 15941.5, 7626

Madrid, Spain
Area: Eastern North Atlantic and Mediterranean Sea
Freq: 3650, 6918.5, 10250

Athens, Greece
(U.S. Navy KFAX Broadcast)
Area: Eastern North Atlantic and Mediterranean Sea
Freq: 5206, 8100, 12903

Monsanto, Portugal
Area: North Atlantic and Western Mediterranean Sea
Freq: 4235, 8526, 13002

Dakar, Senegal
Area: Eastern Atlantic—Equator
Freq: 13667.5, 19750, 7587.5

Rome, Italy
Area: North Atlantic, Mediterranean, Black and Caspian Seas
Freq: 4777.5, 8146.6, 13600

Beograd, Yugoslavia
Area: Mediterranean Sea
Freq: 5800, 3520

Sofia, Bulgaria
Area: 30°N, 20°W, 28°N, 34°E; 64°N, 45°W, 60°N, 63°E
Freq: 3259, 5093

Ankara, Turkey
Area: Mediterranean Sea
Freq: 3377, 6790

Cairo, Egypt
Area: Mediterranean Sea, Red Sea and waters around Africa
Freq: 4526, 10123

SOUTH ATLANTIC

Rio de Janeiro, Brazil
Area: South Atlantic
Freq: 12025, 8291.1

Buenos Aires, Argentina
Area: Outlined by 48°S, 12°E; 48°S, 132°W; 04°N, 30°W; 04°N, 90°W
Freq: 5185, 10720, 18093

Pretoria, South Africa
Area: South Atlantic east of 40°W, Indian Ocean west of 80°E
Freq: 4014, 7508, 13773, 18238

NORTH PACIFIC OCEAN

Esquimalt, B.C., Canada
Area: N. Pacific, N. Polar Region
Freq: 4268, 6946, 12125

Edmonton, AB., Canada
Area: Eastern North Pacific
Freq: 8160, 11615.5, 15770.5

San Francisco, CA
Area: Eastern North Pacific, South Pacific
Freq: 4344.1, 8680.1, 12728.1, 17149.3

La Jolla, CA
Area: 05°S, 30°N, east of 140°W
Freq: 8644.1, 17408.6

Honolulu, Hawaii
(U.S. Navy Fleet Broadcast)
Area: North Pacific Ocean
Freq: 2122, 9440, 13862.5, 4802.5, 16398, 21785

Honolulu, Hawaii, USA (KVM 70)
Area: 25°S-40°N, 160°E-110°W (Broadcast is broadly beamed to the west)
Freq: 5037.5, 7770, 9982.5, 11090, 13627.5, 16135, 23331.5

Kodiak, Alaska
Area: Gulf of Alaska and Bering Sea
Freq: 4298, 8459

Guam, Marianas Islands
(U.S. Navy Fleet Broadcast)
Area: Western North Pacific and Eastern Indian Oceans
Freq: 4975, 7645, 10255, 13807.5, 18620, 23880

Khabarovsk, U.S.S.R.
Area: Territory and the neighboring Pacific waters.
Freq: 4516.7, 7457, 9230, 14737, 19275

Tokyo, Japan
Area: Western North Pacific
Freq: 3622.5, 7305, 9970, 13597, 18220, 22770

Peking, Peoples Republic of China
Area: West Pacific, E. China Sea
Freq: 5525, 8120, 10115, 12110, 14365

Bangkok, Thailand
Area: 30°S, 50°N; 45°E, 160°E
Freq: 6765, 7395, 17520

SOUTH PACIFIC, INDIAN OCEAN AND PERSIAN GULF

Darwin, Australia
Freq: 5755, 7535, 10555, 15615, 18060

Canberra, Australia
Area: South of 10°N; 70°E, 150°W
Freq: 5100, 11030, 13920, 19690

Nairobi, Kenya
Area: Indian Ocean
Freq: 9043, 17365

Tehran, Iran
Area: 58°N, 20°E; 28°N, 85°E; 23°N, 20°E; 08°N, 65°E
Freq: 8715

New Delhi, India
Area: 45°N, 25°S, 30°E, 125°E
Freq: 7405, 14842, 18227

Reunion-Saint Denis
Freq: 8176, 16335

ANTARCTIC

Orcades
Area: 50°S-Pole, 20°W, 90°W
Freq: Summer: 2422.5, 8818, 8195, 11147
Winter: 2422.5, 4250, 6454

Table 1. FAX Transmitter Sites, frequencies, and areas covered.

that carry live weather picture transmitting equipment.

Unlike the super high frequency satellite imagery that you *cannot* pick up on a scanner from the geostationary weather satellites (near 1700 MHz), relatively lower altitude Tiros satellites spin around earth every 102 minutes at approximately 825 kilometers high and beam sharp weather photos on scanner frequencies. This would allow you to see the surrounding area if you had your scanner tied into a weather FAX recorder.

Here are the most common frequencies to try scanning. Remember, an outside antenna is usually necessary for picking up these low power orbiting satellite transmitters. You will only be able to hear the broadcast for seven minutes on each pass.

Table 2
137.150 MHz (USSR satellite)
137.300 MHz (USSR satellite)
137.400 MHz (USSR satellite)
137.500 MHz (USA NOAA6 satellite)
137.600 MHz (USA NOAA7 satellite)

USA satellite characteristics:

Transmitter power output	5 watts
Antenna gain	3.7 DBI
Polarization	Right circular
Modulation	F4
Modulation index	17
Subcarrier frequency	2400 Hz
Subcarrier modulation	92% AM
Baseband video band width	1600 Hz

If your scanner does not tune down low enough for these frequencies, you may wish to try a scanner converter. A 100 MHz up converter from MFJ Corporation, Mississippi, allows you to scan the 37 MHz frequencies, yet pick up the weather satellite band at 137 MHz. Remember, a good outside antenna is absolutely necessary for picking up VHF weather broadcasts directly from the orbiting satellite.

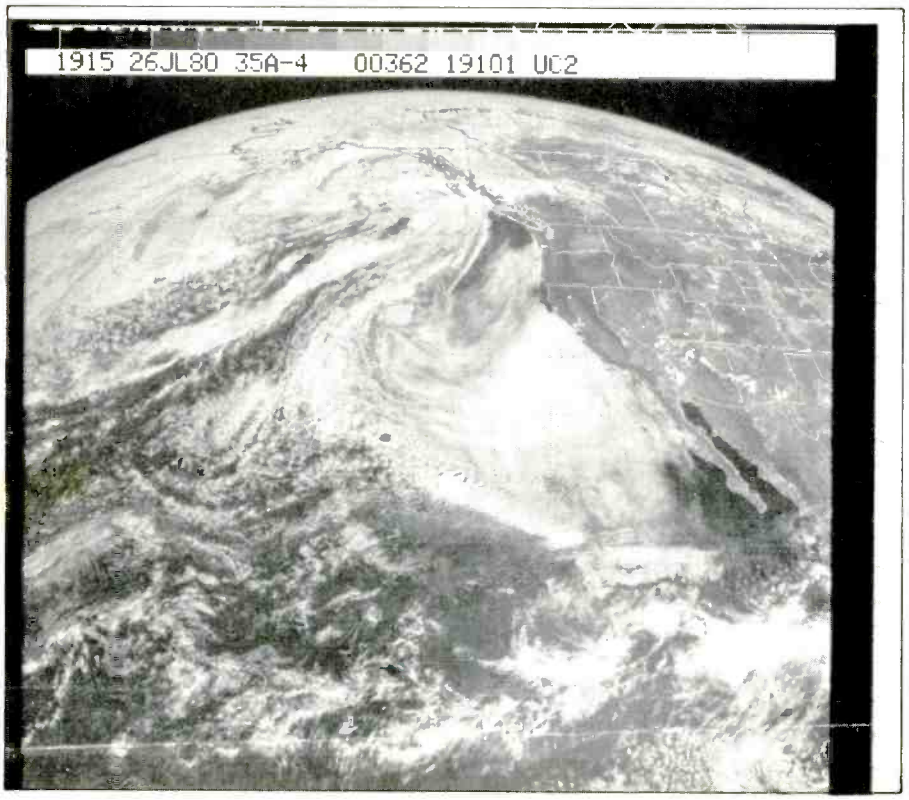
Weather Chart Recorders

Without a chart recorder, you will be able to see nothing. There is no circuit that will bring these sounds into picture form on your TV or computer—at least not yet. Professional chart recorders are the way to go. They sell for under $1,000 and tie easily into your present shortwave receiver or your programmable scanner.

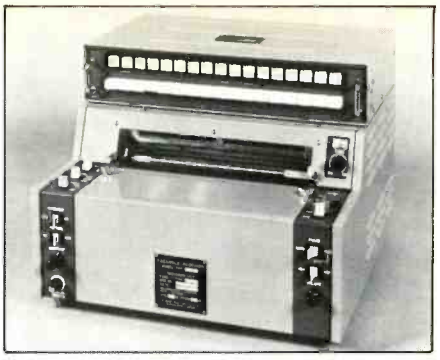
The hookup of a chart recorder is straightforward. Plug them into the power source, and then take the audio output of your shortwave receiver or your scanner and run it into the jack marked "audio input." Find a transmitting weather station on the air and tune it in so the audio sounds begin to produce a picture-perfect weather chart. Tuning the sound too low will make your chart dark. Tuning the sound too high will make it too light. After a couple of minutes, you will get the hang of how easy it is to tune in and start receiving weather maps.

Weather maps are easily received in all areas of the world.

Here is a high-quality weather map of the eastern Pacific Ocean and western U.S., which came by weather FAX.



Alden's Marine FAX is a very popular unit and it produces excellent results.



Here is a weather FAX machine made by Furuno Electric Co. Ltd.

It is possible to convert old facsimile recorders for weather map reception. However, it will take several weekends of modification and adaptation to match the Weather Service transmitting format. Unless you like to play around with this type of thing, you might be better off choosing a professional chart recorder. Alden Electronics, Washington Street, Westborough, MA 01581, makes the best one around for the price. Just under $1,000, the complete Alden weather chart recorder kit is easy to assemble and will work with any shortwave receiver or scanner monitor set.

What You Will See

The best weather charts and geostationary satellite imagery will be found on your shortwave set, not your scanner. Here in the United States, our Weather Service presents several types of weather charts. A typical one hour broadcast would include the following charts, one after another:

- Surface weather analysis with position, speed, and direction of frontal systems and their associated pressure patterns.
- Surface weather prognosis charts showing forecast conditions for 24 or 36 hours away.
- Extended surface prognosis shows forecast conditions tc six days ahead.
- Wave analysis shows height of ocean waves and their direction of movement.
- Sea temperature data indicating temperature contours for fishermen.
- Sea ice shows characteristics of large icebergs.

Satellite imagery shows the same exact pictures you see on your television set that evening—well ahead of regular television broadcasting.

I doubt that you would ever get bored watching the fascinating world of weather conditions unfolding right before your eyes. This holds especially true when it's hurricane season or tornadoes may be in town. However, if you want to try something else, try tuning into commercial facsimile broadcasting. I have picked up photographs, schematic diagrams, advertising layouts, and a host of other images being sent over the airwaves by commercial broadcast stations using radiofacsimile.

Little Maintenance

There is little to go wrong with your facsimile equipment. When the paper runs out after hundreds of charts, simply replace it with another inexpensive roll. After a couple of years, you may wish to change your stylist for a sharper picture. This takes a whopping two minutes! The weather facsimile equipment is straightforward and should seldom require servicing.

So what are you waiting for? Try tuning in a weather broadcasting station right now after you have put this article down. Imagine watching a picture unfold right before your eyes as you listen to the twice-a-second sound. Then make the plunge and get yourself a weather facsimile chart recorder. It will add a whole new dimension to your shortwave monitoring and scanning.

See you at the next rainstorm.

RECEIVE WEATHER CHARTS IN YOUR HOME!

You can DX and receive weather charts from around the world.

Tune in on free, worldwide government weather services. Some transmitting sites even send weather satellite cloud cover pictures!

You've heard those curious facsimile sounds while tuning through the bands—now capture these signals on paper!

Assemble ALDEN's new radiofacsimile Weather Chart Recorder Kit, hook it up to a stable HF general-coverage receiver, and you're on your way to enjoying a new hobby activity with many practical applications. Amateurs, pilots, and educators can now receive the same graphic printouts of high-quality, detailed weather charts and oceanographic data used by commercial and government personnel.

Easy to assemble—Backed by the ALDEN name.

For over 40 years, ALDEN has led the way in the design and manufacture of the finest weather facsimile recording systems delivered to customers worldwide. This recorder kit includes pre-assembled and tested circuit boards and mechanical assemblies. All fit together in a durable, attractive case that adds the finishing professional touch.

Buy in kit form and save $1,000!

You do the final assembly. You save $1,000. Complete, easy-to-follow illustrated instructions for assembly, checkout, and operation. And ALDEN backs these kits with a one-year limited warranty on all parts.

Easy to order.

Only $995 for the complete ALDEN Weather Chart Recorder Kit. To order, fill out and mail the coupon below. For cash orders enclose a check or money order for $995. Add $5 for shipping and handling in the U.S. and Canada (for Massachusetts delivery, add $49.75 sales tax). To use your MasterCard or Visa by phone, call (617) 366-8851.

ALDENELECTRONICS

Washington Street, Westborough, MA 01581

NAME: _____

CALLSIGN: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

☐ I've enclosed a check or money order for $995.00 and $5.00 for shipping and handling, plus applicable sales tax.

☐ Charge to: ☐ MasterCard ☐ Visa

ACCOUNT # (ALL DIGITS)

EXPIRATION DATE

SIGNATURE REQUIRED IF USING CREDIT CARD _____

Pop Comm

CIRCLE 27 ON READER SERVICE CARD

PRODUCT SPOTLIGHT

VHF FM PLL Synthesized Communications Receiver

The AR-22, from ACE Communications, 2832-D Walnut Avenue, Tustin, CA 92680, has been designed to provide more effective communications to meet increasing monitoring requirements. It is a PLL frequency synthesized dual-conversion receiver that can monitor most of the communication frequencies up to 9 MHz band in the VHF high-band.

This base size receiver in a small package is not to be confused with ordinary monitors or scanner receivers. It utilizes highly advanced technology and offers the same reliability as commercial two-way radio.

The AR-22 is designed specifically for application where people on the move must monitor radio communications. As a sub or command receiver, the AR-22 offers unlimited monitoring applications—whenever and wherever you need information on a selective basis. All at an economical price.

This receiver's performance matches the receiver section of a commercial grade hand-held transceiver.

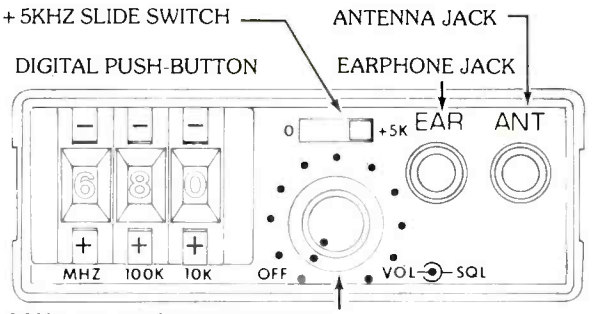
The AR-22 receiver features the optimum in portability and reliability. The AR-22 is designed and tested to operate under adverse conditions. The high-impact ABS plastic housing protects the circuit against physical shock. Furthermore, the components are mounted on double-side glass-epoxy board, which is used for high grade radios. These features are incorporated with the electrical performance and allow you to carry the AR-22 in your shirt pocket, coat pocket, or with an optional clip on the belt.

The custom designed low-noise CMOS logic in the PLL circuit of the AR-22 has achieved remarkably high stability. The use of miniature connectors for major connections provides easy servicing, and selected precision micro-components give the AR-22 long-term stability for maintenance-free operation.

The most outstanding feature of the AR-22 is its digital frequency design, which permits the reception of a 9 MHz band in the VHF high-band. The digital synthesized design eliminates the need for individual channel crystals. This design allows the revision of frequency and perfect continuous reception in 5 kHz steps.

The PLL circuit of the AR-22 generates clean and stable signals which provides wideband coverage with the highest possible frequency stability over temperature ranges from −10°C to +60°C. This maximizes the effectiveness of important specifications.

Two leading digits are already programmed at 140.000 MHz (Type-A), 150.000 MHz (Type-C) etc. . . . and do not require reprogramming. The third, fourth, and fifth digits are individually controlled and set by the three-section digital push-button on the top panel. The illustration shows the top panel layout and an example for the AR-22 Type-C at 156.805 MHz. The slide switch allows for 5 kHz reception increments—these features allow the receiver to monitor the exact radio frequency or to be set for standby at a predetermined frequency.



AR-22 Top Panel Layout

The frequency tuning of the AR-22 is simply set by using the three-section flip-up digital pushbutton located adjacent to the digit to be changed. The button (+ or −) is flipped up, then pushed down to set the desired frequency.

Electric Stage Tuning

Electric Stage Tuning permits the AR-22 to receive the full band width of 9 MHz with no degradation in performance.

The input and RF stages of the receiver are tuned electrically by variable tuning diodes that are inserted into each stage to obtain maximum sensitivity and selectivity. Furthermore, the electric tuning circuit in the first local oscillator ensures maximum injection into the mixer.

The two-stage High IF crystal filter rejects unwanted out-of-band signals and maximizes image and spurious attenuation levels.

The AR-22 power consumption is as low as 18 mA at standby condition and its low current design allows the receiver to operate for up to eight hours under normal conditions on a single charge.

Low-noise CMOS logic generates a clear signal to the mixer stage and minimizes the so called "BIRDIES" that are a common problem of synthesized radios.

The following table shows the available frequencies for the standard AR-22 receivers.

Model	Type	Service	Frequency Range
AR-22	A	Amateur	141.000 MHz-149.995 MHz
AR-22	B	Amateur/Commercial	146.000 MHz-154.995 MHz
AR-22	C	Commercial	151.00 MHz-159.995 MHz
AR-22	D	Commercial/Marine	156.000 MHz-164.995 MHz
AR-22	E	Commercial	161.000 MHz-169.995 MHz

141.000 MHz 151.000 MHz 161.000 MHz 169.995 MHz

TYPE - A TYPE - B TYPE - C TYPE - D TYPE - E

141.000 MHz to 169.995 MHz

Technical Data

Frequency Range	131.000 MHz to 179.995 MHz
Maximum Frequency Coverage	8.995 MHz with no degradation of performance
Receiving Mode	Frequency Modulation, 16F3
Receiver System	PLL Frequency synthesized dual conversion superheterodyne.
Usable Sensitivity	0.2 μV EIA 12 dB SINAD
NQ Sensitivity	0.35 μV at 20 dB
Audio Squelch Sensitivity	0.2 μV at threshold squelch, adjustable
Selectivity	Adjacent channel rejection ± 12.5 kHz greater than 65 dB.
Spurious And Image Attenuation	Less than 50 dB
Frequency Stability	Within ± 10PPM over the operating temperature range.
IF Frequencies	1st 10.7 MHz, 2nd 455 kHz
Audio Output Power	450mW into 8-ohm load at 10% THD
Power Consumption	18mA at receiver squelched
Operating Temperature Range	−10°C to +60°C
Battery	Rechargeable NiCd battery pack, 4.9 volts and 225mAH
Physical Size	5¼"(H) × 2½"(W) × 1.0"(D) without knobs
Weight	7.1 oz. (200 grams) with battery pack
Frequency Selection	3 digits of digital push switches and slide switch
PCB	Double-side glass-epoxy printed circuit board
Housing	High-impact ABS plastic case

* Specifications subject to change without notice.

Standard Accessories

Wall-type Charger (110 V or 220 V)
Mini-Helical Antenna
Wire lead Antenna
Earphone

Optional Accessories (Subject to availability)

Vehicular Charger
Leather Carrying Case
Belt Clip
Tone Decoders

FREE RADIO FOCUS

ACTIVITIES OF UNDERGROUND BROADCASTERS

BY AL MUICK

How I Built An FM Translator—I Even Thought It Was Legal!

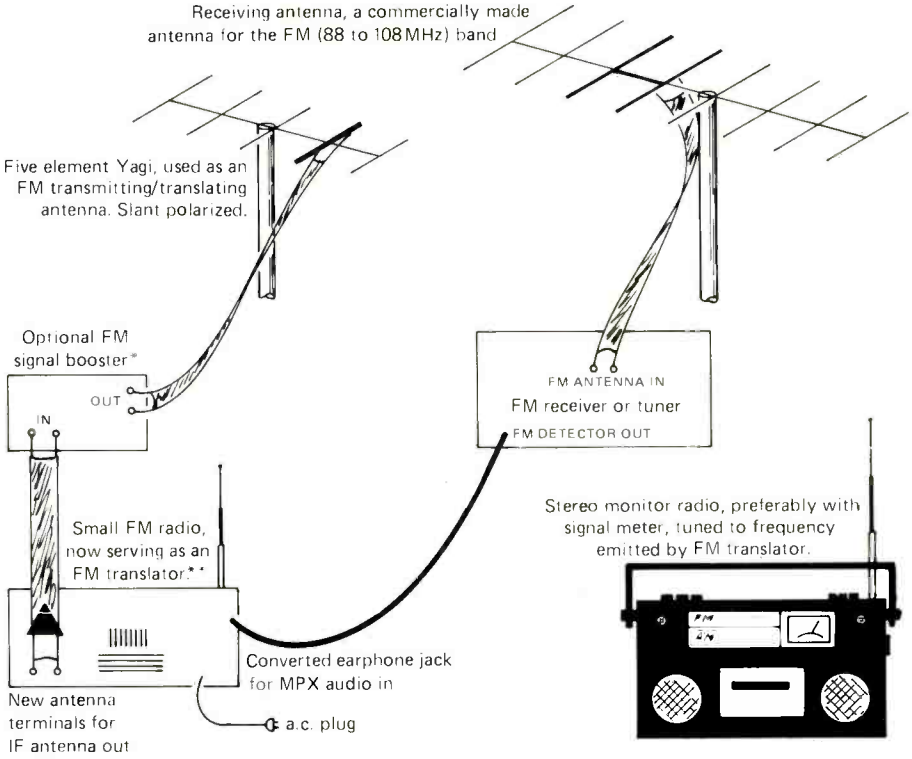
Being able to transmit an FM radio signal around your house, or even your neighborhood, can be a real convenience. An easy and inexpensive way to do this is by creating your own FM translator.

Translators are the talk of the TV industry, especially "low power TV," with the ability to carry satellites, pay TV, originate programs, and to rebroadcast nearby station signals. In radio, translators have a similarly bright future. Commercial FM translators have been in existence since 1971, when the FCC made FM radio translators legal after many years experience with TV translators in this country. In other countries, notably Italy and Norway, FM translators had long been in operation.

The whole concept behind a translator is that it enables a station, because of distance or terrain factors, to be heard clearly in another city, rural area, or in part of a metro area that might otherwise experience insufficient signal quality. In television, of course, this would mean good quality color, freedom from ghosting, and excellent sound. In FM, the rules of the Federal Communications Commission specify that translator stations should convey all of the characteristics of the originating stations, including stereo if the main station is stereo; it would include an FM sub-carrier if the main station has an SCA authorization, such as for background music or talking book for the blind.

There are now over 500 legally licensed FM translator stations in the United States. Most are in the western part of the country, with California being the state with the largest number of FM translators. But we're going to try to open up the possibility of a whole new class of FM translator stations—a class of ultra-mini translator station. These are stations that might serve just an individual's house, an apartment building, or a college dormitory. It's master antenna reception without the interconnecting cables; a means by which the excellent reception realized by a person's receiver connected to an outside antenna can be spread around an entire area, with the need for audio cable, speakers, distribution amplifiers, and other stuff.

Before I personally stumbled onto the idea of a do-it-yourself translator, I thought (when I moved into a new home) of installing wires in the room dividers, stringing audio cable around the house, and then trying to decide what rooms to put the cable into. Should it go into the bathroom, all of the bedrooms, the basement, the rec room, the kitchen? And if so, where in those rooms should the cable come out?



NOTES:

*Preferably, a tunable booster, peaked to your transmitting frequency.

**This radio can be monaural, but will still transmit in stereo if connected right.

Serendipitously, the answer presented itself as I explored the inner workings of radio receivers. Within every radio receiver is the potential to utilize that circuitry for more than just reception. In fact, if you look at the back of any radio made in the United States within about the last 20 years, you will see wording to this effect: "Design certified in compliance with FCC rules part 15." These rules of the Federal Communications Commission are designed to limit the amount of radiation that a radio receiver sends out, for it's true that radio receivers are also miniature radio transmitters because of the superheterodyne system used in virtually all radios and television sets. By taking advantage of this radiation emitted by a radio receiver, and superimposing upon this radiation modulation—in essence, making a radio receiver a radio transmitter—you might be on the air in your own home and create your own FM translator station!

To test this principle, three FM radios are needed. Two should be smaller, cheaper radios; one acting as a transmitter-radio and the other as an on-air monitor. The third should be a quality FM tuner or receiver, from which the incoming signal will be drawn. First, tune one radio to a frequency high in the FM band, maybe between 101 and 108 MHz, where there is no local radio broadcasting—one where the FM hiss can be heard. Turn up the volume on this radio. Then, slowly tune the second radio, with its volume low, to a point about 10.7 MHz lower in frequency than the first receiver.

When tuning across the correct place, a sound like a dead spot or a thumping will be heard on the first receiver. This is the carrier emitted by the second receiver. On a stereo receiver (or a portable radio that has a tuning meter), this is precisely where the point is for tuning the carrier emitted by the second radio. Activity can be seen on the receiver's tuning meter. It will deflect to maximum, just about as strong a maximum as your strongest local station produces. And this is true even of radios made within the last 20 years that are in conformance with Section 15 of FCC rules. Those rules state that a radio can emit a certain minimum amount of radiation. And it's within this minimum amount of radiation that there is considerable latitude within which to work.

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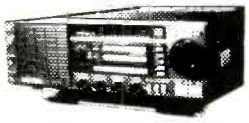

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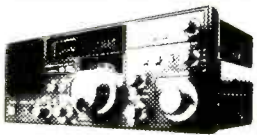

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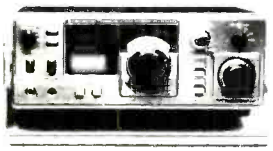

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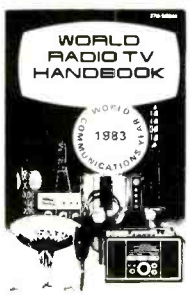

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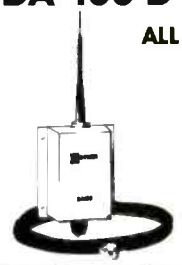

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driving by the house, or on a portable radio as one strolls about. This radiation (without any further enhancement) might cover your entire property; at least the entire building in which a radio is. Certain radios radiate farther than others. You might wish to determine which radio to use; if there are several, buy the one that packs a greater RF wallop. As a general rule, older transistor radios radiate a greater distance than newer models.

Once modulation is added—the addition of talking and music to this radiation—it becomes much easier to notice. Instead of just being a dead spot somewhere on the top half of the FM dial, the "station" suddenly comes alive with intelligence. This is done by introducing an audio input to the radio—now a mini-transmitter. Exploring with various radios, the places for introducing this signal can be easily found. In fact, I think the best radios to use for this purpose are AM/FM portables that also tune in TV audio.

Because FM IF frequency is standardized at 10.7 MHz in virtually all radios made and sold in the United States, it means that whatever station is tuned to on a radio, there is emitted exactly at 10.7 MHz above that frequency a radiated signal that is there for the taking, the exploration, and the grabbing. By using a TV audio radio, you might emit a radiated signal anywhere within the FM broadcast band; emit a frequency down to the bottom of the FM band, at 88 MHz, by tuning the TV audio into the segment of frequencies occupied by Channels 5 and 6. Want to radiate at 87.9 and have no local TV Channel 6 station to contend with? The radio dial would be set at 77.2 MHz, or 10.7 MHz lower than the transmitting frequency.

So there it is, radiating! It is capable of covering the entire broadcast band allocated to FM in the United States. (The best TV-audio radios for this purpose have one band for low-band TV and FM—not separate bands separated by a bandswitch. This ensures correct IF positioning in the FM band when you are tuned to low-band TV.)

There is the problem, however, of straying off of these frequencies too much; you should not get into frequencies occupied by local or semi-local stations and not create interference with other broadcasters. The broadcasting system is inviolate, and without undue interference. The idea is not to radiate off the FM band. Going higher in frequency could interfere with aircraft communications in the air navigation band. And there should be no transmission in the public service bands, where there are police, ambulances, public safety, and commercial communications. Radiation should only take place on unoccupied frequencies within 87.9 and 107.9 MHz, and not on other channels; not the TV audio spectrum—not so it can be heard on TV sets, but only so as to be heard on FM radio receivers. This is due to the fact that it is an FM translator concept and it is designed to achieve what the FCC has already authorized commercial and educational broadcasters to do, but on a smaller scale.

A possible way to figure out a potential channel on which to broadcast, rather than just stumbling around the dial and noticing where the open spots seem to be, is to have a reference book to the FM radio stations in a given area. Most of us are not really familiar with all the stations in our own areas. There could be an audience out there for stations that you might be interfering with, and the best way to prevent interference would be to have an up-to-date and complete reference, such as the *FM Atlas and Station Directory*. The *FM Atlas* includes (on maps and station lists by frequency and geography) all of the FM stations in the United States, Canada, and Mexico. It even tells their radiated powers, music formats, and how far they get out with their primary signal in miles. For your copy, write to "FM Atlas," Adolph, MN 55701, and enclose $7.45, which includes postage for the current edition.

Once an open frequency is located, the next step would be to introduce modulation onto your translator. This is where the tricky part comes in. I went in just before the FM oscillator coil of the radio, now transmitter. A schematic made it easier to find that point. This was done only on transistorized equipment, not on tube equipment—even old tube equipment made before part 15 of the FCC's rules was in effect. Those older radios will radiate a greater distance than the newer ones, but they are to be avoided as they are almost invariably tube-equipment, and they contain high (often lethal) voltages should a mistake be made. With transistorized equipment, there is little opportunity for mistakes and it is easy to probe in the vicinity of the FM oscillator coil, which is quite early in the detection stage of the FM circuit. Even if there is no schematic for a receiver, you can find the locations of this coil by probing.

Even a non-qualified service personnel-type person can do this simple operation as long as they avoid the area where the power cord comes in (the power supply section of the radio), and stick to the part of the radio closest to where the FM antenna input is, and where the smaller transistors, resistors, and capacitors are. The largest voltage encountered will probably be about 9 volts, and that is not enough to cause any damage either to you or to your equipment. Once that radio is apart, a third receiver—the better FM tuner or receiver—is set to a station one intends to retransmit. An audio output patch cord is attached to "Rec Out," or better yet, to "FM Detector Out," or "Horizontal Oscilloscope Out," if it has such a jack.

The end of the patch cord away from the tuner should have clip leads attached. I clipped the shield part of the lead to a transformer casing on the radio for good ground connection. The center of the patch cord will go via its alligator-clip lead to different possible points in the radiator-transmitter that might yield audio as picked up by the other radio tuned 10.7 MHz higher in frequency. A technician's test probe or another small, stiff piece of wire is useful in doing this checking.

As I experimented, I found that I'd often hit it right away and hear a nice clear signal on the monitor radio, one that sounded just about as sharp as the originating station. Chances are that many times you will only hear some clicks or distorted audio. That is a sign that you have not hit the right spot within the radio being used as a transmitter.

When that happened to me, I kept on checking around that area of the radio. Looking at the top of the chassis, I found resistors and capacitors, especially resistors having paint on their leads, which makes it rather hard to make a test connection. With the set turned off, I took out a sharp pocket knife and scraped paint off the tops of several of these resistors to make a good test connection. I turned the radio back on to make sure it was radiating as it should've been, and I heard its dead spot on the other radio. Then after this scraping of paint, I rechecked. I found the spots where I could get a quality response in the neighborhood of the FM oscillator coil. Of course, without a schematic, it might be hard to identify the FM oscillator coil as such, but probing should indicate a good place for bringing FM into the radio, introducing modulation to the spot on the monitor radio that had hitherto been a dead spot.

Okay, so now you have modulation. You've reached the point where you can decide to add a jack—an audio input jack. If you want to, connect the center point of the jack exactly to where the probe showed the best place for reception, with the jack's ground going to the radio's ground. With a VOM, it's possible to find a good place for grounding; otherwise, it might be wise to try soldering right to a transformer case. You might want to convert the earphone jack in the radio to this audio input jack, and not have an earphone jack. The earphone could be rewired so the radio will play independently (without a jack), and you can devote the earphone jack to an entirely new purpose.

A way to make this installation even more perfect is to use a good stereo receiver as the one that supplies the program to the transmitter, and to look for the right place on this receiver (not just the place that gives an audio output, but to find a place that gives a composite signal, a signal before the stereo circuitry takes effect, before the de-emphasis circuit in the receiver), that will enable it to send out a signal just like the regular FM broadcasters do. Thus, you might send out a signal that is inherently capable of being received in stereo, as matrix-quad, with subcarrier SCA. This may take probing inside the radio, as few radios have a jack on the back marked "MPX OUT," "composite out," "detector out," and so forth, which often works fine for this purpose. By probing still further, one might find a spot that will cause the stereo light on a receiver to come on. If it's possible to tap into the stereo receiver or tuner and find a point that yields the brightest and most faithful reproduction of the original sounds, plus permitting stereo, that's the exact place for bringing audio into the newly-created transmitter.

To find this point, it's possible to use two stereo receivers—one from which the signal

is tapped, and a stereo monitor radio. Once the spot for optimum-quality broadcasting is found, an audio output jack on the receiver is installed, or one of the existing jacks not being used is re-wired so that this spot can appear on the back of the receiver and be connectable to the translator-radio by means of a patch cord. Label this jack "MPX Out." There will still be reasonably good audio just by connecting the general output of the receiver, such as to a "tape out" jack to the transmitter. However, it's not possible to just plug a microphone into it because of the need for microphone preamplifications.

By utilizing an audio amplifier or a tape recorder instead of the tuner for the program source, you might transmit and originate programs. If you add a little extra circuitry, you might have the essence of a wireless microphone or mini-radio station.

The main reason for converting a radio to a transmitter, however, should be to provide you with the ability to spread excellent FM radio programming and reception to any FM radio you have in the house, be it the cheap set in the bathroom, the clock radio in the bedroom, or the radio you might have in the garage or in a workshop. And you would be able to send out FM-DX, including semi-local stations that are a real challenge to pick up for the smaller radios that the main receiver, perhaps in your living room or den, is getting almost perfectly. This is especially true if a better receiver has an outside FM antenna connected to it.

Besides just covering your own property, the signals generated could be amplified and sent out at greater distances. A person in a rural area, a ranch, or a farm might find it advantageous to beam a signal into an outlying building. The output can be fed to a booster or preamplifier, such as is used in master antenna (MATV) work; but this requires two antennae—one for receiving and one for transmitting (see illustration).

The best transmitting antenna to use is a five-element FM yagi, pointed in the general direction to be covered. This antenna can be horizontal, vertical, or slant polarized for best coverage. A good booster to use is the GAM-Stereo One, sold by Castle Marketing, Alexandria Bay, NY 13607. By hooking a transmitter-radio to an antenna and booster, it is easy to exceed FCC radiation limits. You would have to probe, too, to find points of antenna connection to the radio's IF circuitry. This is *not* at the radio's own antenna terminals.

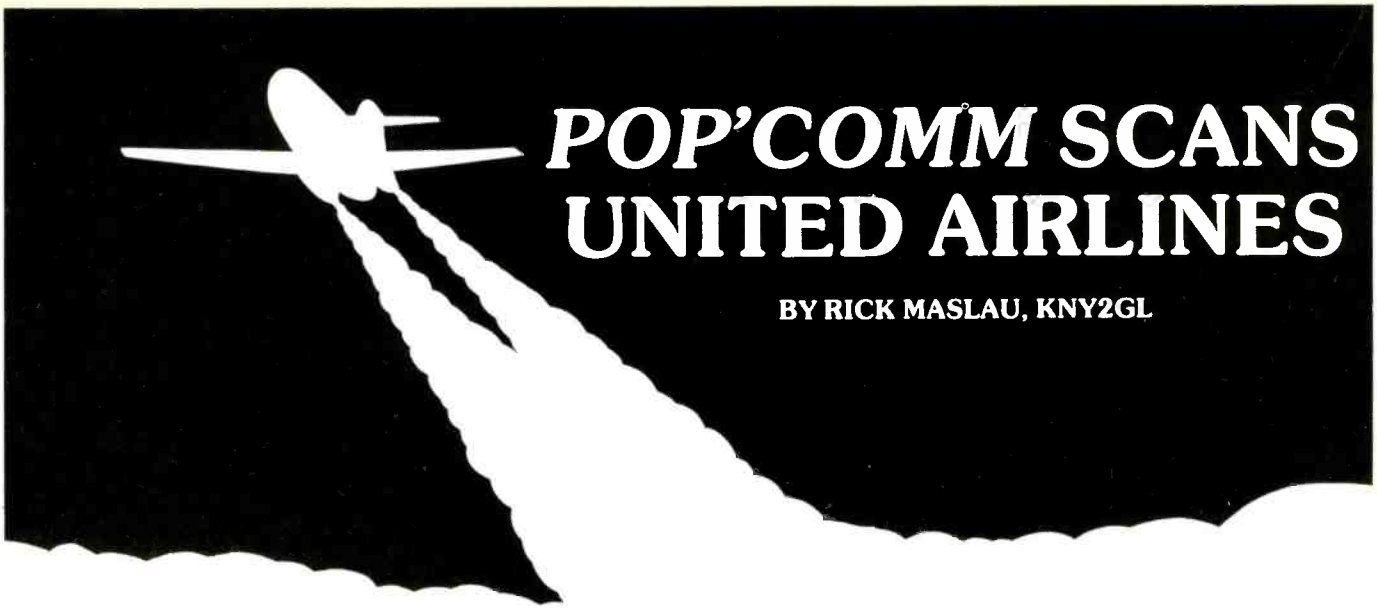
In keeping with the present mood of the FCC, allowing for low power TV, it is entirely possible that a new class of aural low power/translator service by and for citizens could be set up using the concepts explained here, especially if legions of readers would petition the Commission for such action. The FCC would have to allow a waiver of its rules to permit operation with less that the normal power of a translator, but still more power than a regular, unmodified FM radio would send out. Here is a way that built-up neighborhoods and rural areas alike could get more reliable radio service and cut down the need for individual receiving antennae, thus promoting civic beautifications!

The technical means exist to send out a low power signal very easily—perhaps the signal of an esoteric station that only a deluxe receiver can pick up—with all the clarity afforded by a multiple-speaker system at a fraction of the cost, and with considerable flexibility for the present and future needs of you, your family, and your neighborhood friends. This is probably the best way yet devised to get an audio signal around a house or property, a neighborhood, or even a small town. You'll be able to walk around with those popular stereo FM radio-headphones and not have to limit your listening to only a few local stations!

After conducting my original experiments to see how and if this concept was technically feasable, I wrote to the FCC monitoring station in my area (it's in Grand Island, Nebraska) to advise them of this technique and ask them for the green light to actually operate this system I had devised. Unhappily, I received prompt word from the FCC that present regulations are not structured to include any arrangement such as I had described to them. I then applied to the FCC office in Washington for an experimental license to conduct further tests so as to develop this idea to the point wherein it might be evolved to fit into their rules—again I was turned down!

With the current trend towards deregulation, the FCC concepts of low powered local TV broadcasting, and the usefulness of this system I have devised, perhaps someday a way will be found to permit my system (or one similar to it) to be licensed and fully operational. I can only look back to the days when there were many "illegal" TV translators in operation—illegal simply because there was no licensing structure by which they could become authorized. Yet, the public wanted such a service and eventually the FCC devised a way in which they became licensed and legal.

This month's guest columnist was Bruce F. Elving, Ph.D.



POP'COMM SCANS UNITED AIRLINES

BY RICK MASLAU, KNY2GL

The internal and behind-the-scenes operations of major airlines are always fascinating. While many of these communications between aircraft and ground stations are to be heard in the 128.8 to 132 MHz portion of the VHF aero band, the airline operations at various airports generally take place elsewhere in the communications spectrum.

This month, we are presenting the airport operations system used by United Airlines. Generally, these stations are intended to cover the area in and around specific airline terminals. Therefore, they are low powered and best reception will be within a few miles of the airport at which the United Airlines facility is situated. These frequencies (all MHz) are especially interesting to monitor if you're seeing someone off or waiting for them to arrive—you get advance info on gates, delays, etc.

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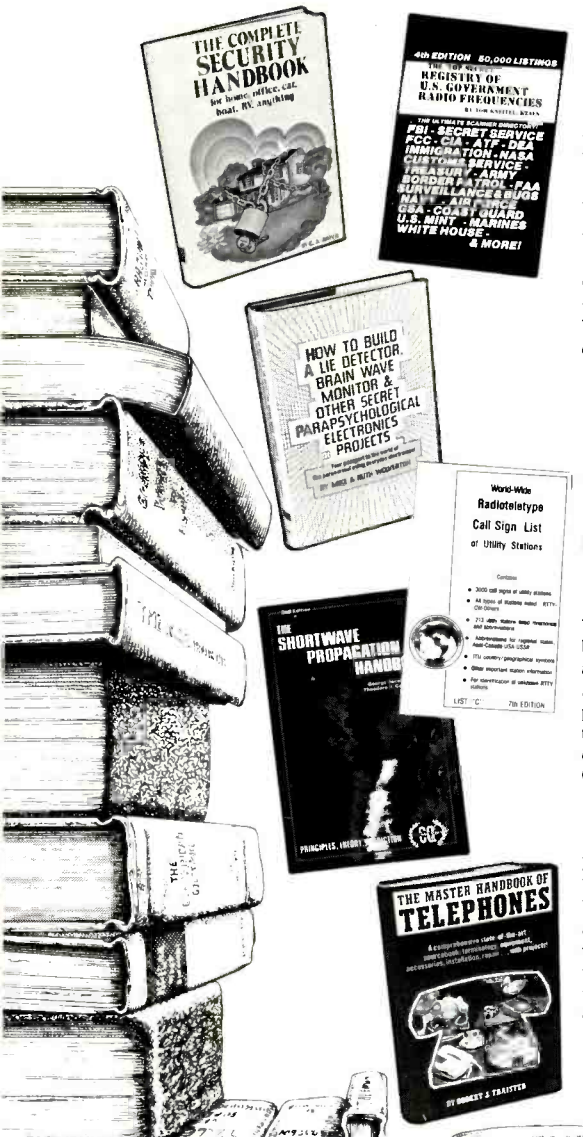

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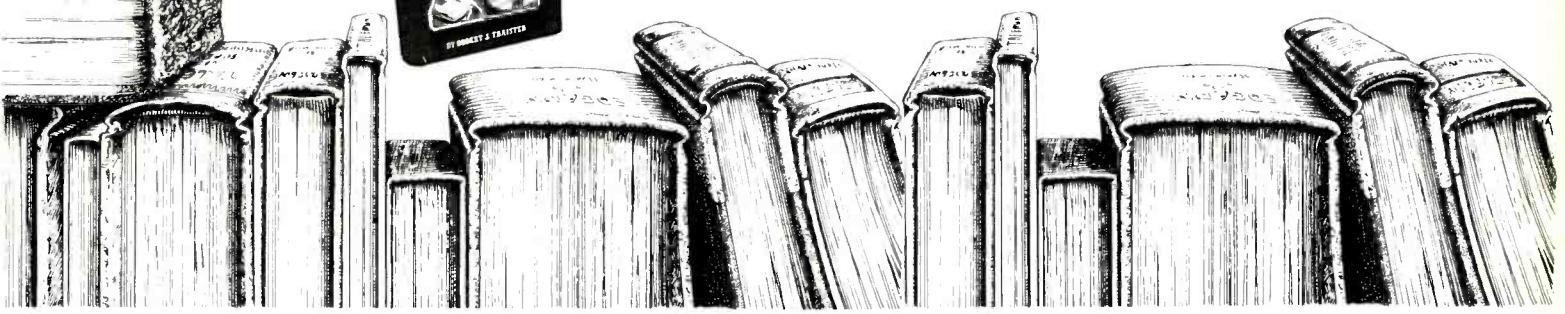

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THE MONITORING MAGAZINE

SATELLITE VIEW

INSIDE THE WORLD OF TVRO EARTH STATIONS

BY MARK LONG, WA4LXC

In the February issue of *POP'COMM*, we explained how home TVRO owners could watch Russian television via the Gorizont satellite located over the Atlantic Ocean at 14 degrees west longitude. Although a few satellite earth station enthusiasts in Europe and the Americas have been watching Gorizont (Russian for "horizon") for several years now, it was only recently that the U.S. Department of Defense installed an earth station on the roof of the Pentagon, allowing the U.S. Air Force TV Center to monitor the daily news programs of the Soviet Union and its Warsaw Pact allies. The Astrospec TVRO system was designed by Comtech Antennas to allow reception of both Soviet and American satellites. A second earth station at the Pentagon was donated by Ted Turner so that America's "top brass" could watch news programs from Turner Broadcasting Company's *Cable News Network*. The earth station was necessary because our nation's capital has not yet acquired a cable television service of its own.

Satellite Launch Schedule

November, 1982	Satcom V	(143 degrees West)
March, 1983	Satcom IR	(139 degrees West)
May, 1983	Galaxy I	(135 degrees West)
July, 1983	Telstar 3A	(95 degrees West)
September, 1983	Galaxy II	(74 degrees West)
October, 1983	Satcom IIR	(66 degrees West)
December, 1983	Westar VI	(79 degrees West)
February, 1984	Spacenet I	(119 degrees West)
May, 1984	Telstar 3B	(87 degrees West)
June, 1984	Galaxy III	(? degrees West)
July, 1984	Telstar 3C	(? degrees West)
July, 1984	Spacenet II	(70 degrees West)
June, 1985	Spacenet III	(? degrees West)

Future Satellite Systems For North America

Within the next two years, there will be a new generation of satellites gracing the skies over North America. Technological advancements in satellite engineering will escalate the impact that earth station technology is having on our nation's businesses, cable services, and private households. As the available satellite parking slots are filled above North America, there will be an even greater number of satellite-delivered services available.

Inevitably, demand will outstrip the number of transponders in service; this will pressure the FCC to reduce the orbital spacing from 4 to 3 or perhaps even 2 degrees between birds. This would create more room within the Clarke Belt for future generations of satellites. It will also create some technological problems that will have to be dealt with by tomorrow's space engineers. This month's column is dedicated to presenting an overview of the new C-band satellites. Next month's column will take you on a tour of present and future K-band satellites both for fixed communications as well as Direct Broadcast Satellites (DBS) for home TVRO reception.

Satcom V, representing a new generation of Advanced Satcom satellites from RCA Americom, was launched late last year from the U.S. Air Force Eastern Test Range at the Kennedy Space Center in Florida. Unlike all previous 4 GHz satellites, which have used TWTAs (traveling wave tube amplifiers) for their transmitting circuits, Satcom V is the world's first all solid-state C-band domestic communications satellite.

Six foot dishes similar to this one can now be used in Canada for reception from ANIK.

Fully deployed, Satcom V's solar wings, which automatically rotate to track the sun, span 51.8 feet. The new Advanced Satcom satellites are larger and heavier than all RCA domestic satellites launched to date. Although they retain the basic three-axis body stabilization design of their predecessors, the Advanced Satcom birds have an increased propellant supply, solar voltaic power capacity, and a higher reliability factor for the on board electronic components. Continuous operation of all 24 transponders over a ten year period will now be possible.

Improvements in the beam shaping of Satcom V's antenna have been combined with multiple feed horns whose size, location, power division, and relative phasing achieve the desired EIRP (effective isotropic radiated power) contours. High-powered 8.5 watt solid-state amplifiers on board the Advanced Satcom birds improve performance and reduce the effects of intermodulation distortion between stacked signals.

Satcom V is dedicated to providing Alaskom, Inc., the long-distance common carrier for Alaska, with long distance telephone and data communications within Alaska, and between Alaska and the rest of the United States. The Satcom V satellite also carries the Alaskan Rural Area Network, Alaskan Television Network, and emergency medical network. Satcom V is currently in the process of taking over most Alaskan communications traffic previously handled by Satcom I and II.

Satcom IR & IIR

Satcom IR & IIR are spare RCA satellites identical to the Satcom IIIR and V birds now in operation. They were held in reserve as back-up birds in case of a launch or operational failure involving the primary RCA cable satellites. Satcom IR and IIR are being launched to replace Satcom I and II, which have provided years of service and are nearing the end of their operational lifetime.

Galaxy I & II

Hughes Communications, the manufacturer of many of today's domestic and international satellites, will become a common carrier with the launch in 1983 of their Galaxy I and II satellites. The Hughes Communications domestic satellite system provides facilities for C band fixed satellite service to a variety of users with the continental U.S. (CONUS), Alaska, and Hawaii. The system consists of two operational satellites at 74 degrees and 135 degrees west longitude, with a third satellite to be eventually launched when needed. The Galaxy satellites are based on the Hughes HS 376 series design used for the 24-transponder Westar IV & V, ANIK D, and Indonesian Palapa B satellites. The HS 376 birds are spin stabilized with a despun payload (see *POP'COMM* December, 1982 Satellite View column). Solar voltaic cells attached to the exterior of the cylindrical HS 376 satellite provide the operational power.

Galaxy I (135 degrees west longitude) will

be dedicated to providing cable TV programming to cable systems throughout the United States. Already 18 of the total 24 transponders on board Galaxy I have been sold, like condominiums to the following customers:

Time, Inc. (HBO and Cinemax)	6
Times Mirror	2
Turner Broadcasting System (WTBS, CNN & CNN Headline News)	2
Viacom International (Showtime)	2
Westinghouse (The Satellite News Channels)	4
Spanish Independent Network	1
Galavision	1

The remaining 6 transponders will be held in reserve by Hughes Communications and programmed for cable services on a preemptive basis. In the event that one or more of the Satellite "condos" listed goes on the blink, Hughes can provide their preferred customers with a new transponder, without disrupting their services unduly.

To make their cable TV programming more attractive to Cable TV systems already taking services off of Satcom IIIR (131 degrees west longitude), Hughes Communications has designed a dual-beam feed modification which enables a single CATV dish antenna to simultaneously receive signals from two adjacent satellites. With the addition of a special dual beam feed system and additional LNAs, up to 48 program services from both satellites are readily accessible without the need to move the antenna. This provides a cost-effective way for cable TV systems to maximize their access to satellite-delivered services.

Galaxy II, to be launched in late 1983 and positioned at 74 degrees west longitude, will be used to provide voice, data, and other telecommunications services to business organizations in the U.S. A few transponders may be used for occasional video traffic, like teleconferencing or news and sports feeds.

Telstar

AT&T will be replacing the Comsat birds they are currently leasing with their own satellites, starting sometime this year. Telstar 3A, 3B, and 3C will continue to provide AT&T with the facilities for transmitting most of Ma Bell's long-distance telephone traffic and prime time television programming for the major broadcast networks. The Telstar birds, like the Galaxy and Westar satellites, are from the HS-376 family now manufactured by Hughes Communications. The Telstar satellites have switchable beam patterns to allow transmissions between mainland U.S. and Alaska, Hawaii, and Puerto Rico.

Spacenet I & II

The Southern Pacific Communications Company (SPCC) has commissioned RCA Astro-Electronics to construct two SpaceNet satellites to be located at 119 and 70 degrees west longitude, where they will be used for the relay of video, voice, and data signals. SpaceNet I & II are America's first dual band

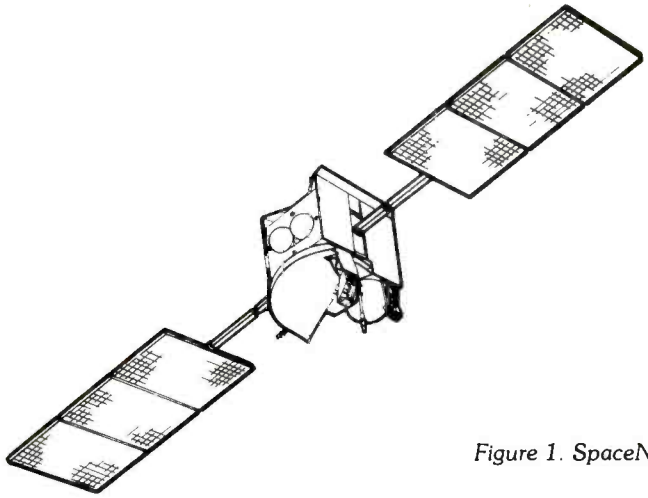
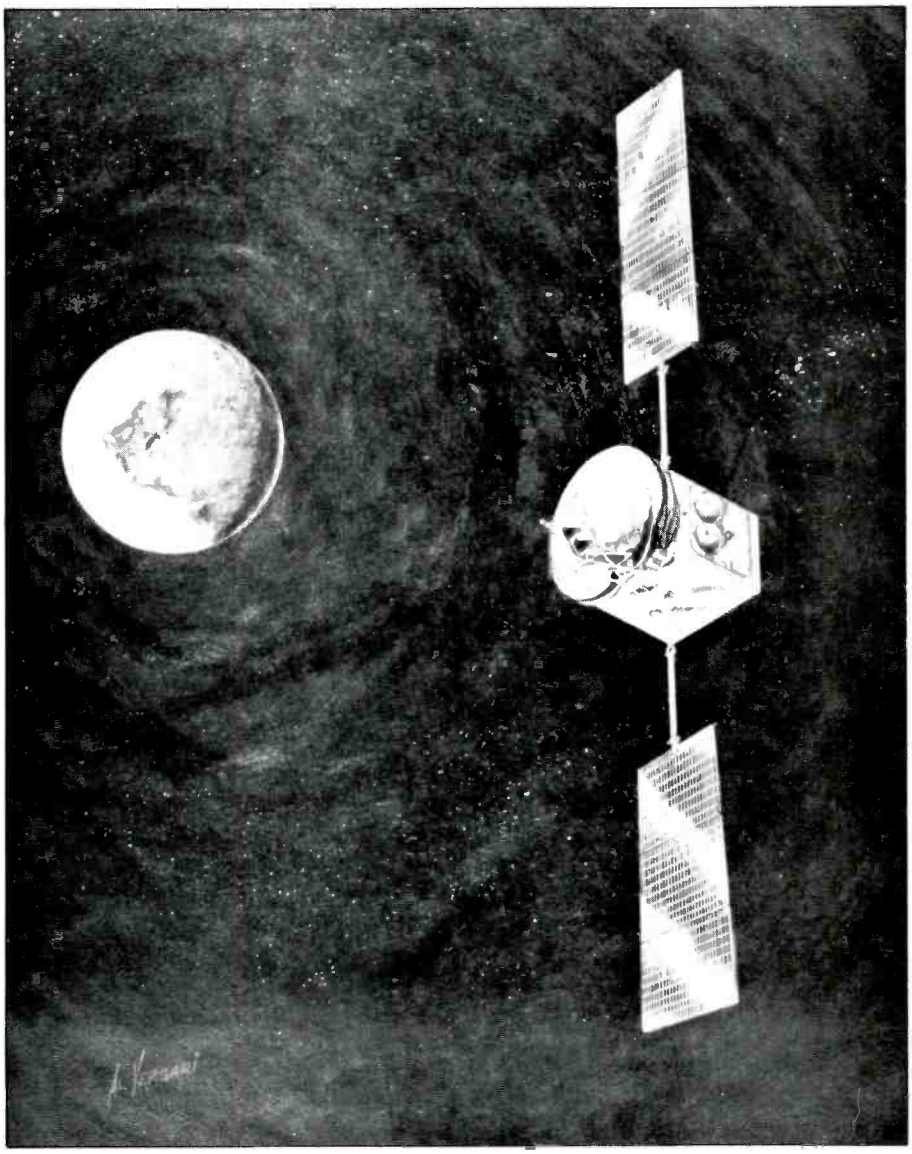


Figure 1. SpaceNet satellite.



An artists' rendering shows the advanced RCA Satcom as it will look in orbit. Designed and built by RCA Astro-Electronics in Princeton, NJ for RCA American Communications Inc., the satellites will be the first all solid-state communications spacecraft. They will provide up to a fifty percent increase in voice/data capacity and will be compatible with RCA Satcom satellites now in orbit, as well as with existing terrestrial facilities. The traffic capacity improvement is based upon the combination of a shaped-beam antenna design and 24 solid-state 8.5-watt power amplifiers. (Courtesy of RCA Government Systems Division)

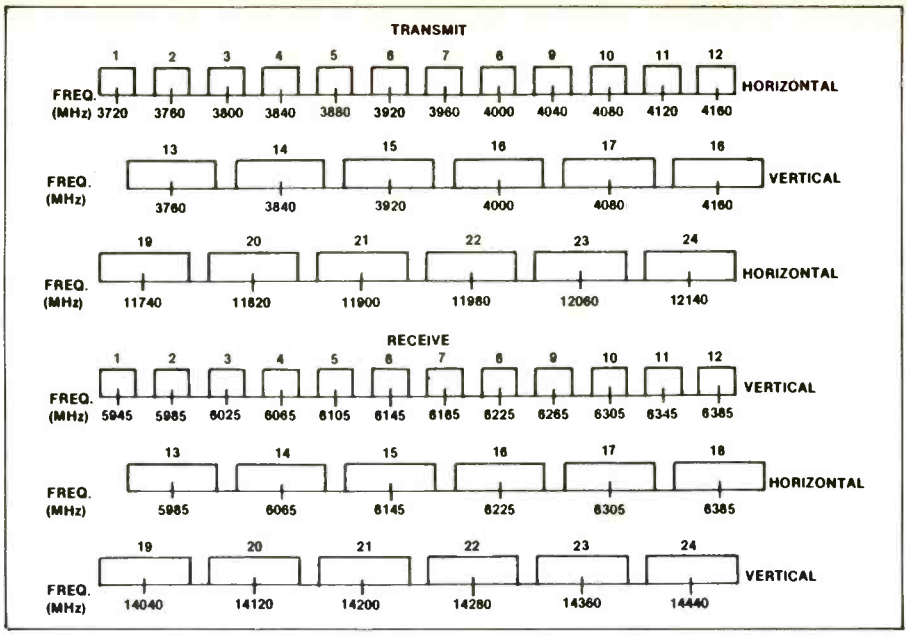


Figure 2. SpaceNet Transponder Center frequencies.

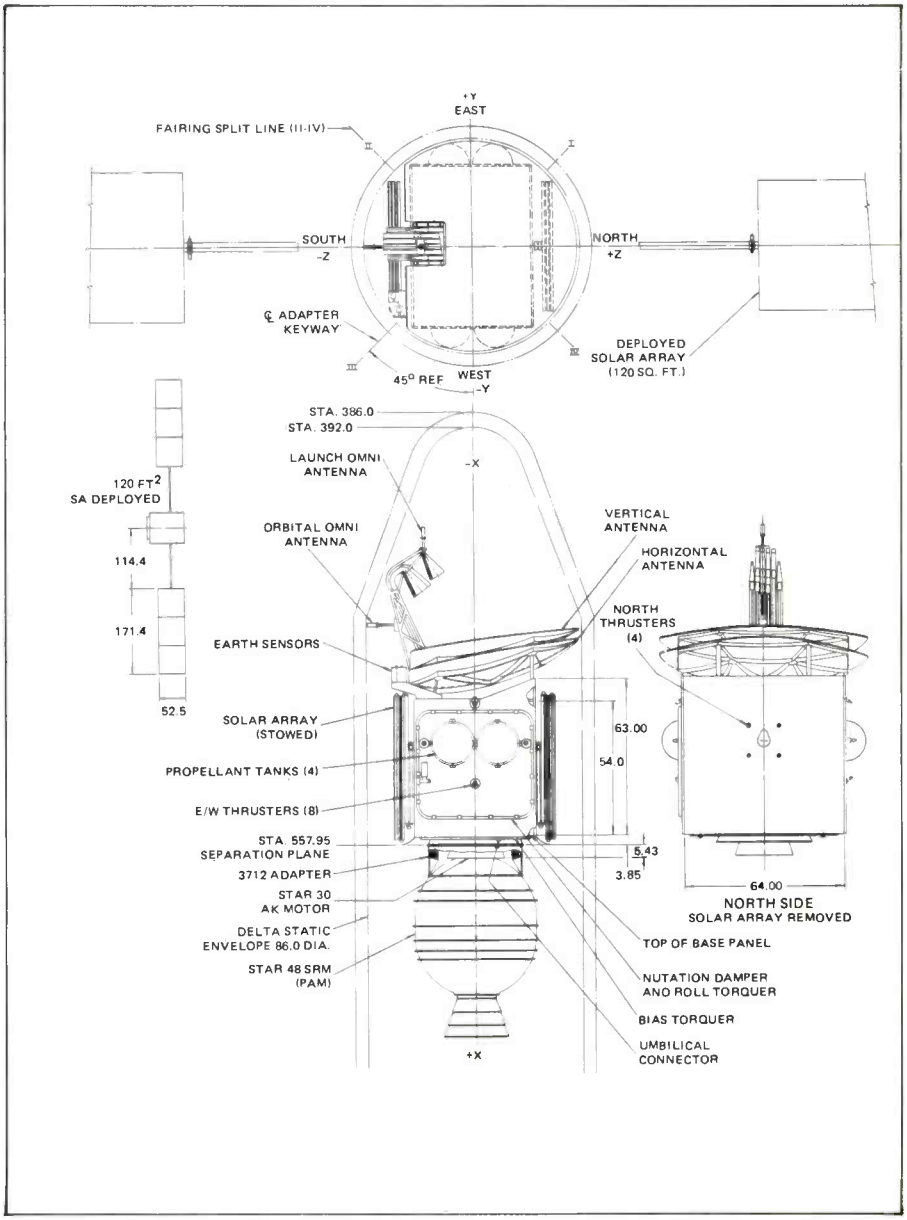
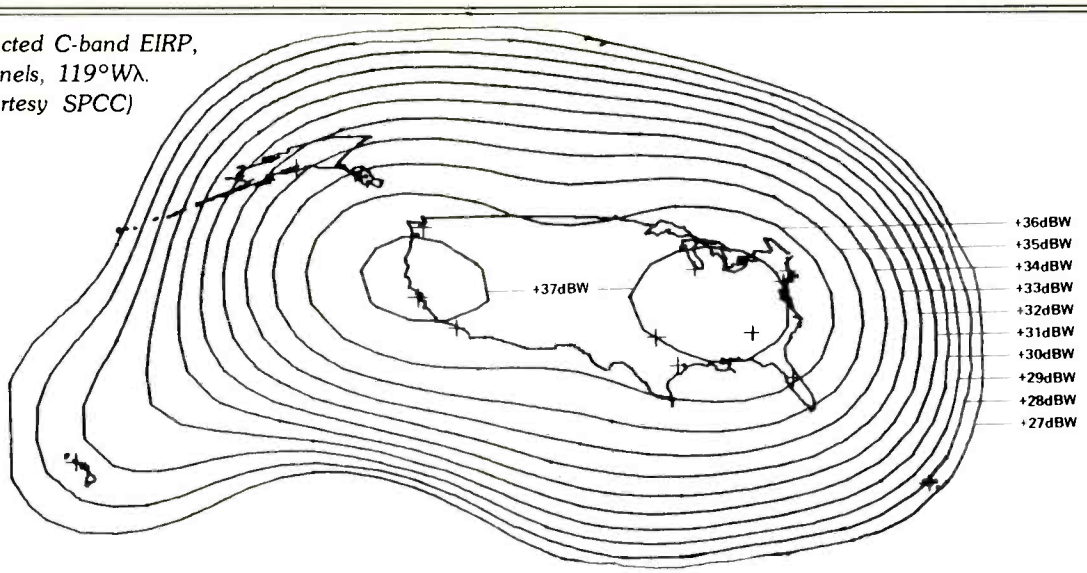
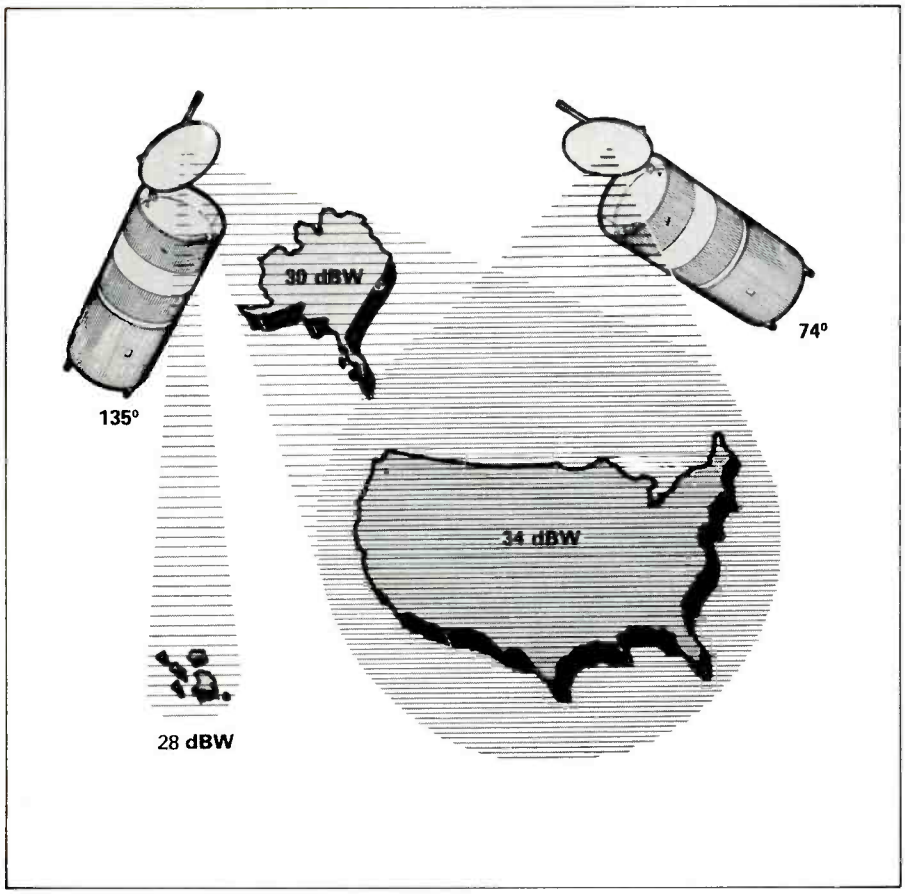


Figure 3. Advanced RCA Satcom general arrangement drawing. (Courtesy of RCA Government Systems Division)

Figure 4. Expected C-band EIRP, wideband channels, 119°Wλ. (Spacenet, Courtesy SPCC)





The Satellite located 135°W longitude provides 24 operational channels of at least 34 dBW, 30 dBW, and 28 dBW to the continental United States, Alaska, and Hawaii, respectively. The satellite located at 74° provides 24 channels at a minimumof 34 dBW to the continental United States; Alaska and Hawaii are not visible from this easterly location.

4/12 GHz domestic satellites. Based upon transmitted RF power and usable bandwidth, they represent the most capable domestic satellites yet authorized by the FCC.

The SpaceNet satellites will each have 24 transponders (see transponder center frequencies chart). Twelve narrowband 36 MHz-wide C-band, 6 wideband 72 MHz-wide C-band and 6 72 MHz-wide K-band transponders are used. The 36 MHz-wide C-band channels will use 8.5 watt SSPAs (solid state power amplifiers); the C and K wideband channels will have 16 watt SSPAs. The SpaceNet satellites are powered by solar cells on two sun-tracking panels with over 130 square feet of total surface area.

It is planned that the SpaceNet birds will be launched from the Kourou, French Guiana Ariane Space Center on board an Ariane 3 rocket. However, the SpaceNet satellites have been designed to allow launching from either the Ariane 3, the Space Shuttle, or a NASA Delta-Thor rocket.

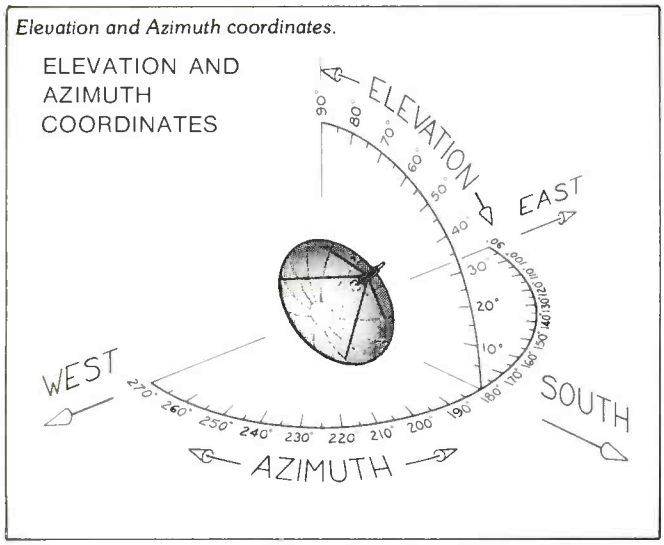
SpaceNet I, to be located at 119 degrees west longitude, is expected to become another "cable-satellite," leasing most of its available transponder space to the cable TV industry. Additional use by SPCC to allow extension of SPRINT, SPCC's alternative long distance telephone service to Hawaii, is also expected. A listing of SpaceNet I customers and services appears below:

Bonneville Satellite Corporation
Cox Broadcasting
Double B Enterprises
Landmark Communications
NBC network
The Pop Network
Rainbow Communications
Satellite Program Network (SPN)
Satellite Syndicated Systems
The Southern Baptist TV Network
Southern Pacific Communications Corp.
Spanish Independent Network (SIN)
United Video
Vitalink
Midwest Radio and TV Network

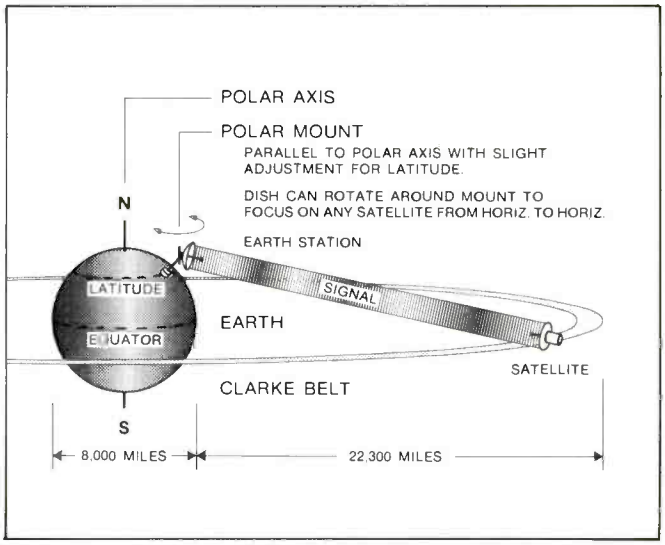
SpaceNet II, to be located at 70 degrees west longitude, is also scheduled to carry some cable TV programs. However, the bulk of its traffic will be dedicated to providing business telecommunications and voice and data transmissions, as well as an occasional video teleconference or relay of news or sports feeds for the major networks.

If you would like to learn more about satellite television, *The World of Satellite Television* by Mark Long and Jeffrey Keating is available from The Book Publishing Company, 156 Drakes Lane, Summertown, TN 38483, price: $8.95. Also available: International Satellite Coordinates Computer Printout (please include your exact latitude and longitude): $3.95. Site Survey Kit: includes a copy of *The World of Satellite Television*, an inclinometer, an engineer's compass, and computer printout for your location (include lat. & long.): $34.95. Please include $1.00 for postage and handling with any order.

The World Of Satellite Television



Elevation and Azimuth coordinates.



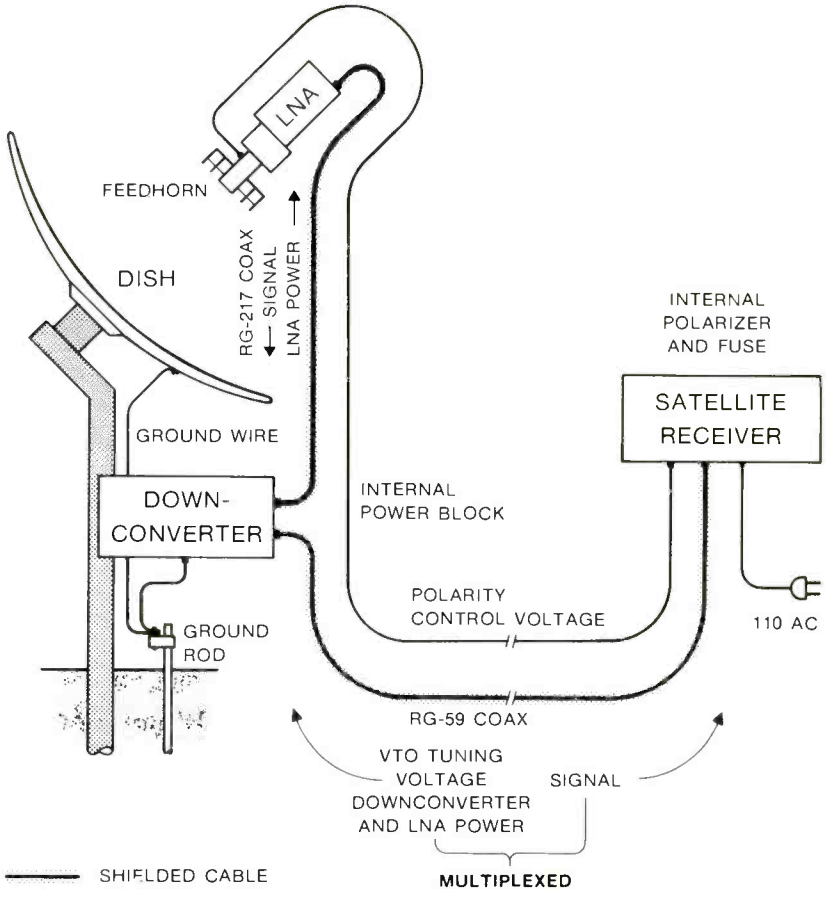
This year, satellite earth stations have been springing up in peoples' back yards at a remarkable rate. Because of the incredible variety of satellite programming available and the lowering of home satellite earth station price tags, more and more people are becoming interested in this exciting new technology. A new book, *The World of Satellite Television* by Mark Long and Jeffrey Keating, takes you through all the ins and outs of home satellite TV reception. Thoroughly comprehensive, yet written in a simple down-home style, this book takes the mystery out of the more technical aspects of buying, installing, operating, and maintaining your home earth station.

Over 200 photos, satellite footprint maps, cartoons, and other illustrations help the reader visualize what could otherwise be a confusing subject. The available equipment is thoroughly outlined to provide consumers with enough information to make an educated selectionof the earth station that fulfills their individual tastes and needs. The detailed charts, graphs, bibliography, and index make this book an ideal reference source for the accomplished video enthusiast as well as the newcomer.

Some of the chapters include: "The World of Satellite Entertainment" (a complete satellite-by-satellite programming guide); "Understanding Your Earth Station"; "How to do Your Own Installation"; "Accessories"; "Cooperative Earth Station Sharing"; "Troubleshooting"; and "TVRO Legal Questions and Scrambling." The reception of those international satellites that carry foreign television programming is detailed, with instructions on how the home TVRO owner can access them. A preview of the Direct Broadcast Satellites (DBS) and other future innovations coming your way is also included.

With over 100 channels of entertainment, news, sports, and special programming available now and many new services being launched in the near future, this handy reference guide can be your ticket for a launch into the world of satellite television.

Reviewed by Tony Earll, KNY2AE



SIMPLIFIED TVRO WIRING SYSTEM WITH POWER-UP-THE-LINE

Simplified TVRO wiring system with power-up- the-line.

Introducing incredible tuning accuracy at an incredibly affordable price: The Command Series RF-3100 31-band AM/FM/SW receiver.* No other shortwave receiver brings in PLL quartz synthesized tuning and all-band digital readout for as low a price.† The tuner tracks and "locks" onto your signal, and the 5-digit display shows exactly what frequency you're on.

RF-6300 8-band AM/FM/SW

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*Shortwave reception will vary with antenna, weather conditions, operator's geographic location and other factors. An outside antenna may be required for maximum shortwave reception.

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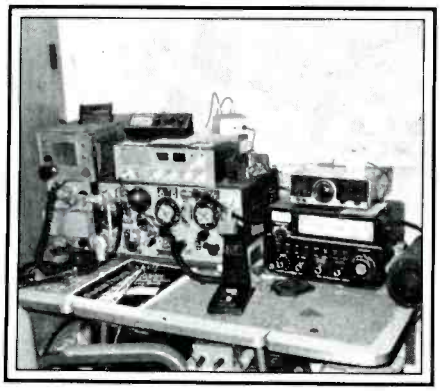
SURVIVAL

BY R.L. SLATTERY

ESTABLISHING SURVIVALIST COMMUNICATIONS SYSTEMS

Stay In Yer Own Back Yard

Hunters and survivalists know the advantages of being well aware of keeping on top of information regarding anything "moving out there." With an intrusion detection device, an alarm goes off and someone can be dispatched to see what it's all about.



Shown left-center atop the desk in this photo of the station operated by Floyd in Corpus Christi, Texas, is an old WWII mil surplus rig called the MARK II. This was designed and built in the U.S. for export use in the USSR (in tanks). It operates on the HF bands as well as UHF but is a monster to convert to civilian use, especially since all of the writing on the front panel is in Russian!

Maybe you have your little hideaway in the woods set up and you're hoping for a bit of privacy. Hopefully, folks will just leave you alone and let you go about your business. Or perhaps you've established a compound right at your home; in your mind, the borders of your yard are the lines your neighbors cannot cross.

In normal times, like when you're camping in a wooded location or at home watching the 11 o'clock news on TV, you never really know exactly who or what is lurking about in the darkness, or for what reason. Don't think you're paranoid; lots of strange and unwanted persons and animals can appear before your very eyes and could cause you or your family very real harm. Even the government is aware of this harm potential and has made considerable efforts to keep out those who would intrude. They use fences, barbed wire, nasty and threatening "No Trespassing" signs, guarded gates, dogs, and that sort of paraphernalia. If the perimeter is not in a particular or permanent location (such as a military encampment), then sentries may walk patrols, possibly aided by guard dogs.

In times that aren't normal, you may well be interested in your security to the point where you'd like to be made aware of unwanted persons (or animals) trespassing into your appointed space. Getting a big dog to do your patrolling is one way of accomplishing this; or maybe you can send your spouse out into the fray with a flashlight and a hand-held transceiver. When all is said and done, it appears that the best approach to perimeter protection is by the aid of electronics in the form of an intruder detection system.

Intruder detection systems are useful to:

Campers – You won't be kept awake by those strange nocturnal thumps and obvious movements in the undergrowth. With an intruder detection system, you can sleep soundly knowing that you'll be instantly alerted if something (or someone) should enter your area.

Survivalists – Someone intruding into your compound —are they friend or foe? It may be that you'll have to ask them, but with an intruder detection system you'll at least know that you've got visitors, and the direction from which they are approaching.

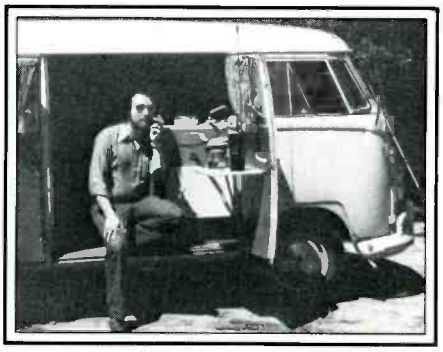
Homeowners – It's both frustrating and frightening to discover that while you were at home, prowlers, vandals, or thieves have been busily at work in your garage, shed, or backyard—and you never knew about it. With an intruder detection system on your property, you can be secure in the knowledge that no one can enter your protected area without alerting you. Haven't you ever wished you could catch the neighborhood dog who has been tearing open your garbage bags or destroying your flower beds?

Farmers – Many farmers use an intruder detection system to offer a warning when prowling animals are around the chicken coops or storage areas, or to protect valuable crops from both animals and thieves. An intruder detection system can be used to watch over areas that are a long distance from the house.

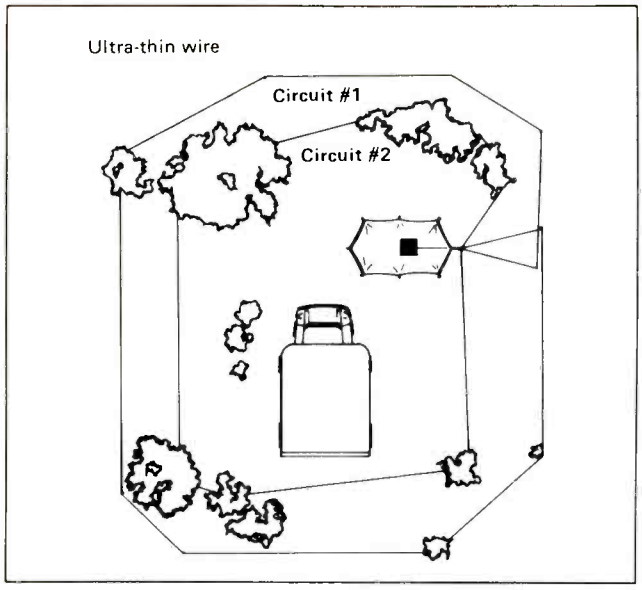
Hunters – A hunter can sit relaxed in one position using an intruder detection system knowing that only he will be alerted when game approaches, and he'll be able to tell which direction will be a big plus.

Police & Guards – Such a system is ideal for police or security personnel in situations that require temporary protection, such as at construction materials storage sites. Once a perimeter has been established around a site, an officer can remain concealed and relaxed knowing that he will be alerted when an intruder enters the area or moves a guarded object.

The Anite Company's effective "Night Watch" unit offers two separate circuits.



A private encampment in the wilderness can be given that extra degree of privacy with the aid of an intrusion detection alarm.



Typical campsite installation of a wired intruder alarm system.

The Systems

Intruder detection systems are ingenious devices and may operate by ultrasonics, radio, or "hard-wire" methods. Here are some of the more commonly encountered units we have seen from the commercial and military surplus sectors.

Stano Components, P.O. Box 6274, San Bernardino, CA 92412, has been offering several mil surplus type intrusion detection devices. These include:

The AN/FSS-9, which is used for interior space surveillance such as a home, store, garage, shed, office, etc. It's ultrasonic.

The AN/GSQ-138 seismic system. It's used for wireless large perimeter protection and saw service in Viet Nam. Comes with seven detector/transmitters, siesmometers, and the control box. Runs on standard flashlight batteries.

The AN/PSR-1 seismic system is used for wire seismic surveillance in combat. Includes a control box, four seismometers, headset, and ground rod, and it operates from standard flashlight batteries.

If you're interested in finding out more about these devices, including the current prices, contact Stano directly.

The *Campalert* is a low cost (about $30) unit that is pocket sized and gives both audio and visual indications of a breech of your perimeter area, and the audio comes through an earphone for privacy. It operates from a 9 volt battery and includes 1,000 feet of reusable perimeter tripwire. Additional wire for larger areas is available from the supplier of the Campalert, which is Thrush Enterprises, 1626 North Wilcox No. 130, Los Angeles, CA 90028.

An exceptionally fine unit is the *NightWatch*, which sells for about $75. This is a simple, portable, and quickly installed alarm system that can be set up by anyone. Each unit comes with a dispenser containing 8,000 feet of almost-invisible ultra-thin tripwire. The wire is strung around trees, bushes, fences, vehicles, chair legs, communications equipment, fence posts, etc., to create a protected area. Anything or (anyone) trespassing breaks the tripwire and activates the alarm. The wire is no thicker than a human hair, so the intruder will not see it, feel it, or realize he has set off an alarm. Two separate circuits are provided and can be used individually or together, and the use of both can aid in pinpointing an intrusion. You select your own circuit pattern or shape.

The supplier of the NightWatch is the Anite Company, P.O. Box 375, Pinole, CA 94564. Check with them directly for more details, although they did answer some of the following questions about the device.

Q: What kind of battery does it use and how long will it last?

A: NightWatch uses a standard 9V transistor battery available anywhere. When used with an alkaline type battery (which is strongly recommended), the unit will run 24 hours per day for about five months before needing a battery change.

Q: What sort of sound does NightWatch make?

A: When activated, the unit will sound a very loud buzzer. You have the option of using the buzzer or the private earphone only, which cuts off the buzzer.

Q: Is the system based on keeping tension on the tripwire?

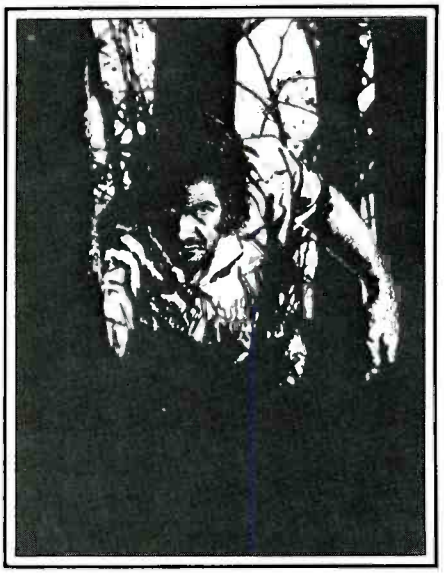
A: No, the tripwire is copper wire which conducts a very small current. The alarm goes off only when the tripwire actually breaks.

Q: What about small animals . . . Won't they break the wire?

A: You can discriminate between small and large animals by placing the tripwire just a few inches off the ground or several feet above it.

Q: What happens if the wire gets wet?

A: Nothing. Water (rain, mist, snow, seawater, etc.) will not affect the way the system operates.



Q: What happens if the wires touch each other?

A: Nothing. The tripwire is actually fully insulated copper wire; it will not short or ground out if it contacts other metal objects.

Q: How long can each circuit be?

A: Several miles if desired (although not very practical). You can make a circuit as long as needed.

Q: Won't the tripwire break while I'm stringing it out?

A: Not if you are careful. The tripwire comes in a specially designed dispenser which allows fast and easy setting-up.

Q: Can I buy more tripwire?

A: Yes. Additional tripwire is available.

Q: How big is the unit?

A: About 3″ × 4″ × 1½″ and it weighs about 7 ounces.

You should be able to see the many potentials and possibilities for safety and security offered by intrusion detection alarm devices. Ascertain your specific needs and then select the type of device that best meets your requirements.

Are Cordless Phones A Wrong Number For Hams?

BY GORDON WEST, WB6NOA

This year, a million new cordless telephones will go on the air in the United States. The majority of these phones operate on two distinct Part 15 low power radio bands. The two bands—one at 49 MHz and the other at 1.7 MHz—are within a few kilohertz of popular weak-signal amateur radio bands. Here lies the problem for the amateur radio operators—improperly adjusted cordless telephones or illegally modified phones are covering up weak signals on the bottom end of each amateur radio band.

Cordless Handsets At 49 MHz

The cordless telephone handset is limited to 10,000 microvolts per meter at 3 meters. Emission type is narrow band FM (F3 ± 5 kHz). The following frequencies are available for cordless telephone operation within the non-interference standards of FCC Part 15: 49.830 MHz, 49.845 MHz, 49.860 MHz, 49.875 MHz, and 49.890 MHz.

The bottom end of the amateur radio 6 meter band for weak signal CW work begins at 50.0 MHz—a mere 110 kHz away from cordless calls.

Base Sets At 1.7 MHz

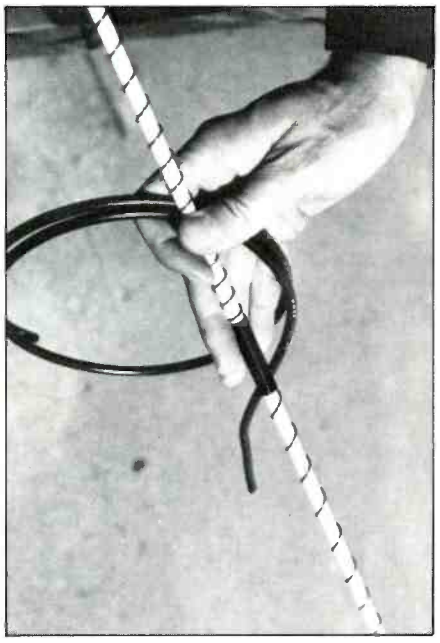
Most base transponders operate on Part 15 frequencies just above the broadcast band. They are also limited to a maximum radiated power of 10,000 microvolts per meter at 3 meters. Most base transponders dump the radio energy directly into the power line for maximum dispersion of signal. Still within rules, this weak signal may travel several blocks before it is attenuated into power line noise. Frequency modulation (F-3) emission is used at ± 5 kHz.

The following frequencies are used by cordless telephone base transponders: 1.705 MHz, 1.735 MHz, 1.765 MHz, 1.795 MHz, and 1.825 MHz.

The amateur radio 160 meter band begins at 1800 kHz (1.800 MHz). One cordless phone channel falls *directly* atop the weak signal slot for world-wide DX CW reception.

The frequencies from 1825 kHz to 1830 kHz are considered the "DX window," where United States and Canadian amateur operators listen for weak signal European stations!

"Just the other night I was hooking with a rare European station while operating split frequency on 160 meters. Just as the European station was sending his call letters, my receiver blanked out and all I could hear was some idiot making a garbled phone call," comments Bill Alber, WA6CAX, an amateur radio operator in the San Francisco Bay area.



Helical windings on cordless base antenna.

"The dialing pulses were so strong they completely clobbered the bottom half of the band," adds Alber.

VHF amateur radio operators who operated weak signal CW work at 50 MHz have the same complaint.

"I run moon bounce at 50 MHz, and when the cordless phone is turned on next door, it completely wipes out my station. I don't care what frequency they are on, they are slopping over on our 6 meter band," says an Arizona amateur radio operator.

Adding to this problem is the illegal modifications being made to cordless telephones. Outside antennas and long extension cord AC antennas tremendously add to the amount of radiation a simple cordless telephone system puts out. Manufacturers are selling these add-on extension antennas like they are going out of style. However, some are seeing some FCC pressure.

"During a consumer electronics show, someone from the FCC came by and wanted more details about our cordless antennas," says a cordless antenna accessory manufacturer. "He didn't really say anything—he just wanted to see the literature."

I asked another manufacturer in the Midwest whether or not he felt that the external antennas they were selling were illegal.

"It's not illegal to sell and market antennas at any frequency. However, if the end user hooks these antennas up and illegally modifies his cordless phone, then it's their problem—not ours."

Cordless phones are the rage!

Everyone wants more range from their cordless telephone, so it's routine to soup them up, which may cause additional problems for the amateur operators.

What can an amateur radio operator do if he is being interfered with on legitimate ham frequencies? He could go down to the local FCC office and fill out a complaint. The question is, will the FCC take any action on one single complaint? I doubt it.

I contacted a local FCC office to find out why a Part 15 frequency was authorized on an amateur radio frequency—1825 kHz. I was informed that they "would look into the assignment."

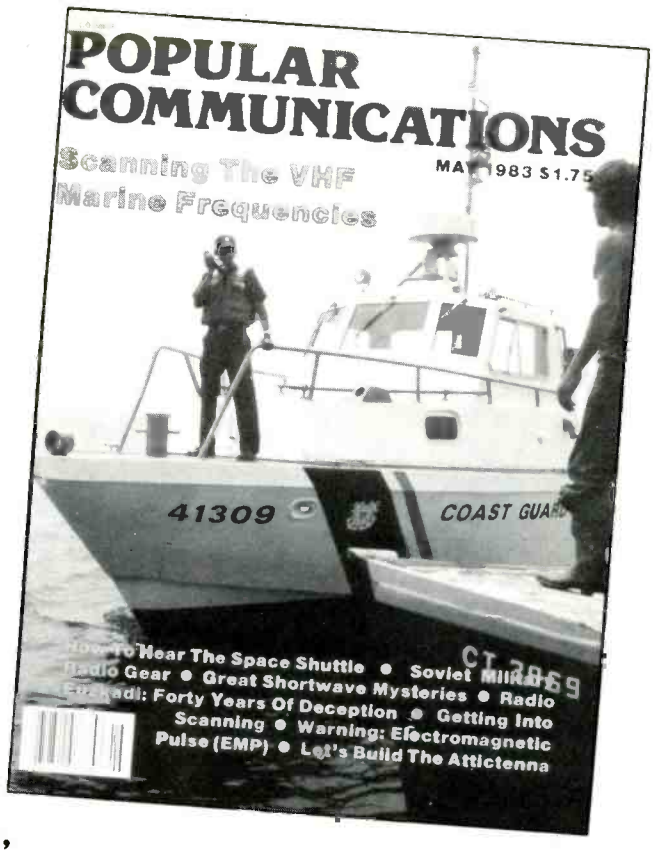
Cordless telephone manufacturers are all lobbying for more channels near 72 MHz. This might help relieve the congestion presently on 49 MHz and 1700 kHz. However, it's doubtful as to whether or not existing users would ever vacate the present frequencies. I forecast a gigantic dump of cordless phones on these frequencies at ridiculously low prices when new channels are authorized. This again compounds the problem for the ham operator.

The solution? Manufacturers should carefully consider the consequences of producing antennas and extenders that illegally extend the range of cordless telephones. The FCC should take immediate action on eliminating the one cordless telephone channel that is smack dab in the middle of the amateur radio DX window at 160 meters. Cordless phone manufacturers should cooperate with the amateur radio fraternity and not ship units that transmit on ham bands.

Is all this really going to work to clean up the amateur radio/cordless phone interference problem? I doubt it. Let's hope that a war doesn't develop between the high powered ham stations and the lower powered cordless telephone sets. One thousand watts at 1825 kHz would probably render most 10,000 microvolt per 3 meter cordless phones useless—that is, if they don't blow them up!

. . . . from the publishers of CQ

You be the judge...



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Scanner Antennas

BY GORDON WEST, WB6NOA

An outside antenna will dramatically improve the range of your scanner receiver. The antenna is relatively inexpensive and goes up as easily as a TV antenna. Let's look at external antenna considerations for your scanner receiver station.

The little telescopic whip that is shipped with your scanner is fine for local use. However, even though you may pick up base stations up to 20 miles away, don't be overly impressed. An outside scanner antenna will dramatically pull in base stations up to 50 miles away, and mobile units almost as far!

The true professional scanner enthusiast would never be caught scanning the airwaves with anything less than a big outside base antenna.

There are approximately 15 manufacturers of outside base and mobile scanner antennas. Each company offers a wide selection of antennas that may easily be mounted on your roof or on a vehicle.

Resonant Frequencies

Most scanners work on all three bands—low, high, and UHF. The antennas incorporate loading coils and traps to automatically electrically tune themselves for each band of reception. Some antennas actually use individual resonant elements in order to pull in all three bands well. Even though your scanner may be capable of "five band" reception, the tri-band scanner antenna will normally do its job well in each frequency range.

There are literally hundreds of ways that a single antenna setup may be electrically constructed to pick up a wide group of frequencies. Even a non-military version of the discone antenna works well for scanner radio users. This type of antenna offers over 400 MHz of continuous frequency resonance.

Now the big question is—*which antenna is best?* They are all good! Each antenna may have its individual strong points. For instance, some very large multi-element tri-band antennas offer considerable gain on the lower bands because of their big size. Smaller antennas may offer almost no actual gain on low band, but will offer a small increase of signal strength on high band. Generally, the larger the antenna setup, the better the reception.

Most scanner antennas are constructed for omnidirectional coverage. They are mounted vertically. The antenna should be mounted well above any other metals in their general vicinity, such as air conditioners, vent pipes, etc. Watch out for power lines! Keep your antenna as far away as possible from any power wires.

Height is very important, too. An extra 10 feet of elevation will dramatically improve your mobile unit reception capabilities. Once again, make sure it won't blow over on a nearby power line.

Directional beam antennas are also a consideration for your scanner listening. If you wish to pull in distant stations in only one direction, try a beam antenna. A scanner beam antenna may increase signal reception by as much as 8 to 10 times on UHF! Polarization is usually vertical—just opposite from what your TV antenna looks like.

You may wish to put your beam on a rotor. This would allow you to point the antenna to distant stations for maximum receptions. You should still pick up local stations off the back of the beam with little trouble.

So Which Antenna Is Best?

Once again, they are all good if produced by known antenna manufacturers. Choose the largest antenna possible and put it up as high as you can. Keep it away from other metals and be sure to watch out for power lines. Go for that extra 10 feet whenever practical, provided you have full control over the antenna.

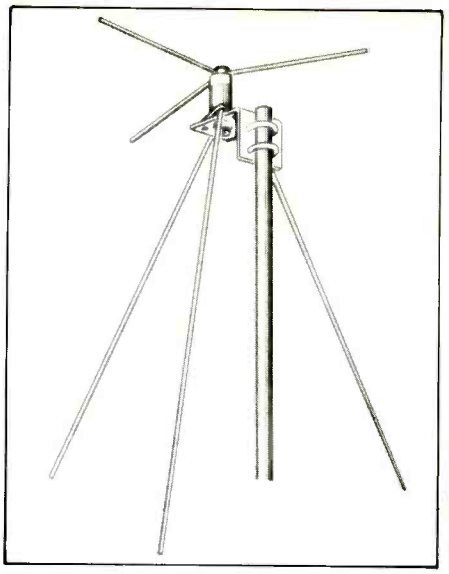
Feed Lines

Coaxial cable is used for your scanner feed line run. If you want absolutely the maximum amount of reception, choose the large garden hose type cable, RG-8U or RG-9U. Be sure to seal the exposed end of the cable or connector completely with "coax seal." This stuff goes on like putty, never dries, and keeps out moisture. It is available at most amateur radio stores.

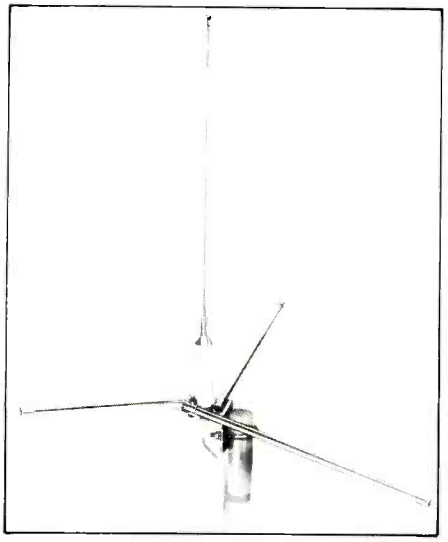
Sure, you can use the smaller RG-58U or RG-59U, but this cable offers less signal carrying capabilities at UHF frequencies. If your cable run is under 30 feet, the smaller cable will probably work out okay.

Technically speaking, there is little difference in 50 ohm and 72 ohm impedance cable to your scanner. Most scanner sets do not have a critical input impedance that the antenna or cable must match. Don't lose any sleep over whether or not your setup is 50 or 72 ohms. I have tried all the combinations with no discernable differences in cable impedance. However, going to the larger cable makes a difference on UHF frequencies.

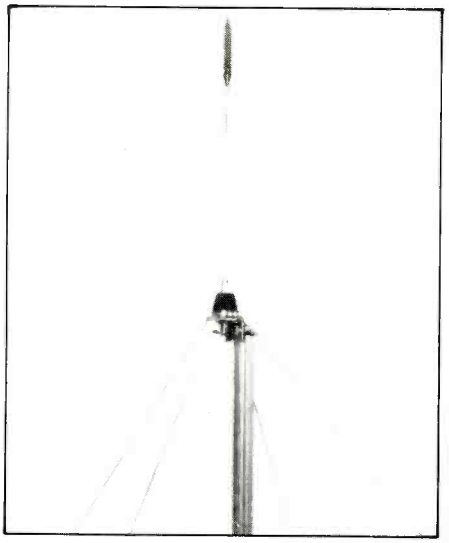
Scanners will not accept a PL-259 coaxial cable connector. So, don't put one on the radio end of the cable. You must try and solder on a Motorola plug. This is an easy task with the small cable. You may have to use a PL-259 adaptor assembly for the larger cable. Anyway, just remember that a coaxial cable plug normally for two-way radio use is not going to work with scanner receivers. It's cheaper to build a scanner set with



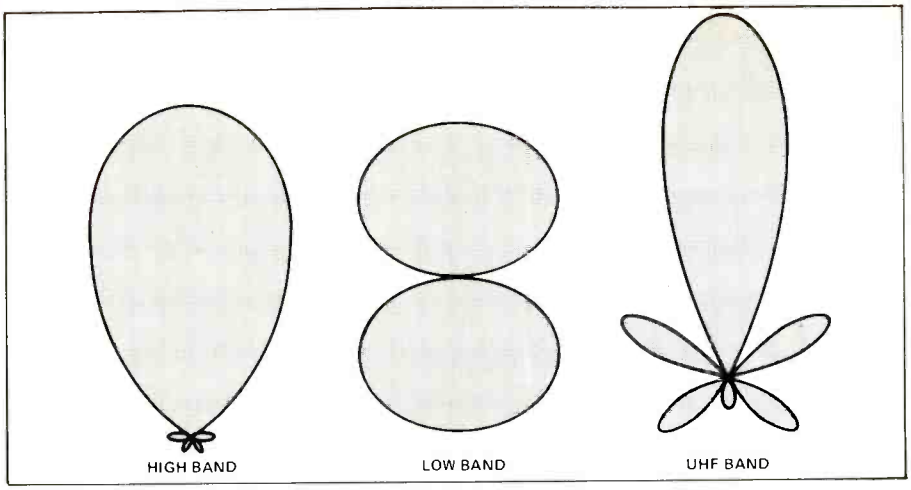
The discone antenna, such as this one from Antenna Specialists, offers reception between 30-500 MHz.



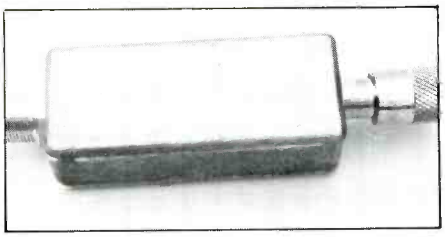
This is a tri-band base station antenna from Communications Electronics.



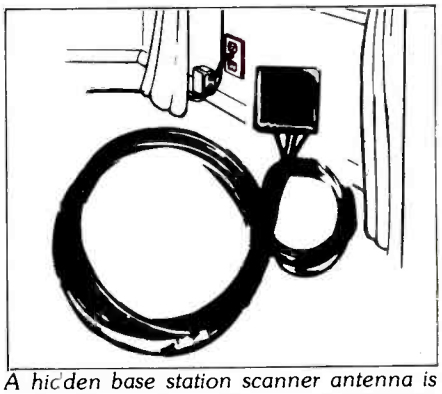
This is Antenna Specialists model MON-38 all-band base station antenna.



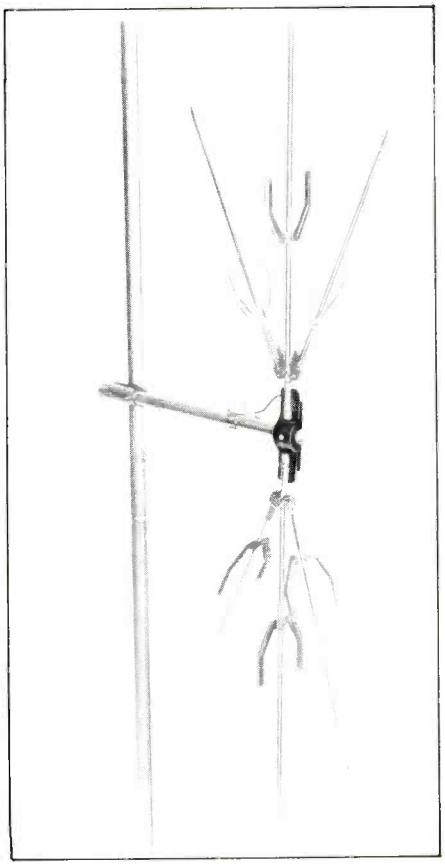
Grove scanner beam radiation patterns.



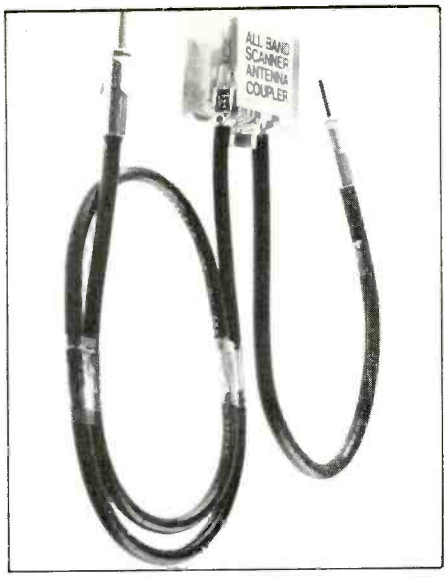
Winn-Tenna makes this base station antenna booster.



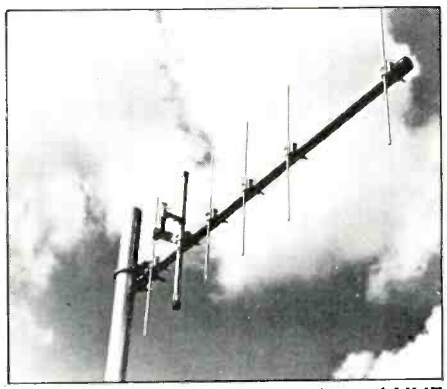
A hidden base station scanner antenna is perfect for apartment house use. Available from Antenna Inc.



Channel Masters' Monitenna offers all-band scanner reception.



The Antenna Specialists' MON-63 permits you to operate your scanner from your car's broadcast antenna.



Cushcraft offers an extensive line of VHF beam antennas.

the Motorola jack rather than a chassis PL-259 receptacle jack (SO-239).

Once your base antenna is up, give it a try. Compare it to the reception of your small telescopic whip on the scanner set itself. You should hear a definite increase in range. Try that distant weather channel for a continuous check. If you don't get whopping better range with the outside antenna than with your inside whip, something's wrong aloft. Check everything over, double-check your connections, and then test again. The outside antenna should surely bring in a year's supply of additional stations.

Mobile Use

Using your scanner in a vehicle will always necessitate an outside antenna for maximum range. Unplugging your automobile antenna connection and plugging it into the scanner is a great deal of work each time you wish to monitor one set or the other. Putting in a simple "y" connector is also not recommended. This type of connection will detune your AM/FM radio, and your scanner will interact with your entertainment set.

Special antenna couplers will allow you to use your automobile antenna for both your scanner set as well as your automobile radio. These are good performers in some cases. Depending as to what type of automobile antenna you have, you may find good results—you may not.

Trying to use a windshield automobile antenna for a scanner antenna will lead to poor range. Automobile whip antennas work slightly better.

A mobile CB antenna is generally a poor performer for most scanner frequencies. At any other than 27 MHz, it will look like a direct short to ground. Using the CB antenna connection to your AM/FM automobile radio also leads to poor reception.

To maximize your scanner range in a vehicle, you need to purchase a separate triband scanner antenna. These antennas are usually characterized by a loading coil in the center of the antenna. The entire antenna resonates for low band. At VHF frequencies, the antenna looks like a quarter wave length. At UHF frequencies, usually only the bottom section of the antenna resonates. This is all done automatically without any moving parts. The loading coil creates the perfect match for all scanner frequencies.

Keep your scanner antenna as far away from the engine compartment as possible. Also, mount it at least three feet away from any other type of antennas you may have on your vehicle. This will prevent CB signals from wiping out your scanner reception.

Never, I repeat NEVER put any connection in between a CB antenna and a scanner. When you transmit on your CB radio, you will more than likely burn out your scanner for good.

Using a quality commercially-made outside scanner antenna will give you plenty of range while driving around town.

Scanning with an outside scanner antenna—you will literally hear the difference.

RADAR REFLECTIONS

RADAR DETECTORS AND THEIR USE

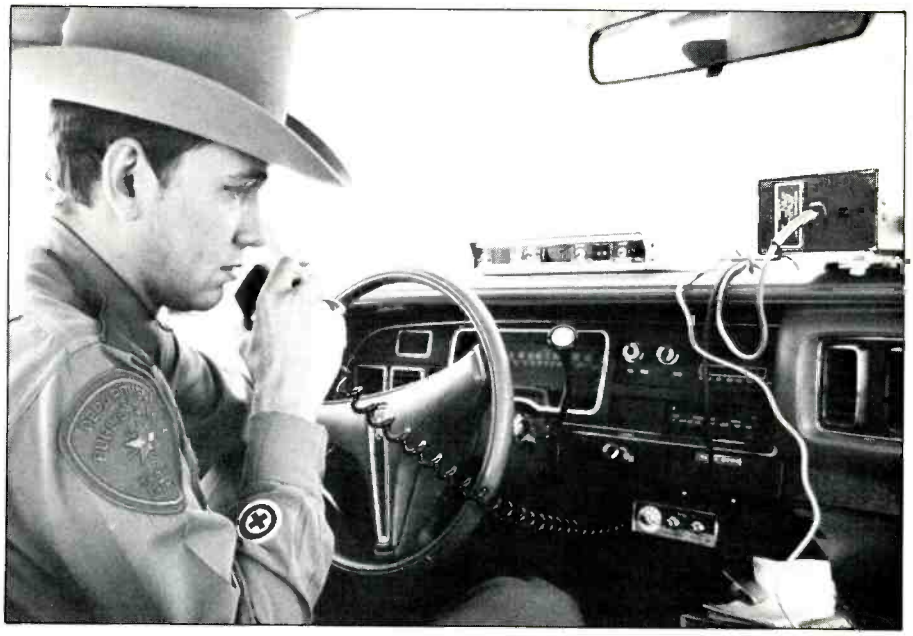
BY JANICE LEE

Radar Blip?

An Amherst, Ohio police officer recently pulled a car over for speeding. Nothing unusual with that, except Mayor Anthony DePaola was driving the car. His Honor escaped a ticket after insisting that he was not speeding and saying the officer's radar must not be working properly. He received a verbal warning instead.

However, DePaola's complaints didn't spare him the court appearance—he escaped a ticket because his speed wasn't clocked with radar! The cruiser that stopped him wasn't even equipped with a radar unit.

Two days later, John Presutti, DePaola's safety/service director, told Police Chief William Hall to send the department's three radar units back to the manufacturer in Kansas to be recalibrated. Hall says his officers check the units every day and they have never had any trouble with them. DePaola says he didn't learn that he was not clocked with radar until the units were sent away.



North Olmsted, Ohio's Sheriff Gets An "A" For Attitude

Sheriff Gerald T. McFaul, caught speeding in North Olmsted last month, was fined $10 and court costs of $27 in Rocky River Municipal Court.

"Technically, this ticket is waiverable, but I would rather appear in court and enter a plea publicly," McFaul said during his court appearance. He refused further comment.

McFaul's car was clocked by radar at 41 miles per hour in a 25 MPH zone by Patrolman Robert D. Flynn at 1:46 a.m., according to court records.

"The court is overwhelmed, and I wish to commend you," Rocky River Municipal Judge William McCrone told McFaul. "You set an example that no person is above the law, and demonstrated to this court your great respect for the law."

Boisean Invents Speed Checker To Replace Radar

It took 30 years of tinkering, experimenting, and improving, but 71-year-old Ervin T. Dunn finally has done it.

The retired Idaho State Police Officer has received a patent for a speed detector that he says is better and less expensive to use than radar units.

The TSR (Time Speed Ratio) computer is a black metal box with a calculator on its face. "It works", says Dunn.

He says the instrument is simple to master—all officers have to do is watch cars and push buttons.

The TSR works by first having a car drive between two selected points—say from a tree to a red fencepost on an interstate—at a designated speed. An officer in another car punches one button on the hand-calculator-sized device when the car goes by the tree. He presses a second button when the car passes the red fence post. That locks a time-distance ratio in the computer's memory.

When in use, the officer repeats the same sequence and, within 10 seconds, the computer provides a digital read-out of the driver's speed.

Dunn says his detector has several advantages over existing speed-detection devices. Speeds of several vehicles can be simultaneously computed as can trucks or cars going in different directions, he said. Officers also can clock drivers from a distance, out of the sight of motorists, and radio officers nearer the highway to watch for offenders. Best of all, it works without a radar beam, he said.

Dunn thinks his invention would be particularly appealing to small departments with low budgets. The TSR could be marketed at $400 to $500 a unit, compared with radar units that can cost from $2,500 to $3,000 a piece.

Now, Dunn said, he only needs someone to help him find a market for his invention.

CHP Poll Rids Jurupa of Radar

The California Highway Patrol has decided not to use radar to patrol the streets of Jurupa, after its opinion showed more residents against it than in favor.

Officer Al Smith said that of 238 responses, 55 percent were against or probably against, with 45 percent in favor or probably in favor.

Former County Supervisor Donald Schroeder, who represented the area, had passed along the constituents' complaints about speeding. The CHP conducted the survey, and then contacted Supervisor Melba Dunlap last week.

Dunlap ousted Schroeder in November's election, Smith said. Dunlap was neither for nor against radar but favored "whatever her constituents wanted."

Dummy's Work Brings Arrest

A Hartford, CT man was charged with drunken driving when he asked for directions from a mannequin dressed as a police officer, authorities said.

Police said the man, identified as 28-year-old Gerald McDoon, was arrested recently after he parked his car next to a radar cruiser manned by "Gertrude", the police department's mannequin. McDoon told police that he was asking directions and had not understood Gertrude's response.

Bill Would Limit Radar Use

Senator Ernest Chambers of Omaha, NE will try once again to set restrictions on the use of law enforcement radar or speed direction equipment as evidence against accused speeders.

Chambers offered LB88 last week which would establish that a law enforcement officer could use speed detection equipment to corroborate his "visual observation" that a motor vehicle was speeding.

The bill, which is similar to an unsuccessful 1982 measure, requires that readings

taken from the speed detection device be considered as competent evidence only when the state can prove the device was working properly and that the officer involved was properly trained in its use.

'Routine' Stop Leads to Legal War

According to the policeman, it was a routine stop of a speeding motorist.

According to the motorist, it was a "set-up" and a deprivation of his civil rights.

An altercation recently between Patrolman Dennis Brady, Indiana's 1964 Mr. Basketball from Lafayette Jefferson High School, and the motorist, Lafayette attorney Richard O. Bovey, has led to a court battle. Each has sued the other for millions of dollars.

It all began when Bovey was driving home about 9 p.m. in his white Volkswagen Dasher with his wife and two sons after Christmas shopping.

The patolman said radar showed Bovey was traveling 49 mph in a 30 mph zone.

After being stopped, Bovey "became extremely unruly, disorderly, and uncooperative," the patrolman said. Bovey "was in a rage, screaming and threatening, denying that (I) had the authority to arrest him."

The attorney's suit counters that Brady stopped him "without any legal cause on a pretext of speeding, which he knew to be false."

Bovey maintains the real issue is a vendetta against him by some Lafayette policemen "because I've handled some cases and stepped on some toes."

Bovey, 37, an attorney for 12 years, said he learned of several cases of police brutality brought against the city. "They want to bring me down because I know what goes on down there (at the police station)," he said. "When I see someone being oppressed, I can't stand by in good conscience and watch them being oppressed."

Bovey is seeking $7.5 million in damages in his suit in federal court. Besides Brady, Bovey's suit also charges Lafayette Police Chief Ronald O. Milks, shift commander Edward Moser, and Dan Money, another Lafayette policeman involved in the arrest.

Bovey claims the policemen were operating under departmental procedures approved by Milks and that Milks and the city knew the policemen "were prone to the use of excessive and unreasonable force."

Milks said an internal investigation of the incident determined that Brady, a member of the police force since August 1976, did nothing wrong in making the arrest. The investigators said Brady did not use unreasonable force and that he followed departmental regulations.

Radar Speed Detection: Reliability of Equipment

A Federal District Court has held that a radar device called the Speedgun 8 "cannot be operated in a scientifically reliable manner". Expert testimony presented by the prosecution in a speeding case pointed out three difficulties with the device.

First, if there is more than one target within the device's 1500-foot-wide beam, an incorrect reading may be given. Second, the device picks up signals from other sources of electromagnetic radiation, such as a car's heater fan. In this case, a false reading might have been given by ventilation fans in a building near which the officer had parked his car. Finally, street signs, buildings, and other objects will reflect the beam at an angle; the device will then pick up movement to the side or rear of the operator instead of in front of him.

Besides these problems, the officer in the instant case was not properly trained; even if he were, the Court found "that it is virtually impossible for a trained operator to fulfill the conditions of correct operation." While this decision relates only to the named device, it was noted that "the expert testimony presented by the prosecution in this case raises the issue as to whether any type of radar device is scientifically reliable for the purpose of detecting the velocity of an automobile traveling on a highway where there are reflecting objects, electromagnetic interference, or other vehicles within the beam range of the device." (U.S. v. Fields, _____ F. Supp. _____, 30 CrL 2459, Ohio, 2-4-82).

Santa Was a Cop

In Morrisville, PA around the Christmas holiday, motorists learned that Santa Claus was just as good at saying, "No, no, no" as "ho, ho, ho."

The learning came about in a Christmas spirited speeding. Motorists speeding through the intersection of Pennsylvania and Osbourne Avenues were pulled over by a stern, uniformed officer—and then were handed a poetic warning by a chuckling officer decked out in Santa garb. The holiday warning had been penned earlier by the borough's police chief.

"Everything the police do during the year is negative—writing tickets or arresting people," said Police Chief Harry Merker. "So we decided to reverse the thing and do something nice. Literally! We're not all bad."

The idea was Merker's. The poem, which he said he rewrote "at least 15 times before I could get it to rhyme," intoned, "Oh, no. Oh, no. You had to go and break the law today/Please slow down. We want you around for the Christmas holiday/Ho, Ho. You are free to go with a warning and we pray/You have a safe and happy holiday."

Merker said three officers were involved in the speed trap.

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

ON THE LINE

BY GORDON WEST, WB6NOA

NEW AND EXCITING TELEPHONE TECHNOLOGY

This is the year of the telephones! Private companies are sprouting up everywhere offering telephones, telephone accessories, and telephone maintenance equipment. This makes sense. The world is just waking up to the fact that they can buy their own telephones and do all of the phone wiring and hookup themselves!

Years ago this wasn't true. There were horror stories of telephone men discovering extra phones hooked up to their service. I can remember my college days when the phone man came in and appropriated 10 working phones in our dormitory—all hooked up "illegally."

Today they can't touch your properly hooked up installation. You can own your own equipment, trade it in for new equipment, and pick out a telephone style and color exactly to fit your pleasure.

Telephone set prices range anywhere from $40 to $400. I recommend you stay away from "swap meet" specials. There are a host of telephones floating around that are still the property of Ma Bell. It is illegal to own equipment that has been stolen, so make sure that you buy your telephones through a reputable phone dealer.

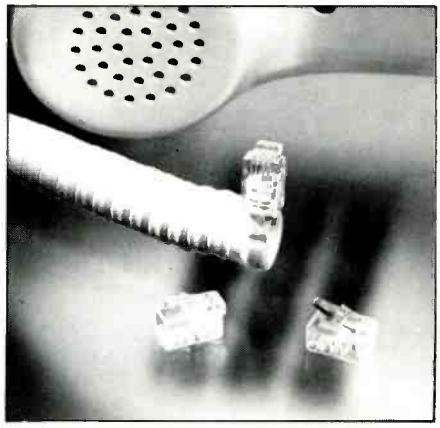
You also need to inform your local telephone company the model number and ringer equivalent number of your new phone setup. These numbers are usually on the instructions that accompany the telephone set.

Let me repeat, don't buy telephones that are not legally or commercially available. Buying stolen Bell telephones could lead to some serious consequences, and it's not worth it.

Sometimes, telephones that are commercially sold look like they aren't all there! The latest innovation is to sell the complete telephone in the handset. The long curly cord doesn't attach to a telephone set, but rather goes to your regular telephone jack. All of the electronics are in the lightweight handset, and the handset can stow away almost anywhere out of sight.

Combination telephone/intercoms are also now available. They look exactly like multi-line office phones, but they really aren't. The buttons allow the phone call to be transferred to any other phone apparatus in the house. You may also inter-communicate between the different telephone sets throughout the house or office. Although only one line is available, you can also put that line on "hold."

This same telephone system from Technicom, 23 Old Kings Highway South, Darien, CT 06820, also encompasses an ingenious controller system. You can turn on the lights, heat, or appliance from remote locations with your phone setup. The same system also has a built-in alarm system. It will alert you to intrusion or fire throughout the house. Of course, this phone system is compatible with either your existing rotary or push button service.



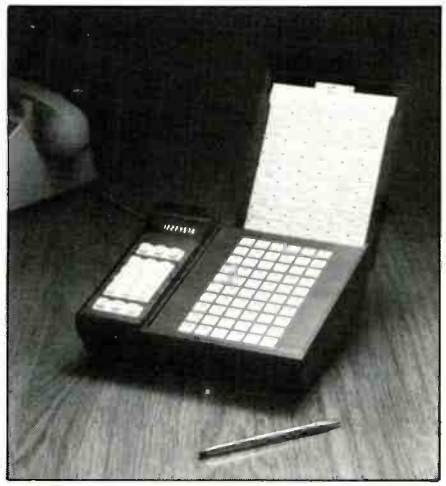
The easy modular jack connection.

A 40 Channel auto-dialer.

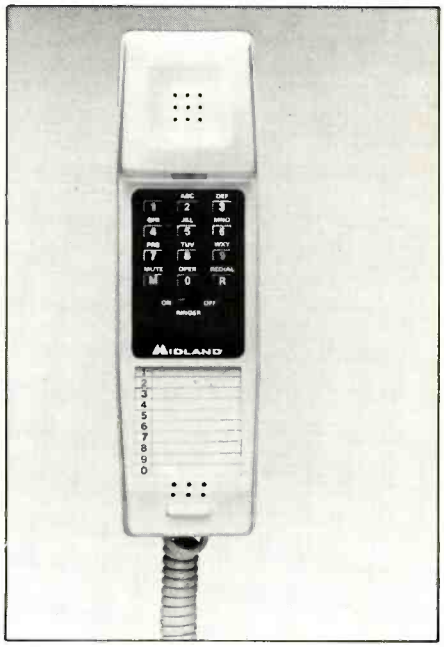
A few months ago, we talked about a 60 memory automatic telephone dialer. The response to that article and the unit was fantastic. Here are the details: It is produced by a company called Cal-Tel Systems Incorporated, 2674 South Grand Avenue, Santa Ana, CA 92705, phone (714) 966-3074. They offer several different models, even one with up to 183 memory positions! All units have built-in batteries in case of disconnection with the power source. To my knowledge, there is no other telephone dialer that has as much memory as these sets, but there are some priced competitively with less-memory sets. Write them for details and the name and address of the nearest dealer that sells the equipment.

Another interesting product is the music machine that soothes your callers when you may wish to put them on hold. There is also another gadget that you can add to your private or business phone that talks to the callers and reminds them to not hang up but wait for an open line.

Inexpensive "on-hold" telephone sets are available for the home from Viking Electronics, Box 362, Hudson, WI 54016. It installs in seconds on modular phones that you may already own. A red light indicates whenever a caller has been placed "on hold."



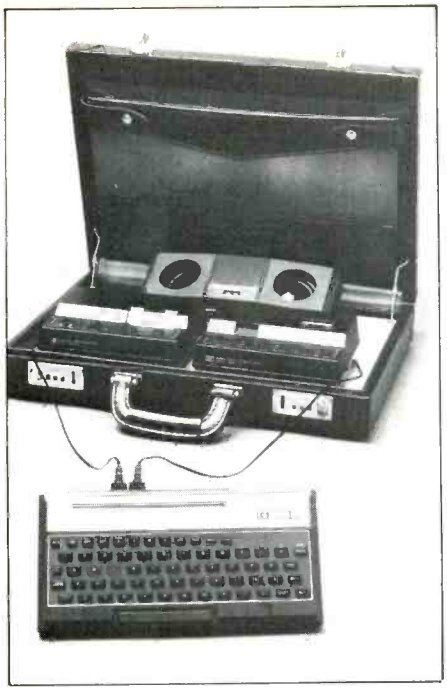
The Cal-Tel automatic dialer.



This is the complete phone—no other connections but the plug!

By the way, there is no shortage on the complete selection of telephone jacks. Phone marketeers offer no less than 50 different types of jacks for any type of equipment. These accessory jacks are generally inexpensive, but will greatly assist you in hooking up a host of telephone gadgets to a single incoming line. Contact Phone Patch Accessories, P.O. Box 19361, Irvine, CA 92713 for more information.

Is your portable computer tied into a telephone system: Some computers will exchange information, over the phone lines, with other home-based computers. This allows you to transact business from your



The HP-75 portable computer makes personal computing power in a briefcase today's newest innovation.

portable computer from a hotel room back to the office. The hotel telephone, or your private telephone, simply fits into the telephone pickup assembly. Just as long as you are near a telephone, your computer will be able to "phone home" all its information.

Finally, call screening systems are also available for your private telephone setup. The caller that rings your line is informed that he may go ahead and leave a message on your answering machine. However, the caller is also informed that if the message is an extremely important one, to press a certain digit on the telephone apparatus. This tone causes your tape machine to beep. The caller is also informed that he may alert you to an emergency message by hitting a certain tone. When he does this, your answering machine automatically beeps and it also may forward his emergency message to you at any one of ten program numbers until your answering machine finds you. How's that for service! Contact Command Communications Incorporated, Denver, CO for additional information on this subject.

The year of the telephone is here! You should march right down to your local telephone sales outlet and look at all of the new innovations. Many folks throughout the country are turning in their phone company equipment rather than renting it on a monthly basis. It takes only about a year to save on the cost of renting equipment with a low-cost purchased telephone set.

If you are now renting, you may wish to consider switching. There is little to go wrong with the purchased phone apparatus, and now you can get the one that you like the best.

POPULAR COMMUNICATIONS
FREE INFORMATION SERVICE

For further information on products, dealers, or literature in this issue, circle the appropriate numbers below. Be sure to include your name and address before mailing to: POPULAR COMMUNICATIONS Magazine, Reader Service Management Dept., P.O. Box 305, Dalton, MA 01226.

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LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

As was the case last month, we have some interesting station developments to report again this time.

Rather than trying to figure out which frequencies are from the Deutsche Welle relay station at Malta so you can log that country, you can now be certain of it when you check for the new "Radio Mediterranean." Actually, Radio Mediterranean isn't really new since it was on the air over the Malta transmitters a couple of years ago before it suspended operations.

Now Radio Mediterranean is back. It's scheduled in English from 1800 to 1900, in Arabic from 2130 to 2230, and in French from 2230 to 2330, originally on 5.960; but it's reported to have moved to 6.110 to avoid interference.

Radio Mediterranean is operated by the government of Malta and receives financial support from the government of Algeria as well which, in turn, also receives some program time on the facility. Incidentally, the first time around, Radio Mediterranean's additional support came from Libya.

Norman Hamilton is the general manager of the station and reception reports can be sent to Post Office Box 2, Valeta, Malta.

"Forget it!" That's what Radio Denmark has been told to do with their plans for 500 kilowatt transmitters on shortwave. A change in government, bringing with it budget changes, resulted in a recommendation that plans for 500 kilowatts be postponed or dropped. So, the Danish Shortwave Service will have to make do with their ancient 50 kilowatt facilities for awhile longer and we won't be treated to improved reception from Denmark.

Meantime, in Sweden, Radio Sweden continues to make improvements in their facilities, this time by putting a new antenna system into operation. The aim is to improve reception particularly in North America and East Asia. According to Radio Sweden, the antennas are necessary due to the auroral zone through which Radio Sweden's signals must pass. The new antennas are expected to triple the strength of the signals from the antennas previously in use.

But, there's a drawback. The higher gain of the new antennas causes a narrower beam width—30 degrees—compared to twice that with the old antennas. Thus, some adjustments in directionality have been made. Radio Sweden would appreciate hearing from you concerning your reception, particularly if you can compare it to average reception before the antenna switch was made. Write: Radio Sweden International, S-105 10, Stockholm, Sweden.

Shortwave listeners and DXers are always eager to log a new country and there's good news in that department. Another new one is coming on the air! Alaska! KNLS, a religious station at Anchor Point near Anchorage, was scheduled to begin testing in April using 100 kilowatts. The station, owned by the World Christian Broadcasting Corporation, planned to use 11.940 and 17.880 from 1800 to 0400 GMT.

Radio Moscow loses the calendar war. Their's is on the back of this small card. Radio Beijing issues a giant wall calendar.

Steven Sienicki of Jamesborg, New Jersey with his Realistic DX-200 and Hallicrafters S-41g receivers.

There's fresh activity in Venezuela. Radio Catatumbo Internacional broadcasting from Maracaibo is using 9.620 and has been well heard around 1100 GMT. And the government outlet, Radio Nacional de Venezuela, has instituted a new international service on 9.540 (although they announce it on 9.555) and also on 11.695. It's being heard at 1100 with one hour broadcasts announced also for 1400, 1800, 0100, and 0300.

For clandestine buffs, there are two new targets to go after.

La Voz de Nicaragua Libre (The Voice of Free Nicaragua), an anti-Nicaraguan government outlet, has been noted at 0000-0045 and also at 0400 jumping around on many frequencies. These include 5.674, 5.785, 5.893, 5.745, and 5.720 to name just a few.

A station speaking on behalf of the Miskito Indians, Radio Miskut, has been heard on 9.620 (variable) at 0200 and again at 1100 GMT. This, too, is an anti-Sandanista station. Unfortunately, addresses for both of these stations don't exist, at least to our knowledge, so you'll have to be satisfied with just listening to them.

Listening Post reporter David Bush of Sebring, Ohio.

This handsome shack belongs to John Palumbo of Windber, Pennsylvania.

Reader Letters

Let's check the mail. Steve Leite of Falls River, Massachussetts checks in with some nice loggings. Steve uses one of those old reliables—a Hammarlund HQ180, to which he's added digital readout. Steve's got 165 countries under his belt with 142 of them verified. Steve was picked as DXer of the month for both June and July last year by HCJB's Andex DX Club. Congrats!

Bruce DeShazo of Memphis, Tennessee has three receivers—a Realistic DX-160, Kenwood R-300, and a Panasonic RF-4900, which is the one he uses for most of his DXing. Bruce promises a picture later on and we look forward to that.

Charles Ames of Grand Canyon, Arizona sends along some photos of his QSLs, which you'll note in this and future issues. Many thanks Charles!

Larry Rempala, Lisle, Illinois has switch-

Charles Ames of Grand Canyon, Arizona combines hamming and SWLing. He uses a Tentec Century 21 transmitter and Kenwood R-600 receiver.

Doug Cummins at his Independence, Missouri listening post.

ed to a Realistic DX-200 receiver and added 26 countries to his heard list. Larry wonders if Central America shouldn't be added to the Verified All Continents-Low Power figurings. Well Larry, Central America is considered part of North America for VAC/QRP purposes.

Keith M. Halverson of Whitehall, Wisconsin notes that it's hard to keep up with all the schedule changes on shortwave. Right you are! And a good reason to read *POP'COMM* every month as well as having membership in one or two DX clubs. Shortwave changes every day as we've often mentioned.

Rick Wilson, who hails from Kansas City, Missouri uses a Kenwood R-1000 and has to operate withoug an outside antenna. So, he uses a dipole strung around the ceiling of his bedroom. Shortwave freaks will always find a way!

J. Don Tally of Midkiff, Texas says he's just getting back into listening after an absence of several years and writes to suggest several article ideas. They're gratefully received Don, and so are *yours*! Don also asks about finding a reporting form in Dutch to use for a report to SRS in Surinam as well as report forms in other languages, such as Russian and Chinese. As for SRS, they accept reports in English, and except for Spanish to Latin America (and Portuguese to Brazilians), Indonesian for stations in that country and French for the French-speaking African countries, it's almost always true that English reports are acceptable everywhere else. That probably explains why Arabic, Vietnamese, Russian, and other language report forms don't exist or their use never caught on. They really aren't necessary and they're extremely difficult to use as well!

Doug Cummins of Independence, Missouri has been a listener for about six years and has a Panasonic RF-3100, an RDA-127, and an Airline multi-band receiver. Doug is a spotter for the National Weather Service.

David Scott of Newark, Ohio notes that he's new to the listening game and uses a Hallicrafters S-38C.

John Palumbo of Windber, Pennsylvania is also new to the hobby and has a GE World Monitor ten band set along with a DX-200 and asks for our suggestions on what make and model or receiver to buy. There are many good ones on the market, John, and we just can't make recommendations on equipment. We might suggest you read Larry Magne's equipment reviews in the 1983 (and previous) edition of *The World Radio TV Handbook*.

Barbara Harris of Nashville, Tennessee uses a DX-100 and GE Monitor Ten portable and has logged 55 countries so far. Thanks for the article suggestion Barb—it's in the works and, incidentally, ladies are always welcome!

Dave Bush of Sebring, Ohio says one of his high school teachers got him interested in shortwave.

Erik E. Gravelle of Elkhart, Indiana is a member of the Radio RSA monitoring panel and has gotten into serious listening only recently.

Bill Carney, Jr., who lives in Pinconning, Michigan uses an Aimor TR-105 and is interested in using his VIC-20 computer as part of his shortwave listening efforts.

Good to hear from you! Letters and notes on what you're hearing are always welcome, as are photos of you in your shack and good, high contrast copies (or photographs) of your favorite QSLs. It will help if you put your name and location on the back of each photo or copy you send.

We'd also ask that when reporting loggings you include some details other than country, station, time, and frequency. Language used, program details, QRM, and the like will make your information more useful. And since we read most of the major shortwave publications regularly, your information should come from your own listening efforts or be in the form of material received direct from stations.

Okay. Let's see what's being heard on radios around the country. Remember that all times are in GMT.

Albania Radio Tirana at 0335 on 7.300. (Wilson, MO) The Gjirokaster home service outlet on 5.057 heard 2245 to 2305 with identification on the hour. (Crawford, FL)

Angola Radio Nacional at Luanda, on 11.955 at 0625 with woman in Portuguese. Parallel with 7.245. Emisorra Regional do Benguela, 5.041 from 0502 to 0515 with national news, in parallel with 7.245. Emissora Regional do Lobito on 7.170 from

This Radio Andorra QSL belongs to Robert Brossell in Wisconsin. There are no shortwave broadcasts from Andorra at present.

0510 to 0514, national news, local ID after interval signal at 0512 and into Cuban-sounding music. (Crawford, FL)

Belize Radio Belize heard at 0132 on 3.285. (Talley, TX)

Burundi La Voix de la Revolution, 3.300 at 0410 to 0442 in French. Violin music, U.S. country-western, identification, and news. (Crawford, FL)

Cameroon Radio Bertoua, 4.750 at 0544 to 0600 in French with identification during news. (Rempala, IL) Radio Buea, 3.970 from 2140 to 2204 with hi-life music, French announcer, possibly some English, too. Radio Garoua on 5.010, with woman giving news of Africa in English at 0544, back into vernacular language at 0545. (Crawford, FL) From 0427 to 0500 with identification at sign on which included English. (Ryeder, FL)

Central African Republic Radio CentroAfrique, 5.035 from 0517 to 0529. Open carrier to 0520 and audio up in mid-sentence at 0520 when news in French by two men, identification and hi-life music. (Crawford, FL)

Chile Radio Nacional de Chile noted in Spanish at 2205 on 15.150. (Rempala, IL)

China Harold Frodge forwards this schedule for Radio Beijing to North America: To the East Coast from 0000 to 0100 on 11.650, 15.120, and 15.520; 0100 to 0200 on those same frequencies; 0200 to 0300 on 11.650 and 15.120; and 1200 to 1300 on 9.820. To the West Coast from 0300 to 0400 on 11.650, 15.120, and 15.520 and 0400 to 0500 on 11.650 and 15.120 (Frodge, MI)

Clandestine La Voz de Cuba Independiente y Democratica noted on approximately 7.420 at 1200 with identification in Spanish. (Bush, OH)

The Voice of the Libyan People heard from 0550 to 0628 on 11.977 in possible Arab dialect. It goes off with a fanfare. (Crawford, FL) Radio Venceremos, heard with what seemed to be the same program on two frequencies but out of sync; one on 6.830 around 0230, the other on 6.712. Other frequencies used to avoid the jammer (using buzzing and American pop music) included 6.806, 6.809, 6.843, 6.860, and 6.865. Until the last minutes, 6.712 didn't seem to suffer much from the jamming. The frequency 6.8 went off at 0320, and 6.712 at 0330. (Talley, TX) La Voz de Sandino noted at 0110 on 6.227. (Talley, TX)

Colombia La Voz del Tolima, 6.040 heard from 1005 to 1026 with bouncy music, ads, and identification. (Crawford, FL) Radio Super de Medellin heard on 4.875 at 0600. (Talley, TX)

Costa Rica Radio TIFC from San Jose heard on 5.055 at 0320. (Talley, TX)

Cuba Radio Havana noted on 6.115 at 0630, 11.930 at 0415, and 6.020 at 0715. (Wilson, MO)

Denmark Radio Denmark with English identification at their 0000 sign on 11.715. (Halverson, WI)

Egypt Radio Cairo's North American service runs from 0200 to 0330 in English on 9.475 and 12.000. (Gravelle, IN) To Europe daily from 2115 to 2245 on 9.805. (Carney, MI)

Equatorial Guinea Radio Nacional de Guinea Equatorial, on 5.002 at 2155 to 2230 with hi-life music and rock. (Crawford, FL) Nominal frequency is 5.005. (Editor)

Georgian SSR Radio Tbilisi, 4.930 at 0114 to 0137 with classical music and man announcer in Russian. (Leite, MA)

Grenada Radio Free Grenada on 15.045 at 2330, 15.105 at 2100. "World of Jazz" heard on 15.045 at 2230 on a Saturday. (Talley, TX)

Guinea La Voix de la Revolution, 4.910 from 2301 with identification and talk in French by two men. (Crawford, FL)

Guyana Guyana Broadcasting Corporation on 6.010 from 0810 to 0845 with strong signals in English. (Rempala, IL) Is this a new frequency? Normally they use 5.980. (Editor)

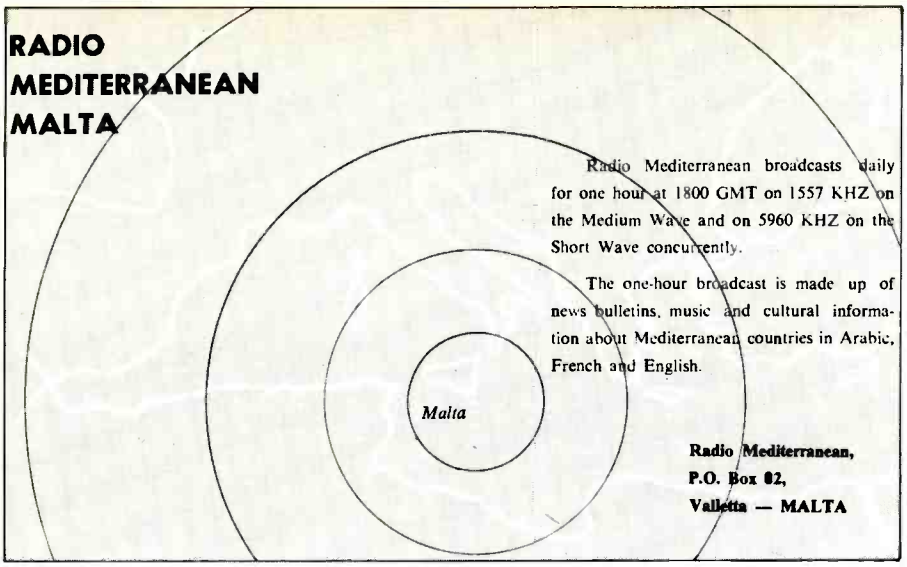
Hungary Radio Budapest with news and commentary in English at 0313 on 9.585. (King, MN)

Italy RAI, Rome, with news in English at 0100 on 9.575. (Gremlin's got the name of the reporter on this one—Editor).

Japan Far East Network, Tokyo heard at 1030 on 6.155 and 3.910 but with heavy QRN. (Talley, TX)

Kampuchea Voice of the People of Kampuchea, 11.938 at 1245 to 1259, good signal in Laotian, man and woman talking about Kampuchea. Interference from Radio Bucharest on 11.940 at 1259. (Leite, MA)

Kenya The Voice of Kenya on 4.804 at 2101 to 2110 sign off in the general service, talk in English, off with their national anthem. (Leite, MA)



QSL card from the new Radio Mediterranean in Malta.

Kuwait Radio Kuwait in English to Africa on 15.490 from 0530 to 0600. (Rampala, IL) English from 1800 to 2100 on 11.675. (Carney, MI)

Lebanon The Voice of Hope, 6.215 from 0435 to 0505 with identification by man in English. (Leite, MA) Voice of Lebanon, 6.550 at 0506 to 0535 in Arabic with man and woman announcers. (Leite, MA)

Liberia ELWA at Monrovia, 4.765 at 2145 in English. (Ryeder, FL)

Monaco Trans World Radio noted at 0730 on 9.495. (Talley, TX)

Nicaragua La Voz de Nicaragua (Voice of Nicaragua) on 5.955 from 0020 with news in English and Spanish. (DeShazo, TN) In English at 0526 when suddenly switched to Spanish. (Wilson, MO)

Nepal Radio Nepal, at 1147 to 1205 when Norway interfered. Talk by man in Nepali, mention of "Yo Nepal." Sign on is at 1147. (Leite, MA)

New Caledonia Radio Noumea has dropped its English, which was previously carried on Saturdays from 0900 to 1100. (Carney, MI)

Niger ORTN Niamey, on 3.260 at 0606 with world news in French, talking drums, guitar music. (Crawford, FL)

Nigeria Radio Nigeria (FRCN) from Kaduna heard on 4.770 at 0400 to 0515 fade out. Program was in English. (Ryeder, FL)

Numbers On 9.000 at 2200, 4 digit numbers by woman in Spanish, very clear; also between 9.180 and 9.200 at 0200, 5 digits by woman in German, very weak. (Bush, OH)

Poland Radio Polania, in English at 0646 on 7.260. (Rempala, IL)

Saipan KYOI on 9.670 from 1624 to 1701 with rock music and identification "This is KYOI, Saipan" at 1700. Good signal. (Leite, MA) Schedule is 1500 to 2200 on 9.670; 2200 to 0300 on 15.405 (believe changed to 15.415—Editor); 0300 to 0900 on 15.190 and 0900 to 1500 on 11.900. Address is KYOI, Box 795, Saipan, CM 96950. (Carney, MI)

Sao Tome Radio Nacional de Sao Tome e Principe, 4.807 from 0644 to 0702 with talks in Portuguese and music. (Leite, MA)

This giant QSL card from Radio Clarin in the Dominican Republic belongs to Harold Frodge of Michigan.

Saudi Arabia Broadcasting Service of the Kingdom of Saudi Arabia on 11.850 or 11.855 and 7.210 from 1700 to 2100 and 11.850 or 11.855 and 7.235 from 1100 to 1300. (Carney, MI)

Somalia Radio Mogadishu, 6.790 with clear ID in Somali at 0330. (Rempala, IL)

South Africa Radio RSA on 4.990 from 0300 to 0400 in English. (Ames, AZ) On 9.580 at 0320 with a good signal. (King, MN) English from Radio RSA is scheduled to the U.S. and Canada from 0200 to 0257 on 15.325, 11.900, 9.615, and 9.580. To East, Central, and Southern Africa from 0300 to 0427 on 9.585, 7.270, 5.980, 4.990, and 3.230. To West, East, and Southern Africa plus the United Kingdom and Ireland from 0630 to 0730 on 17.780, 15.220, 11.900, and 7.270. To Central, East and West Africa, the Middle East, United Kingdom, and Ireland on 25.790, 21.535, and 15.220 from 1100 to 1157 and again from 1300 to 1557 on the same frequencies. Also to West Africa, the United Kingdom, and Ireland from 2100 to 2157 on 11.900, 9.585, and 5.980. (Frodge, MI)

South Korea Radio Korea logged on 11.810 at 0530. Announces schedule for North and Latin American service on 11.810 at 0200 and 0530, 9.750 at 1000 and 1300, 11.830 at 1600. (Talley, TX)

Surinam SRS on 4.850 at 0832 playing religious music, some talking going on over songs. (Talley, TX)

Switzerland Swiss Radio International heard 0145 to 0215 on 6.135, 1315 to 1350 on 21.570 in English; national and local news, weather, and sports. (Koch, IL)

Togo Radiodifusion Television Togolaise, Lome, on 5.047 at 0530, all in French. (DeShazo, TN)

Ukrainian SSR Radio Kiev, 7.165 at 0325. (Wilson, MO) Probably not from Kiev but relayed by one of the Radio Moscow sites. (Editor)

United Arab Emirates Radio Color TV Dubai, 9.550 with clear ID at 2030 in Arabic, Arabic instrumental and vocal music. (Crawford, FL) In English from 0330 to 0400 on 11.755. Also noted on 9.595 and 9.605. (Halverson, WI)

United States WRNO Worldwide, New Orleans, at 0200 on 6.155 with news and rock music. (King, MN)

Upper Volta Radio Haute Volta, 4.815 at 0530 with National Anthem, wild tribal music. Interference from Africa Number 1 on 4.810. (Crawford, FL)

USSR Radio Moscow heard at 0310 on 7.195, 0330 on 7.135, and at 0345 on 7.440. (Wilson, MO)

Venezuela Radio Nacional, 11.695 at 1150 to 1201 in Spanish with news, schedule, and gave address as Apartado 3979, Caracas. (Crawford, FL) Radio Lara on 4.800 heard at 0355 in the process of signing off. Radio Rumbos on 4.970 noted at 0400. Radio Reloj Continente at 0440 on 5.030. (Talley, TX)

Vietnam Voice of Vietnam, Hanoi, in English from 2330 to 2358 on 10.080. Good signal but poor audio. (Ryeder, FL; Wilson, MO; Ames, AZ)

West Berlin Radio In American Sector (RIAS) at 0715-0740 in German on 6.005. (Leite, MA)

West Germany Deutsche Welle, The Voice of Germany in English at 0500 to 0550 and 0100 to 0150 on 6.040, 6.085, 6.145, 9.545, 9.640, 11.785, and 11.865. (Gravelle, IN) Most of these frequencies are from the Antigua relay base. (Editor) Deutsche Welle, 0100 to 0150 on 6.040, 6.085, and 6.145 in English. (Koch, IL)

And many thanks to: Bill Carney, Jr., Pinconning, Michigan; Erik E. Gravelle, Elkhart, Indiana; David Bush, Sebring, Ohio; Steve Leite, Fall River, Massachusetts; Barbara Harris, Nashville, Tennessee; Bruce DeShazo, Memphis, Tennessee; Charles Ames, Grand Canyon, Arizona; Larry Rempala, Lisle, Illinois; David N. Scott, Newark, Ohio; Steven Sienicki, Jamesburg, New Jersey; J. Douglas Cummins, Independence, Missouri; Robert L. King, Austin, Minnesota; Keith M. Halverson, Whitehall, Wisconsin; Rick Wilson, Kansas City, Missouri; J. Don Talley, Midkiff, Texas; Redd Ryeder, Florida; David E. Crawford, Oak Hill, Florida; Harold Frodge, Midland Michigan; and Kevin Culbertson, Spokane, Washington.

SCANNER SCENE

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 512 MHz "ACTION" BANDS

Imagine this: You come home from work one evening, turn on the TV for a night of viewing, and switch on the scanner to keep in touch with what's going on in the neighborhood. But instead of hearing the routine motor vehicle checks and Code 7's, all you can hear is static over the local police channel—even if you try to adjust the squelch.

Welcome to DVP.

There's nothing wrong with your scanner. But you might as well forget listening to your local police department anymore. They've discovered a way to keep you from overhearing their communications and so far there's no way for you to "unscramble" it.

DVP, or Digital Voice Protection, is unlike scrambling in which a low-cost scrambler can be used to turn unintelligible underwater-sounding voices into comprehensible speech. DVP, a trademark of Motorola, basically converts the human voice from an analog signal to a binary signal.

However, from that point, the coding of the signal gets more complicated. After the voice signal is converted, the order of the digital bits that represent the analog signal (which has a number of scalar values) is transformed so that a routine digital-to-analog converter is unable to restore the signal. Because there are many possible combinations that the signal could be coded as, each radio in a fleet must be set up with the same code. To ensure security in such a DVP system, usually only the radio repairman will know this code, which is entered into each radio with an external device. Once entered, it is impossible to find out which of the thousands of possible codes is being used in the system. The DVP system also is flexible enough so that the code could be changed routinely, if needed.

Anyway, once the signal is converted and coded, it modulates an audio frequency shift keying (AFSK) device that modulates the FM carrier. But because the signal being transmitted actually is an FSK-modulated digital version of the actual human voice, it doesn't even sound like a voice. Thus, every time the transmitter is keyed, persons without DVP encoding (such as scanner listeners) will only hear what sounds like static.

If all you can hear is static whenever it sounds like the transmitter is being keyed, then the agency you are listening to is probably using DVP. Keep in mind that it will be pure static that you will hear, not static on top of a voice or anything like that. Also, with DVP, a very short tone is transmitted at the end of each transmission.

Although few agencies are able to afford the cost of switching over to a complete DVP system, surprisingly enough, many agencies are. Although some smaller units—such as the police in Pennsauken, New Jersey, have converted their two-channel UHF system to DVP and the Pennsylvania Bureau of Cigarette and Beverage Taxes converted to thwart smugglers who were listening in, the biggest conversion is in the works at none other than the FBI.

Typical fixed frequency CB rig of the 1960's. You can buy these for a song at ham radio swap meets and use them to tune offbeat communications frequencies which your scanner ignores. Forget about using them for transmitting purposes.

The FBI awarded a $13 million contract to Motorola in 1981 to begin converting all of its 15,000 two-way radios. With about three more years of equal spending by the FBI, all of its radios will be employing DVP. In 1982, the Reagan administration requested a total of $12 million to install DVP systems in New York, Detroit, Miami, Washington, Boston, Chicago, and San Francisco, cities in which there are on-going drug and organized-crime investigations.

In some cities—such as Philadelphia, where there is an extensive organized crime investigation because of a series of gangland slayings—a normal scrambling system is used when agents tail suspects. However, a simple single-inversion unscrambler can decode these signals. Los Angeles, meanwhile, will be the first city in which the FBI installs a full DVP system because of the upcoming 1984 Olympic Games. There are also reports that the FBI has experimented with DVP as far back as three years ago in areas like Chicago.

In any event, if listening to the FBI on the VHF high band is one of your favorite pastimes, you might consider that this agency will most likely switch over to DVP. If you hear any agency switch over to DVP, write in and let us know. We certainly don't want to see our hobby ruined.

Down Under

Have you ever wondered about what kind of radio communications you can hear below 30 MHz? In addition to citizens band and other radio services, there are six business radio channels you can listen in on if you know how. Because most of these transmissions will be AM, rather than FM, scanners are unable to receive these signals even if they can be programmed out of band.

The best bet to intercept these signals is with an old multichannel CB radio—one that uses receive and transmit crystals for each channel and usually has three, five, or six channels. Some popular models include the three-channel Realistic TRC-9A, the five-channel Johnson Messenger 120, and the six-channel Realistic TRC-11. The only problem is that except for walkie-talkies, multichannel (those with less than 40 channels) CB radios are not made anymore, primarily because crystals are used for each channel and bootleggers and survivalists discovered they could be used to operate on unauthorized frequencies. Thus, you'll need to keep an eye out in the classified section of the newspaper for someone selling a

really old unit. The best way to buy one, though, is at a hamfest (a flea market usually sponsored by an amateur radio club) where five- and six-channel units from the 1960's can be bought for as little as $10 in working condition. Even if it doesn't transmit, it doesn't matter because you'll be using it only to listen.

Instead of having costly crystals cut to listen in on the six 27 MHz business band channels, the trick is to buy CB transmit crystals and insert them in the *receive* crystal slot. Thus, if you want to listen in on 27.47 MHz, you would take a CB Channel 5 transmit crystal, which is cut for 27.015 MHz, and insert it in the receive crystal slot. To arrive at the receive crystal frequency, subtract the receiver's intermediate frequency (IF) from the frequency you wish to monitor. Most late-model multichannel CB radios use an IF of 455 kHz. The accompanying chart tells you what CB (including a radio-control channel) crystals you'll need to listen to the six channels. These frequencies are used mostly in rural areas and places where extended communications range is not needed, such as an airport.

Of course, you could use an old CB tube radio such as the Lafayette Comstat 19, which had a tunable receiver, but you won't know exactly which frequency you are listening in on. Also, the advantage of using a CB radio over a shortwave receiver is the availability of the squelch control—of utmost importance if you intend to listen to a frequency for extended periods of time.

Frequency To Be Monitored (MHz)	Channel Usage	Receive Crystal Frequency (MHz)	Use This CB Channel Transmit Crystal
27.43	General	26.975	Channel 2
27.45	General	26.995	Radio control
27.47	General	27.015	Channel 5
27.49	Itinerant	27.035	Channel 7
27.51	2 watt max.	27.055	Channel 8
27.53	2 watt max.	27.075	Channel 10

Mailbag

Reader David Shirey of Middletown, Indiana, asks whether crystals from one scanner are interchangeable with other scanners. Well, it depends on the scanner. In the manufacturing business, there essentially are two different IFs used by scanners. Most scanners use a 10.7 MHz IF. However, Bearcat scanners use a 10.8 MHz IF. Generally, you will hear scanner hobbyists refer to the two different types of crystals as "Bearcat type crystals" and "Regency type crystals," although they're actually made by many different manufacturers.

Thus, if you were to install a 10.7 MHz IF crystal in a Bearcat scanner, the frequency you would actually hear would be .1 MHz higher. Thus, a 154.13 MHz crystal cut for a 10.7 MHz IF scanner would receive signals on 154.23 MHz in a Bearcat scanner.

We welcome your input to Scanner Scene. We will accept frequency lists, code lists, black-and-white photographs of your equipment, and any questions that you might have.

May We Recommend . . . .

The American SWL Club, 16182 Ballad Lane, Huntington Beach, CA 92649. This club has been operating since 1959. It publishes an excellent 60 page monthly DX publication covering shortwave and broadcast band DX, utility stations, QSL reports, and more. The club co-sponsors three annual DX meetings per year held in southern California. Dues in North America are $16 per year (includes First Class Mailing of monthly publication). Students (located in North America and 16 years old or younger) can join for $13 per year. A sample bulletin is available from the club for $1 (in North America).

The Longwave Club of America, 45 Wildflower Rd., Levittown, PA 19057. Here's a club for those rugged enthusiasts interested in knowing what's happening below 540 kHz! Their monthly publication, *The Lowdown*, not only covers listings of stations operating between 10 and 540 kHz, but also has interesting coverage of the 1750 Meter (no license) low power communications band as conducted by Ken Cornell (W2IMB—well known "Lowfer" authority. Membership includes mailing of the publication by First Class Mail and costs $10 per year (anywhere in the world).

When writing to the above, please mention that you saw it in POP' COMM!

RTTY

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

BY JOSEPH JESSON

Any RTTY enthusiast worth his salt will continuously look for various ways to improve the overall received FSK signal quality. Many different add-ons, or peripherals, are offered in the marketplace to improve the received quality of faint and often rapidly fading RTTY signals. Additions include audio filters, which consist of notch, peak and bandpass filters arranged in such a way as to combat audio interference. Another technique is adding an intermediate frequency filter, or IF filter, which tailors the IF bandpass to allow only the intended signal to pass. This technique of adding either a crystal IF filter or a mechanical IF filter is preferable to a simple audio filter connected on the audio output, due to the resultant AGC problems of an adjacent strong signal passing through the IF section, causing errors.

Let's review the tradeoff associated with different IF frequencies used and its impact on the choice of filter required. This review should aid the RTTY DXer to select a superior receiver for monitoring world news transmissions. A bandpass filter is one that will allow a selected band of frequencies with minimal loss, but that will attenuate all frequencies—either higher or lower—than the desired band. The stop band is the frequency spectrum in which attenuation is desired. The selectivity characteristics of any receiver are determined by the quality of the IF filters and the number of tuned elements, or poles.

Filters at the IF frequency are usually of bandpass characteristics; filters at audio frequency may be either bandpass, low pass, or notch. Many different types of filters are in common use: LC filters, crystal filters, mechanical filters, ceramic filters, and RC active filters.

In order to judge the overall shape factor, or skirt bandwidth, an absolute number is normally assigned to the filter. Usually the greater the individual filter sections used will result in better shape factors. In many low cost receivers, the overall shape factor is about 3:12, while a high quality IF filter has shape factors between 1 and 2.5. A filter for RTTY reception should have a shape factor of approximately 1.5 to 2.5 for ultimate selectivity. Remember that the goal is to obtain a small number representing the shape factor.

Normally, when one is reviewing receiver specs, this number is often derived by measuring the IF output at a 60 dB input and dividing this value by one measured at 6 dB. Simply stated, a sharp rectangular or ideal "window" gives a shape factor of one. The resultant *ratio* of 60 dB down and 6 dB down is the shape factor noted.

LC filters are used in low frequency IF's. Generally, it is only possible to construct effective LC filters at 200 kHz or less—an expensive proposition. The lower the IF, the higher the selectivity and gain. But a low IF also brings the image nearer to the desired signal; and as a result, decreases the image ratio.

An explanation of this is in order since images can be a real listener problem. Each HF local oscillator frequency will cause IF response at two signal frequencies, one higher and one lower than the oscillator frequency. If the oscillator is set to 9455.0 kHz to tune to a 9000.0 kHz signal, for example, the receiver can detect signals on 9910.0 kHz. This bogus, or undesired signal, is called the image. This is why modern receivers use a very high frequency, such as 70 MHz, for the first IF in order to keep images further away. Raising the IF increases the frequency separation between the signal and the image. With an IF of about 10.7 MHz, satisfactory image ratios can be realized on 3-30 MHz with one RF stage of low noise and tuned design.

A common solution to this dilemma of low IF frequency for good selectivity and a high IF for image reduction is to use double conversion. Effective LC filters require several High Q inductors set up to form an optimum inter-stage coupling. The shape of these characteristics are determined by the degree of coupling between the inductive circuits. When using coils to achieve good selectivity, triple-tuned transformers, with a third tuned circuit inserted between the input and output windings, have been commonly used. If greater attenuation and sharper cut-off are required, several sections are connected in series. Inductive LC filters tend to be quite good, but expensive to build and align correctly. This was a common filter technique used in the past.

Crystal filters have taken a rapid forward growth in modern communications gear. Crystal filters are preferable in an IF circuit of relatively high frequency, typically a center frequency of 3 to 10.7 MHz. Multiple crystal filters are preferable to the single High Q crystal, since multiple crystals can create a filter with an excellent shape factor. A single quartz crystal has a sharply peaked resonance; and then at a much higher amplitude input signals, a very broad skirt is then created resulting in shape factors greater than 3. Also, a problem with a single crystal filter is that, when used in a position of maximum selectivity, it may create considerable "ringing", making it difficult to copy a weak RTTY signal. This is solved when several crystals are combined, creating an optimum shape factor design in a structure, which is termed lattice or bandpass crystal filter.

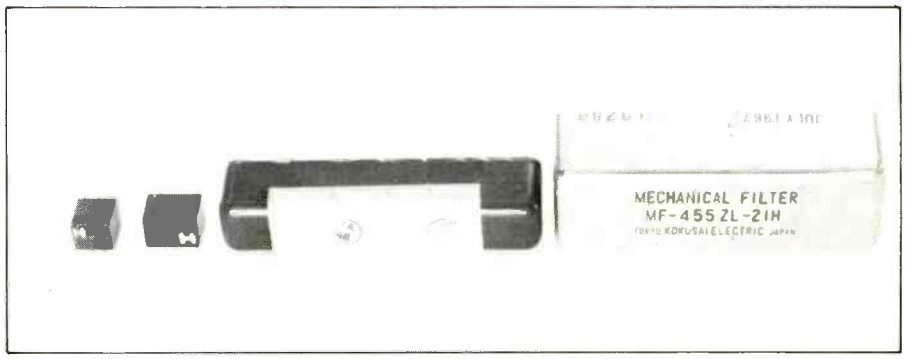


Figure 1. Here are some various IF filters showing old and new mechanical style filters and ceramic types.

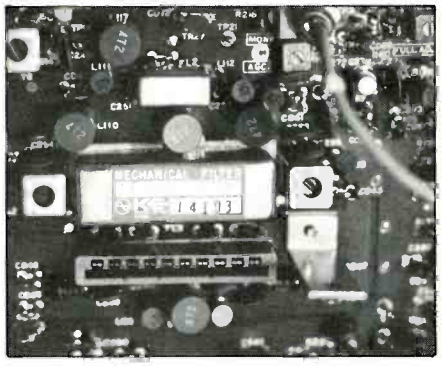


Figure 2. This is the mechanical as placed in the Japan Radio NRD-515 communications receiver.

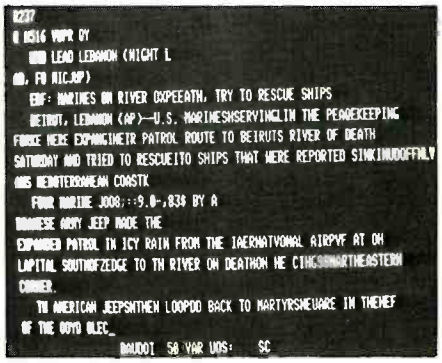
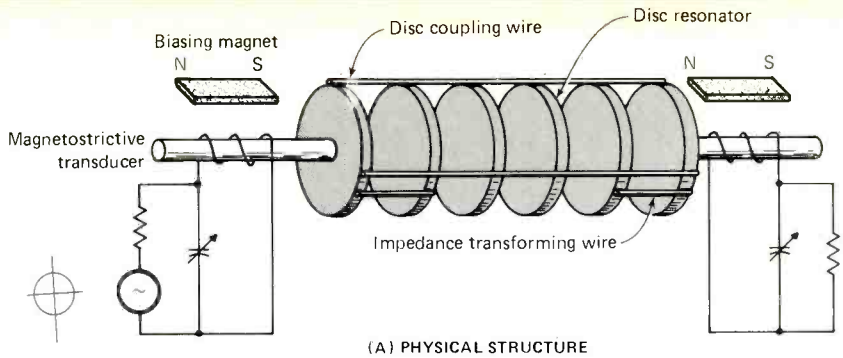
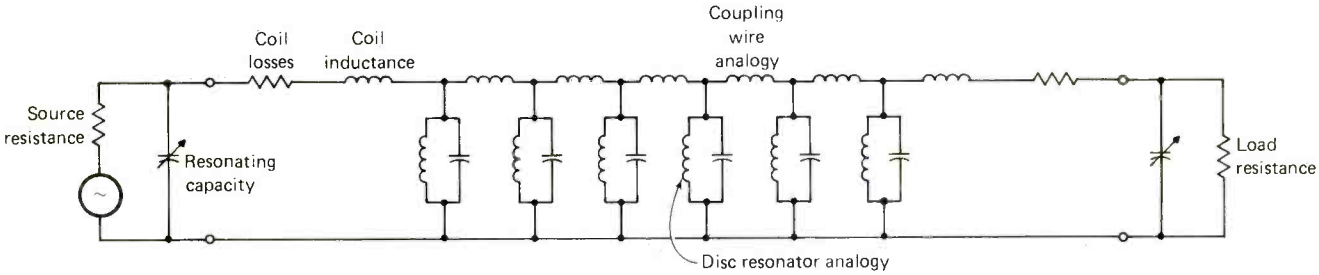


Figure 3. How the AP news from Lebanon looked during a transmission. This was monitored on 9349.0 kHz at 1940 GMT.



(A) PHYSICAL STRUCTURE



(B) ELECTRICAL ANALOGY

Typically, good RTTY bandpass crystal filters use at least 4 crystals. Some of the best crystal filters have up to 12 crystals. Since each crystal represents a resonant circuit, multiple crystals at different close frequencies allow a tailored shape factor.

In recent years, we have seen the introduction of ceramic IF filters. Small disks of lead zirconate titante can form very low cost selective filters in the same way as quartz, although with much lower Q. Ceramic filters are also a convenient way of providing the low impedances needed for bi-polar transistor drivers. As with quartz crystals, multiple ceramic filters can be coupled together to form filters of required bandwidth and shape factor. Again, multiple resonators are also required if good shape factors are to be achieved, as ceramic filters can be combined up to 15 elements. A typical center frequency of a ceramic filter is 455 kHz with a bandwidth of 3 kHz at 6 dB, and 7.5 kHz at 70 dB.

The two finest low frequency IF filters currently available are the crystal lattice filter and the disk-wire mechanical filter. Mechanical filters provide high adjacent channel rejection by steep-skirted selectivity while achieving a flat-topped frequency response. Electrically and mechanically stable, the filters tolerate extreme temperature changes with minor frequency shift. Filters are provided either in hermetically-sealed metal cases, or lower cost molded-phenolic cases. Frequency stability over temperature may vary from 2 to 10ppm/°C between -40°C and +85°C.

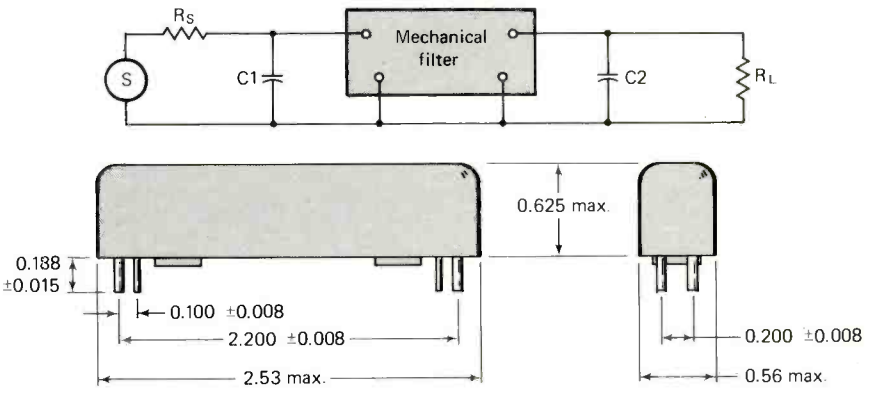
As shown in Figure 1, the large metal canned mechanical filter is of older design, while the center Rockwell-Collins mechanical filter is quite small and modern. To the far end of Figure 1, one can see two small ceramic multiple filters. Most low-cost Japanese receivers use a type of ceramic filter with great variances in performance.

The physical structure of a mechanical filter is shown in Figure 1a. The three basic elements that comprise the filter structure are the 1) magnetostrictive or piezoelectric transducers used for coupling electrical signals into mechanical vibrations, 2) High Q mechanically resonant disks, and 3) disk coupling wires.

An electrical analogy of the above mechanical arrangement is shown in Figure 1b. When an electrical signal is applied to the input coil, an alternating magnetic field is produced. This field is then passed through the magnetostrictive rod that is attached to the first disk. When properly biased, the rod will vibrate at the intermediate frequency. This is due to the dimensional changes of magnetostrictive material that occurs when being subjected to a magnetic field. The vibrating rod drives the first disk which, by means of connecting coupling wires, drives the next disk. Each successive disk is then driven by the preceding disk until the signal reaches the output transducer. Once the signal has propagated to the output transducer, the alternating magnetic field then introduces a voltage across the output coil.

Wanting to increase RTTY performance, I decided to install a Rockwell-Collins low cost F455FD series of mechanical filters in my NRD515 HF receiver. Bandwidths available include 375 Hz to 5.8 kHz. I've selected the 1.2 kHz bandwidth, while keeping in mind accurate RTTY reception of an 850 to 1000 Hz shift. Certainly, the minimum bandwidth should be judged in view of what maximum shift is required and any variables have to be taken into consideration when selecting the proper filter. The selection will, in fact, depend on the baud rate, the characteristics of the filter you use, signal to noise ratio, the number of errors you're willing to tolerate, and the signal processing after the filter.

Normally, we can only control two parameters of the above: the filter characteris-



Termination circuits should be designed to eliminate DC currents and voltages from the filter. Satisfactory results may be obtained with current up to 2 ma DC, but in no case to exceed 3 ma DC. DC voltage should not exceed 100 volts DC.

Electrical Characteristics

Part and Type Numbers	Minimum 3 dB BW @ 25°C (kHz)	Minimum 4 dB BW OTR (kHz)	Maximum 60 dB BW @ 25°C (kHz)	Maximum 60 dB BW OTR (kHz)	C_1, C_2 Res Cap ±5% (pf)
526-9689-010 F455FD-04	0.375	0.375	3.5	4.0	350
526-9690-010 F455FD	1.2	1.2	8.7	9.5	350
526-9691-010 F455FD-19	1.9	1.9	5.4	5.9	330
526-9692-010 F455FD-25	2.5	2.5	6.5	7.0	510
526-9693-010 F455FD-29	2.9	2.9	7.0	8.0	510
526-9694-010 F455FD-38	3.8	3.8	9.0	10.0	1000
526-9695-010 F455FD-58	5.8	5.8	14.0	15.0	1100

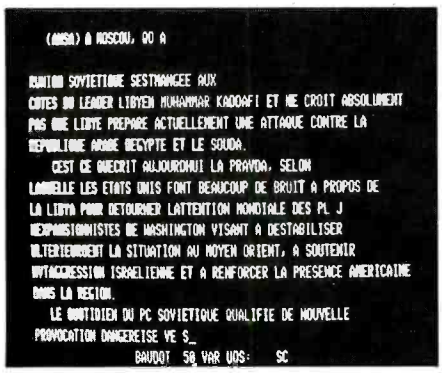


Figure 4. ANSA news in French at 1600 GMT on 20085.0 kHz.

tics and the signal processing after the filter. So, for significant improvement, we can control and select the proper filter to be installed in your receiver. With all the above factors considered, again the 1.2 kHz with a center frequency of 455 kHz seemed to be the logical choice to install as an auxiliary filter in my NRD515, as my RTTY monitoring can range from a 170 Hz shift to 1000 Hz.

Figure 2 illustrates the current mechanical filter and ceramic filter used in the NRD515. As the markings indicate, the mechanical filter has a center frequency of 455 kHz and a bandwidth of 2.1 kHz. Slightly above the large mechanical filter, we can see the small ceramic filter used for a bandwidth of 6 kHz, commonly used for voice and music. The auxiliary filters plug into the small in-line receptacle below the mechanical filter. Pins 1 and 2, numbering from left to right, are the input to the filter; and the output is pins 10 and 9, with an electrostatic earth-ground of pins 5 and 6. Pins 1 and 10 should have a series .1μfd capacitor, isolating any DC voltage on the input of the filter which may damage the mechanical filter. I used a simple perf board with the correct edge spacing to mount the filter and miscellaneous components. A good ground is required in order to obtain maximum shielding between the input and output.

The "proof of the pudding" is in Figure 3, where the first eight lines are using the 1.2 kHz Rockwell-Collins F455FD filter; and the next eight lines were using the broader 6 kHz ceramic filter. Obviously, the 1.2 kHz filter is much better than the standard ceramic filter. And even using the 1.2 kHz filter, obviously it is not error free, but yet results are certainly worth the cost and effort. A consistent improvement in RTTY readability was observed whenever this narrow filter was switched in. If you are too faint-hearted to dig into your receiver to modify it, there are several shops that may be willing to modify the IF sections of certain receivers for you. These include: Gilfer Shortwave, Box 239, Park Ridge, NJ 07656 and Radio West, 3417 Purer Road, Escondido, CA 92025. Universal Radio keeps a good supply of Rockwell-Collins mechanical filters on hand, so they would be a good place to obtain individual component filters. Universal Radio is located at 1280 Aida Drive, Reynoldsburg, OH 43068. Also, remember that all inputs and outputs to the mechanical filter *must* be terminated to the correct source and load impedance.

Typically, the low cost mechanical filters are designed to operate with a 2,000 ohm source and load resistance and need to be parallel tuned with a fixed capacitive. The 1.2 kHz filter has a parallel input and output capacitive of 350 pf. If the 350 pf capacitors are not readily available, use Mica trimmer capacitors with a nominal center capacitance of approximately 350 pf. For further information on Rockwell-filter products, contact Rockwell International Filter Products, 4311 Jamboree Road, Newport Beach, CA 92660.

Most mechanical filters are capable of providing stop band rejection, or out of bandpass, greater than 90 dB or ultimate deep selectivity. To take maximum advantage of the 90 dB capability, great care and physical layout and good design practices must be used. Do not allow any leakage to pass around the filter (from sloppy installation practices), as leakage in the IF is the worst enemy of good selectivity.

If the termination wires are not short and directly mounted with minimum length, couplings from the input to the output can destroy the effectiveness of using a mechanical filter.

If your receiver has an intermediate frequency of 9 or 10.7 MHz, you would probably choose a multiple pole crystal filter. The same installation rules apply, as correct impedance match is also required of the crystal lattice filter. Let me know what success you have in installing an IF filter in order to improve RTTY reception.

Turning this month to our loggings, Figure 4 shows a display of ANSA, or Radio Stampa, from Rome, Italy. ANSA seems to be quite weak in the midwest, as my S meter rarely tops S5. Detailed listings of ANSA are included here in this column.

Frequency	*Location*	*Time (GMT)*	*Language*	*Shift*	*Baudot Rate*	*Normal/Reverse Phase*
ANSA - Agenzia Nazionale Stampa Associata—Radio Stampa *ISX22, IRS27, IRS24, IRR31, ISX86, ISX56, ISX19, IRK28, ISX35, IRJ22, IRJ31, IRJ21, IRG53, IRG20, IRC21*						
25377.4 kHz	Rome, Italy	1100	English	425 Hz	50 baud	Normal
22955.0 kHz	Rome, Italy	1000	French	425 Hz	50 baud	Normal
20728.2 kHz	Rome, Italy	0800	English	425 Hz	50 baud	Normal
20430.0 kHz	Rome, Italy	1900	English	425 Hz	50 baud	Normal
20085.0 kHz	Rome, Italy	1556	French	425 Hz	50 baud	Normal
19178.2 kHz	Rome, Italy	1720	RY's	425 Hz	50 baud	Normal
18666.0 kHz	Rome, Italy	0800	English	425 Hz	50 baud	Normal
15693.5 kHz	Rome, Italy	1600	French	425 Hz	50 baud	Normal
14630.4 kHz	Rome, Italy	1905	RY's	425 Hz	50 baud	Reverse
13974.0 kHz	Rome, Italy	2015	French	425 Hz	50 baud	Normal
13898.0 kHz	Rome, Italy	1700	English	425 Hz	50 baud	Normal
13487.4 kHz	Rome, Italy	1120	Italian	425 Hz	50 baud	Normal
12293.0 kHz	Rome, Italy	1730	English	425 Hz	50 baud	Normal
12128.0 kHz	Rome, Italy	0800	English	425 Hz	50 baud	Normal
12108.0 kHz	Rome, Italy	0900	French	425 Hz	50 baud	Normal
9361.4 kHz	Rome, Italy	0600	RY's	425 Hz	50 baud	Normal
9082.0 kHz	Rome, Italy	1830	French	425 Hz	50 baud	Normal
5128.4 kHz	Rome, Italy	1640	RY's	425 Hz	50 baud	Normal

ANSA transmissions are not active Sundays, although several frequencies (noticeably 14630.4 kHz and 20085.0 kHz) are active Saturdays. Keep me posted of interesting RTTY signals.

The Merchant Mariner

BY B. FRANCIS BIRON

Our senses are assaulted on a daily basis by news reports telling of a movie star or someone prominent in the business or political world. Hardly ever do we read about the little guys, such as the men of the merchant marine. These men transport goods from this country to those we call trading partners, returning to our ports with goods we need for our survival. They serve our country in all types of conditions, 365 days a year, sometimes at the risk of life or limb.

While listening to my shortwave radio the other night, I came upon a transmission initiated by the radio operator of a modern merchant ship located in the Caribbean Sea. The radioman was in the middle of a conversation with the Coast Guard Marine Assistance operator in San Juan, Puerto Rico.

The conversation I overheard was distressing and prompted me to relate the words I heard. The Coast Guard operator was speaking:

"The doctor is concerned about internal bleeding and feels that your patient could die without proper treatment. How long before you can make port?"

"Roger roger standby!" retorted the radio operator of the *S.S. Dover Joy. A few minutes lapsed and the drama on the high seas continued.

"Coast Guard—Dover Joy. The port we are closest to is Colorado, Costa Rica and that is at least 20 hours out. Request information on possible medical evacuation of the patient by helicopter?"

"At this time, we regret to inform you that you are beyond the reach of any Coast Guard helicopter. I will check with Howard Air Force Base, Panama to see if they are able to help. The doctor requests info on whether or not you have any morphine on board. If you do, he needs to know what is written on the bottle. He also wants the patient's pulse and blood pressure as well as which area is most painful."

"Roger, roger Coast Guard, standby!"

"Coast Guard—Dover Joy. The patient's most severe pain is in the lower back. He has a bruise that extends about 5 to 6 inches. His pulse is normal and he has a temperature of 102. The patient says he is more comfortable when he lies on his right side. His blood pressure is 35 over 30 seconds. We have morphine and the strength is 25 milligrams or one quarter gram per milliliter."

"Roger, standby while the doctor determines whether you can use the morphine safely. Be advised Howard Air Force Base reports they are also out of range for medical evacuation."

"This is Coast Guard. We now have directions from the doctor. You may administer the morphine at not more than 5 milligrams per injection. Cautions with the injection! Injections are to be made in the muscle only. Do not administer in vein. The doctor suggests the lower quadrant of the buttocks."

"Roger roger Coast Guard. Understand administer injections of morphine at not more than 5 milligrams per injection and injections to be made in muscle only preferably the lower outer quadrant of the buttocks."

"The doctor also advises that the injections should remain at least two hours apart and that if the breathing slows, the morphine should be discontinued."

"Roger understand!"

"The doctor requests that you establish a four hour schedule of reporting for the purpose of obtaining the patient's pulse and temperature as well as respiration rate."

"Roger roger."

"There isn't anything else that can be done at this time other than maintaining the four hour schedule. If the patient worsens, contact us immediately. Good luck."

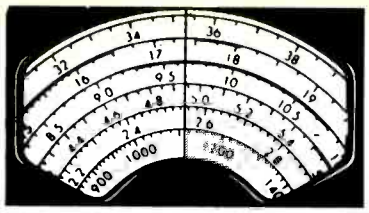
"Roger roger Coast Guard. Thank you for your assistance. See you in four hours."

Needless to say, I stayed tuned to that frequency for the next several hours, following the progress of the ship and its patient. The next afternoon upon returning home from work, I arrived just in time to hear that the merchant ship had the port of Colorado, Costa Rica in sight and that the patient had stabilized.

The ship, after securing medical help for the ailing crewman, resumed its voyage and none of us would be the wiser save the curiosity of a shortwave radio listener.

We owe a debt to these men of the sea. They certainly are not in the limelight and do not receive accolades, but without their dedication supplying the needs of our country, reading about movie stars and other prominent people would not be as interesting.

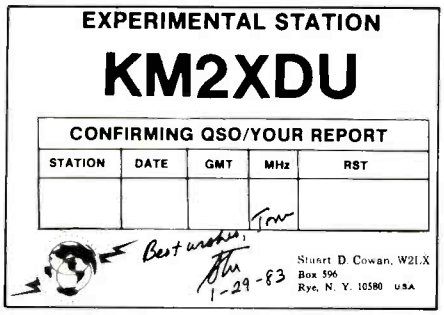
*(The S.S. Dover Joy is a fictitious ship's name in order to protect the rights of the individuals involved)



COMMUNICATIONS CONFIDENTIAL

BY HARRY HELMS, KR2H

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS



Experimental station KM2XDU has its own QSL. Its purpose is to explore the potentials of a new UHF amateur radio band.

Suppose you're involved in some form of clandestine or extralegal activity. You need a compact, reliable, and inexpensive means of world-wide and local communication. These means of communications should be readily available and not arouse too many suspicions when purchased or in your possession. What would fit this bill? Easy—almost any contemporary amateur radio SSB transceiver.

Amateur radio gear has long been a favorite of pirate broadcasters, and has also been used by illegal "HFers" operating in the frequencies between the CB and ten meter ham bands. But of late, there has been an upsurge in interesting *and* questionable activity in and around the ham radio bands—and it's a cinch that most operators are using amateur radio transceivers.

Most amateur transceivers operate outside the ham bands without modification because virtually all amateur transceivers cover the ham bands in 500 kHz wide segments, even though some bands (such as 40 and 20 meters) are less than 500 kHz wide. Moreover, most transceivers have some "overtravel" at the beginning and end of each tuning range. For example, the 40 meter ham band is 7000 to 7300 kHz. Yet a transceiver's 40 meter coverage might actually be from 6950 to 7550 kHz. (It's no mistake that the 6950-7000 kHz and 7300-7550 kHz ranges are among the most active for various extralegal communications.)

The last World Administrative Radio Conference allocated roughly 100 kHz of frequency space at 10, 18, and 24 MHz for amateur operations. New transceivers covering these frequencies are now appearing, opening up entirely new ranges for extralegal communications. Other transceivers may be easily modified to operate in desired frequency ranges; some manufacturers have offered transceivers that can operate in a desired frequency range merely by plugging in an accessory crystal. Other new transceivers have even greater potential for the extralegal operator; they can transmit or receive anywhere from 1500 kHz to 30 MHz!

Here's a list of frequency ranges where you can hear activity using such "converted" amateur transceivers. You'll find most of the activity to be in SSB, although an increasing amount of FM activity is showing up on the higher frequency ranges (kHz):

3400-3500
4000-4100
6900-7000
7300-7550
10000-10500
13900-14000
14335-14550
18000-18500
20900-21000
21450-21550
24000-24500
25500-26000
27410-28000

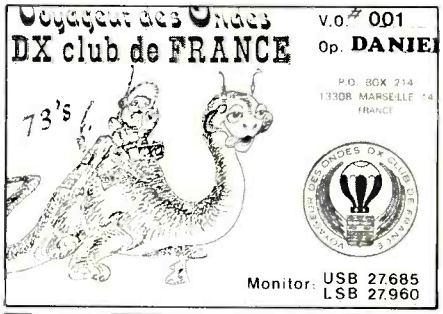
From The Mailing

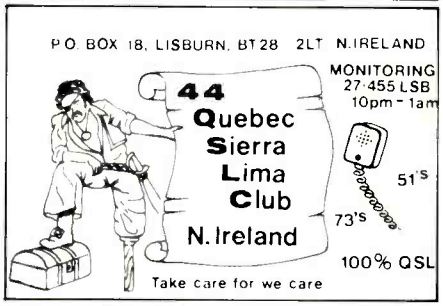
Reader Lhary Meyer of California writes to ask if anyone can help with the identity and locations of two stations he heard on 5785 kHz in SSB. One used the call P7Q; the other call was P1Q-relay. Lhary, I would suspect that those two were military stations of some sort using tactical calls, although they could also be part of an unauthorized network for smugglers, etc. Can any readers help Lhary with this?

Many readers have also written asking about reference works to the locations and addresses of stations they have heard. If you are seriously interested in identifying and collecting QSLs from the stations covered in this column, you'll need a good reference work. One that your editor recommends (mainly because he wrote it) is *The SWL's Manual Of Non-Broadcast Stations*, published by Tab Books. It contains mailing addresses for many non-broadcast stations. Another valuable guide is the *Confidential Frequency List*, published by Gilfer Associates. Both books are available from many sources. It goes without saying that you need a current copy of the *World Radio Television Handbook*, even if you're not an active broadcast DXer.

Listening Reports

Here are this month's listening reports. We'd like to have *your* reports; submit them in the format you see here. All times are GMT (that's Eastern standard time plus five hours) and all frequencies are in kHz. *Please* put your name and location of your report; also, try to arrange items in order of frequency. Send your reports to: Harry L. Helms, P. O. Box 157, Rockefeller Center Station, New York, NY 10185. Please enclose an SASE if you desire a reply.





Communications operators using illegal frequencies are not only easy to hear, some of them even QSL!

Several loggings this month have again been contributed by members of the American Shortwave Listeners Club (ASWLC). If you're interested in the type of DX covered in this column, you'll find ASWLC's monthly bulletin, *SWL*, a valuable aid in your monitoring. For membership details and a sample bulletin, send $1.00 to ASWLC, 16182 Ballad Lane, Huntington Beach, CA 92649. Tell them Communications Confidential sent you! And now to this month's loggings. . . .

194: TUK, Nantucket, MA, weather broadcast in AM 0837. (Joe Woodlock, IL/ASWLC)

236: GNI, Grand Isle, LA, weather broadcast in AM 0517. (Donald Saunders, NF/ASWLC)
365: FT, Fort Worth, TX, weather broadcast in AM 0822. (Joe Woodlock, IL/ASWLC)
379: FWR, Newark, NJ, weather broadcast in AM 0529. (Donald Saunders, NJ/ASWLC)
411: VFU, Van Wert, OH, CW beacon 0628. (Joe Woodlock, IL/ASWLC)
529: SQM, Level Island, AK, CW beacon 1003. (Don Moman, Alberta, Canada/ASWLC)
1613: RAB, Rabinal, Guatemala, CW beacon 0502. (Harold Frodge, MI/ASWLC)
2716: CCS, Chilean Navy, Santiago, Chile, CW traffic at approximately 0545. (Tom Lewandowski, NY)
2980: Oakland Aeradio (VOLMET), Oakland, CA, weather broadcast in SSB 0435. (Bob Valen, SD)
3210: Four-digit English "numbers" station with female announcer 0215. (Mike Martin, IA)
3250: Five-digit Spanish numbers station with a female announcer at about 0625. (Mike Martin, IA)
3442: Five-digit Spanish numbers station with female announcer 0625. (Lani Pettit, IA/ASWLC)
4046: Several five-digit Spanish numbers stations noted here around 0100. (Lani Pettit, IA/ASWLC) This frequency range is well within the tuning range of most amateur transceivers. (Editor)
4100: A CW "spy" station has been heard around this frequency for several weeks each Tuesday evening at 0400. The station begins exactly on the hour by sending a three letter call and group count, as in AAN WT AAN WT. After repeating the call and group count, BT is sent three times, followed by a series of five letter groups. The sign off is AR AR AR VA VA VA. The call used varies each week. The only letters used for the call and code groups are A, N, D, R, U, W, I, G, M, and T. (Phil Bowers, TN) Okay readers, let's keep an ear on this channel and see if this activity is still going on! (Editor)
4285.3: XFU, Veracruz, Mexico, CQ marker in CW 0446. (Sam Neal, TX/ASWLC)
4428.7 NMN, U.S. Coast Guard, Portsmouth, VA, weather broadcast in SSB 0530. (Stewart MacKenzie, CA)
4525: Y3S, Nauen, East Germany, AM time signals 0313. (Thad Adamaszek, OH/ASWLC)
4670: Four-digit Spanish numbers station with female announcer 0325, begins with "Grupo" and three numbers; then into four-digit groups. Faint background hum noted. (George Osier, NY) Other four-digit Spanish numbers stations noted around 0200, sometimes parallel to 5810 kHz. (Lani Pettit, IA and Thad Adamaszek, OH/ASWLC) Lani Pettit also reports an open carrier here from 0410 to after 0800 one night! (Editor)
4730: Five-digit German numbers station with a female announcer at approximately 0510. (Tom Lewandowski, NY)

N 1443-V

This will confirm your reception of N1443V on 6595kc Nov. 25, 1949. Type of plane C-46
Power: 100 watts, Antenna st. 15', CW Call letters:
Owner: World Airways, Inc. Remarks:

Flight was ~~xxxx~~ South east of Nassau at 8500' en route San Juan to Miami to NY We were transmitting on a crystal control AT 13 Collins. You evidently picked us up better than New York Oversees radio that night.

signed E.S.G. Hicks
Captain

FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON 25, D. C.

January 10, 1950

ADDRESS ALL COMMUNICATIONS TO THE SECRETARY
IN REPLY REFER TO:
5230

Mr. Thomas Kneitel,
175 West 93rd Street,
New York 25, N.Y.

Dear Sir:

Reference is made to your informal request of January 3, 1950.

A check of the Commission's records does not indicate a valid license for aircraft radio station aboard N-1443V; however, a special temporary authorization was issued to World Airways for aircraft radio station aboard N-1443V, Call Sign WHJUZ, on December 17, 1948 and expired February 17, 1949. The frequency 6595 kc. was not authorized for operation.

Very truly yours,

T. J. Slowie,
Secretary

Here's a rarity! First came the QSL, followed shortly thereafter by a letter from the FCC saying that the station's license had expired and the frequency was unauthorized. (Courtesy Tom Kneitel)

4770: This frequency has been the site of several German numbers stations lately. Tom Lewandowski of NY reports hearing a station twice at 0512, beginning with a count from 1 to 10, followed by "996," a tone signal, and then five-digit groups read by a woman. George Osier of New York caught a similar station at 0410. He reports the woman, in the middle of the transmission, read a series of three numbers three times, and then read off ten consecutive numbers. J. Don Talley of Texas also heard German numbers at 0504, but read in a different pattern. Two digits were read, followed by a brief pause, and then three additional digits. Don wonders if this transmission is alternating two and three digit groups or a variation of five-digit groups (2 + 3 = 5).

5014: Five-digit German numbers station with female announcer 0015, high-pitched background hum. (George Osier, NY)
5135: Five-digit Spanish numbers station with female announcer around 0130. (Lani Pettit, IA and Donald Saunders, NJ/ASWLC)
5302: Five-digit English numbers station with female announcer 0126. (Donald Saunders, NJ/ASWLC)
5539: Five-digit Spanish numbers station with female announcer at 0435. (J. Don Talley, TX)
5610: This frequency is used by Air France and KLM for in-flight communications with San Juan, PR; Santa Maria, Azores; and JFK Airport, NY. (Bob Valen, SD)
5624: This is another in-flight communications channel, used for traffic with the Montreal, Quebec airport. (Bob Valen, SD)
5641.5: Four-digit Spanish numbers station with female announcer 0230. (Spence Naylor, CA/ASWLC)
5810: Several four-digit Spanish numbers stations heard here from 0200-0400; often parallel to a second station heard between 8416-8419 kHz, although once parallel to 4670 kHz. (Lani Pettit, IA/ASWLC) As regular readers of this column know, 5810 kHz is the most "reliable" frequency to hear four-digit stations. (Editor)
5865: The numbers 1 through 5 repeated continuously in CW 0814, no other material heard. (J. Don Talley, TX)
5930: CW numbers station, five-digit groups, 0525. (J. Don Talley, TX)
5935: Five-digit Spanish numbers station with female announcer 0733, *distinct tapping sound in background*. (J. Don Talley, TX) Similar station, but no tapping sound heard, 0825. (Mike Martin, IA)
6221.6: Here are some of the coastal stations heard here in SSB during the evening hours: KHS, San Diego, CA; KIS, Portland, OR; KUY, Port Arthur, TX; WBJ, St. Louis, MO; WHS, Miami, FL; WJN, Weehawken, NJ; WJU, Dravoborg, PA; WKC, St. Petersburg, FL; and KEA986, Pearland, TX. (Spence Naylor, CA/ASWLC)
6344: SVB3, Athens, Greece, traffic in CW 0252. (Donald Saunders, NJ/ASWLC)
6355: PZN, Paramaribo, Surinam, "DE PZN" in CW 0604. (Spence Naylor, CA/ASWLC)
6355: UBN, Jdanov, USSR, call repeated in CW 0609. (Spence Naylor, CA/ASWLC)
6357: UBJ, Baku, USSR, V marker in CW 0613. (Spence Naylor, CA/ASWLC)
6463: HKB, Barenquilla, Colombia, CW marker 0005. (Tim Wolfe, PA)
6493: VIA, Canadian Coast Guard, Vancouver, British Columbia , CW traffic 0345. (Bob Valen, SD)
6506: NMO, U.S. Coast Guard, Honolulu, HI, weather broadcast in SSB 1200. (David Spraker, NY)
6755: Spanish numbers station with female announcer 0919. Pattern is similar to the station heard by J. Don Talley on 4770 kHz; three digits, a pause, then two more digits. This was repeated for thirty seconds. (Dennis Short, IN) A new wrinkle in the numbers stations game has apparently been found. Readers, be on the lookout for these and report any you might hear. (Editor)
6761: "Looking Glass Alfa" (the airborne SAC command post) heard 2215 using *AM*, not SSB. (Clifford Fiscus, IN)
6855: Five-digit German numbers station with female announcer 0510, *in SSB*. (George Osier, NY)
6970: Five-digit Spanish numbers station, female announcer 0825. (Mike Martin, IA)
7340: Five-digit Spanish numbers station with female announcer 0803, *tapping sound in background*. (J. Don Talley, TX)
7740: Five-digit German numbers station with female announcer 2032, *used SSB*. Opened with musical tones, then "Zulu Lima" repeated four times, followed by number groups. (Tom Lewandowski, NY)
7837: Spanish numbers station with female announcer 0937, "708 737 558 823" repeated, "5" added to last block just before sign off. (J. Don Talley, TX)
8413: Five-digit Spanish numbers station with a female announcer at 0330. (Lester Robison, NV)
8420: Four-digit Spanish numbers station with a female announcer at 0406. (J. Don Talley, TX)
8444: KFS, San Francisco, CA, V marker in CW 1157. (David Spraker, NY)
8479: FUF, French Navy, Martinique, CW traffic 2328. (Tim Wolfe, PA)
8521: VIS26, Australian Telecom, Sydney, Australia, V marker in CW 1144. (David Spraker, NY)
8550: WPA, Port Arthur, TX, V marker in CW 1157. (David Spraker, NY)
8593: UFB, Odessa, USSR, CQ marker in CW 0200. (Spence Naylor, CA/ASWLC)
8608: HPN60, Canal Radio, Panama, CQ marker in CW 0349. (Brent Levit, TX/ASWLC)
8610: WMH, Baltimore, MD, V marker in CW 0047. (Brent Levit, TX/ASWLC)
8925: A variation of the numbers stations, with the phonetic alphabet substituted for digits! At 0440, a female announcer repeated "Charlie India Oscar" *35* times, then said "three messages" twice, "message" twice, "group 1-8" twice, "text" twice, and then into groups of five phonetic letters. The other two messages were preceeded by the same opening, except that "group 4-6" and

"group 4-1" preceded them. After all three messages were read, the announcer said "repeat, repeat" and all three were read again. Then she said "end of transmission, end of transmission" and open carrier. . . . but the same female voice could be heard faintly in the background reading more letters! Carrier went off at 0515, but station returned at 0540 and repeated the previous transmission. The same woman's voice was heard the next day at 2245 repeating "Charlie India Oscar One" until 2250 sign off. Same voice again at 2345 repeating "Victor Una Bravo Two," switching back to "Charlie India Oscar One" and off 2350. Apparently this goes on all evening, with calling done at 15 minutes before the hour and messages 20 minutes before the hour. (Jim Kellner, NY) Tremendous report, Jim! Readers, keep a close watch on this one. (Editor)

8992.9: 6WW, the French Navy reported, Dakar, Senegal, CW marker 0410. (Tom Lewandowski, NY)

9452: Five-digit Spanish numbers station with a female announcer at 0511. (J. Don Talley, TX)

10570: Female announcer reading three-digit groups in Spanish 0130, transmission opens with tones. (Lester Robison, NV)

11221: Foxtrot broadcast (coded messages to SAC bombers) in SSB 2345, ended "Doorstop . . . Out." (J. Don Talley, TX)

11530: Four-digit Spanish numbers station with female announcer 2331. (J. Don Talley, TX)

11532: Four-digit Spanish numbers station with female announcer 0400. (Lester Robison, NV)

13215: Air Force One in contact with Andrews AFB in SSB at 1600, phone patch made to "Crown" (the White House). (Tom Lewandowski, NY)

14487-14491: Two stations noted here between 2220-0240 in CW. One station uses the call YOR and the other station is IOC. Two types of traffic are exchanged. The first type is groups of five letters and digits, and the second is five-digit groups. Traffic is sent in "lines" of ten groups followed by "AA" or "AAA," with lines often preceeded by "NR NR NR." Sometimes one operator will break into a transmission to request a repeat of a particular line. Usually, YOR is the station transmitting the groups. There is also some CW "chatter" in the Spanish language. (Donald Schimmel, VA) Excellent report! The use of "break in" CW strongly points to the use of amateur transceivers. (Editor)

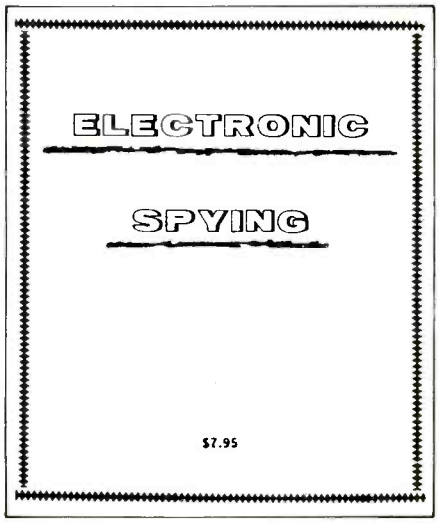
18171: "A1O" calling "A59" in SSB at 1723, A1O telling A59 to ". . . put black box in sync position," A59 requested a "T series" from A10. (George Osier, NY) Very likely using new amateur transceivers covering the 18 MHz ham band, which has not yet been released for amateur use. (Editor)

25590: NAR, U.S. Navy, Key West, FL, CW traffic 1649. (Tom Lewandowski, NY)

Thanks for the great support. Be here next month!

PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS



Electronic Spying

While there are numerous books that toss in a couple of paragraphs or maybe even a chapter or two on electronic espionage (spying), and there are many others that are written for the advanced technician and professional electronic spy, we came across a unique book called *Electronic Spying*.

If you are simply curious about the subjects of *bugging* and *wiretapping*, or are seriously interested in protecting your own privacy from the electronic invasion, *Electronic Spying* is the book for you. It's packed with fascinating information that will give you a thorough education in the art and science of electronic surveillance. Once you've read this eye-opening book, you will have a depth of knowledge that is virtually impossible to obtain from any other source.

Electronic Spying explains the A-to-Z of the subject in crystal clear layman's language and is packed wall-to-wall with illustrations and photographs, facts, and details that no other material on the subject provides. Let's just say that it leaves little or nothing to the imagination in revealing and showing the latest techniques! All of the media nonsense, TV and Hollywood fiction and fantasy which surrounds this is denounced, and the reader is given the real facts pertaining to the working techniques and the actual equipment used in 95% of all electronic surveillances—legal and *illegal!* The reader is shown how professionals operate an audio surveillance, and what's even more important, how inexpensive and easy-to-obtain devices can be used by a rank amateur to tap your telephone and bug your living room, office, business, or bedroom! Frankly, you'll really be amazed at how startlingly easy it might be for *you* to become one of the many thousands who are victimized by the rapidly growing army of amateur electronics eavesdroppers every day—*and night!*

Electronic Spying is divided into two separate sections, which thoroughly cover the individual subjects of bugging and wiretapping. Some of the detailed subjects it covers include: Wireless surveillance transmitters, surveillance receivers, bugged appliances, installing bugs, direct (hard wired) microphone bugs, the telephone used as a room bug, bugging with a voice-controlled tape recorder, listening through walls with *spike mikes* and other devices, taps "on premises" and "off premises," telephone wiring, "direct taps" and how they are installed, recording telephone conversations, sending a phone conversation into an FM radio receiver, long distance room bugging, how the wiretapper locates the proper pair of lines to use, the famous "infinity transmitter" and how it's used, the amateur do-it-himself wiretapper, and lots more!

Everything is discussed in simple language and made even clearer with illustrations of the devices and techniques and exactly how they are deployed. No complicated schematics are used.

This book has recently been highly reviewed in some of the better law enforcement publications and apparently is quite popular with many police departments and private investigators. Even if you don't know how a flashlight works, this book could transform you into a comparable authority on this increasingly popular subject, and you'll enjoy every minute of it. It's one of those books you just can't put down.

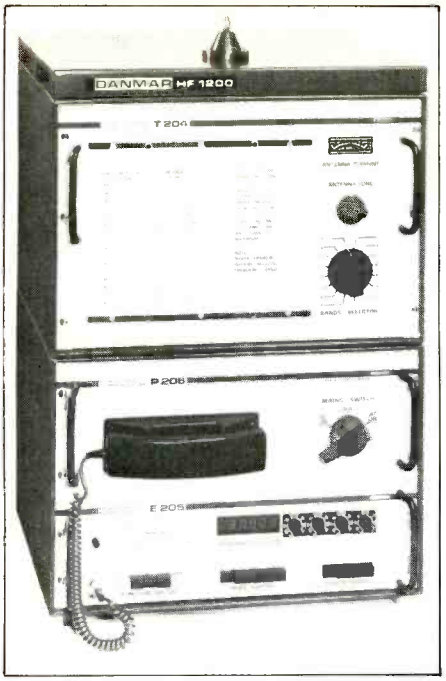
A word of caution: Electronic surveillance is generally illegal. Except in the case of authorized law enforcement personnel, actual use of the information contained in *Electronic Spying* will be a violation of all sorts of laws and statutes.

Anyway, here's *the* book on the subject—the book that we didn't think anybody would or could write. It's especailly fascinating to those of us interested in electronics. The book is available by mail for $7.95 per copy plus 50¢ postage (total price $8.45, including postage) from CRB Research, P.O. Box 56, Commack, NY 11725.

"Danmar" HF-1200 HF Radiostation Receives FCC Type Acceptance

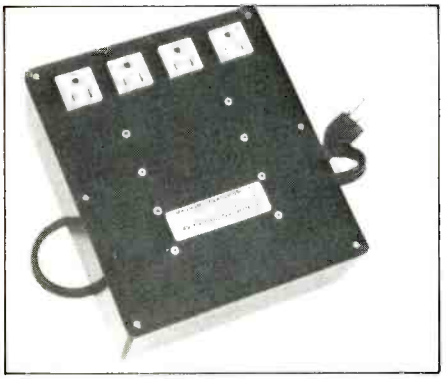
It was announced by M.E.M.A.C. in Boca Raton, Florida, that the Danmar Model HF-1200 (1-KW) HF Solid State Radiostation has been FCC Type Accepted for use under Regulations No. 81&83 from 1600 to 25000 kHz.

The Danmar HF-1200 is now available with remote controlled automatic antenna tuner, built-in battery charger, and built-in antenna dummy-load USB/LSB Mode,



and is suitable for shipboard/land-based communication. The HF-1200 Radiostation can be circulated by 15 nationwide U.S. distributors, with full installation and service back-up for the U.S. Flag maritime industry and oil exploration, and world-wide service.

For additional information, circle number 102 on the reader service card.



Software Pollution Control

Electrical pollution drives Micro Programs bananas! Power line electrical noise, hash, and spikes often cause erratic computer operation. In addition, severe spikes from lightning or heavy machinery may damage expensive hardware.

Many systems create their own pollution! Disks and printers often create enough electrical interference to disrupt an entire program. Nearby electronic equipment is affected as well.

Electronic Specialists recently announced the Magnum Isolator, designed to control severe electrical pollution. Incorporating heavy duty spike/surge suppression, the Magnum Isolator features four individually quad-Pi filtered AC sockets. Equipment interactions are eliminated and disruptive/damaging power line pollution is controlled. The Magnum Isolator will control pollution for an 1875 watt load. Each socket can handle a 1000 watt load.

The Model ISO-17 Magnum Isolator eliminates severe AC power line pollution for smooth program operation. It is available for suggested retail of $200.95.

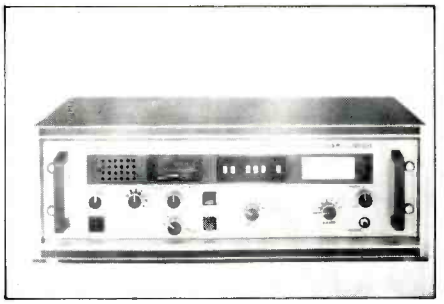
For more information, contact: Electronic Specialists, Inc., 171 South Main Street, P.O. Box 389, Natick, MA 01760, or circle number 103 on the reader service card.

30 Channel Scanner

Regency Electronics, Inc. announced the introduction of the DX 3000, a 30 channel automatic/programmable scanner. The DX 3000 joins the Regency family of scanners, which are now the only scanners made in the United States.

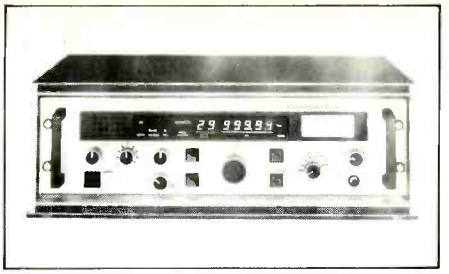
The programmable capability allows the user to choose from over 15,000 frequencies covering 6 bands. No crystals are required. In addition to the scanning function, the DX 3000 also has a search mode for locating additional frequencies. Other features include priority control, CMOS battery memory, dual level display, AC or DC power, and channel lockout.

The DX 3000 is available at a retail price of $269.95. For additional information, contact Regency Electronics, Inc., 7707 Records St., Indianapolis, IN 46226, or circle number 104 on the reader service card.



Two New High-Performance H.F. Communications Receivers

The new Vigilant SR-501 and SR-511 synthesized H.F. Communications Receivers are available for fixed and transportable H.F. Communications. They provide reception of SSB (LSB and USB), CW, AM, RTTY, or FSK modes of operation. Requiring no preselection at the antenna input, unusually high-performance specifications are guaranteed repeatable between 50 kHz and 30 MHz at temperatures from −15° to +55°C.

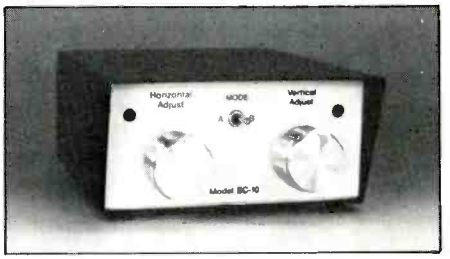


The SR-501 synthesized frequencies are selected by direct access push-buttons in 100 Hz decade switched steps, with up to six channels programmable by diode matrix.

The SR-511 synthesizer is tuned in 10 Hz steps by a unique, single Automatic Progressive Tuning Rate control with slow "fine tuning" to fast frequency change for rapid search. Stability is better than 0.1 PPM.

This professional quality equipment is currently offered at: SR-501, $2995; and SR-511, $4995. These appeal to a wide variety of users, ranging from the quality minded radio monitoring enthusiast to demanding Telex operations users.

For more information, contact: Hamilton Communications Systems, Inc., Suite 4545, One World Trade Center, New York, NY 10048, or circle number 105 on the reader service card.



Automatic Polarization For TVRO Systems

TEM Microwave Corporation announced its Model SC-10 Polarization Control interface. The SC-10 is designed to interface with satellite TVRO receivers that have odd/even channel logic output signals, such as the R. L. Drake ESR-24, or SPDT contacts, such as the Automation Techniques GLR-500 series. The SC-10 produces the correct power and drive signals to control the popular servo motor type feed systems, such as the Chaparall Polarotor I™ or the Boman EFH-75. Other features include: independent front panel horizontal and vertical fine adjustment control and LED indicators that show which control is enabled; a mode switch that allows choice of either Satcom or Westar type polarization; and a built-in regulated power supply.

The size of the device is 4″×5″×2″; Power: UL listed plug-in wall transformer. Cabinet: metal. Pricing: $89.00 for SC-10 control unit only or $189 for SC-10 control with servo feed system. Quantity pricing: available upon request. Delivery: stock to two weeks. Manufacturer: TEM Microwave Corporation, 22518 - 97th Avenue North, Corcoran, MN 55374. For more information, circle number 110 on the reader service card.

WASHINGTON PULSE

FCC ACTIONS AFFECTING COMMUNICATIONS

Facsimile Communications Between Coast Stations And Ships At Sea Proposed

The Commission has proposed providing for facsimile communications between coast stations and ships at sea. Essentially, facsimile involves the electronic transmission and reproduction of documents, whereby an image is scanned at an input terminal, transmitted to a receiving station, and duplicated on paper.

Specifically, the Commission requested comments concerning the frequencies to be assigned to coast stations and the technical standards to be included in the rules to assure intercommunication capability between ship and coast stations. Since equipment currently used aboard ships and at coast stations uses single-sideband suppressed carrier, the Commission proposed using this mode for marine facsimile.

The assigned frequencies proposed for ship station use are: Family #1: 2071, 4160.6, 6238.6, 8326, 12485, 16654, and 22186 kHz; Family #2: 2076, 4168, 6242.6, 8341.5, 12489, 16658, and 22190 kHz.

Regardless of whether frequencies are taken from coast telegraph or from shared bands, responsibility for their selection would rest with the public coast station licensee. Therefore, the Commission invited comments on those frequencies to be used by public coast stations.

Amateurs Authorized To Use AMTOR Digital Code In High Frequency Bands

The Commission has authorized use of the AMTOR digital teleprinter code by licensed amateur operators in the high frequency bands (3-30 MHz) of the Amateur Radio Service.

The FCC acted on a petition by the American Radio Relay League, an organization of licensed amateurs. The League said AMTOR has the capability of delivering reliable, error-free copy at the receiving teleprinter and giving the sending operator certainty that the data sent is received correctly.

AMTOR was developed for the commercial maritime service, where it commonly is known as "Sitor." It incorporates a pause between blocks of transmitted characters, during which the receiving station automatically transmits an acknowledgement or instructions to retransmit.

The Commission on September 14, 1982, authorized use of any code, including AMTOR, on amateur frequencies above 50 MHz (PR Docket No. 81-699). It did not grant such a blanket authorization below 50 MHz, in part because of concern for Article 41 of the International Telecommunication Union Regulations, which requires transmission in plain language on frequencies on which international propagation of signals is unavoidable.

Whether a particular code is sufficiently standardized world-wide to be considered plain language must be determined case-by-case, the FCC said.

AMTOR is an internationally recognized code recommendation for the commercial maritime mobile service, the Commission noted. In view of that fact, it said AMTOR can be considered plain language and can be authorized in the HF bands.

The action will take effect on publication in the Federal Register.

Electric Utility Power Line Carrier Systems In 10-490 kHz Band Receive Recognition

The Commission has amended its rules to provide recognition of electric utility power line carrier (PLC) systems in the 10-490 kHz band. It also adopted rules establishing a notification procedure listing the PLC transmitter and receiver locations and other parameters, an industry-operated entity, the North American Electric Reliability Council (NERC), to oversee the notification process and a data base so band occupants can cooperate to minimize or eliminate mutual interference.

The addition of Footnote U.S. 294 to Section 2.106, National Table of Frequency Allocations, recognizing PLC operations and amendment of Parts 15 and 90 establishing the NERC and setting up a data base became effective March 7, 1983.

New Land Mobile Application Forms Available

On August 24, 1982, the Commission, by Memorandum Opinion and Order (FCC 82-397, Mimeo 32011), adopted new FCC Forms 574, 574A, and 574B for use by applicants in the Land Mobile and General Mobile Radio Services governed by Parts 90 and 95 of the Rules. The Forms 574 and 574A replace the Forms 400 and 400S. Form 574B is entirely new and must be filed with Form 574 only when requesting frequencies below 27.5 MHz. This action was published in the Federal Register, 47 Fed. Reg. 57049 (December 22, 1982). The use of the Forms and the implementation of the procedural rules were contingent upon approval of the forms by the Office of Management and Budget (OMB).

Approval has been received from OMB and the new forms are now available for distribution to the public. Therefore, effective February 14, 1983, Parts 1, 90, and 95 of Title 47, Code of Federal Regulations are amended as set forth in the appendix attached to the Memorandum Opinion and Order (FCC 82-397, Mimeo 32011). Forms 574 and 574A are to be used in place of Forms 400 and 400S.

The new forms are to be submitted to the Private Radio Bureau's licensing facility in Gettysburg, PA. We will accept Form 400 for the use of frequencies 27.5 MHz and above for an indefinite period. Applicants requesting the use of frequencies below 27.5 MHz must now file the Forms 574 and 574B. When we receive significantly more Forms 574 than Forms 400, we will issue another Public Notice setting a deadline for the continued acceptance of the Form 400.

The new forms may be obtained from our headquarters in Washington, D.C., our facility in Gettysburg, PA and from our district offices in the field. Requests for quantities not exceeding three may be addressed to FCC Consumer Assistance Branch, Gettysburg, PA 17325, or to any of our district offices. Requests for larger quantities of the forms may be addressed to FCC Supply Section, Room B-10, 1919 M Street, N.W., Washington, DC 20554. Other inquiries concerning private radio forms and licensing matters should be directed to our staff in Gettysburg, telephone (717) 337-1212.

UHF-TV Channel 15-16 Use Proposed For Gulf Offshore Oil And Gas Rig Communications

The Commission has proposed to reallocate UHF-TV Channels 15 and 16 to expand the Offshore Radio Telecommunication Service (ORTS) to meet growing needs of oil and gas exploration and production units operating in the outer continental shelf area of the Gulf of Mexico off the coasts of Texas and Louisiana.

The FCC acted in response to a petition by the Offshore Telephone Company, a licensee providing common carrier services linking offshore oil and gas production platforms and drilling rigs in the Gulf with each other and the mainland by means of radio, cable, and point-to-point microwave. The outer continental shelf is the seabed from the three mile limit out to a water depth of 200 meters (656 feet).

The ORTS was established in 1976 (Docket No. 20368), and UHF Channel 17 was reallocated from UHF television to the Domestic Public and Industrial Radio Service in the Louisiana offshore Gulf Coast area. ORTS was allocated 4 MHz of the channel's 6 MHz of spectrum (488-494 MHz).

The FCC agreed with Offshore Tele-

phone that the communications service provided through the ORTS is more satisfactory than any available alternative. It noted the growth in recent years in offshore oil and gas development in the Gulf and projections of continuing future growth and concurrent communications needs of the industry which Offshore Telephone will be unable to meet with the frequencies assigned it. The FCC proposed use of interstitial frequencies, which use offset channels to increase capacity, as requested by the company.

There may be instances in which satellite communications would be practical for offshore operations, the Commission said and asked for comments. But it said satellite use appeared inefficient for most offshore needs. Some other frequencies available for private systems in the area are congested and restricted in their operational uses, it noted, while others involve difficult propagation problems.

The Commission concluded that the Channel 15 and 16 frequencies would be the best selection for meeting the service needs. While extra care must be used in estimating potential interference in the Gulf area because of enhanced propagation characteristics, experience with Channel 17 indicates that ORTS operations on Channels 15 and 16 would not be incompatible with present and potential TV uses.

It noted that there have been no reports of interference from ORTS operations to UHF reception. Present rules require a 150 mile separation between an ORTS station operating on Channel 17 and a broadcast station on that channel. The criteria for separation between the ORTS Channel 17 stations and co-channel and adjacent channel UHF-TV stations appear to establish a sound basis for new rules to govern ORTS use of the other two channels.

ORTS use of Channel 17 has been permitted in the outer continental shelf area roughly between a line extended south from Port Arthur, Texas, and a line south from Mobile, Alabama. The Commission proposals woule extend that shelf area to the west for Channel 16 use and create a zone farther west, reaching closer to the Texas coastline, in which Channel 15 could be used.

The FCC proposed to preclude low power television operations on Channels 15 through 18 in the Gulf Coast area. Previously established requirements would keep those channels from low power use in much of the Gulf Coast area. The Commission said the land areas affected south of Corpus Christi, Texas, are sparsely populated and numerous other UHF channels are available for low power use, which under FCC rules must operate on a secondary, noninterfering basis to full-service broadcast stations and other primary uses.

The Commission said its analysis indicated that intermodulation problems arising from ORTS use of Channel 16 and land mobile radio uses of Channel 17 frequencies in the Houston area would be minimal but asked for comments on the need for protection from interference for land mobile licensees.

40 MHz Field Sensor Operation Proposed; Waiver Granted For "Sentrax" System

The FCC proposed to amend its rules (Part 15, Subpart F) to allow use of the 40.66-40.70 MHz band for radio frequency disturbance sensors.

A field disturbance sensor is a radiation device which is used primarily to detect unauthorized entry into or exit from a protected area. A sensor establishes a radio frequency field and, by detecting changes in that field, detects movement of persons or objects within the field. Sensor systems are typically installed at businesses or high security areas.

The Commission proposed the rule change at the request of Senstar Security Systems Corporation for its newly developed "Sentrax" perimeter protection system. The FCC also granted Senstar's request for waiver of the rules to permit immediate marketing and operation of Sentrax pending the outcome of the rulemaking.

The Sentrax system uses a pair of openported transmit and receive cables buried along the boundary of an area to be protected. Senstar said the optimum frequency of operation for the system would be between 40 MHz and 100 MHz. FCC rules at present do not provide for operation of field disturbance sensors in that frequency range.

Since the 40.66-40.70 band is primarily allocated for industrial, scientific, and medical devices, the Commission said sensor operation in that band would be unlikely to cause harmful interference to authorized radio communication services. It proposed and requested comments on emission limitation, emission restriction, including powerline-conducted emissions, frequency tolerance, and a test procedure.

The Commission said that, in view of the low probability of harmful interference to radio communications and the apparent benefits of the Sentrax system, allowing its immediate use would be in the public interest. In granting the waiver, the FCC required compliance with the technical standards proposed in the rulemaking, correction of interference to any authorized radio communications service, and filing of emission measurements for each installation.

Improving Narrow-Band Direct-Printing Frequency Assignments

The FCC initiated a rulemaking proceeding seeking comments on proposed rule amendments which would change the way narrow-band direct-printing (NB-DP) frequencies are licensed.

Utilized by the maritime mobile service, NB-DP is an electro-mechanical system which operates on radio frequencies below 25 MHz and permits communication between distant terminals fitted with teletypewriters, which may or may not include error detection and correction capability.

Currently, the FCC has assigned selected series of NB-DP frequencies for the exclusive use of specific public coast stations. Five stations are now operating and applications have been filed for additional frequencies for stations which now provide service. (Public coast stations provide common carrier, ship-to-shore communication services to third parties on a profit-making basis.) The FCC now assigns discrete frequencies in designated series to public coast radiotelegraph stations by specific call sign and geographic location.

It is proposing to assign frequencies on a first-come, first-served basis but would give priority to public coast stations that are not providing service and assign the remaining frequencies based on a showing of need to stations now providing service. It said this method would maximize the number of stations offering service and assign the remaining available frequencies where traffic indicates they are needed. It also would maximize the FCC's ability to license frequencies to more than one station while avoiding or minimizing potential interference.

The Commission said it had developed a set of criteria which must be met by existing licensees in order to qualify for additional frequencies, and invited comment on these criteria.

In order to ensure that all series licensed are actually placed in operation, it proposed a "cut-off" rule requiring all NB-DP licensees to place them in service within eight months of the Report and Order terminating this proceeding or within eight months of the receipt of a license, whichever is later. By the end of this period, licensees would be required to certify that the licensed NB-DP series has been placed in service. Licensees failing to do so would automatically forfeit those frequencies which would then be made available to other applicants.

Use Of Radiotelegraphy In Maritime Services

The Commission amended its rules governing the use of radiotelegraphy in the maritime services adopted at the 1974 ITU World Maritime Administrative Radio Conference to:

- permit public coast radiotelegraph stations (PCRTs) to use fixed-tuned receivers;
- make available 444 additional A-1 Morse calling frequencies to ship radio-telegraph stations;
- delete requirements for marine radioteleprinter equipment to use a 1700 Hz subcarrier, and
- apply technical standards required for error detection/correction systems used with marine radioteleprinters only to 5 unit radioteleprinter systems.

These changes relax restrictions and increase flexibility for communications between high seas vessels and PCRTs.

These actions came as a result of petitions for reconsideration of the 1977 report and order implementing changes made at the 1974 ITU Maritime WARC held in Geneva

in 1974. The petitions were filed by ITT Mackay Marine, Mobile Marine Radio, Inc. (MMR), and RCA Global Communications, Inc. (RCA Globcom). The Maryland Port Administration (MPA) requested that it be allowed to join in RCA Globcom's petition.

In response to other proposed changes, however, the Commission said it did not believe it should require PCRTs to maintain a listening watch on specified A-1 Morse calling frequencies during specified hours of service, nor did it feel that vessels fited with radioteleprinter equipment should be required to be fitted with error detection/correction systems. Both of these changes were urged by MMR. The Commission said, however, that these matters could be better determined by the needs of the vessel or PCRT operator.

In response to MRR's petition, the Commission noted that it felt some adjustments should be made to the allotment of narrowband direct printing (radioteleprinter) frequencies to PCRTs. Therefore, it was simultaneously adopting a notice of proposed rulemaking to foster a more efficient use of these frequencies and to explore ways to encourage new providers of this service.

800 MHz Private Land Mobile Matters

The FCC has denied, with one partial exception, requests by Dennis C. Brown, on behalf of the National Mobile Radio Association (NMRA), under the Freedom of Information Act for disclosure of agency records relating to its 800 MHz private land mobile radio proceeding (PR Docket Nos. 79-107, 191, 334, 81-703).

The FCC's action came on Brown's application for review of the Private Radio Bureau's denial of his request for access to nine categories of predecisional agency documents, studies, and internal memoranda. The Bureau identified five documents as within the scope of Brown's request but refused disclosure on grounds that they fell within the FOIA exemption for predecisional records forming part of the deliberations preceding a final agency decision.

The Commission, in action July 22, 1982 (released August 16, 1982), made available the reserve of 250 private channels in the 800 MHz band and adopted and amended rules to govern licensing and operation of land mobile radio systems operating on those channels. The new rules substantially changed the FCC's approach to management of the 800 MHz spectrum.

The Commission added a sixth document which was inadvertently omitted from the list prepared by the Private Radio Bureau but found that it, too, was exempt from disclosure. It declined to exercise its discretionary authority to release the exempt documents, finding that they reflect the Commission's decisional process and should remain confidential in order to maintain a free and frank internal exchange of ideas.

Portions of four pages of a ten-page flip chart used by the staff for briefing contain factual material which will be made available to Brown, the FCC said. It declined to release the remainder of the flip chart, which contains staff analysis and recommendations and could not be disclosed without compromising the agency's decision-making process.

The Commission said a diligent search failed to reveal any information about the existence of logs or minutes of staff briefings to individual Commissioners before the FCC meeting at which the rulemaking was adopted. Brown had also asked for logs or minutes of those presentations.

The FCC further denied a request for stay of major provisions of its July 22, 1982 action releasing the reserve of 250 private channels in the 800 MHz band and adopting and amending rules to govern licensing and operation of Private Land Mobile Radio Service systems on those channels.

The National Mobile Radio Association (NMRA) and the E. F. Johnson Company, a radio equipment manufacturer, asked for the stay pending FCC resolution of six petitions for reconsideration, one by Johnson, and NMRA's appeal to the U.S. Court of Appeals for the District of Columbia Circuit.

The FCC said NMRA and Johnson did not meet the requirements for showing good cause for stay, since they are unlikely to succeed on the merits of reconsideration or appeal, their economic injury arguments are speculative and were previously considered and both third parties and the public interest would be harmed.

In the July action, released August 16, the Commission, changing its approach for management of the 800 MHz spectrum, established four pools of channels for each major category of private land mobile use and, instead of earmarking channels for trunked or conventional use, permitted use of any form of technology.

The FCC required applicants in noncommercial categories to select their own channels and coordinate with other users. To promote competition and innovation, it eliminated a restriction on equipment manufacturers which limited each to a trunked Specialized Mobile Radio System (SMRS), a system which provides service to other users on a commercial basis. It revised its rules to permit substantially enhanced technical flexibility in system operation.

The Commission said a stay, by preventing action on all SMRS applications, would deprive land mobile users and the public of service that could be provided on critically needed channels, particularly in major urban areas, where available channels have been exhausted. Private users, most of which are small businesses, would be directly harmed by withholding of additional frequencies even temporarily, the FCC said. It rejected other arguments that its conduct of the proceeding was unfair or prejudicial to the interests of current SMRS operators.

Photo by Barry Loeb.

POP'COMM Tunes In On Las Vegas Casinos

BY RICK MASLAU, KNY2GL

There's a never-ending fascination with monitoring the behind-the-scenes communications of the world's most glittering attractions, and certainly there are few places that can match the gutsy allure of Las Vegas, Nevada. We have put together a listing of what we feel are the most interesting frequencies to monitor in this truly amazing city, and we pass it along with the hope that if you visit this spectacular city you can bring along a scanner and find out what's happening behind the glitter.

Las Vegas Hotels, Casinos, Etc.

31.04	California Hotel & Casino	KQE316
	Jockey Club Hotel	KYJ725
31.24	Mint Hotel	KVK975
	Sahara Nevada Corp	KVK975
35.08	Hilton Hotel	KQT263
151.665	Airport Casino	KAZ358
151.715	Nob Hill Casino	WXM880
151.745	Hotel Riviera	KJA645
151.775	Paradise Road Hotel	KX5968
	Horseshoe Club	KQZ748
	Hotel Frontier	WRT417
151.805	Casino Coin Machine Co	KLP569
	Aid Bail Service	KRA831
151.835	Rendezvous Hotel & Casino	KIM565
151.865	Treasury Hotel	WYN345
	Paradise Hotel & Casino	KZL231
	20th Century Hotel & Casino	KSC988
151.895	First Western Savings	KJN376
151.925	Circus Circus Inc.	KLT322
152.48	Marina Hotel	KXW463
154.515	Aladdin Hotel	KCD229
154.54	Hilton Hotel	KQT480
	International Hotel	
154.57	Aladdin Hotel & Casino	KX4532
154.60	Hacienda Hotel	KN2614
157.56	Silver Nugget	KZF428
157.74	Consolidated Casinos	KSS543
	Las Vegas Convention Cntr.	KVE608
158.46	Lucerne Hotel	KVH551
	River Boat Casino	KXA968
	Caesars World	WQY424
452.80	Purolator Security	KMK700
460.30	U. of Nevada Police	KUG738
460.95	Showboat Security	WYD829
461.00	Alarmco Inc.	KLN826
461.05	Horseshoe Club	WYA467
461.10	Silver Nugget Casino	WFF293
	Statewide Investigators	WXX721
	N. Las Vegas Casino	WXZ871
461.20	Imperial Palace Hotel	WRK891
461.20	Casino Equipment Int'l.	WXT373
461.275	La Concha Motel	KQK677
461.325	Imperial Palace Hotel	KES921
461.40	Keystone Security	KZL940
461.425	California Hotel & Casino	KXV290
461.45	Pokermatic Corp.	KRM716
461.50	Spanish Oaks Security	WYL345
461.55	Landmark Hotel	KAI274
461.675	Tropicana Casino	WYJ470

461.75	Golden Nugget Hotel	WXC287
461.775	Caesars Palace	WSU904
461.80	Griffin Investigating	KVZ213
461.925	Hilton Hotel	KWA915
461.95	Caesars World	WYM734
461.975	American Security Patrol	WXU501
462.00	Golden Nugget Hotel	KGB660
462.075	Vans Security	KYI675
462.15	Sunrise Security	WXT326
	Four Queens Hotel & Casino	KCB222
462.825	MGM Grand Hotel	KUF444
462.85	Hilton Hotel	WYF663
	Hotel Sundance	WRP724
462.875	Riviera Hotel	WYA978
	Golden Gate Casino	WYL401
462.90	Sands Hotel	KVJ230
462.925	Aladdin Hotel & Casino	KZY272
463.325	Hilton Hotel	KVR332
463.375	Hilton Hotel	KQT480
	Union Plaza Hotel	WSM289
463.45	Las Vegas Convention Cntr.	KIM705
463.475	Casino Operations Inc.	KEA718
463.525	Statewide Investigations	WXV468
463.575	Desert Inn & Country Club	KWN603
463.60	Grand Resorts Inc.	KVS350
463.625	Sundance Hotel Security	WRP383
463.70	Executive Security Svc.	WRJ957
463.775	Castaways Casino	KIV744
	Silver Slipper	KIV765
	Castaways Hotel	KSA541
463.80	Nevada Security Patrol	KWV939
463.825	MGM Grand Hotel	WSW824
463.90	Showboat Hotel	KUT994
464.00	Holiday Inn	KTR326
464.025	The Inn at Las Vegas	WRX970
	Royal Inn of Las Vegas	WXD833
	Mint Hotel & Casino	KEX379
464.125	Sam's Hotel & Casino	WXD889
464.15	Bally Distributing	KUD390
464.225	Holiday Inn Downtown	KKZ942
464.325	Motel 6 Inc.	KIM620
	Marianna Inn	KIT550
464.375	Caravan Travel Lodge	KRH545
464.425	Desert Inn	KWK203
464.525	Sahara Nevada Corp.	KEM267
464.575	Fremont Hotel	KEM267
464.625	Dunes Hotel & Country Club	KZU324
464.675	Desert Palace Inc.	LSV244
464.725	Stardust Hotel	KDI337
464.85	Maxim Hotel	KIS670
464.975	N. Las Vegas Casino	KIM408
465.000	Landmark Hotel	KFK546

Other Las Vegas Listings

State Police: 42.58, 42.94
Sheriff: 154.65, 154.71, 154.74, 154.77, 155.25, 155.55, 155.73, 156.03, 158.79, 159.03, 159.09, 159.15, 159.21, 453.00, 460.20, 460.525
County Fire Dept: 153.77, 153.95, 154.205, 154.34, 154.37, 154.43, 453.10, 453.70
City Fire Dept: 154.37, 154.43, 463.15
State Gaming Commission: 42.50, 42.58
City Government: 45.56, 155.82, 156.015, 158.925, 453.825
County Government: 153.845, 153.86, 153.905, 153.995, 154.025, 154.10, 154.98, 154.995, 155.025, 155.085, 155.115, 155.88, 155.94, 156.015, 158.745, 158.82, 158.94, 158.97, 453.20
State Government: 155.76, 158.895, 453.20, 453.775, 453.875
Civil Defense: 153.815
Housing Authority: 154.115

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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.

DX'ing Down Below

Another scanner user told me about a supposedly unusual communications system used by the federal government in this area. It's used for below-the-ground communications at a coal mine in Indiana, PA. Other than that, I have no information and nothing can be located on my scanner that would account for anything especially unusual. Maybe it's on a strange frequency. Can you find out?

J.H. Ratner
Rossiter, PA

I've had several inquiries about this system and it is most definitely unorthodox. It's an experimental underground operation located in Lucerne Mine #8. The callsign of the station is KA2XSD and it's operated by the Dept. of The Interior's Bureau of Mines. KA2XSD is a low power 10 watt repeater operating in FM mode on 930 kHz (correct, right in the standard AM broadcast band). The repeater's input frequency used by control and mobile units (all running 10 watts) is 780 kHz. The station is used below ground in the mine's shafts and tunnels and the amount of surface level radiation is supposed to be held to a minimum (within FCC Part 15 specs). If you could figure out how to get a receiver to tune 16 kHz-wide FM on 930 kHz, and if you could stand over the top of the mine with it, you might hear KA2XSD. That would make quite a rare catch. The Bureau of Mines has always been innovative in their underground communications efforts; another of their experimental systems has the callsign KA2XRR and is used in coal mines throughout West Virginia, Pennsylvania, Kentucky, Tennessee, and Ohio. It's a 5 watt portable system operating on the unlikely (for government communications) frequency of 456.80. Since it's within the frequency range of a scanner and is used in so many areas, it might be worth a listen for those in coal country. —Editor

Missile Monitor

I'm within monitoring range of the Army's White Sands Missile Range and have heard transmissions on 139.525 MHz. However, sometimes they switch over to other channels. What are the other channels?

A.L.J.
Tularosa, NM

The way it seems to be set up is Channel 1—138.975, Channel 2—139.075, Channel 3—139.225, Channel 4—139.525, and Channel 5—140.025. These aren't the only frequencies in use by any means, but they are the frequencies used by the stations on 139.525 MHz. —Editor

Maybe He's Got Good Ears

In a recent issue, it was mentioned that the U.S. Navy operates its OMEGA long range radio navigation system on 10.2, 11.3, and 13.6 kHz. Can you hear this station without a receiver?

William Novotny
Aliquippa, PA

No, can you?—Editor

It's A Help

I've got an inexpensive multiband receiver that I use to tune international shortwave broadcasters. This set is used with a 50 foot length of wire acting as the antenna. Would reception be improved by the use of an antenna trimmer to peak the electrical length of the antenna for each of the bands I monitor?

M. Driskell
Simla, CO

It should! Any antenna will provide improved performance if it is trimmed to optimum length. A trimmer capacitor should do the trick and offer the best signal to noise ratio. You'll find that a trimmer capacitor of the air variable type with a maximum capacitance of about 150 pf. should improve reception on all bands. Just place it in series with the antenna before the antenna gets to the receiver's antenna terminal, then peak it for maximum signals. —Editor

New Use For *POP'COMM*

Your recent article "Secrets of Propaganda Broadcasting" (December issue) has prompted me to write. As a Social Studies teacher in the High School Alternate Program in this city, I am always on the lookout for unique and interesting material. The article is brimming with so much information I would like to use it in my classes. Let me also say that your excellent magazine has rejuvenated my husband's long-time interest in SWLing and other radio-connected hobbies. He is licensed as Amateur NØBLD.

Darlene Reece, NØCBG
Alternate Education Program
Topeka Public Schools
Topeka, KA

Glad you have found materials in POP'COMM worthy of being used as teaching aids in your classes—we are honored!—Editor

Back Copies

My subscription began with the March '83 issue. Friends have shown me earlier issues of *POP'COMM* and I'd like to now complete my *POP'COMM* collection with the issues I don't have. Are back issues available? If so, how might they be obtained?

Neal Regardie
Oakland, CA

At present we have copies of all of our back issues available, commencing with the first issue (September '82). These can be ordered by mail at $1.75 each from Popular Communications, 76 North Broadway, Hicksville, NY 11801. Be sure to specify which issues you want to order. —Editor

Score One For Personal Broadcasters

I'd like to comment on your January editorial concerning pirate broadcasting stations. Speaking specifically for the state of Alaska (primarily the more remote regions), private low power radio stations would serve a very useful purpose. There are only 30 AM (31 if you count a relay station) broadcasting stations here and they are all concentrated in the more populated areas. Having once lived in a relatively isolated part of Alaska, I can tell you that the few signals that could be picked up from stations in larger cities were only of minor listener interest because they did not cover events in our own community. In remote areas, there is insufficient capital available to build and run a full scale commercial station, hence the tendency for small local pirate broadcasters to appear on the bands here from time to time. These stations are the only form of communications in their respective areas.

John D. Phillips
Anchorage, AK

Your coverage of pirate radio monitoring is the only thing I don't care for in your otherwise excellent publication. Maybe if you'd stop talking about these idiots, they'd pack up their bootleg transmitters and find something else to occupy their spare time. I become very angry whenever I stumble across these stations broadcasting their nonsense on the airwaves. I was especially dismayed when I was listening to pirate WGUT (1630 kHz) and heard them not only talking about *POP'COMM*, but saying that you called their station and spoke to them over the air.

Sam Bonifacio
Teaneck, NJ

Sam, "nonsense" is a very subjective opinion. One man's nonsense is another man's listening relaxation. Personally, the fact that Laverne & Shirley *or* Three's Company *are broadcast over licensed stations doesn't convince me that they are worthy of my time. The worst nonsense heard over a pirate broadcaster has got to be at least several cuts above legit programming of this low caliber. —Editor*

Beaming In *(from page 4)*

to intercept private telegraphic and telephonic messages between Americans and persons overseas, even if there isn't any reason to believe that the American is an agent of a foreign power. The court also said it is okay for the NSA to share these intercepted messages with other intelligence agencies and with foreign governments.

This all came up in the case of Abdeen Jabara, an American-born Michigan-based attorney who specializes in defending aliens in their various courtroom battles. The NSA admitted that it had had Jabara under surveillance since 1967, and had provided the FBI with summaries of his overseas communications. The FBI then supplied that information to no less than 17 other law-enforcement and intelligence agencies, as well as three foreign governments. It isn't at all difficult to see the ramifications of this type of operation—getting the NSA to front for all manner of other agencies who wish to skirt the formalities of obtaining any court orders or warrants for establishing wiretaps.

Fact is that, as pointed out in Winston Smith's book, Americans seldom get or make an overseas telephone call, or Telex, or cablegram without the NSA very carefully checking it out.

Secrecy of communications? It's a fairytale—a nice delusion that is propped up by statutes and laws but which, in the final analysis, aren't quite what they're cracked up to be.

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(continued from page 74)

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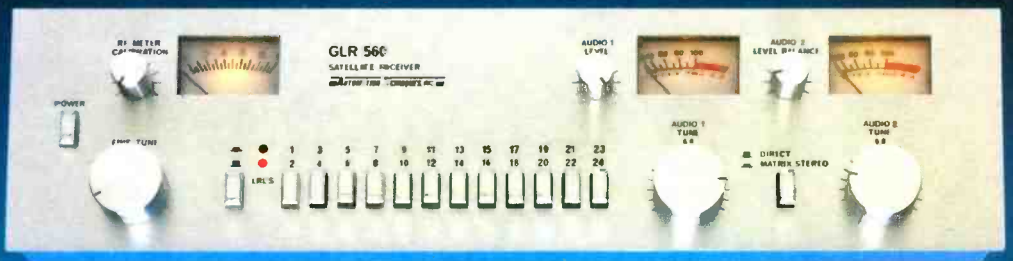

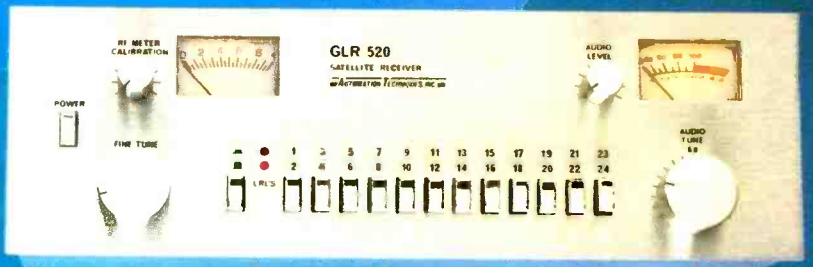

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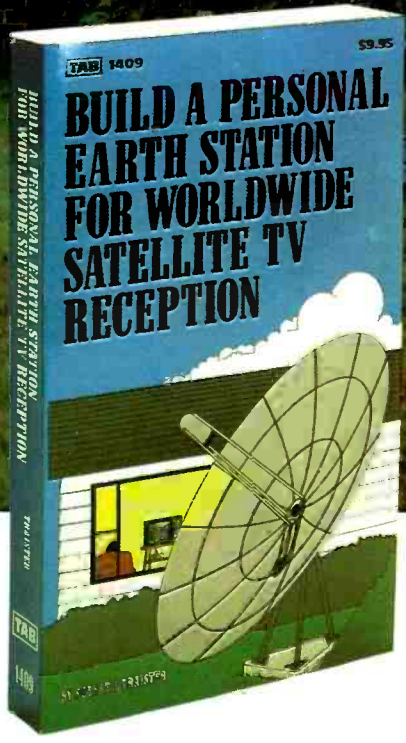

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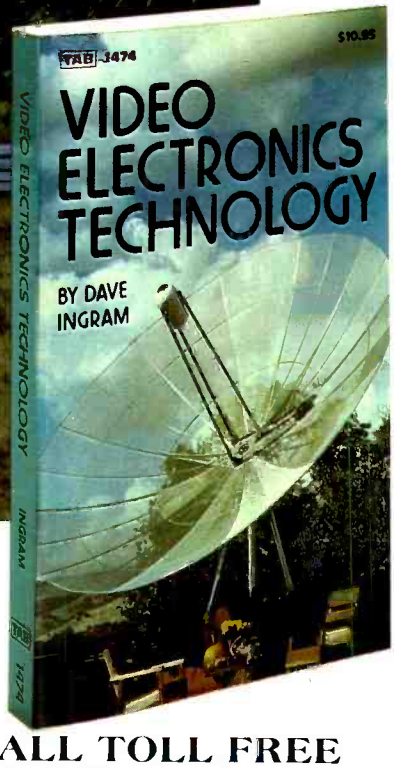

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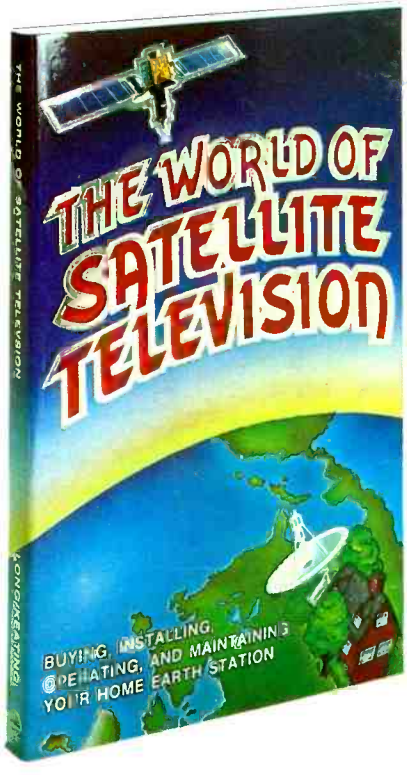

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