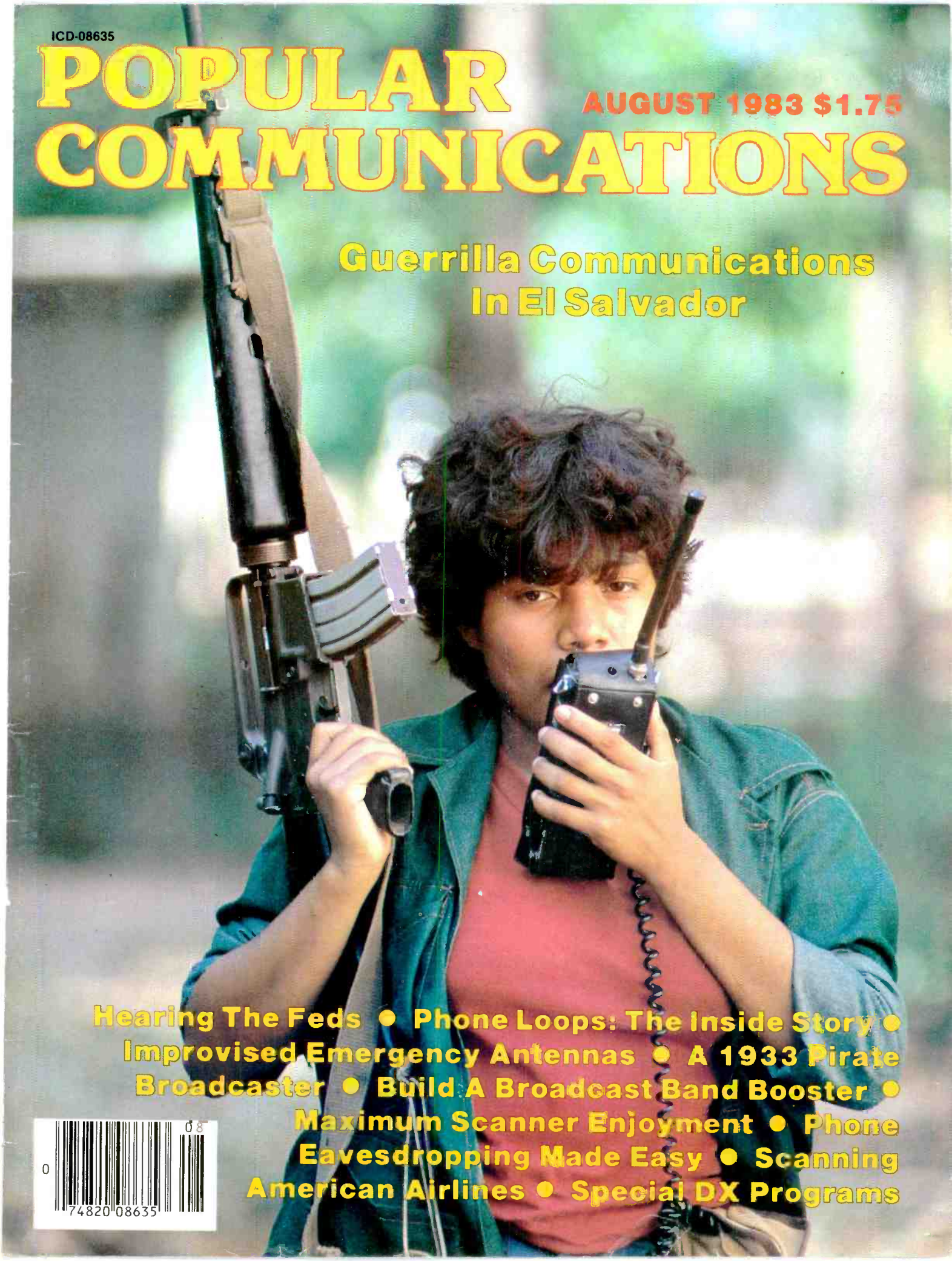
ICD-08635

POPULAR COMMUNICATIONS

AUGUST 1983 $1.75

Guerrilla Communications In El Salvador



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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 transmitter 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.

As an additional plus to ICOM IC-720A owners, the R70 has an optional interface that will allow the R70 to control the transmit frequency of the 720A for the ultimate in hamming versatility.

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.

ICOM SYSTEM

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.

PRICE

Check with your local ICOM dealer for pricing on the R70. You will be amazed.

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The World System

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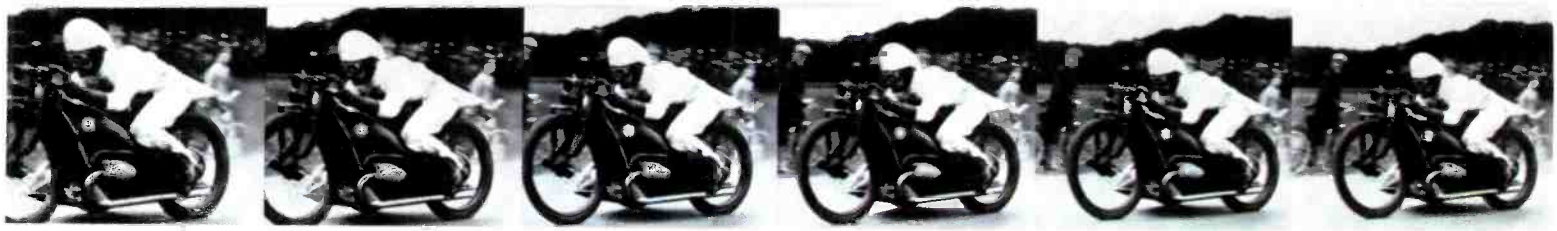

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While the fine lines and sculpted features of most sport bikes spring from the drawing tables of stylists, those of the BMW R65LS had a different birthplace.

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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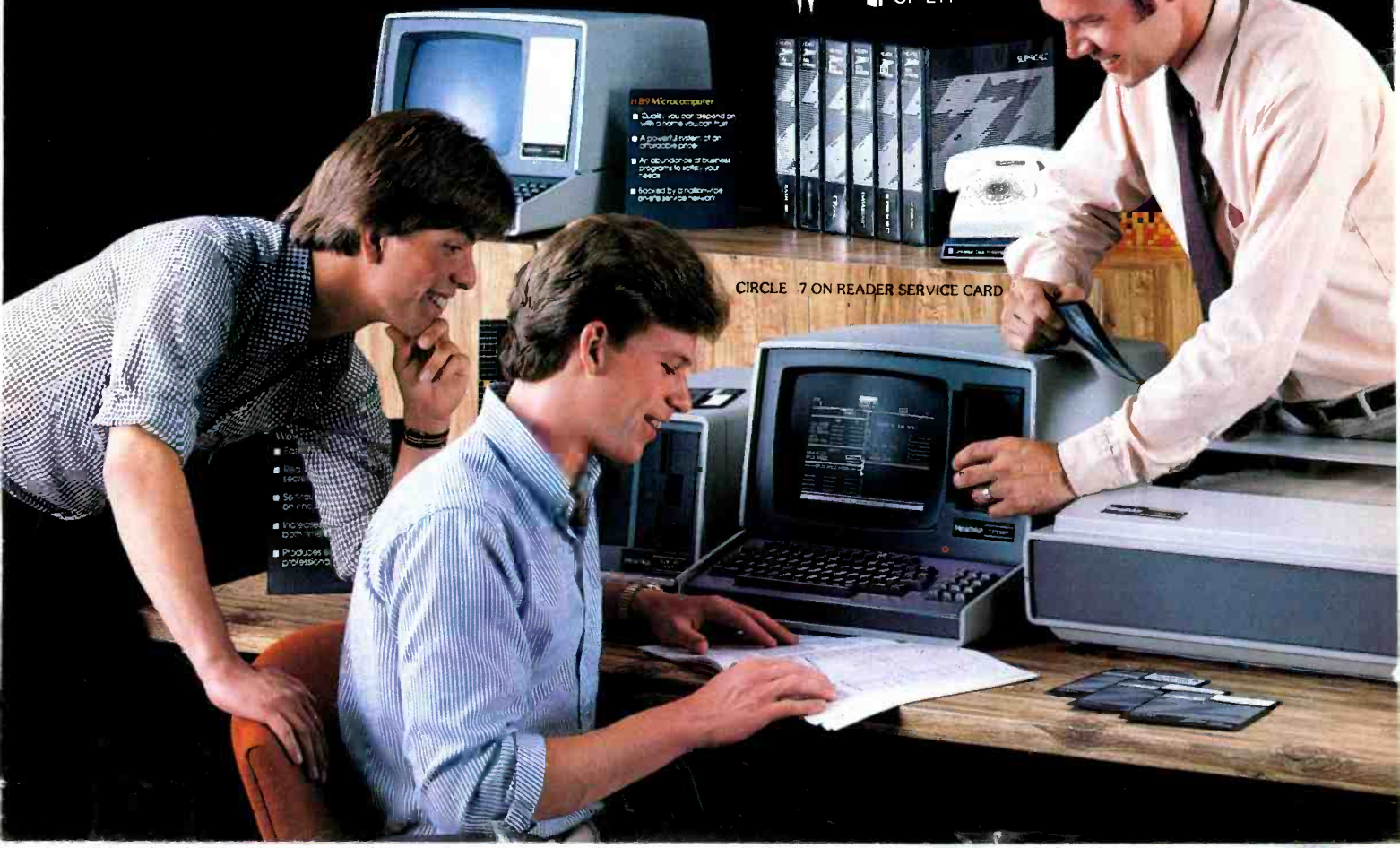

CIRCLE 7 ON READER SERVICE CARD

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AUGUST 1983 **VOL. 1, NO.12**


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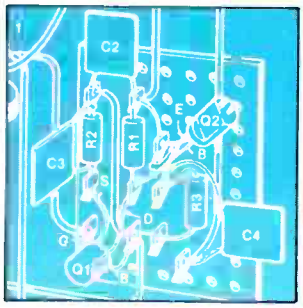

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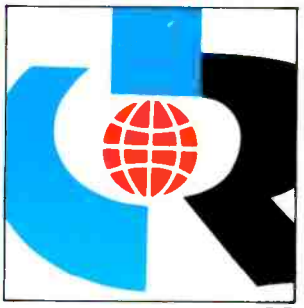
38

FEATURES

This month's cover: *Courtesy of SYGMA, ©1982. Photo by Michel Philippot.*

DEPARTMENTS

BEAMING IN

BY TOM KNEITEL, K2AES

AN EDITORIAL

Vox Populi

From time to time my thumb accidentally slips on the tuning knob of my communications receiver and I end up on one of the seemingly limitless number of shortwave frequencies used by the Voice of America. It never ceases to amaze me when I hear the programming on the VOA, which sends out broadcasts in 39 languages addressed to 80 million foreigners, most of whom are living in Communist controlled nations. I just don't know what it is with the VOA, but somehow they've never really been able to get things together to the point where the venerable organization does anything that permits it to reach its propaganda goal of "selling" democracy and freedom, nor which justifies its occupation of so many frequencies throughout the shortwave broadcasting spectrum. They've been doing it wrong for decades!

During the 1950's, the VOA launched into a campaign that was tied into the John Foster Dulles' concept of "Liberation of The Satellites." The hope was that the VOA's gentle persuasion would foment such a large amount of unrest in eastern bloc nations under Soviet domination that the people would rise up to obtain their freedom. Radio Free Europe and Radio Liberty picked up on this chant (only more militantly than the VOA) and it became the main pitch of American controlled propaganda broadcasters. There wasn't any reason for those hearing these broadcasts to doubt that if they rebelled the Americans would rally to their aid and rescue. When the Hungarians revolted in 1956, the United States apparently had second thoughts about the wisdom of deploying any military forces to the cause of the Hungarians, and the result was that the Soviet military forces crushed the revolt. Eastern bloc nations never forgot.

The VOA then took a new tack. The media people running the VOA decided to institute a major campaign centered around the curious term "People's Capitalism." They thought it was clever to rip off the Communist word "People" (as in "People's Republic," "People's Collective," etc.) and try to hook it to one of our own buzz words. Too bad they weren't experienced enough to know that in many societies (including non-Communist ones) the word "capitalism" has a different meaning than it does in this country. In many nations (such as India), capitalism is used in the colloquial tongue to mean cheating and price gouging.

You'd think that by now we would have learned a lot from these assorted blunders and political disasters broadcast over the VOA. We haven't.

The present approach of the VOA consists of the most simplistic, combative, and boring techniques imaginable. It's about as subtle as a Madison Avenue soap suds sales pitch—*ring around the collar* and that sort of thing. It's as if the people at the VOA have been tape recording only the most dreary and uninteresting Communist propaganda broadcasts, and then running them back out over the air with the Marxist sales pitch replaced by absolutely bottom of the barrel grade hysterical super-patriotic flag waving slogans and jargon. It's a mirror image of the Communist stuff. It's not that this cornball approach hasn't been attempted before, because it has; it's that this approach was proven to be a failure in its earlier incarnations. And they've even gone a step further.

Remember the goof when, almost 30 years ago, they came up with the supposedly clever term "People's Capitalism"? You guessed it—now they've resurrected the whole disaster with a new campaign called "Revolutionary Capitalism."

Let me say that all of this hasn't gone down in the halls of the VOA as smoothly as a kid sliding on a stair bannister. Within the VOA, this latest series of approaches has caused a considerable amount of resignations and tensions. Suffice it to say that in the last two years, there have been no less than five "permanent" and acting heads of the VOA! Obviously, there are those in higher offices than the VOA or its parent agency, the International Communications Agency, who happen to like the present approach and are determined to force it through the airwaves regardless of past experience and failure.

Time has shown that there are two basic approaches to propaganda. One approach was formulated by Josef Goebbels, Hitler's Minister of Enlightenment, who claimed that "news is a weapon of war; its purpose is to wage war, not to give information."

The other side of this approach is typified by the British Broadcasting Corporation (BBC), which assumes a respect for the intelligence of others. They feel that if programming is presented which is unchauvinistic, honest, and neutral (or at least appears to be), eventually listeners will believe you and, in the long term, the effect will achieve maximum benefit for the broadcaster. This has resulted in the BBC becoming what is probably the most trusted and believable foreign broadcast news service to be found on the airwaves.

During the recent hostilities in the Falklands, the British proved their point. American diplomats in Argentina reported that Argentinians disdained their own nation's

(continued on page 74)

WORLDS OF ENTERTAINMENT

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But perhaps the most outstanding feature is simply that you no longer have to choose between your love of music and your love of water.

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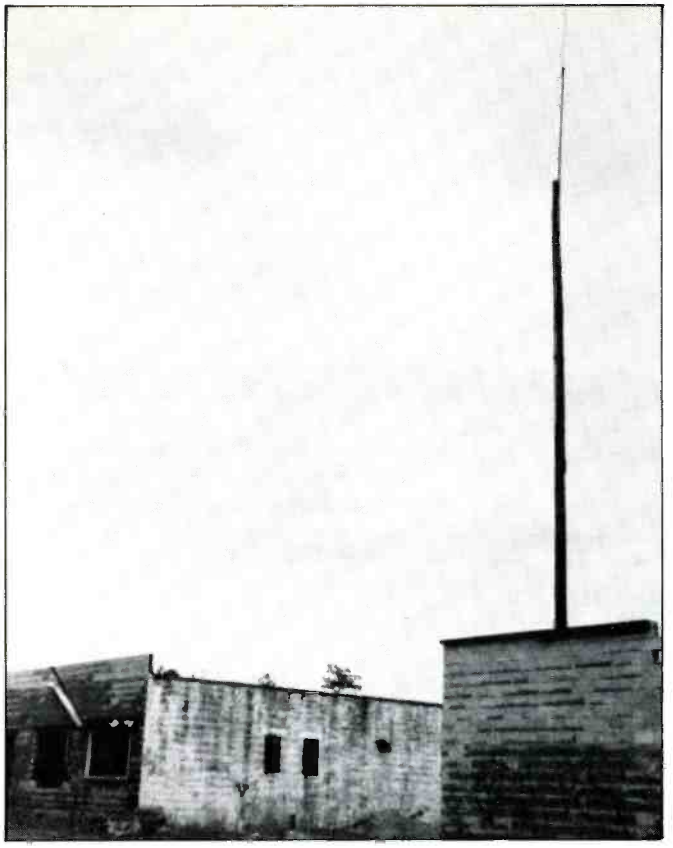

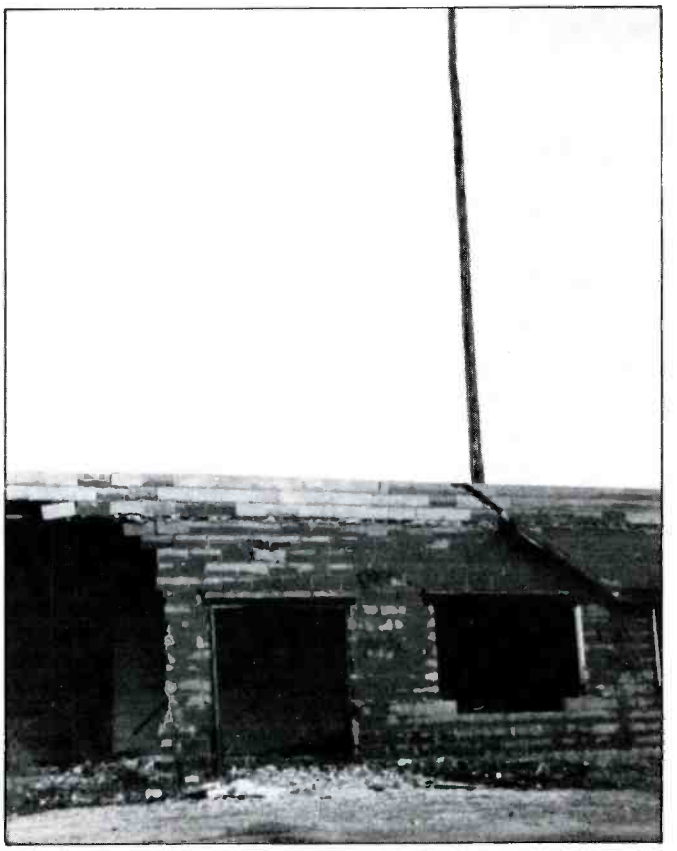

In the October, 1982 issue of Popular Communications, *we originally ran these photos showing guerrilla headquarters in El Salvador with a base station antenna as shown in the photographs. Government troops ended this station's career in a rather violent manner.*

Communications Of The Guerrilla Fighters In El Salvador

BY TOM KNEITEL, K2AES, EDITOR

The current civil war in the small Central American nation of El Salvador is dated from 15 October 1979, when a group of reform-minded army officers overthrew the government of Gen. Carlos Humberto Romero and declared a state of siege. They promised to form a civilian-military junta to rule until there were free elections, to free political prisoners, and to respect human rights.

The new reform-minded junta was opposed by both left and right. The left denounced it as an attempt to weaken "popular movements," while the right called the proposed reforms "subversive and Communist-inspired." That juncture was the beginning of the U.S. policy of support for the reforms as a means to create a democratic "center" in Salvadoran politics, a policy that lead in March (1982) to the voting for a constituent assembly. The guerrillas called for a boycott of the elections and tried to disrupt them. Despite those efforts, says the United States, about 90% of eligible voters participated—although a study by the Jesuit-run Universidad Centro-Americana in San Salvador claims that the percentage was actually quite a bit less.

In the aftermath, critics of the political regime in El Salvador complain about the lack of promised land reforms, the lack of human rights, hunger, poverty, and the general low quality of life of the people living in rural areas.

The war still rages at a high pitch. In only six months of 1982, unidentified para-military death squads were blamed for 1,227 civilian deaths, mixed armed forces groups for 973 deaths, the army for 674, the National Police for 4, the Civil Guard for 35, and the guerrillas for 46. Many people claim that the death squads are made up mostly of members of the Civil Guard, National Guard, National Police, and Treasury Police. The overall total for last year of 4,419 non-combat dead is an indicator of the violence which rages through the small nation and which permeates the streets of its villages.

The United States has supported the government forces in El Salvador with technical advisors, supplies, and with large amounts

Keyboard programmable 2-meter FM ham transceivers such as these by Yaesu and Kenwood are more versatile and lightweight than standard military communications gear.

of money. The position of the United States is that the Salvadoran government is worthy of U.S. support because it became a democratically elected one in the legislative election and is continuing to carry out meaningful political and economic reforms—although there are many who dispute that the elections were not what they seemed and economic reforms haven't resulted in much change.

Despite the money and technology which has been poured into El Salvador, the guerrillas continue to fight on with the encouragement from at least part of the general populace. The leftist guerrillas have been helped by their own resourcefulness and the overall ineptitude of the government forces. In fact, last October, the guerrillas received new weapons and communications gear and launched into a new offensive against government forces. They attacked targets in the departments of Chalatenango, Morazan, Usulutan, and La Union. Much of their weaponry has been funneled in by Moscow and Havana via Nicaragua, or it is purchased from Salvadoran soldiers.

It is generally considered necessary for a conventional army to have a 10-to-1 numerical advantage to defeat a guerrilla movement. The Salvadorans don't quite make the grade. The army consists of 22,400 men, about 4100 of whom have been trained by the United States; there are another 11,000 local security forces. The armed forces have been low on munitions. They have no air defense, no field hospitals, and only 18 helicopters for air transport. Casualties have been heavy; last year, 12% were killed or wounded. There are, in contrast, 6,000 or so guerrillas of the Farabundo Marti National Liberation Front.

When it comes to communications, the guerrillas don't have to go to Moscow or Havana, for neither of these sources can easily supply what they need. Both Moscow and Havana are bogged down with large and clumsy tactical radio gear of outdated design. The guerrillas require lightweight and highly portable gear, short-range and versatile. They found a very simple and direct approach to the problem, having obtained on the world market a large number of amateur radio 2-meter band hand-held FM transceivers. They are simple to operate, rugged, easy to obtain, and generally far more suited to their needs than cumbersome military transceivers, such as might be supplied by either the Soviets or the Cubans. The guerrillas appear to be unconcerned that their operations are taking place within a frequency band reserved for other purposes. At this point, there is little legitimate use of the 2-meter ham band in El Salvador anyway.

The guerrillas especially like the keyboard programmable hand-held transceivers. Popular types noted in actual use include the Santec ST-144 (runs 3.5, 1, and .1 watts between 142 and 149.995 MHz), the Kenwood TR-2500 (2.5 and .3 watts from 143.9 to 148.995 MHz), Yaesu FT-208R (2.5 and .2 watts from 143.5 to 148.495 MHz), and the ICOM 2AT (1.5 and .15 watts from 144 to 147.995 MHz). Keyboard programmable transceivers offer the handy feature of 10 channel memory or the ability to re-program all new channels without very much effort. They can also operate in duplex mode to add a measure of security. Despite the fact that some of these sets can be programmed to operate outside the limits of the 2-meter ham band (144 to 148 MHz), most guerrilla communications seem to take place within the band, and one of the popular frequencies noted has been 146.57—although when you've got almost 800 potential "channels" from which to choose, you can be quite innovative and seldom have to be "married" to any particular frequency for more than a day or two at a time.

The fact is that the guerrillas change frequencies regularly and also seem to like to modify their coded station identifications on a regular basis, although ID's are often no more than an informal nickname for the guerrilla who happens to have control of the equipment at that time. Each band of guerrillas appears to have at least one transceiver available, while most roving bands actually have several transceivers on hand for intercommunication within their own unit and for checking with other bands. Various guerrilla headquarters units are also radio equipped and utilize ground plane antennas mounted atop trees, poles, church steeples, or other high points for extended range.

The casual listener to the 2-meter ham band in and around El Salvador is probably going to hear only the communications of the Marxist guerrillas. The voices of men, women, and even youngsters are heard shouting commands and giving recon information. Transmissions are short and usually sound highly animated and emotional.

Our cover photo this month shows a lady guerrilla seen in Usulutan while radioing recon information back to one of the other fighters in her own unit; hardly what you'd expect to hear on the 2-meter band on a lazy Sunday afternoon in Baltimore, Birmingham, Burbank, or Bellingham!

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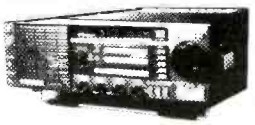

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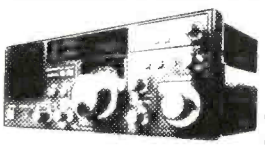

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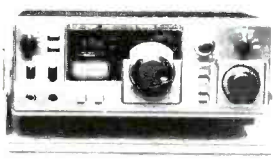

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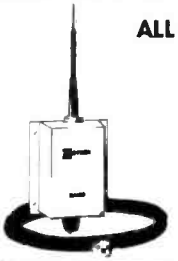

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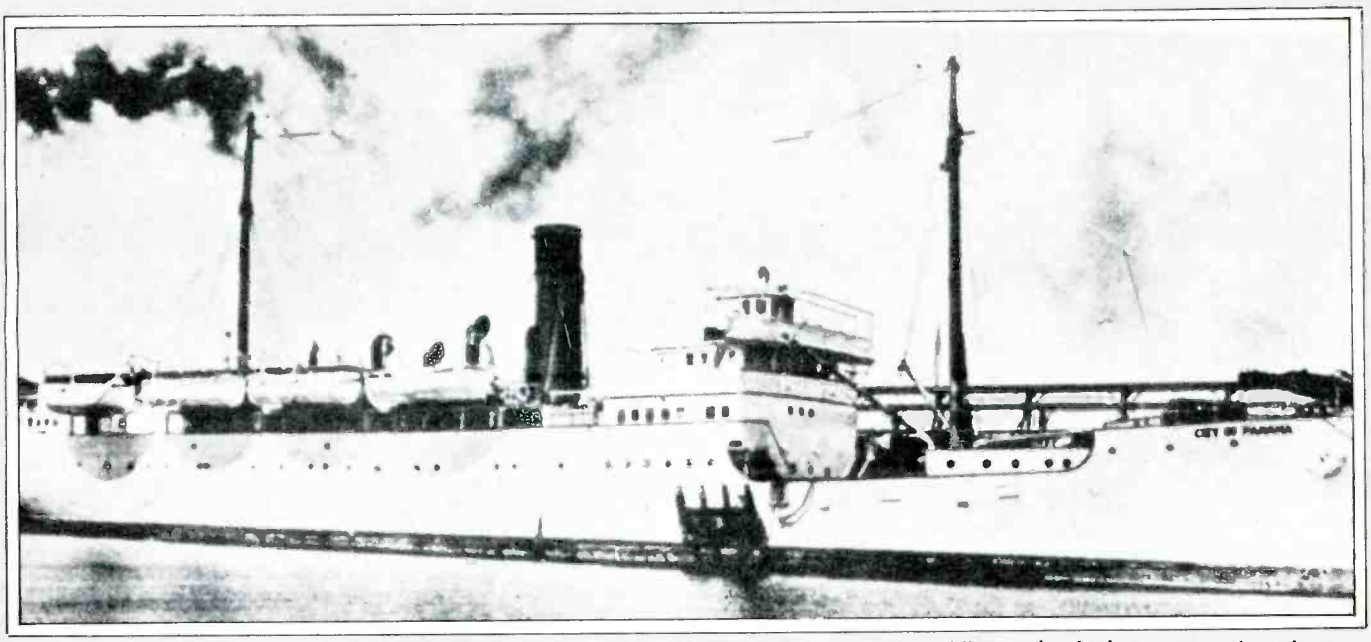
CIRCLE 16 ON READER SERVICE CARD



Only known photo of the famed S.S. City of Panama, floating speakeasy and casino and world's very first high-seas pirate broadcaster.

It's The Golden Anniversary Of:

The World's First High Seas Pirate Broadcaster!

The Year Was 1933 And The Place Was The U.S.A! By TOM KNEITEL, K2AES, EDITOR

The Soviets like to claim that they invented television; the Chinese lay claim to the discovery of spaghetti; while folks in some midwestern American city (St. Louis?) like to say that they invented the ice cream sandwich. I suppose that there are those who could (and perhaps would) try to dispute any or all of those claims, but there are few who would dispute that it was the United States that was host to the world's very first high-seas pirate broadcasting station. It was a full-fledged, four star international flap from start to dramatic finale, and 1983 marks the 50th anniversary of the infamous pirate broadcaster "RXKR."

RXKR was a big and brassy buccaneer that operated right off the California coast. Before RXKR walked the plank, it managed to scuttle at least two licensed broadcasters and had bureaucrats and diplomats of several nations howling long and loud.

This bizarre story took place aboard a former convoy sloop (or "Q-boat"), the *HMS Mistletoe*. Built by the British Royal Navy for use during World War I, the *HMS Mistletoe* was completed in only five months, just in time to be too late for wartime service. In fact, the *HMS Mistletoe* was a piece of war surplus junk right from the day she was launched and slid down the ways into the water.

The British promptly unloaded the vessel and found ready customers in Mexico who renamed her *Chiapas* and engaged her in merchant trade sailing from Mazatlan. But the vessel did not turn the profit that had been expected, and it wasn't long before she was repossessed and turned over to new owners, who decided to change her name to *Playa Ensenada* and then later to *La Playa*.

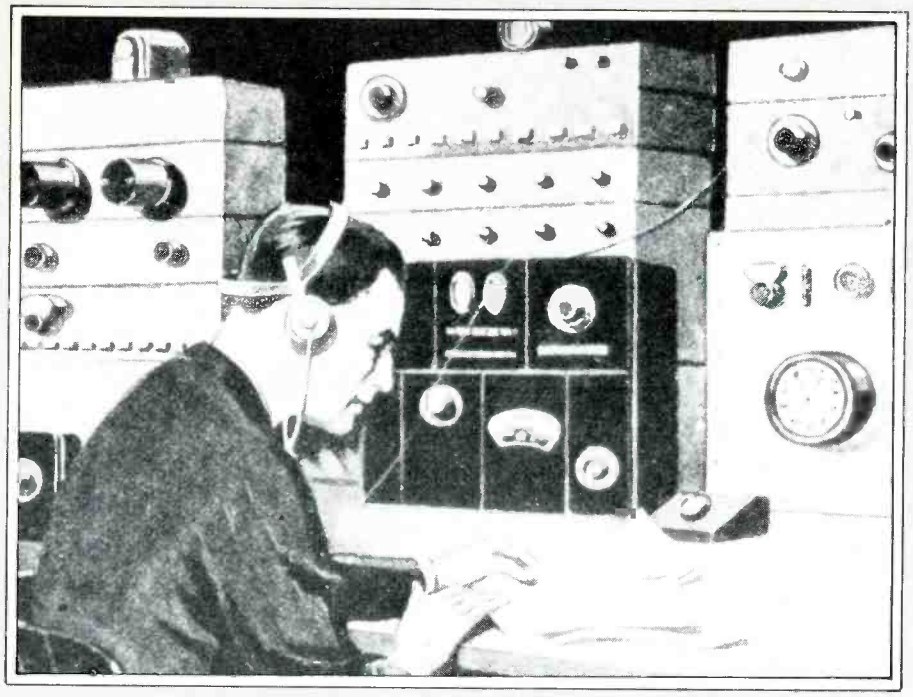
At some point in the career of *La Playa*, her owners gave up on the notion of trying to turn a profit with the vessel functioning as a cargo steamer. By 1933, *La Playa* was 15 years old and for some months had been operating as a floating saloon (the polite description in those days was *excursion ship*), which took passengers from San Pedro (California) into international waters for a few glorious hours of immunity from Prohibition and anti-gambling laws. Actually, there were many such ships during the early 1930's. During the floating saloon era of the *La Playa*, the vessel was owned by George A. McLoney under mortgage from one J. Dale Gentry.

It seems that in December of 1932, McLoney had promised Gentry that he would end *La Playa*'s career as an excursion ship and transfer it to new owners who wanted to make her into a respectable lady by turning her into a floating public-relations showboat plying Pacific coastal waters of the United States on behalf of Panamanian export products. The new owners had big plans and said that they were going to install a lavish restaurant, bar, and dance hall, and would also provide the ship with a radio station to be called The Voice of Panama.

The manager of the public relations ship was Cecil M. Newcorn, who promptly received a temporary ship's registration from the Panamanian government. Then they happily granted the ship a change of name from *La Playa* to *The City of Panama* in order to mark her new image and role in the service of Panamanian industry. They were also pleased to issue the ship a license to conduct experimental non-commercial broadcasts from international waters on a frequency of 815 kHz. This license, which bore the callsign RXKR, permitted a power of 500 to 1,000 watts.

On The Surface

All of this, on the surface, sounded like an ideal situation for all concerned. There were a few minor glitches however, not the least of which was that Mr. Newcorn was well known to most Panamanian businessmen and many of them were somewhat uneasy about Newcorn and his floating public rela-



tions scheme. They recalled that in 1931, he had promoted an outfit proposing to use a new palm nut cracking machine for the commercial production of palm oil. The idea was a dismal flop and all who had been convinced to invest in it, according to the U.S. State Department, were said "to remember Mr. Newcorn with anything but pleasure."

In April 1933, about three weeks before the formal opening of broadcast operations by RXKR, the Voice of Panama, a formal protest was made to the American Secretary of State by a Washington law firm. The attorneys suggested that RXKR might well be expected "to interfere with and ruin the transmission" of American broadcasting stations. The State Department agreed and thereupon cabled a demand to the Panamanian government to cancel the registration of *The City of Panama*.

The Panamanian consul in Los Angeles was furious at such a suggestion and promptly told us to mind our own business. He said that the vessel was fully within its legal rights, that the United States could not dictate rules of conduct for vessels operating in international waters, and that the owners of RXKR had promised to operate it as "a high class station" that would abide by the standards established by the Federal Radio Commission (forerunner of the FCC).

Full Steam Ahead

Amidst all of the ruckus, a company called the Panama Broadcasting Co. was formed, with Mr. Cecil M. Newcorn at the helm. The offices were located at 1646 West Adams Blvd., Los Angeles. By the end of May, RXKR had commenced broadcasting on 815 kHz (the FRC measured the exact frequency as 815.067 kHz).

The fact was that despite the name change and grand plans, the bottom line was that *The City of Panama* could not accurately be described as a public relations showboat for Panamanian industry. Essentially, it was still the same floating speakeasy it had been when it was owned by McLoney and sailed under the name *La Playa*. The major difference was that it now had a radio station aboard, a station which was running an estimated 5,000 watts and had started soliciting advertising from companies in Los Angeles. It was reported that advertisers had contracted for as much as $1,500 per month. The FRC was claiming that at least some of the RXKR broadcasts were being made while the vessel was "anchored in Santa Monica harbor."

In Shock

The State Department viewed all of this on a very grim level. American broadcasters were in absolute shock. The listening public was both confused and angry. Since broadcast receivers in those days exhibited poor selectivity (tuning about 40 kHz at a clip), listeners were in the habit of seeking out a clear-channel, high powered broadcaster, even if it meant listening to a station hundreds of miles away.

When RXKR hit the airwaves on 815 kHz with 5,000 watts, their signal was nothing short of fantastic. So was the interference the station caused. Clear channel station WCCO on 810 kHz in Minneapolis was no longer heard in the western states; neither was WHAS (820 kHz) in Louisville. Listeners from as far away as Hawaii, New York, and even Nova Scotia reported hearing excellent signals from RXKR. Actually, 815 kHz was an excellent frequency for RXKR's purposes; the only broadcasters in southern California near that frequency were a couple of 500 watt stations, KELW and KTM, in Burbank and Los Angeles, and they were on 780 kHz—too far from 815 kHz to hamper the mighty RXKR signal in any way at all. On the other hand, CNRH (815 kHz) in Nova Scotia called it quits shortly after RXKR commenced broadcasting, and they never returned to the air!

In Mexico, station XFI, operating on 818 kHz with 1,000 watts from Mexico City, also tossed in the towel soon after RXKR arrived on the scene. Another station in Mexico City, XETW, had been running 500 watts on 830 kHz, where interference from American clear-channel powerhouse KOA in Denver had long irritated the station owners. When XFI called it quits, XETW quickly hopped over to 815 kHz, bucked RXKR for a few harrowing weeks and then fled back to its old 830 kHz frequency to take its chances with interference from KOA in Denver.

Many listeners in southern California simply gave up trying to hear any stations operating between 790 and 840 kHz during RXKR's operating hours. Complaints poured into the FRC. Impassioned pleas were presented to *The City of Panama*'s owners to remove the station from the air. Such pleas were ignored. However, when several American broadcasters whose signals were being jammed implored RXKR to at least have the decency to change its operations to another frequency, RXKR's owners responded that they would be "willing to accept $5,000 or $10,000 as compensation for their troubles if they are requested to operate on other frequencies." In other words, they were, in effect, holding 815 kHz hostage for ransom! In addition, the RXKR management was so pleased with the effect of their operations that they were planning a voyage along the entire Pacific, Gulf, and Atlantic coasts.

The State Department, with obvious feeling of panic, told Panama that they feared the development of a gigantic racket with many itinerant pirate broadcasting ships "moving from place to place and demanding tribute from broadcasting stations under penalty of disrupting their service." Besides, the Mexican government had been considering removing from the air stations that peddled quackery (like Dr. Brinkley's station) to American audiences, and some of those folks were also starting to make noises like they might take to the high seas for their broadcasts.

Reading The Mail

Letters were zipping all over the hemisphere in an attempt to get RXKR off the air. On June 7, 1933, a cablegram from Washington decried the "serious interference" problem and demanded that RXKR's broad-

casting license be canceled without any further delays. On June 16, Panamanian President Arias has obviously reconsidered his position because he requested his Secretary of The Treasury to cancel the registration of *The City of Panama*. The cancellation was announced officially in the Panamanian newspapers on June 18, 1933. According to the Panamanian news media, the ship was no longer sailing under that nation's flag and it had no license.

Nevertheless, three weeks later the ship was still in operation and RXKR was going full blast on 815 kHz as if nothing had transpired. Our government contacted the Panamanian Consul in Los Angeles, who claimed that he had received no cancellation of the ship's registration and/or radio license. The management of RXKR was also playing it cool and innocent, coyly offering to voluntarily give up their Panamanian registry if they could obtain a U.S. registration. This way, they claimed, they might be able to obtain an FRC broadcast license.

Fuming with rage, the State Department suggested that the Los Angeles port authorities "see that the Panamanian flag is removed from the vessel." On August 2, with RXKR still holding down 815 kHz with music and commercials, Washington again telegraphed Panama and strongly demanded that they advise their Los Angeles Consul that the ship was no longer the holder of a Panamanian registration.

A New Problem

Now there suddenly appeared a new complication. There arrived on the desk of Secretary of State Cordell Hull a letter from Sen. Hamilton F. Kean of New Jersey. Kean asked for a report on "who is placing the complaint (about RXKR) and the reason and nature of same" and went on to complain of the losses to the station's owners should they be forced to shut down. Apparently, *The City of Panama* folks had sold the Senator a bill of goods without mentioning any of the many problems involved, and the Senator, without bothering to check further, believed what he was told.

Kean's letter made the rounds of various State Department officials for a few weeks. Seemingly, nobody quite knew how to gracefully advise Sen. Kean that he had been taken in. Eventually, Cordell Hull fired off a very strong four pager in reply, which very bluntly stated the entire gory situation concerning the ship's operations and operators. Sen. Kean discretely decided to back away from the situation as quietly and quickly as possible. Within a few weeks, a sufficient amount of data had been sent to the Panamanian Consul in Los Angeles to make it abundantly obvious that *The City of Panama* had actually lost its Panamanian registration and had no right to fly that nation's flag, nor broadcast under that nation's license. The ship was towed into Los Angeles harbor by American authorities—a vessel without a country. In 1934, just after Prohibition was repealed, she was sold to new owners who renamed the ship *Star of Hollywood*. In 1939, at the age of 21—with more years of high adventure in her log book than many ships several times that age—the vessel was dropped permanently from registration for reasons which could not be learned.

Because of the RXKR affair, a special section was written into the 1938 Cairo Radio Regulations which states: "Mobile stations at sea are forbidden to make radiophonic broadcasts for direct reception by the general public." The law has been perpetuated and expanded in subsequent international radio conferences at Atlantic City in 1947 and Geneva in 1958. It worked pretty well until 1958, when the Dutch pirate Radio Mercur went on the air, bringing with it a whole pack of high-seas pirate broadcasters such as Radio Caroline and various others.

But it was Uncle Sammy who keel-hauled the first high-seas radio pirate 50 years ago. It was an international first, causing embarrassment and necessitating enormous political maneuvering before the station became dislodged from the airwaves.

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.

Making Light Of A Serious Topic

Many years ago, I remember reading how to build a two-way communications system which, instead of radio waves, used light waves—the kind you get from a battery powered lantern. These light sources could be modulated and received via photoelectric cells connected to audio amplifiers. It would seem to me that this type of system would have many applications for sensitive point-to-point communications, offering more security and privacy than even microwave. Whatever became of "talking on a light beam"?

Samuel Cavalerro, Sr.
Big Bend, TX

The idea you mention seems to have been explored to a large degree by ham operators during World War II, when the hams weren't allowed to operate on the regular bands. The concept of using light waves as a communications medium eventually evolved into so-called fiber-optic communications, which sends the light waves along fine strands of glass fibers to their destinations rather than through free space, as done in earlier experiments. This type of operation is now being put to many uses by various telephone companies, and it has an enormous potential in military communications. So far, the military has been extremely sensitive about its possible uses of optical fiber communications, which would imply that it has big plans for this technique. In fact, last March there was a fiber-optic symposium in New Orleans and military censorship caused three papers (all written by members of the military) to be censored to the point where they had to be withdrawn. That was small potatoes. Last August there was an optical engineering meeting in San Diego; about one hundred papers caused havoc. All of the censored papers were to have been general surveys of military applications of fiber optics. Came a long way from using battery powered lanterns as an alternative to ham radio, wouldn't you say?—Editor

Broadcast Comment

I cover the technology end of things for a publication called *Broadcast Week* and I have found *POP'COMM* useful in filling me in on broadcasting topics not usually covered by other publications. I thought your idea for low-power AM radio broadcast stations in the January issue made sense, especially since the FCC is considering a similar idea in the TV area. Keep up the good work with *Popular Communications*.

Les Lutcher
Broadcast Week
101 Park Avenue
New York, NY 10178

Thanks, Les, and Broadcast Week *looks good to us, too. In fact, if any of our readers are interested in tapping in on the latest news of what's happening in the world of commercial broadcasting,* Broadcast Week *looks to have a lot of information to offer. Check directly with* Broadcast Week *for current rates. —Editor*

Hot Time In The Ol' Scanner

My hand-held scanner is equipped with Nicad batteries. Can I charge these batteries in the scanner directly from my vehicle's charging system, or can I operate my scanner directly from my vehicle's electrical system and eliminate the batteries altogether? I have a Bearcat Thin Scan.

Morton Krumgold
Albuquerque, NM

I'll admit that it sounds like a good idea except that your scanner (which takes four "AAA" 1½ volt batteries) requires 6 volts for its operation. Your vehicle's charging system puts out about 13 volts and will certainly sizzle the pants off of your scanner if you try direct charging or operation of the thing. Check with a couple of auto electrical shops as they probably have a voltage dropping device available, which will drop the vehicle's voltage to 6 volts and allow you to do what you want without damage to the scanner. A suitable device would be the National Semi conductor type 7806 — Editor

Two Sides Of The Same Story

I can't believe anyone would be so stupid as Joe Belinni in writing an article like "Getting Those Non-Broadcast QSLs" (April issue) unless it's you for publishing it. The last thing we need is a bunch of jackasses QSLing sensitive frequencies and letting the operators realize the extent to which they are being explored. Jerks like author Belinni and those who take his advice will start up their scanners someday and the only unscrambled transmissions they'll have left will be the weather on 162 MHz. Let the hams and SWL/DXers have their collection of QSL cards. QSLing has no place on VHF and UHF.

Phil Lavette
Longmont, CO

The April issue was the first one I received under my subscription and I was especially pleased to see the exceptionally candid and well thought-out story on QSLing non-broadcast stations. The author reasonably presented all aspects of this most interesting topic. Even though I've been actively collecting QSL cards from aero, marine, industrial, and public safety stations for the past two years, I must say that your story pointed out many useful ideas which had not occurred to me previously. I've put those ideas to use in my own efforts and have noticed a definite increase in the percentage of returns I've gotten. For the most part, I've found that these stations have been willing to QSL by means of a prepared return QSL card.

Robert Kellerman, Ph.D.
Elgin, IL

Despite reader Lavette's negative thoughts on the topic, many readers have written in with information on their generally good experiences in QSLing VHF communications stations of various kinds, as well as voice, CW, and even RTTY stations on the HF bands. It is rather naive to think that with millions of scanners now in use there are users of the two-way communications who are unaware that many people can (and will) listen, regardless of requests for QSLs. —Editor

Spy Lingo Comment

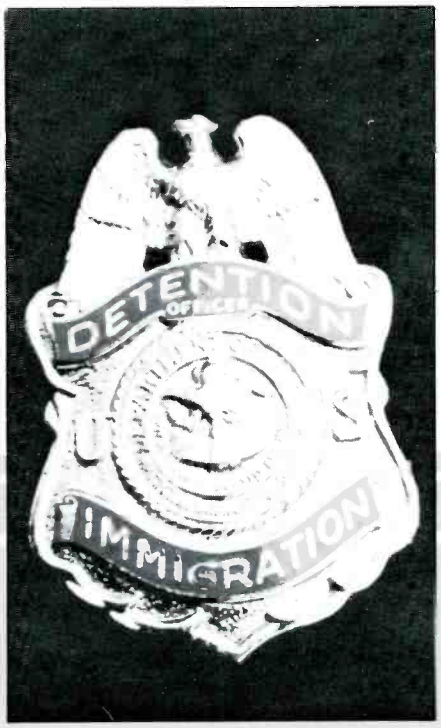
I compliment you and your staff on a unique and extremely informative journal. As a charter subscriber and long-time SWL, I haven't missed a single issue and enjoy them all thoroughly. Congratulations on filling a void that existed for too long on true SWL information.

Your "Spy Lingo" story (Nov83) was impressive. I must comment on the letter from your Ohio reader. I was a member of the intelligence community for 28 years and am now with a commercial firm that produces defense electronics systems. The organization referred to as the Old Crows does indeed exist. It is now called the Association of Old Crows (AOC) with headquarters in Arlington, Virginia and has an extensive national membership. Their official journal is the "Journal of Electronic Defense," published monthly. The AOC sponsors many symposiums yearly dealing with such matters as electronic warfare, electronic countermeasures, communications, etc.

I take exception with your Ohio reader's comments regarding the explanation of the caveat NOFORN. Your original explanation was accurate: NOFORN means exactly that, no foreigners. If classified material with a NOFORN caveat is to be distributed to the British, Australians, Canadians, and New Zealanders, it is labeled such (UK, US, EYES ONLY). The "UK" includes the British Commonwealth and former members noted above. Separate exchange agreements have been made with the Israelis concerning access to classified material and are not allowed carte blanche access with the British and our other allies. Perhaps your reader from Ohio has been out of the intelligence community too long.

Continue your fine work.

Name withheld by request
Gaithersburg, MD



Federal Agencies Use HF Frequencies Too!

DXing The Feds On Shortwave

BY HARRY L. HELMS, KR2H

If you're like a lot of other *POP'COMM* readers, you have a VHF/UHF scanner to eavesdrop on the various law enforcement agencies in your area. That's good—but did you know that you can listen to such agencies as the FBI, Border Patrol, and even INTERPOL on *shortwave*? It's true, and not really surprising when you consider that the needs of these agencies extend beyond the limited coverage afforded by VHF/UHF. Let's take a closer look at this activity.

FBI Communications

The Federal Bureau of Investigation is the closest thing the United States has to a national police force and needs a nationwide communications network to support its operations. While most communication between offices is conducted by wire, a radio network is still maintained and can be heard in operation.

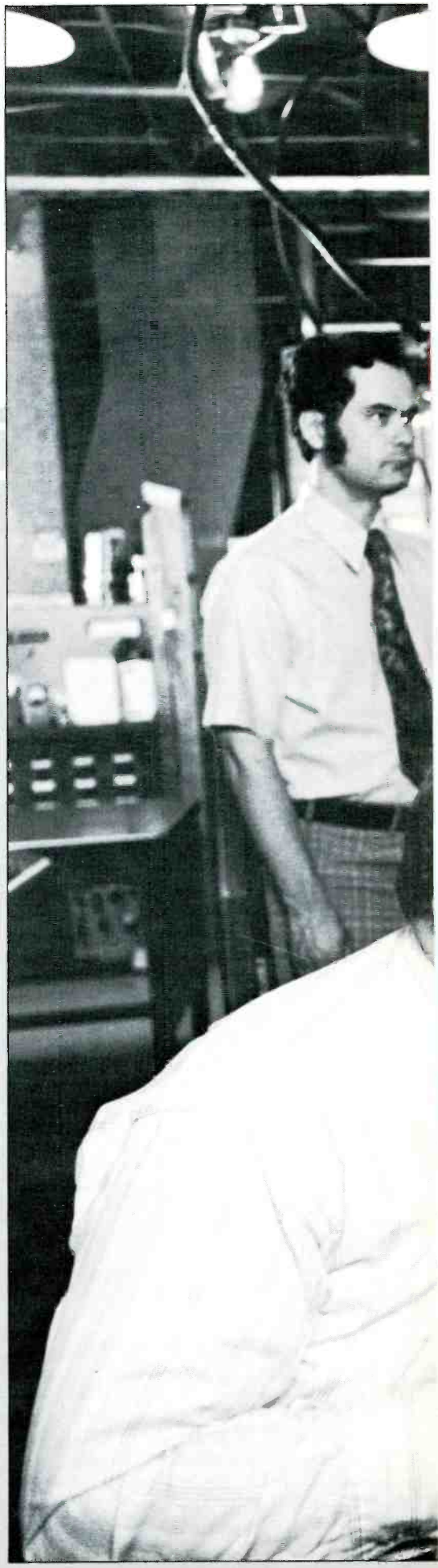
FBI stations can be found on 7905 kHz using CW or RTTY and on 10913.5 kHz in SSB. The net control station is KGE33, operated by FBI headquarters in Washington, DC. A third channel, 11488 kHz, has been used in the past. Call signs and locations of other FBI stations are as follows:

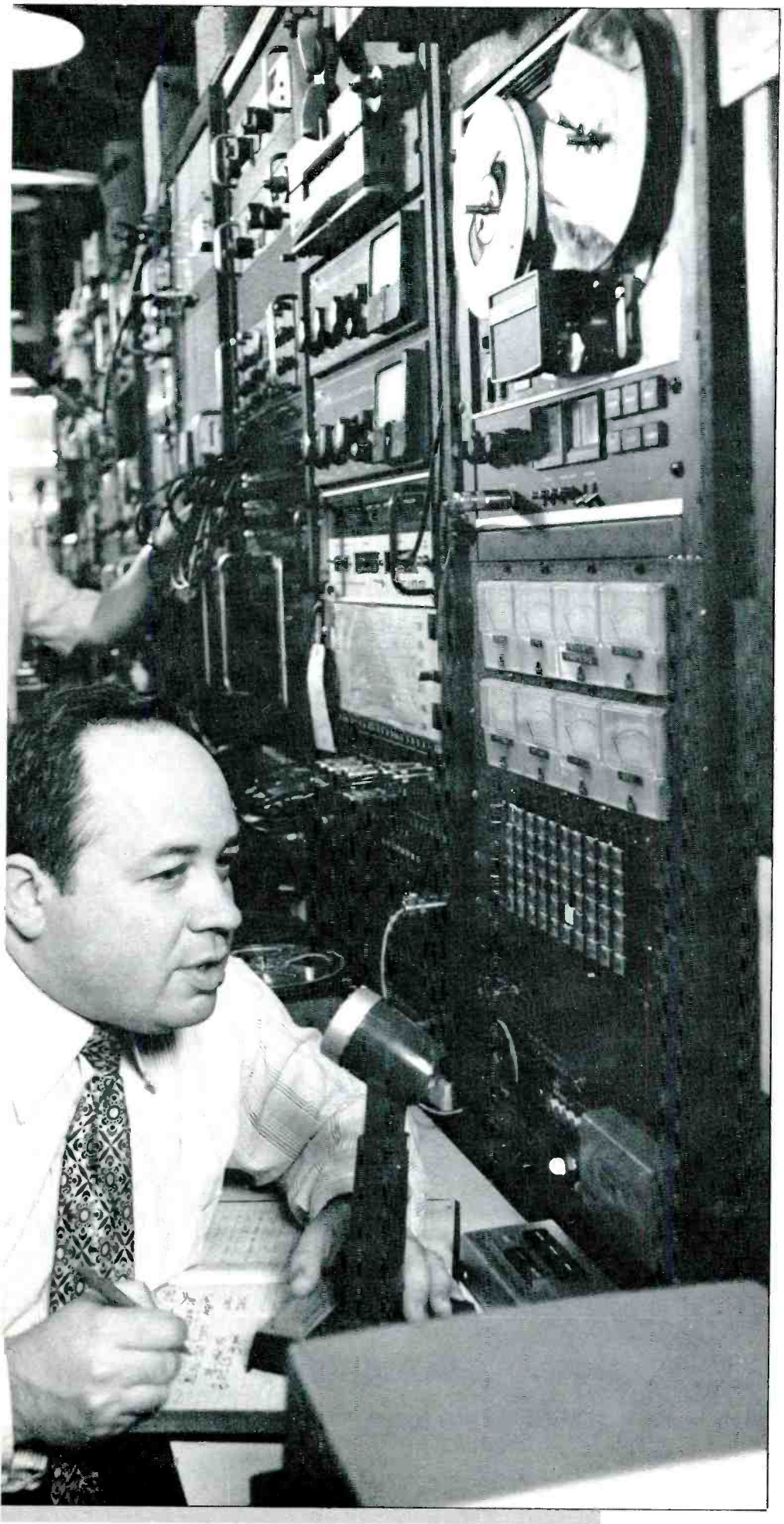
KEC71	Buffalo, NY
KEC96	New York, NY
KIJ22	Miami, FL
KKI99	San Antonio, TX
KKJ22	San Francisco, CA
KKJ88	New Orleans, LA
KKJ98	Oklahoma City, OK
KMG27	San Diego, CA
KOG71	Phoenix, AZ
KOG93	Salt Lake City, UT
KOH22	Seattle, WA
KSD61	Chicago, IL
KUR27	Honolulu, HI

Other U.S. Government Frequencies

If you've traveled north from the Mexican border on a major highway, you may have spent some time in a traffic jam created by the U.S. Border Patrol. Such traffic jams are the by-product of roadblocks set up by the Border Patrol to catch illegal aliens. Such roadblocks are coordinated through VHF/UHF communications. However, the Border Patrol also maintains communications facilities on shortwave. The most common frequency is 9434 kHz, and transmissions are in CW and RTTY. Some stations recently heard there have been KAD260, New Orleans, LA; KAD680, Buffalo, NY; and KAK700, Detroit, MI.

It might come as a surprise to discover that the agency responsible for assigning shor-





wave frequencies is also a major user of the shortwave spectrum. That's right—the FCC maintains a network on shortwave. All transmissions are in CW or RTTY, and active frequencies include 10902, 13892.5, 22964, and 23035 kHz. Among the stations operated by the FCC are:

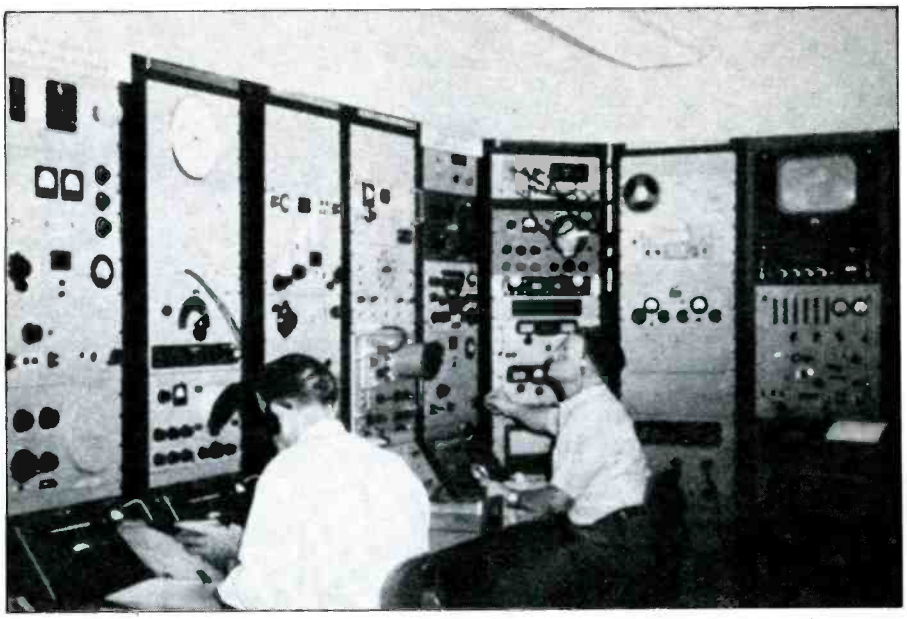
KAA60	Grand Isle, NE
KCA35	Belfast, ME
KCA38	Canadaigua, NY
KCA39	Ambrose, TX
KGA91	Laurel, MD
KGA93	Washington, DC
KIA84	Powder Springs, GA
KIA85	Ft. Lauderdale, FL
KKA59	Douglas, AZ
KKA60	Kingsville, TX
KMB27	Livermore, CA
KOA56	Marietta, WA
KQA62	Allegan, MI
KQG56	Chillicothe, OH
KUN70	Waipau, HI
KUN75	Imperial Beach, CA
KWC41	Anchorage, AK

Those of you who engage in pirate radio activities might find it worthwhile to keep an ear on these frequencies before, during, and after your activities!

INTERPOL Communications

The International Police Organization (INTERPOL) has been featured in numerous novels and movies, with its agents popping up around the world to smash spy rings, recover stolen gems, and foil kidnapers. In reality, INTERPOL has no agents and engages in no overt crime-busting activities. It is an information-sharing organization of national police forces (for the United States, the FBI participates in INTERPOL). One extensive INTERPOL net is on 10390 kHz, and all transmissions are in CW. The stations in the net are as follows:

AYA47	Buenos Aires, Argentina
CNP	Rabat, Morocco
CSJ26	Lisbon, Portugal
DEB	Wiesbaden, West Germany
EEQ	Madrid, Spain
FSB57	Paris, France
GMP	London, England
HEP39	Zurich, Switzerland
IU481	Rome, Italy
JPA56	Nagoya, Japan
LJP20	Oslo, Norway
LXF50	Luxembourg
ODW22	Beruit, Lebanon
OEQ35	Vienna, Austria
OGX	Helsinki, Finland
ONA20	Brussels, Belgium
OWS4	Copenhagen, Denmark
PDB2	Utrecht, Holland
SHX	Stockholm, Sweden
TCC2	Ankara, Turkey
XJE57	Ottawa, Ontario
YO99	Bucharest, Rumania
4XP41	Tel Aviv, Israel
5BP6	Nicosia, Cyprus
7RA20	Algiers, Algeria
8UF75	New Delhi, India
9TK21	Kinshasha, Zaire



Typical FCC monitoring station is in Laurel, MD. The man on the left is running a frequency check on an incoming signal. At the top of the panel over the man on the right, and also at the extreme left, are tape recorders used to capture evidence of on-the-air misdeeds. Indicator for DF antenna is at the upper left. The teletype (far right) links all of the stations.

A second INTERPOL net operates on 11538, 13520, 13820, 14607.5, 14707, 14827, 15738.2, and 19360 kHz. The stations in this net include:

HEP58	Zurich, Switzerland
ONA20	Brussels, Belgium
SHX	Stockholm, Sweden
TUW220	Abidjan, Ivory Coast
PPC	Brasilia, Brazil
ZPZ	Asuncion, Paraguay
5OP25	Lagos, Nigeria
5TP25	Nouakchott, Mauritania
5YG	Nairobi, Kenya

Good DXing! And be sure to report reception of any of these stations to Communications Confidential in *POP'COMM!*

One "DX Corner" program is aired by Radio RSA in South Africa. Three of the people who put the program together are (left to right): Peter Martins, writer and presenter; Colin Houston, producer and co-presenter; and Rodney Larsen, the recording engineer.

The DX Program Directory

Let Your Shortwave Receiver Bring You Late DX News!

BY GERRY L. DEXTER

Remember the TV series entitled *The Prisoner*? "Number Two" in The Village was always demanding information from "The Prisoner," played by Patrick McGoohan.

The program was perhaps prophetic in a way not intended, for we have come to live in an information-dominated society. For the DXer, information is a vital ingredient if one is to be successful in tuning those elusive stations.

One of the many sources of information available to the shortwave listener is the DX program.

Like automobiles or breakfast cereals, DX programs come in a wide variety of sizes, shapes, and brand names. Some have a lot of "snap, crackle, and pop" to them; others are just "there" offering little of substance. Some are a straight read through of loggings; others deal more with technical information, inside looks at various elements of the media, station, and equipment reviews; and still others are little more than answering letters from listeners.

Let's examine a few DX shows and get an idea of what they're all about.

Sweden Calling DXers This show, from Radio Sweden International, is the longest-running and perhaps most widely known of the DX programs. It was originally produced by veteran Swedish DXer Arne Skoog and the first show went on the air on February 28, 1948, losing out by six months to Radio Australia for the honor of being the first DX program.

Skoog retired in 1978 and turned the show over to California-born George Wood, who likes to point out that he is younger than his program.

The program is news-orientated, with reporters presenting information from the various continents. Particular emphasis is placed on news of Third World broadcasting and the reception of stations in these countries.

Listeners who submit reports to Sweden Calling DXers get on a mailing list to receive free copies of the *Sweden Calling DXers* bulletin, which is issued once a month and contains highlights of the past four programs. Over 1,700 issues of the bulletin have been produced and there are some 1,500 DXers, club bulletins, editors, and stations on the mailing list.

The show has also dealt with such subjects as the New International Information Order, unofficial radio (that is, pirate broadcasting), community radio, and features about the various stations Wood has visited.

Sweden Calling DXers has also transmitted tests in slow scan TV (SSTV), put together by the inventor of the Cop MacDonald.

Sweden Calling DXers is aired each week on Tuesdays at 1400 on 21.615, at 2300 to 0230 on 9.695 and 11.705. Other versions go out in German, French, Spanish, and Russian.

Media Network Radio Netherlands Media Network, hosted by Jonathan Marks, is a relatively new effort begun in 1981. But DX programs on Radio Netherlands go back more than twenty years, when the DX Juke Box was founded by Harry van Gelder.

Today's Media Network places emphasis on electronic media of every kind.

The show goes into production early on Wednesday morning and is recorded on Wednesday evening. The show makes heavy use of the telephone, often going right to the source of the week's media news. You might hear, for example, an interview with an engineer or owner of a new station about to go on the air. The program deals with clandestine broadcasting, single sideband test broadcasts, the transmission of computer programs, and so on.

Pirate and clandestine news is offered periodically by John Campbell, African items from Richard Ginbey in South Africa, North American items from Dan Robinson in Washington DC, as well as others. A lot of material is packed into the thirty minute show, which is sprinkled with wry humor.

According to Marks, the show presents "why a development is taking place rather than just when and where on the dial."

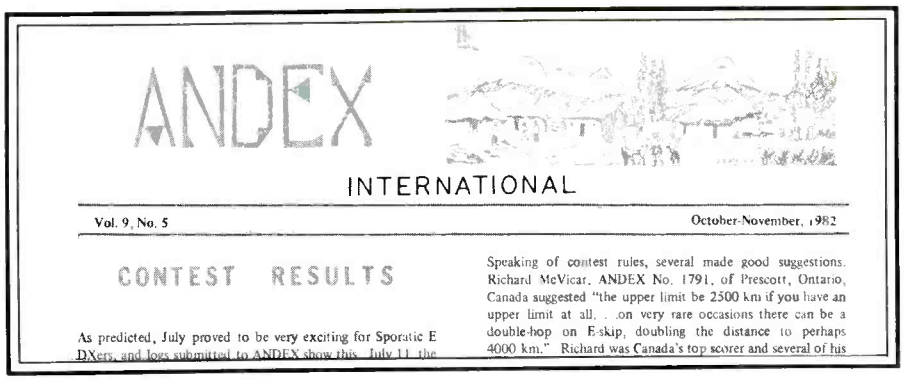
Marks believes "this approach enables us to cater to a wider audience than the traditional DX program and thus offers an alternative to other broadcasters."

Explaining why it is necessary to make such extensive use of the telephone, Marks says, "we try to reach people behind a particular story since the news is then direct and less prone to misinterpretation."

Media Network makes available a number of booklets and information sheets to interested listeners. These include a booklist covering a wide range of printed and recorded material of interest to shortwave listeners and DXers. There are also over a dozen one sheet receiver reviews available. You can get a list of the publications by writing to Media Network, Radio Netherlands, P.O. Box 222, 1200 JG, The Netherlands.

Media Network is aired in English at approximately 0750, 0850, 0950, 1350,

Ben Dalfen, editor of "DX Corner" on Israel Radio.



ANDEX

INTERNATIONAL

Vol. 9, No. 5 October-November, 1982

CONTEST RESULTS

As predicted, July proved to be very exciting for Sporatic E DXers, and logs submitted to ANDEX show this. July 11 the

Speaking of contest rules, several made good suggestions. Richard McVicar, ANDEX No. 1791, of Prescott, Ontario, Canada suggested "the upper limit be 2500 km if you have an upper limit at all. . .on very rare occasions there can be a double-hop on E-skip, doubling the distance to perhaps 4000 km." Richard was Canada's top scorer and several of his

HCJB's "ANDEX International" bulletin, published by Andes DXers International in conjunction with the "DX Party Line" program.

1450, and 1850 on Thursdays and on Fridays (GMT) at 0250 and 0550. The Friday 0250 broadcast is probably the most convenient. Look for it on 9.590 or 6.165 via Bonaire in the Netherlands Antilles.

SWL Digest This is the current version of the Radio Canada Shortwave Club, which began in 1962 under the guidance of Pip Duke and Duncan Nichelson. At the time, Duke was head of RCI engineering and Nichelson was his assistant.

The listener's club continued until 1975 when the show was discontinued. In 1977, a DX show returned under its current host, the popular Ian McFarland. It was called DX Digest and began as a brief, five minute feature. In 1981, the program was named SWL Digest and now runs twenty minutes.

SWL Digest features reports from the Association of North American Radio Clubs and European DX Council, which alternate on the second program of each month. The third program of the month features a report from the ANARC DX Equipment Information Committee. Also every third week, there's an equipment test report by Larry Magne.

A regular weekly feature wrapping up each show is the week's DX news, presented by Glenn Hauser.

Other aspects of SWL Digest include special features on communications developments and material designed for both those who are just getting started in the hobby as well as more experienced listeners.

As McFarland describes it, "SWL Digest is a communications field magazine program. We try to cover many aspects of the Canadian communications industry and international aspects of communications as well." He notes "the program is designed for anyone with an interest in the fascinating field of communications technology."

Special features tied to 1983 and World Communications Year are being planned for the program.

SWL Digest can be heard on Saturdays in Radio Canada International's African service at 2130 GMT on 17.875, 17.820, 15.325, 15.150, and 11.945. This is a slightly longer version of the show than aired at other times. On Sundays, SWL Digest is aired in the European service at approximately 1930 on 17.875, 15.325, 11.905, 7.285, and 5.995; and on Mondays (GMT) during the North American Service at 0100 and 0400 during standard time months (0000 and 0300 during daylight savings); and also at 0000/0100 on 11.850 and 5.960 and at 0300/0400 on 9.755, 9.535, and 5.960.

Swiss Shortwave Merry-Go-Round "There's a lot more to DXing than just QSL cards" is the philosophy of the "two Bobs"—Bob Thomann and Bob Zanotti—who host this program on Swiss Radio International.

The 40 minute Saturday show concentrates on the technical side of radio featuring personalized answers to listeners' technical questions, along with technical demonstrations and what's termed "sometimes controversial" views on DXing versus shortwave listening. Actual DX news is also featured along with other topics.

The Shortwave Merry-Go-Round is aired on the second and fourth Saturday of the month; to North America between 0115 and 0345 on 6.135, 9.725, 11.715, or 15.305; between 0400 and 0630 on 9.725 and 11.715; and between 1245 and 1515 on 21.570.

Shortwave Merry-Go-Round got its start in 1951.

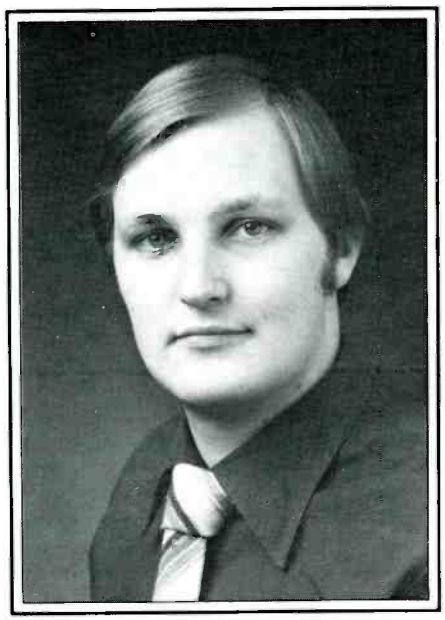
DX Party Line HCJB's popular show has been a staple from South America for many years.

The half hour program is aired twice a week (each a different program), on Monday/Tuesday and Saturday/Sunday.

The program is hosted by HCJB engineer Clayton Howard and his wife, Helen, with occasional assists or fill-in by Roger Stubbe, also an engineer at the station.

Regular features on DX Party Line include a report from the SPEEDX club, a European report from the Benelux DX Club on the first Monday of the month, a feature from the Handicapped Aid Program (HAP) USA on the second Monday, DX tips from well-known monitor Arthur Cushen of New Zealand on the third Monday, and a South Pacific report from Peter Bunn of the Australian Radio DX Club on the fourth Monday. Stubbe also does special features from time to time.

DX Party Line tries to introduce the hobby to newcomers, trying to include features and information that will capture the interest of the general listener—someone who just happens to tune in the show.



Jonathan Marks, who produces and presents the "Media Network" program on Radio Netherlands.

Associated with DX Party Line is the ANDEX DX Club, which publishes *ANDEX International* six times per year. The bulletin contains information about members, technical tips, and stories about South American radio stations. For information on joining ANDEX, write to the club in care of HCJB, Casilla 691, Quito, Ecuador.

DX Party Line is currently on the air on Mondays and Saturdays at 0930 on 6.130, 9.745, 11.925, and 26.020 (the 100 watt transmitter); 2130 on 15.295, 17.825, 21.447.5, and 26.020; Tuesdays and Saturdays (GMT) at 0230 on 9.745, 15.155, and 26.020; 0630 on 6.095, 9.745, 11.915, and 26.020.

Spectrum Australia Calling DXers was the title of the long-running program on Radio Australia which passed into history a few years ago. So, for a time, Radio Australia had no DX program.

But in the summer of 1981, Spectrum

was born and has been a regular part of Radio Australia's programming since.

The show is produced in conjunction with the Australian Radio DX Club and the Southern Cross DX Club, both of which provide material. It's on the air on the first, third, and (when there is one) fifth Sunday of each month.

A wide variety of features make up Spectrum and contributions are solicited from both individual listeners and DX clubs. The program attempts to interest more people in the hobby by trying to include information of a wider interest rather than simply reading a list of station names, frequencies, and times—something host Dick Speekman refers to as "digital diarrhea."

Speekman, incidentally, is no stranger to DX programs since he was the host of Radio Netherland's DX Jukebox in the 1970's and was involved in the production of Radio Netherland's series of technical courses for DXers.

Spectrum is aired Sundays at 0612 on 15.160, 15.240, 17.795, 17.870, and 21.680; at 0810 on 6.045, 9.570, 17.725, 21.720, and 61.680; at 1612 on 5.995, 6.045, 6.060, 6.080, 9.710, 17.795, and 9.770; at 2112 on 11.790, 15.160, 15.240, 17.795, 11.770, 21.650; and Mondays at 0330 on 15.160, 15.240, 21.740, 21.650, 17.870, and 21.680.

Waveguide A fairly recent entry into the ranks of DX programs, the BBC's Waveguide is designed for the general listener and its primary intention is to help listeners hear the BBC more clearly.

It also features advice on antennas, equipment reviews, and news about BBC engineering developments. Most importantly, at least for the serious DXer, Waveguide features regular reports on world broadcasting based on information provided by the BBC Monitoring Service.

According to Andrew Piper, who is Presentation and Operations Organizer for the BBC World Service, Waveguide is "very much shaped by what listeners ask or comment upon in their letters."

Where possible, listeners letters are read on the air. Every correspondent is replied to individually and each receives a frequency chart for their listening area.

Waveguide also issues computerized great circle maps showing the exact paths of shortwave transmissions around the world. Leaflets are also available explaining the connection between frequency and wavelength and the location of the BBC's transmitters in various parts of the world.

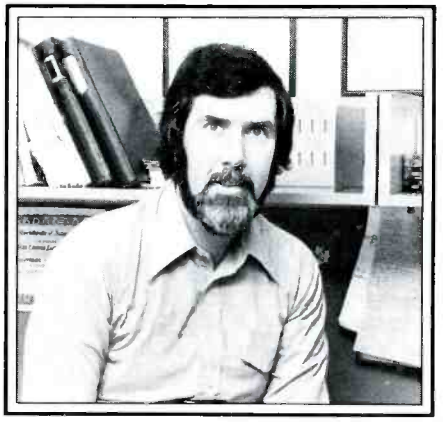
You can listen for Waveguide in the BBC World Service on Mondays at 0915, Tuesdays at 0100, Wednesdays at 0430 and 1735 over BBC World Service frequencies.

World of Radio An independently produced DX program, it's being aired weekly on WRNO, New Orleans, on Sundays at 0230 on 6.155 and at 2330 on 11.890 or 11.955. The program is also carried on a few low powered educational FM outlets.

DX Corner is a three to four minute feature of Calling All Listeners, the weekly letter box program on Israel Radio.

QSL card issued in commemoration of Sweden Calling DXers 35th anniversary.

"The two Bobs"—Bob Thomann, left and Bob Zanotti of "Shortwave Merry-Go-Round on Swiss Radio International.



Ian McFarland of Radio Canada International's "SWL Digest."

Winnie Almeida of Adventist World Radio's DX Program.

The host is ham operator Ben Dalfen who includes receiver reviews, advice on antennas, new frequencies for Israel Radio, and occasionally more general information such as new developments in communication, ham radio developments, propagation, and so on.

The program has been on the air since 1974, although there have been occasional, brief interruptions.

Listener participation is an important aspect of the show. DX Corner broadcast the world's first slow scan TV test via shortwave broadcast on November 2, 1980 and since then has transmitted two more tests.

DX Corner is aired Sundays at 2020 on 15.585, 13.745, 11.655, and 9.815; to Africa on 17.685 and 9.009; again at about 0020 GMT and 0220 GMT (Monday) on 11.655, 9.815, and 7.410.

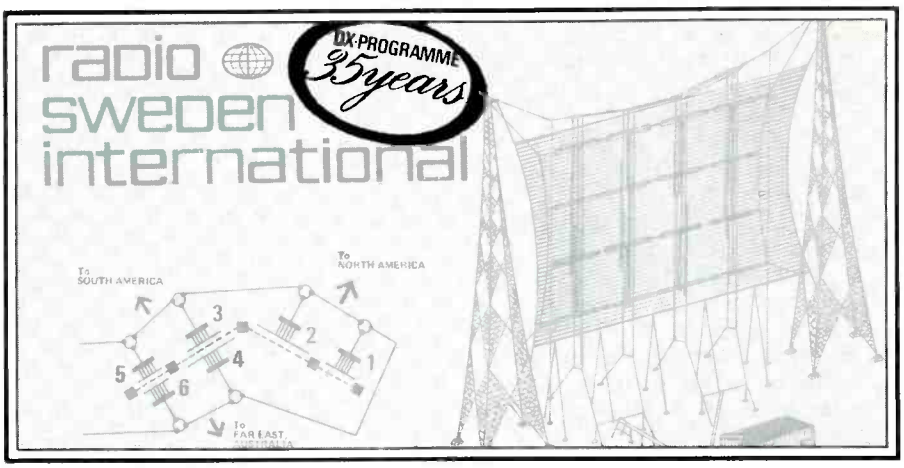
Another "DX Corner" is aired by Radio RSA in South Africa. And like several other DX program hosts, Peter Martins of DX Corner is an avid DXer. But in reality, he is more than that. His position of Principal Engineer in charge of frequency planning at Radio RSA's Panorama monitoring station north of Johannesburg makes him well suited to gather information about shortwave stations around the world.

Martins writes the scripts for the show and is co-presenter of the program along with producer Colin Huston.

Subject matter runs the gamut from strictly engineering themes to shows for beginners with hints for improving one's DXing to discussions about particular shortwave programs or program formats.

On-the-scene reports are used wherever possible and the show features a regular re-

Left to right: Andrew Piper, Mike Sollars, Tom Walters, Elizabeth Francis of the BBC's "Waveguide."



"Sweden Calling DXers" host George Wood.

Clayton and Helen Howard, hosts of "DX Party Line" on HCJB.

port from Duke Alexander, a DXer based in Houston, Texas.

DX Corner is on the air Thursdays at 1300, Fridays at 2100, and Sundays at 0200 within the 57 minute Radio RSA English transmissions. Frequencies include 25.790, 21.535, 15.325, 15.220, 11.900, 9.615, 9.580, 6.160, 6.065, and 5.980.

Adventist World Radio's DX program is transmitted over the Sines, Portugal facility on Sundays at 0930 on 9.670.

Hostess Winnie Almeida does features on stations around the world and there are regular reports of DX news by Finn Krone of the Danish Shortwave Club International, DXer Adrian Peterson of AWR-Asia, and Barry Davis of Britain's World DX Club. Before joining AWR, Almeida worked in the English section of Radio Portugal. She started on the AWR DX Program in April, 1982.

We've covered the major DX shows, but there are a lot more. Here's a listing:

Actualidad DX over Radiodifusora Argentina al Exterior (RAE) in English at 1100 and 2230 Thursdays on 11.710; 1930 Thursdays on 15.345; 0100, 0230, and 0430 Thursdays on 11.710, 9.690, 6.180, and 6.060.

Shortwave Panorama over Austrian Radio at 0900, 1230, and 1805 on Sundays, 0430 Mondays. Try 5.945, 6.155, 9.770, 21.615.

Belgian Radio airs a DX program Sundays at 1900 and Mondays at 0030. Try 15.590 for the first transmission, 11.695 or 9.870 for the second.

Radio Sofia Bulgaria in English Fridays at 1940 and 2140 on 15.310, 15.110, 11.735, and 11.720; at 0000 on 15.110, 9.700; at 0430 on 11.765, 11.750, 11.730, and 9.560; and at 0740 on 15.110, 11.720, 9.700, and 9.560.

Radio Prague Czechoslovakia on Wednesdays at 2000 on 7.345 and 5.930; 2130 on 6.055; Fridays at 0100 on 7.345 and 5.930; and 0300 on 9.630 and 9.540.

DX Circle from the Voice of Germany Saturdays at 0940 on 11.850, 15.275, 17.780, 17.800, 21.540, and 21.680; and at 1630 on 9.590, 11.785, 15.405, 17.825, and 21.620.

RBI DX Club over Radio Berlin International at 0510, 0710, 0840, 1010, 1240, 1325, 1355, 1540, 1610, 1640, 1810, 1825, 1940, 2010, 2155, and 2240. Frequencies include 15.450, 17.880, 9.730, 11.700, 17.830 and others at various times.

DX Listeners's Log from KTWR in Guam Fridays at 0100 on 17.875, 0915 on 11.840, 1530 on 9.505.

Radio Budapest Hungary on Wednesdays and Saturdays at 0400. Try 6.025, 9.585, 9.835, 11.910, 15.220, or 17.710.

All India Radio on the second and fourth Monday at 1040, 1435, 1830, 2030, and 2130 and Tuesdays at 0400. Frequencies include 17.875, 15.350, 15.335, 11.810, 11.620, and 9.912.

DX Corner over Radio Japan's Overseas Service at 0810, 1225, 1625, 1840, and 2025 on Sundays; Mondays at 1025, 1316, 1516, and 1916 and Tuesdays at 0010 and 0155. Frequencies used include 9.505, 9.645, 9.675, 9.705, 11.815, 15.195, 15.235, 17.755, and 17.785.

Trans World Radio Monaco at 0845 the third Saturday of the month on 9.610.

Radio Veritas Asia in the Philippines Saturdays at 0030 on 15.280 and 15.195, Mondays at 1430 on 15.215 and 11.955.

Radio Portugal every third Friday at 1800 on 17.880 and/or 15.225; 2030 on 11.775, 9.740, and 6.025. The following Saturday at 0300 on 11.925 and 9.520; 0530 on 9.520 and 6.075.

Radio Bucharest Roumania on Saturdays at 0230, 0645, Mondays at 2015, Tuesdays at 0200, Wednesdays at 2010, Thursdays at 0230 and 1300, and Fridays at 2015. Check 11.940, 11.810, 9.570, 9.550, 9.510, 6.155, and 5.990.

DX Corner from Radio RSA, South Africa on Saturdays at 2100 on 5.980, 9.585; Sundays at 0200 on 5.980, 7.270, 9.585; Tuesdays at 1100 on 25.570, 21.535, and 15.220; and Thursdays at 1300 on the above frequencies.

Radio Exterior de Espana Spain on Sundays at 1950 on 11.840 and 9.765; 2050 on 15.375; Mondays at 0050 on 9.630; at 0150 on 9.630; and 0620 on 11.880.

Radio Monitors International a presentation of Adventist World Radio over the Sri Lanka Broadcasting Corporation, is on Sundays at 1100. Try 7.190, 11.800, 11.835, 15.120, and 17.850; at 1330 try 7.190, 9.720, 11.800, 15.425.

Radio Moscow's DX program is carried Wednesdays at 2000 and Thursdays at 0050 and 0320 over many Radio Moscow World Service and North American service frequencies.

Keep in mind that many of these programs have variable starting times or are scheduled within an overall program service starting at a particular hour so it's possible that times given may vary. Naturally, the frequencies will vary with seasonal changes so you may have to hunt around a bit.

Not all of the above programs are strictly DX-focused. Some are little more than letter box shows or a vehicle to encourage reports to the particular station involved. Still, they are worth listening to at least once. That way you can decide for yourself which ones strike your fancy and which ones you believe will benefit you the most in your listening.

We think you'll find that listening regularly to one or more of the better DX related programs will prove instructive and help you add new stations to your log.

Radio Pirates, Bookies, Phone Phreaks, And Weirdos Use 'Em Regularly

Everything You Ever Wanted To Know About Phone Loops

BY VINCENT J. PINTO

If you are an active radio or electronics hobbyist like myself, you have probably run across telephone loops. In this article, we will explore the basics of loops and take a look at how and why people use loops.

Loops occur in all area codes and consist of two phone numbers. These numbers are in the same exchange, and the last four digits are usually similar. A typical loop pair might look like 212-555-9990 and 555-9993. There are usually at least twenty loops in an area code, and often all of the loops in an area code will have identical suffix pairs.

The basic thing about any loop is that the two numbers are connected together. If I were to call one number, and you were to call the other, we'd be connected. It's all a bit eerie at first, because most loops do not ring; if you dial a loop and there is someone on the other end, you will be instantly connected. What will you hear if you dial a loop number and there's no one on the other end? That depends upon which of the numbers you dial. If you dial the higher number of the pair, you will hear only silence; if you dial the lower, you will hear a 1000 Hz tone. On most loops, you can talk to one caller after another on the other end without redialing. So, loops allow two people to talk and usually sound like any other phone connection. You may be asking, "so what?" The answer to your question is that loops offer anonymity. People use this anonymity for many reasons.

Let's pop a few myths about loops before going further. Normally all 99 numbers and loop numbers belong to the Telco for internal use. Usually Telco internal numbers are uncharged or "toll free," and because of this many people assume that loop calls are free. *This is not so!* Loops are billable (or "supervised"), as are any calls to that exchange. A second myth states that loops can only be called within your area code. This is definitely not true. You can dial a loop from anywhere if you are willing to pay the bill. You pay for a loop call as soon as dialing is complete, even if no one is on the other end.

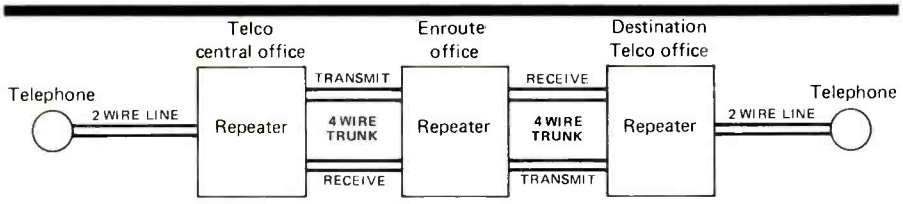
We are now to the point of wondering what Telco uses loops for. There have been a number of theories advanced on this topic over the years, but few people have bothered to ask Telco. One common theory has been akin to the idea that the loops are somehow used to "tie up" unused phone lines at the Central Office to "keep them out of trouble." (I have always enjoyed the image of two lonely phone lines tied together to keep them company.)

Loops are used to save time and manpower in testing long distance trunks. We're not talking about the phone line that connects your phone to the Central Office, but the trunks that connect Central Offices, and run in length from a few thousand feet to many miles.

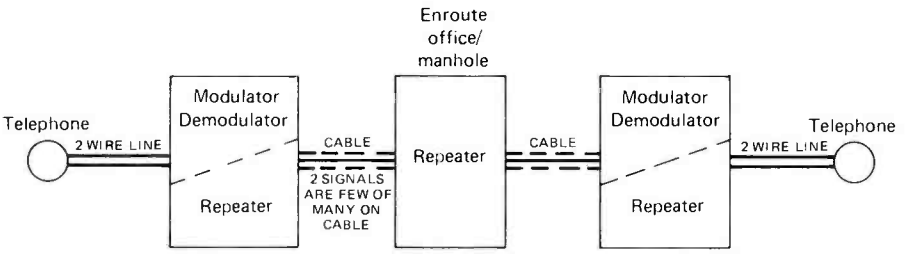
Some Basics Of The Phone System

The phone line coming to your home or business telephone is a two wire circuit. These wires carry your voice and the caller's voice in different directions. Once the line gets to telco premises, the signal is divided up into two circuits. One circuit carries your voice, and the other carries your caller's voice. If the signals were kept on one circuit, there would be problems with feedback and echoes.

Trunks may consist of two pairs of two



4 Wire Trunk



Carrier System Trunk

wire circuits, or may be radio frequency carriers on a cable. Trunks have repeaters along the way which amplify the signal, remove echoes, and equalize frequencies. Repeaters occur about every two miles on an "old style" wire trunk line, and about every 2000 feet on carrier trunks. Very short trunks may not have a repeater.

Repeaters need to be tested and adjusted occasionally. In the old days, a tech would test a trunk by arranging for someone to be at the other end. He would then send a 1000 Hz test tone to the other person, who would read the volume on a meter. To complete the test, the other tech sends a signal back on the other leg to the first tech, who records its volume.

Birth Of The Loop

As the phone system grew, Telco decided to cut down on manpower by tying two lines together. Thus the loop was born. Trunks are tied together via a thing called a "zero loss terminator," which connects lines so there is no change in volume. By the mid fifties, the entire phone system had been equipped with loops, so a tech at one end could test a trunk alone by dialing a loop. He dials the other half of the loop with a known good trunk. He now sends his test tone down one leg, and watches his meter attached to the other trunk. Then he reverses the signal path to complete the test.

It wasn't long before some ordinary citizens discovered that loops could also pass voices, not just tones. Since the lines belonged to Telco, they weren't billed for the call. So a few people made free calls to friends, but there was so little of this that its effect on the phone company's income was way "down in the noise." It wasn't until years later, in the early seventies, that Bell was to put billing circuitry on loop numbers.

Rats And Cheeseboxes

Within a few years, bookies found out about loops. To avoid giving away their location, most bookies used a cheesebox, a device that connects two phone lines together. Cheeseboxes were installed in a small business, often a small butcher shop or a grocery. The bookie arranged with the proprietor to have two phones installed in the shop, and would pay a small monthly fee. He then tied the lines together with his cheesebox and gave one of the numbers to his clientele.

Some bookies either couldn't afford a cheesebox or couldn't locate one at any price, so they hit upon using loops. It was good while it lasted. Gradually, however, more and more shady characters started using loops. The authorities weren't blind to this, and started approaching the Telco to do traces on these loops. Eventually, the phone company was spending a lot of time on criminal traces, and decided to do something about these loops.

Around 1960, Telco started inserting a bandpass filter that passed only 1000 Hz in the terminator end of its' loops. With this change, the loop blocked voices. We're going to see that the solution was only temporary, though. The old style four wire trunks could only handle one call at a time, taking up a lot of wire and space. There had to be a way to cram calls into a smaller space.

By the early 1960's, Bell had started switching to carrier trunks which put many calls on a cable. Each signal modulated an AM carrier on a different frequency. Because carrier uses radio frequency transmitters and receivers, there are more things that can go wrong with a signal. A carrier may test out okay at one audio frequency (say 1000 Hz), and be inadequate at another. To fully test it, you must use frequencies from 300 to 3000 Hz. Telco did not want to discard the 1000 Hz filter, so a switch was added to switch it on and off. Normally, the filter would be left on. When a tech wished to test a trunk, he would turn the switch on, bypassing the filter. When he was done, he was expected to turn off the switch. If he forgets, a loop will continue to pass voice frequencies until some Bell employee notices and turns it off.

Let's look at how loops are used nowadays. If a tech dials up the lower number, he will immediately get a 1000 Hz tone coming back to him, which is injected at a specific volume, known as "zero dB" level. Using his meter, he can gauge if there are any problems on the line, and if he needs to do a complete test at various frequencies, he then turns the filter bypass switch on. Most of this work is done at night, when repair people are free from normal chores.

Bell Has Strange People On Its' Loops

In preparing this report for *POP' COMM*, I interviewed several security directors for New York Telephone Company, and spent some time on loops talking to people who use them. It turns out there are people using loops for more things than I had imagined.

I have always wondered if spies use loops, but I haven't encountered any yet. When I started looking into loops, I was aware that some radio pirates use loops. Especially in the New York City area, you'll often run into AM and FM pirates on loops late at night.

In New York and some other cities, some local loop numbers are pretty well known, and are passed around high schools and colleges. When students get bored at night or want to find a party, they call a loop and wait there till someone else calls. It may be someone they know, or a complete stranger, but it's someone to talk to.

Then there are the loop habituates. They regularly meet with their circle of friends and acquaintances on loops, and tend to resent strangers on their loops. There are also a few loners who literally live on loops, and can be found on a loop hour after hour, day after day. It seems that for these groups, either the anonymity or possibility of meeting people draws them to loops. Many are very friendly, and will talk to a stranger for hours. A loop is a unique social phenomenon, and a world in itself.

Some electronics hobbyists pop up on loops to see what's new. Then there are the phone "phreaks," hobbyists interested in cracking the phone system. Most are quite innocent in their explorations, but a few are actively out to rip off the phone company. They "hang out" on loops, hoping to meet like-minded phreaks.

What Doth Bell Think?

Bell representatives are quick to point out that loops belong to the phone company. Anyone else using them is a transgressor. Since Bell is the aggrieved party, it needn't have any qualms about listening to loops, nor about tracing callers. Bell wishes to discourage people from using them, and periodically programs its' billing computer to look for loop numbers. Any customer thus found is sent a card pointing out that these numbers belong to Telco.

With the exception of those stealing services, Telco does not seem to hassle those using loop lines. Occasionally, Bell becomes aware that someone is calling a loop using a faked credit card number; or Spring or MCI will ask for help tracing someone illegally

stealing their services to call a loop. Then, it's a matter of waiting for the person to try again and tracing the call. In these affairs, the phone company is very aggressive and effective in tracking down offenders. Bell has some very well trained people who are most adept at keeping the offender on the line until a trace is complete.

I wondered specifically about radio pirates. Apparently, Bell does not consider pirates to be major criminals, nor doing any harm to the Bell system. So, the phone company never traces pirates using loops on its own initiative. Traces are reserved for serious criminal activity, like kidnaping or murder. Once in a while, the FCC will approach Bell for help in tracing a pirate that it can't find by other means. The last time New York Telephone was approached by the FCC to do a trace was over a year ago and the trace was successful. The customer's name and address led to the subsequent closing of an FM pirate on Long Island.

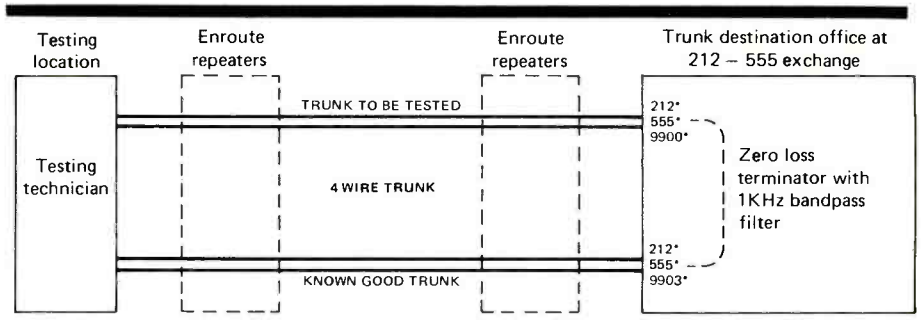
Tracing A Call

Generally, Bell does not seem very enthusiastic about doing pirate traces for the FCC. Priorities aside, one of the rubs is personnel. There are often no people on duty at the right place and time to complete a trace, especially at night. A trace is more an art than a science, and takes people at each end. Years ago, the Telco system used lots of people. The average switching office had twenty people on duty each shift. Nowadays, the average office is automated. There may be only six people on duty during day shift, and during the night shifts the average office is locked and abandoned.

Even if someone were on duty, the trick is in knowing who to call at the other end. This is not too difficult within a region served by the same phone company. The tracer often knows who to call from experience, or has directories for within the company. If the call is from outside the city or area, problems multiply horribly. Let's say the call is coming from another state. The tracer often has no idea who to call at the other phone company. In any case, there may be no one on duty at the other end.

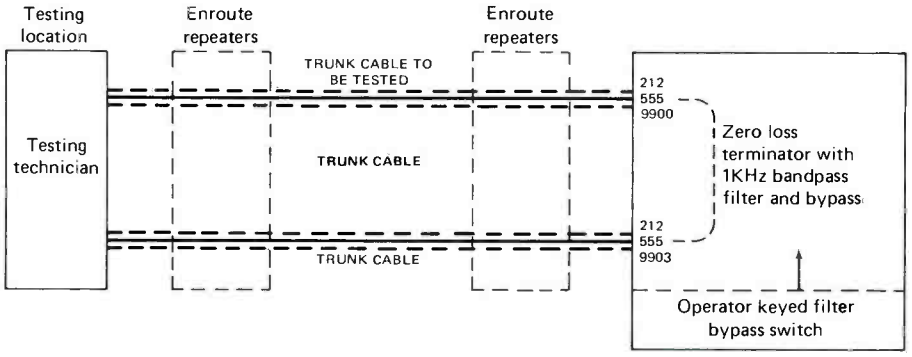
Nonetheless, with a little luck, a good tracer can often work wonders. There was a recent case which Bell tells proudly of. They completed a trace on a weekday afternoon from a diner in a small California resort town to downtown Manhattan in less than 30 seconds. They had been aware that the calls were coming from this area for several days, but did not know who to call within Bell in California. By the time this call came through, they had done their legwork and knew just who to contact. The subject was arrested by local police two minutes later, still on the phone.

Generally, from what Bell says, there are certain things pirates do to avoid being traced. They use loop lines outside their immediate area and preferably in another state. They don't remain on any one loop for long, and don't use the same loop repeatedly. If they use a loop line halfway across the country, they are quite safe.



NOTE:
* The numbers shown are examples only. They are not actual loop numbers.

4 Wire Loop Line



Carrier Trunk Loop

How People Find Loops

It's not the easiest thing to get a good loop number, as at any given time most loops won't pass voices. In some high schools and colleges, loop numbers are passed around for fun. In small towns, only a real electronics buff may be familiar with loops. In many cities, you can get loop numbers from hobbyists. Pirate radio enthusiasts also pass numbers around to each other. People find their own loops using two phones and a knowledge of local suffixes, or by trial and error.

One of the security people at the phone company mentioned that loop numbers are disseminated by computer hobbyist dial-up bulletin boards that specialize in phone phreak information. These boards are not secret. The phone company knows about them, and doesn't bother them, as Telco security people regularly check into them to see what's going on.

We have taken a look at how and why loop lines work, and what they sound like. We've also seen some reasons people use them, and who these people are. Since there are now switches on loops, potential loop users have to work a little harder to find loops that work.

Hopefully, this article has given you enough information so that the next time you hear a pirate radio station announcing a loop number, you won't be completely mystified as to how he does it.

Scanning The Indiana State Police

BY MICHAEL J. DEWEY

The Indiana State Police operate on a multi-channel, statewide radio system from twenty locations throughout the state, from District Posts. Each district varies in size from three to nine counties. The districts are divided into counties based on population. Various personnel are assigned to each post. They include a District Commander, Command officers, Investigators, Crime Scene Technicians, Motor Carrier Enforcement Officers, Weighmasters, Troopers, Clerical and Communications Officers.

The ISP also handles communications for the Indiana State Excise Police, and the Federal Bureau of Investigation officers. The ISP maintains area headquarters at various posts in the state, complete with crime labs and area command officers. In various parts of the state where there is an interstate highway, there are permanent scale units for weighing of all large trucks and semi-tractor trailers. Portable base stations are maintained at these locations.

The fleet of vehicles for the ISP consists of both marked and unmarked police cruisers, 4X4 utility vehicles, vans, buses, and aircraft. Marked and unmarked police cruisers are used by both patrol and non-patrol officers. The 4X4 utility vehicles and vans are used by specialists and truck enforcement officers, and weighmasters. Aircraft are used for aerial traffic control and enforcement, as well as searches. Buses are used as mobile command posts and portable crime labs at the scene of felony crimes and major crowd events; for multiple homicides, large thefts and robberies; and for large crowd events—such as county fairs, the Indianapolis 500 Race, and the Indiana State Fair—as public relations and security. Inside each bus is a portable base radio station.

The ISP radio system operates on the following radio frequencies (MHz), followed by district headquarters, city of post, and call letters and numbers.

Channel #	Base	Mobile	Use of frequency
1	155.475	155.475	ILEEN-statewide emergency channel
2	42.420	42.260	Base to mobile
3	none	42.420	Car to car
4	42.160	42.160	Tactical frequency
5	42.120	42.120	Backup frequency
		155.445	Walkie-talkies
	155.370	none	Statewide Intersystem

District #	City	Call letters & numbers
11	Toll Road	KSA-566
13*	Lowell	KLT-229
22*	Fort Wayne	KSC-813/KSA-857
24	Breman	KSC-899
32	Terre Haute	KSE-807
33	Bloomington	KSE-706
34*	Jasper	KSA-449
35	Evansville	KSC-804
43*	Seymour	KSA-771
45	Sellersburg	KSA-568
51	Pendleton	KSA-461
52*	Indianapolis	KUA-772
53	Putnamville	KSA-838
61*	Peru	KSD-627
62	Lafayette	KSA-764
71	Redkey	KSE-295
72	Connersville	KSA-837
73	Versailles	KSE-704
Port Of Indiana	Portage	KZZ-979
Headquarters	Indianapolis	KSJ-280
Mobile units		KA-2181

* Denotes area headquarters

Channel number one is the Indiana Law Enforcement Emergency Radio Network (ILEEN). It is reserved to be used in emergency situations. It is primarily used in the event of major crime alerts, pursuits, kidnaping, and hostage situations. The ILEEN frequency can also be used for direct communications to ISP post and mobile units, and by city and county law enforcement officers. This is so all officers in the state have a common frequency.

The channel can be used for confidential communications or as a back up radio channel, or in the event of a radio break down on other frequencies as well. All Indiana State Police, Indiana Department Of Natural Resources Conservation Officers, Federal Bureau Of Investigation Agents, Indiana State Excise Police, and most city and county police officers have the ILEEN frequency in their patrol unit.

National "8" Code used by law enforcement agencies.

8-1 Bomb threat	8-7 Burglary
8-2 Actual bomb	8-8 Alarm
8-3 Homicide	8-9 Vandalism
8-4 Assault	8-10 Disorder
8-5 Armed robbery	8-11 Drowning
8-6 Robbery	8-12 Suicide

Indiana State Police Signals

1 Call your post
2 Call general headquarters
3 Call State Police radio
4 Report to general headquarters
5 Report to your post
6 Call by telephone
7 EMERGENCY—serious situation (Extreme emergency use only)
8 Meet
9 Disregard
10 RUSH—quick action desired (Red lights and siren)
11 Information confidential
12 Reply via other than radio (Telephone or in person)
13 Army convoy
14 Plain clothes detail
15 Unable to broadcast, security
16 Aircraft accident
*17 Grant emergency right-of-way privileges to vehicle (Followed by vehicle description, route of travel and destination)
18 Pistol practice
19 Truck check
20 Car wash
21 Car grease
22 Car repair
23 Speeding vehicle (Follow by vehicle description and route of travel)
24 Vehicle and occupants detained
25 Regular post meeting
26 Bringing subject(s) to court, notify
27 Stopping vehicle (Follow with vehicle description and location)
28 Bank detail
29 Post meeting, all leaves canceled
30 Special patrol assignment
31 Traffic congestion
32 Check all records (Full name, DOB, SS#)
33 Known burglar
34 Possible mental subject
35 Regular post inspection
36 What is the working schedule of? (Follow by unit number)
37 Advise if there is anything for me?
38 There is nothing for you
39 Post inspection, all leaves canceled
40 Records indicate subject is wanted or article is stolen
41 Is polygraph available?
42 Is breathalizer available?
43 Have in possession: J-1 personnel, J-2 property, J-3 prisoner, J-4 papers
44 Advise traffic conditions
45 Give your FCC assigned call letters and numbers
46 In pursuit (Give description, location, route of travel)
47 Escort, give details
48 Visitors or officials present
49 Put riot control platoon on standby
50 Activate riot control platoon
55 Activity report
60 Narcotics or dangerous drugs involved
66 The requested service is not now available
80 Records indicate not wanted or stolen or not in file
100 EMERGENCY—(Hold all but emergency traffic)

* Signal 17 no longer granted. A/ISP headquarters

Submitted by: Michael J. Dewey, Dispatcher with the Hartford City, Indiana Police Department.

When That Mobile Antenna Just Ain't Enough

Improvised Communications Antennas For Emergency Use

BY JOSEPH J. CARR, K4IPV

What would you do if you had to get through on either the Citizen's Band or the land-mobile band near 6200 kHz—it's a matter of life or death—and your puny little mobile transceiver and loaded whip antenna just can't cut it?

This question was posed to me recently by a man who already knew the answer. He is a missionary with the Swedish Pentecostal Church, and he serves in Sudan. In his line of work, he could easily find himself stranded 200 miles out on a desert that is so inhospitable that camel corpses litter the dusty trail that serves as a "road"! His organization regularly uses the 6200 kHz commercial SSB band and the amateur bands for communications. A Stoner Communications HF SSB mobile rig is literally his lifeline!

Deserts and other remote areas of the world are dangerous places for humans. Although there are numerous areas of the world where wild animals and armed natives could give one pause for concern, there are equally dangerous places a lot closer to home. Breaking down in the Arizona desert, or, in one of the blizzard-prone areas of the country is no picnic; one could easily die of exposure. I recall a newspaper account of a hunter who died of exposure one November only 20 yards from busy Route 17 in the dismal swamp of southeastern Virginia; one needn't go to Sudan to find potentially lethal "breakdown" situations! A CB walkie-talkie on either Channel 19 (trucks rolled by only yards from the man's body) or Channel 9 would have probably saved that hunter's life. The police in that area reportedly monitor Channel 9, and if they don't, others do.

It *can* and *does* happen! Breakdown situations can easily kill those who aren't prepared to live in the wild, be it desert, blizzard-swept mountain, or freezing southeastern Virginia swamp.

While it is well and good to equip oneself with a mobile or portable two-way radio, there are situations where it will not get through because the signal strength is too low and the interference too high. One solution to the problem is to improve the monumentally inefficient antenna typically used on HF mobile stations. If you are planning a trip to an area where a broken down vehicle can have serious—perhaps fatal—consequences, then it behooves you to take along certain elementary survival supplies, including antenna building materials.

The typical mobile antenna for HF bands, be they landmobile, CB , or amateur, consists of a fender or bumper-mounted inductively loaded whip that is operated against the body of the car for "ground." Of the services mentioned, only the CB (and 10-meter amateur for those with ham licenses) allows anything like an efficient quarter-wavelength mobile antenna. All lower frequencies require a compensation antenna in which some of the length is taken up by the inductance of a loading coil. At best, this type of antenna works poorly! The antenna is, especially on the lower bands (i.e. 6200 kHz), grossly undersized (which is why the loading coil is needed), and the "ground" is the pits.

I know! I know! Some ham buddy of yours boasted the other day that he worked Outer Mongolia using only a few watts loaded into a wet string, and received "5-by-9" reports. But so what? An occasional multi-kilomile contact from a 100-watt mobile station doesn't tell the tale—they are the rarity, not the everyday. You don't want to depend upon fickle ol' Sol to liven up HF "skip" in order to get you out of a pickle. Unfortunately, the very bands in most parts of the world where it is most likely that you would be able to communicate with someone who could help you are also the most crowded. Could you get through from a remote area at 6 p.m. on Channel 19 of the Citizens Band or on the landmobile HF SSB frequencies? I think not! It isn't impossible for you to contact some yachtsman on the high seas, and then get him to place a buck-a-minute call through the marine operator to the Goose Bump National Park Ranger Rescue Department, but it would be a lot nicer if you could talk to someone only a few dozen—or a few hundred—miles away!

It is also wise to have a daily schedule with someone who knows your itinerary, or at least some idea of where you will be. My missionary friend tells me that his "company" won't let their people go out on a trip unless they have an itinerary filed, and check in by radio daily with an update. If the dude misses his schedule, then the mission station sends out the search party.

When you try to punch through the electromagnetic crud on any band, especially the lower bands, the results are typically marginal. The giants of kilowatt alley drown you out. In many parts of the world, small landmobile transceivers seem to compete with broadcasters and high-power point-to-point services, not all of them either in the same country or ITU region (or, even legal for that matter!). The result is that you are drowned out. To make matters worse, you may well be forced to limit transmitting time because the car battery isn't being recharged by an engine that isn't running!

Since I am a ham, and am interested in missionary radio, I occasionally monitor the Halo Net and Inter-American nets which meet daily on 21,390 kHz starting at 1800 Zulu time (actually, the chatter goes on for an hour or two before the net, which could benefit SWLs who listen to hams from exotic locations). The net control station is mindful of the fact that some check-ins are stationed 1500 miles up the Amazon or in the rain forests of west Africa, operating on solar-cell charged batteries or kerosene *(not* gasoline!) light-plant generators. He will periodically quiet the net down (if that can ever be done on a ham band) and ask for check-ins from light-plants ("putt-putts" in net jargon) or battery-operated stations. My Swedish friend tells me that it takes 4½ days for his Phillips solar-cell array to charge the battery enough to allow him to talk for 30 minutes on his weekly ham radio contact with his dad in Stockholm! And he is in a desert region where the sun is optimum for solar power.

A decided edge, a life-saving difference, might be purchased by the back-country traveler for the price of some common antenna materials. Let's look at some common antenna types and see how they might fit our purposes. Let's further stipulate that the antennas we examine are capable of being stored in an auto trunk, or possibly under the driver's seat in a jeep or camper. While it would be handy to have a full-size Yagi beam on top of a 50 foot tower, it's also not very practical to tote one of those monsters around.

The halfwave dipole (Fig. 2) is an old standby that is almost universally suitable for emergency communications situations. This antenna is simple to build, it is well-behaved, and can be built with a minimum of low-cost materials. The dipole is a half wavelength radiator, so its physical length is found from the old familiar formula:

$$L_{feet} = 468/F_{MHz}$$

Since the dipole is center-fed, each half of the dipole radiator is half of this length.

When building the dipole (they can be ready-built *before* your trip!), be sure to include sufficient small-diameter rope to hoist the antenna to supports from each end! It would be a shame to have the antenna per-

fectly functional, but laying useless on the ground for lack of a means for hoisting it into the air!

In our base stations we sometimes tend to be perfectionists with regard to the antenna. I don't care what radio service you use, or whether you just monitor, the antenna is a good place to invest money. In fact, a good antenna will do better in many cases (on a dollar-for-dollar basis) than buying a linear amplifier! At the base station we should be perfectionists regarding the antenna, but in the wild we can get away with murder! It isn't really *necessary* to have a BALUN coil at the center of the dipole, despite what the "expert" counterman at the radio dealer will tell you! Nor must the end-insulators be super-duper nylon wonder insulators with an "effective length" of 6 feet (they lie a lot). In fact, the end insulators could be old tooth brushes or blocks of wood if that is what you have handy. The important thing is that you *insulate* the radiators from *each other* and from *ground*. In a pinch, you can get away with a lot less than perfection.

Since I am a ham, I occasionally participate (the last time was 1962, that's how "occasionally" it is!) in an event called "Field Day." This is a contest where amateurs go out into the field on the last full weekend in June and practice emergency communications (actually, we drank a lot of beer and had a lot of fun). The typical field-day station is low power and operates from a "light-plant" portable A.C. generator, or from batteries.

During the 1959 Field Day, I learned a lot about *practical* transmitting antennas from a couple of old pros who had been in the two-way business since the time when Guggi Marconi met David Sarnoff. We opened the club's Field Day antenna box, which had not been opened since Field Day 1958, and found plenty of wire, all cut to the right lengths, but not one damn insulator! My first thought was to jump in the '55 "Bucket" (Buick) and head back to Arlington, Virginia to buy some from Key Electronics—if we could get there before Saturday closing time. Not to worry, sez the grey-haired wisened pro. We'll be on the air long before kick-off time (4 p.m. local). He used a piece of twig salvaged from somewhere near where the Copperhead was sunning himself for the center insulator and didn't use end insulators at all! The ends of the dipole were tied directly to the rope that supported the antenna!

Although I really didn't intend to regale you with a lot of ham radio nostalgia from my misspent teenage years, there is a lesson to be learned here. *Don't be paralyzed for the lack of a lot of store-bought goodies!* That antenna wire could be salvaged from the vehicle electrical system; the antenna wire can be tied directly to the support rope without the need for end insulators; the coaxial cable transmission line can be tied off either to a stout twig, or, in a pinch, just split and tied to the radiator wires. It's not elegant, it won't win prizes for either beauty of technical innovation; it won't even last very long. But, it might save your life!

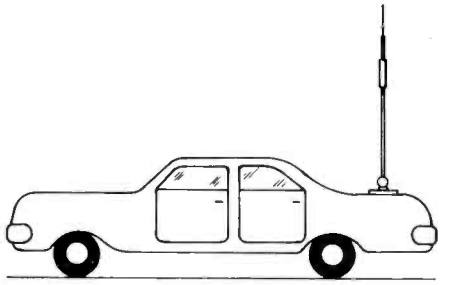


Figure 1 *A typical mounted mobile antenna installation.*

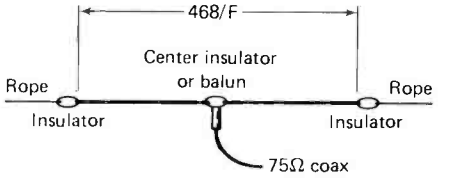


Figure 2 *Half-wave length dipole.*

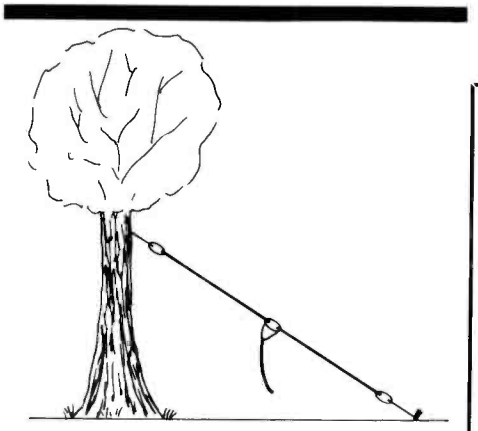


Figure 3 *"Slipole."*

The dipole normally requires two supports: masts, trees, or even helium balloons (don't laugh! It's been done!). But that is, once again, not strictly necessary, especially in a mortal pinch. You could work just as well with either a vertical dipole, suspended from a single tree, rock formation, or whatever is available. Or, you can make a *slipole* (slanted dipole, see Fig. 3). In this form of antenna, inelegant as it might be, the dipole is hoisted to a single support, and the other end is attached to, but insulated from, ground.

The *long wire* is another antenna that can be made to work in difficult circumstances (see Fig. 4). The antenna radiator consists of a single length of wire that is at least quarter-wavelength on the lowest frequency that you anticipate using. For my friend who uses 6200 kHz, this means 38 feet, while for the sailor who uses the 2-3 MHz HF SSB channels, this could mean 117 feet (I know one who actually used the helium balloon trick in this band!). For almost all users, a 100 foot roll of wire will do the trick. The long wire will work on the band for which it is at least quarter-wavelength, and all bands of higher frequency.

The catch is that the long wire antenna requires an antenna tuner to operate properly, or even at all. Luckily, many mobile

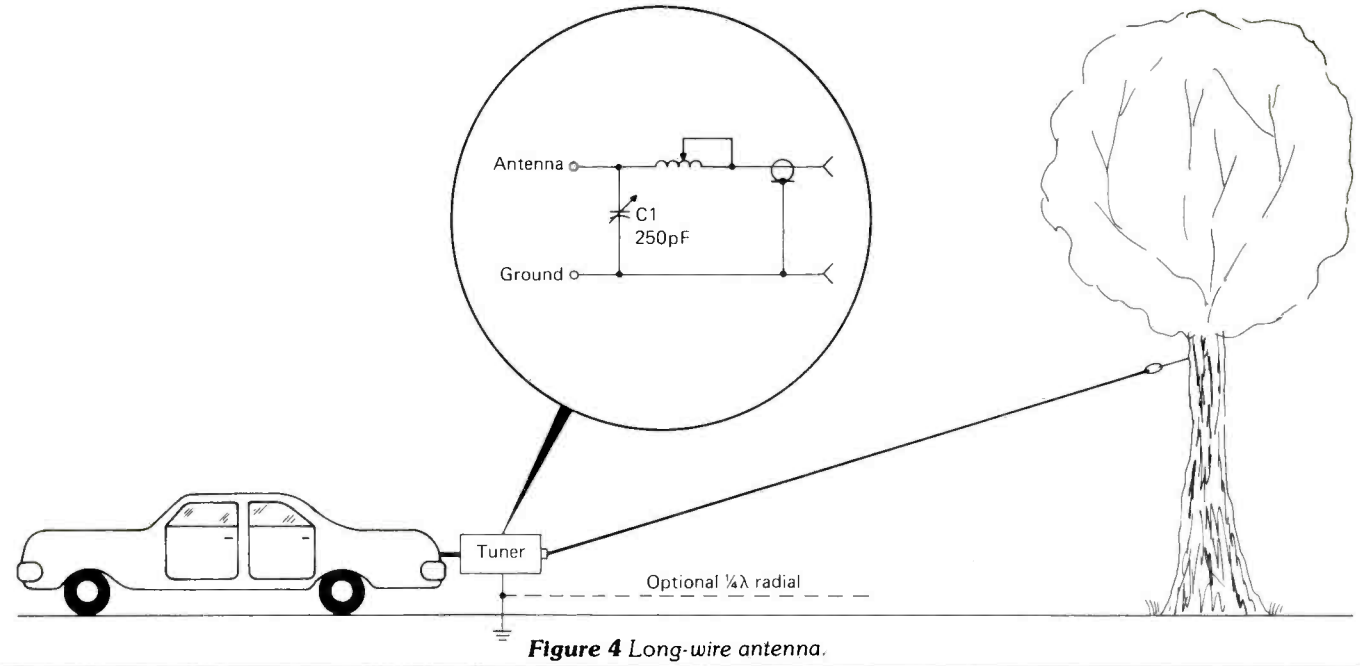


Figure 4 *Long-wire antenna.*

transceivers made these days are not tolerant of high VSWR, so come with antenna tuners either built-in or as optional accessories. Many mobile operators therefore will already have an antenna tuner of sorts. Some of these will work nicely on long wires, as well as on loaded whips. Ham antenna tuners can be used on non-ham frequencies most of the time. Some models are continuously tuned, so can be adjusted to operate on any frequency between D.C. and daylight (well, 3 to 30 MHz, maybe!). These are identified by having a rotary inductor control knob on the front panels. Other models use a switched inductor, and the switch will be labeled with the ham bands (80-meters through 10-meters). But there is usually sufficient over-lap on each band that users in adjacent landmobile and other services can use the ham band tuner with no modification. This is especially true now that ham equipment makers are gearing up for the new bands granted under WARC'79. Even if the tuner won't operate on your frequency, the modification is cheaper than some commercial antenna tuners!

The antenna tuner might be a simple L-section network as shown in the inset to Fig. 4. In this arrangement, a variable capacitor of 100 to 250 pF (or so) maximum capacitance and a coil are used to tune the antenna. The dimensions of the coil vary with the frequency and the actual length of the radiator, so some pre-trip experimentation might be in order.

There is another catch to this antenna: it needs a "good ground" to work effectively with a transmitter. This is not so apparent as it might seem to those whose radio activities are limited to monitoring because similar antennas seem to work well on receive. Many articles and books that deal with this form of antenna glibly tell us that the antenna needs a "good ground" but rarely tell us what that means.

Often, the very factors which prevent us from using a better antenna also make it difficult to obtain a "good ground." For the stranded mobile operator, a good ground might be nigh-on impossible. One could, of course, carry a couple of 4 to 8 foot ground rods and a 5 lb. sledge hammer and drive them into the ground (irretrievably, I might add! Don't get stuck twice on the same trip). Or, one can use a *counterpoise ground*. This is a fancy term for the old-fashioned radial, as used on vertical antennas and *ground planes*—in fact, the counterpoise ground is the "ground plane." You read that right incidentally, we recommend a radial on a mobile/portable antenna, not just the formal vertical sitting on a pole at some base station; radials are not the exclusive property of commercial verticals!

A quarter-wavelength radial is needed for each band of operation (i.e. ± 250 kHz from the operating frequency). Since most HF SSB landmobile operators in most areas of the world will be assigned to only one frequency, then they will need just one set of radials. For the amateur operators, or the non-ham who might have license(s) to operate on several frequencies, plus possibly the Citizen's Band, more than one set of radials is needed. Although the system will work with just one radial, the usual wisdom is to use at least two. The actual answer is the more the merrier, up to an absurd limit. I have had good results on the 40-10 meter ham bands with just two radials per band, and have done quite well on 21 MHz frequencies with just one radial. As the frequency decreases, however, I suspect that the performance with but one radial would decrease.

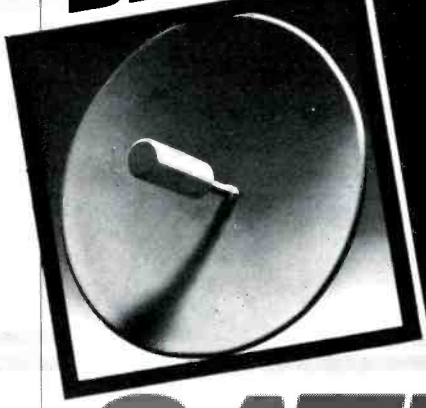
The FCC, according to a now out of date AM broadcast engineering handbook, required 120 radials for vertical antennas in the 550 to 1650 kHz AM broadcast band. Of course, those radials are buried, but yours will be above ground and will work as well. The chart in the engineering textbook, incidentally, showed a marked reduction in performance gained by adding additional radials as the number of radials increased. More than 32 radials offers little extra performance, and the performance increases begin to fall off above 6 per band.

For the purposes of surviving a broken-down vehicle, however, we can state that two radials per band would be nice, and one per band will be a lot better than just the simple mobile antenna. A 100 foot roll of wire for the long-wire radiator, and another to make resonant radials, could work wonders. Connect the radials to the ground connection on the antenna tuner, or, to the ground (shield) of the coax.

Radials can also make the mobile antenna work better. Besides the fact that most mobile antennas on frequencies below 25 MHz are compensation antennas, there is also the fact that these antennas are little more than verticals with poor grounds. Figure 5 shows how several quarter-wavelength radials can be connected to the antenna. These radials are not practical for operation while in motion, but can dramatically increase the effectiveness of the antenna when operating from a fixed location, whether or not you are stranded (e.g. camping).

Connection of the radials to the antenna can present a bit of a problem unless you came prepared in advance. One of the mobile-mount screws can be used to secure a terminal lug that can receive the radials. If an alligator clip-lead or two is available, then the radials can be connected directly to the lug with ease (but compensate for the radial length by subtracting the clip-lead length). You can also permanently affix a short "pigtail" of wire to the antenna mount grounding screws and use it to electrically connect the radials when the time comes (a handful of assorted electrician's "wire nuts" would

TECHNOLOGICAL BREAKTHROUGH!



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work wonders here!). You could also, on some mounts (especially the ball type) replace one of the hex nuts that fasten the bolts which hold the mount to the car body with a wing nut.

Figure 6 shows two tricks (actually just one with two applications) that my Swedish friend in Sudan uses. An inverted-Vee antenna is slightly longer than a dipole; a figure of six percent or so is usually quoted. Such an antenna is an effective solution to our "stranded" problem. Figure 6A shows an example of an inverted-Vee antenna. Note that the "vee" is merely a dipole with its center elevated 20 feet or so above the ground on a mast or support. The ends slope down and are insulated from ground. Tent pegs, rocks, or almost anything else that is relatively immovable will keep the ends tacked down and well behaved.

Figure 6B shows a mobile antenna salvaged from the inefficient back of a car and elevated to the status of a loaded vertical complete with radials. Such a buffoonish-looking antenna works well, by the way. Several years ago, when Bonnie and I moved into our present home, there were several months before my budget recovered from the certified check we had to give to the lawyer at settlement (Shakespeare was right!). During that period, my home ham station antenna consisted of a Hustler band mobile antenna stolen from my car. The Hustler ball-type mount was bolted to a piece of wood that was nailed to the cinder block wall with casehardened nails, just outside of a bedroom window. Several radials were attached. The scheme, while crude, gave surprising results on 15-meters, and should work even better on the 11-meter CB . Results were less spectacular on lower frequencies, but still surpassed all expectations. It seems that little Hustler rescued from my '70 Chevy plus a few yards of #14 insulated wire went a long way toward rescuing my radio communications hobby!

Now what's the secret to these antennas? Why are they similar enough to be carried under the same rubric? It's the *mast!* The mast will be the limiting factor to our camper-in-trouble. The mast should be 20 to 30 feet high for these antennas to work well, and it isn't always possible to find convenient supports when and where you break down. Remember *Finagle's Principle*: "The perversity of the universe tends to a local maxima whenever and wherever it can do the most harm," which is Murphy's law if you went to college. According to mssrs. Finagle and Murphy, you will probably break down in the middle of nowhere . . . where there simply ain't no place to erect an antenna. That's why my Swedish Pentecostal contact liked this idea . . . he always breaks down in the middle of one of the most lethal deserts in the world.

The mast can be built from several different types of materials. Of course, you *could* carry several 6 to 8 foot lengths of 1 x 2 lumber drilled appropriately to accept bolts and wing nuts for fashioning into an antenna mast.

Another method is to carry lengths of PVC plumbing pipe in 6 to 8 foot sections. These pipes can usually be either butted end to end with special couplings, or, without couplings if one end of each is flared to accept the mating end of another length of pipe. This type of mast can be built to lengths of approximately 20 feet, and still have the strength needed to support an inverted-Vee antenna.

Surplus military masts are also a possibility—you know the kind that used to be widely available in mail order surplus companies several years ago. Of course, only us over-35-types would remember those in any quantity, but they still show up occasionally. Among military surplus are telescoping masts and telescoping antennas complete with antenna tuners in the base box support. Of course, my missionary friends will probably want to look to another type of antenna than this one! It seems that they are frequently suspected of working for the Cuban Invasion Authority (CIA) anyway—so what do you think a rural police commander is going to think when this strange dude shows up in his precinct with American military communications equipment!

One other possibility for a mast is the telescoping masts used to erect TV antennas. These masts are usually available in 30, 40, and 50 foot lengths. Although the 50-footers are a little cumbersome, they can be attractive for those capable of manhandling them. Those masts are low cost and will telescope to 8 feet or so when not erected. Some camper and motorhome owners have been known to buy such a mast and then hire a welder to attach it and a mount to the vehicle. The mast mount can be welded to an extension from the vehicle frame similar to the mount used for trailer hitches and tow-bars. The mast can then be braced against the frame of the vehicle cab, or, from an extension from the roof assembly of the camper.

The tools that you carry with you can also be important. Of course, emergency tool kits are like first-aid kits: they contain everything *except* what you need most! First in your tool kit should be a low-cost VSWR meter. I recommend those little jobs with 2-meter movements and calibration knobs between them, especially those based on the *Monimatch* principle (Fig. 7). These can usually be obtained from CB and Ham suppliers, and I have even seen them at Radio Shack stores on occasion. They all look enough alike to make me believe that the same Japanese firm makes all, despite different brands. The idea is to buy one that is relatively rugged, small enough to not become a nuisance and cheap enough to not break the bank. If you take some large, expensive, delicate instrument with you two or three times and don't use it, then it is likely to be left at home the time you need it!

Also take with you a set of tools for making electrical and antenna repairs. For example: diagonal side-cutters, long-nose pliers, gas (slip-joint) pliers, several different types and sizes of screwdrivers (including

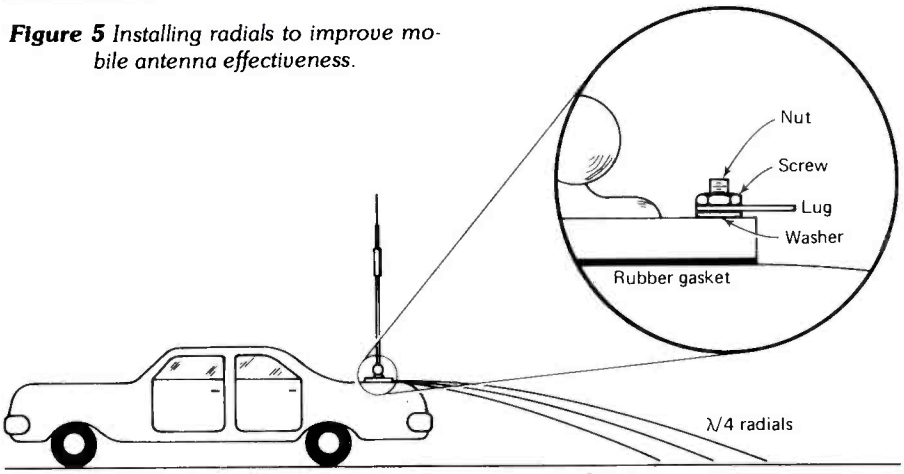


Figure 5 *Installing radials to improve mobile antenna effectiveness.*

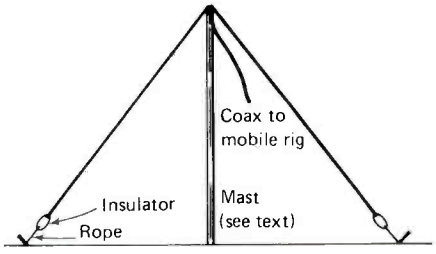


Figure 6A *Inverted-Vee.*

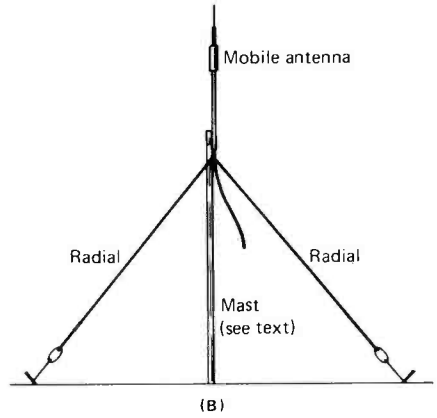


Figure 6B *A mobile antenna made into a vertical.*

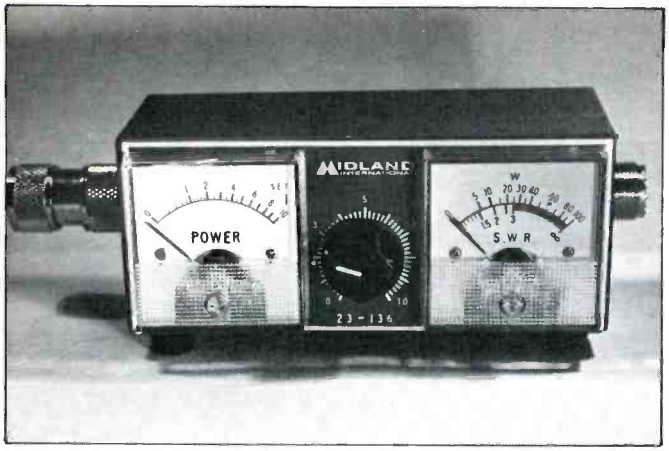


Figure 7 *Typical VSWR meter, useful for packing along on a camper trip into the boonies.*

Commercial antenna tuners are often very expensive, but amateur radio tuners, such as this one, can be used on adjacent commercial frequencies to good effect.

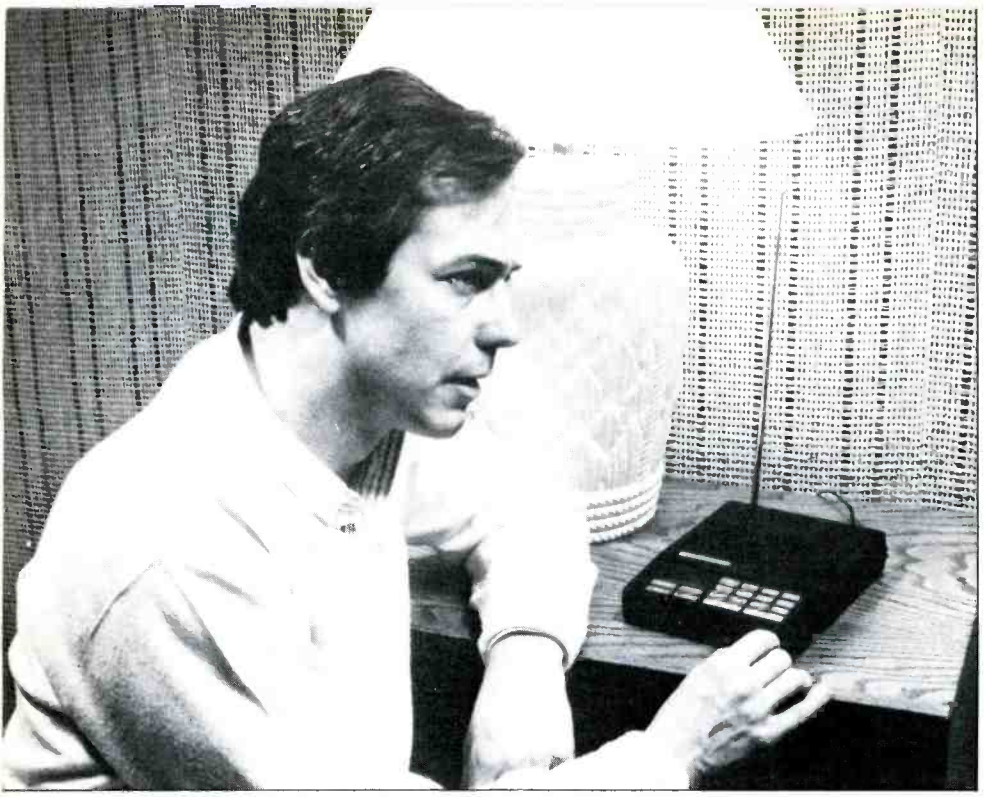
the small 3/16-inch pocket types used for making some adjustments on transceivers!). Also take along any special tools needed (e.g. metric) for your particular equipment. Especially needed might be special antenna wrenches such as those packed with the mobile antennas. A soldering iron is also handy. There are several on the market that will operate nicely from 12-volt D.C. batteries. One of the most handy (and often overlooked) tools is the pocket knife. I personally prefer a folding sheath knife such as those by Buck, Schrade, and others. These well-made knives come in two or three sizes, and are well worth the investment. You can never appreciate the utility of a good knife, especially when camping, until you have to do without one!

Other supplies to include will be determined by your own travel plans, but there are still a few suggestions to be made. For example, keep plenty of extra rope handy, especially the sizes needed to hang antennas. Don't get caught without a supply of alligator clip leads (6″, 12″, 18″, and 30″). These can be made from Mueller number 60 alligator clips and Belden test probe wire (comes in black and red). *Do not* (let me repeat that: DO NOT) rely on those "bargain" alligator clipleads that are imported in plastic bags by the dozen. Those little clips always break, are extremely fragile, and usually have a fair amount of D.C. resistance because the crimped-on alligator clip has corroded at the junction with the wire. The jaws of the alligator clip leads don't have sufficient spring tension to make good contact, and often fall apart. In general, they are a bargain that seems too good to be true: *it is.*

In some cases, where space permits, it might be wise to carry along one of those tiny little Honda or Kawasaki generators in the 400 to 1000 watt class. These generators can be used to directly power the transceiver if the A.C. power supply is available, or, can be used to charge the vehicle battery enough to make a transmission every hour or two. These models have a 12-volt D.C. outlet that will charge an automobile battery. If your model does not have a D.C. outlet, then a simple 12-volt filiment transformer (1 to 10 amperes) and a matching diode will suffice to trickle charge the battery. No filtering is needed for trickle charging, only half-wave rectification (fullwave is preferable).

Emergency situations can be better handled if you are prepared. Whether the communications emergency occurs in the wild while camping or in a city struck by a hurricane or other natural disaster, the prepared communicator will be capable of getting back on the air in minimum time. Only a little foresight is needed to turn around an otherwise potentially dangerous situation. The time to think of possible antenna needs in the wild is not after you kick the tire for daring to go flat, but before you leave on the trip.

Joseph Carr is an electronics engineer with the U.S. government. He has written a number of books on electronics for TAB Books.



Special Emergency Radio Service Channels carry a great deal of EMS communications even though these frequencies may be rather quiet much of the time.

The Time Is Right
The Trick is Knowing When To Use Your Scanner For

Maximum Monitoring!

BY LEONARD LAZAR, KMS5LR

It's one thing to have a scanner and turn it on from time to time, but quite another to use the device somewhat creatively. That means doing more with it than turning it on to scan the same old frequencies for a couple of hours whenever you get a chance. The trick is to try to select the time and frequencies for the more interesting stations.

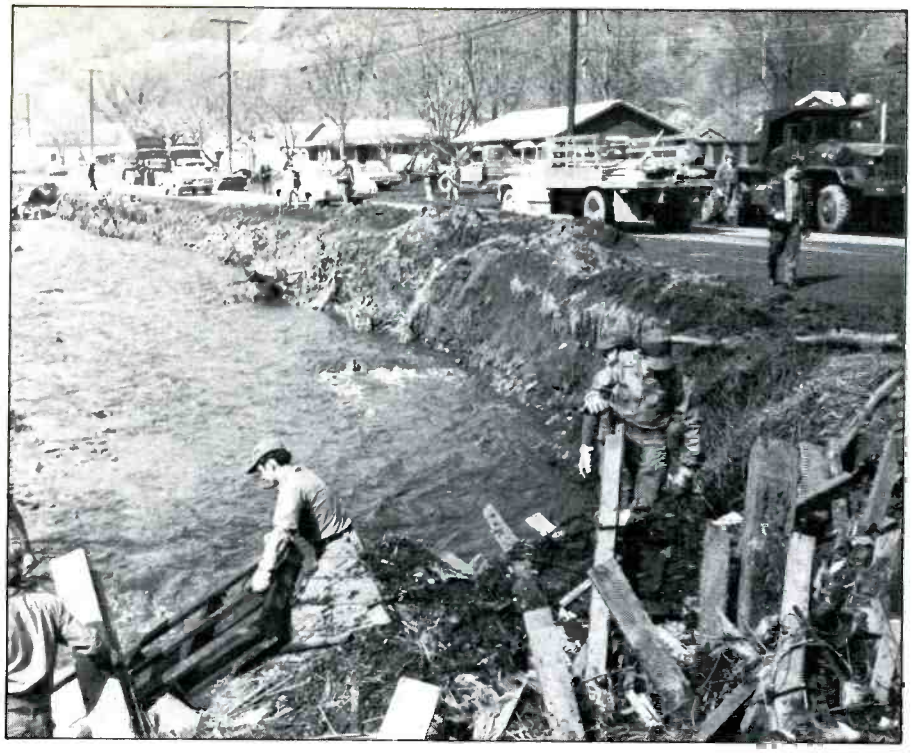
For instance, if you learn that there has been a lost aircraft, even if you don't normally monitor 123.1, 143.9, and 122.9 MHz, you might want to set your scanner there to catch any search and rescue operations. A missing ship or small boat is quite likely to trigger exciting communications on 156.30, 157.10, 157.05, 157.15, 157.075, and 157.175 MHz.

Major crimes could easily activate normally silent public safety (Police Radio Service) frequencies assigned to your local community, county, or state agencies. Should the crimes involve kidnaping or a bank robbery, then there's a good possibility that there will be increased activity on FBI frequencies. That being the case, it might be of interest to place your scanner in the *search* mode between 163.8 and 164 MHz, also between 167.1 and 168 MHz, to see if there is any activity relating to the crime.

And speaking of federal frequencies, the aftermath of an air crash could activate frequencies (such as 165.75 and 166.175) as federal investigators check out the circumstances of the mishap. Otherwise, those frequencies are relatively quiet.

I've also found that when federal government VIP's are in the area, there is a lot of increased activity on frequencies normally silent. This not only includes all sorts of regular public safety frequencies, but usually frequencies in the 164 to 168 MHz range used by various federal agencies. Put your scanner in the *search* mode the next time your area gets a visit from a Washington official

Military manuevers generate interesting scanner chatter on a wide range of frequencies, especially in the VHF "low band." (Photo courtesy U.S. Army)



Floods, earthquakes, storms, and other natural disasters require extensive communications, activating emergency, police, and many other frequencies. (U.S. Army photo)

and you'll undoubtedly discover some new frequencies to keep on file. Check out 164 to 168 MHz!

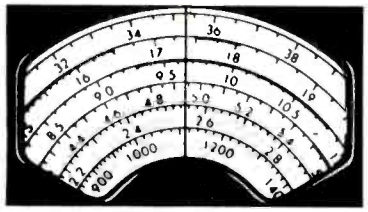
If you live in an area where illegal immigrants are prone to making their arrival, you may also note from your local news media that from time to time there are periods of increased enforcement. During those times, you may find it especially interesting to check out frequencies between 162.8 and 163.8 MHz for such enforcement activities. Here's another job for your scanner's *search* capabilities.

Fact is that just about all newsworthy events—floods, storms, forest fires, accidents, VIP arrivals and departures, earthquakes, military maneuvers, anti-smuggling activities—all seem to cause normally inactive or semi-active frequencies to come alive.

You may find it of value to take special note of any newsworthy events that are announced in advance, such as VIP visits or military maneuvers, and then start frequency exploring at the appointed hour and date. Other spur-of-the-moment events can be learned about from news bulletins coming over your local radio or TV station, or by monitoring local police and fire frequencies on your scanner. When a report of "something big" taking place begins coming through, then pull out all of the stops and start rooting through lots of normally ignored frequency space for those extra communications channels that are going to give you the background on what's really taking place. These revelations could take place on Forestry Conservation Radio Service frequencies, Special Emergency Radio Service frequencies, Police or Fire Service channels, or Federal frequencies.

Be sure to make note of those frequencies you discover to be activated when things are hopping. That way you'll know where to listen the next time things get especially interesting in your local area. That's what I call "creative scanning."

Rescues of all kinds trigger activity on several scanner frequencies, 122.9 and 123.1 MHz. (U.S. Army photo)



COMMUNICATIONS CONFIDENTIAL

BY HARRY HELMS, KR2H

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

Our recent column on time signal stations apparently inspired many of you to DX them! Some of you also started reporting and QSLing such stations, too. Our friend George Osier of New York sends along a copy of a QSL card he received from DAM, Hamburg, West Germany, which he received on 8638.5 kHz at 2355-0006 GMT. A nice addition to the QSL collection, George, and many thanks for sharing it with the other *POP'COMM* readers!

Several of you wrote and asked for addresses for various time signal stations. Such addresses can be found in the latest edition of the *World Radio Television Handbook*, available from many *POP'COMM* advertisers, local bookstores, and, of course, *POP'COMM*'s office. If you do *any* tuning on shortwave, whether broadcast or utility, you need a copy!

Readers Tony Kobylski, Tim Wolfe, and Mark Chinsky all wrote concerning the logging of station D3E51 reported in this column a few months ago. All correctly identified this station as Luanda Coastal Radio in Luanda, Angola. Many thanks, guys! Mark Chinsky has also contributed some additional info on two items appearing in the April Communications Confidential. Mark says that ABM6USA, logged on 14511 kHz, is the U.S. Army MARS station located at Fort Shafter, HI. Mark also suggests that stations "N61" and "N52" heard on 6910 kHz in SSB could have been U.S. Army stations. Many thanks, Mark!

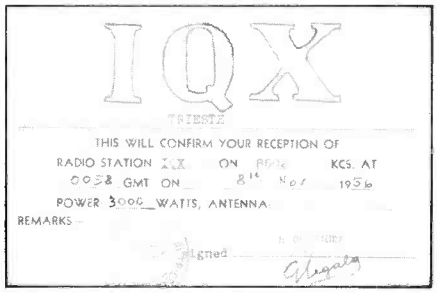
Arizona's Trevor Stanley has run across some active frequencies for high seas ship-to-shore operations. Most of the traffic you'll hear will be telephone calls and the activity will be in SSB. Trevor suggests listening to 8759.2, 8722, 4425.5, 8762.3, and 8731.4 kHz. Thanks for contributing these frequencies, Trevor!

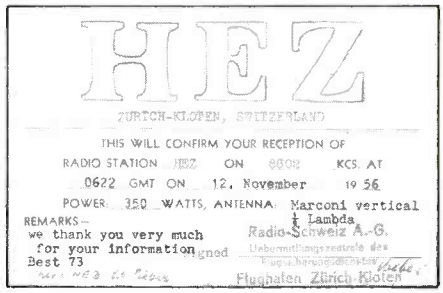
DXing the Russian Navy

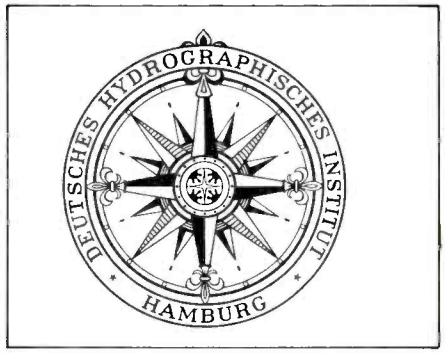
We often get reports of reception of various U.S. Navy stations, but few about reception of stations operated by the Soviet Navy. Actually, reception of Russian Navy stations shouldn't be too difficult.

There are four main communications stations operated by the Soviets for naval communications. One is near Moscow. A second is at Khiva in the Uzbek SSR. The other two are located in Cuba, at Santiago and Havana.

You can hear these stations running the same CW markers used by coastal stations world-wide as well as traffic to and from Soviet ships, although the messages will be coded. Here is a list of frequencies, call signs, and locations. Keep in mind that actual operations may be within a few kHz high or low of the frequencies listed:







George Osier's QSL card from DAM in Hamburg, West Germany.

4264	RCV, Moscow, USSR
5258	CMU967, Santiago, Cuba
6394	RIW, Khiva, Uzbek SSR
6445	ROT2, Moscow
7577	RIW, Khiva
7935	COY895, Havana, Cuba
8456	ROT, Moscow
8508	RIW, Khiva
8523	RIW, Khiva
8576	RCV, Moscow
9145	RIW, Khiva
10433.5	CMU967, Santiago
10434	RIW, Khiva
10509.7	RIW, Khiva
10725	CMU967, Santiago
10912	RIW, Khiva
11046	RIW, Khiva
11114	CMU967, Santiago
11406	COY895, Havana, Cuba
11555	CMU967, Santiago
12056	RIW, Khiva
12723	RCV, Moscow
12744	RCV, Moscow
12752	RIW, Khiva
12995	ROT, Moscow
13045	ROT, Moscow
13064	RIW, Khiva
13390	COY851, Havana, Cuba
14405	RIW, Khiva
14696.5	COY895, Havana, Cuba
14792	CMU967, Santiago
15465	RCV, Moscow
15497	CMU967, Santiago
16942	RCV, Moscow
17130	ROT, Moscow
17504	RIW, Khiva
19098	RCV, Moscow
21764	RIW, Khiva
22450	ROT, Moscow
23525	RCV, Moscow
25130	ROT, Moscow

In addition to the above list, there are reports that D3M93, Luanda, Angola, on 16090 kHz is also used by the Soviet Navy for communications with ships in the Indian Ocean.

Other Soviet maritime communications can also be easily monitored. The so-called "fishing trawlers" use 3347 and 3382 kHz for ship-to-ship traffic in SSB. Russian language traffic in SSB has been caught on 4391.5, 4591.8, and 19050 kHz, and Russian traffic in CW has been monitored on 10141 kHz.

It's highly unlikely that you could ever QSL any of these stations. However, if you do hear any of these stations, why not send them a reception report anyway . . . just to annoy them!

Featured Frequencies

Two of your author's favorite frequency ranges for monitoring unusual activity are 6900-7000 kHz and 7300-7500 kHz. In this range, you can hear smugglers, Latin American guerrilla groups, numbers stations, and various other illegal and clandestine transmissions. Check these ranges during the evening and night hours and report what you hear!

Frequencies 3060 and 3090 kHz have long been common for five-digit Spanish numbers stations during the evening and night hours. This month, keep an eye on both of these frequencies. Be on the lookout for parallel frequencies carrying the same transmission. Ranges to search for parallels

include 4400-4600, 6600-6800, and 8200-8400 kHz. Be sure to report the results to Communications Confidential!

New Goodies

Your editor has compiled a list of recent activity of the types we cover in this column each month. Stations are listed and described in the same format used in this column. The list is ten pages and is available for $3.00 postpaid. In addition, your editor has put together a cassette of the activity we've discussed in this column. On it are numbers stations, various unexplained transmissions, as well as various marker transmissions. It's available for $5.00. Send a money order for the correct amount to Harry Helms, Box 157, Rockefeller Center Station, New York, NY 10185.

Listening Reports

Here are this month's listening reports. Once again, several of them have been contributed by members of the American Shortwave Listeners Club (ASWLC). If you're seriously interested in the subjects covered in this column, you should consider joining ASWLC. A sample bulletin is $1.00 and available from ASWLC, 16182 Ballad Lane, Huntington Beach, CA 92649. Tell them that *POP'COMM* sent you!

We'd like to see your reports here as well. Submit them in the form you see here, in order of frequency, and all times are in GMT (that's EAstern standard time plus five hours). Send your reports to Harry Helms, P.O. Box 157, Rockefeller Center Station, New York, NY 10185. Please include an SASE if you'd like a reply. And now to this month's reports . . .

1622: A remote location crew from the Satellite News Channel was heard using this channel in the Washington, DC area for a live remote. Other channels used for live remotes are 1606-1646 kHz. (Ralph Tennant, WV/ASWLC)

2670: NMF, U.S. Coast Guard, Boston, MA, weather broadcast in SSB 0300. (Timothy Starr, GA/ASWLC)

4028: Five-digit Spanish numbers stations using woman's voice reported at 0130 and 0600. (Spence Naylor, CA and George Zeller, OH/ASWLC)

4250: XFL, Mazatlan, Mexico, CW CQ marker 0240. (George Zeller, OH/ASWLC)

4272: OFJ8, Helsinki, Finland, CW traffic at 2050. (Charles Keilholz, West Germany/ASWLC)

4349: JCS, Choshi, Japan, CQ marker in CW 0724. (Bruce Opitz, VA/ASWLC)

4444: Five-digit Spanish numbers station with female announcer 0310 *in SSB*. (George Zeller, OH/ASWLC)

4736: Four-digit Spanish numbers station with female announcer *in SSB* 0240; followed by RTTY "bursts" on the frequency 0245. (George Zeller, OH/ASWLC)

5000: ZUO, Olifantsfontein, South Africa, time signals with identification in CW every five minutes, approximately 0300. Best reception is at 49 minutes after the hour when WWV doesn't play its 500 Hz tone. (Bill Carney, MI)

5571: Rockwell Flight Test working Saudi 02 in SSB 0509-0530. Rockwell Flight Test made several attempts to establish a phone patch for Saudi 02, but the number was busy each time! (Kevin Wehner, MO) Anyone know where Rockwell Flight Test for this particular frequency is located? (Editor)

5812: Four-digit Spanish numbers station with female announcer 0215. (Gordon Williams, NJ)

6226.8: Five-digit Spanish numbers station with female announcer 0359, "open mike" sounds preceeding and during the transmission. (Spence Naylor, CA/ASWLC)

6436.3: WPA, Port Arthur, TX, V marker in CW 0330. (George Zeller, OH/ASWLC)

6487.5: VRT, Hamilton, Bermuda, V marker in CW 0150. (George Zeller, OH/ASWLC)

6506.4: NMN, U.S. Coast Guard, Portsmouth, VA, working ships in SSB 0000. (Brent Levit, TX/ASWLC)

6572: Five-digit Spanish numbers station with female announcer 0303. (Lani Pettit, IA/ASWLC)

6683: Air Force Two in SSB 0700. (Lani Pettit, IA/ASWLC)

6722: Five-digit English numbers station with female announcer 0500. (Spence Naylor, CA/ASWLC)

6723: "E3HR" working "R3R" in SSB 0330, apparently military traffic of some sort. (Tim Wolfe, PA)

6764: SAC traffic in SSB around 0334. (Tim Wolfe, PA)

6826: Five-digit Spanish numbers station with female announcer 0515. (George Zeller, OH/ASWLC)

6879: Five-digit Spanish numbers station with female announcer 0441. (Spence Naylor, CA/ASWLC)

7375: Four-digit English numbers station with female announcer 0400 and 0415, reported in both AM and USB. (George Zeller, OH and Spence Naylor, CA/ASWLC)

7404: Five-digit German numbers station with female announcer 0637. (Spence Naylor, CA/ASWLC)

7652: KKN44, U.S. Embassy, Monrovia, Liberia, QRA marker in CW 0019. (Mike Lawrence, WI/ASWLC)

8055: Unidentified Japanese language traffic net in SSB 1139; similar net same time on 8057 kHz. (Spence Naylor, CA/ASWLC)

8291.1: Here's an active frequency for coastal stations. The following were heard in SSB during the evening and early morning hours: KCQ, Galveston, TX; KDJ, Houston, TX; KGN, Delcambrie, LA; KIZ, Charleston, WV; KUR, Port Arthur, TX; WNW, Pascagoula, MS; and KBK495, Tampa, FL. (Spence Naylor, CA/ASWLC)

8441: C5G, Banjui, The Gambia, V CQ marker in CW 0903. (Spence Naylor, CA/ASWLC)

8480: XUK2, Kampong som Ville, Cambodia, CQ marker in CW 1100. (Spence Naylor, CA/ASWLC)

8610: WMH, Baltimore, MD, V marker in CW 2315. (George Zeller, OH/ASWLC)

8767: NMN, U.S. Coast Guard, Portsmouth, VA, SSB weather broadcast 0539. (Michael Harris, GA)

8989: Radio check by C-141 enroute to Hickam AFB in Hawaii; this is a very active frequency for Air Force traffic. Transmission heard at 0325. (Trevor Stanley, AZ)

9040.1: Five-digit German language numbers station with female announcer 0405. (Spence Naylor, CA/ASWLC)

9074: Four-digit Spanish numbers station with female announcer 0127. (Michael Harris, GA)

10612: Five-digit Spanish numbers station with female announcer 0459. (Spence Naylor, CA/ASWLC)

11243: Here are some of the military tactical calls recently heard in SSB on this channel: "Lightning Duty," "Lamp Cord," "Peanut," "Swanky," and "Exault." (Brent Levit, TX/ASWLC)

11515: Five-digit Spanish numbers station with female announcer 0300. (James Hicks, IA)

11533: Four-digit Spanish numbers station with female announcer 2000. Opened with a three-digit group repeated three times, then a string of ten consecutive numbers. This was repeated for ten minutes. At 2010, there were ten time pips, followed by "Grupo ocho quatro" and into the four-digit groups. Excellent signal, pegged the meter—almost overloaded the receiver. (George Osier, NY) An excellent, detailed report, George! (Editor)

12075: HO8D and U8HO8 passing intermittent traffic in SSB at 1900; also occasional RTTY. (Tom Kennedy, MI)

12662: UMV, Murmansk, USSR, working FYV in CW 0015. (Tony Kobylski, MD)

12943: CUL7, Murmansk, Portugal, CQ marker in CW 2355. (Tony Kobylski, MD)

12988.5: 3BM5, Bigara Radio, Mauritius, marine weather broadcast in CW 0135. (Julian Harris, FL)

14455: NA4XK, Wallops Island, VA, and NA4XL, Peru, passing traffic in SSB 1815; both stations are operated by NASA. (Tom Kennedy, MI)

15004: RID, Irkutsk, USSR, time signal station at 0148 and 1156. (Tom Kennedy, FL and George Osier, NY)

18087: INTERPOL network passing traffic in CW 0030. (Julian Harris, FL)

18218: Possible spy numbers station in CW, five-digit groups sent at 37 words-per-minute, at 1955. Transmissions began "NR77 NR77 GR88 GR88." (Michael Harris, GA)

18798: Possible naval training exercise 1600-1900 in SSB, lots of talk about tracking incoming planes (some were declared "friendly" or "splashed"). Used various tactical calls. (Gordon Williams, NJ)

20008: This frequency was used for telemetry during the recent Salyut-7 Soviet space mission. (Brian Webb, CA/ASWLC)

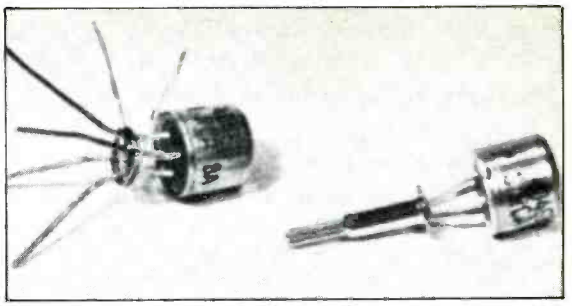
20905: "Echo 01" and "Echo 31" in net operation 1700, in SSB. (Tom Kennedy, MI)

Thanks for your great support! See you next month here in *POP'COMM!*

Build This

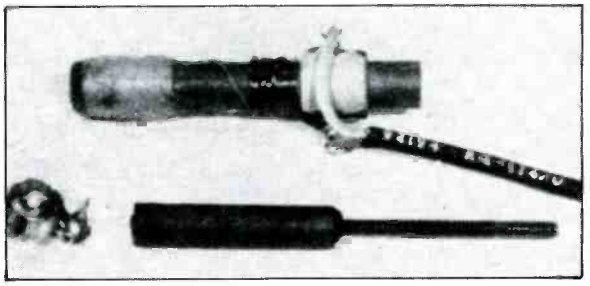
Broadcast Band Preamp

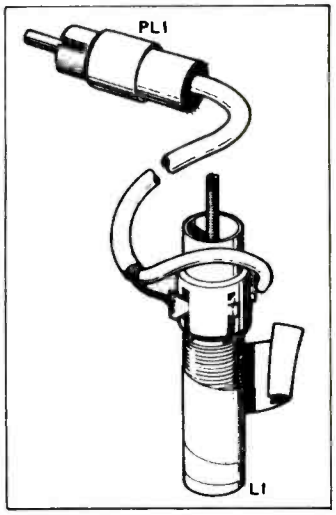
Add Some Moxie To Your Receiver For The Coming DX Season!



FET at right is supplied with leads shorted with rivet. Before installing, wrap a fine wire around leads (left). Remove rivet, install, remove wire.

BY JERRY McGUIRE, KCA6PK





A loopstick antenna at the end of RG174/U coax couples the preamp's output to radios equipped with a built-in loop antenna. The cap, at left, can be discarded. The slug should only be used if it makes an improvement in performance, in which case cement it in the coil. You simply position the coil near the radio's loopstick antenna. Make sure when you connect the coax to the coil that you do not solder one of coax's leads to the tap lug.

Sure I like to DX those mega-power shortwave broadcasters, but sometimes I like to clamp those cans on my head and try to pull those weak DX stations through the maze of stations on the regular AM broadcasting band. A good evening's time and effort usually rewards me with some local programming and color from 1,000 watt (sometimes less) from almost anywhere in North America, Central America, and the Caribbean. A couple of times I've managed to reach outside the hemisphere when conditions were just right.

Surprisingly enough, you don't necessarily have to have a super whiz-bang, ultra sophisticated communications receiver to partake of this aspect of DXing. A regular household radio will pull in a goodly amount of DX, as will a small transistor portable. When the wee hours of the morning come along, and the season of the year is prime, you can hear the DX come rolling in from a thousand miles away.

You like your local station's "Top 40" selection? You may be surprised to find out that the "Top 40" selections in Austin (Texas) and Peoria (Illinois) are totally different. Like country music, the kind you hear in Houston, Los Angeles, New York, or Chicago? After you hear what they're playing in West Virginia and Kentucky, you may decide that there's a lot more to country music than you had imagined.

All it takes for a new outlook on broadcast listening is any radio that will tune 540 to 1600 kHz, aided by our preamplifier—a signal souper-upper which gives a radio a 20 to 40 dB kick in the front end. Connected to a radio that has antenna and ground terminals, such as a budget communications receiver, the preamp will pull in signals you wouldn't normally hear on that receiver.

When used with such a receiver, the preamp's output jack J1 should be connected to the receiver's antenna and ground terminals, with low-capacitance coax such as RG-174U (or a cable with even lower capacitance). This offers between 20 and 40 dB gain, depending upon the receiver's input circuit.

When used with a receiver having a built-in loopstick antenna, the output at J1 should be connected to a loopstick antenna that you place near the antenna of the radio. The signal radiation from the preamp's loop to the radio provides 20 to 28 dB gain, depending upon the radio.

Before starting construction, it is rather important that you know how to handle an FET. An FET (Q1 in the circuit), while being installed, is easy prey to almost everything and it offers you no second chances; goof and the FET is sent to its reward in semiconductor heaven without any delay. As shown in the photos of the FET, the device is supplied with all of its leads tucked into a hollow metal rivet which shorts all of the leads together. Until the FET is in the circuit, the leads must be kept shorted because a high static voltage (such as might be caused by dropping the FET on a wool carpet, or induced AC voltage at the tip of a soldering iron) is all it takes to cause immediate destruction of the FET's gate.

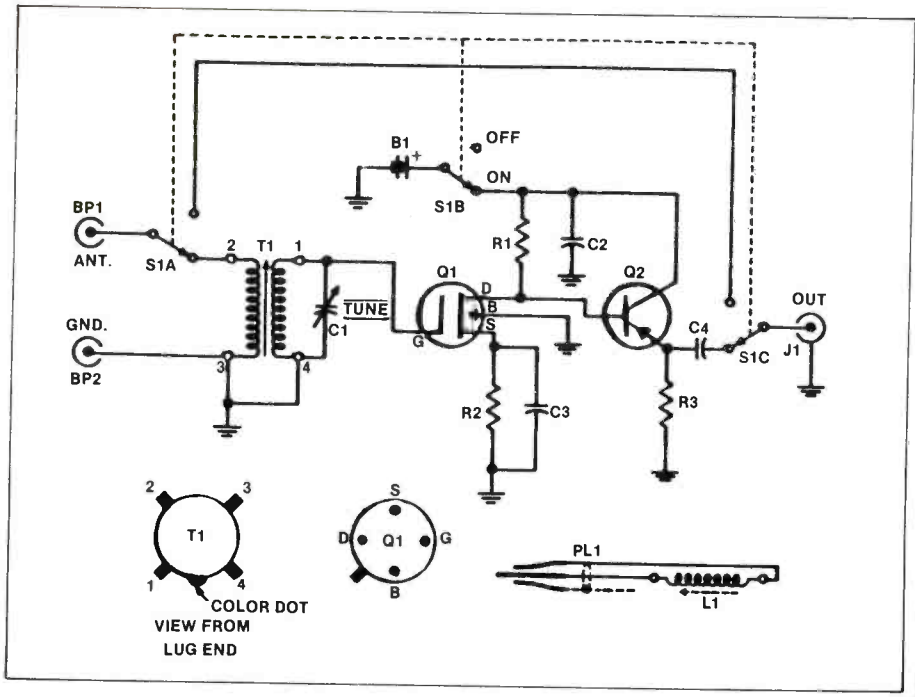
Obtain a length of fine wire by removing a single thread from a 6-inch length of lamp wire (zip cord). Lightly wrap a few turns of the strand around the FET's leads between the rivet and the case; then slide off the rivet and fan out the FET's leads. Leave ends free so the strand can be unwrapped after the FET is soldered in the circuit.

When soldering, use a heat sink on each lead and solder quickly. If you suspect the FET is damaged, seat yourself firmly so you won't stumble, grasp the case of the FET firmly so it won't be dropped, and measure the resistance from the gate (G) to the drain (D) and source (S). Using either probe polarity, the resistance between the gate and drain or source should be almost infinite. If it is between 600 and 2,000 ohms, or equal to the drain-to-source resistance, the FET is defective. (You probably won't notice a change in the normal operating current if the FET is defective.)

Let's Build It!

The preamp is built in the U-section of a 5¼" × 3" × 2⅛" Minibox or similar sized container. The parts layout isn't critical as long as it approximates the pictorial. First step is to mount all of the cabinet components except the battery holder. Transformer T1 mounts in a ¼-inch diameter hole positioned ⅞-inch from the cabinet's left edge. Position tuning capacitor C1 1⅛ inches down from the top so it is centered on the front panel *after* the cover is installed. Keep C1 as close as possible to T1, making certain T1 does not interfere with C1's terminals. Position antenna post BP1 and ground post BP2 ⅝-inch from the right edge of the cabinet. Locate output jack J1 3 inches from the right edge, and switch S1 between the binding posts and T1.

Complete the cabinet wiring and then set the cabinet aside. It may be difficult to solder to C1's terminals, so instead of frying the capacitor, use a very small drop of soldering paste, and make certain all of the paste is wiped away after the connections are soldered. Make certain T1's color dot is properly oriented before soldering any leads to its



Incoming signal is tuned by T1's secondary and C1 and is fed to gate of FET Q1. Signal is direct coupled to Q2, an emitter follower. When S1 is set to the off position, signal from antenna goes directly to output jack J1. Schematic at lower right is of loopstick and connecting cable which must be used if preamp is to be operated with radio that doesn't have pair of antenna and ground terminals.

Parts List

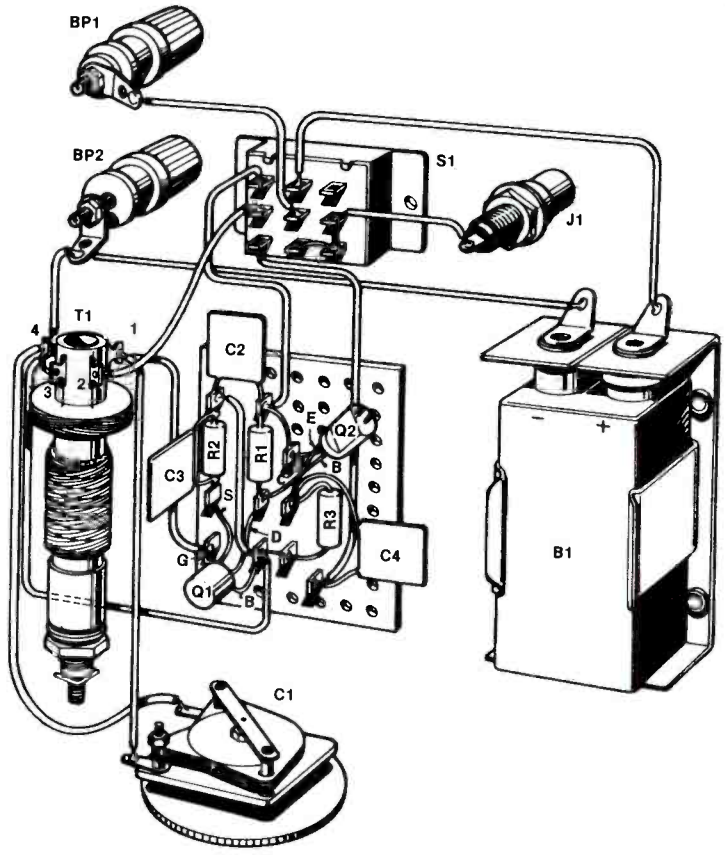
B1 9 volt battery (Burgess 2U6 or equivalent)
BP1, BP2 Five-way binding post
C1 10 to 365 pf. miniature variable capacitor
C2, C3, C4 .05 μf min. ceramic capacitor (10 v. or higher)
J1 Phono jack
L1 Loopstick antenna (see text)
PL1 Phono plug
Q1 RCA 40468 or equivalent (such as Archer 276-2028 or other)
Q2 2N3394 or equivalent (such as Archer 276-2009, 2N784A, 2N2397, 2N2921, 2N2923, 2N3396, 2N3854A or other)
R1 2,200 ohm, ½-watt 10% resistor
R2 470 ohm, ½-watt 10% resistor
R3 4,700 ohm, ½-watt, 10% resistor
S1 3PDT slide switch
T1 Broadcast band RF coil (Miller A-5495-A or equivalent)
Misc. perforated board, flea clips, RG-174/U coax, 5¼" × 3" × 2½" Minibox.

lugs. The dot should face the bottom of the cabinet. When wiring T1, don't use the terminal connections supplied with it. Instead, follow the wiring and terminal numbering shown in the pictorial.

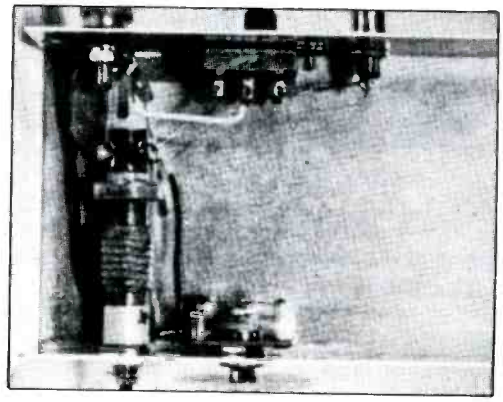
The Perf-Board Assembly

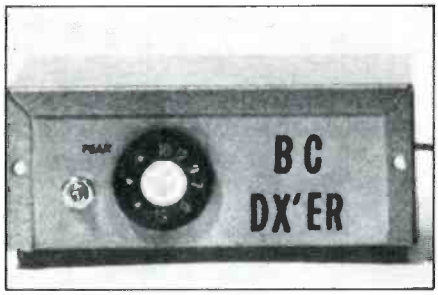
Transistor Q1 and Q2's circuit is assembled on a 1½" × 2" piece of perforated board; push-in terminals are used for tie-points. A single small L-bracket used at a mounting foot will secure the assembly to the cabinet. Make certain that when the board is mounted, it does not extend above the top of the cabinet, or it will be impossible to get the cover on.

Transistors Q1 and Q2 should be the last components installed on the board; all other components and wiring should be completely soldered before Q1 and Q2, which should be tack soldered; *do not* wrap Q1 and Q2's leads around the terminals and apply at lot



In pictorial, C1 and T1 are shown out of position so the connections to them can be seen. Their true positions are shown in the photo below, which was taken before the board was installed. In the pictorial, the three leads going to C4, R1, and Q1 (B) actually connect to the ends of the clips on the rear of the board. Wire going from left lead of C2 to Q1's lug marked B should be on the back of the board and centered between the lugs to which Q1's source and drain leads are connected. Mount board in U-section of Minibox perpendicular to bottom, with angle brackets and between front and back.





of heat and solder. To avoid soldering-heat damage to Q1, fan out the leads so they form a square, and install the push-in terminals in a matching-size square, with one board hole between the terminals. Attach the board's connecting leads to the push-in terminals on the back of the board; allow about 2 inches on the leads; they will be cut short during final assembly.

Position the board in the bottom of the cabinet so that one edge is approximately ¼-inch from T1's winding and the transistors are at least 3/8-inch from C1. Mount the board in the cabinet vertically, using a starwasher between the mounting foot and the cabinet. Connect the board's leads to S1 and T1.

Checkout

Temporarily connect a 10-ma DC millimeter between B1's positive terminal and S1 and turn S1 *on*. The meter should indicate approximately 2 to 3 ma. If it indicates less than 2 ma or more than 5 ma, check for a wiring error. The indication will depend on Q1 and Q2. Transistor Q1 will normally draw about 1.7 ma, but can go as high as 3 ma. Transistor Q2 will draw about 0.8 ma, but can go as high as 1.3 ma.

Note that if Q1 has been damaged, its current drain will be about normal, but the preamp won't work. If the indication is normal, remove the meter from the circuit.

Using The Preamp

If your radio has antenna and ground terminals, connect the preamp to them using a 12 to 15 inch length of RC-174/U coax. If your radio has a built-in AM loop, prepare a 12 to 15 inch length of coax and connect L1 to the free end. L1 can be a tunable loopstick antenna; remove L1's collar and slug.

If the preamp is connected to antenna terminals, set S1 to *off*, connect a long wire antenna to BP1 and a ground to BP2. Tune in a weak station on the receiver at the high frequency end of the broadcast band and set C1 so that its plates are opened fully. Then set S1 to *on* and adjust T1's slug for maximum received signal. Once T1 is aligned, signals are peaked by simply adjusting C1. The preamp won't work if the signals are strong because the receiver's AVC actions will compensate the receiver for the extra gain provided by the preamp.

If your radio has a built-in loop antenna, position L1 near the loop and align T1 as previously described. After T1 is aligned, tune in a weak, high-end station on the loop-antenna radio. Position L1 in a fixed position and slide L1's slug in and out. If moving the slug has no effect on the received signal, discard the slug. If it has had an effect, position the slug for maximum received signal and cement it in position.

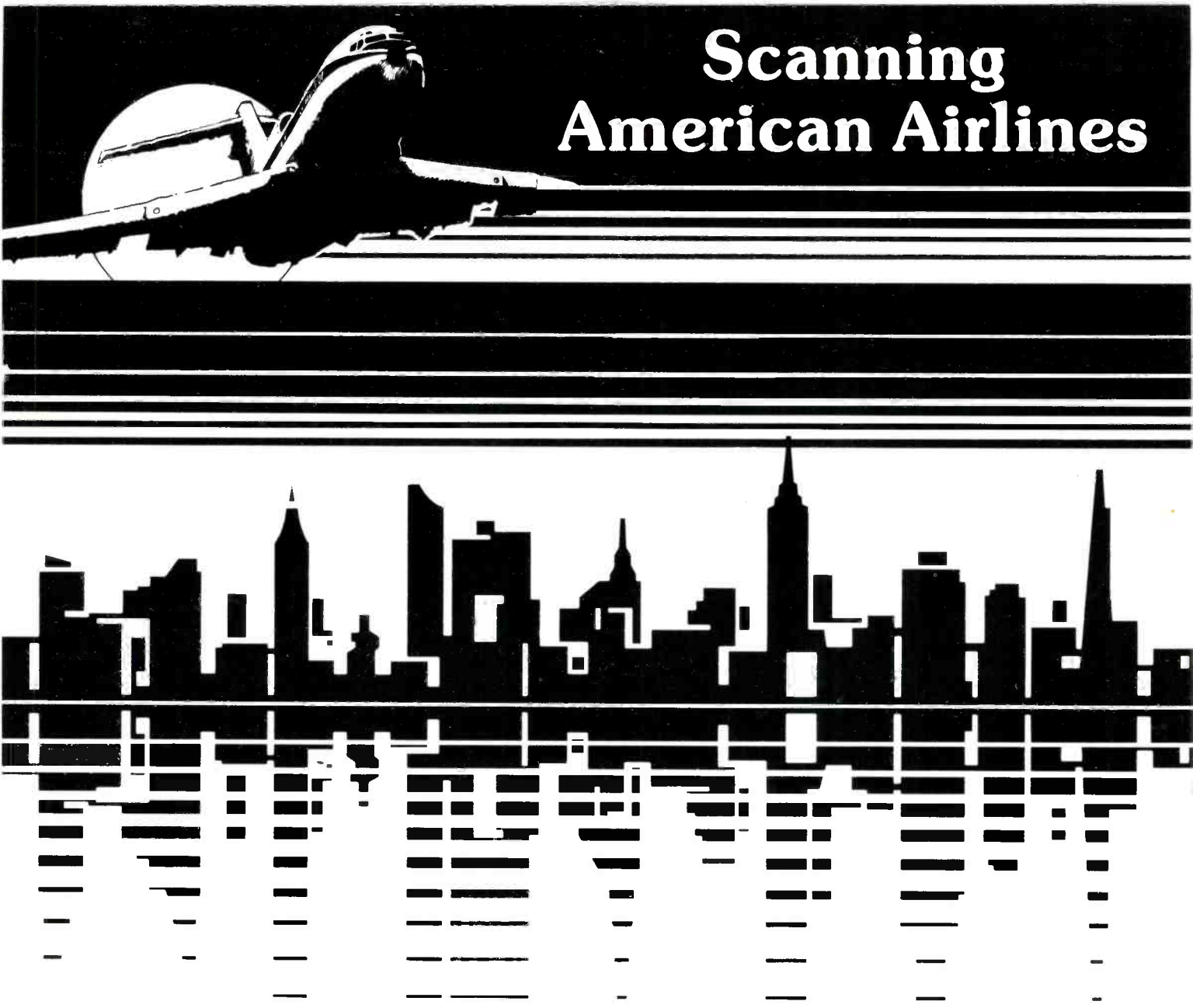
Feedback

Because of the preamp's high gain, it is entirely possible that radiation from L1 to the preamp's input might cause some instability, as evidenced by different stations being tuned when C1 is adjusted for peak reception. If this occurs, try adjusting L1's slug. If this fails to cure the instability, we suggest the external antenna be connected to the preamp with a few feet of coax. In most instances, it will be possible to cure the instability by simply moving the preamp or L1 a few inches.

On some radios with antenna terminals and poor shielding, some instability might occur by radiation from the receiver's antenna coil. This can be eliminated by slightly detuning C1. Since the preamp has loads of gain, the very slight loss caused by detuning will not be noticed.

The preamp is totally immune from overload and may be left in the circuit even when receiving strong stations. However, the receiver's AVC might be overloaded. This can be cured easily by slightly detuning the preamp with tuning capacitor C1.

Scanning American Airlines



BY RICK MASLAU, KNY2GL

Here are the ground stations utilized at the locations served by American Airlines. These stations are used by airline personnel for security, coordinating operations in connection with passenger handling, public relations, cargo, aircraft maintenance, gate assignments, and problem solving in general. Normally these stations have a limited transmission range and are probably heard best in areas near the airports at which they are located. All frequencies listed are MHz.

AZ	Phoenix	**KVN409**	460.775
	Tuscon	**KQF285**	460.775
CA	Los Angeles	**KJD675**	460.775
		WXB251	462.85
	San Diego	**KYH456**	460.775
	San Francisco	**KXY211**	460.775
IL	Chicago	**KDM873**	460.775
		KAC8703	462.70
IN	Indianapolis	**KXZ236**	460.775
	Union Mills	**KQ8046**	460.9125
KY	Covington	**KXD996**	460.775
MD	Baltimore	**KVN410**	460.775
MA	Boston	**KQX924**	460.775
MI	Detroit	**KSU331**	460.775
NJ	Newark	**KJQ269**	460.775
NY	Buffalo	**KRB331**	460.775
	Flushing	**KBN870**	151.685
		KFH397	460.775
		KSK529	460.775
	Jamaica (JFK)	**WRZ922**	464.425
	Syracuse	**WSJ566**	460.775
NV	Las Vegas	**WSO703**	460.775
OH	Cleveland	**KWW231**	460.775
OK	Tulsa	**KQR740**	460.775
PA	Philadelphia	**KXK923**	460.775
	Pittsburgh	**WZT263**	460.775
PR	San Juan	**KQY563**	460.775
TN	Nashville	**KEP830**	460.775
TX	portable	**KD2345**	154.57
	Dallas	**KSM463**	460.775
	Houston	**WXC269**	460.775
US	portable	**KSN459**	460.775
VI	Charlotte Amalie	**KTB423**	460.775
	Christansted	**KTB422**	460.775
VA	Arlington	**KXA937**	460.775
	Chantilly	**KRP451**	460.775

SURVIVAL

BY R.L. SLATTERY

ESTABLISHING SURVIVALIST COMMUNICATIONS SYSTEMS

Odds And Ends

Ceramic microphones are noted for their rugged ability to survive extremes in temperature and humidity.

Reader Bart Arkanian of Iowa writes to this column to ask about message security, taking into account the desire to be effective while spending little or no money for exotic hardware such as voice scrambling gear. During WWII, the military discovered that by employing American Indians who could speak the complex Navajo language, they had a totally secure communications system. Therefore, you could always get some of your friends together and all of you could learn to chat in Navajo. Short of doing that, I could suggest an alternative approach which, although simple, is surprisingly effective.

People familiar with passing communications messages ("traffic") by voice are generally familiar with the international phonetic alphabet—y'know, the old favorites Alpha, Bravo, Charlie, Delta, Echo, and that sort of thing. Those phonetics are employed to make it easier for people to copy traffic. A way of achieving some measure of communications security is by simply modifying the phonetic alphabet to the extent of removing the standard phonetics for certain letters of the alphabet and replacing them with devilish ringers. What comes out is a bizarre phonetic alphabet which sounds at least a little like the familiar one but is far enough removed from it so as to effectively disorient someone listening in to the point where you can get your message past would-be eavesdropers. This system works. I've used it!

The "devilish ringers" aren't just substitute phonetic letters, by the way, they are ones that have been carefully selected to be misleading. For instance, the phonetic letter *Alpha* (representing the letter "A") is replaced with the phonetic letter "Aesop" (pronounced "E-sop"). The phonetic for the letter "E" (normally *Echo*) now becomes "Eiffel" (like the tower). Other selected similar substitutions are made, the substitute phonetics being selected to offer misleading and confusing sounds which differ sufficiently from the actual sound of the letter. This makes it difficult for an outsider to convert the offbeat phonetics into reality while trying to keep up with copying your traffic. For instance, by the time they realize that the phonetic they've heard which sounds like "Wau-keen" isn't the letter "W" but, instead, is the letter "J" (for the phonetic *Joaquin*), they will have missed a dozen letters of the message.

You may wish to create your own misleading phonetics, but I offer here one sample phonetic alphabet which I've used in the past—a combination of familiar and fantastically fractured phony phonetics. Although simple, it does work if you can become familiar with it in order to pass your traffic at a normal rate of speed.

Voice Security Phony Phonetic Alphabet

A	Aesop	N	November
B	Bravo	O	Oedipus
C	Charade	P	Pneumatic
D	Delta	Q	Qatar
E	Eiffel	R	Romeo
F	Foxtrot	S	Sierra
G	Gesture	T	Tango
H	Herbal (silent "H")	U	Umlaut
I	India	V	Victor
J	Joaquin	W	Wry
K	Knife	X	Xenon
L	Lima	Y	Yclept
M	Mnemonic	Z	Zulu

Just think how it will sound when you use this set of phonetics and pass along a transmission that sounds like "Wau-keen, Edipus, Iffel, E-clept." You seriously think that very many folks are going to quickly know you've spelled the simple name "Joey"? No way! Easy to use but totally confusing!

He's Faded

R.J.M. of Newport Beach, California, writes to say that he's been able to obtain a piece of military surplus communications equipment having the nomenclature AN/GRR-5. He complains that it operates fine for about 20 minutes but then it starts fading in and out and becomes relatively useless for reliable communications. This is nothing new with the AN/GRR-5 and, if it's any consolation to R.J.M. and others owning "Angry-5's," there is a solution. The problem is that one of the rectifiers is going out. The solution to the problem is to replace the rectifier with a couple of semiconductors. The job requires no more than a soldering gun and a pair of pliers. The replacement rectifiers (and instructions for installing them) are available from Denninger Electric, 5885 Bancroft Ave., Oakland, CA 94605. The cost is minimal; check with Denninger for current price and information on ordering.

What The Pro's Use

Buddy Saenkel, Bogue Chitto, Mississippi, dropped this column a letter to mention that he read that the primary communications gear taken along on last Spring's mission into Cambodia to try to locate MIA's was known as the AN/PRC-47—that was apparently Lt. Col. Bo Gritz' communications mainstay. Buddy wants some more information on the PRC-47 and our opinions on its general suitability for Survivalist uses; also if the set is available on the military surplus market at this time.

As a matter of fact, the AN/PRC-47 is an excellent piece of commo gear and is right out of the Special Forces arsenal. Although it's not something you could very easily strap to your back and run around with (since it weighs about 190 lbs.), it does offer both CW and SSB (USB only) communications on all frequencies (1 kHz channel spacing) between 2 and 12 MHz. It has a dual power output, which means you can run either 20 watts (PEP) or 100 watts (PEP), and you can mount it in a vehicle or use it as a fixed station. Power requirements are 24 VDC, 26.5 VDC, or 115 VAC (400 Hz).

The complete AN/PRC-47 package includes whip and long wire antennas, handset, speaker with vehicular mount, head set, CW key, power cables for all types of installations, back pack, canvas accessory bag, and generally ready to use. These sets have recently begun to trickle out to the public from the military. Two sources we've noted for the AN/PRC-47 are Fair Radio Sales, 1016 E. Eureka, Box 1105, Lima, OH 45802; and Michael P. Murphy, 11621 Valle Vista Rd., Lakeside, CA 92040. Mike's a well known mil surplus dealer who seems to specialize in Survivalist commo gear.

Dry This Trick

Reader Gerald Higgins of Duvall, Washington passes along this hint. Gerry says that he's in an especially damp area which seems to constantly threaten various pieces of electronics gear he uses. He notes that when he buys certain over-the-counter medicines (such as vitamins), the bottles contain a pill-like dehumidifying agent. After the bottles are depleted of their vitamin contents, he used to throw the bottle and the dehumidifier in the waste basket. Now he's decided to

just throw out the bottle. He saves the dehumidifying "pill" and places it inside of his electronics equipment. When the equipment isn't in actual use, he says he wraps it carefully in water and dampness resistant material and stores it in a closet.

I might add to Gerald's comments that microphones seem especially prone to being damaged by moisture and humidity and many's the communicator who learns that a microphone has been rendered useless after long-term storage in a garage, vehicle, or other unheated facility. Crystal microphones are especially delicate when it comes to moisture damage and such mikes (as well as most other types) are best stored inside of a heated home or office during the colder months. When in use, it is often found to be of some protective advantage to let the microphone remain enclosed in a clear plastic bag held in place by a rubber band. If you have one of those dehumidifying "pills" handy, toss it into the bag with the mike. The bag will also keep dirt out of the mike, especially the push-to-talk switch.

Ceramic mike "buttons" appear to be the most rugged and moisture resistant for all-around communications purposes and they can usually be used to replace any crystal type mike elements which seem to be encountering moisture problems. Nevertheless, never forget that moisture and humidity, in general, is the enemy of all of your electronics equipment and care should always be taken to protect the equipment from these two gear-wreckers when planning storage or installations.

That takes care of some lingering odds and ends which have been stacking up on the desk here—items which I thought you'd be interested in having shared with the general readership.

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FREE RADIO FOCUS

ACTIVITIES OF UNDERGROUND BROADCASTERS

BY AL MUICK

In a letter recently received from our good friend The Scorpion, he informs me that he is now "free" (cryptic message, OM? HI) and has started preparations for his newest station WCFR, Chicago Free Radio. He says that the equipment is just about completed, with the exception of getting the antenna up in the air.

WCFR will operate on frequencies of 10655 and 16445 kHz with a 300 watt input to two 6146W's in his final amplifier. The oscillator-exciter is variable crystal controlled for low frequency drift and the modulation will be low-level in the driver stage and all audio will be processed. Their antenna is a 22 foot tall base-loaded vertical about 15 meters above ground level. They are also organizing a mobile unit in a van which will be operating during the summer months. The frequencies and power will be the same, but the antenna will be an inverted "V" feeding east.

WCFR's programming will consist of Heavy Metal on Fridays, fifties and sixties music on Saturdays, and a mixed format on Sundays. Scorpion informs me that they will QSL, so be sure to keep an ear out for WCFR. They should be in full swing by the time this column hits the presses!

Another letter from Pirate Joe at Pirate Radio Central brings the following news: PRC runs its "flagship" station, KPCR, out of New York City. Their antenna is specially designed to give an efficient skywave signal for maximum long-distance coverage. They operate sporadically on 1616 kHz, and mostly at night. Their programs are mainly devoted to listener input via the telephone and through the mail, which, on occasion, they read over the air. At KPRC, they try to pick some timely, important subject to discuss over the air and encourage comments on. They center on current problems, such as nuclear power (which they are against), military expenditures (uh-oh, HI—Al), and human rights violations throughout the world. Pirate Joe says: "At times we get political . . . meaning we express ourselves outright as free Americans, outraged at a lot of the madness going on. The very nature of Pirate (or Free) Radio demands that we say something, and not only play music."

He goes on to inform me that there are no tape delays at KPRC and that they chose 1616 kHz for two reasons: one, it is separated enough from the standard broadcast band so as not to cause interference, and, two, it is still close enough that the average listener can receive it.

I tend to agree with him on one point, and I'm sure that you, the reader, will agree also: "As you know, free stations are on borrowed time. There is always the specter of the

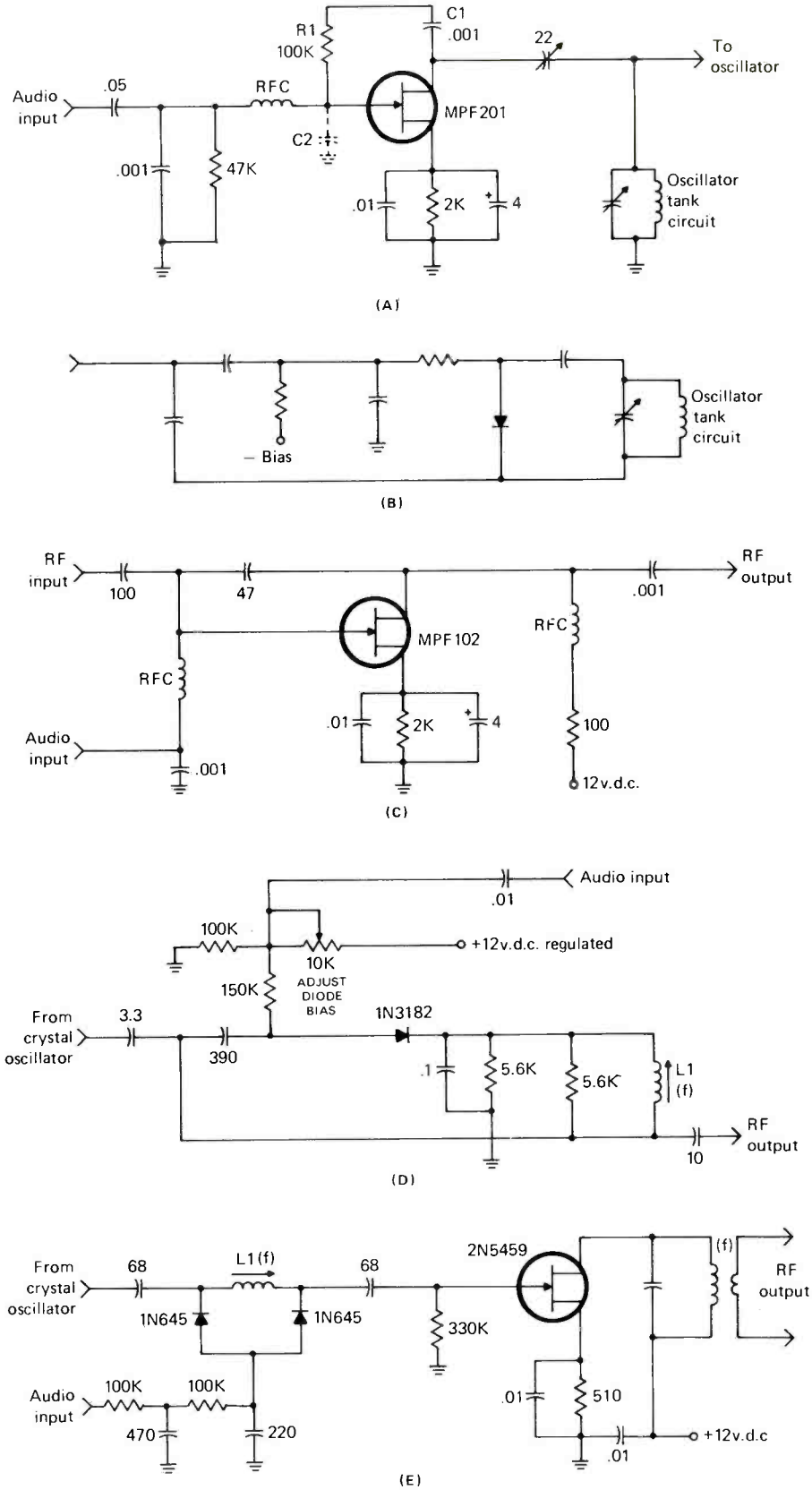


Figure 1.

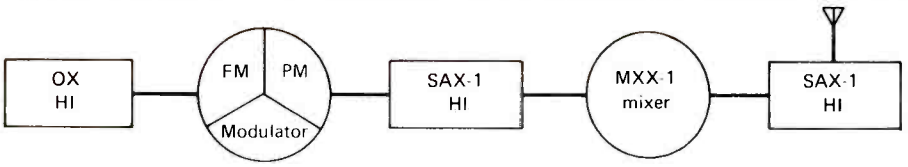


Figure 2.

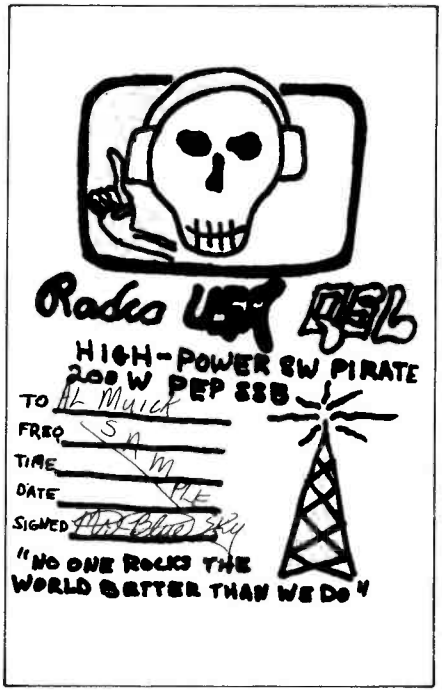
FCC over their heads. This is, of course, the reason for sporadic nature of the medium. KPRC hoped to keep broadcasting into the night, and hopefully, if enough stations are heard and the programming proves to be an asset to serve the public need, the pressure may subside." Thanks Joe, not only for the information, but for your many laudatory comments about both myself and *POP-COMM* magazine!

Another letter just in comes from the people at Radio USA. They are pleased to announce that after four months of hardships and technical difficulties, they have finally started successful broadcasts. They use a power of 200 watts PEP (SSB) into an inverted "V" antenna and operate on 7220 or 7230 kHz; but, they hope to move up to 7337 kHz. You can try for them between 0000 to 0700 GMT and they are hoping to establish relays in Europe.

Radio USA's format will include hard rock music, news, humor, relays of TWR Bonaire (now *that's* original!—Al) and computer programs. They publish RU news, QSL cards, and RUDX, the Radio USA DX program. The letter was signed by the Radio USA DJ's: Mr. Blue Sky, Quicksilver, and Hubbie.

Winding up the Free Radio news, listeners in the Odessa, Texas area may want to check their local dials for Radio North Star, which will be hitting the air very soon on AM, FM, and shortwave. In a taped letter from the operator of the station, I was told that the format will be a Top 40 type of show and may be semi-automated. The DJ has access to a professional station, so the programs promise to be something worth listening to. Unfortunately, I have no further information at this time.

On to the technical tips corner of our column. I'm sure that most of you have seen the advertisements in certain electronics magazines by the International Crystal Manufacturing Co., Inc., in which they advertise their little experimenter kits. These kits can be purchased for a very nominal fee, work very well, and are extremely simple to assemble. In order to build a 100 milliwatt transmitter for the FM band, you would need the following: one OX HI oscillator, kit # 035101 ($6.31), two SAX-1 HI RF amplifiers, kit # 035103 (@$7.02 each), one MXX-1 HI RF mixer, kit #035105, ($7.02), and one experimenter crystal at ½ your proposed FM frequency ($6.86). You may want to write for a catalog from ICM Customer Service Department, 10 North Lee, Oklahoma City, OK 73102. You can also order from that address; all kits are postpaid. A block diagram of how the entire project is set up follows in Figure 2.



The next part of this month's project is to FM modulate a transmitter. In the kits themselves, you are shown how easy it is to amplitude modulate the thing, but the real trick is to build an FM modulator. There are several ways to do this.

In Figure 1a you see one of the best (albeit hardest) methods to FM a transmitter. This is called direct FM, and, as always, it has its drawbacks. Due to the presence of the reactance-tube modulator, the stabilization of an FM oscillator in regard to voltage changes is considerably more involved than in the case of a simple, self-controlled oscillator for transmitter frequency control. If desired, the oscillator itself may be made perfectly stable under voltage changes, but the presence of the FM modulator destroys the beneficial effect of this stabilization. It thus becomes desirable to apply the stablilizing arrangement to the modulator as well as the oscillator. Here is a simple one-transistor modulator that will solve all of the above problems, as long as it is connected to the oscillator tank coil as shown in the diagram.

In Figure 1b, we have what is known as the diode modulator. When a resistor and a capacitor are placed in series across an oscillator tank circuit, the current flowing in the series circuit is out of phase with the voltage. If the resistance or capacitance is made variable, the phase difference may be varied. If the variation is controlled at an audio rate, the resulting current may be used to frequency modulate an oscillator. The variable element is placed in series with a small capacitance across the tank circuit of an oscillator to produce and FM signal. The bias voltage (another drawback, but, unfortunately, a necessary evil) applied to the diode should be regulated for best results.

Those are the two best, but most hair-tangling methods of FM'ing this month's project. A simple solution to this problem would be to use what is known as phase modulation. Phase modulation (henceforth to be called PM) is much the same as FM, but the real difference can only really be seen with an oscilloscope, and the adverse effect upon the transmitter will be much less than nominal. The only disadvantage of PM, as compared to direct FM, is the fact that very little frequency deviation is produced by the phase modulator. The deviation produced by the phase modulator is independent of the actual carrier frequency on which the modulator operates, but is dependent only on the phase deviation which is being produced and on the modulation frequency. This can be expressed as an equation for you math freaks:

$$F_d = M_p \times \text{modulating frequency}$$

where,

F_d is the frequency deviation one way from the mean value of the carrier

M_p is the phase deviation accompanying modulation expressed in radians (a radian is approximately 57.3°)

Enough of the tech talk for a moment. It must be pointed out that with phase modulation, the extreme highs of the modulation frequency should be limited or abnormally wide frequency deviations will occur, producing unwanted sidebands that will cause distortion on the signal and splatter on the band.

In Figure 1c we have a solid-state, one-transistor phase modulator that is inserted between the oscillator and first RF amplifier of our project. This is by far the easiest to assemble and install, and I must admit that it's one of my favorites. But best of all, it's entirely self-explanatory.

In Figure 1d is another fairly easy phase modulator using a varactor diode. It is also placed between the oscillator and first RF amp. Audio voltage applied to the varactor varies the phase of the tuned circuit. The diode bias can be adjusted for the largest phase shift consistent with linearity.

Last but not least we have a phase-modulated field effect transistor in a gate circuit in 1e in which two silicon diodes are used as varactors across a phasing coil (L_1). The RF output of the 2N5459 transistor used in this circuit is about 30 mW and when connected to the first RF amp will give you even more power out in your final.

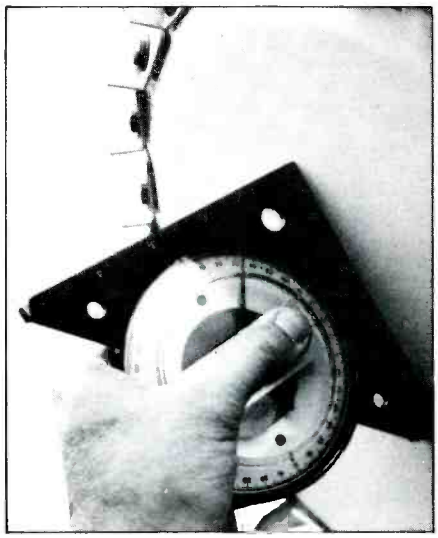
I hope I didn't lose you with all this, but I think I got the general point across. I would be interested to hear of your successes (or otherwise) with this month's project, so please drop me a line at *POP'COMM*, 76 N. Broadway, Hicksville, NY 11801. Until next time, 73's and FFFR!

SATELLITE VIEW

INSIDE THE WORLD OF TVRO EARTH STATIONS

BY MARK LONG, WA4LXC

The Movie Channel, TR 5, Satcom IIIR. (Photo by Michael Bonnickson)



The elevation angle of the dish antenna can be measured with an inclinometer. (Photo by Michael Bonnickson)

Occasional video from Westar IV. UPITN News feed. (Photo by Michael Bonnickson)

In recent months, significant changes have been made in the video programming lineup on the major North American satellites. Today, there are more than 85 active transponders in full-time operation on our domestic birds. An additional two dozen transponders are regularly used for occasional video (o/v) transmissions, like news feeds, teleconferencing, or special events video.

Several cable TV services began operation on Westar IV, a satellite which has also carried a high volume of network feeds and occasional video traffic. But this was only a temporary arrangement, with all services now relocated to either Satcom IV or Westar V—two fairly new birds with an attractive selection of cable TV programming. With the recent premier of The Disney Channel and The Nashville Network, Westar V has become a more active video marketplace, with many local cable TV companies adding a second dish to receive its services in addition to those of the fully-occupied, 24-transponder Satcom IIIR bird.

This month's column is devoted to providing an updated guide to the available video programming carried by our domestic satellites.

Satellite Transponder Frequencies

TR No.	Frequency	TR No.	Frequency
1	3720 MHz	13	3960 MHz
2	3740 MHz	14	3980 MHz
3	3760 MHz	15	4000 MHz
4	3780 MHz	16	4020 MHz
5	3800 MHz	17	4040 MHz
6	3820 MHz	18	4060 MHz
7	3840 MHz	19	4080 MHz
8	3860 MHz	20	4100 MHz
9	3880 MHz	21	4120 MHz
10	3900 MHz	22	4140 MHz
11	3920 MHz	23	4160 MHz
12	3940 MHz	24	4180 MHz

For Satcom I-IV and Comstar I-IV: even TRs are horizontal polarization/ odd TRs vertical.
For Westar IV & V, and ANIK D: even TRs are vertical/odd are horizontal.
For Westar I-III and ANIK B: only odd TRs are active with horizontal polarity.

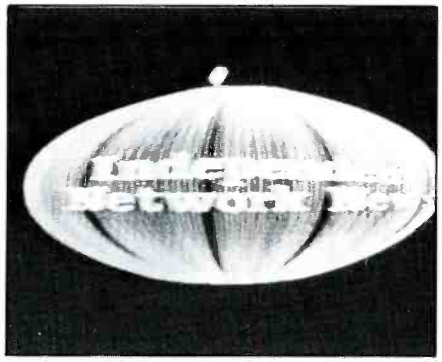
Satcom V 143 degrees West longitude
TR No.
19 occasional video (o/v) use
20 Learn Alaska TV Network
24 Alaska Satellite TV Project

Satcom IR 139 degrees W.
1 o/v
3 o/v

Satcom IIIR 131 degrees W.
1 Nickelodeon/Arts: children's/cultural programming
2 Praise the Lord (PTL) Network
3 WGN-TV: Chicago Superstation
4 Spotlight: premium movie service *
5 The Movie Channel: pay TV movie service *
6 WTBS: Atlanta Superstation
7 ESPN: Sports Network
8 Christian Broadcast Network (CBN)
9 USA Cable Network
10 Showtime: premium movie service, west coast edition *
11 Music Television (MTV)
12 Showtime: east coast edition *
13 Home Box Office (HBO): west coast edition *
14 Cable News Network (CNN)
15 CNN Headline News
16 Home Entertainment Network (HTN): premium program service
17 Cable Health Network
18 Reuters News Service
19 C-SPAN: live coverage of the U.S. House of Representatives
20 Cinemax: pay TV movie service, east coast edition *
21 The Weather Channel
22 Daytime: women's programming
23 Cinemax: West Coast Edition *
24 HBO: east coast edition *

Comstar IV 127 degrees West longitude
TR No.
8, 11 On TV **

Financial News Network, TR 2, Satcom IV. (Photo by Michael Bonnickson)



Independent Network News, TR 21, Westar III. (Photo by Michael Bonnickson)

Cable News Network, TR 14, Satcom IIIR. (Photo by Michael Bonnickson)

Westar V 123 degrees W.
TR No.
3 WOR TV: New York City Superstation
8, 11, 14, 16, 18 The Satellite News Channels
10 The Disney Channel: east coast edition
12 The Disney Channel: west coast edition
17 The Nashville Network: country/western entertainment
21 Spotlight: pay TV movie service *
22 SelecTV: premium programming

Satcom II 119 W.
TR No.
13 NASA Contract Channel: live coverage of space shuttle
20 American Forces Radio & Television Service (AFRTS)
24 o/v

ANIK B 109 degrees W.
TR No.
7 o/v
11 CBC North: Pacific edition
13 o/v
15 CBC Quebec
17 o/v
19 CBC North Atlantic Edition
(ANIK B services will be moving to ANIK D by the end of 1983.)

ANIK D 104 degrees West
TR No.
8 CHCH-TV: Hamilton, Ontario Superstation **
14 TCTV: Telemedia Communications TV, Montreal **
16 CBC Parliamentary Network: (French Language edition)
18 CITV: Edmonton, Alberta Superstation **
22 BCTV: British Columbia Television **
24 CBC Parliamentary Network: (English language edition)

Westar IV 99 degrees W.
TR No.
2 o/v
4 o/v
5 o/v
15 PBS: Public Broadcasting System feeds
17 PBS
20 The American Network
21 PBS
23 PBS

COMSTAR I & II 95 degrees W.
TR No.
1, 4, 9, 11, 12, 14, 20, 21, & 24 used for occasional video (o/v)

Westar III 91 degrees W.
TR No.
5 o/v
19 o/v
21 Independent Network News (INN)
23 U.S. Army Video Teleconference Channel

The Satellite News Channel, TRs 8, 11, 14, 16, & 18, Westar V. (Photo by Michael Bonnickson)

Comstar III 87 degrees W.
TR No.
1 NBC Network Prime Time programs
8 o/v from Wold Communications
10 o/v from Wold Communications
13 ABC Network programs
17 CBS Network programs

Satcom IV 83 degrees W.
TR No.
1 Spanish Independent Network (SIN)
2 Financial News Network (FNN)
3 Satellite Program Network (SPN)
6 Bravo: cultural programming from the performing arts
7 The Playboy Channel: adult entertainment programs
11 Eros: Hard "R" movies and programs
15 BizNet: U.S. Chamber of Commerce business programming
17 Trinity Broadcasting Network (TBN)
23 Galavision: Spanish language programming service

Westar I & II 79 degrees West
TR No.
3 o/v
11 o/v
19 o/v

* will eventually be scrambled
** scrambled right now; descramblers available for lease from CANCOM.
o/v occasional video.

CHCH TV, TR 8, ANIK D. (Photo by Michael Bonnickson)

To locate any specific satellite, two coordinates are required: the elevation and azimuth. We have a computer program available which can predict the correct az/el coordinates for each bird. The only information required is the correct latitude and longitude of the site of the earth station installation. The elevation of the dish is measured with an inclinometer which is placed against the back portion of the dish which runs parallel with the polar mount axis. A magnetic compass is used to orient the dish to the correct azimuth bearing. Magnetic compass readings must be corrected to true north in order to be accurate. Call the nearest airport for the correction factor for your area.

If you would like to learn more about satellite television, *The World of Satellite Television* by Mark Long and Jeffrey Keating is available for $9.95 from Solar Electronics, 156 Drakes Lane, Summertown, Tennessee 38483. Also available: International Satellite coordinates computer printout (when ordering, please specify your latitude and longitude). Price: $4.95. Please add $1.00 for postage and handling.

Radio Syd—The Trip From Denmark To The Gambia

BY AL MUICK

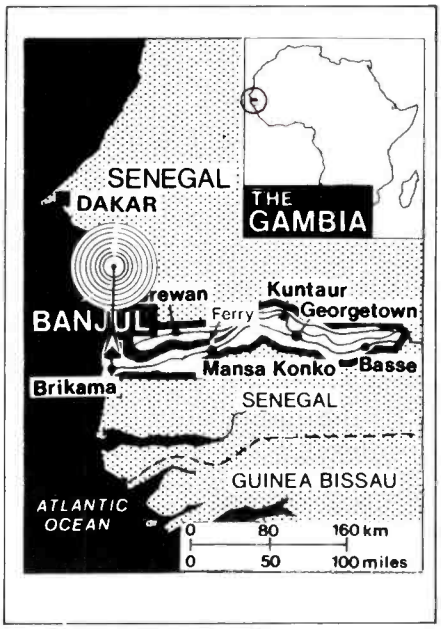
Radio Syd is a low-powered (2500 watts) medium wave station operating on 909 kHz from the capital city of The Gambia, Banjul. In a letter that I received from the General Manager, Miss Constance Wadner Enhörning, the following story was related to me:

The Gambia has a population of approximately 500,000 and Banjul, the capital city, has a population of some 40,000 people. The entire country covers an area of less than 4,000 square miles and the primary language is English.

Radio Syd has been broadcasting since 1959 and claims to be one of the world's first offshore radio stations. From 1959 until 1966, Radio Syd, aboard the good ship "Cheeta II," lay anchored in Oeresund, between Malmö and Copenhagen. After 1966, they set sail for England, where they spent one year anchored off of Harwich broadcasting for Radio Caroline, the most famous pirate station ever.

From Harwich, the "Cheeta II" sailed to the Canary Islands, where it was rebuilt to serve as a restaurant, disco, and coffee shop with a souvenir boutique. The ship sailed to The Gambia just before Christmas of 1968, and shortly thereafter Mrs. Britt Wadner, the founder and owner, began to construct the Radio Syd studios. The studios, transmitters, and office are located on land near the main road about two kilometers outside of Banjul, but they are still near the sea as there is a beach just outside of the studios.

Radio Syd is a totally non-political music station and they have been officially operating in The Gambia since May 7, 1970. They have a lot of competitions and give away some really great prizes, like the Lada Saloon Car given away in the recent Picadilly Competition. This particular competition had 347,631 entries, which is quite surprising considering the country's small population. Radio Syd is also popular in The Gambia's neighboring countries like Mauritania and Senegal, with its capital Dakar, which has over one million inhabitants.



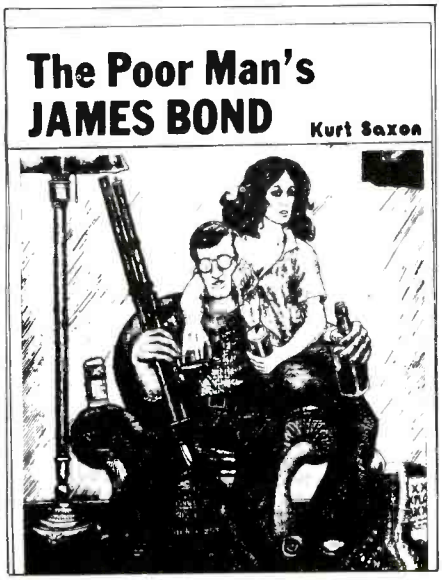
They welcome reception reports, which are of significant interest to the station staff, and all correct reports will be QSL'ed as long as return postage in the form of International Reply Coupons is enclosed. Be careful when reporting though, as even though the official language of The Gambia is English, Radio Syd also broadcasts in the French, Swedish, German, Wollof, and Mandinka languages. To help prospective DXers along, I am pleased to be able to bring you Radio Syd's current broadcasting schedule.

Well, I hope you all have good luck in receiving Radio Syd. It'll take a lot of patience, good skip conditions, and some really fancy antennas, but with these and a little hope, anything's possible. I'd be really interested to know if any of you ever manage to add Radio Syd to your log, so please drop me a line c/o *POP'COMM* if you do.

Program	Language	Times (Local)	Comments
Morning Show	English	0800-1030	April 16-November 14 only
		0900-1030	November 14-April 15 only
Request Time Part I	English	1400-1430	Three times weekly
Request Time Part II	English	1900-1930	Two times weekly
Takusan	Wollof	1700-1730	Mondays and Wednesdays
Top Ten	English	1530-1600	Saturdays
		1900-1930	Wednesdays
Swedish Program	Swedish	0800-0830	For Scandinavian and German
		2000-2030	Tourists from October til
German Program	German	0830-0900	May. With news, interviews,
		2030-2100	and "What's Up in The Gambia."
Seven O'Clock Special	Mandinka	1900-1930	Mondays, Tuesdays, and Fridays
Saturday Night Get Together	English/ Wollof	2200-2330	Saturdays

PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS



The Poor Man's James Bond

Kurt Saxon's outrageous, rare, and classic reference book on improvised weaponry and do-it-yourself is the undisputed leader in the field. Saxon is one of America's most infamous and controversial authors and he has assembled many years worth of research on paramilitary knowledge as developed and actually used by all manner of radical, dissident, underground, undercover, and otherwise thoroughly far-out groups. Featured is a section entitled "Arson By Electronics," which reveals (complete with charts and diagrams) basic circuits and techniques for detonation of explosives by radio, sound operated devices. He explains what "electronic arson" has in common with "conventional arson." He explains how people "beat" metal detection devices, how they evade pursuit. He then goes on to give complete and amazingly detailed descriptions of how various groups secure common items from grocery stores and other local sources and turn them into things such as pipe bombs, improvised firearms and zip-guns, flame throwers, silencers, poisons, nitro, fuses, mortars, fireworks, etc. An informative book in a massive 11″ × 14½″, 146-page format, fully illustrated. This is the one important reference work for all survival, law enforcement, intelligence, and other similar interests. Containing hundreds of formulas, *The Poor Man's James Bond* is a complete tactical and paramilitary reference library in itself.

The Poor Man's James Bond is $14.95, plus $1 for shipping and handling by Book Rate Mail. If First Class Mail is wanted, send $14.95 for the book and an additional $3 for First Class Mail and handling (total $17.95). Order your copy from CRB Research, P.O. Box 56, Commack, NY 11725.

Frequency Hopper

An advanced, self-contained frequency hopping transceiver has been announced by Transcrypt International, Inc.

The SC-1000 has been specially developed to meet the demand for high security by government and law enforcement agencies world-wide. Long recognized by military organizations as the best form of protection, frequency hopping is now available to non-military users. Several automatic and fail-safe features make the SC-1000 very secure and easy to use.

Security is provided by changing frequency rapidly (600-750 times per minute), thus avoiding unauthorized monitoring as well as jammers or direction finders.

The manufacturer claims that the SC-1000 "can go completely unnoticed, avoiding detection altogether."

The SC-1000 operates on 1,000 frequencies over a 10 MHz spread between 140 and 174 MHz. Six thumbwheel switches permit the user to select from one million combinations. The pseudo-random sequence has a thirteen-year repeat cycle.

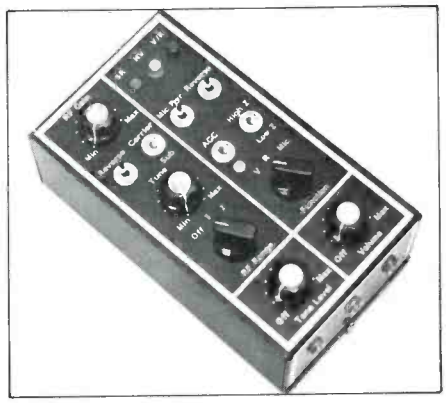
For further information contact: Transcrypt International, 7221 Old Post Rd., #15, Lincoln, NE, USA, or circle number 102 on the reader service card.

Countersurveillance Device

Viking International has a new multi-purpose countersurveillance instrument.

The MC-2 is a unique, multi-purpose Technical Surveillance Countermeasures device that combines numerous critical countermeasures functions in a single, convenient package. The following are some of the MC-2's many applications:

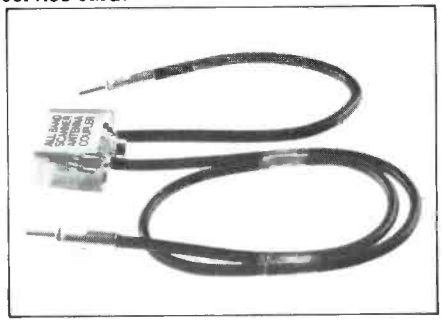
- Helps locate hidden microphone
- Demodulates subcarrier RF signals
- Detects parallel and series telephone taps during on-premise loop inspections
- Checks telephones for several hook-switch by pass attacks
- Detects carrier current bugging devices on power lines
- Generates 900 Hz tone to give assistance in wire tracing



- Checks for eavesdropping devices wired internally across appliance cords
- Indicates if low or high voltage is present on a wire pair

The instrument is battery-powered and measures 6″ × 3½″ × 2″.

For more information, contact Viking International, P.O. Box 632, Newhall, CA 91322 or circle number 106 on our reader service card.



Scanning To Vehicular Broadcast Antenna Reception

Owners of scanning monitor radios now can enjoy excellent mobile reception without adding a separate monitor antenna, thanks to an innovative device introduced by the Antenna Specialists Co., Cleveland, Ohio. The tiny electronic coupler, designated model MON-63, interconnects with a split coaxial cable between the existing AM/FM standard broadcast antenna, the car radio, and the scanner, remaining hidden behind the dash board and requiring no physical installation or power connection. According to the manufacturer, the result is performance substantially superior to the conventional whip provided with all scanners, but does not degrade performance of the broadcast antenna either on AM or FM. MON-63 is furnished complete with all necessary cable and connectors. Suggested list price is $15.95. For further information, write to: The Antenna Specialists Co., 12435 Euclid Avenue, Cleveland, OH 44106, circle number 103 on the reader service card.

Connect your computer to the air!

The "AIRWAVES" that is, thru the Microlog AIR-1, a single board terminal unit AND operating program that needs no external power supply or dangling extras to put your VIC-20 computer on CW & RTTY. And what a program! The famous Microlog CW decoding algorithms, superior computer enhanced RTTY detection, all the features that have made Microlog terminals the standard by which others are compared. Convenient plug-in jacks make connection to your radio a snap. On screen tuning indicator and audio reference tone make it easy to use. The simple, one board design makes it inexpensive. And Microlog know-how makes it best!

There's nothing left out with the AIR-1. Your VIC-20, America's most popular computer, can team-up with Microlog, America's most successful HAM terminal, to give you an unbeatable price and performance combination for RTTY & CW. If you've been waiting for the right system at the right price, or you've been disappointed with previous operating programs, your time is now. At $199, the complete AIR-1 is your answer. Join the silent revolution in RTTY/CW and put your VIC-20 ON-THE-AIR! See it at your local dealer or give us a call at Microlog Corporation, 18713 Mooney Drive, Gaithersburg, Maryland. TEL (301) 258 8400. TELEX 908153.

Note: VIC-20 is a trademark of Commodore Electronics, Ltd.

MICROLOG

INNOVATORS IN DIGITAL COMMUNICATION

CIRCLE 147 ON READER SERVICE CARD

SCANNER SCENE

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 512 MHz "ACTION" BANDS

As technology keeps advancing, the day may come when voice communications becomes obsolete. And by recent indications, that day may not be far away.

IBM Corp., the largest computer manufacturer in the world, currently has perhaps the most extensive voice-paging system in the nation for dispatching field service technicians to their assignments. Perhaps you've heard them on the 151, 154, and 461-465 MHz business channels with a seemingly never-ending series of paging for typewriter repairs, etc. The firm operates perhaps more VHF and UHF transmitters for paging than any other business in the nation.

But being in the computer business, the Armonk, NY-based firm has come to realize that it is feasible to combine computers with radio to dispatch service representatives. Thus, IBM has received a waiver from Federal Communications Commission licensing deadlines to install a nationwide computer-radio network.

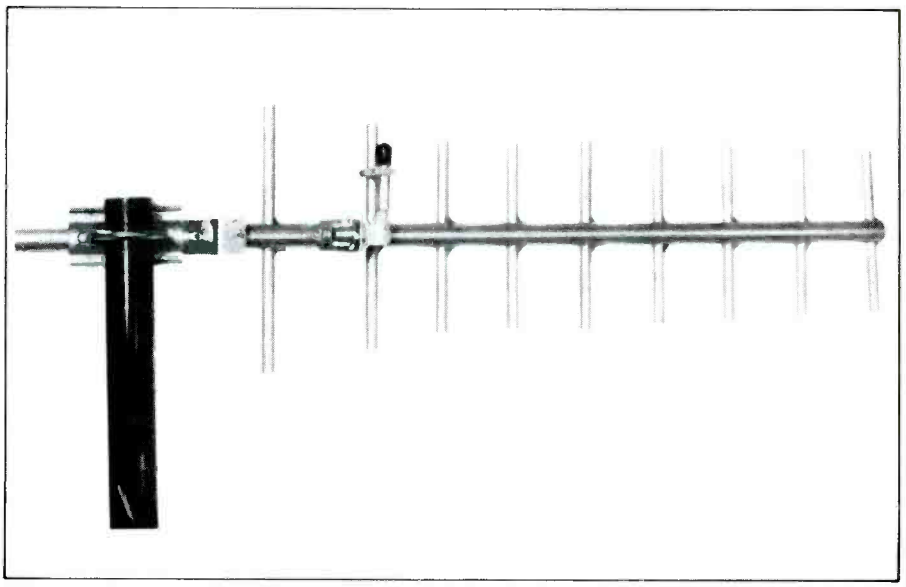
The system will employ portable computer terminals to be used by the field service technicians. The terminals, which will measure 7.75 inches by 4 inches by 1.3 inches, will resemble a calculator with a special keypad and a display window that can show two lines of letters and numbers. The terminals will have built-in radio transmitters and won't have to be connected to the company's mainframe computers by telephone.

"As proposed, the IBM system would enable field personnel, through the use of portable units and computer keyboards, to communicate not only with other IBM personnel, but also to access directly the company's mainframe computers," the FCC said in releasing the order.

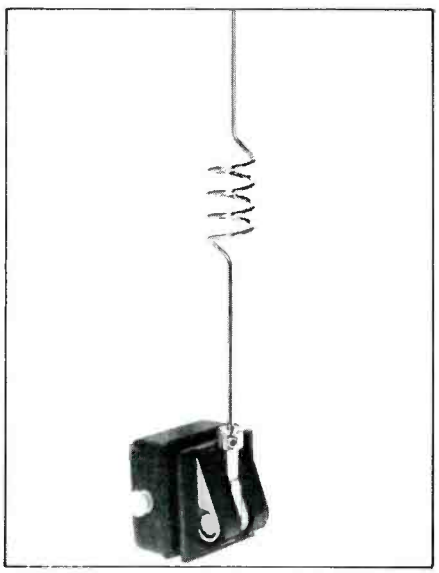
"We have thousands of service personnel all over the United States, and this is a two-way communication device that can speed their response to customer calls and speed their reports back to us on what they did," Edward Stobbe, manager of communications operations for IBM's field engineering division, told The Associated Press. "If you don't do it this way, then you continue to have to do it via paperwork. Reports come back, then the data has to be entered into our computers. You're really talking about a tremendous time differential."

The new system is being hailed because it is expected to lead to a significant increase in business productivity. The system is being produced by Motorola Inc. and also will be offered to other commercial and government users.

The IBM system will be installed in 250 cities throughout the continental United States, Alaska, Hawaii, and Puerto Rico. The first such digital radio system is expected to be on the air in Chicago in September. According to FCC records, the entire nationwide system should be fully implemented by June 1985.



Antenna Specialists' model ASP-962 800-MHz Yagi antenna can be mounted on a mast with an automatic rotor and be pointed right at the station you want to hear.



The Avanti-mount model AP850.3 by Antenna Specialists needs no drilling and is affixed to either the front windshield or rear window of a car. This mobile antenna is for 800 MHz.

Who's Upstairs?

While space on the VHF and UHF bands is rapidly becoming more crowded, many businesses and government agencies have moved to the 800-MHz band. Even the new cellular mobile telephone systems that are currently being installed in many American cities are on the 800-MHz band.

Although there currently are no 800-MHz scanners on the market, there are converters available from Hamtronics Inc. and other similar firms. Electra Co. did try to market the Bearcat 5/800, an all-band crystal scanner that could receive the 800-MHz band, a few years ago, but was forced to discontinue manufacturing the unit because of many problems. Perhaps another 800-MHz scanner will appear on the market again soon.

In the meantime, we've received several letters here at *POP'COMM* from readers interested in the new band. Luther Branch of Missouri writes in to say he has purchased an 800-MHz converter from Hamtronics to use with his Regency D810 scanner. He questions whether an 800-MHz antenna has to be used to receive signals on this band.

Most scanners used in conjunction with 800-MHz converters should be able to receive the signals with whatever scanner antenna you are presently using. A VHF high-band or UHF ground plane antenna should work just fine for hearing 800 MHz. Almost all communications on this band are through repeater stations, thus mobile units are retransmitted on the base frequency. Thus, if you live in an urban or suburban area, you should be able to hear 800-MHz repeaters without much difficulty. Even a telescoping antenna on the converter should be able to hear signals.

However, if you live in a rural area, the ability to hear the 800-MHz channels, which are primarily used in metropolitan areas, lessens. You might even need to erect a beam antenna to receive the signals. Although there is not much on the market available for hobbyists, professional antennas are available. Antenna Specialists recently intro-

duced a nine-element Yagi antenna for 806-890 MHz. The antenna is only 27 inches long and weighs slightly more than one pound. However, the ASP-962 carries a suggested list price of $79.50.

If you listen to 800 MHz while mobile, you should be able to use whatever antenna you use for VHF high or UHF. However, professional antennas do work better and you might want to install a quarter-wave spike (about 3 inches tall) and—including coaxial cable, connectors, and mounting hardware—should not cost more than $15. Another possibility is to install an 800-MHz gain antenna such as the Antenna Specialists model AP850.3 windshield-mount, which retails for about $45.

Once you start listening in on 800 MHz, you'll find there is a lot of business band activity and perhaps even some governmental activity. For instance, the water department in Trenton, N.J., and the city school district in Los Angeles both have 800-MHz radio systems. Perhaps as more agencies realize scanners to date are unable to receive this band, they will switch over.

On The Hill

Do you live in the deepest of valleys? Do you have trouble hearing mobiles just blocks away? Well, we don't have any special device we can tell you about that will bring in signals up to a hundred miles away, but we can tell you this: Hop in the car with your scanner and head for the hills!

Being one who formerly lived on a nice high hill and now resides at a low point, I don't let that detract from the hobby. Just look around for a high hill that overlooks the area. Chances are there will be a series of radio towers and antennas at the site if it is in a good spot.

However, the more antennas there are at the site, the greater the chance you will have of receiving all types of intermod and other interference as you try to scan the bands.

If you don't normally keep a scanner in the car, attach a cigarette lighter plug to the end of a wire for 12-volt operation. Because of your height on the hill, almost any antenna will do. A gutter-mount CB antenna or a 2-meter ham antenna on a magnetic mount will serve fine and both can be purchased for less than $13 each. The best locations are where there are no business band transmitters, because they are often busy. My favorite mountain top is about 15 miles away and the only active transmitters are repeaters on the amateur bands. The mountain top also is about six times higher than where I live, so I can hear transmitters up to and more than 100 miles away.

Two points should be made, however, First, it would not be best to attempt this if your state prohibits the use of scanners in motor vehicles. Also, don't trespass on to private property to park your car. Look for a parking lot nearby or pull over to the side of the road to listen. Use common sense and you won't get into trouble while mountain-topping. Happy listening!

LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

Welcome to another Listening Post. Glad you could join us again.

There's good news from Down Under. Late word is that Radio New Zealand's shortwave service has been saved. Further budget cuts have been made and while the service will, admittedly, be a bare-bones operation, it's a lot, lot better than the alternative, which was no shortwave from New Zealand at all. The yearly cost of operating the service has been cut to just $170,000! If you're a fan of this station, expel a sign of relief and send a note expressing your continued support. It's Radio New Zealand, P.O. Box 2092, Wellington, New Zealand.

A new station has appeared on the dials from Colombia. It's Radio Macarena in Villavicencio, a member of the Todelar Network and it's operating on 5.973 MHz, but announcing as on 5.975. The station has been heard around 0900 GMT and in local evenings from around 0100 GMT. It does suffer occasional interference.

There is a report of good news and bad news from Africa. The good news is the arrival of two new stations.

In Chad, a regional shortwave station has come on the air from Moundou, operating on 5.288 variable with sign on in French at 0500. Reception of this one is rather difficult but it has been heard in the midwestern United States.

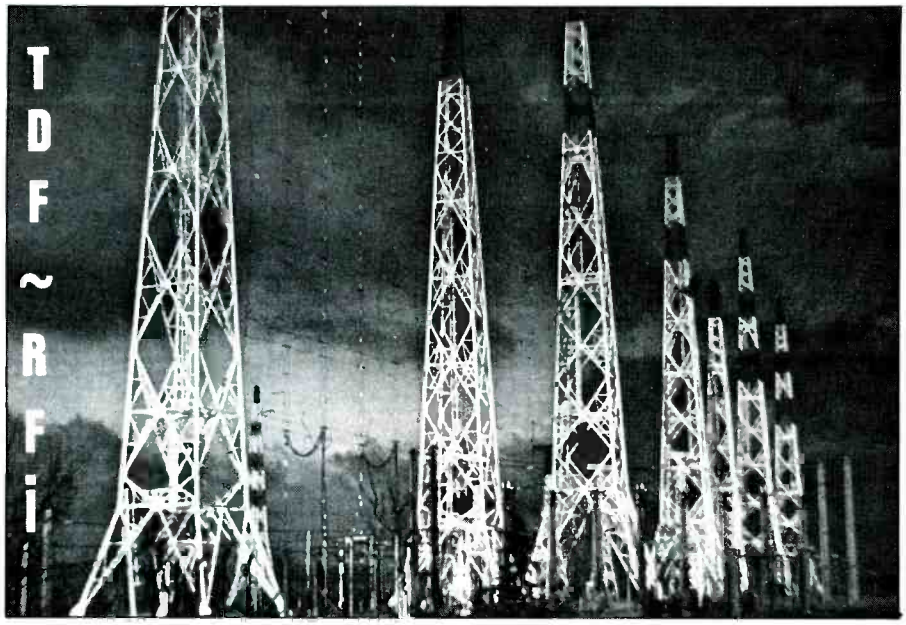
Another regional outlet, this one at Parakou in Benin, has long been in the planning stages and has finally come on the air. Try for this one on 5.025 with interval signal and sign on announcements in French just before 0400. Reception of this is better than the new Chad regional station.

Now for the bad news. Swazi Music Radio, which has operated under several other names in its lifetime, has closed down, apparently for good. Station officials blame lack of advertising and increased competition for the decision to pull the big switch for the last time. The departure leaves only Trans World Radio operating on shortwave from Swaziland.

Also from Africa (somewhere!) is a new clandestine station. It calls itself "Radio Truth" and is apparently beamed at the government of Zimbabwe. It's reported to use a bird call interval signal and to be running test programs in English from 0430 on 6.010. To our knowledge, it hasn't been heard in the United States.

French Focus

"ORTF," "Radio France," "Societe Nationale de Radiodiffusion," "Paris Ondes Courtes," "The Voice of France" . . . French shortwave radio has had many names over the years. The current one is Radio France International.



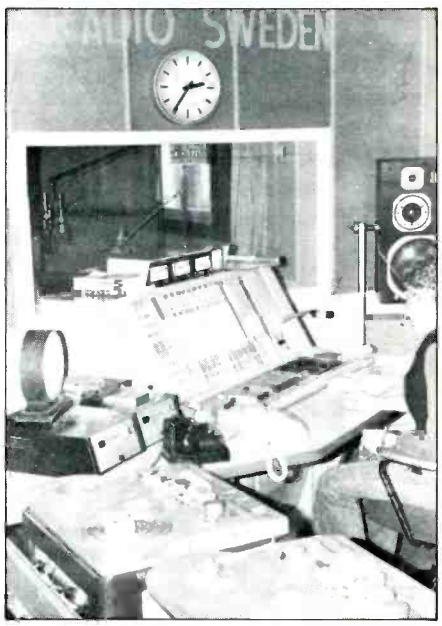
Current version of Radio France International's QSL card.

The staff of "Paris Calling Africa." Seated (left to right) Jim Apio, Edward Collins, Pierce Kenner. Standing: John Abraham, Ray Billings, Lillian Malki; Simson Majovits, Isabelle Cayoubon, and Christopher Wells.

French shortwave broadcasting goes all the way back to 1931, making France one of the first of the great powers to use the medium of shortwave.

The first transmitter took to the air with 12 kilowatts from Pontoise, broadcasting the inaugural speech of the President of France on May 6, 1931. And, even through the disruptions of World War II, French radio has occupied spots on the shortwave dial almost continuously since.

A 100 kilowatt station was on the air when the war began for France in 1939. Broadcasts from transmitters, by then located at Allouis, were suspended in June of 1940 and replaced with the Vichy government's "Voice of France." The Nazi occupiers controlled Radio Paris Mondial until August, 1944 when the Allouis transmitter was destroyed.

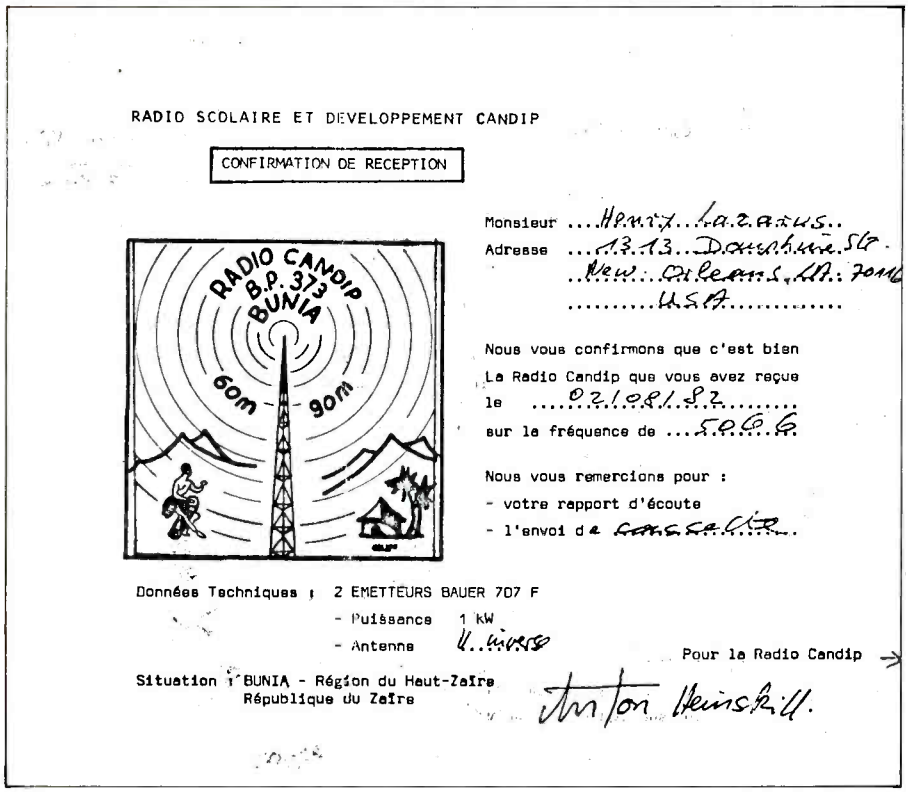


One of the control rooms at Radio Sweden International.

Fortunately for the free French, shortwave facilities had been placed in Brazzaville, which was then French Equatorial Africa; so, Radio Brazzaville became the outlet of the free French.

Radio France International today has 20 shortwave transmitters from two different locations—Allouis and Issoundun. There are twelve 100 kilowatt units and eight giant 500 kilowatt transmitters.

While other European countries, such as England, The Netherlands, Spain, and



RADIO SCOLAIRE ET DEVELOPPEMENT CANDIP

CONFIRMATION DE RECEPTION

Monsieur ...Henry..Lazarus..
Adresse ...13.13..Dauphine.St.
...New..Orleans,.LA.:.70116
.....USA.....

RADIO CANDIP B.P. 373 BUNIA 60m 90m

Nous vous confirmons que c'est bien
La Radio Candip que vous avez reçue
le ....02/08/82.....
sur la fréquence de ...5.0.6.6.

Nous vous remercions pour :
- votre rapport d'écoute
- l'envoi de cartes

Données Techniques : 2 EMETTEURS BAUER 707 F
- Puissance 1 kW
- Antenne U..wires

Pour la Radio Candip

Situation : BUNIA - Région du Haut-Zaïre
République du Zaïre

Anton Heinrich

This very tough catch belongs to Henry Lazarus of New Orleans. Radio Candip is one of several regional stations operating in the range of 5.000 to 5.300.

West Germany have relay stations outside their borders, RFI covers the world from just the two sites within France. There are, however, plans to put relay transmitters in South America and the Pacific, although installation is still some time off.

Radio France International is on the air for 17 hours a day, broadcasting mainly to listeners in Africa and the Indian Ocean. Many of the programs beamed to these areas are taken directly from the French national networks since the shortwave broadcasts are intended mainly for French citizens living abroad.

Fifteen hours per day goes out to Central and Eastern Europe, with an even larger segment of local French programming included in this service.

For North America and the West Indies, the entire five hour per day output is taken from the France-Inter home service.

The French love their language and that's reflected in how little non-French language programming is heard on RFI. One hour per day in German, one hour per day in Spanish (on medium wave only), an hour daily in Portuguese, and another sixty minutes per day in English.

This hour long English program is the very popular "Paris Calling Africa," which is well heard in the United States. The show features news, with a special emphasis on African events, commentaries, in-depth reports and, of course, music of the continent. Paris Calling Africa is aired daily from 1600 to 1700 GMT on 15.300, 17.620, and 21.685 beamed at West Africa; on 21.580 to Central and South Africa; on 15.300, 17.620, and 21.620 to East Africa and the Indian Ocean; 15.300 or 15.315 and 17.620 to North America; and on 6.175 to Europe.

RFI also produces special programs for foreign workers living in France, in languages ranging from Arabic to Cambodian. These, however, are transmitted only on medium wave.

Cooperation is also maintained with some 17 other French-speaking African stations through special shortwave news transmissions designed for use by other stations. Occasionally, programs are also taped and dispatched via air.

RFI also ships cultural and educational programs via air to some 22 African stations and provides a transcription service to stations in more than 100 countries.

Additionally, the organization acts as a press agency for French Embassies abroad, maintaining a radioteletype system that sends out five news summaries each day in various languages and is made available to foreign press and radio stations.

Reception reports on RFI can be sent to P.O. Box 9516, Paris, France.

Mailbag

Scott Gamble of Kingsport, Tennessee tells us he's using a DX-302 receiver coupled to a 65 foot longwire antenna. Scott makes mention of Jerry Berg's article entitled "A Primer on Latin American DXing," which appears in the 1983 *World Radio TV Handbook*, and says he finds the article "a gold mine of information." You're right Scott. Jerry Berg is one of the country's ace DXers.

It's a good trick and in the March issue, we did it; we relocated a city! Larry Rempala of Lisle, Illinois points out that Libreville is in Gabon, not in the Cameroons.

John Frazier of Nacogdoches, Texas wonders about a station he heard calling itself "Radio New Orleans." It was probably WRNO, John. The station also uses the slogan "the rock of New Orleans." Check the schedule in this month's listings.

A number of you, including Michael Schuster of Staten Island, New York, sent copies of KYOI QSLs. We've already run one, but thanks to those of you who forwarded your copies. Incidentally, Michael is using a new ICOM R70 receiver along with a Sony ICF-2001.

Another DX-302 user is Werner Baum of Rochester, New York who makes do with an indoor antenna fastened to the ceiling.

Gary Hickerson of Fort Smith, Arkansas got a reply from Radio New Zealand and discovered that the station can no longer return taped reception reports, so keep that in mind if you plan to send a tape. It's probably part of the economic cutbacks we mentioned earlier. Gary's using an FRG-7 receiver with an RAK-3 double dipole and 70 meter longwire antennas. He plans to buy an ICOM R70 soon.

George Osier from Norfolk, New York started out with a DX-302 but now uses the FRG-7700 and says Listening Post is a great help. Thanks George!

Frank Carter of Seekonk, Massachusetts asks some questions about receivers. Again, we have to say that we can't make equipment recommendations since a receiver is a personal choice and not even longtime DXers always agree on the subject. Best bet is to read the ads, reviews, shop around, try to see and use a few models in person, and then make a decision.

Looks like we have a shy crop of readers out there lately! Don't be bashful about sending in photos of you in your shack. And, of course, we're interested in copies of your better QSLs, schedules from stations, and not the least, your loggings. Please use GMT/UTC, and include at least a few details other than country, frequency, and time. Let's hear from you!

Listening Reports

Here's what's on. All times are GMT. And remember that shortwave schedules and frequencies change often!

Afghanistan Radio Kabul, 3.965 heard at 0140 with Koran chants. In parallel with 4.450, 4.740, and 7.196; 3.965 was poor, the rest fair to good. Transmitter on 3.965 may actually be in the USSR. (Crawford, FL)

Albania Radio Tirana noted nightly at 0230 on 7.120. (Gamble, TN)

Antigua The Voice of Germany relay station was heard in Portuguese on 15.105 at 2125. Interval signal, identification in English, and opening to Brazil. (MacKenzie, CA)

Australia Radio Australia noted at 1200 in English on 9.580. (Baum, NY) On 9.760 at 0735 with music and identification in En-

glish. (Konen, WI) VLM4 from Brisbane often noted around 1130 with news and classical music on 4.920. (Laskowski, IN)

Belgium Belgian Radio heard with a newscast in French at 1745 on 21.460. (MacKenzie, CA)

Benin La Voix du la Revolution du Benin on 4.870 heard at 0545 in French with a music program. (Konen, WI)

Bolivia Radio Panamericana from La Paz heard at 1052 with pop and reggae music. Identification by man and woman in Spanish. (Konen, WI)

Botswana Radio Botswana with its unique barnyard animals and cowbells; interval signal at 0355 on 4.847 variable, then national anthem and identification by a woman. (Paszkiewicz, WI)

Brazil Radio Bras noted with loud and clear signals at 0100 on 11.780 and in English at 0200 on 15.290. (Baum, NY)

Bulgaria The current schedule for Radio Sofia from within Bulgaria is from 0000 to 0100 on 9.700 and 15.110; 0400 to 0500 on 11.860; 0730 to 0800 on 11.720 and 15.110; 1930 to 2000 on 11.720 and 15.110; 2130 to 2200 on 11.720, 11.860, and 11.920; and 2230 to 2300 on 9.700 and 15.110. (Paszkiewicz, WI)

Cameroon Radio Garoua from the city of that name noted on 5.010 around 0400 to 0500 with English and French. (Rempala, IL)

Canary Islands Radio Exterior Espana's Canary Island relay station heard on 9.360 at 0230. The outlet on 11.880, which is from Spain, was putting in an equally good signal at the same time. (MacKenzie, CA)

Clandestine The anti-Cuban clandestine La Voz de Cuba Independiente y Democratica (CID) heard from 0250 to 0300 on 7.345 with mentions of Radio Clarin. (Bush, OH) Radio Clarin in the Dominican Republic carries some La Voz del CID programming on its 11.700 channel. (Editor)

Colombia The new Radio Macarena, from Villavicencio, heard on 5.973 at 0027 to 0055 with identification as "Somos Radio Macarena, la emisora de los . . . HJKT, 1080 kilociclos . . . HJHZ, 5.975 kilociclos, banda internacional de 49 metros . . . Somos Todelar . . ." The signal was very strong but suffered interference from the BBC on 5.975. (Crawford, FL) Another Villavicencio station, La Voz del Llano, was found on 6.115 at 0825 with lively vocals and frequent identification. (Konen, WI) Radio Nacional in Bogota heard on 9.635 at 2304 with announcer in Spanish and gong interval signal. (Bush, OH)

Cook Islands Radio Cook Islands heard at 0746 on 11.760 with mostly local music and announcer in Maori. Difficult reception. (Konen, WI)

Costa Rica Faro del Caribe, TIFC, from San Jose heard with a religious program in English at 0330 on 5.055. (Konen, WI)

Denmark Radio Denmark found at 1956 on 15.165 with their interval signal followed by station identification in Danish and English, schedule announcement, chimes, news, music, and talk in Danish. (Paszkiewicz, WI)

East Germany Radio Berlin International heard in German at 0455 on 9.560 up to sign off at 0459. (MacKenzie, CA)

Ecuador HCJB found on 21.477.5 around 1930. (Gamble, TN)

Egypt Radio Cairo heard in Arabic and English on 12.000 at 0155 with the English portion beginning at 0200 til 0330; 9.475 noted at the same time in Spanish. Domestic Service heard on 9.455 at 0430 in Arabic as well as on 9.620, 9.805, and 11.665. (MacKenzie, CA) Radio Cairo heard with the DX Club at 0200 on 12.000 and 9.475 on a Tuesday evening. (Gamble, TN)

Falkland Islands Falkland Islands Broadcasting Station heard at 0903 on 3.958 with easy listening music, pop tunes, and male disc jockey. (Konen, WI) At 0900 with severe interference from ham operators. (Laskowski, IN)

France Radio France International noted variously from 1145 to 1715, all French, on 17.775. (Baum, NY) Heard on several frequencies: 21.645 at 1707 and showing up at the same hour on 21.620, 21.580, and 21.515 with popular music and announcements in French. (MacKenzie, CA)

French Guiana FR3 from Cayenne heard at 0925 on 3.385 and 0920 on 5.055, all in French. (Konen, WI)

Gabon Africa Number One with popular music following a newscast in French at 0530 on 11.940. This frequency signed off at 0555 but the station continued to use 4.810. (MacKenzie, CA)

Grenada Radio Free Grenada heard in English on 15.045 at 2204 with a program of jazz. (Paszkiewicz, WI) At 2200 on 15.045. (Gamble, TN)

Guam KTWR on 9.505 at 1511 with religious program in English; then station identification at 1530. (Paszkiewicz, WI)

Ireland Radio Dublin International on 6.910 heard with Top 40 music, identifications, and disc jockey at 0620. (Konen, WI)

Israel Israel Radio's home service "Network B" heard on 9.385 at 0402 in Hebrew with advertisements and pop music. Also noted on 11.655. (MacKenzie, CA)

Ivory Coast Radiodiffusion Ivoirienne from Abidjan logged with hi-life music at 0625 on 7.215. French announcements. (Konen, WI)

Japan Radio Japan was heard in French on 17.705 at 1730 up to sign off at 1745. NSB from Tokyo found in Japanese at 1655 on 6.055 and 9.595. (MacKenzie, CA)

Kampuchea Voice of the People of Kampuchea with program in Lao and Vietnamese on 11.938 at 1249 to 1315 sign off. Interference from Bucharest's 1300 sign on in English. (Konen, WI)

Liberia ELBC, Monrovia heard on 3.255 at 0614 with local music. Local static made reception difficult. (Konen, WI) The Voice of America Liberian relay station heard in Afrikaans at 1735 on 11.715. (MacKenzie, CA)

Libya The SPLAJBC found in Arabic on 15.450 at 2244, in parallel to 17.930. (MacKenzie, CA)

Luxembourg Radio Luxumbourg heard on 15.350 with U.S. and British pop music and a jingle identification which mentioned "WLKN" at 0009. (Paszkiewicz, WI)

Madagascar The Radio Netherlands Relay station heard in Arabic to 1720 sign off on 21.640. (MacKenzie, CA)

Malta International Christian Radio, one of several program services beamed over this Malta facility, was noted at 2043 on 9.515 with religious programming. (Konen, WI)

Mexico XEUDS, Radio Universidad de Sonora from Hermosillo heard on 6.115 with classical music and a woman announcer in Spanish at 1650. (MacKenzie, CA)

Netherlands Radio Netherlands heard in its African service from 2030 to 2120 on 21.685, 17.695, 15.220, 11.730, 9.715. (Gamble, TN)

Niger ORTB at Niamey with African chants and announcements in French on 5.020; up to fade-out at 0615. (Konen, WI)

Nigeria the Voice of Nigeria heard with English at 0533 on 7.255. World news, identification, and commentary. (Konen, WI) In English at 2135 on 15.120 with news and commentary. Also noted on 17.800 at the same hour. (MacKenzie, CA) The Kaduna outlet heard on 4.770 at 0558 in English with identification and commentary. (Konen, WI)

North Korea The Korean Central Broadcasting System from Pyongyang heard in Korean at 1715 on 11.350 in the home service. Also noted on 6.600 at 1630 and 6.250 at 1635. (MacKenzie, CA)

Norway Radio Norway International broadcasting in Norwegian at 1640 on 25.730. An English ID was given at 1644 just before sign off at 1645. (MacKenzie, CA)

Oman The BBC Eastern Relay Station from Masirah Island heard on 11.955 at 0300 with World News and "News About Britain." (Paszkiewicz, WI)

Pakistan Radio Pakistan with slow-speed news in English observed at 0239 on 17.840 with station identification at 0245; also noted on 21.595. (Paszkiewicz, WI) Heard on 17.640 at 1600 to 1615 with English news to sign off at 1615. (Rempala, IL)

Peru Radio Eco from Iquitos logged at 1013 on 5.112 with popular Latin American music and identifications that included "Panorama de Radio Eco." (Konen, WI) The hard-to-catch Radio Santa Cruz was tentatively heard on 5.340 at 0143 to 0215 with local music through heavy radioteletype interference. (Crawford, FL)

Philippines The Voice of America relay station observed from 2155 to 2200 sign off in Korean on 15.215. (MacKenzie, CA)

Poland Radio Polonia, weak on 7.145 with man and woman reading the news at 0200. (Bush, OH)

Rwanda the Voice of Germany (Deutsche Welle) relay station found with an English identification and schedule information announcement for the African service at 0430 on 7.225. (Paszkiewicz, WI)

Saipan KYOI heard with the usual rock

music and English announcements at 2240 on 15.405. (MacKenzie, CA) The latest KYOI schedule is 1500 to 2200 on 9.670; 2200 to 0100 on 15.405; 0100 to 0900 on 15.190; 0900 to 1500 on 11.900. (Schuster, NY) Heard at 0430 on 15.190, poor but readable with announcements in Japanese every so often and an English identification at 0500. (Anderson, NM)

Senegal ORTS, Dakar, on 4.890 at varying times; 0116 and also at 0658 sign on, another time at 0558. All in French and local languages. (Konen, WI)

Singapore The BBC Far Eastern Relay noted on 11.750 in English at 1740 with "Scotland This Week" followed by a sports roundup. Also noted on 11.955; and heard on 6.195 at 1645 with identification followed by "The World Today;" and on 15.320 at 2200 to 2230 in Japanese. Chinese followed at 2230. (MacKenzie, CA) On 17.715 with world news, "News About Britain," "Radio Newsreel," then a transmitter site identification at 0030 followed by "English by Radio." (Paszkiewicz, WI)

Somalia Radio Mogadishu noted back on 6.790 from 6.095 where it operated briefly. Local programming at 0425. (Crawford, FL)

South Korea Radio Korea, the Korean Broadcasting System heard on 7.550 at 1710 in Korean; also noted on 6.480 and in French on 15.575 at 2255 to 2300. (MacKenzie, CA)

Spain Radio Exterior Espana heard on 15.125 at 2140 in Spanish; 15.535 also heard but not as strong. (MacKenzie, CA)

Swaziland Trans World Radio Swaziland with a religious program in an African language on 9.525 at 2003. Identification at 2015 with schedule information at interval signal. (Paszkiewicz, WI)

Tunisia Radio Tunis, noted in Arabic on 7.225 at 0417 with news, station identification, anthem, chanting. (Paszkiewicz, WI)

Ukranian SSR Radio Kiev transmits to North America from 0030 to 0059 on 17.870, 15.240, 15.100, 11.790, and 9.685; and again from 0300 to 0329 with 9.710 replacing 9.685. Seven reception reports within a six month period qualifies listeners to join the Radio Kiev DX Club. Reports should be numbered and marked for DX Club membership. Address is Radio Kiev, Kiev, Ukranian SSR USSR. (Rempala, IL) But most, if not all of the above frequencies are actually Radio Moscow transmitters. (Editor)

United States The current WRNO schedule is 1800 to 2000 on 17.775; 2000 to 2200 on 15.420; 2200 to 0000 on 11.955; 0000 to 0200 on 9.725; and 0200 to 0600 on 6.155. (Gamble, TN)

USSR The Radio Moscow home service program via Magadan noted at 0245 in Russian on 9.500. Via Krasnoiarsk on 9.480 with home service in Russian at 0440; via Nikolaev on 9.490 in Russian at 0445. The World Service from Radio Moscow was noted on 15.140, via Vladivostok, at 2145. (MacKenzie, CA)

Venezuela Radio Nacional de Venezuela heard at 0350 on 9.540 with station identification at 0400 giving broadcast schedule, then the national anthem and sign off at 0402. On 4.830, Radio Tachira from San Cristobal was logged at 0225 in Spanish with classical and Latin American music. (Paszkiewicz, WI) Radio Mara from Maracaibo noted at 0343 on 3.275 in Spanish with Latin American popular music, occasional station identification and sign off at 0358. (Konen, WI) Other Venezuelans noted around 0100 were Radio Barquisimeto on 4.990, Radio Lara also from Barquisimeto on 4.800, and Ecos del Torbes from San Cristobal on 4.980. (Baum, NY)

West Germany Radio Liberty noted in Russian at 1647 on 25.690. Radio Free Europe at 1700 on 21.745 in Russian. (MacKenzie, CA)

Yugoslavia Radio Yugoslavia with news and station identification in English at 2222 on 9.620, then interval signal and schedule announcement to 2230. (Paszkiewicz, WI) From 2215 to 2230 in English with a woman announcer and interference from Radio Berlin International. (Bush, OH)

Zaire La Voix du Zaire, with African-style music on 15.245 at 2205 and announcements in French. (MacKenzie, CA) Jazz and African music at 0050. (Konen, WI)

Zambia Zambia Broadcasting Corp., 4.910 heard from 0346 with fish eagle bird interval signal, anthem at 0351, identification in English, prayers, another identification, music. Music and talks in local language at 0440, news in English at 0500. (Konen, WI) At 0404 with a newscast in African language, mentions of Zambia and Lusaka, identification at 0412. (Paszkiewicz, WI)

A tip of the hat and our thanks to: David E. Crawford, Oak Hill, Florida; Stewart MacKenzie, Huntington Beach, California; Mark Konen, Milwaukee, Wisconsin; Sheryl Paszkiewicz, Manitowoc, Wisconsin; Tom Laskowski, South Bend, Indiana; Larry Rempala, Lisle, Illinois; Dave Bush, Sebring, Ohio; James C. Anderson, Albuquerque, New Mexico; Michael Schuster, Staten Island, New York; Warner Baum, Rochester, New York.

Don't forget to drop a line and let us know what you're hearing. See you next month. Good listening!

ON THE LINE

BY GORDON WEST, WB6NOA

NEW AND EXCITING TELEPHONE TECHNOLOGY

Telephone Eavesdropping Made Easy

Telephone calls over the airwaves are not secure. Anyone and everyone may be listening to your conversation. This even applies to that low powered cordless telephone. This month, we will look at the various types of radiotelephones, and understand how easily your conversation may be intercepted.

Cordless Telephones

Your cordless telephone system has approximately a one-block range. Cordless telephones operate full duplex, simultaneous talk and listen.

The cordless phone base transponder transmits on frequencies between 1700 kHz and 1800 kHz. These frequencies are just above your standard AM broadcast band. Any shortwave receiver can easily tune into both sides of the conversation on this band. The base transponder transmits both the telephone side of the conversation, as well as retransmits the cordless telephone side of the conversation. A 300 foot shortwave antenna will pull in stations up to a block away without any problem at all. The longer your antenna, the further your range. Set your shortwave receiver in the AM mode and use slope detection for tuning in the FM signal. Simply tune to one side of the signal and it will come in loud and clear.

The cordless handsets operate on frequencies between 49.500 MHz to 50.0 MHz. These frequencies are easily monitored with a scanner by searching between 49.5 to 50.0 MHz. Chances are you will hear not only the cordless handsets but also toy walkie talkies, personal communicators, and even a garage door or two! An outside scanner antenna will generally pull in cordless handsets up to a block away.

Illegal Cordless Phones

Most "export" cordless phones use a 49 MHz/70 MHz frequency split. The 49 MHz is the base side of the system, and the 70 MHz is the handset side. Only a few scanners will tune 70 MHz, so check and see whether or not yours will. If you hear conversations between 70-72 MHz, chances are they're probably coming from an illegal cordless telephone handset.

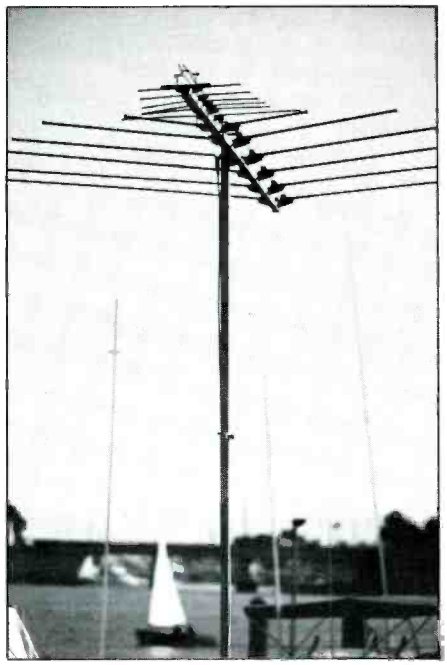
Mobile Phone Channels

It's easy to tune into the mobile telephone service. Most phone companies retransmit the mobile unit on their base frequency for phenomenal range. Your regular programmable scanner will easily eavesdrop on mobile telephone calls, as well as high-powered hand-held telephone calls.

On low band, search between 35.26 and 35.66 MHz for mobile telephone calls. Channels are spaced every 40 kHz beginning at 35.260 MHz.

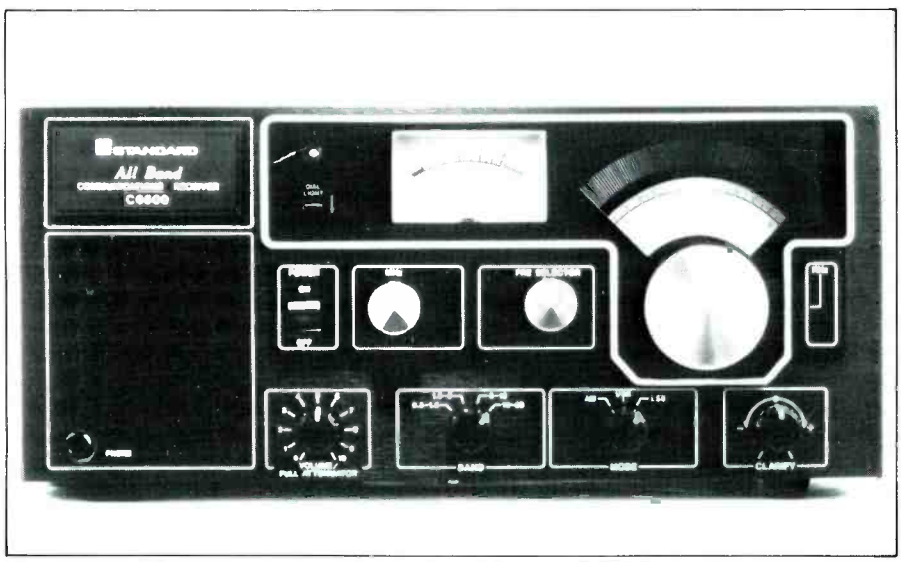
On VHF high band, tune into mobile telephone calls between 152.030 and 152.810 MHz. Channels are separated every 30 kHz, beginning at 152.030 MHz. These frequencies cover both Bell telephone channels, as well as radio common carrier channels. You will hear both sides of the conversation from the base station on these channels.

On UHF, try searching between 454.025 and 454.975 MHz for mobile telephone channels. Channels are spaced every 50 kHz, beginning at 454.025 MHz. These frequencies cover Bell, as well as private radio common carrier services.



An outside TV antenna will increase cordless phone reception.

Shortwave sets tune from 1700 to 1800 kHz for calls.



Marine Channels

If you wish to eavesdrop on telephone calls and you live near a large lake, a river, or next to the ocean, try the marine radiotelephone service. Search the frequencies between 161.800 and 162.00 MHz. Channels are spaced every 50 kHz, beginning at 161.800 MHz. Just like the other frequencies, you will hear both sides of the conversation automatically retransmitted by the high powered base station for maximum range.

Aircraft Frequencies

Air phone calls are soon to have their own set of frequencies in the 800 MHz range. We will have to wait until there is a scanner before we can tune into those calls. However, for the time being, tune in both sides of air telephone calls between 454.675 MHz and 454.975 MHz. Channel spacing is 25 kHz.

Future Channels

As predicted, cordless telephones may soon be going to new and additional channels. The FCC has issued a notice of proposed rule making on General Docket 83-325, which would allocate ten additional "interim" channels in the 46 and 49 MHz bands for

cordless telephone operations. The ten duplex channels would span between 46.6 MHz and 47.0 MHz and 49.6 MHz to 50.0 MHz.

These ten new interim channels would dramatically reduce the amount of interference now experienced by cordless phone users on the present channels. Watch for some exciting discounts on present equipment as soon as the FCC authorizes the ten new frequencies.

General Electric is proposing a private "cordless" telephone service at 900 MHz. The range might be up to 5 to 10 miles away from your home base unit. Additional range could be achieved by going through repeater stations.

Chances are your phone calls at these 900 MHz frequencies would be relatively private. It is not anticipated that scanner equipment would be available for this type of service.

Secrecy Act

One final note—whatever goes out over the airwaves is considered private and secret. If you tune it in, you're not allowed to divulge the contents of a message not directed toward you. But if you are talking over your radiotelephone, don't expect that anyone will honor this law! Always expect that someone may be listening, and watch out what you say. Never trust your cordless telephone as being anything like private. It definitely is not.

CIRCLE 47 ON READER SERVICE CARD

WASHINGTON PULSE

FCC ACTIONS AFFECTING COMMUNICATIONS

Users Of Authorized GMRS Mobile Relay Stations To Begin Operations Immediately

The Commission will establish a temporary permit for additional users of multiple-licensed base stations, acting as mobile relays (repeaters), in the General Mobile Radio Service (GMRS) so they can begin operations immediately while their formal applications are being processed.

However, the Commission declined a proposal by Standard Communications Corporation of Carson, California, to make the temporary permit available to all GMRS users. The Commission said this would be unadvisable because a new station's particulars—antenna array, power output, etc.—would be examined after the station had begun operation.

As for Standard's request for simplification of the GMRS license application form, the Commission noted this request has been mooted since FCC Form 574 is scheduled to replace the current application form.

The Commission will announce the effective date for use of the temporary permit when it has been approved by the Office of Management and Budget.

Classes Of Coast Stations Redefined

The Commission has reclassified radiotelephone and radiotelegraph coast stations according to service provided, deleted the requirement to modify coast station licenses when transmitter power is changed, and removed restrictions on the use of communications in frequency bands other than VHF when in a VHF station coverage area.

This action amends Parts 81 and 83 of the rules.

The Commission noted there were inconsistencies in defining medium frequency (MF) and high frequency (HF) assignments in Parts 81 and 83 of the Maritime Services rules and in Part 2 and the International Radio Regulations. Furthermore, there have been inconsistencies in actual frequency assignments for particular coast stations, resulting in assignment of 4000 kHz frequencies—i.e., HF frequencies suitable for long-range high seas communications—to Class II (MF) coast stations licensed to provide regional or medium-range service.

In addition, the present method of classifying coast stations is with a Roman numeral indicating the frequency band and operational range of the service authorized, followed by a letter indicating the mode (telegraphy/telephony) of operation. For example, a Class II-B coast station operates in the MF band, providing regional service of 150 miles utilizing voice communications, and is further classified as public—open to public correspondence—or limited—restricted to operational and business communications of the licensee.

Under the revised classification, for example, a Class II-B coast station would become a "regional telephony coast station" serving ships up to 150 miles on assigned frequencies between 1605 and 3000 kHz. Such classification would be less confusing to the public and would follow the international designation of frequency bands, the Commission said. However, a coast station which uses its 4 MHz frequencies to supplement its regional coverage on 2 MHz may, if it so desires, retain its 4 MHz assignments under a "regional coast station authorization" rather than "high seas authorization."

The Commission also deleted the requirement whereby licensees must submit an application for modification when transmitter power is changed and removed restrictions on the use of other than VHF communications when vessels are within the coverage area of VHF stations.

The Commission also had proposed eliminating the requirement found in Section 22.509(b) of the rules permitting the use of Domestic Public Land Mobile Radio Service stations on board ships, but requiring termination of communications on this system when VHF public coast service becomes available in an area. However, it felt it would be more appropriate to consider the ramifications of this restriction in an on-going rulemaking proceeding (CC Docket 80-57).

Certain Restrictions On Non-Voice Operations In PLMRS Eliminated

The Commission has eliminated the two-second limitation on the duration of non-voice (data) transmissions on base/mobile frequencies below 800 MHz in the Private Land Mobile Radio Service (PLMRS) and elevated non-voice transmissions from secondary to a co-equal primary status with analog voice transmissions.

In amending Part 90 of the rules, the Commission cited the increased spectrum efficiency which can result from digital data messages, the reluctance of licensees to invest in digital equipment when operations are restricted to secondary use, and the inconsistency between a two-second limitation in transmitting digital data messages and the new rules placing no message length restriction on digital voice transmission, since the two types of digital transmissions substantially are technically similar.

The changes are, however, limited to base/mobile frequencies below 800 MHz; and they extend only to frequencies subject to coordination requirements. The Commission decided to retain the requirement which permits a base station to identify on behalf of all its associated mobile units. It also added additional emission types to those permitted for secondary fixed operations.

The amendments become effective thirty days after publication in the *Federal Register*.

Phase-Out Of Voice Communication Proposed For Aeronautical Radiobeacons

The Commission has proposed to phase out the use of voice communication from radiobeacon stations in the Aeronautical Radionavigation Service.

Frequency congestion associated with radiobeacons, which operate between 190 and 535 kHz, has been a longstanding problem, the Commission said. In much of the United States, it is difficult if not impossible for the Federal Aviation Administration to satisfy all radiobeacon requirements. The FCC noted that a federal advisory committee, the Radio Technical Commission for Aeronautics, recently recommended elimination of voice communication from radiobeacon stations as a means to alleviate the congestion.

The committee said use of the aeronautical radionavigation system for both navigation and communications resulted in an unfortunate compromise for both services. The bandwidths employed are not ideal for voice reception, it said, and yet voice requires greater bandwidth than the navigation function and thus requires greater frequency protection. Elimination of the voice function would use the spectrum more efficiently and ultimately make additional spectrum available.

Radiobeacon stations are part of a navigation system consisting of airborne automatic direction-finders and nondirectional radiobeacon ground stations. About 1,200 of the 2,000 radiobeacon stations are privately operated and are licensed by the FCC in coordination with the FAA.

The Commission proposed that voice transmission would not be authorized on newly licensed radiobeacon stations and stations with renewed licenses, beginning 180 days after the effective date of its proposed rule change, when adopted.

Amateur Radio License Without Morse Code Requirement Proposed

The Commission proposed to establish an amateur radio operator license class with no requirement of proficiency in international Morse code.

Posing two alternatives for the proposed codeless amateur class, the FCC said it believed there are intelligent, disciplined persons who can make a valuable contribution to the Amateur Radio service without proficiency in Morse telegraphy. They might include, it said, younger persons with a primary interest in computer technology and physically handicapped persons as well as others.

The proposed class would be an "entry" class for which additional proficiency in radio theory, operation, and practice would be required rather than proficiency in code. In that way, individuals could prove that they have the ability and discipline to make a serious contribution.

The Commission proposed as alternatives either to change the requirements for the existing Technician Class license to eliminate the novice code examination (requiring proficiency of five words per minute) or to create a new Experimenter Class license without a code requirement and perhaps requiring demonstration of greater proficiency by written examination than the Technician Class does. The latter would be similar to the Canadian Digital Amateur Class Certificate.

The alternative proposals would have certain features in common. They would not confer operating privileges on frequencies below 30 MHz, since those still would require code. The Commission asked for comment on specific frequencies above 30 MHz to authorize for the codeless class.

Requiring code serves an important purpose for operations below 30 MHz, the FCC said. Also, upon ratification of the Final Acts of the 1979 World Administrative Radio Conference, the United States will be committed to a requirement that amateurs operating below 30 MHz (formerly 144 MHz) demonstrate code proficiency.

There is no intention to deemphasize code as a communications mode in the amateur service, the FCC said. Code's attributes of wide recognition and efficiency substantiate the belief that "code can stand on its own feet," without being made a prerequisite for amateur licenses operating exclusively above 30 MHz.

The Commission noted that code is seldom used in the VHF and higher bands. Beyond the understanding of radio communication and the regulations under which it operates, the FCC said it could leave to the individual the decision whether code would benefit his endeavors in amateur radio.

The Commission said it was aware that a codeless license probably is the most controversial matter that can be raised with the amateur radio community. For many amateurs, it said, code stands as the absolute cornerstone of the service.

It noted a survey conducted for the American Radio Relay League, Inc. (ARRL), an organization of licensed amateurs, showing that very large majorities of the amateurs responding believe code is essential or important for operator privileges.

Once an individual becomes involved in the amateur service, there will be a desire to learn more about radio and the offerings of the service. Codeless-class licensees may develop an interest in code, just as other licensees usually develop interests in greater knowledge of radio theory and greater proficiency in code.

The codeless Technician Class license would retain the other current requirements for that class: examination on basic law and rules essential to a beginner's operations and sufficient elementary theory for their comprehension (Element 2 of the Amateur Radio Operator License Examinations) and general amateur practice, regulations on operations and apparatus and applicable laws, treaties and rules (Element 3). Those also are the examinations in theory, practice, and regulations required for the General Class license.

The license would confer all operating privileges on all amateur frequencies above 50 MHz, as at present, including use of all emission modes.

The principal difference between a codeless Technician Class license and the alternative Experimenter Class license would be in the subjects and level of the written examination an applicant would be required to pass. For the Experimenter Class, the Commission proposed a single new examination element, Element 5.

It asked for comments on the level at which the exam should test knowledge of regulations and theory. Suggesting that the new element might be composed of existing elements, it asked for comments on which elements should be contained or, alternatively, whether an entirely new syllabus should be developed.

The FCC proposed that the Experimenter Class license, if adopted, convey all amateur privileges on frequencies above 144 MHz. Yet it noted there is nothing to prevent authorization of the frequencies from 50 MHz to 144 MHz and said it intended to be flexible on the frequency issue.

It also noted that establishment of a new class would create a substantial administrative burden involving new or modified examinations, revised application forms, and other publications and changes to data processing programs and procedures.

The Commission observed that both Japan and Canada have significant numbers of amateurs and that both provide for a license class without a code requirement. It said it was unaware of any resulting difficulty in either country.

The FCC declined ARRL's request that it delay action on the codeless license class for 18 months while a volunteer amateur license examination program, proposed in concurrent action (PR Docket No. 83-27), is put into effect.

Change Proposed In 6 MHz Fixed Service Allocation To 932-935 And 943-946 MHz

The Commission has proposed to change a proposal for allocation of 6 MHz from the land mobile reserve for government and non-government fixed service to make the frequencies 932-935 MHz and 943-946 MHz available for that purpose.

The action would amend a proposed rulemaking adopted April 29, 1982 (released May 10), under which two other bands would have been allocated: 899-902 MHz and 938-941 MHz. The allocation was originally proposed in response to a request by the National Telecommunications and Information Administration for additional spectrum for low-capacity fixed government systems. The FCC proposed use of the released frequencies on a shared basis by both government and non-government systems.

The Commission said the change was made necessary by two concurrent actions proposing to reallocate the frequencies 896-898 MHz and 941-943 MHz for a public, air-to-ground telephone service (Gen Docket No. 83-30) and to reallocate the 898-902 MHz and 937-941 MHz bands for a personal radio service (Gen Docket No. 83-26).

The FCC noted that there may be difficulties involved in allocation of both the 932-935 MHz and 943-946 MHz bands for fixed services. It originally did not propose 932-935 MHz, it noted, on the understanding that Canada was considering a general mobile radio service at 933-935.5 MHz. There now is uncertainty whether Canada will implement that service, the Commission said, and if it does, careful engineering and coordination may be able to avoid major incompatibilities.

The 942-947 MHz band is used for aural broadcast studio-to-transmitter links (STL) and intercity relays (ICR) on a secondary basis to the primary land mobile radio service, the FCC noted. Removing the approximately 500 STL and ICR licensees from those bands to the 2130-2150 MHz and 2180-2200 MHz bands over a five year period is under consideration in General Docket No. 82-335. Sharing also may be possible between those uses and the fixed services, the FCC said.

The Commission asked specifically for comments on the impact of the proposal on frequency separation in the two-way mobile services, compatibility problems in Canadian border areas, the feasibility of applying Part 94 frequency coordination procedures and technical standards, and the impact on STL and ICR licensees.

FCC To Use Lotteries In Selecting Initial Licensees

The FCC adopted rules which will permit use of a lottery system to select initial licensees in those cases where there is more than one applicant for a communications facility.

The services to which lotteries will apply are Low Power TV and TV Translators (Mass Media Bureau), Private Land Mobile, Operational Fixed Microwave, Aviation and Maritime (Private Radio Burea), and Public Land Mobile, except Cellular Radio (Common Carrier Bureau). In the Private Radio area, lotteries will be used on a case-by-case

basis when there are no substantial differences between applicants.

The FCC placed particular emphasis on the Low Power TV and TV Translator Service (LPTV) because of the complexity involved in using a lottery in this service. It noted the new lottery statute requires that minority and diversity preferences be given certain LPTV applicants when lotteries are used for licensing. These preferences are 2:1 for applicants more than 50 percent controlled by minorities; 2:1 for applicants whose owners control no other mass communications media; and 1.5:1 for applicants whose owners control 1, 2, or 3 media of mass communications. No diversity preference will be available to LPTV applicants whose owners control local media of mass communications serving essentially the same area. Applicants may qualify for both the minority and diversity preferences. Preferences are not available in the Private Radio and Common Carrier Services.

Generally, in services where petitions to deny are permitted, petitions will only be considered post-lottery and only against the tentative selectee. Cases will be reviewed by the staff to determine whether a grant can be made or whether the application(s) must be designated for hearing. Paper hearings will generally be used. In cases where a paper proceeding cannot resolve all issues, oral testimony will be heard by an Administrative Law Judge who will issue an initial decision. If a tentative selectee in any proceeding is found unqualified, a second application will be drawn from the same pool.

The Commission pointed out that the use of lotteries to select licensees from among competing applicants would decrease significantly the cost and delay imposed by traditional comparative hearings, and, thus, speed new service to the public.

Spectrum Space To Provide Air-Ground Public Radiotelephone Service Proposed

The Commission has proposed allocating 4 MHz of spectrum the 896-898 MHz and 941-943 MHz bands for use by domestic public land and mobile stations to provide air-ground public radiotelephone service.

There are now 12 paired channels in the bands 454.40-455 MHz and 459.40-460 MHz available for this service.

The Commission received petitions requesting the allocation of spectrum to establish a public air-ground system for Airfone, Inc. and Aeronautical Radio, Inc. (ARINC).

Airfone proposed a nationwide air-to-ground telephone system that would permit a passenger aboard a telephone-equipped commercial airplane to place a call to any other telephone on the ground within the continental United States. Airfone said that while it was technically feasible for a ground telephone to originate a call to a party aboard an aircraft, the interruptions to flight attendants to page a passenger were considered objectionable.

Airfone also proposed charging flat rate fees irrespective of the distance called. This, it claimed, would eliminate the high costs involved in computing charges. These savings could then be passed on to the public through lower rates. Payment for calls would be made through the use of nationally recognized credit cards or through the use of a token purchased from the flight attendant or at airport counters.

Airfone requested an allocation of 4 MHz to be split between two bands, 896-898 MHz for the ground-to-air link and 941-943 MHz for the air-to-ground link.

ARINC is a communications company that provides various communication services to the aviation industry. This includes the operation of facilities for air-ground and point-to-point operational control communications throughout the United States. In ARINC's proposed system, ground facilities would consist of a number of interconnected trunked radio stations controlled by a number of switching computers. These stations would provide continuous radio coverage and automatic zone transfer of calls in progress or "handoff."

In ARINC's system, when a call is initiated from an aircraft, a ground computer assigns that aircraft a control channel and a voice channel. Thereafter, non-voice call signals to the aircraft are conducted over the control channel. These signals include billing information, call addressing, frequency assignments for subsequent calls, and "handoff."

ARINC's system would also accommodate needs of corporate and general aviation, as well as single-channel requirements of small air carriers. Because continuous coverage cannot be assured below 25,000 feet throughout the nation, at the aircraft operator's option, ARINC's system would also provide a lower grade of service which would not involve the "handoff" capability. ARINC claims the requirement for nationwide coverage would not prevent the establishment of competing nationwide systems.

ARINC's proposal would require 6 MHz in each direction for a total of 12 MHz.

The Commission said there had been an adequate showing of need to support a proposal to allocate spectrum to expand the current air-ground radio-telephone service now provided under common carrier rules. Having reviewed the attributes of each proposal in this matter, it said it could not conclusively state that either system was distinctly preferable from an operational point of view.

However, it said, from a spectrum management viewpoint, since Airfone's system design indicates that a viable, useful air-ground service could be provided in only 4 MHz of spectrum, the public interest would be served by limiting the proposed allocation to 4 MHz.

The Commission said that while it was proposing 4 MHz be allocated to the Domestic Public Land Mobile Radio Service to expand the public air-ground radio telephone service, it was not making any proposal for the operational or technical rules to govern such expanded service and was seeking comments that would give it guidance with respect to what operational features the public desires and what corresponding technical parameters are needed to define the service.

FCC Proposes To End Requiring General Radiotelephone Licenses For Some Services

In line with its ongoing deregulation program and in response to several petitions for rulemaking, the Commission has proposed the following licensing changes:

- To eliminate all regulations in Parts 21, 73, 74, 78, 90, 94, and 95 of its rules that permit only persons holding a General Radiotelephone Operator License to perform transmitter operation, maintenance, and repair. The Commission does not propose to abolish the licensee, just the rules that require its use in these services: Domestic Public Fixed Radio; Radio Broadcast; Experimental, Auxiliary, Special Broadcast, and Other Program Distribution Services; Cable Television Relay; Private Land Mobile Radio; Private Operational-Fixed Microwave; and Personal Radio.
- To eliminate the rules requiring that stations in the Instructional Television Fixed Service and several other broadcast-related services be operated and maintained only by persons holding a commercial radio operator license.
- To eliminate the Aircraft Radiotelegraph endorsement and the blind operator restrictive endorsement, because they are no longer needed.
- To increase the license term for the general radiotelephone license to lifetime to free the Commission resources involved in processing renewals for other uses.
- To increase the renewal grace period for commercial radio operators from one to five years, eliminating the time required to process waiver requests which are routinely granted under delegated authority.

The Commission indicated the requirements in question are unnecessary and deleting them will not jeopardize the quality or efficiency of communications in the radio services involved. It invited comments to assist it in developing a final decision.

The FCC is not proposing to change its licensed operator requirements in the Maritime, Aviation, or International Public Fixed Radio Services, noting that these are international radio services and that, at a minimum, certain implicit operator licensing obligations do exist. "However, we are further investigating the question of licensed operator requirements in these services and, if appropriate, will initiate a separate proceeding," the Commission said.

Previously, in the broadcast area, the agency found no significant correlation between the requirement for licensed opera-

tors at broadcast stations and signal quality or interference control and concluded it could reduce costs associated with the commercial radio operator licensing program by abolishing the broadcast endorsement, the Radiotelephone Third Class Operator Permit, and the Radiotelephone First Class Operator License.

In two prior notices, the FCC has proposed abolishing requirements for licensed operators in the Experimental Radio and Public Mobile Radio Services.

Ten Year License Terms In General Mobile and Amateur Services, Extension Of Grace Time For Amateur Renewals Proposed

The FCC proposed authorizing ten year license terms in the General Mobile Radio Service (GMRS) and the Amateur Radio Service as well as changing the period of grace for renewing an expired license in the Amateur service to two years.

Currently, GMRS and Amateur licenses have five year terms.

GMRS is a private, short-distance radiocommunications service for the business or personal activities of licensees. There are over 16,000 licensees.

There are over 400,000 licensed amateur radio operators.

The Commission noted that the Communications Amendments Act of 1982 (P.L. 97-259), enacted by Congress on September 12, 1982, authorized license terms not to exceed ten years in both GMRS and the Amateur Radio Service.

It pointed out that extending the license terms would significantly reduce the number of license renewals that would have to be processed. The Commission estimated these changes would result in a time savings to the public of 33 paperwork burden hours a year in the GMRS and 1,000 paperwork burden hours a year in the Amateur Radio Service.

It also noted that increasing the grace period for Amateur station licensees should materially reduce the number of inadvertently lapsed station licenses.

Troy, Michigan, Radio Dealer Assessed $500 Forfeiture For Rule Violation

The Private Radio Bureau, under delegated authority of the Commission, has assessed a $500 forfeiture against Allen Electronics of Troy, Michigan, for allowing unauthorized users on its community repeater in willful violation of FCC Rule 90.427. Allen Electronics is the licensee of the repeater (mobile relay) station KNBC-418 in the Business Radio Service.

It was found that Allen Electronics allowed unlicensed operation by two firms who had obtained their equipment from Allen Electronics. Both firms told investigating engineers from the Commission's Detroit field office that they were unaware of their illegal operations because Allen Electronics said it would take care of their licensing for them. The engineers issued warnings to both firms to cease operation until they were properly licensed.

The Bureau sent a Notice of Apparent Liability to a Monetary Forfeiture of $500 to Allen Electronics in August 1982 for "failing to have its mobile relay transmitter installed and protected to prevent operation by other than those authorized." Allen Electronics replied that the forfeiture was not warranted because the violations "were not intentional," but the Bureau concluded that the violations occurred because of the dealer's laxity and lack of concern for Commission rules and directed it to pay the $500 forfeiture by March 4, 1983.

Dolton, Illinois CBer's Station License Revoked

The FCC Review Board has revoked the license of Theodore E. Sousa, Dolton, Illinois for citizens band radio station KEV-6939 for numerous violations of the FCC's CB rules.

This proceeding began in 1978 with an Order to Show Cause where it was alleged that Sousa had operated his station in willful and repeated violation of the following rules: failure to identify the station by its assigned call sign; communicating with another station at a distance of more than 150 miles; and communications in excess of five consecutive minutes. Further, it was alleged that Sousa had failed to make his radio station available for inspection by Commission representatives.

In a 1979 initial decision, FCC Administrative Law Judge Joseph Stirmer found that Sousa had engaged in willful violations of the rules for which he had been charged. The Review Board rejected Sousa's exceptions and affirmed the ALJ's conclusions that revocation is warranted.

Revocation of Sousa's license for station KEV-6939 becomes effective 40 days after the release date of this decision, unless application for review or petition for reconsideration is filed within 30 days, in which case the effective date will be suspended pending further order of the Review Board or the Commission.

FCC To Suspend Licenses Of Radio Operators Who Assist Illegal Communications Operations

The FCC is now authorized to suspend the licenses of those commercial radio operators who advise, equip, or otherwise assist illegal communications operations.

On September 13, 1982, Public Law 97-259 amended Section 303(m)(1)(A) of the Communications Act authorizing the Commission to suspend the license of any radio operator who has "caused, aided, or abetted the violation of any Act, treaty, or convention binding on the United States, which the Commission is authorized to administer or any regulation made by the Commission under any such Act, treaty, or convention; . . ."

Implementation Of Nationwide, Two-Way Digital System Permitted

The Commission waived its rules to give IBM Research and Development, Inc. an extension of time in which to implement its newly developed 800 MHz, two-way nationwide digital communications system in the Business Radio Service.

IBM's system would enable field personnel using portable units with computer keyboards to communicate not only with other IBM personnel, but also to access directly the company's "main frame" computers. The system will be installed in 250 cities in the continental United States, Alaska, Hawaii, and Puerto Rico.

In granting the waiver, the Commission noted that Section 90.629 of its rules provides for up to a three-year implementation schedule for "slow-growth" systems, provided the applicant meets certain criteria. Applicants in the Business Radio Service are not eligible for such consideration under this section, but must construct and place their systems in operation within eight months of the date their licenses are granted. IBM requested longer than eight months.

Noting the considerable efforts made to come up with this highly innovative, technically advanced digital data communications system, the Commission said its policy has always been to encourage advancements in communications system design, particularly when improvements in spectrum efficiency result. Clearly, IBM's proposed system meets these requirements.

New Experimental Stations

The Commission, by its Office Science and Technology, Frequency Liaison Branch, took the following actions:

KE2XML, State Of California, Tuolumme Meadows, CA, experimental research station to operate on 401.7895 MHz for collection of data using GOES Satellite for fire weather forecasting and prediction of water runoff.

KE2XYMM, Navidyne Corp., Within Continental U.S., experimental developmental station on 1636.5-1645 MHz to demonstrate capabilities of the INMARSAT satellite to potential users.

KM2XKM, American Bell, Inc., Within Continental U.S., to operate RF Devices in accordance with Part 15, Subparts C, D, E, H, and J, but have not been thru Certification or Verification procedures.

KM2XKO, A. Prose Walker, Tallahassee, FL, experimental research to operate on 18.068-18.168 and 24.890-24.990 MHz to conduct studies of Gray Line propagation effects and investigate the potential of vertical incidence transmission and ionospheric echoes.

KM2XKP, American Standard, Inc., Within Continental U.S., on 452.925 452.950, 457.925, and 457.950 MHz to develop remote control via radio of braking system.

KM2XKR, Metretek, Inc., Melbourne, FL, experimental developmental station to operate on 154.46375 MHz to develop equipment to transmit data to be used by utility companies.

KM2XKS, Admiral Petroleum Holding Co., Grand Rapids, MI area, experimental research station to operate on 154.57 MHz to research feasibility of new frequency bands for DDSMS type equipment.

KM2XKT, Union Pacific Railroad Co., Omaha, NE, experimental research station to operate on 2450 and 10525 MHz to evaluate a railroad electronic identification system.

KM2XKU, Maritel, Inc., Odenton, MD, experimental developmental station to operate on various bands between 4170 and 22227 kHz to develop and test a fully automatic high frequency radio telex system.

KM2XKV, Control Data Canada, Ltd. New York City, NY, experimental research station to operate on 57 MHz to study use of guided radar in commercially installed perimeter surveillance systems.

KM2XKW, Control Data Canada, Ltd., New York City, NY, experimental research station to operate on 57 MHz to study use of guided radar in commercially installed perimeter surveillance systems.

KM2XKX, Motorola, Inc., Schaumburg, IL, experimental research station to operate on various discrete frequencies between 860.700 and 934.750 MHz for development and field testing of a cellular type radio system for shipment to Japanese Mobile Telephone Service.

KM2XKY, Westinghouse Communications Services, Inc., Anne Arundel, MD, experimental research station to operate in 2900-3100 MHz band to develop radar for shipment to Govt. of Switzerland.

KM2XKZ, Westinghouse Communication Services, Inc. Anne Arundel, MD, experimental research station to operate in 2900-3100 MHz band to develop radar for shipment to Govt. of Switzerland.

KM2XLA, Medical Communications & Instrumentation, Inc. Canoga Park, California, experimental developmental station to operate on frequencies between 458.000 and 463.175 MHz to develop and repair Biophone for medical communications.

KM2XLB, Rockwell International Corp. Cedar Rapids, Iowa, experimental research station to operate on discrete frequencies between 5760 and 16160 kHz for testing and analysis with psuedo randome pulsed wide band emissions on high frequencies.

KM2XLC, Rockwell International Corp. Richardson, Texas, experimental research station to operate on discrete frequencies between 5760 and 16160 kHz for testing and analysis with psuedo randome pulsed wide band emissions on high frequencies.

KM2XLF, Rockwell International Corp. States of Alaska, Hawaii, P.R., and International Ocean areas, experimental developmental station to operate on discrete frequencies between 2399.5 and 29931.5 kHz for development and testing of equipment prior to equipment being type accepted and approved to be used in avionic service.

KM2XLG & KM2XLH, Motorola, Inc. Chicago, Illinois and Schaumburg, Illinois, experimental development stations to operate on 869-870 MHz and 824-825 MHz respectively to field test and develop radio system to allow closer channel spacing.

KM2XLI, Motorola, Inc. Chicago, Illinois, experimental developmental station to operate on 869-870 MHz band to field test and develop radio system to allow closer channel spacing.

KM2XLJ, Motorola, Inc., Tempe, Arizona, experimental research station to operate on 9250 MHz for system acceptance testing of radar under U.S. Govt. contract.

KM2XLK, Cardion Electronics, Woodbury, New York, experimental research station to operate on 3.1-3.5 GHz to develop equipment to be exported to Govt. of Denmark.

KM2XLL, ITT Gilfillan, Inc. Van Nuys, California, experimental research station to operate on 5400, 5650, and 5900 MHz to test radars being developed for Govt. of Sweden.

KM2XLM, Martin Riess, Bloomfield, Indiana, experimental developmental station to operate on 9345 MHz to evaluate feasibility of utilizing low power ARINC-708 weather radar in land based operation looking to find suitable replacement for existing obsolete systems.

KM2XLO, ISA Communications Services, Inc., Atlanta, Georgia, experimental research station to operate on 23.250 MHz to investigate the feasibility of 23 GHz microwave radio as an alternative transmission media for short-haul data links.

FCC Expands Segments For Telephony Operation In High Frequency Bands

The Commission expanded the segment of the 14 MHz Amateur radio band available for telephony use by adding 14150-14200 kHz to those frequencies currently authorized for such use.

They also adjusted the operator privileges for that band by making the frequencies 14150-14175 kHz available only to Amateur Extra class licensees and the frequencies 14175-14225 kHz available only to Amateur Extra and Advanced class licensees. The frequencies 14225-14350 kHz will be available to Extra, Advanced, and General class licensees.

In amending Part 97 of the rules, the Commission noted that the small potential impact of the telephony subband expansion on non-U.S. operators is outweighed by the necessity to alleviate the extraordinary overcrowding U.S. Amateurs currently face in the 14 MHz band.

The Commission also issued a further rulemaking proposal asking for comments on expanding the telephony subbands in other HF bands. Specifically, the Commission proposed to add the frequencies 3750-3775 kHz, 21200-21250 kHz, and 28300-28500 kHz to those authorized for telephony operation. New operator privileges for the 3.7 and 21 MHz telephony subbands would be: 3750-3775 kHz and 21200-21225 kHz, Amateur Extra class only; 3775-3850 kHz and 21225-21300 kHz, Amateur Extra, and Advanced classes only; and the remaining telephony frequencies for Amateur Extra, Advanced, and General class operators.

The Commission also proposed to allow Amateur operators in Hawaii and nearby areas to use the frequencies 7075-7100 kHz for telephony.

Graphic Scanning Corporation Generally Denied Freedom Of Information Review

The FCC has basically affirmed a November 1982 denial by the Chief of the Common Carrier Bureau of a request by Graphic Scanning Corporation for documents under the Freedom of Information Act.

The FCC denied Graphic Scanning's request for review of the Bureau's decision except as it applied to limited factual portions of certain documents, which the FCC decided to make available.

Graphic Scanning's original request arose in the context of the Commission's consideration and investigation of four applications for authority to construct one-way paging stations operating at 35 and 43 MHz in the Domestic Public Land Mobile Radio Service. The applicants are A.S.D. Answer Service, Inc., B.W. Communications, Inc., P.A.L. Communications Systems, Inc., and Vineyard Communications, Inc. The central issue in the proceeding is whether Graphic Scanning is a real party-in-interest in control of the four applicants.

In response to Graphic Scanning's request for all documents relating to the proceeding, the Bureau identified 20 documents and released six, plus factual parts of another. It denied disclosure of the remainder on grounds that they were shielded by an exemption in the Act covering predecisional documents involved in an agency's deliberative process and an attorney's preparations for a proceeding.

Graphic Scanning's request for review centered on two of the documents that were withheld by the Bureau's action: an internal memorandum and an attorney's handwritten notes.

The Commission agreed with the Bureau's treatment of the documents as predecisional and deliberative or as attorney work-product entitled to a zone of privacy in which preparations for a proceeding can be carried on. In the few instances in which the protected documents contain reasonably segregable factual material which is not already available, the FCC agreed to release those portions.

POPULAR COMMUNICATIONS BOOK SHOP

Early Wireless: A Collector's Guide
by Anthony Constable
Retraces the paths of history which culminated in the final appearance of the wireless set. Many early sets are illustrated, along with listings of early wireless manufacturers. A must for those interested in wireless history. 160 pages, hardcover, $19.95. Order #S167.

Air-Scan, Directory of VHF Aero Band (108 to 136 MHz) Stations, 3rd ed.
by Tom Kneitel, K2AES
More than 30,000 listings in U.S., Canada, and Mexico—Control Towers, Unicoms, Multicoms, Approach/Departure frequencies, Flight Service Stations, Air Route Traffic Control Centers, airline frequencies, search/rescue, etc. 80 pages, paperback, $7.95. Order #C152B.

World Radio TV Handbook 1983
The world's only complete directory of international broadcasting and TV stations—the established, authoritative guide endorsed by the world's leading broadcasting organizations. A comprehensive listing of short-, medium-, and long-wave stations revised and updated to reflect actual conditions. Also includes special features on listening gear, how to adapt older receivers for use today, and DX club activities. 560 pages, paperback, $17.50. Order #B097.

The Shortwave Propagation Handbook, 2nd ed.
by George Jacobs, W3ASK,
and Theodore J. Cohen, N4XX
A new, revised edition of the popular guide to all your propagation needs. Contains up-to-the-minute information and charts, and guides you through producing your own propagation data. 154 pages, paperback, $8.95. Order #C137.

How to Build a Lie Detector, Brain Wave Monitor & Other Secret Parapsychological Electronics Projects
by Mike and Ruth Wolverton
Your passport to a new world of electronic adventure . . . a unique collection of electronic projects that deal with the paranormal. Eavesdrop on telepathic messages, monitor brain waves, or "measure" emotions and hang-ups. Step-by-step instructions and plenty of diagrams and illustrations show you how to do it all. 308 pages, 101 illustrations, paperback, $12.95. Order #T193.

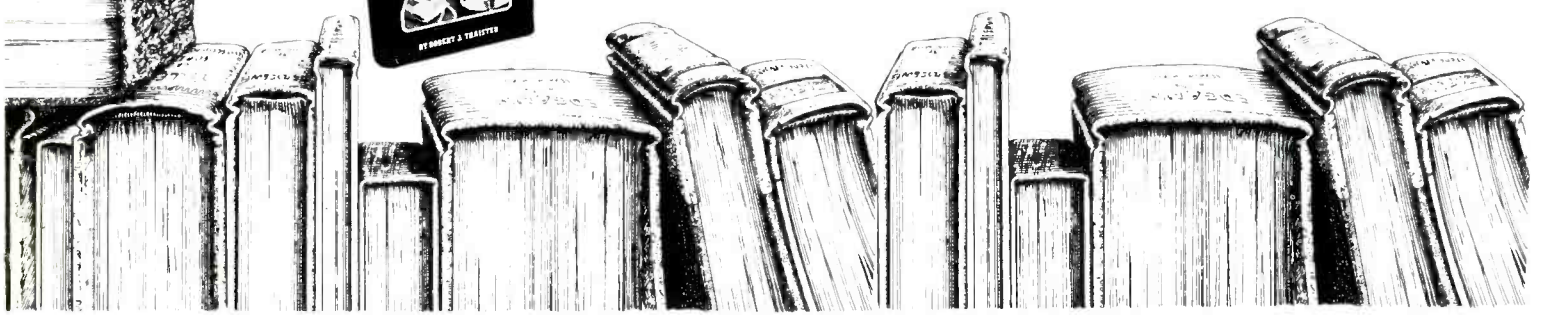
The Complete Security Handbook—for home, office, car, boat, RV, anything
by C.A. Roper
If you've ever worried about your home or vehicle being burglarized . . . this book has the answers you need. An all-inclusive source on how to determine your security needs, buy the right systems and devices, and install them. Includes alarm systems to protect your home, vehicles, and other property against fire, smoke, lightning, vandalism, theft, gas, water leaks, and more. 540 pages, 681 illustrations, paperback, $13.95. Order #T194.

The Master Handbook of Telephones
by Robert J. Traister
An info-packed manual of modern telephone communications, covering literally every aspect from terminology and equipment to accessories and repair . . . with projects! Covers standard telephones, decorator models, answering devices, electronic telephones, a multitude of accessories, scramblers, and security devices . . . makes it easy for anyone to install, use, and repair almost any kind of phone equipment imaginable! 360 pages, 250 illustrations, with 8 pages color section, paperback, $10.95. Order #T195.

World-Wide Radioteletype Call Sign List.
Some 3000 callsigns of RTTY and CW stations located in all parts of the world. Starts out at AAA3USA and goes to ZYK and beyond—through the numerical prefixes from 3AC to 9YM. Handy directory for identifying unknown RTTY and CW transmitters on international frequencies. $6.00. Order #U201.

World Press Services Frequencies
by Thomas Harrington
A comprehensive manual covering the field of radioteletype news monitoring—antennas, receivers, terminal units, monitors, and more. Contains 3 master lists of times of transmission, frequencies, plus ITU list of over 50 news services worldwide. 72 pages, paperback, $5.95. Order #U173.

Amateur Radio, Super Hobby
by Vince Luciani, K2VJ
A complete source of information on what amateur radio is. How to get started in amateur radio, some of the theory behind the hobby, plus exclusives on the lives of some members of the amateur radio community. 144 pages, paperback, $8.95. Order #C168.



POPULAR COMMUNICATIONS

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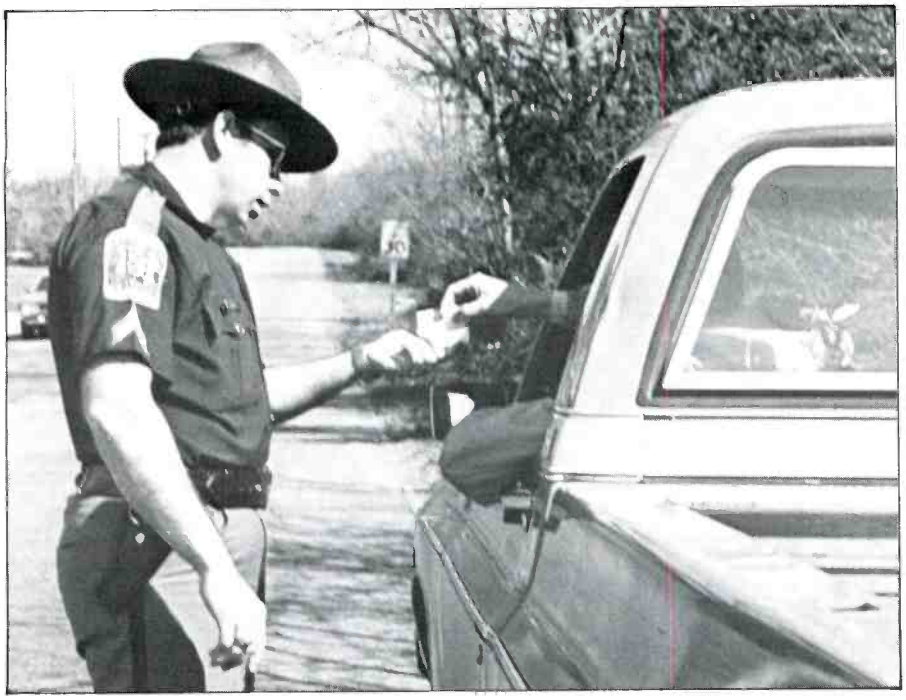
RADAR REFLECTIONS

RADAR DETECTORS AND THEIR USE

BY JANICE LEE



Proposed Legislation Called Unconstitutional

A bill to outlaw radar detectors, passive radio receiving devices tuned to the frequencies used by police radar, is in the Michigan Legislature despite defeats of similar bills in previous sessions and judicial initiatives set forth last year in a decision by the state's Supreme Court.

Not only in Michigan, but in nearly 40 other state legislatures, similar bills have been soundly defeated on the basis of constitutional issues and the impracticality of such a law. A radar detector prohibition has not been successfully enacted since 1962.

Opponents of the bill, including Electrolert, Inc. of Ohio, manufacturer of the popular Fuzzbuster® brand radar detector line, cite constitutional issues which preclude enactment of such laws, the foremost being the preemption issue. The Congress of the United States remanded sole authority over radio Communications to the Federal Communications Commission who, in their Communications Act of 1934, restricted any state from legislating in the area of radio reception and transmission. The act specifically allows reception of all radio signals by any person. In the past several years, the FCC has specifically addressed the radar detector issue and its stand has not wavered.

Undoubtedly, enforcement and judicial intent will be the strongest points of debate on this bill in the legislature. In September, the Michigan Supreme Court upheld the legality of radar detectors. The ruling by the state's highest court overturned a previous appellate decision which held that radar detectors could be banned under a 1929 "police radio" law enacted long before the advent of police radar and radar detectors.

In addition to overturning the prohibitions upheld by the lower courts, the Michigan Supreme Court questioned the propriety of police radar use by calling it "electronic surveillance by the police (which) is serious business and an intrusion into the privacy of anyone who is subjected." Of even greater impact, however, was the Michigan Supreme Court's declaration that: "The police derive their authority from the Legislature, not the Constitution. The Legislature alone can empower the police to engage in electronic surveillance."

Electrolert, Inc., who has spent more than $1 million on judicial proceedings, lobbying efforts, and in litigation on behalf of individual motorists, including the most recent Michigan Supreme Court case, has remained in the forefront of opposition to radar detector prohibitions and has been instrumental in their defeat in over 30 states. Counted among one of Electrolert's most significant accomplishments has been the introduction in Florida of minimum performance standards for police radar itself. This move by the Florida Legislature was in response to findings by experts of the high incidence of error by police traffic radar.

Perhaps Michigan legislators will find that they must not only consider the constitutional arguments of radar detector advocates around the country and the experience of other states, but must consider the judicial intent of their own highest court. Perhaps the legislature may not only find themselves with another defeated piece of legislation, but with the introduction of a new bill which acts on that judicial intent and aims to govern police radar.

Jackson Denies Ticket Quota For Troopers

The Wisconsin Senate Transportation Committee recently recommended that Lowell B. Jackson be confirmed as transportation secretary, but not before three senators accused the Department of Transportation of setting traffic-ticket quotas for state troopers. Jackson denied that troopers must issue a certain number of speeding tickets to keep their jobs.

However, he said, ticket writing is "one of ten evaluation measures" used to judge a trooper's performance. He also acknowledged recurring criticisms by motorists and legislators who say troopers have claimed they must meet a quota.

"We have danced around the question a number of years," Jackson said.

Sen. Michael G. Ellis indicated that he believes Jackson is still dancing. "What did you just say?" he asked after Jackson's lengthy explanation of the evaluation system. The committee just laughed.

"We all know they have a quota system out there," Ellis said. "We don't like it, and we want the quota aspect of trooper performance taken off the books."

Senator Richard Kreul said he does not care whether Jackson calls it a quota system or an "activity chart," he wants it stopped.

Senator Rodney Moen said troopers have told some of his constituents that they must write tickets to meet their quota.

Jackson said it is "unfortunate" that any trooper would say that.

Judges 3 Refuse To Compensate A Tree

There was both rhyme and reason behind a recent Appellate Court decision upholding the dismissal of a lawsuit seeking damages for injuries to a tree hit by a car.

William Fisher of Oakland County, Michigan claimed he was entitled to damages beyond the expense of having a tree surgeon repair his "beautiful oak" because it was "a living thing" with "esthetic quality such as beauty, majesty, and loveliness."

The suit, against the owner of the car and a woman who was driving it when it left the road and hit the tree, was dismissed in Oakland County Circuit Court; Fisher appealed.

"We thought that we would never see
A suit to compensate a tree.
A suit whose claim in tort is prest
Upon a mangled tree's behest.
A tree whose battered trunk was prest
Against a Chevy's crumpled chest.
A tree that faces each new day
With bark and limb in disarray.

A tree that may forever bear
A lasting need for tender care.
Flora lovers though we three
We must uphold the court's decree."

"I always remembered Joyce Kilmer's poem 'Trees' so I started fooling around with it and got some help from a staff person who should remain unknown, but is quite a poet," Gillis said.

The tree surgeon repaired the damage for $550 and the insurance company said we'll pay it," the judge added. "His (Fisher's) contention was that the tree was a living thing, almost like somebody dear to him, so he asked for $15,000. The tree is not dead. It's repaired and living."

Gillis said the poem fully explains the court's position and was not a frivolous undertaking.

Judge Gillis was also the author of perhaps the shortest ruling in the history of the state appeals court a few years ago.

In a case where a man tried to convince an appeals panel to distinguish certain allegations different from facts as stated in a lower court decision against him, Gillis wrote:

"He didn't. We couldn't. Affirmed."

Senate Zaps Anti-Speed Gun Proposal

The Nevada Senate defeated a bill aimed at crippling the use of speed guns by law enforcement officers to nab motorists.

SB9, which lost on a 6-15 vote, would have required the prosecution to prove in speeding cases that the electronic device being used in that instance was reliable.

Senator Joe Neal, D-Las Vegas, who in the past years has tried to outlaw the speed guns, said this would not stop the use of radar. Instead, it would help those who plead innocent by putting the burden on the prosecution to prove the device is reliable.

In most instances, the defendant would not be required to go out and hire a high priced attorney to prove the speed guns or other devices were faulty.

Voting for the bill were Neal, James Bilbray, Floyd Lamb, and Robert Robinson, all D-Las Vegas, and Don Mello, D-Sparks.

Chicago Cop's Testimony Puts Blip In Speed Radar

A Chicago police officer who contends 10 percent of all speeding tickets based on radar devices are wrongfully issued is under investigation by the department for remarks he made to a Traffic Court Judge.

Patrolman William P. O'Brien of the Traffic Enforcement Section has been charged with violating departmental rules for telling Associate Circuit Judge John J. Devine that he could have been wrong in issuing a ticket to a woman who was allegedly speeding on Int. Hwy. 57.

O'Brien has told officials at the Fraternal Order of Police, the patrolmen's union, that he was only speaking "honestly" about the radar device in response to Devine's question of whether it was "conceivably possible" that he could have been wrong. In the official complaint against him, O'Brien is said to have "no faith in radar operations."

What may result from the investigation is unclear, but the sentiment among law enforcement officers and judges is that lawyers who represent speeders may use the case to attack the credibility of radar.

"I still consider radar to be accurate," said Judge Devine in an interview in his chambers last week. "When an officer under oath tells me it is his opinion the radar was working correctly, I must believe him. He is trained in radar and the motorist usually admits to speeding.

"In this instance, considering what the officer said, I had no choice but to dismiss most of the other arrests he made."

In Wisconsin, the State Supreme Court recently issued guidelines which delineated the levels of proof required for conviction in a radar case. In part, it specified that an officer must show that the radar was used in an uncluttered area.

It seems that no other official complaints by other officers in Chicago, either in court, to a superior, or to the union, about radar devices used by the traffic enforcement division or training traffic officers have been received.

Radar Traps Park Snowmobiles

Yellowstone National Park rangers are using radar on speeders this winter, just as they do in the summer, but their target this season is speeding snowmobilers.

Chief Ranger Tom Hobbs said the number of citations this year is about the same as last year, but snowmobilers are keeping rangers busy.

The speed limit is 45 mph in the park, winter or summer, and Hobbs said snowmobiles going 60 mph or faster get a ticket instead of a warning.

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

RTTY

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

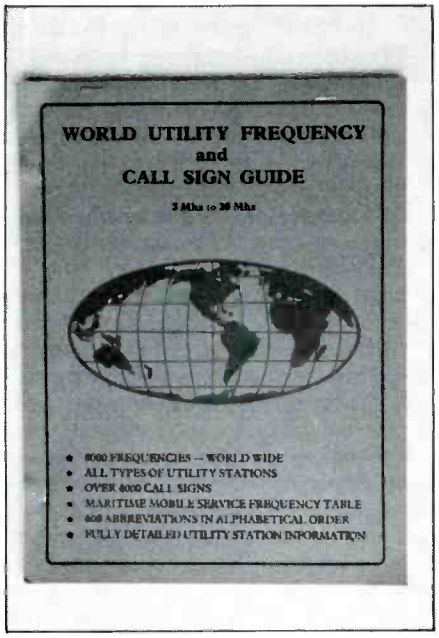
BY JOSEPH JESSON

There's good news for the beginning or dyed-in-the-wool RTTY enthusiast—three recent superb RTTY directories have been published. Random tuning about the HF band listening for the characteristic frequency shift RTTY signal is seldom productive unless one has several complete frequency guides. Unless one knows where to look, a great deal of time is wasted trying to get plaintext copy from the many encrypted military signals. In fact, with such a large ratio of encrypted signals versus plaintext, combined with the often changing schedules and frequencies, one would be lucky to find a few readable RTTY signals. Given a 24-hour day and RTTY transmissions having an average length of 30 minutes to 1 hour, one has a difficult time finding the elusive press broadcasts in the 3 to 30 MHz range.

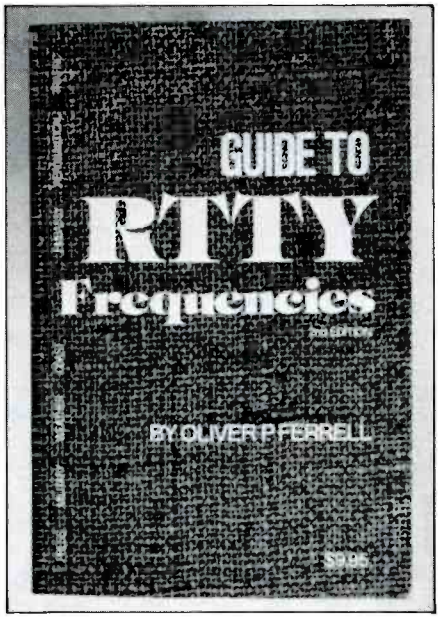
Most of the battle in finding commercial RTTY point to point transmissions is to be at the right frequency at the right time. Well, the good news is that this is now possible with the addition of three new RTTY books. These welcome RTTY directories are the answer to what is really being broadcast using frequency shift keying, or FSK. Since point to point RTTY transmissions often change frequency, sometimes randomly, it is quite important that the information being presented in books is up-to-date in languages, timing, and frequency.

Looking through my older collection on RTTY frequencies, I came across the 1976 *Confidential Frequency List* (published by Gilfer). This 80-page directory has not only RTTY press, but FAX (Facsimile), coast stations calling ships at sea, military aircraft, embassy stations, and voice mirrors of fixed service stations. What is remarkable is that this is *only* 80 pages, while the latest list published by Gilfer Associates is 193 pages of RTTY loggings alone! Many of the same challenges exist, mostly related to publishing a directory based on moving targets. Even cross referencing ITU callbooks and frequency lists are restricted to voluntary submissions by each country. The treaty organization based in Geneva, Switzerland, known as the International Telecommunications Union (ITU), charges around $1,900 for a complete set of lists. Unfortunately, certain third world countries ignore their published frequency slot. Cuba, in particular, is notorious for changing frequency at a whim, sometimes an unintentional drift in frequency.

It is the stated intent of the authors of our reviewed lists to avoid any risk to national security through divulgence of classified material. We will also avoid in this column any reference to military or embassy communications. Rest assured some embassy communication *does* occur using nonencrypted



Joerg Klingenfuss' useful call sign and frequency directory.



Perry Ferrell's Guide to RTTY Frequencies *has just been published in a second edition, which is absolutely invaluable.*

point to point RTTY (try monitoring 7919.0 kHz around 1800 GMT).

The author has logged various embassies around the world with very interesting content. Keep in mind Section 605 of the Communications Act of 1934, or Article 17 of the 1938 Radio Regulations adopted by the International Telecommunication Union which prevents anyone divulging the content of any nonbroadcast radio transmission.

Embassy communication would fall under this regulation. Note that the content of the message is of concern—not the listed frequency and times. Hence, one can find embassy frequencies throughout the world posted in the new *Guide to RTTY Frequencies*, 2nd Edition, by Oliver Ferrell and the *World Utility Frequency and Call Sign Guide*, by Joerg Klingenfuss (Book "G") and published by Universal Electronics, Inc.

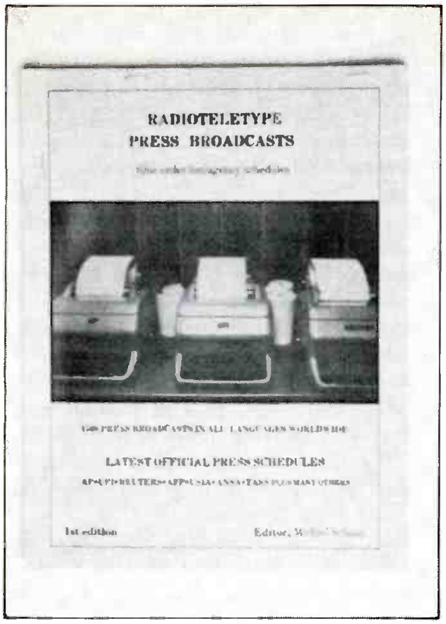
The *Radioteletype Press Broadcasts* by Michael Schaay is specifically for press buffs, since the directory is strictly comprised of "official" press schedules totalizing 1,500 actual listings in numerous languages. Michael Schaay's book is divided into two sections: the first is in time order for each half hour segment of the 24-hour day. Each half hour segment lists the agency that will be transmitting at that time period and the language format utilized during transmission. Languages associated with the broadcast include English, French, German, Spanish, and Portuguese. The calculated average of 30 different news transmissions is mentioned in the preface; however, when ionospheric conditions are excellent, I've found no more than 15 at a given time. Even 15 loggings represents a peak number during prime time (before 1900 GMT) and 6 or 7 average loggings during late afternoon-early evening. The format of the first section is as follows:

Time Agency Language(s) Frequencies *Transmission Time

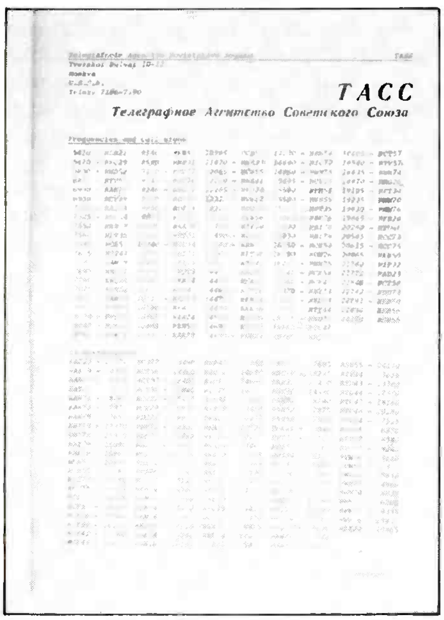
An asterisk (*) indicates the start of a specific transmission period. Of course, all times mentioned in this publication are Greenwich Mean Time.

The second part is listed by agency—really an excellent way of "targeting" certain news agencies. Targeting is an effective way of continuously monitoring listed frequencies to find the ideal settings. For example, to log the Iraqi News Agency, one notes seven frequencies are listed over a five hour period from 1200-1700 GMT, so continually listening to each frequency on a daily basis will establish active times and an optimum direction. This technique is in contrast to those stations that were discovered more or less by accident while scanning the HF bands. By "targeting" a certain news agency, detailed transmission schedules can be created over a period of one week.

Since the second part of *Radioteletype Press Broadcasts* contains detailed time and frequency schedules per agency, this can remove some of the tedium of continual monitoring to form listening patterns. As part of the second part, feature articles are included on most of the agencies such as Agence France Presse (AFP), Deutsche Press—Agentur (DPA), Kuwait News Agency

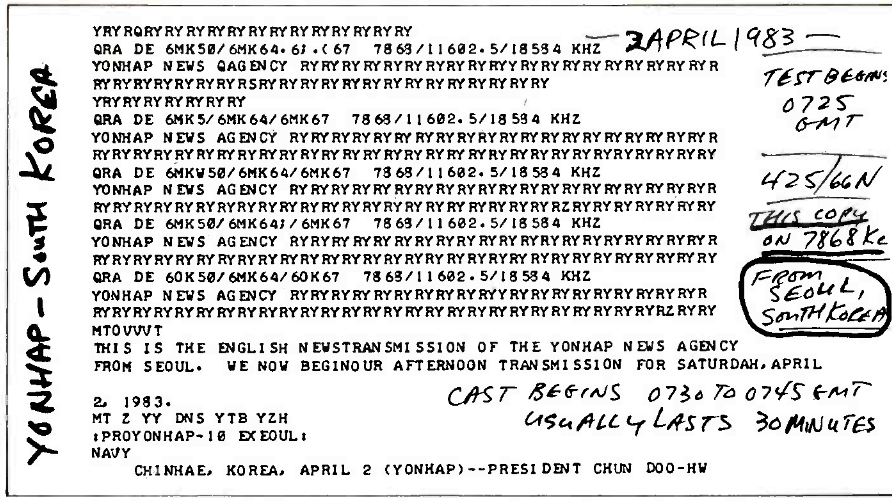


Michael Schaay's book Radioteletype Press Broadcasts.



TACC
Телеграфное Агентство Советского Союза

A page from Michael Schaay's book.



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MTOVVVT
THIS IS THE ENGLISH NEWSTRANSMISSION OF THE YONHAP NEWS AGENCY
FROM SEOUL. WE NOW BEGINOUR AFTERNOON TRANSMISSION FOR SATURDAH, APRIL

2, 1983.
MT Z YY DNS YTB YZH
:PROYONHAP-10 EXEOUL:
NAVY
CHINHAE, KOREA, APRIL 2 (YONHAP)--PRESIDENT CHUN DOO-HW

A printout from the YONHAP *News Agency in Seoul, South Korea. This was copied at 0725 on 7868 kHz.*

(KUNA), Maghrel Arabe Presse (MAP), and Prensa Latina (PL).

Another bonus is the column called Additional Information, or history of the news agency. It is an extensive in-depth look at the agencies background, including news gathering and distribution.

For example, the MAP agency page under news gathering and distribution quotes:

> "In total MAP employs 290 people, 80 of which are journalists. The administrative department counts 60 and the technical department 120 employees, while the remaining personnel are assistants. Newly appointed editorial staff members are often sent as trainees to France, West Germany and Italy. Foreign offices are located in Paris, New York, Washington, London, Madrid, and Dakar."

Very interesting facts, indeed.

Finally, it is important to mention that most of the factual and up-to-date information results from actual published official press schedules obtained from the agencies.

The *World Utility Frequency and Call Sign Guide*, like *Radioteletype Press Broadcasts*, is an 8½"x11" paperback, 132 pages long and is organized by listing utility stations in frequency order in the first table, call signs in the second table, and by Maritime Mobile Service frequency tables. Unlike the *Radioteletype Press Broadcasts*, this guide includes utilities using various modulation techniques—single sideband (SSB), independent sidebands, audible within a 4 kHz bandwidth (ISB), Facsimile (FAX), a combination of telephone and telegraph audible within a 4 kHz bandwidth (COMB), and of course RTTY. Over 8,000 frequencies and 4,000 call signs are referenced throughout 3 MHz to 30 MHz HF.

One area missing from this massive compilation is the number or "tactical" point to point stations since real identification is usually impossible and usually of no obvious interest unless you understand the coded meaning. I've found the author's past publication to be accurate with a large confidence in reception as listed. The *World Utility Frequency and Call Sign Guide* ends off with a reprint of ITU's Radio Regulation's 1982 article 25, useful for identification of modulation and transmission means. Beyond this is the volmet allotment and reception areas map and the major world air routes.

At this point in time, UPI RTTY news transmission originating in North America has all but disappeared. However, it is valuable to note a UPI FAX signal is found on page 45, listed at 15785.0 kHz.

This book is then valuable as a guide to look up a modulation scheme and cross reference this to a country of interest.

Of course, the *Guide to RTTY Frequencies*, 2nd Edition, is a welcome update of RTTY frequencies. Two years have elapsed since the publication of the first edition of the *Guide to RTTY Frequencies*, but this expanded guide has been well worth the wait. Ferrell has remarked in the book's Forward that due to the low cost introduction of stable receivers and the tremendous growth and expansion of radioteletype services, intercepting and demodulating RTTY signals is now an extension to the SWLing hobby. About 4500 frequencies are itemized, which comprises commercial, aeronautical, maritime, press, embassy, UN, and military RTTY services.

Unlike other lists, even unknown RTTY signals are listed by frequency. These transmissions may have an unknown baud rate (marked as . . .e) or unknown data format listed as coded traffic. The second edition uses the identical frequency priority listing but various minor changes have been incorporated. A new dagger symbol (†) appears

Frequency	Location	Time (GMT)	Language	Shift	Baudot Rate	Normal/Reverse Phase
KCNA - Korean Central News Agency						
15632.2 kHz	Pyongyang, N. Korea	0500	English	425 Hz	50 baud	Reverse
14568.0 kHz	Pyongyang, N. Korea	0815	English	425 Hz	50 baud	Reverse
14350.0 kHz	Pyongyang, N. Korea	1215	French	425 Hz	50 baud	Reverse
12174.2 kHz	Pyongyang, N. Korea	0800	Spanish	425 Hz	50 baud	Normal
11230.0 kHz	Pyongyang, N. Korea	1145	French	425 Hz	50 baud	Reverse
9395.2 kHz	Pyongyang, N. Korea	1500	English	425 Hz	50 baud	Reverse

next to the call sign to indicate that there are unresolved questions about a particular station's operation. For example, the UPI listing at 16372.5 kHz has the dagger next to the WFD86 call sign. There is good reason to suspect the station's operation as WFD86 has been off the air for about a year.

All frequencies are in kHz of the higher demodulated mark signal with the receiver set in the lower sideband (LSB) mode. Of course, many of the transmitters drift slightly due to equipment related problems or an intentional shift to bypass interfering, non ITU registered signals. The call signs used tend to agree with the call signs established by international treaty. The location format indicates the city, the transmitting site (in parenthesis), state or province, and finally, the country.

Last month we mentioned how difficult it is to determine the actual location of a few of the eastern bloc transmitter sites. The problem is further complicated as intercountry RTTY relay stations are utilized. As mentioned last month, the official Soviet News Press, TASS, relays its service through Cuban transmitters. The *Guide to RTTY Frequencies* does quite well in determining the actual location in spite of complications. Service is broken down into three categories: AX-Aeronautical Fixed; FC-Fixed Coastal; and FX-Fixed Point to Point service. Any exceptions are included in the mode column, in addition to the normal shift/rate-normal, reverse format. Examples include A1 for Hellschreiber, A9B for RTTY and SSB combination, FEC for Forward Error Correction, and F6 for frequency division multiplexing.

Power is also listed with data derived from the files of the IFRB/ITU. Beware the uncertainties of specifying powers from IFRB/ITU files. Ferrell warns "Power figures are likely to be accurate to only within a factor of 2 (half as much or twice the printed figure)." I find the most interesting column is Remarks, such as the station's primary function, embassy, traffic handling (TFC), and weather material in coded groups (METEO). An extra bonus, which appears on page 187, is the chapter "Getting to Know Cyrillic." Cyrillic is usually used by the Eastern Bloc and Soviet nations instead of the commonly recognized Latin letters of the western romance languages.

In order to obtain many cyrillic characters, multiple shifts are required. Two types of cyrillic systems are used: 2nd register and 3rd register. The advantage of a 3rd register is the ability to print both Cyrillic and Latin letters. While I'm not aware of any hobbiest cyrillic RTTY demodulator, Robert French gives tips on reading Cyrillic transmissions. This makes the *Guide to RTTY Frequencies* a well written and valuable book for any person interested in RTTY monitoring.

So then, which directory is best—the *Guide to RTTY Frequencies*, *World Utility Frequency and Call Sign Guide*, or the *Radioteletype Press Broadcasts?*

My unhesitating response to any RTTY enthusiast is all three are needed. All three tend to be quite complimentary in coverage of RTTY press and utilities. Often, a particular logging may be uncertain and referring to each of the three directories tends to create a good overall picture of the logging. Three excellent RTTY directories are a genuine boon to the RTTY buff, especially since each is a recent publication.

The books *Guide to RTTY Frequencies*, 2nd Edition, by Oliver Ferrell, and Michael Schaay's *Radioteletype Press Broadcasts* are available from Gilfer Associates, Inc., P.O. Box 239, 52 Park Avenue, Park Ridge, NJ 07656. The *World Utility Frequency and Call Sign Guide*, by Joerg Klingenfuss (Book "G") is published by Universal Electronics, Inc., 1280 Aida Drive, Reynoldsburg, OH 43068.

Thanks to reader Eric Kern for submitting a YONHAP News Agency RY test logging.

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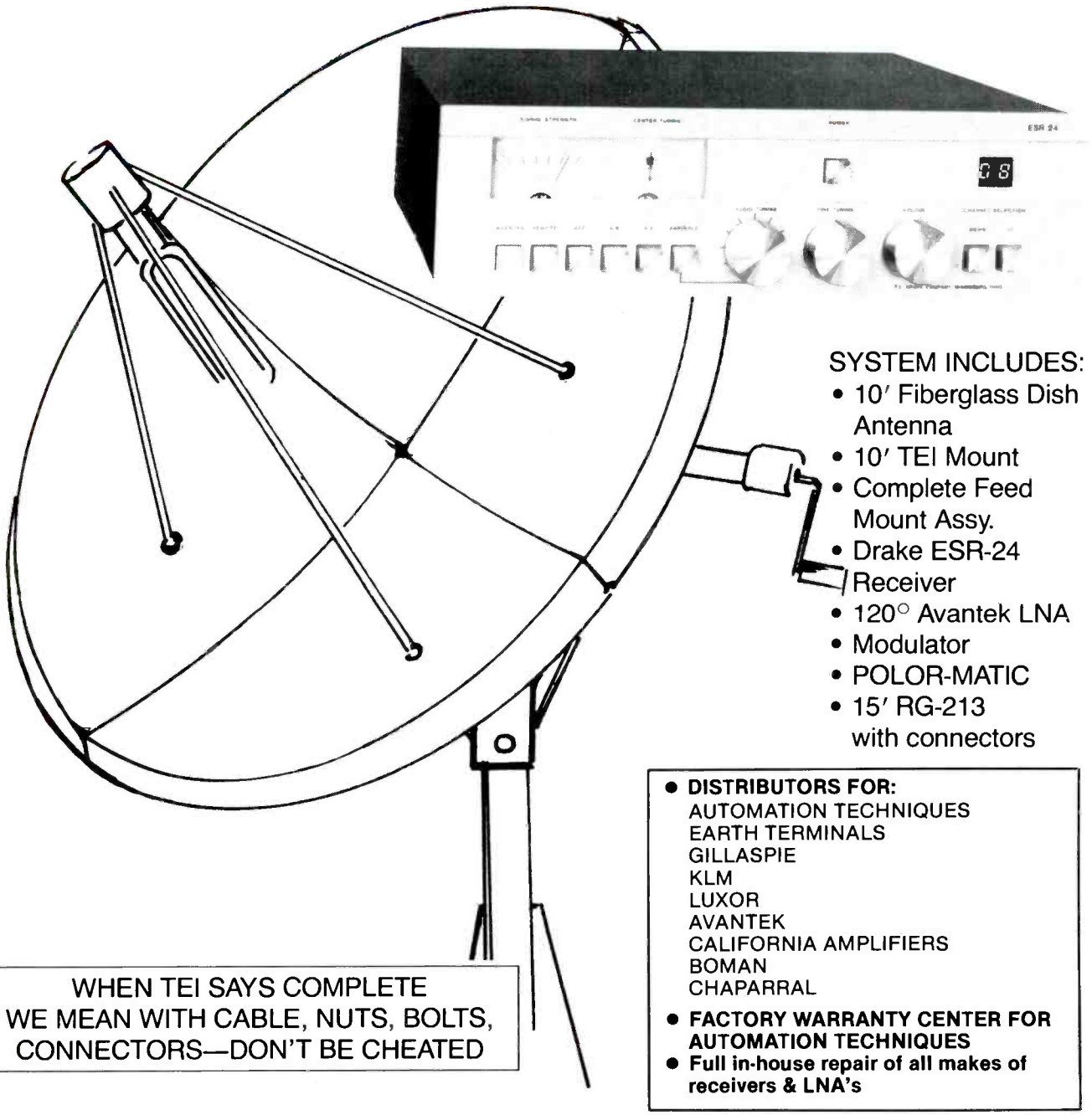

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***Beaming In** (from page 4)*

news broadcasts in order to see what the BBC had to say, because they felt it was the BBC that had the "real" news. It was no new story. Forty years ago, Goebbels wrote in his diary (sadly) that the British could get far more support from their people by reporting a defeat than the Germans could by announcing a victory!

Unfortunately, the present approach of the VOA takes none of this into account. Rather than assessing the long term impact potentials of various world events, the VOA seems content to react with superficial and shallow flag waving catch-phrases which look to be wholly inappropriate to a world which takes its many crises with increasing seriousness. I think that the world's peoples have become weary of much of the rhetoric to be heard over many of the shortwave voices of various governments. The VOA should reassess its positions and basic approaches and stop going for the short-jab catch-phrases which are as corny as Kansas in August.

Oh, there's one other factor involved here; it could well be a saving grace in all of this. The fact is that the VOA's studio and transmitting equipment is so old and decrepit that visitors to the VOA are astonished to see what the station is using. American diplomats overseas have informed the VOA's HQ that Radio Moscow's signals are far stronger than those of the VOA, so maybe all of the mistakes they're making aren't being heard by as many listeners as they might be reaching if the VOA had decent equipment.

Most of the VOA's transmitters are from the 1950's and are described by the VOA itself as being "worthy of a broadcast museum." At a major VOA relay station, they are using transmitters captured from the Nazis at the end of World War II. The VOA has to maintain a machine shop to fabricate parts for most of their equipment because those parts are no longer commercially available.

During the past ten years, there has been an 800% increase in the number of high powered shortwave broadcast transmitters by the nations of the world. The VOA has added new languages, on-the-air hours, and new frequencies, but the station's technical facilities have remained practically status quo. The present director of the VOA, Kenneth Y. Tomlinson, was quoted as saying that, "The Soviet Union spends more to jam western broadcasts coming into the Soviet Union than we allocate for the entire VOA world-wide budget."

Clearly, something is wrong with the way our nation's shortwave propaganda voice is being run. The problem stretches clear through from the programming concepts to the antenna towers. The question is where and how to approach the situation in order to make this voice worthy of our nation in both political philosophy and technical quality. Perhaps the dilemma was best summed up by an overseas listener who wrote to the VOA complaining about the poor signal strength and said, "It bewilders me why a country whose astronauts can easily speak to Earth from outer space is not able to transmit her own voice across the world."

Of course, we haven't spent many dollars to get our astronauts speaking to anybody from outer space lately either. But then that's another story!

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