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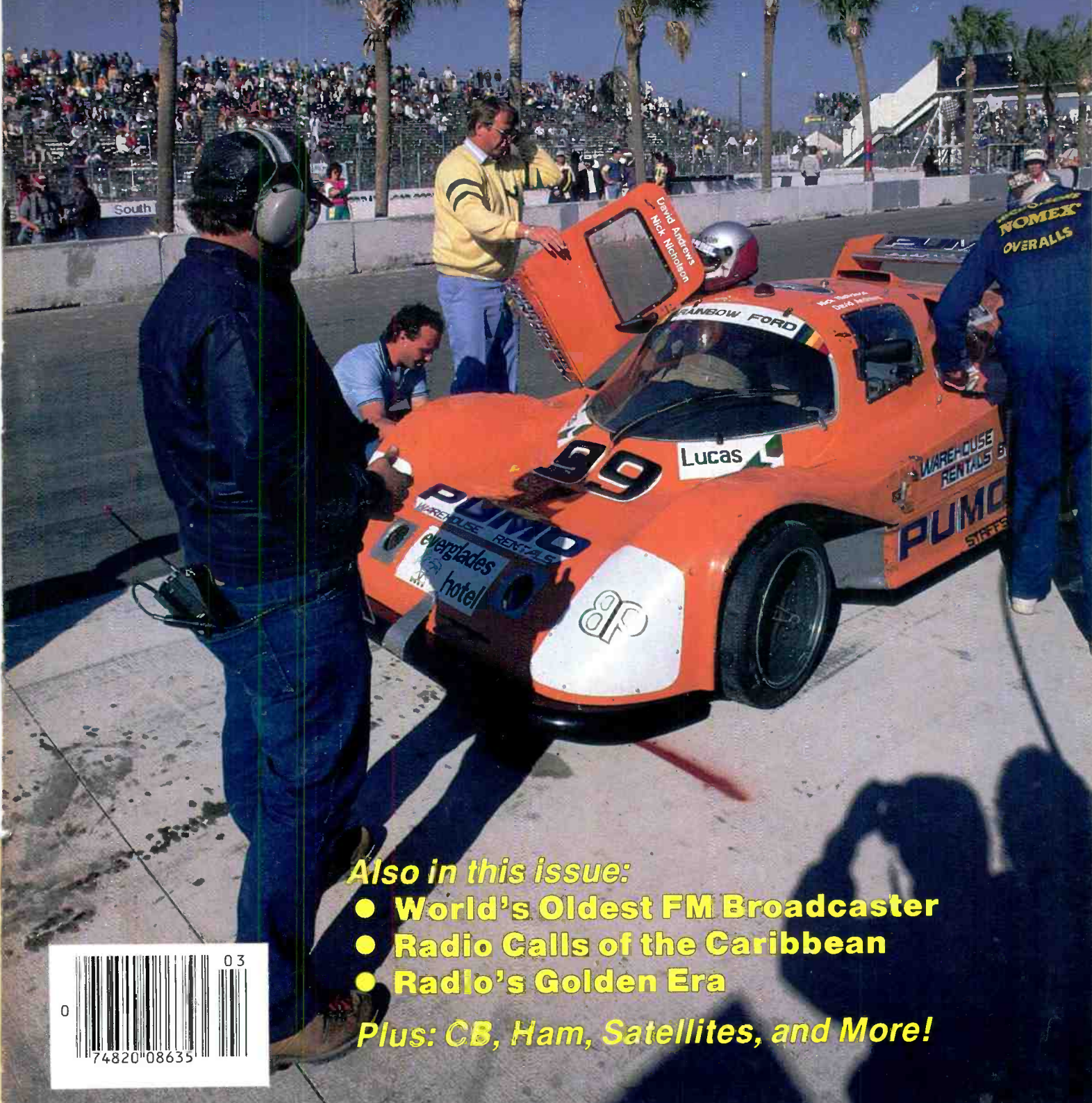
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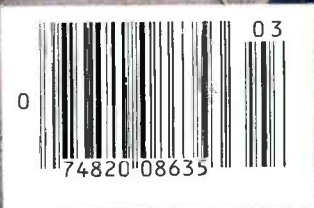
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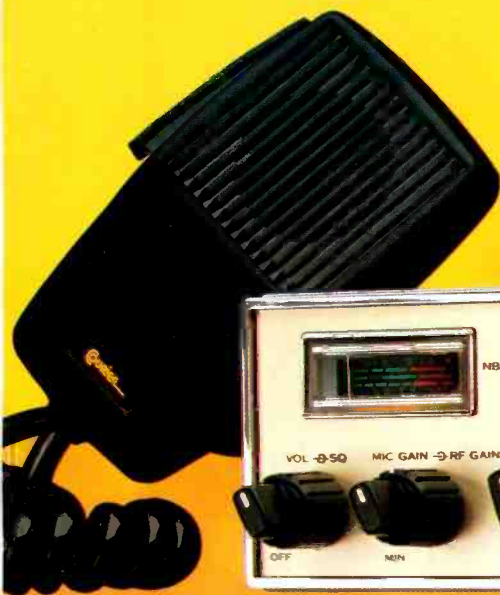
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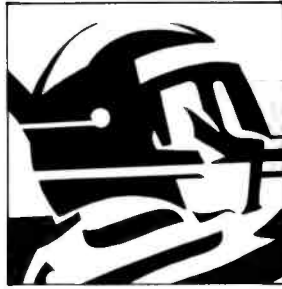
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MARCH 1988

VOL. 6, NO.7



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Letters, We Get Letters!

Last September, in these pages, I jotted down some observations I had on the early days and history of POP'COMM, and some of the unusual mail we receive here at our offices. My comment at that time that each issue seems to outrage at least several readers brought in mail from readers to reassure me that POP'COMM is always read and thoroughly enjoyed at their stations, and that it seems inconceivable that anybody could ever react with an emotion that might be described as "outrage" to the magazine's contents.

Certainly, I was more than a little pleased to receive these supportive letters. We take much effort to make POP'COMM unique. Since our approach is different, I can only assume that those who dig the magazine are probably folks who recognize and enjoy that difference. Nevertheless, not all readers see these differences as any particular benefit and, I suspect, would prefer that we fell into step with the parade of rather dull periodicals in the field of communications.

As a result, scarcely a single issue goes by without getting a number of people red-faced and worked into a lather about one thing or another. It's a tradition I seem to accomplish without even trying very hard. Even before POP'COMM existed, I found that I had this unusual ability. It's a heavy responsibility, too, knowing that sitting here at my typewriter using my one-finger hunt'n peck typing system, I have the power to cause intense rage and apoplexy to persons in all corners of the nation and the world. I don't do it intentionally, it just "happens." On the other hand, it's probably better than being met with apathy and indifference.

I like to think that everyone is entitled to my opinions, and I recognize that occasionally there are those who disagree, even to the point of being offended. In POP'COMM I have tried to bring together authors and columnists who have the ability to express unusual opinions that motivate people into thinking rather than reading their words with passivity.

Often, hostile letters arrive from people who delight in using those yellow highlighting markers to show up those portions of their sentiments to which I am directed to pay particular attention. It's really nice, because sometimes my attention does wander. Wonder why nobody ever uses a black highlighting marker.

Pirate radio is a topic that has always been a real blood boiler, even though we have had a monthly column on the topic ever since our earliest issues. It's neither illegal, nor unethical, to listen to broadcast pirates,

and we run all of the grisly details of the FCC raids on these stations. Still, there are some readers who insist that by our giving any coverage at all to such stations, even their ID's, skeds, frequencies, and addresses, we are somehow encouraging pirate broadcasters to set up shop. It overlooks the fact that pirate broadcasters were in evidence sixty years before there was a POP'COMM!

The plea, is that if we would only discontinue mentioning unlicensed broadcasters, then they would all vanish from the airwaves. What a curious notion, like something you might expect to see on a *Twilight Zone* segment. The Editor of the *Daily Herald-Telegraph* newspaper one day doesn't have room to fit in a story on poverty, so he omits it and suddenly poverty ends. He thinks nothing of it until, a few days later, he leaves out a war item and instantly there is no longer any such thing as war. He realizes that if he avoids printing certain things, he can cause them to end: crime, illness, drugs, drought, hunger, injustice, accidents, crooked and inept politicians, illiteracy, and lots of other things. Works fine until one day he realizes that there's nothing left to put in his newspaper, and no readers either! Then his paper goes away.

Correct me if I'm wrong, but my assumption is that people seek out POP'COMM to be kept informed about what's going on in the world of broadcasting and communications. So long as pirate broadcasters are in evidence, we'll seek to cover them and give you our opinions on their plight. Despite

sanctimonious letters demanding that we cease such coverage, we find that many readers are pleased with this type of information.

Our extensive in-depth information on offshore station *Radio Newyork International* (RNI), I can assure you, brought in some really furious letters. We were still getting angry letters about RNI even long after the FCC dropped all charges against the station's operators. Still, that November issue was one of the best selling issues of 1987!

We have seldom run an equipment review that has failed to attract mail. While some readers thank us for bringing to their attention a piece of equipment that has been of value to their operations, other readers react with mild or severe annoyance at the review. The fact that there are so many different makes and models of receivers, scanners, antennas and transceivers confirms the concept that there are many different tastes, price ranges, applications requirements, and levels of acceptance out there in Radioland. If everybody felt the same way about everything, there would be only one manufacturer producing one model, and wouldn't that be awful?

Any particular piece of gear is guaranteed to have people who would rate it (to one extent or another) better or worse than other makes and models. Indeed, probably every piece of equipment you have ever purchased and loved would be rated as the last choice by many others.

Regardless, equipment reviews never fail

(Continued on page 72)

BEAST THAT SPEAKS HAS LIFE IS UFO MACHINE. ISAIAH 27:1-9 IN MEASURE WHEN IT SHOODETH FORTH THOU WILT DEBATE WITH IT. PURGE SIN. DEBATE WITH IT MEANS UFO MACHINE SPEAKS TO YOUR BRAIN READS YOUR THOUGHTS SEES WHAT YOU DO USING YOUR BRAIN AS TWO WAY RADIO. PURGE YOU MEANS UFO MACHINE DIRECTS YOUR BEHAVIOR MAKES YOU TROUBLE. JEREMIAH 51: 20-24 BATTLE AXE WEAPONS OF WAR. UFO MACHINE BEING USED ON ALL NATIONS. BREAK IN PIECES RULERS. UFO MACHINE BEING USED ON EVERYONE ON EARTH. BREAK IN PIECES MEANS IT DIRECTS BEHAVIOR MAKES YOU TROUBLE. DANIEL 11:17 "HE SHALL GIVE HIM DAUGHTER OF WOMEN CORRUPTING HER" MEANS MAN IN US GOVT GOT HIS DAUGHTER A JOB ON THESE UFO MACHINES CORRUPTING HER BECAUSE SHE COULD SEE PEOPLE HAVING SEX WITH THESE UFO MACHINES. DANIEL 11:24-25 FORCASTS. DEVICES MEANS. UFO MACHINE WATCHES PEOPLE KNOWS WHAT YOU DO. DANIEL 11:30 IS US INTELLEIGENCE AGENCY.

CIA FBI HAVE THIS UFO MACHINE ON SECRET BASE IN U.S. USING THEM ON PEOPLE ALL OVER EARTH. — JEREMIAH 18:11 BEHOLD I **FRAME** EVIL AGAINST YOU AND DEVISE A DEVISE AGAINST YOU. CHANGE YOUR EVIL WAYS." UFO MACHINE **FRAMES** YOU, USED ON EVIL PEOPLE. CIA FBI USED UFO MACHINE TO **FRAME** LOUIS RODA TO ALL MENTAL HOSPITALS HE BEEN IN. WHY DID FBI CONTACT LOUIS IN HERMAN KIEFER HOSPITAL IN 1973?

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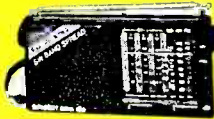
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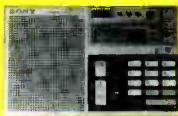
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MAILBAG LETTERS TO THE EDITOR

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

Noisy and Shiftless

Two questions about RTTY monitoring, if I may. I have an Info-Tech M-600 RTTY decoder connected to a Zenith ZVM-121 video display. On frequencies below 400 kHz and above about 15 MHz, the video display generates RF signals that sound like a buzz every few hundred kHz across the dial. This makes reception extremely difficult on these frequencies. Also, the variable bandwidth (shift) control on the M-600 has no calibration data so I don't know whether it is set to 850 kHz, or whatever. Can anything be done to change the situation?

Roger Paternoster
Kansas City, KS

The buzzing signals should be attacked by several methods. First, be sure that all equipment is adequately grounded, and try relocating the video monitor further from your receiver. Use coaxial cable to connect the M-600 to the video monitor, using a piece no longer than necessary to span the distance. Using a coaxial connector at the antenna input of your receiver, use coaxial cable as your antenna lead-in, grounding the braided shield of the cable at the point where the center conductor reaches the antenna. As for the calibration, my suggestion is to receive RTTY signals of known shift (using the M-600's fixed-bandwidth settings) and then switch over to the variable control. Adjust it for best reception of the incoming signal, marking the spot on the panel with a dab of white typing correction liquid. You'll then know where 170, 425, and 850 kHz are on the control. That should give you enough to go on to figure out any other shifts you'll encounter. —Editor

Speakin' of a Beacon

In the *Communications Confidential* column, there are often listings of radiobeacons in the 200 to 400 kHz band. While I generally find the column informative and very useful, I fail to see the point and purpose of taking up space with this beacon nonsense. What entertainment could anybody possibly derive from listening to boring transmissions from radiobeacons?

Joseph Denneault
Montain Home, ID

We at POP'COMM are slow to offer put downs for anybody's preference, and have long taken a somewhat eclectic approach to monitoring. Signals are signals, DX is DX —

regardless of the frequency band or type of sound the station generates, be it propaganda, Top 40 rock, news, weather, Ham, CB, ship/shore, RTTY, radiobeacons, or whatever. It's strictly a case of the medium consisting of the message. You want signals and DX, tune the spectrum to monitor everything you can. You want mainly entertainment and chuckles? Watch reruns of Laverne and Shirley. Personally, I tune the radiobeacon freqs quite often and have found as much grist for the monitoring mill there as on any other band. If you haven't tried it, don't knock it. —Editor

Another Satisfied Reader

I've written to POP'COMM no less than five times demanding the inclusion of a monthly computer column. Thusfar, this column has not appeared, nor has there been any indication that such a column is imminent. I take umbrage at your ignoring my repeated demands. Unless a computer column starts forthwith, I will be forced to begin supporting *Monitoring Times* because every issue I see of POP'COMM without this column gives me a headache.

Barry Randolph
Carson City, NV

Well, Barry, you'd better take a few more spoonfuls of that umbrage stuff and a couple of aspirins, too. I've never understood why some readers think that backing up their demands or annoyances with "threats" to read other publications is going to add major muscle to their words. Is it supposed to inflict a severe wound to the ego, or what? It produces "convincing power" so miniscule that it can't be measured on even the most sensitive instruments. I know of no editor who doesn't laugh at this rather common, tiresome and totally meaningless type of "threat." Suggestions are put into action only when they can be justified on several levels. Demands and threats such as the old "reading another publication" routine generate nothing more than yawns or laughs. —Editor

True VHF High Band

In the July issue letters column there was some discussion of the use of VHF aero communications over open ocean areas. You mentioned that 200 to 250 miles was the normal air/ground range in this band. This made me interested in learning whether greater ranges were available from Concorde, which regularly cruises between 45,000 and 58,000 feet at Mach 2 (1340 mph). This caused me to write to the Concorde Flight Manager of British Airways to ask about this point. He replied that "the

normal maximum VHF range from Concorde at cruising altitude is 300 miles, but on occasion we have achieved 350 miles. Concorde-to-Concorde has achieved ranges up to 600 miles."

A.G. Halligey
Cottingham

N. Humberstone, England

These aircraft coming towards each other at almost 2700 mph would probably just have enough time to exchange "hellos" without getting around to asking for QSL's before they went out of range. By the way, this points up why AM is used in this band rather than FM, which is the usual mode for VHF two-way comms. FM signals coming from (or going to) moving aircraft are subject to the doppler effect, which can shift them off the established communications channels. The faster the speed of the aircraft, the more pronounced would be the frequency shift. —Editor

Data Matter

I'm within receiving range of several state correctional institutions that I monitor on 453.40, 453.575, 453.875 and other UHF frequencies. I've noticed that when stations operate on these frequencies, each transmission commences with a brief "brrrrp" sound. What purpose does this serve?

H. Pavisian
Beacon, NY

The sound you describe is commonly noted in many VHF/UHF systems using repeaters. What you're hearing is a short burst of rapidly sent data that can be interpreted by equipment at the repeater site. Depending upon the installation, the information contained in the data burst could identify the particular unit that is transmitting, it might be required to permit various units to access the repeater, it might be required to "open" the squelch of units functioning within a given system.—or perform all of these services. In instances where several repeaters in the same area share a common frequency (or when several different systems share a single repeater), such methods are required to keep the various networks separate from one another. —Editor

Beyond The Fringe

I live in the boonies and that makes for spotty pickings on my scanner. I saw something called a "Super Signal Orbiter Long-Range Full-Coverage/All-Band Deep Fringe Directional Array Scanner Antenna." In your opinion, would this help?

W.S. McGregor
Keene, ND

I don't know if it will help, but with a name like that it certainly wouldn't hurt. —Editor

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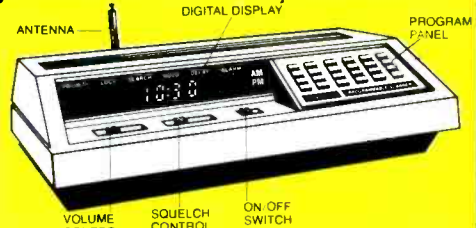
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OFFICIAL NEWS COLUMN OF THE SCANNER ASSOCIATION OF NORTH AMERICA

Dope Dealers Plug Into Cellular Phone Network

Several members have sent us clippings from a *Newsweek* story entitled, "Crime: Dialing for Dollars." It seems that drug dealers have discovered cellular phones and the Drug Enforcement Administration (DEA) isn't at all happy about it. They are apparently finding it harder to tap into phone conversations as deals are being made. That strikes us as very curious. Instead of complaining, what the DEA really should be doing, is acquiring the right equipment and find someone who knows how to use it. A little investigation would turn up the phone number which is sent every time the phone transmits its radio signal. Tracking from cell site to cell site, as the phone changes frequencies, can be easily done with the right equipment. Rather than complaining, the DEA should get some competent people working on getting their technology into this century.

In fact, cellular phone calls are so easy to intercept, that the Utilities Commission in California asked the state phone companies to insert a notice in phone bills concerning privacy. One of our California members sent us a copy of the insert which says, "Normally, you don't have to worry about the privacy of conversations you have on telephones in your home or business. However, if you make calls using a cellular telephone or receive calls from people who do, you need to be aware that your conversation on *these phones* may not be entirely private. Cellular telephones send calls over *public radio frequencies*. . . . For this reason, the California Public Utility Commission (CPUC) has asked those placing calls on cellular telephones advise the people they are calling about the privacy issue at the beginning of each conversation." Acknowledging that these are public radio frequencies, and that the radio signals can be intercepted, goes a long way towards educating the general public that these phones are really radiotelephones. We hope to see similar action in other states.

Another interesting note came in from a reader who says that the police in his town have switched to cellular "for privacy". Even if you ignore the fact that the International Association of Chiefs of Police and the National Sheriffs' Association are on record as endorsing citizens listening in to their local police, this plan has so many flaws it is laughable. Can you imagine the phone bill at 60 cents a minute? (Although, I suppose the busy traffic on a Saturday night would be at the "off peak" charge of only 35 cents!) If a real emergency happened, they'd get a busy signal just like everyone else. On top of that, we know that the impression that these cellular radiotelephones are private is an illusion anyway. I doubt if we'll see many other police departments try this approach to communications.

A Special Week for Every Scanner Owner

This is the time of year for National Crime Prevention week, as well as many local prevention weeks. It really is important—especially for scanner owners. It is all too easy for local officials to fall into the trap of blaming scanners for a crime wave, just because one criminal is caught with one. SCAN has gone a long way in correcting this impression with films, literature, and national police organization endorsement. But it falls apart if you don't participate in your own town and show them that you care. The next time someone tries to extend the Electronic Communications Privacy Act to prohibit listening to police and other public safety communications, will you want your local officials to shrug their shoulders and say, "That's okay?" It could happen without active participation by scanner owners like you.

If you run into a situation where officials question the value of scanners in Neighborhood Watch, and other crime prevention pro-

grams, please write to us enclosing a business size self-addressed, stamped envelope. We'll be happy to send information to you to share with your local police. In almost all cases, they'll welcome you with open arms. They want you to be their extra eyes and ears when a call goes out for a lost child, a hit-run vehicle, or a suspicious person. As a scanner owner, you're the first to know, and possibly be that critical extra help. Join in your local crime prevention program for yourself, your neighbors, and your fellow scanner owners.

If you do plan to join or start a local program you should know that SCAN, in cooperation with the Neighborhood Crime Prevention Coordinating Committee and the National Sheriffs' Association, has produced a 10-minute color film on the subject of crime prevention and scanners. We are in the process of making this available as a lower cost home video tape (it was previously available only in broadcast quality at a very high price.) We will let you know when it becomes available.

There's something else you can do, too. Have you nominated a local policeman or policewoman yet for the SCAN Public Service Award. It is very easy to do, and very rewarding. All we need is a newspaper account or a letter from you about the incident. (Please be sure to include the dates, newspaper name and date, and police department phone number if possible.) We'll take it from there. You don't have to have met with the officer, or even notified them. We'll do it all. If selected, the officer receives a handsome engraved plaque and a cash award from SCAN. You will also receive one of these very special personalized engraved plaques for making the nomination. Just send your nomination to SCAN Public Service Award, P.O. Box 414, Western Springs, IL 60558. This is a very important project in continuing our fine relationships with the law enforcement community . . . we look forward to receiving your nomination.

Those Confusing Cellular Terms

While we're on the subject of cellular—we receive many letters here at SCAN asking questions about how the cellular phone network works, and the sometimes mysterious terms used in the systems. Let's take a look at some of that you've probably heard or read about . . .

IMTS car phones—This stands for "Improved Mobile Telephone Service" and is actually not cellular at all. It is the older system that used area wide frequencies and became hopelessly overloaded in many cities because of "roamers" (see definition below).

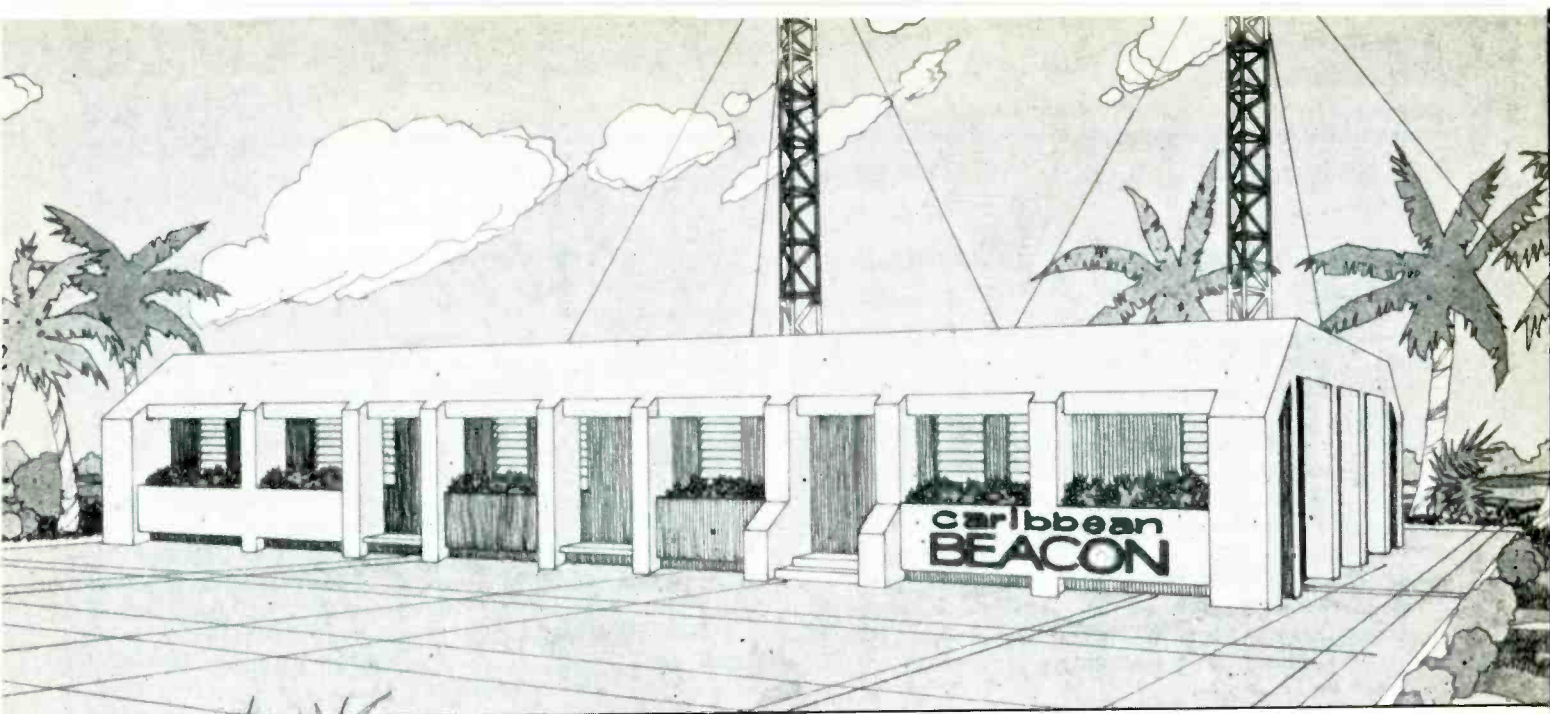
Cell or cell site—The key to the cellular system is the re-use of frequencies. To do this, many low power transmitters are used to produce a "cell" of only a few miles in diameter. The "cell site" is where the transmitter/receiver and its strange looking "three legged" vertical antenna system are located. The problem is, that these cell sites are very expensive to install in the areas (downtown-large cities) where they are most needed.

Hand off—This is what happens when a mobile unit hits a point where the signal from the adjoining cell site becomes stronger than the cell being used. The "hand off" is a computerized "hand shake" with the mobile unit that automatically switches the frequency being used by the mobile.

Drop—It is one of the more annoying things about cellular, and it is happening more frequently on heavily used cellular systems. Typically what happens, is that the vehicle has traveled to the next cell and there is no room for it. The system may try to keep the call on the previous cell for awhile, but eventually the signals become noisy and weak and there's a sudden "drop" or disconnect.

Roaming or roamer—A person is signed onto a system in the lo-

(Continued on page 73)



This artist's drawing shows the facilities of the Caribbean Beacon, which operates from Anguilla on 1610 kHz.

Calls Of The Caribbean

Great DX Pickings Right In Our Own Backyard!

BY GERRY L. DEXTER

Ask a travel agent what the most popular vacation destinations are and it's very likely one or more of the islands of the Caribbean will appear high on the list. The attractions are many, everything from long, warm beaches to long, warm women. Sailing, skindiving, shopping, casinos, croquet, polo and pirate lore. You can pick out a posh resort area or spend your time in a remote spot off the path of the big time tourist industry.

Pick the travel package you want, whip out your checkbook, pack your bags and you can be on the beach tomorrow. Or, flip on your shortwave receiver and you can be there in a matter of seconds. In a manner of speaking, anyway. The trouble is, "Shortwave Airlines" doesn't service all of the Caribbean islands—far from it. For that matter, not even the "S.S. Medium Wave" calls at all the ports. There are plenty of Caribbean spots we broadcast DX listeners just can't get to from where we are. Still, there are many which we can reach, though some may require a little more effort and patience than others. And luck, too!

So here's a brochure telling us all about this DX tour of the Caribbean islands. First we'll look at what can be heard via the shortwave broadcasting bands and then fill in some of the gaps with a few of the more likely loggings you might make on the AM broadcast dial.

Antigua - Some places in the Caribbean sport big transmitters and giant antennas. They can be heard easily and yet they offer about as much Caribbean flavor as a used snowshoe. Although physically in the West Indies, they are servants to their European masters, existing only to relay the programming of a big international broadcaster. There's such a facility on Antigua, which serves both the BBC and the Voice of Germany. You can find the Voice of Germany's Antigua relay during the station's North American English language service in our evenings. Check 6040, 6085 or 6120. A number of other frequencies are also used at various times for English and other languages.

The BBC relay carries World Service programming in the evenings on such frequencies as 5975, 6110, 6120, 6175 and 9510 among others.

Aruba - On the stepping stones to independence, Aruba is the "A" in the so-called A-B-C Islands of the Netherlands Antilles. There is no shortwave service here, but there will be. The religious broadcaster Radio Victoria, already established on AM and FM in Aruba, will make use of a 100 kw shortwave transmitter donated by the Far East Broadcasting Company.

Cuba - The kingpin of Caribbean power broadcasting. If you listen to shortwave for long periods of time, it's impossible to avoid

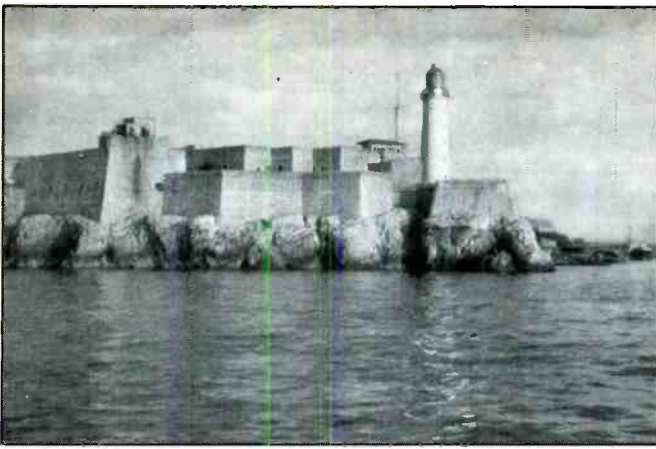
hearing Radio Havana Cuba. English language programming intended for the "Yanquis" airs nightly from 0000-0600. Try 6090, 6140, 9525 or 9740. RHC also broadcasts in French, Portuguese, Quechua, Creole, Guaranti, Arabic and, of course, Spanish, at various hours on frequencies throughout the shortwave bands.

A longtime medium wave broadcaster, Radio Rebelde, added a shortwave outlet several years ago. It broadcasts non-stop, all in Spanish, and can be heard regularly and loudly on 5025.

The Soviets are a third broadcast entity in Cuba; 4765 provides a home service relay for Soviet citizens in Cuba and nearby areas. There are also high power transmitters which relay the World and North American services of Radio Moscow. Such frequencies as 9600 and 11840 sporting Moscow in English are transmitted via Cuba.

The Dominican Republic - There have been periods in shortwave history when the Dominican Republic has had as many as a half dozen shortwave stations operating. And other times when there's been only one. Currently things seem to be on a definite upswing.

Radio Clarin on 11700 is the easiest Dominican station to pick up, thanks in part to recent technical improvements. If you aren't aware of the situation, however, you may think you have something else as Clar-



El Morro Castle in Havana.



RADIO DISCOVERY

The Voice of the Caribbean

World Radio Network, S.A. • 332 Corey Avenue • St. Petersburg Beach, FL 33706 USA

Radio Discovery in the Dominican Republic bills itself as "The Voice of the Caribbean."

in spends much of its broadcast day relaying the programming of the Cuba Independiente y Democratica organization, with its anti-Castro line. Identifications for Radio Clarin are aired, however.

The newest station on the air from this half of "Hispanola" is Radio Amanecer in Santo Domingo on 6025. The shortwave schedule is uncertain, but is probably the same as the station's 1570 variable medium wave outlet, that is, 1000 to 0300 UTC. Heavy interference in this frequency area makes the station rather tricky to tune in. You'll have to watch the channel and find a "window" when the QRM level is low.

Radio Santiago is also a rather tough station to log, due to the fact that the transmitter is off the air, more than it is on. Watch 9778 in the evenings early morning hours.

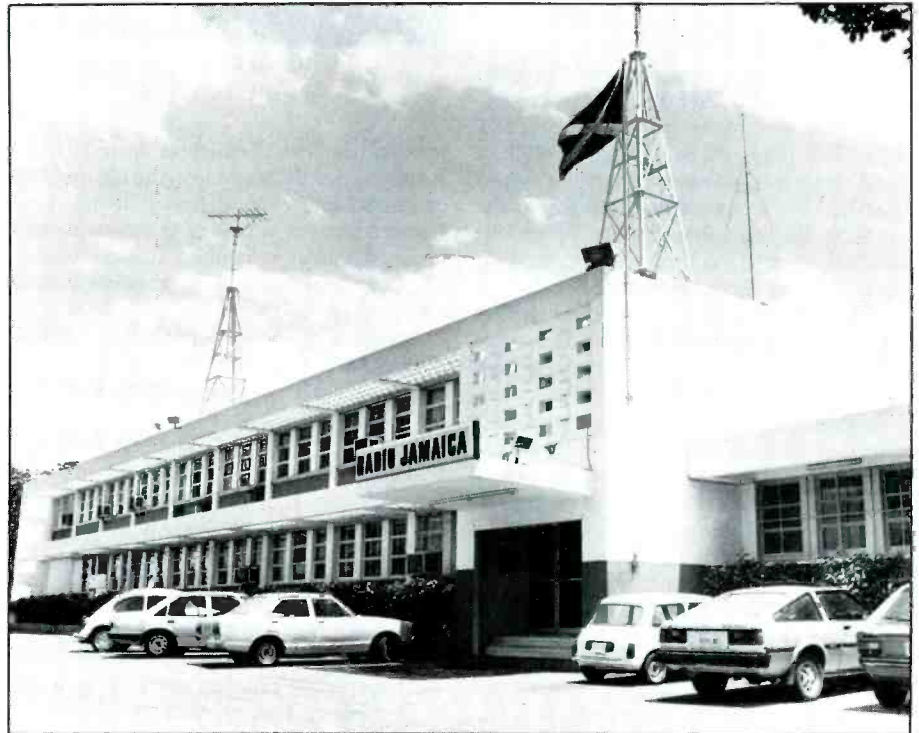
Radio Discovery in Santo Domingo is using 15045 with about 1,000 watts. By August 1987, the station was to begin carrying the programming of the government station, Radio Television Dominicana (RTVD) for most of the broadcast day. Discovery's own program "This is Santo Domingo" was to air in English at 2000 and 0000 and in Spanish at 1900 and 2300.

Haiti - Once upon a time there were a handful of shortwave stations operating from Haiti, too. But, reflecting the overall conditions in the country, the situation in broadcasting has also degenerated over the years. There is only one shortwaver on the air at present, 4VEH, the long time religious broadcaster. It can be heard with mostly French and Creole programs on 4930 up until sign off at around 0100 or 0200.

Montserrat - The Voice of Germany also operates a relay station here which serves to provide improved signal strengths to parts of the Western Hemisphere. You should find it during the North American service at 0100 and 0300 on 9565, and 9690 at 0500.

The Netherlands Antilles - There are two major broadcasters here, both on Bonaire island. Radio Netherlands has a powerful relay, used for putting clear signals into North America. It's easily heard at 0230 or 0530 on frequencies including 6020, 6165 and 9590.

Also on Bonaire, is a major international



Radio Jamaica is no longer on shortwave and its medium wave frequencies are tough, if not impossible for most in the U.S. to hear. (Photo: Walshes Studio, Kingston)

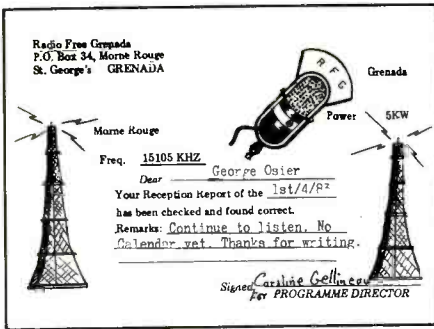
religious broadcaster, Trans World Radio. 9535 and 11815 are commonly used frequencies for English to North America at 1100 and 0300. Incidentally, TWR is also responsible for one of the most widely heard medium wave signals out of the Caribbean—a 500 kw giant operating on 800 kHz.

There continues to be promises that Radio Earth will one day have a station operating from the next door island of Curacao. The latest word is that progress is being made, but we would guess that this day is still a long way off.

Sadly, that is the extent of the Caribbean offerings on shortwave! If the ghosts of those lost in the Bermuda Triangle still haunt Caribbean waters, then so do the spirits of shortwave transmitters, long silent, still haunt DX'ers. Radio Trinidad on 3275, the occasional cricket matches broadcast over

Barbados Rediffusion on 7547, Radio Jamaica on 4950, the Windward Islands Broadcasting Service (Grenada) on 15045, Martinique on 5995, Guadeloupe on 7430 are all gone from the airwaves.

If you factor in medium wave DX'ing, then it is possible—and let's stress possible—to add one or more additional countries to what you can log on shortwave. But how much you can hear, and from where, depends far more on where you live than on what receiver/antenna combination you are using. Reception on the standard AM broadcast band is far more a matter of geographical location, not only from the standpoint of how far you are from the intended target, but how distant you are from strong domestic signals on the target's frequencies, or channels just above, and below, that frequency. For instance, if you live in the mid-



"Radio Free Grenada" was the last name used by the government broadcaster on this island before it went off shortwave.

western United States, you don't have much of a chance of hearing Radio Jamaica on 720 kHz, since WGN-Chicago holds forth with 50 kilowatts there 24 hours a day.

More and more signal clutter has been added to the U.S. AM dial over the years: more stations, more non-stop broadcast schedules have made foreign broadcast band reception increasingly difficult unless you live near a coastal area. Adding to the problem has been the adoption of 10 kHz channel separations by many more countries, which has resulted in there being fewer stations using so called "split frequencies" or frequencies located in between the normal even numbered broadcast station channels (590, 600, 610, etc.) There are still some Caribbean outlets which are using split frequencies and, although that is a significant aid in being able to log them, distance and local interference are still very large factors. Our list includes many of these, along with a few which are on even frequencies, but which are using enough power to make them possibilities in some U.S. locations, depending again on local interference. The medium wave listing contains only countries not found on shortwave.

Anguila - The religious broadcaster, Caribbean Beacon, is an exception to the medium wave reception problems discussed above because the station has chosen to



Trans World Radio's facility on Bonaire Island in the Netherlands Antilles.

make an end run. It operates on 1610 kHz, slightly above the turmoil on the normal AM band. 50 kilowatts of power helps, too. Consequently it is one of the most widely heard Caribbean medium wave stations. Check any evening and you are likely to find it.

Bahamas - The 20 kilowatts of ZNS-1, the Broadcasting Corporation of the Bahamas on 1540 kHz are a possibility if you are far enough away from KXEL and the many others on this channel. The Bahamas station uses this frequency 'round the clock, so try very late at night, when the greatest number of stations are likely to be silent.

Cayman Islands - Radio Cayman has a ten kilowatt transmitter on 1555, so if you don't have a lot of local interference from stations on 1550 or 1560, this is a possible log. The station airs BBC news at the top of the hour, approximately every other hour.

Dominica - The government's Dominica Broadcasting Corporation may be a possibility for some since it is on the split frequency of 595 kHz and uses 10 kw.

Grenada - One of the former shortwave broadcasters (and maybe again one day if the station manager has his way) Radio Grenada also uses a split frequency channel—535 kHz—which is slightly below the bottom of the AM dial and, hence, less likely to suffer interference. Good conditions and the absence of a local on 540 may bring this one into your shack. Broadcasts run from 1000 to 1700 and 2000 to 0200.

St. Kitts - There are a couple of possibilities here. The government station Radio ZIZ runs 20 kilowatts on 555 with English daily from 1000 to 0300. A better chance is probably offered by Radio Paradise, a religious broadcaster using a jumbo 50 kw on 825 and running from 0900 to 0430. Again, you'll need to be free of strong signals on 820 and 830 kHz.

St. Vincent - If you can get away from Cincinnati's powerful WLW on 700 kHz, you might have a shot at Radio St. Vincent, using 10 kilowatts on 705.

Trinidad - Power is the only positive thing one can cling to here—50 kilowatts of it. But the government's NBS Radio on 610 could be easily blocked by same channel or adjacent channel local broadcasters.

Turks and Caicos - The Atlantic Beacon, another religious station, is active on 1570 and has been heard in many areas where local interference can be minimized.

There are, of course, a number of other Caribbean islands which have medium wave stations, but they don't seem to be very good prospects for any DX'ers, except those who happen to have ideal locations. So we'll leave those folks to do their own individual research and go after those which QRM buries for the rest of us.

Of course, the best way to log them all loud and clear, is to be within sight of the towers. All you have to do is pick out your cruise ship, grab your portable and plenty of suntan oil and then talk the boss into giving you several months of vacation time. With pay, naturally.

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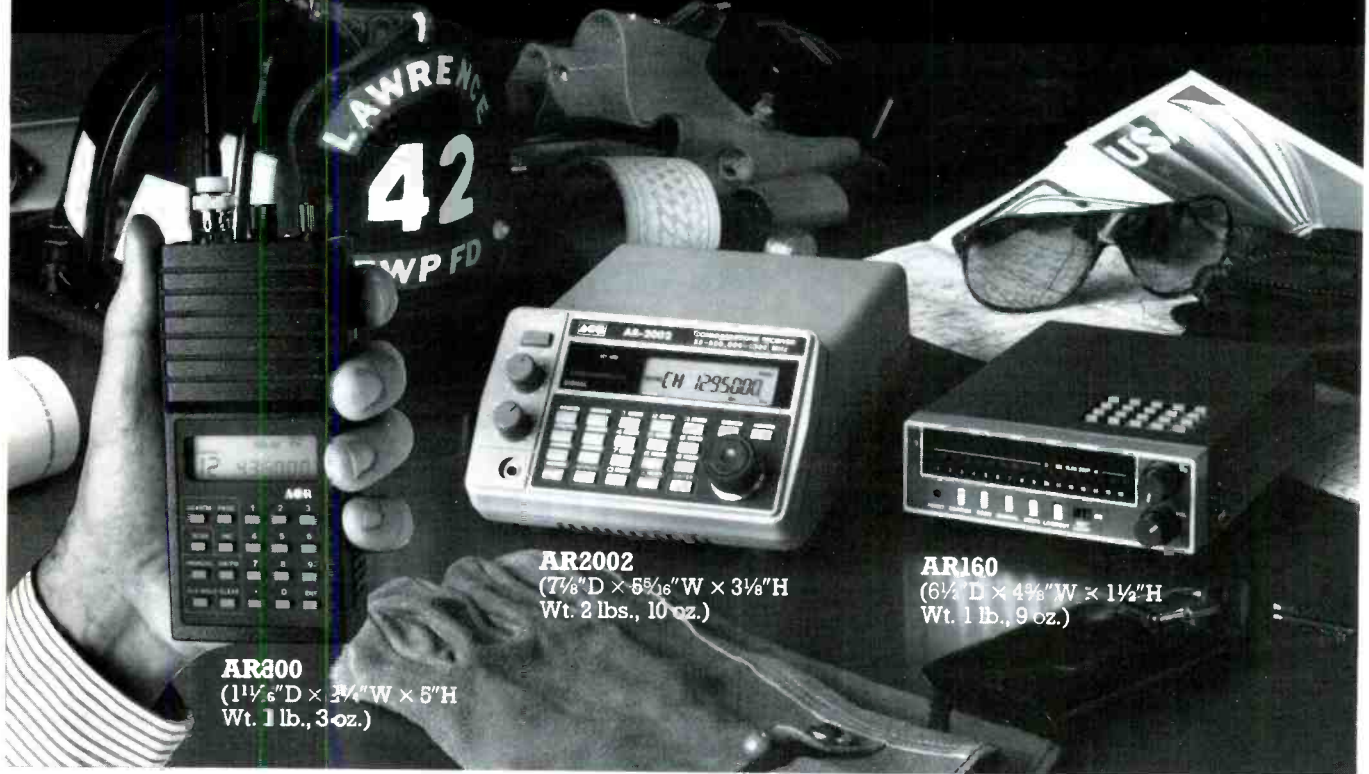
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Hot Wheels Over Your Scanner

A Scanner Can Be An Added Extra At The Car Races

BY THURSTON WAINWRIGHT, KFL4PN

About forty years ago, someone realized that motorsporting could be aided by the addition of two way radio. The most basic use was for race car drivers to stay in constant contact with their pit crews. It was an idea that worked, and these days, there's scarcely a motorsport event of any kind that doesn't reflect extensive use of two-way communications.

Twenty years ago the scanner was invented, and that technology has progressed to the point, where, today, you can carry a 50 or 100-channel handheld programmable with you to the speedway and hear most of these conversations. This certainly adds a totally new dimension to any racing fan's enjoyment.

Unlike seasonal sports, motorsporting offers year round activity. For instance, this month there's the Grand Prix of Miami, in Florida. On Memorial Day, there's the Indy 500—and so on around the calendar, with major and minor races of all classes and types of vehicles. While the Indy 500 takes place on a formidable speedway used only by racing vehicles, the Grand Prix of Miami is held right on the streets of Miami, which are cordoned off for the event. Regardless of the race, or where it's held, look for a maze of VHF and UHF antennas sticking up from the pits.

Communications to be heard include discussions of service, fuel problems, information on the track, the positions or speeds of other vehicles, and emergency situations. Of course, it's not only the fans who bring



This early-1947 photo reveals one of the earliest applications of two-way communications in motorsports. Driver H.W. Mitchell gets ready for a trial spin on the track at Indy while the operator (in the truck) gives him a shout on the two-way. (Courtesy Alice Brannigan.)

their scanners to the track. Pit crews bring their scanners so that they can tune in the communications of the other crews. In addition to the pit crews and drivers, two-way communications are also used for security purposes, as well as by race officials for communicating with pace cars, parking attendants, crowd control personnel, timing

and other officials, and ticket sales. Then there are the news media channels, as well as those used by police and fire agencies.

Business Radio Service frequencies are in heavy use, with some crews using multi-channel radios. It might be a good idea to see what the search/scan feature of your unit will produce for you if you let it sift through the following bands:

151.625 to 151.955 MHz
 154.515 to 154.60 MHz
 457.5125 to 457.6125
 460.6625 to 460.6875 MHz
 460.9125 to 462.1875 MHz
 462.55 to 462.9125 MHz
 463.20 to 464.9875 MHz
 465.6625 to 467.1875 MHz
 467.55 to 467.9125 MHz
 468.20 to 469.9875 MHz

You should always check the following frequencies, as you'll probably find most of them in use:

30.84	457.60
33.14	464.50
33.40	464.55
35.02	467.75
35.04	467.775
42.98	467.80,
151.625	467.825
154.57	467.85
154.60	467.875
457.55	467.90
457.575	467.925 MHz.

Sanctioning organizations, such as

Table 1

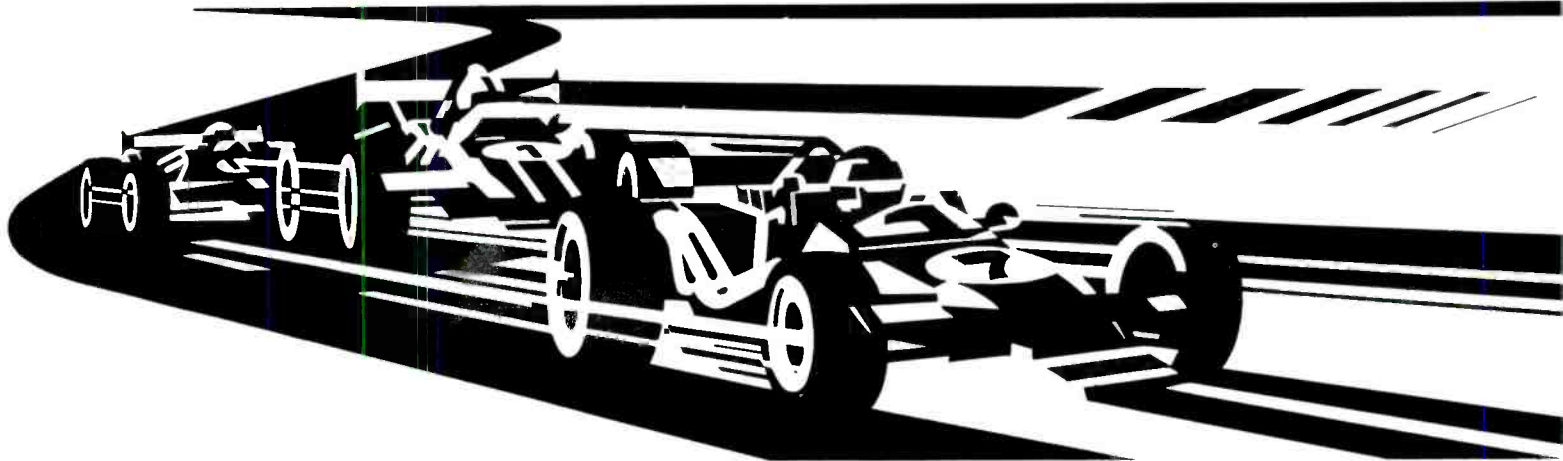
464.500	All-Pro Racing Association	464.500	SCCA Glen Region
151.625	American Motor Sports Association	151.625	SCCA Houston Region
469.500	American Speed Association	151.625	SCCA Land-O-Lakes Region
154.570	Auto Race Promotions	151.625	SCCA Missouri Region
464.625	Championship Auto Racing Teams F-1	151.625	SCCA North Carolina Region
464.750	Championship Auto Racing Teams F-2	151.625	SCCA Northeastern Region
464.550	Championship Auto Racing Teams F-3	151.625	SCCA Northwest Region
464.500	Championship Auto Racing Teams F-4	154.570	SCCA Northwest Region
154.570	International Motor Sports Association	154.600	SCCA Northwest Region
464.500	National Association of Stock Car Auto Racing (NASCAR)	462.725	SCCA Oregon Region
464.775	NASCAR	151.625	SCCA Pennsylvania Region
151.625	National Hot Rod Association	151.625	SCCA San Francisco Region
154.570	National Hot Rod Association	151.625	SCCA South Carolina Region
154.600	National Hot Rod Association	151.625	SCCA Southwest Louisiana Region
151.625	National Off-Road Vehicle Association	151.625	SCCA Texas Region
151.925	National Off-Road Vehicle Association	151.625	SCCA Washington state Region
151.625	North American Car Club	154.570	SCCA Washington state Region
151.625	Professional Auto Racing Teams Inc.	154.600	SCCA Washington state Region
151.625	Race Communications Association	154.570	SCCA West Virginia Region
151.625	SCCA Alamo Region	154.600	SCCA West Virginia Region
151.625	SCCA Arkansas Region	151.955	Sports Car Racing Association
151.625	SCCA Central Carolina Region	463.925	Sports Car Racing Association
151.625	SCCA Chicago Region	151.625	United Racing Club Inc.
464.500	SCCA Corning (NY) Region	151.655	United States Auto Club
151.625	SCCA Dallas Region	151.745	United States Auto Club



News media personnel use communications to coordinate their coverage of motor-sports events.



You don't have to be an Indy 500 supercar to be equipped with two-way communications. This race-painted VW sports a whip.





Over the top! It doesn't have to be the Daytona International Speedway to provide you with listening fare. Note the rooftop whip as this racer takes a hurdle on a dirt track.

NASCAR, USAC, CART, SCCA, etc., also have their own frequencies for on-site communications as shown in Table 1.

Through the fine efforts of monitor John Oblinger of Fort Wayne, IN we have information on frequencies noted as (or believed to be) in use by various NASCAR drivers in table 2.

Armed with these vital frequencies, go forth to the speedways of America, fearlessly toting your handheld scanner. You'll get a perspective of the races not perceived by those sharing the grandstands with you. See you at the Grand Prix of Miami; scanner and all!

Table 2

1	Brett Bodine	463.775	Bull's/Chevrolet
3	Dale Earnhardt	469.015	Wrangler/Chevrolet
4	Rick Wilson	463.450	Kodak/Oldsmobile
5	Geoff Bodine	851.500	Levi/Chevrolet
		854.500	
7	Alan Kulwicki	461.150	Zerex/Ford
8	Bobby Hillin	856.800	Miller/Buick
9	Bill Elliott	853.500	Coors/Ford
11	Terry Labonte	855.575	Budweiser/Chevrolet
		855.525	
15	Ricky Rudd	464.300	Motorcraft/Ford
17	Darrell Waltrip	856.5000	Tide/Chevrolet
21	Kyle Petty	463.4625	Citgo/Ford
		463.4875	
25	Tim Richmond	851.575	Folgers/Chevrolet
26	Morgan Shepherd	468.4875	Quaker State/Buick
27	Rusty Wallace	463.900	Kodiak/Pontiac
28	Davey Allison	457.600	Havoline/Ford
		463.700	
29	Cale Yarborough	464.600	Hardee's/Oldsmobile
		466.770	
33	Harry Gant	461.687	Skoal/Chevrolet
		461.975	
35	Benny Parsons	856.925	Folgers/Chevrolet
43	Richard Petty	464.800	STP/Pontiac
44	Sterling Marlin	461.875	Piedmont/Oldsmobile
50	Greg Sacks	834.075	Valvoline/Pontiac
55	Phil Parsons	464.450	Skoal/Oldsmobile
		466.476	
71	Dave Marcis	467.825	Lifebuoy/Chevrolet
75	Neil Bonnett	468.975	Valvoline/Pontiac
88	Buddy Baker	466.700	Crisco/Oldsmobile
90	Ken Schrader	467.162	Red Baron/Ford

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Flashback!

Remembering Broadcasting and Communications As It Was

BY ALICE BRANNIGAN

Long before there was an Army MARS, there was the Army/CMTC; that was the Citizens' Military Training Corps. During summers of the 1920's, the CTMC would offer radio fans an exceptional opportunity to learn about communications. Interested young men between the ages of 17 and 24 could spend the month of August, at no cost, learning about radio at any of several U.S. Army posts. The courses included technical as well as phone and telegraph operation.

The most advanced training facility was located at the Army's Signal School, Camp Alfred Vail (Fort Monmouth, NJ). Those who attended the courses at Camp Alfred Vail were given hands-on operating practice over Experimental station 2XBB and (if they held ham tickets) at ham station 2CXL.

From the CMTC, in the 1920's, there developed a number of shortwave communications networks, three in each Army Corps area, involving the Regular Army, the National Guard, the organized reserves, and individually affiliated hams. Any licensed ham was eligible to sign up for participation in a CMTC net and would receive a two-year designation as an "Army Amateur Radio Station" from the Corps Area signal officer.

We are fortunate in being able to share with you some photos of this early ancestor or Army MARS, and also give you a look at a genuine QSL card from stations 2XBB/2CXL of the CMTC.

WHA Happen?

"Who's on first?" may be the catch phrase of a wonderful old comedy routine, but to readers of these pages, it's a totally unanswerable question that seeks to determine which broadcaster was the world's first. Every time we have brought up the subject, those who claim that it was KDKA, or KQW (KCBS), or WWJ, or WBZ, or several other static... *p forward to advise me of the correct claimant. I'm not taking sides, but this month we'll take a look at station WHA, which puts up a very convincing argument for the crown.

Station WHA, in Wisconsin, traces its roots back to the early efforts of Prof. Earle Terry of the University of Wisconsin (Madison). In 1902, Terry started wireless experiments on the Madison campus. By June of 1916, the station had received an experimental license (9XM) and in December of that year, they began regular telegraph



A CMTC class at Camp Meade, MD in 1925.

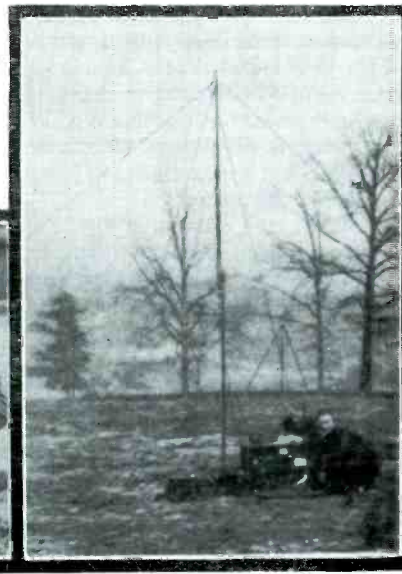
weather broadcasts. Voice and music broadcasts began in 1917 and in the fall of 1921, a full broadcast schedule was started. On January 13, 1922, the experimental status of 9XM was exchanged for a regular broadcasting license with the callsign WHA.

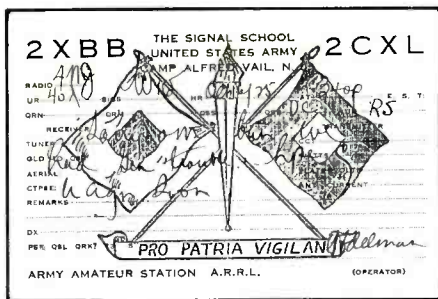
It should be remembered that various claimants to the title of First Broadcaster had traded in their experimental licenses for reg-

ular broadcasting licenses earlier than WHA. The government had started issuing regular broadcasting licenses in September of 1921, and by the end of that year had given out twenty five such authorizations, including KDKA, WBZ, and KQW. The serious contenders for first place all reach back past these days to an earlier era when the original experimental programming began.

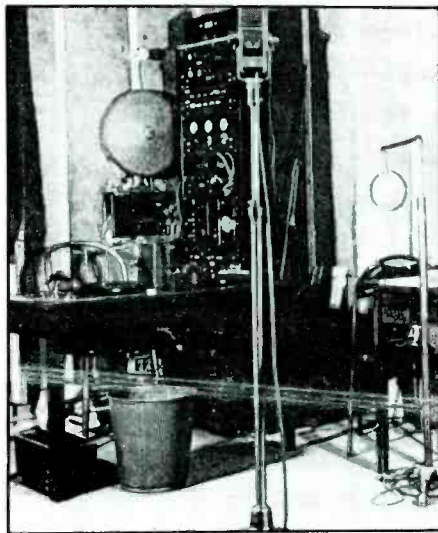
CMTC camps offered courses in AM/CW operations.

Most CMTC activities took place between 3.5 and 4.5 MHz.





A combo QSL card from CMTC stations 2XBB/2CXL.



An old photo of the WHA studios, probably mid-to-late 1930's.

Today, WHA operates with 5 kW on 970 kHz. Since 1958, a historical marker has been in place on the University of Wisconsin's Madison campus that proclaims WHA as "The Oldest Station in the Nation." Many historians agree with this claim, and we thank Ernie Brown, of Luck, WI for bringing this to our attention.

You Can't Wynn

Harold Winard, KB2M, of Wharton, NJ wrote to ask if I could shed any light on the derivation of the callsign of station WNEW (1130 kHz) in New York City. He says that on a recent WNEW program, a listener who was interviewed had said that WNEW stood for "Network Ed Wynn," since comedian Ed Wynn was a major factor in first putting WNEW on the air in 1934.

WNEW, itself, claims that they believe the callsign was used because it was the first new station to come on the air in New York since 1928. Winard suspects that the truth may lie elsewhere. WNEW, he notes, grew out of the merging of two Newark, NJ stations, WODA (Paterson) and WAAM (Newark). He feels that the new may, in fact, relate to Newark.

It's true that WNEW was the outcome of WODA and WAAM, two time-share stations. Both used 1250 kHz, and when they became WNEW (on 1250 kHz), the station's city of license was Newark. There may

well be something to this theory, although the Ed Wynn tie-in story has been popular for a long time.

Interestingly, at the time WODA and WAAM were in the process of formalizing their merger, the word was that the newly formed station would be in New York City and using the callsign WBO. If readers have any thought on the derivation of WNEW's callsign, please step forward.

Vox Populi

Norman P. Maine, Bristol, NH wrote to say that unless I have an identical double, he spotted me at the Bristol Diner recently. Must have been my double. And, thanks for those antique CB QSL cards, Norman. I've passed them along to the magazine's CB column.

From Norfolk, VA we heard from Charles R. Foxx, Jr., of the Old Dominion DX Association, who says that he's the "Southern Regional Coordinator of the Alice Brannigan Fan Club of North America, Inc." He sent along a diamond-shaped window sign being distributed to members of his group. It reads, "We Want To See The Real Alice Brannigan!" I tried to hang it in the window of my little imported car and I couldn't see the real road—but I do appreciate the sentiment, anyway.

Many readers wrote in to chide me for not having ever heard of the song *One Meat Ball*, which I mentioned a few months ago in connection with the NBC chimes. It came out during the early 1940's and was recorded by Josh White. What can I say? Josh



This bright yellow car-window sign arrived from a reader in Virginia.

White's touching music will live for a long time in the hearts of all who hear it, and I'm sure that if I ever hear *One Meat Ball*, it will stick with me.

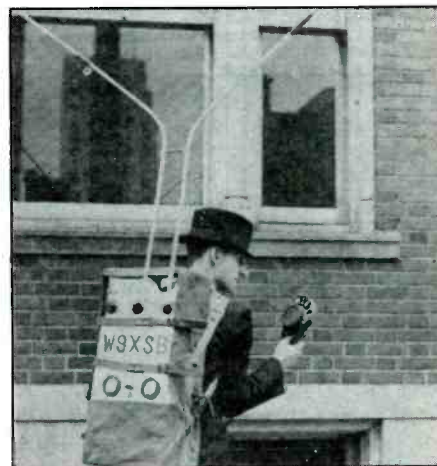
Additional information on John Kluge, whom I mentioned last November as being one of the ex-GI founders of station WGAY, right after WWII. I might have pointed out that John Kluge parlayed his WGAY expertise to the point where he became the head of Metromedia. *Forbes* magazine lists him as a billionaire! Thanks to H.S. Killgore, of station KMPG in Hollister, CA for pointing this out. Reader Killgore recalls when, as a Collins Radio Co. employee just after WWII, he sold Kluge and his partner their first broadcast equipment for WGAY after they couldn't get credit anywhere else. Killgore had to go to bat with Collins in order to get them to finally go ahead and let WGAY have the transmitter. Now that Kluge is the second richest man in America, it looks as if Collins Radio made a good bet in extending WGAY credit. WGAY is now called WNTR.

A Remote Idea

As frequencies above 30 MHz began to come into their own for two-way radio in the



First announcements of WNEW, New York. The station's 424-ft. tower was in Wayne, NJ. Although WNEW now runs 50 kW on 1130 kHz, in 1934, it operated on 1250 kHz with 2.5 kW (1 kW nights). Station trivia: two of the best known WNEW personalities of the 1940's and 1950's were hams. Martin ("Make Believe Ballroom") Block was W2MGE, and "Dee" Finch (of "Klavan and Finch") was W2SJH.



W9XSB was portable, it was true. But you had to be built like Hulk Hogan to walk more than ten paces with it on your back.



These German Army Mountain Troops are using a two-man pack transceiver.

1930's, one of the uses found was for remote news pickups for broadcast stations. Today, the transmitters for such purposes can be fit into the pocket, but in the days of vacuum tubes, the equipment was quite bulky, and batteries needed were heavy. We have a photo of just such a backpack

transmitter as used for W9XSB, the remote transmitter of station WSBT in South Bend, IN. This monster was really only semi-portable, since the controls for the transmitter couldn't be seen or adjusted by its operator when strapped to his back. The large antenna must have presented lots of problems



In 1927, this was the main dispatching desk for the Pittsburgh, PA police. The radio operator, Bill Gamble, later became President of APCO. The call sign, WPDU, is proudly displayed on the transmitter.

when going through doors. James McAuliff, of South Bend, sent along a photo to show us.

Another Portable

A reader in Hamilton, Ont., who signs himself only as *Sticks*, sent in a photo of a German Army WWII patrol using radio. Although no information about the scene was included with this photo, it gives us a good look at this communications outpost.

From what we can determine from the photo, this is a signal unit of the German

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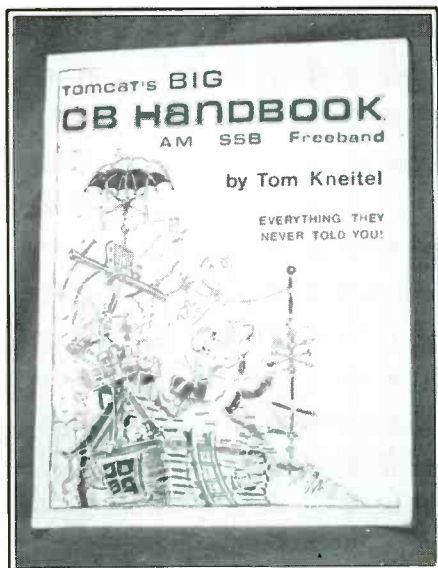
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PC 22

BOOKS YOU'LL LIKE!

BY R. L. SLATTERY



CB Radio's Rebirth

The renewed interest in CB communications is tied in with the returning DX conditions. Last time 27 MHz skip was rolling in, it created a CB service that was bursting at the seams with operators. The past few months have seen more stations, new transceivers and accessories, and many CB equipment dealers. To abundantly meet the needs of 27 MHz enthusiasts, there's also *Tomcat's BIG CB Handbook*, by Tom Kneitel.

This is a large-format (8½ by 11 inch size), very thick, 221-page new book fully illustrated with numerous photos, illustrations, rare CB QSL cards, and other delights for the AM, SSB, and "Freeband" enthusiast. As noted, it's "everything they never told you." It's the largest handbook for 27 MHz operators we've ever seen, probably the largest ever published, and covers just about everything the enthusiast would ever need to know to get the maximum use and enjoyment from 27 MHz; all written in Tom's familiar breezy and often irreverent style.

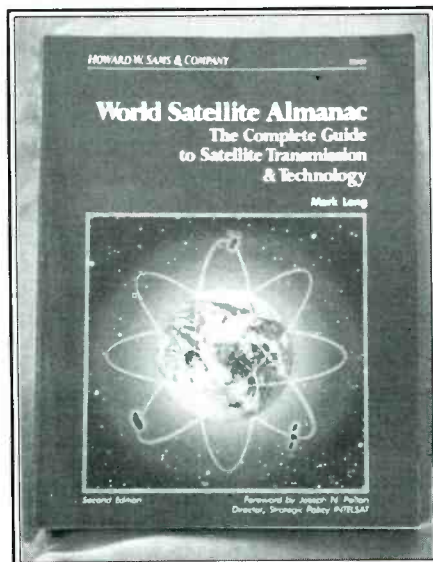
Some of the highlights are a "warts and all" unexpurgated history of CB; information on CB "handles;" how to talk on CB; information on CB range; the best way to use CB during an emergency; getting the most from CB QSL's; buying new/used equipment; loads of inside information on being a successful Sidebander (this book was just selected as the official handbook of the *SSB Network*; installing and operating CB equipment, accessories, antennas; troubleshooting minor transceiver problems; understanding CB skip; invaluable information on CB antennas (base/mobile); anti-theft measures; information on out-of-band operations, CB broadcasters, FCC regulations and enforcement techniques; CB in the nations of the world; 10-Codes,

Q-Signals, and other CB codes; a complete CB lingo dictionary; a large state-by-state mobile in-transit channel directory; AM and SSB operating tips and taboos; and much more.

Scattered throughout are many clever and hilarious off-the-wall illustrations, comments, ideas, complaints, and mini-features—like the blank "U.S. Patent Certificate" you can fill out to prove to everyone that you're the one who invented CB radio; the illustrated description of the CB rig they'll never produce, etc., etc. The information on illegal CB practices and equipment is the type of data that's usually only whispered about. I especially liked all the information intended to take the mystery and mumbo jumbo out of Sideband operations.

Tom has been an active 27 MHz operator, observer, and author ever since the CB service was created in the 1950's. He founded and ran the world's leading CB magazine for twenty years. He's undoubtedly the only person with the background and experience to put together a book offering the insights in this no-holds-barred, let-it-all hang-out CB handbook that is so candid, blunt, witty, useful, and eye-opening.

Tomcat's BIG CB Handbook is available from better communications dealers. It is also available by mail for \$13.95 (plus \$2 postage/handling to USA/Canada/APO/FPO addresses) from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. NY residents add sales tax.



Look, Up In The Sky

The World Satellite Almanac, 2nd Edition, by Mark Long, describes itself as "the complete guide to satellite transmission and technology." Being a 650-page book weighing in at almost 3 lbs., we'd be the last ones to disagree.

The profusely illustrated book has an interesting in-depth general discussion about the evolution of satellite communications then goes headlong into specifics. The major portion of the book contains exhaustive information and statistics on the world's commercial satellites used for TV and radio broadcasting, two-way communications, telephone calls, computer links, movies, sports, and whatever. All commercial satellites of every nation are covered, although ham, scientific, weather, military and tactical (such as spy) satellites are not included.

Each satellite is discussed individually, telling where it came from (and when), where it is positioned, who owns it, who put it there, what it is used for, as well as its physical statistics. Maps are given to show the signal footprint of the satellite, along with signal intensities within those areas. The satellite payload is given with all modes, transponder users and signal polarities, output power, uplink/downlink frequencies, and lots of additional information.

Long (a former POP'COMM staffer) knows his stuff. His book is a comprehensive and reliable reference book for professionals and serious hobbyists. It is loaded with charts, maps, tables, charts, graphs, and photographs. The information is current and well prepared. If you've got an interest in satellite communications technology, or TVRO reception, this reference book will be a reference guide you'll turn to very often.

The World Satellite Almanac, Second Edition, is priced at \$34.95. Look for it at dealers of Howard W. Sams Co. books. Or contact the Howard W. Sams Co., directly at 4300 West 62nd Street, Indianapolis, IN 46268.

1934 Lives Again

The year 1934 was exciting in the world of radio reception. By then, many new vacuum tubes (such as the types 17, 38, 40, 41, etc.) were on the market and could be purchased cheaply. In those days, if you wanted to hear shortwave, the popular approach was to take anywhere from 1 to 6 or 7 of those vacuum tubes and build yourself a set. It wasn't so hard to do so long as you had a blueprint to follow that told you how many turns to wind on the coils, and where the capacitors, chokes, and resistors hooked to one another and the pins of the tubes.

Hugo Gernsback's publishing company helped to popularize such projects and issued many different designs for receivers of varying complexities. In 1934, Gernsback's company brought out a book called the *1934 Official Short Wave Radio Manual, Complete Experimenter's Set Building and Servicing Guide*. This was a collection of his



best receivers and transmitters, complete with schematics, construction information, and photos. It also had plenty of information on antennas, plus wonderful features on interstellar radio, shortwave propagation, and other marvels. There was also a section dealing with commercially available receivers of the day, showing schematics, specs, parts lists and (for some) lots of descriptive information.

There are probably not too many copies of this book still in existence, but it's still possible to peruse it thanks to Lindsay Publications, Inc.

Lindsay has reprinted this book in all of its glory, then added some additional material of more recent vintage in order to guide those who might like to build some of these wonderful old designs. Tubes and other components for these old designs are still available!

The modern reprint of the *1934 Official Short Wave Radio Manual* is a 260 page book in a large-size format that's interesting to read and look through even if you don't intend actually building anything shown. Although there is a nifty one-tube 40 and 80 meter band CW transmitter shown that might be interesting to fire-up on the air, even though the plate tank circuit "has a tendency to spark over on high power . . . if the antenna circuit happens to become detuned."

It's quaint, curious, as well as an educational look at the status of roll-your-own and commercial shortwave equipment as it was 54 years ago. Even if you can't read schematics, there are wiring pictorials to show you how everything gets hooked-up.

This book is from Lindsay Publications, Inc., Bradley, IL 60915. Check with Lindsay for price and ordering information. **PC**

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Picky Facts About The Oldest FM Station

Finding The Truth Wasn't At All Easy

BY PETER HUNN

Some teachers can be very picky. They're always so interested in details. Take my 6th grade teacher in West Simsbury, Connecticut for example. She got real picky the second I finished a nervously delivered oral report about my favorite radio station; WDRC-FM Hartford.

During my presentation, a dog-eared, 3 X 5 cue card led me to point out that the "BIG-D" FM had cool Top-40 music, a funny DJ named Sandy Beach, and could be received at 102.9 megacycles." I even went so far as to tackle the tough word "simulcast," when describing WDRC-FM's programming in relation to its AM sister, WDRC 1360. "And besides," I concluded with a stutter, "WDRC-FM is really neat because . . . well, because . . . it's the oldest FM broadcast station in the whole wide world!"

"That is QUITE in-ter-es-ting, Peter," my teacher announced. "But," (and here's the picky part) can tell our class the source of your definitive, historical radio information?"

In retrospect, it was probably the shaky, "I guess some guy told me—or, maybe I read it in the papers," that served to weigh my anticipated A+ down to a B-. Picky teacher or no, trusty old WDRC-FM and I remained close friends until college and career snatched me away from its coverage area.

If absence does make the heart grow fonder, then it must have been the lonely hiss at 102.9 MHz that made me seek out a copy of the BROADCASTING YEARBOOK.

"Let's see," I wondered, while flipping through the YEARBOOKS' radio station section. "Let me check the start-up dates from FM facilities, and vindicate my old radio report."

The YEARBOOK showed me that most of today's prominent FM outlets were built in the 1950's, 1960's, and 1970's. A few, like WGFM(FM) Schenectady, NY; WMGK (FM) Philadelphia; and WEFM Chicago,

had even been born back in the early 1940's. But, as I had told my long ago class, it was the Hartford, Connecticut FM station listing that looked the most senior. It noted a trio of FM'ers boasting of birthdates in the 1930's!

Chronologically, Hartford stations WLVH (FM), and WHCN (FM) were tied for second place honors—each with a 1939 premier. And sure enough, just as I reported to my picky teacher and squirmly classmates, there was WDRC-FM—listed with an impressive 1936 debut! It was clearly the most vintage FM date in the whole book!

"UH OH, wait a second," my conscience pleaded. "Didn't I read it in the papers, or somewhere, that E.H. Armstrong (the inventor of FM broadcasting) did not even have his experimental FM station (in Alpine, NJ) up and running until 1937-38?" "OK, I'd better face facts," an inner voice admitted, "WDRC-FM's 1936 start date looks a little fishy, and could use a bit of . . . well . . . a touch of re-examination."

Well, it turns out that Franklin Doolittle, founder of Doolittle Radio Company and WDRC, began operating a 1,000 watt experimental "APEX," or HI-FI station (W1XSL) in 1936. Two years later, this station changed call letters to W1XPW, and transmitted on 40.3 MHz. It is important to note, however, that this facility utilized amplitude modulation (AM) and not FM.

So where is WDRC-FM? It makes a part-time debut in October 1939 when the FCC gave Mr. Doolittle the ok to shift W1XPW from AM "APEX" to the revolutionary, new frequency modulation (FM) transmissions around 43 megacycles. (Unlike today's FM spectrum, the original FM broadcast band ran from 42 to 50 megacycles.)

The following year, W1XPW changed to 46.5 MHz, and in 1941, became a commercial station under the call sign W65H. ("W" for east of the Mississippi River; "65" for 46.5 MHz; and "H" for Hartford.) The famous WDRC-FM call letters appear for the

first time in 1943 when the FCC dropped its unusual number/letter FM call sign system.

After WWII, the Commission bumped WDRC-FM "upstairs" to the new 88 to 108 mc band. The Hartford facility broadcast at two spots—46.5 on the low band, and 94.3 on the high side. (The old 46.5 signal was silenced in 1947.)

Next, the pioneer FM made a few more frequency changes—94.3 to 106.3, back to 94.3, and then down to 93.7 MHz. This 93.7, 7,000 watt WDRC-FM remained unchanged until 1955 when its calls were switched to WFMQ(FM).

Needless to say, none of the aforementioned modifications did much to attract listeners. Consequently, in 1956, Mr. Doolittle decided to sell WFMQ(FM) to The General Broadcasting Corp.

WFMQ(FM)'s new owners specialized in fine arts and classical music programming on their other stations (like WBCN(FM) Boston, and WNCN(FM) New York). So, after receiving a 1957 FCC grant to move WFMQ(FM) from 93.7 to 105.9 MHz, this company got Commission permission to change WFMQ(FM)'s calls to WHCN(FM) (for Hartford Concert Network.)

Now if it really is WHCN(FM) that can trace its electronic roots to WDRC's early FM station, then what about the contemporary WDRC-FM? (The one at 102.9 MHz that I reported about back in 1964.)

Well, it seems that in the late 1950s, Mr. Doolittle wanted to sell WDRC and retire. In order to make the offering a bit more attractive, he sought an FCC go-ahead to include an FM station in the deal. The Commission granted Doolittle's request, and, in 1958, WDRC was sold along with a construction permit for a new WDRC-FM at 102.9 MHz.

WLVH(FM), the other Hartford FM with a vintage BROADCASTING YEARBOOK debut listing, has a minor link with Franklin Doolittle's 1939 frequency modulation experiments. But, only in that its present fre-

quency (93.7 MHz) was once used by WFMQ(FM). (Remember WFMQ(FM) vacated 93.7 in favor of 105.9, and then became WHCN(FM).) Actually, WLVA(FM)'s earliest ancestor WFNQ(FM) (not to be confused with WFMQ(FM)!) first went on the air (in the then empty 93.7 dial position) during January 1959. In 1962, this FM'er was sold to a church group and renamed WSCH(FM). WSCH(FM) went dark two years later, and, again, was sold. The new owners called it WLAE (FM) and programmed beautiful music. (I recall hearing bits of happy, relaxing tunes from WLAE in between the whirring drill sounds at my dentist's office.) WLAE(FM) changed hands in 1970, and within a couple of years, had switched to a Spanish language format under the call sign WLVH(FM).

All of this leads me to believe that station WLVH(FM) should be listed with a 1959 on air premier. And, yes, I guess the same holds true for WDRC-FM. It is WHCN(FM), a station (under various owners, call signs, and frequencies) in operation since 1939, that can claim the title of WORLD'S OLDEST FM BROADCAST STATION. As for my old "Hi-Fi Friend and Broadcast Buddy," WDRC-FM 102.9? The best I can do is label its vintage as 1959 . . . October 1959 . . . OK, October 26, 1959 to be perfectly exact. But, when it comes to a kid's very favorite radio station, who wants to sound like some picky teacher?

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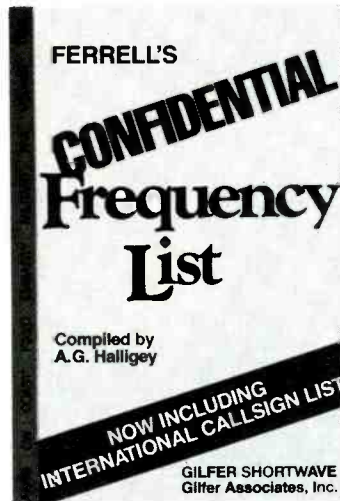
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AISD Office of Public Affairs

In a war zone, a commander must know what resources are available. An automated system designed to keep track of aircraft and the cargo it carries will help do that job.

Utilizing a Z-150 computer with an uninterrupted power supply, the new software is designed to be used by field commanders for accountability of aircraft landing and take-off times, departure and destination points, and passenger and cargo being hauled.

The software was written by 1st Lt. Roy

A. Rogge, chief of Mission Branch, Automation Support deputate at AISD headquarters. He said, "The system was used initially during ULCHI FOCUS LENS in August 1985 and since then has been used in every major exercise run by 21st and 22nd Air Forces.

Known as the Theater Airlift Management System (TAMS), the program supports the Military Airlift Command airlift control centers. These centers plan, schedule and execute all airlift missions for MAC

aircraft in a particular theater. Under the direction of the AISD TAMS program manager, Capt. Jim Albert, TAMS has significantly improved the command and control of the ALCCS by expediting the various types of operations, transportation, weather, and logistics information required by the commanders.

This information was previously recorded manually on large display boards or on paper that required constant updating. The TAMS provides the area commander with a

greater decision-making capability by being able to forecast the effect of one airlift mission on subsequent missions. It also gives them the ability to respond to short-notice movement of personnel or cargo and to allow for rescheduling of missions in a real-time mode.

According to Lieutenant Rogge, TAMS is a menu-driven system. It covers many functional areas of the airlift control center, such as: current operations, command post, logistics, transportation, combat control teams, and airlift control element. Selection of the current operations menu would bring to the screen a template for information on the mission number, type of aircraft, its tail number, names of crew members, time of departure and arrival, and destination base.

The transportation menu provides information on materials and personnel being transported as well as station workload and parts backlog.

"The MAC Current Operations folks are the principal operators. We designed the system so that it is easy for them to use. Many times at the air division level, people need to be able to see small pieces of information—time is usually not a critical factor. The system allows them to see the big picture or just a small portion," said the lieutenant.

"We've learned a lot from the first exercises. The system just wasn't fast enough. Since then we've made some modifications. We started using cartridge disks rather than diskettes in the field. The wear and tear on the disks was just too much and they wouldn't work. The cartridge is much more reliable."

"Once set up at the exercise location, TAMS is hooked up to a communications outlet such as high frequency radio or automatic digital network. It's essential for the operating commanders to be able to send out flight following information. There are a lot of reports required. Right now they can plug into the AUTODIN and send the information using a message function. Eventually all the terminals will be hooked up to a network server," Lieutenant Rogge said.

A portable secure local area network is being developed for deployment in to any theater of operation. Each LAN will connect various information processing equipment presently in use. Connecting cable will be transported along with the computers and will be capable of connecting up to 17 Z-150 workstations and peripherals.

Other major commands and Air Force agencies are looking closely at the work being accomplished by TAMS. The system is currently written in Dbase II language. However, to improve system responsiveness Lieutenant Rogge is rewriting it in ADA, the Department of Defense mandated language for the future.

"I think TAMS has proven that computers are a viable asset in the field during contingencies. It definitely improves the theater commanders' ability to perform more quickly and accurately," he said. **PC**

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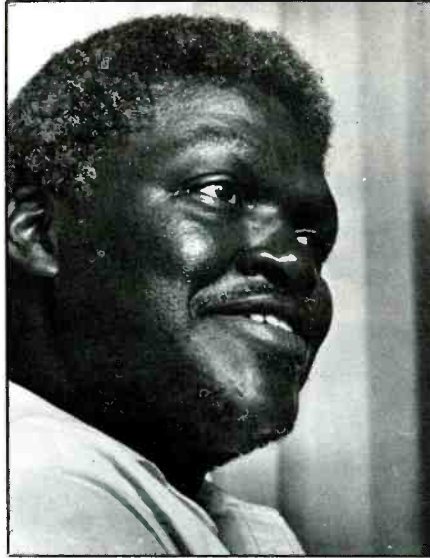
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CIRCLE 125 ON READER SERVICE CARD

Disabled Veteran Helps Save Truckers

James Nevett wasn't a casual bystander to an accident that occurred on an Alabama interstate highway—he was already involved because a truck traveling the wrong way came into his lane, struck his car, and forced him off the road. But that didn't stop the 39-year old disabled Vietnam veteran from pulling two men from the blazing wreckage of the truck.



SCAN PUBLIC SERVICE AWARD

Nevett was driving southbound on Interstate 20/59 in Birmingham toward his home in nearby Bessemer, Alabama, when he looked up and saw a truck and a delivery van coming toward him from the northbound lanes, according to an account of the accident in the *Birmingham News*.

The truck, a tanker carrying chemicals, forced Nevett's car onto the grass off the highway, where the car stopped. Nevett then saw the driver trying to get out of the cab of the overturned truck. He ran to the cab to try to help the driver get out.

"All I could see was gas pouring out of the tank," Nevett told the *News*. "What I did was crazy, but I didn't think about it."

He was successful in getting the driver and a second man out of the cab.

"We went to the fence and were standing there when it blew," Nevett said.

The two men were later identified as Carl Holden, 26, of Baton Rouge, Louisiana, and Marshall Carter, 58, of Marrero, Louisi-

ana. Both were treated and released from Baptist Medical Center-Princeton.

Birmingham Fire Battalion Chief J.D. Bolin said that Nevett's rescue probably saved Holden and Carter's lives because they would not have survived inside the cab.

"When we arrived at the scene, the entire front part of the truck was fully involved," Bolin told David Black, a reporter for WVTM-TV in Birmingham. "Mr. Nevett got 'em out quick!"

The driver of the delivery truck, tentatively identified as Rufus High of Holt, Alabama, was killed in the five-vehicle crash, and three others were injured.

Birmingham firefighters arrived at the ac-

cident scene to find flames engulfing the tanker's cab. Firemen were able to bring fires from the burning tanker and delivery truck under control within 15 minutes.

The Interstate was shut down in both directions by police while they tried to determine if the chemicals in the tanker truck were hazardous. The tanker truck was carrying an unknown amount of Diphenylmethane Diisocyanate, which is used as a base for manufacturing plastic products, according to the *News*. Only a small quantity of the chemical was spilled in the wreck, and police later determined that the contents were not dangerous. The overturned tanker remained on the shoulder of the highway until another truck could transport the load.

Nevett was already involved in the crash, knew that the gasoline spilling from the truck could explode at any time, and didn't know what kind of chemicals were being transported. Still, he approached the truck's cab, saw the occupants and helped pull them to safety. Nevett said that he thought one of the men would have been able to get out on his own, and he could see the gasoline leaking around the truck.

"I really didn't think about getting scared or anything," Nevett said, although he later said that he wouldn't be driving the Interstate when returning to Birmingham a few days later.

For his unselfish actions, James Nevett will receive the SCAN Public Service Award, which consists of a special commendation plaque and a cash prize. For making the nomination, David Black of WVTM-TV in Birmingham, will also receive a commendation plaque.

Congratulations to both of you.

Best Equipped

George Heflin of Manassas, Virginia, writes that he enjoys scanning, general shortwave listening, RTTY monitoring, and chasing utility stations. George (N4IXV) also takes part in amateur radio activities, including county hunting.

His equipment includes a Bearcat 210XL scanner, Bearcat 210, Bearcat III, Icom R-7000 receiver with Icom Discone antenna, Icom R-71A with vertical antenna, and an Info-Tech M-600 multi-mode code re-

SCAN PHOTO CONTEST WINNERS

ceiver with monitor screen. A Kenwood AT-230 antenna tuner rounds out the listening shack.

On the amateur side, George uses a Kenwood TS-430 transceiver with a TA33 tri-band antenna on a 50-foot Rohn tower. He also has a KDK-2030 VHF-FM transceiver and a Kenwood 2600A handheld transceiver at his disposal.

George is especially impressed with his R-7000. He says that it is a great receiver for someone who lives in a metropolitan area such as Washington, D.C. His only regret? The 99 memory channels in the R-7000 are not enough to store the many radio frequencies he monitors.

Best Appearing

Electrical engineer Michael Borman has a lot of interests, including flying model rockets (that's a flyable scale model of a Canadian Black-Brant sounding rocket on the top shelf).

But the Evansville, Indiana, listener acknowledges that he has always been interested in electronics, even though he's only been scanning and shortwave listening for a year or so. Michael started out on a Regency HX-1200 scanner and "got hooked." His Radio Shack Pro-2004 is used as a base unit scanner and is connected to a Radio Shack antenna on the roof. The audio output is fed through a stereo for improved sound quality, and interesting transmissions can be recorded on the stereo's tape deck.

Michael also enjoys shortwave listening and collecting those QSL cards. He uses a Sony ICF-2010, an outdoor longwire antenna, Grove Minituner and Grove power antenna for SWL'ing. He also has a GE por-

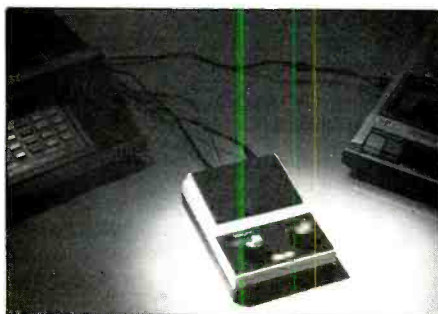




table cassette recorder that can be activated automatically by a Solar Light Co. CC-2020 cassette controller.

An Epson Equity II computer keeps track of scanner frequencies, and a special program tracks satellite orbits. A Commodore 64 is used with a Microlog SWL cartridge and the Sony receiver to decode RTTY and Morse code.

Michael writes that he has built several other rockets that can carry small payloads such as a single frame camera or small 49 MHz transmitters to altitudes up to 2,000 feet. Now that's an unusual way to combine two interesting hobbies!



Winners in the Photo Contest this month receive the BMI "NiteLogger" tape recorder activator. Plugged into a cassette recorder and a scanner, it gives a complete record of all communications with no "dead time" on the tape. If you would like to enter the contest, just send a sharp black/white print to SCAN Photo Contest, P.O. Box 414, Western Springs, IL 60558.

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Out of print for several years, this classic has been reprinted with updates, including an addendum on antenna design for 160 meters. Other sections include feeding and matching, short verticals, ground effects, and much more. 139 pages, paperback, \$9.95. Order #H208.

The Complete DX'er

by Bob Locher, W9KNI

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VHF Aero-Band Weather Broadcasts

Many Scanner Owners Don't Take Advantage Of ATIS Weather Transmissions

BY RICK MASLAU, KNY2GL

We are all familiar with the NOAA's VHF weather advisories on 162 MHz. These high-profile broadcasts are heard in most areas of the United States. The Federal Aviation Administration (FAA) also offers recorded weather information on VHF, although such transmissions are little known by the general public.

These transmissions are intended for use by pilots and come from various airport locations. The facilities used are known as Automatic Terminal Information Service (ATIS), and are repeating recorded broadcasts in areas of high activity. Some especially busy airports may actually have several ATIS transmitters, although airports that are not busy or open during limited hours may have an ATIS facility that operates only during certain hours.

In addition to weather conditions, other information useful to arriving or departing pilots is also provided, including altimeter settings, general runway conditions, temporary situations at the airport that require special attention, etc. These recorded transmissions are updated regularly and each updated program is identified by a phonetic letter so that pilots can discern if they are hearing the latest one—*Echo*, *Foxtrot*, *Golf*, or whatever. When you monitor the Control Tower channel at an airport having an ATIS, you'll usually hear the pilot advise the Tower that "Information Romeo" (or similar) has been received, that means that the Tower operator doesn't have to waste valuable time providing the pilot with this type of data.

Monitoring ATIS stations offers not only additional sources of weather information (especially valuable during any severe weather situation such as a thunderstorm or tornado), but also offers the scanner buff an interesting new group of transmissions to tune in. How many of these broadcasts can you hear, and from how far away? Since these transmissions are continuous, they are especially useful for comparing antennas, scanners, etc., one against the other. If one installation can pick up a certain distant ATIS, and another installation can't—it's an instant evaluation!

Included here is a list of these broadcasts in the 118 to 136 MHz band, along with the schedules (shown in UTC) for those not operating continuously. A few two-way facilities are also included from other bands. Keep in mind that frequency 122.0 MHz is a national two-way (non-ATIS) communications channel used by private pilots for exchanging weather information with FAA ground stations.

VHF Weather Information (All Times Are UTC)

State/City	Airport	MHz	Remarks
Alabama			
Huntsville	Jones Fld.	121.25	
Mobile	Bates Fld.	115.3	
	Bates Fld.	124.75	
Montgomery	Dannelly Fld.	112.1	
	Dannelly Fld.	121.3	1200-0400
Troy	Municipal	110.0	1300-0500 M-F
Alaska			
Anchorage	International	114.3	

	International	118.4	
	Elmendorf AFB	124.3	1600-0700
	Lake Hood	125.6	
	Merrill Fld.	123.7	
Bethel	Bethel	114.1	
Bettles	Bettles	116.0	
Big Lake	Big Lake	112.5	
Delta Jct.	Ft. Greeley	114.9	
Dillingham	Dillingham	116.4	
	Dillingham	125.0	1645-0845
Fairbanks	International	108.2	
	International	124.4	
Ft. Richardson	Ft. Richardson	46.90	1400-0400 2-way
Galena	Galena	114.8	
Glennallen	Gulkana	115.6	1500-0630
Homer	Homer	114.6	
Juneau	International	114.0	
	International	120.7	1600-0730
Kenai	Municipal	117.6	
King Salmon	King Salmon	112.8	
	King Salmon	128.8	1700-0500
Kodiak	Kodiak	117.1	
Kctzebue	R. Wien Mem.	115.7	
McGrath	McGrath	115.5	1500-0700
Middleton Isl.	Middleton Isl.	115.3	
Moses Pt.	Moses Pt.	116.3	
Nenana	Municipal	115.8	Hourly (irreg.)
Nome	Nome	115.0	
Northway	Northway	116.3	
Sandspit	Sandspit	114.1	
Selawik	Selawik	114.2	
Sitka	Sitka	113.8	
Talkeetna	Talkeetna	116.2	
Tanana	Calhoun Mem.	116.6	
Unalakleet	Unalakleet	116.9	
Yakutat	Yakutat	113.3	

Arizona

Casa Grande	Municipal	114.8	1200-0500
Ft. Huachuca	Sierra Vista	111.6	1300-0500 M-F
Goodyear	Phx.-Goodyear	118.35	1400-0300
Grand Canyon	Nat'l. Park	113.3	1300-0400
	Nat'l. Park	123.75	1500-0100
Mesa	Falcon Fld.	118.25	1300-0400
Phoenix	Deer Valley	126.5	
	Sky Harbor	121.2	
	Sky Harbor	124.3	
Prescott	E. A. Love Fld.	114.1	
Tucson	International	123.8	
Yuma	MCAS/Int'l.	118.8	1300-0600

Arkansas

Ft. Smith	Municipal	120.4	1200-0500
Little Rock	Adams Fld.	125.6	1200-0600
Springdale	Municipal	116.4	

California

Alameda	Naval Air Sta.	116.2	
Arcata	Arcata	110.2	

Bakersfield	Meadows Fld.	118.6		Torrance	Municipal	125.6	
Burbank	Burb-Glnd-Pasd	134.5		Van Nuys	Van Nuys	113.1	
Carlsbad	McClellan	120.15	1400-2117		Van Nuys	118.45	
Chino	Chino	121.15	1500-0500	Visalia	Municipal	109.4	1400-0700
Columbia	Columbia	124.65		Colorado			
Colusa	County	114.4		Aspen	County	124.0	1500-0100
Concord	Buchanan	124.7	1400-0600	Aurora	Aurora	117.5	
Crescent City	J. McNamara	109.0		Colorado Spgs.	Municipal	125.0	
Daggett	Brstw-Daggett	113.2			Ft. Carson	44.10	1300-2400 2-Way
El Monte	El Monte	110.4	1400-0600		Ft. Carson	108.8	
	El Monte	118.75	1500-0500	Denver	Centennial	120.3	
Eureka	Murray Fld.	114.0			Jeffco	126.25	1300-0500
Fr. Jones	Scott Vly.	109.6	1300-0600		Stapleton Int'l.	124.45	
Fortuna	Rohnerville	114.0			Stapleton Int'l.	125.6	
Fresno	Air Terminal	112.9		Grand Junction	Walker Fld.	118.55	1300-0500
	Air Terminal	119.3		Pueblo	Memorial	125.25	1300-0500
Fullerton	Municipal	125.05		Connecticut			
Hawthorne	Municipal	118.4		Bridgeport	Sikorsky Mem.	119.15	1130-0330
Hayward	Air Terminal	126.7		Danbury	Municipal	127.75	1200-0300
King City	Mesa del Rey	110.0		Groton	Grtn.-N. London	127.0	1200-0300
Lancaster	Gen W.J. Fox	126.3	1500-0500	Hartford	Brainard	126.45	
La Verne	Brackett Fld.	124.4	1500-0500	New Haven	Tweed	133.65	1100-0300
Little River	County	112.3		Windsor Locks	Bradley Int'l.	118.15	
Livermore	Municipal	119.65	1500-0500	Delaware			
Lompoc	Vandenberg AFB	125.7		Wilmington	Grtr. Wilm.	123.95	1200-0400
Long Beach	Daugherty Fld.	127.75		District of Columbia			
Los Angeles	International	133.8		Washington	Dulles Int'l.	134.85	
	International	135.65		Washington	National	128.8	
Marysville	Yuba County	110.8			National	132.65	
Modesto	H. Sham Fld.	127.7	1400-0600	Florida			
Monterey	Peninsula	119.25		Daytona Bch.	Regional	120.05	
Novato	Gnoss Fld.	110.4		Ft. Lauderdale	Executive	119.85	1200-0300
Oakland	Metro Oakland	126.0			International	135.0	
	Metro Oakland	128.5		Ft. Myers	Regional	124.65	1130-0500
Oceanside	Municipal	115.3		Hollywood	No. Perry	121.3	
Ontario	International	124.25		Jacksonville	International	125.95	
Oxnard	Oxnard	118.05	1500-0500	Melbourne	Regional	132.55	1100-0500
	Pt. Mugu NAS	125.55		Miami	International	119.15	
Palm Springs	Municipal	118.25	1500-0600		Opa Locka	125.9	
Palo Alto	Palo Alto	120.6	1500-0500	Orlando	Tamiami	124.0	
Paso Robles	Municipal	114.3			Executive	127.25	1100-0400
Placerville	Placerville	115.5			International	121.25	
Red Bluff	Municipal	115.7		Panama City	County	128.3	1200-0400
Redding	Municipal	124.1	1430-0530	St. Petersburg	Clearwater	134.5	
Riverside	Municipal	128.8		Sarasota	Srsta-Bradenton	121.3	
Rosamond	Edwards AFB	116.4	1400-0200 M-F	Tallahassee	Municipal	119.45	1130-0400
Sacramento	Executive	115.2	1300-0600	Tampa	International	126.45	
	Executive	125.5	1500-0500	Venice	Municipal	118.05	
	Mather AFB	119.15	1400-0700 M-F	Vero Beach	Municipal	132.75	
	Metropolitan	126.75		W. Palm Beach	International	123.75	
Salinas	Municipal	117.3		Georgia			
	Municipal	119.55		Atlanta	Dekalb-Peacht.	128.4	1200-0400
San Carlos	San Carlos	125.9	1500-0500		County	119.0	1100-0500
San Diego	Brown Fld.	132.35	1600-0400		Hartsfield Intl.	119.65	
	Montgomery Fld	117.8	1400-0500		Hartsfield Intl.	125.55	
	Montgomery Fld	126.6		Columbus	Metropolitan	127.75	
	International	134.8			Ft. Benning	111.4	1200-0400 M-F
	Gillespie	125.45		Dalton	Municipal	127.65	
San Francisco	International	108.9		Savannah	International	121.3	
	International	113.7			Hunter AAF	111.6	
	International	118.05		Warner-Robins	Robins AFB	118.95	1100-0500
	International	118.85		Hawaii			
San Jose	Reid-Hillview	125.2	1500-0600	Hawaii Isl.	Gen. Lyman	126.4	1600-0800
	International	114.1	1400-0800	Keahole	Keahole	127.4	1600-0600
San Luis Obispo	County	112.4		Kauai Isl.	Lihue	126.8	1630-0730
San Martin	So. County	118.35		Maui Isl.	Kahului	124.6	1600-1000
Santa Ana	J. Wayne Apt.	126.0		Oahu Isl.	Honoulu Int'l.	127.9	
	El Toro MCAS	117.2	1500-0300 M-Th		Honolulu Intl.	132.2	
Santa Barbara	Municipal	125.1	1430-0600	Idaho			
	Municipal	114.9		Boise	Gowen Fld.	123.9	1300-0700
Santa Maria	Public	111.0		Lewiston	County	108.2	
	Public	121.15	1500-0300				
Santa Monica	Municipal	119.15	1500-0500				
Santa Paula	Santa Paula	112.5					
Santa Rosa	County	113.0					
	County	120.55					
Shafter	Minter Fld.	115.4					
So. Lk Tahoe	Lk. Tahoe	113.2					
Stockton	Metro	118.25	1400-0700				

Illinois				Hyannis	Municipal	123.8	1100-0300
Aurora	Municipal	125.85	1300-0300		Municipal	114.7	
Belleveille	Scott AFB	118.65	1100-0500	Martha's Vineyard	Marth. Vnyd.	126.25	1200-0300
Cahokia	St. Louis Dntwn	127.85	1300-0300	Nantucket	Memorial	126.6	1100-0200
Carbondale	So. Illinois	119.85	1300-0300	New Bedford	Municipal	126.85	1200-0300
Champaign	U. Ill-Willard	124.85		Norwood	Memorial	125.1	1200-0300
Chicago	Midway	120.05		Westfield	Barnes	127.1	1200-0300
	O'Hare	135.15		Worcester	Municipal	126.55	1200-0300
	Meigs	127.35	1200-0400	Michigan			
	DuPage	104.8		Detroit	City	120.75	
	DuPage	124.8			Metro Wayne	124.55	
	Pal-Waukee	124.2	1200-0200	Flint	Bishop	124.95	
Decatur	Decatur	117.2		Jackson	Reynolds	127.95	1200-0300
Kankakee	Grtr. Kankakee	118.65		Kalamazoo	County	127.25	
Moline	Quad-City	121.2		Lansing	Capital City	119.75	
Peoria	Grtr. Peoria	126.1		Marquette	County	109.0	
Rockford	Grtr. Rockford	126.7	1300-0500	Muskegon	County	124.3	
Springfield	Capital	127.65		Saginaw	Tri City	112.9	
					Tri City	118.6	
Indiana				Traverse City	Cherry Capital	114.6	
Elkhart	Municipal	115.4		Minnesota			
Evansville	Dress Regnl.	120.2		Duluth	International	124.1	
Ft. Wayne	Baer Fld.	121.25		Minneapolis	Crystal	125.7	1300-0300
Indianapolis	International	125.35			Flying Cloud	111.8	
Lafayette	Purdue Univ.	127.25			Flying Cloud	124.9	
Muncie	County	133.25	1200-0300		International	135.35	
Peru	Municipal	116.5	1200-0300	Rochester	Municipal	120.5	
So. Bend	Michiana Regnl	118.15		St. Paul	Downtown	118.35	
Terre Haute	Hulman Regnl.	127.5	1200-0400	Mississippi			
Iowa				Columbus	Columbus AFB	115.2	
Ames	Municipal	126.55		Gulfport	G-B Regional	119.45	1130-0500
Cedar Rapids	Municipal	124.15		Jackson	A.C. Thompson	121.05	
Des Moines	International	114.1	1100-0400	Missouri			
	International	119.55		Columbia	Regional	128.45	1300-0500
Sioux City	Municipal	119.45			Cotton Woods	111.2	
Waterloo	Municipal	120.65		Grain Valley	E. Kansas City	114.0	
Kansas				Kansas City	Downtown	124.6	
Anthony	Municipal	112.9			International	128.35	
Hutchinson	Municipal	124.25		St. Louis	International	119.925	
Junction City	Ft. Riley	109.4	1400-0600 M-F		International	120.45	
Wichita	Mid-Continent	125.15			Spirit of St. L.	134.8	
	McConnell AFB	119.5	1300-0600		Downtown/Parks	127.85	1300-0300
Kentucky				St. Robert	Ft. L. Wood	110.0	1300-0300
Covington	Grtr. Cincinn.	135.0		Springfield	Regional	116.9	
Louisville	Bowman Fld.	112.2	1200-0400		Regional	119.05	1130-0530
	Standiford Fld.	118.15		Montana			
Oak Grove	Ft. Campbell	33.20	2-Way	Billings	Logan Int'l.	126.3	
Radcliff	Ft. Knox	109.6	1200-0400 M-F	Great Falls	International	126.6	
Somerset	J.T. Wilson	124.85		Missoula	County	126.65	1300-0500
Louisiana				Nebraska			
Baton Rouge	Metro/Ryan	125.2		Grand Island	Cent. Nebr.	112.0	
Hammond	Municipal	109.6		Lincoln	Municipal	118.05	
Lafayette	Regional	120.5	1200-0500	Omaha	Eppley	120.4	
Leesville	Ft. Polk	40.35	2-Way		Millard	118.25	
	Ft. Polk	118.45		Nevada			
Monroe	Regional	125.05	1200-0400	Battle Mtn.	County	112.2	
New Orleans	Lakefront	124.9		Beatty	Beatty	114.7	
	International	126.7		Coaldale Jct.	Coaldale	117.7	
Shreveport	Regional	128.45	1200-0500	Elko	Municipal	114.5	
Maine				Ely	Yelland Fld.	110.6	
Portland	Int'l. Jetport	119.05		Fallon	Municipal	114.1	
Maryland				Hawthorne	Municipal	115.1	
Aberdeen	Proving Ground	108.4		Las Vegas	Sky Harbor	116.7	
Baltimore	B-W Int'l.	115.1			McCarran	116.9	
	B-W Int'l.	127.8			McCarran	125.6	
Camp Springs	Andrews AFB	113.1			N. Las Vegas	118.05	1400-0400
Massachusetts				Lovelock	Derby Fld.	114.1	
Ayer	Ft. Devens	46.95	2-Way M-F	Pioche	Pioche	116.3	
Bedford	L.G. Hanscom	124.6	1200-0400	Reno	Cannon Int'l.	117.9	
Beverly	Municipal	118.7	1200-0300		Cannon Int'l.	125.8	
Boston	Logan Int'l.	135.0		Searchlight	Searchlight	114.4	

Tonopah	Tonopah	117.2		Newark	Newark-Heath	116.7	
Wells	Harriet Fld.	114.2		Toledo	Express	118.75	
Winnemucca	Municipal	114.3		Youngstown	Municipal	119.75	
New Hampshire				Oklahoma			
Lebanon	Municipal	118.65	1200-0300	Altus	Altus AFB	109.8	1100-0600
Manchester	Industrial	119.55	1100-0400	Ardmore	Downtown Exec	118.15	
Portsmouth	Pease AFB	116.5	1030-0600 M-F	Norman	Westheimer	119.55	
New Jersey				Oklahoma City	Tinker AFB	115.8	1100-0500
Caldwell	County	135.5			Wiley Post	113.4	
Morristown	Municipal	124.25	1200-0330		Will Rogers	125.85	1300-0600
Newark	International	115.7		Tulsa	R.L.Jones Jr.	126.5	
	International	132.45			International	124.9	
Teterboro	Tererboro	108.4		Oregon			
	Teterboro	114.2		Astoria	Port of Astoria	114.0	
Trenton	County	119.45		Corvallis	Municipal	108.4	
Wrightstown	McGuire AFB	110.6		Eugene	Mahlon Sweet	112.9	
New Mexico					Mahlon Sweet	125.2	1400-0800
Albuquerque	International	118.0		Medford	County	113.6	
Clovis	Cannon AFB	119.9			County	125.75	
Gallup	Municipal	115.1		Newport	Municipal	117.1	
Santa Fe	Municipal	128.55		North Bend	Municipal	112.1	
New York				Portland	International	116.6	
Albany	County	120.45			International	128.35	
Binghamton	E. A. Link Fld.	128.15		Roseburg	Municipal	108.2	
Buffalo	International	135.35		Salem	McNary Fld.	124.55	1500-0500
Calverton	Naval Wpns	117.2		The Dalles	Municipal	112.3	
Elmira	Regional	113.7		Pennsylvania			
Farmingdale	Republic	126.65	1200-0400	Allentown	A-B-E	124.7	
Islip	L.I. MacArthur	128.45		Clarion	County	112.9	
New York	J F K	111.2		Erie	International	120.35	
	J F K	115.1		Factoryville	Seamans Fld.	110.8	
	J F K	115.4		Harrisburg	Capital City	134.95	
	LaGuardia	113.1		Philadelphia	Northeast Phil.	121.15	
	LaGuardia	125.95			International	133.4	
Olean	Municipal	118.375		Pittsburgh	County	120.55	
Poughkeepsie	County	117.6			International	111.0	
Rochester	County	108.2			International	127.25	
	County	110.0		Pottstown	Limerick	116.5	
Syracuse	Hancock Int'l.	120.75		Pottsville	County	114.6	
Utica	County	108.6		Reading	Gen. Spaatz	127.1	
	County	118.7		State College	Air Depot	127.65	
White Plains	County	116.6		Wilkes-Barre	International	111.6	
	County	133.8		Rhode Island			
North Carolina				Providence	T.F. Green	128.7	
Asheville	Regional	120.2	1130-0400	South Carolina			
Charlotte	Douglas Int'l.	121.15		Charleston	AFB/Int'l.	124.75	
Fayetteville	Municipal	121.25		Columbia	Metro	120.15	
	Pope AFB	132.3		Greer	Greenv./Sprtnb.	134.05	1130-0500
	Ft. Bragg	141.25	2-Way 1000-2300	South Dakota			
Greensboro	Regional	128.55		Huron	Regional	117.6	
New Bern	Simmons Nott	113.6		Pierre	Municipal	112.5	
Raleigh	Raleigh-Durham	123.8		Sioux Falls	Joe Foss	126.6	
Salisbury	County	111.0		Tennessee			
Wilmington	County	121.1		Bristol/Jhnsn/Kngspt	Regn'l	118.25	
Winston-Salem	Smith Reynolds	121.3	1200-0400	Chattanooga	Lovell	119.85	
North Dakota				Knoxville	McGhee Tyson	128.35	1200-0400
Bismarck	Municipal	119.35	1200-0600	Memphis	International	119.45	
Fargo	Hector Int'l.	124.5			International	121.0	
Grand Forks	International	114.3	1200-0400	Nashville	Metropolitan	120.0	
	International	119.4	1200-0400	Texas			
Minot	International	117.1	1100-0400	Abilene	Municipal	118.25	1300-0300
Ohio				Amarillo	International	118.85	1230-0530
Akron	A-C Regional	121.05		Austin	Mueller	119.2	
Cincinnati	Grtr. Cincinn.	135.0		Beaumont	County	126.3	1200-0400
	Lunken Fld.	120.25	1200-0400	College Sta.	Easterwood	126.85	1200-0400
Cleveland	Burke Lakefront	125.25	1200-0300	Corpus Christi	International	126.8	
	Hopkins Int'l.	127.85			Naval Air Sta.	138.6	
Columbus	Ohio State U.	118.25	0400-1200	Dallas	Addison	126.8	1200-0400
	Ohio State U.	121.35	1200-0400		D-FW Int'l.	117.0	
	International	124.6			D-FW Int'l.	134.9	
	Rickenbacker	132.1					

THE HAM COLUMN

DAVE NEWKIRK, AK7M
AMERICAN RADIO RELAY LEAGUE HQ

GETTING STARTED AS A RADIO AMATEUR

Those Shared Ham Bands — Part 2

Last month, we discussed how and why radio amateurs share some of the ham bands with nonamateur stations. We had just enough space left for the first stop on a tour of shared shortwave ham bands: 160 meters (1.8-2.0 MHz). This month, we'll continue using terms covered last time (International Telecommunication Union [ITU] Regions and primary, co-primary and secondary frequency allocations), so you may find it useful to have February POP-COMM nearby as you read on. Let's continue our tour with the 3.5-4.0 MHz band.

80/75 Meters (3.5-4.0 MHz)

Region 2 radio amateurs under FCC jurisdiction can use all of this range. So can Canadian hams. But 80 meters (the upper, mainly SSB, portion of which is usually referred to as 75 meters) isn't exclusively amateur radio territory everywhere in the Americas. Depending on the country involved, the broadcast, fixed and mobile services may be primary (an alternative allocation, with amateur radio excluded) or co-primary over part of the band. Where co-primary sharing occurs, stations in each service must avoid causing harmful interference to each other.

In Canada and Greenland, broadcasting is co-primary from 3.95 to 4.0 MHz. This hasn't yet amounted to anything in Canada (the Canadian Broadcasting Corporation has indefinitely tabled plans to use this band for shortwave coverage of northern Canada), but Greenland has had a transmitter on 3.999 MHz for years—a rare SWBC DX target, indeed! Although the ITU Table of Allocations shows no other official evidence of broadcasting in Region 2, there's another rare American broadcaster in the 75-meter broadcasting band: the Falkland Islands Broadcasting Station on 3.958 MHz.

In ITU Region 1, amateur radio territory stops at 3.8 MHz (even lower in some countries); the upper limit in Region 3 is 3.9 MHz. In both of these regions, Amateur Radio shares many of its 80-meter frequencies with stations in the fixed and mobile services. For instance, here in Connecticut, I've logged GHD2, Gallan Head Radio, England, on 3.6078 MHz, and GCC1, Cullercoats Radio, England, just up the band on 3.6083 MHz. Both of these coastal stations transmit their call signs in CW between bursts of radioteletype data. Many evenings, CTP, Lisbon, Portugal, is strong on 3.782 MHz with a CW marker.

Shortwave-broadcast listeners and DX'ers don't need to be reminded that broadcasting takes off in a big way above 3.9 MHz: The 75-meter international broadcasting band stretches from 3.9 to 4.0 MHz in Region 3, and 3.95 to 4.0 MHz in

Region 1. Three easily heard Region 1 broadcasters come to mind: the British Broadcasting Corporation (BBC) on 3.955 MHz; China's Radio Beijing, which broadcasts to Europe on 3.985 MHz via a transmitter in Switzerland; and Deutsche Welle on 3.995 MHz. Strong Region 3 broadcasters include the US Armed Forces Radio and Television Service, Far East Network, on 3.910 MHz, the BBC on 3.915 MHz and a commercial Japanese broadcaster, Radio Tanpa, on 3.925 MHz.

40 Meters (7.0-7.3 MHz)

Throughout most of the world, the amateur radio and amateur-satellite services are primary from 7.0 to 7.1 MHz. (In a few African countries, the fixed service is primary [amateur radio excluded] or co-primary from 7.0-7.05 MHz.) Any broadcasters you hear between 7.0 and 7.1 MHz don't belong there; there's even a special ITU resolution telling them they shouldn't be there!

Hams in ITU Region 2 also get to use 7.1 to 7.3 MHz—but so do 41-meter broadcasters in Regions 1 and 3! Region 2 hams suffer severe interference from 41-meter broadcasters from long before dusk to well after dawn. But it's better to be able to operate there, dodging the worst of the interference, than not to be able to operate at all. As broadcasters have shifted to out-of-band frequencies above 7.3 MHz in increasing numbers, the situation for hams has actually improved a bit. (There is amateur radio operation from 7.1 to 7.3 MHz outside of Region 2, by the way: hams in Australia, New Zealand and a number of other countries may operate in this range if they do not interfere with 41-meter broadcasting.)

30 Meters (10.1-10.15 MHz)

Here's an example of worldwide band sharing that works well. Because the fixed service is primary at 30 meters, and amateur radio is secondary here, hams must not cause harmful interference to fixed-service stations in the 30-meter band, and must accept interference from these stations. Most ham operation at 30 meters consists of CW and digital communication achieved with no more than 100 watts of output power.

20 Meters (14.0-14.35 MHz)

17 Meters (18.068-18.168 MHz)

12 Meters (24.89-24.99 MHz)

I've grouped these three ham bands together because of their similarity as frequency allocations. A quick glance at the ITU Radio Regulations Table of Frequency Allocations indicates that the amateur radio service (and the amateur-satellite service, in some stretches) is primary in all of them, with no secondary allocations for other services. Yay! Ah, but a look at the fine print in

the Table of Frequency allocations reveals—as the saying almost goes—all that glitters is not exclusively primary worldwide.

20 meters is ham radio's number one DX band. Amateur radio has the band all to itself—except in Afghanistan, China, the Ivory Coast, Iran and the USSR, where the fixed service is co-primary from 14.25 to 14.35 MHz.

17 meters is not yet available to US hams, but radio amateurs in Canada and throughout much of the world are already using this band. After July 1, 1989, hams will have 17 meters all to themselves—almost: In the USSR, the fixed service is co-primary throughout the band. (I'm wondering if the BBC transmitter on 18.08 MHz, said to be 100 or 500 kW, will continue to operate there after June 1989.)

12 meters will also be exclusive amateur and Amateur-Satellite Service territory after July 1, 1989—almost: In Kenya, the meteorological aids service (radiosondes) is co-primary between 24.89 and 24.9 MHz. US hams can use all of 12 meters now, under the condition that they cause no harmful interference to fixed-service stations presently operating there. Those fixed-service stations are expected to move out of the band by July 1, 1989. In reality, there are none there; any that were, fled to lower frequencies when the sunspot numbers declined.

Tour's End

That completes our tour of shared shortwave ham bands. We didn't cover 15 meters (21.0-21.45 MHz) and 10 meters (28.0 to 29.7 MHz) because ITU's Table of Allocations contains no fine print allowing routine nonamateur use of these bands! The best way to keep them exclusively amateur is to use them wisely, and as fully as we can.

How to Hear Your Ham Column Editor On the Air

You can find AK7M on the air, if you know where and when to look. These days, my favorite ham band is 30 meters (10.1-10.15 MHz). Just about every Saturday afternoon, I "run" a 30-meter schedule—ham lingo for a regularly scheduled contact—with my father, who operates station W9BRD in Chicago. If you'd like to try hearing us, tune your receiver to 10.149 MHz and set it for CW reception. Although we sometimes try to make contact at 1800 UTC (1 PM, Eastern Standard Time), the best time to hear us is 2200 UTC (5 PM, Eastern Standard Time), when the 30-meter band better supports Chicago—Hartford propagation. Should there be a strong nonamateur signal at 10.149 MHz, try 10.142 MHz instead—that's our alternate frequency. Good luck—and let me know if you hear us!

RADAR REFLECTIONS

RADAR DETECTORS AND THEIR USE

BY JANICE LEE

The Menace of Photo Radar

From start to finish, the process of catching speeders with photo radar seems designed to violate the rights of the motoring public. At the very least, it is a system that intimidates its victims and generates a large amount of revenue for those who use it.

An exaggeration? Consider how the system works: The photo radar unit—consisting of an integrated package of traffic radar, camera and computer—is mounted in the rear of a vehicle. The law officer parks the vehicle next to an expressway and adjusts the angle of the radar antenna according to which lane of traffic he plans to monitor. Then he sets the speed at which he wants passing vehicles to activate the system. From that point, all he does is make sure the camera continues to operate.

When a vehicle passes traveling at or above the preset speed, the radar unit triggers the camera. The supposed offender is caught on film, the photo plainly showing the vehicle, its license plate, the face of the operator and anyone else in the front seat of the car. The device also imprints on the negative the speed, date, time and location. There is no traffic stop made by the policeman; the driver has no idea he has been nabbed.

Once the film is exposed, the officer turns it over to the company that leases the photo radar equipment. The vendor develops and prints the film, and an officer screens the photos to make sure faces and license plates are visible. The police run license checks, then turn over the registration information to the vendor, who enters it into a computer.

The computer generates a threatening letter that is sent to the owner of the vehicle, telling the person to pay the fine, show up in court or provide the name of the person who was driving the vehicle if it wasn't the owner. The letter, which goes out over the signature of a judge (this occurred in Texas), warns that for those who do not respond "a summons may be issued."

Given the volume of violations the system can process and the tone of the letter, the system is quite effective. Many pay and very few challenge. As payment for use of the photo radar system, the municipally compensated the vendor \$20 for each paid citation.

At issue are the lack of a traffic stop, the absence of a legal "charging instrument" and the evidence that photo radar is used primarily as a revenue-generating device.

Camera radar was developed in Europe and made brief appearances in this country in the 1960s in Texas and more recently in Virginia. Legal questions and the potential for overloading the judicial system prevented more widespread use. However, in

1986 a Texas company, Traffic Monitoring Technologies, Inc., began offering a Swiss-made system for sale or lease.

So far, only one jurisdiction is regularly using the TMT photo radar system, Precinct 8 in Galveston County, Texas. TMT is headquartered in Friendswood, which is within the boundaries of Precinct 8.

The town of La Margue, Texas, also employed the photo radar system for three months, but halted its use in early 1987 due to a variety of legal and ethical questions. During the time the system was used, the municipality issued approximately 800 citations and realized a profit of well over \$2,000—without meeting the 192-hour monthly quota spelled out in the contract with TMT.

However, city officials were concerned about the legality of prosecuting persons who failed to respond to the mailed violation notice. Under state law, when a driver pulled over for a traffic violation signs his ticket, he is in essence promising to plead guilty and mail in his fine or to show up in court to contest the citation. The ticket is known as a charging instrument or complaint.

There is no such charging instrument involved with photo radar, and La Marque's city attorney, Leonard Cruse, did not believe officials had the authority to prosecute violators or to issue warrants for those who did not respond. Beyond that, La Marque officials were concerned about the town gaining a reputation as a speed trap and about the possibility that drunk and dangerous drivers might escape detection without a traffic stop.

The lack of a charging instrument also rankles Charles Michulka, a Stafford, Texas, attorney who with RADAR's help earlier this year won a case involving photo radar in Galveston County. When a driver is nabbed by photo radar, Michulka said, "you only get a letter. And not only do you just get a letter, you get a letter from the justice of the peace. He has no business sending these thinly-veiled-threat letters saying confess or pay or we will issue a warrant for you. It is not something that comes from a court or a judge. It should come from the police."

Despite the letter's tone, Michulka said the judge does not have the authority to issue a warrant for anyone who doesn't respond. "In the practical matter, they do nothing if people ignore these letters, because they do not want to get sued for illegal arrest if they do try to go out and get somebody," he said. The American Civil Liberties Union in Texas also has been advising drivers to disregard the letters.

Michulka said the situation also illegally shifts the burden of proof to the accused; in other words, the vehicle's owner has to pro-

ve he is innocent, rather than the court proving he's guilty.

A bill was introduced in the Texas legislature in February to iron out the legal shortcomings of photo radar. House Bill 830 would have allowed the court-issued letter to serve as the legal complaint, would have created the presumption that the owner of the vehicle was the person shown in the camera radar photograph to serve as admissible evidence of a speeding violation. With RADAR's opposition, the bill died in sub-committee.

Manual Fustes, the president of TMT, said the legislation "was nothing but an effort to standardize (to accommodate a new technology). Several states have standardized the way they issue tickets to streamline procedures in court, as well as to avoid excesses or abuses. The effort to introduce a bill to standardize it does not indicate anything in relation to the propriety of the fallacies of anything like that."

Michulka, though, described the legislation as "absolutely horrible. It tried to completely revise the criminal laws of the state."

Another serious criticism of photo radar procedure is the lack of a traffic stop. Without being stopped and notified that he is being accused of speeding, a driver cannot set up an effective defense to the citation. The infamous letter may arrive weeks after the violation is alleged to have taken place.

"The way this system is being used, the motorists' rights are being thrown out the window," commented RADAR attorney David Sloan. "Without the chance to face his accuser, the driver alleged to have been speeding is notified of his guilt by a supposed order to pay signed by the judge. Basic to our system of justice is that one is considered innocent until proven guilty. Here, the driver does not even get the chance to plead not guilty. That is unconstitutional."

TMT's Fustes, however, deflects all such criticisms with the argument of social good. "I feel that safety is the major issue. It's a socially beneficial product, and that's the crux of it," he said.

And then there is his cancer analogy. "There are two philosophical approaches to speed enforcement. You can find something that is wrong, and you can surgically remove it. At the same time, you can have others that are being created (so rapidly) that you cannot excise them one at a time. But you can take chemotherapy, which over a period of time eliminates the problem. We're not saying you shouldn't use police to stop people. We're saying that at least one policeman can be using this system. By using a more systemic approach, every car along the road might be a monitoring vehi-

cle and its placebo effect slows down traffic everywhere."

RADAR, however, does not believe such arguments are grounds for eliminating the rights of drivers. Further, the association also maintains that photo radar is used more as a revenue-generating device than as something intended to improve highway safety.

There are several factors that lead to this conclusion. First, the system, with no time-consuming traffic stops at a high degree of automation, is geared to process large volumes of violations.

Second, the high-tech system is very intimidating to the average driver. When they receive a notice saying they have been caught on film speeding, most motorists don't question the veracity. Attorney Michulka called photo radar a "bogy machine," and TMT's Fustes admitted that of the thousands of notices issued by Precinct 8, very few have been challenged.

And third, TMT is aggressively marketing the \$50,000 system to states and municipalities, making claims that nearly two-thirds of all those who receive notices pay them and that there is a leasing or sales package to fit any size budget. When a small municipality's only expense is \$20 per paid violation generated by photo radar, the system sounds very lucrative. And for a share of the fine, TMT provides the photo radar equipment, training, film and processing, forms, service, citation processing, expert witness-

es and more. In Precinct 8, the arrangement even includes the Blazer in which the photo radar equipment is mounted.

The definitive legal decision on photo radar has yet to be made. The case which Michulka won on appeal hinged not on the legality of the system but on a question of just which vehicle in the photo has produced the radar reading. It also helped, Michulka said, that the prosecuting attorney was "basically appalled" by the system and the violation letter sent by the Precinct 8 judge.

TMT, however, is doing its best to put photo radar into the hands of a policeman

near you. Recently, photo radar has been demonstrated or put into limited use in Arizona, California, and Connecticut, as well as Texas. A published report about the Connecticut demonstration said police were excited by the system but had reservations about its legality.

RADAR has targeted photo radar as a serious threat to motorists' rights and will be focusing considerable efforts on either eliminating the system or ensuring that it is used in accordance with accepted legal practices.

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

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Emergency Position Indicating Radio Beacons (EPIRB'S)

The emergency position indicating radio beacon is called an EPIRB by mariners, and an ELT (emergency locating transmitter) by aviators. To those in distress, they are called a godsend. There are several categories of EPIRB'S in use. Plus, a relatively new type of EPIRB that may become the ultimate emergency radio transmitting device. Let's look at these classifications.

The EPIRB and ELT send out a distinctive modulated warbling tone on its assigned carrier frequency. The ELT is carried by most general aviation aircraft, and all commercial aircraft. The ELT may be activated on impact and/or manually turned on by a switch.

The marine EPIRB transmits the same warbling tone on the same frequencies, and it must be carried on compulsory radio equipped ships as a Class A unit. Private yachts may use either Class A or Class B for worldwide distress, and Class C for local emergencies.

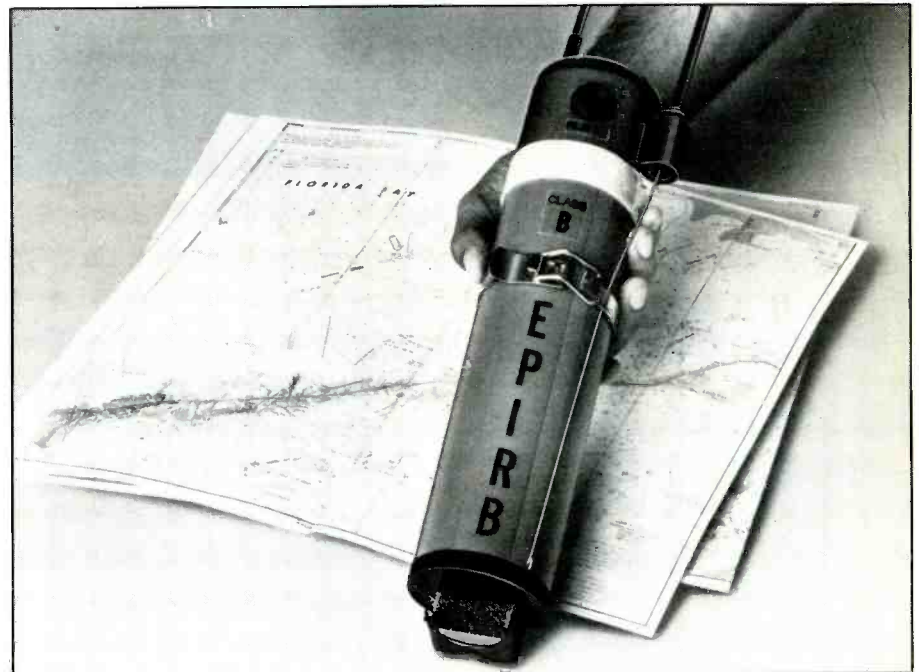
The Class C EPIRB hasn't really gone over that well. It's range is limited to nearby boats and local shoreside stations which monitor the marine VHF distress channel; Channel 16. The Class C EPIRB is no more effective than a marine VHF radio telephone to signal for help—other than it's waterproof and continues to do its thing when you are busy doing something else—like bailing! I would probably carry a marine VHF handheld in a waterproof bag before I would go out and buy a Class C EPIRB on the same frequencies.

The new 406 MHz EPIRB'S are coming. This sophisticated device sends data, rather than an old-fashioned tone, to alert orbiting satellites that a specific vessel requires immediate assistance. The 406 MHz system will become the ultimate EPIRB system for the future once we get all countries to agree on its data format.

But let's look at the Class A and B EPIRB'S that operate on 121.5 and 243 MHz. These are frequencies that you can receive with a scanner, and it might be up to you to track down someone in distress.

These VHF frequencies were originally used only for aircraft emergencies. They were then extended for marine use providing the vessel was more than 20 miles offshore. 121.5 MHz is monitored by most aircraft stations, and 243 MHz is monitored by most military facilities and aircraft. However, the United States Coast Guard and almost all vessels afloat don't guard these two frequencies. It's also been found that few in-flight aircraft monitor these two channels, as

Classification	Activation	Frequency of Operation
Class A	Fully automatic—floats free or turns on impact	121.5 MHz 243 MHz
Class B	Manually turned on	121.5 MHz 243 MHz
Class C	Manual activation	VHF Channel 16 (156.8 MHz) VHF Channel 15 (156.750 MHz)
Class "406 MHz"	Automatic or manual	406 MHz



well. What good is an EPIRB on 121.5 MHz and 243 MHz if no one is listening?

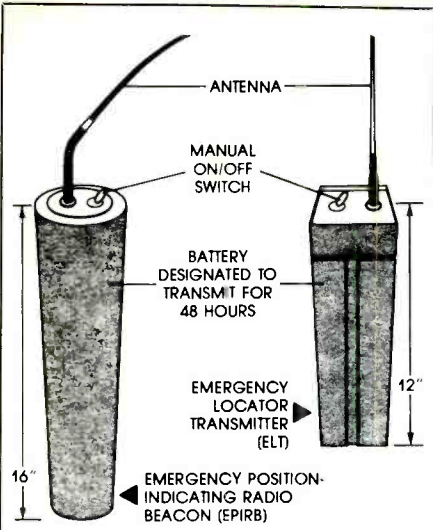
To solve this problem, the United States, the Soviet Union, Canada, and many other countries pooled resources to develop and maintain a new distress system called SAR-SAT/COSPUS. This system uses satellites to hear distress signals and determine the approximate position (about five to ten miles) to the transmitting device.

The information is reported into a centralized computer shared by all countries. Scott Air Force Base in Illinois receives United States distress reports from their Air Force Rescue Coordination Center. If the signal appears to be in the water, the information is then relayed to the local Coast Guard Res-

cue Coordination Center that serves that water region.

It takes four minutes of transmission time for the satellites to get a fix. Satellite coverage is not continuous; however, it is an effective way to alert and provide an accurate position for search and rescue operations.

A U.S. SRSAT satellite circles the earth every 102 minutes at an altitude of 528 miles. The U.S.S.R. satellite circles the earth every 105 minutes at an altitude of 621 miles. We have two and the Russians have three polar-orbiting satellites. This system gives northern hemisphere coverage entailing a circular area within a 2,000 mile radius to a line-of-sight ground station. If the satellite is not within range of a ground sta-



FALSE ALARMS

The majority of ELT and EPIRB emergency transmissions received at the LUT's are FALSE ALARMS. FALSE ALARMS waste valuable search and rescue time that could be used for a real emergency situation. AVIATORS and MARINERS can help stop FALSE ALARMS by doing the following:

- * ELT and EPIRB beacons should be mounted properly.
- * ELT and EPIRB beacons should be maintained regularly.
- * ELT and EPIRB beacon batteries should be disconnected when the unit is not regularly used, or is being shipped or disposed of.
- * Familiarized yourself with ELT and EPIRB operating instructions before having to use the unit in an emergency situation.
- * Only test the ELT and EPIRB during the first 5 minutes of any hour and limit the test to 3 audio sweeps.
- * If equipped, listen to 121.5 MHz to verify that the ELT or EPIRB is not accidentally on.

ing up real signals. While U.S. Coast Guard boats don't use EPIRB direction finding equipment, the aircraft (fixed wing and helicopter) have homing equipment. So does the military. However, the Coast Guard and the military may be far too busy to track down accidentally activated EPIRB's during their four or five day activation life.

It's the job of the Civil Air Patrol, the official auxiliary of the United States Air Force, that helps track down real and accidental EPIRB activations. Civil Air Patrol personnel are very skilled at locating these beacons once they have been detected and localized by SARSAT. These search efforts are conducted in any terrain, on any ocean, day or night, and in any weather by volunteer members of the CAP.

Some United States Coast Guard auxiliary personnel are also trained in ELT/EPIRB direction finding techniques. Both units assist the U.S. Coast Guard in searching for EPIRB'S on the water, and assist the aviation service for tracking down ELT's on land.

Now the bad news—97.4 percent of most EPIRB activations are false or accidental alerts. A large percentage were found activated in boats in port, marine supply and radio stores, and aboard planes in aircraft hangers. Boat owners were the worst offenders—they had more accidental activa-

tions than the hard landing activations by aircraft owners. Since the EPIRB does not give out any cockpit audible signal, you might not even know that it went off.

The new 406 MHz system would allow rescue centers to call up and verify the status of the vessel registered to the EPIRB via the digital information received. This will save a lot of headaches for the auxiliary and the CAP.

The law allows for EPIRB'S only to be tested during the first five minutes of each hour, and only a maximum of ten seconds or one single tonal sweep.

If you're interested in EPIRB and ELT tracking, contact your local United States Coast Guard Auxiliary unit or Air Force unit and ask for more details about their auxiliary groups. Tracking down these signals as a well coordinated group is much better than trying to do it by yourself without any formal training. There are many ELT direction finders available well under \$400 if you have a VHF marine or VHF aeronautical handheld receiver. You can even build DF loops for less than five bucks to add to your existing radio or scanner system.

The emergency position indicating radio beacon system works—thanks to these auxiliaries and the cooperation of anyone who owns an ELT from keeping it from false activating.

PC

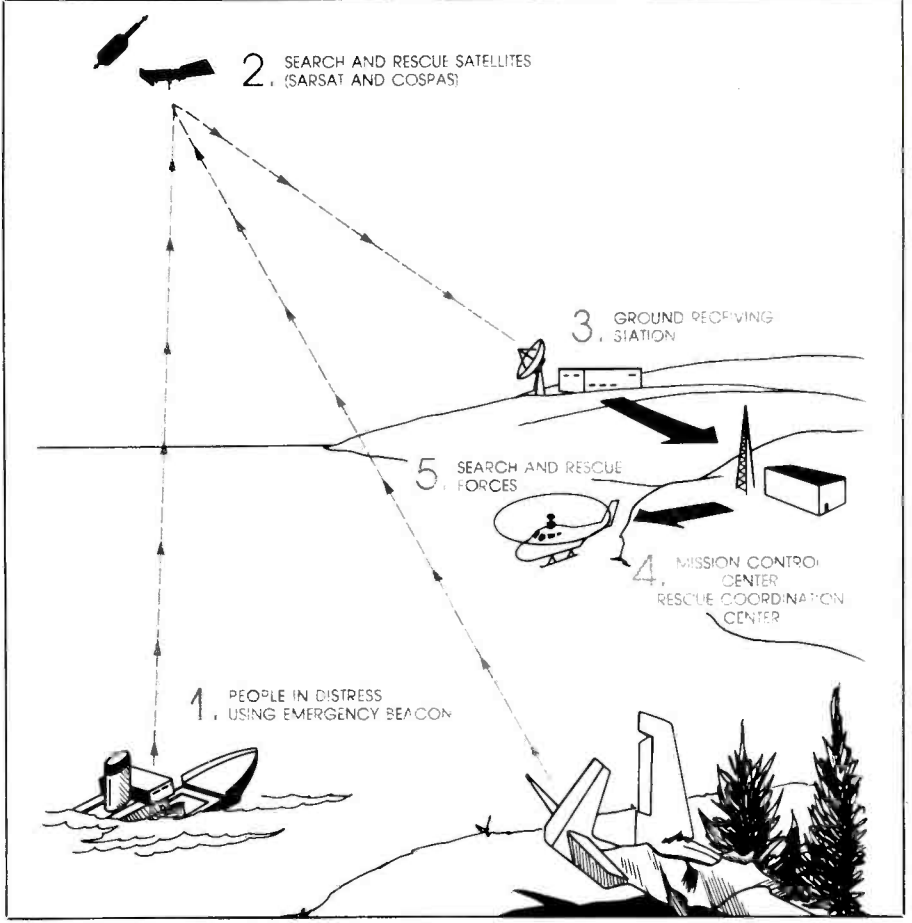
tion, the information is not received on earth. This is a problem with our present system.

The New System

The 406 MHz system will allow satellites to store the digitized information, and transmit it automatically to a ground station when it's within view. This is a big advantage, but the 406 MHz system is still several years away before it will be in full swing.

As of May, 1986, there have been 577 persons rescued, 244 in the drink, 311 aircraft saves, and 22 remote location saves. The number of lives saved by SARSAT, just in Alaska, is over 150!

Your biggest problem, as a potential rescuer, is the accidentally activated EPIRB. They might cover up a real distress signal—because all sets operate on the same frequency and satellites cannot differentiate between real signals and false signals cover-



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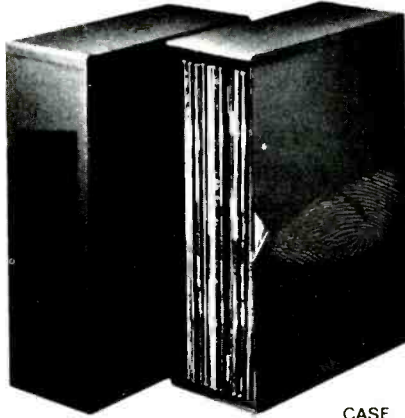
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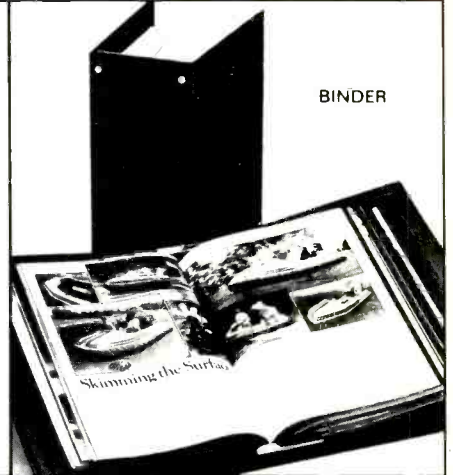
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CLANDESTINE COMMUNIQUE

WHAT'S NEW WITH THE CLANDESTINES

BY GERRY L. DEXTER

Questions. Mysteries. That's what clandestine broadcast monitoring is all about. Without the questions and mysteries, chasing these shadow broadcasters wouldn't be nearly as much fun, nor hold nearly the interest it does. That's not to say that we don't want answers to those mysteries and questions, we certainly do. But it's a sure bet that there will always be questions without easy answers so there's little need to worry about waking up one morning and finding all the mysteries solved.

For the serious clandestine monitor there are three elemental questions which are asked about each clandestine station: What group is behind the station? Where is the station located? How may it be QSL'd? Clandestine hunters feel that they are doing pretty well if they can answer at least two of those questions about each station. And it might be a little surprising when we stop and realize that, indeed, we seem to have accomplished at least that much with the many clandestines currently in operation. We may know the name of a specific political or revolutionary group or, based on strong circumstantial evidence, can at least assume which government is behind a particular station. We may rarely know exactly where a transmitter is located but we can often pin the location in specific country or area within a country. Often we have mailing addresses and often that leads to QSLs.

But there are a few stations about which none or perhaps only one of the three questions has been answered. Here's a look at current clandestines about which we still have more questions than answers.

Radio Caiman - The anti-Cuban powerhouse which is widely heard during its 1200 to 1500 and 0000 to 0400 broadcasts on 9960. We do not know who, or what, is behind these broadcasts other than the possibility of a shadowy group (if it is a group) known as "Pro Libertad de Cuba." Further, there is no address available to which we might send a reception report.

Cubanos de Africa - This station, audible at times from 0500 sign on on 6045 broadcasts in Spanish to Cuban troops serving in Angola. We can presume that the transmitter of this station is somewhere in the Republic of South Africa but we do not know who runs this station nor is there any address to send reports.

Radio Bardai - A station broadcasting against the current government of Chad. It may, as is claimed, be the voice of the Transitional Government of National Unity (GUNT), which is the Libyan-supported opposition group but, more likely, the station is

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GREAT RADIO READS



run by the Libyans under a GUNT wrapper. Either way, we have been unable to obtain any address for GUNT. Radio Jamahiriyah's "European office" in Malta "knows nothing" about the station. Surprise, surprise. Radio Bardai is on 6009 and runs until around 2030 sign off daily, mostly in French.

Radio SPLA - The Sudan People's Liberation Army and Liberation Movement run this station which North American clandestine hunters can often spot around 1300 UTC on 11710. We're not sure where the transmitter of this one is and we've also drawn blanks on an address. SPLA is an active group which has even had its representatives on American TV! Yes, there is an address, in fact, the Red Cross office in Geneva has it—but would you believe they say that its classified information?

The various anti-Chinese broadcasters - those masters of the ten minute spiel, including the *Voice of the PLA*, *Radio October Storm*, *Song of Liberation* and *China*

People's Broadcasting Station, are all government sponsored clandestines. The question is, which government? One set of experts insists they are the work of the Republic of China while others believe these signals come from across the border in the Soviet Union. The arguments in favor of the Taiwan location seem to make sense until you start asking why these stations tend to go off the air for weeks or months when relations between Moscow and Beijing take a turn for the better! Of course, there aren't even any hints about possible addresses for these stations which operate very sporadically, generally between 0900 and 1400 on 7185 and 9270.

The Radio Voice of Ethiopian Unity - Announced as an effort of the Ethiopian Democratic People's Alliance and now on the air in local languages from 1800 on 9430 and 11180 may be coming from the Sudan (since that oddball 11180 frequency was once used by a Sudanese-supported anti-Yemen clandestine) but, still, that's somewhat uncertain as yet and no address for this group has turned up.

Finally, there's the anti-Guatemalan "clandestine" *La Voz de URNG* (Unidad Revolucionaria Nacional Guatemalteca) being heard nightly at 0100 on 9966. Which pigeonhole? Is it more a spy or military communications station than it is clandestine? It seems so, since much of the "programming" is numbers. URNG is, of course, a legitimate group. In the case of this station the question is more "what's this for?" than it is anything else.

Any readers with any leads, information or ideas regarding possible answers to these questions are encouraged to contact this column. We can keep your identity confidential if you so desire.

Robert J. Ross of London, Ontario checks in with three nice loggings: Iran's Flag of Freedom Radio was heard on 9045 at 0421 broadcasting in Farsi. Robert also tuned in the anti-Angolan station operated by the UNITA guerrillas—*A Voz de Resistencia do Galo Negro* on 4975 at 0439 in Portuguese. And he picked up the Voice of Ethiopian Unity (mentioned above) at 1857 in Amharic with talks, flute and string music on 11180, parallel 9430 with the former frequency providing the better reception. It was just the opposite here at our monitoring post; 9430 was fair to good but 11180 was inaudible!

That'll do it for this month. Please let us have your clandestine station loggings, information and observations.

Good hunting!

PC

27 MHz COMMUNICATIONS ACTIVITIES

Some operators affectionately refer to their favorite Cobra CB transceiver as the *Talking Snake*. One of the newest additions to Cobra's long line of quality rigs is the Model 31 Plus; a transceiver that offers some fine innovations that we haven't seen elsewhere.

For one thing, the unit has six user-programmable preset channels that can each be directly accessed by front-panel buttons. This allows you to pick your six most-wanted channels (such as Channel 19, plus five popular neighborhood "home channels") and set them up just like you would for instant-access of AM/FM broadcast stations on your car radio. Another great new feature is instant-access by front-panel pushbutton control to bring in NOAA 162 MHz weather broadcasts.

The Cobra 31 Plus also has an instant Channel 9 button, local/distant receive select button, up/down channel selector buttons, noise limiter/blanker switch, PA system, panel light dimmer, and built-in progressive light indicators that show relative power output, received signal strength, and SWR.

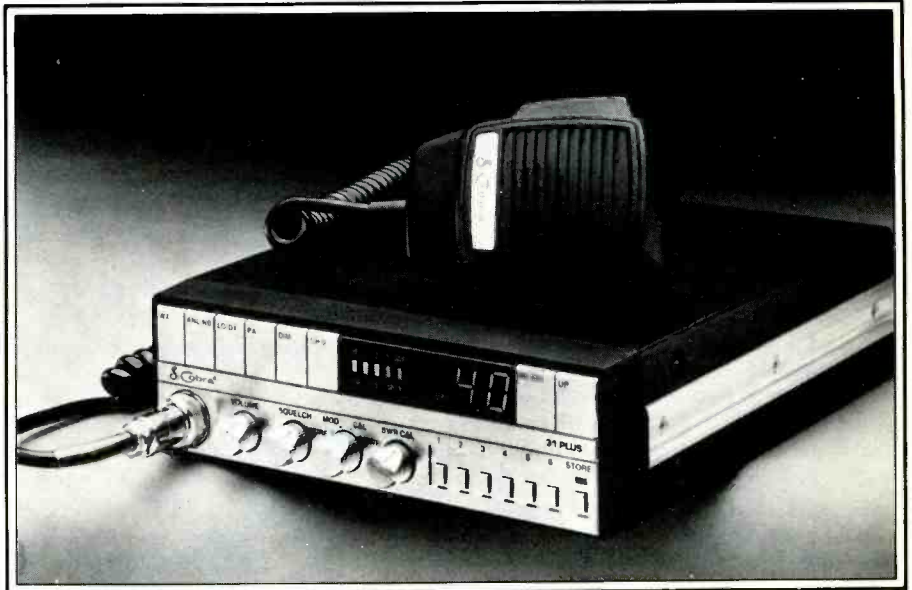
We'd have to say that the Cobra 31 Plus is a definite step forward in CB technology. In addition to being easy on the eyes, it shows that Cobra's design engineers are coming up with interesting and useful features that haven't previously shown up on CB rigs—and, after almost 30 years worth of CB radios, you wouldn't think there would be many new features left to include in a transceiver.

For more information, contact Cobra Consumer Electronics, Dynascan Corp., 6500 West Cortland Street, Chicago, IL 60635. By the way, this new rig carries a suggested retail price of \$199.95.

From Out Of The Mail Sack

The reader response to our CB corner has been quite enthusiastic and I want to encourage readers to keep that mail rolling in. Like Mark Morgan of Loveland, Ohio. Mark sent a photo of his SSB station and a letter that asks us to work towards shaking off the negative stereotypes that some CB'ers brought to the service in the past. He's a scanner monitoring fan and also a broadcast band DX listener, but mostly Mark likes to enjoy meaningful SSB contacts and discussions with others who share his interests.

We like Mark's approach, and also his station layout. Note in the photo how (to the right) he has at hand a selection of frequency guides and other books available for ready reference. A map on the wall shows his county and those surrounding his station.



No doubt about it, this new Cobra 31 Plus has several useful and unique features to delight the fussiest operator.




Mark Morgan's CB station is set up for ease-of-operation.




Nick Turoff stepped off to the side to give us a better look at his complete station which includes CB's, scanners, and shortwave receivers.

SAMLAW



THAI LADY



KZA
6724
Clif & Pon
Freligh

Background PEANUTS

SSB 3447 SWS 1869 Gold Coast 3586 SR 869
ARC 2507 155A-RS 330

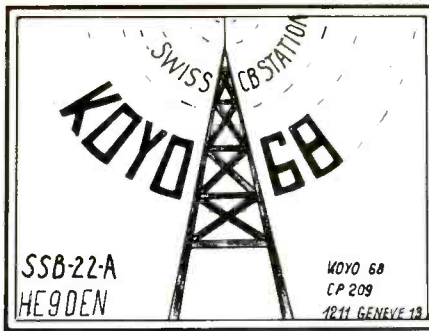
Samlaw is the AM handle of Cliff, SSB-3447. Here's his QSL.

Matt E. Matthews, SSB Network member SSB-533A, of Marysville, CA writes to say that he's been a radio enthusiast since 1933, and into 11 meters for the past thirteen years. His CB station consists of a Robin 520 base and 510 mobile rig. The base station antenna is a PDL-2 and a Starduster modified with four 102-inch Francis graphite whips. Also at the station are AR-2002 and Bearcat 210XL scanners, plus a Realistic DX-302 general coverage receiver. He will soon be replacing his longwire short-wave antenna with an Alpha Delta Sloper.

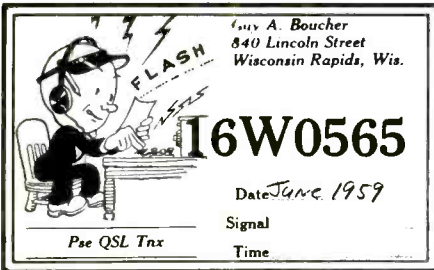
Don Hallenbeck, Pittsfield, ME complains about all of the bizarre sounds that assault his ears every time the band opens for skip. In particular, he doesn't mind the chatter, but he isn't at all pleased about listening to electronic bird calls, Q-birds, whistles, overmodulated voices, and echo



Nick Turoff passed along this photo of his sharp looking CB station.



Our overseas-card-of-the-month comes from Switzerland this time. It's the colorful card designed by Philippe Fontaine of Geneva, known on the band as KOYO-68, and as SSB Network member SSB-22A.



Tracy Sands is interested in those old time QSL's with the strange CB callsigns. This one, from 16W0565 in Wisconsin, shows one of those callsigns. This QSL is from our own collection and is dated 1959.

chambers. He says that during a recent skip opening, there was a skip station on Channel 12 that was overmodulating to the point where he was splattering his modulation on to every channel from 9 to 15!

From Traverse City, MI comes a letter from Ted Jones. Ted comments that winters are usually "rough" around his part of the world, and CB is useful in keeping track of family and friends as they endeavor to travel through the deep snow and over the ice-covered roads. His business requires lots of driving, and his wife is in constant touch with him via CB, passing along his telephone messages while he's on the go. He says that he is eligible for business radio, but the cost is way out of proportion to the benefits of CB. And, besides, CB is constantly monitored by an army of stations that can always relay messages or offer aid if you're in a difficult spot. We agree, Ted.

Delta Tango 62 is the sideband ID of Jack McMahon, Buffalo, NY. He says that Channel 9 in his area is often useless because of bleedover from overpowered stations on Channels 6 and 11. Jack says that he loves his Shakespeare Big Stick antenna, and doesn't miss a single copy of POP'COMM.

Cliff Freigh, whose SSB Network ID number is SSB-3447, goes under the handle Samlaw on the AM channels around Clovis, NM. He says that there's a local AM-mode roll-call and check-in on Channel 33 every Wednesday night at 8 p.m. (2000 hours, local time). Cliff says that all are invited to join the goings-on, even those just passing through.

Baltimore, MD is the yakking area of Nick Turoff. Nick says that his CB station was shown recently on WMAR-TV in Baltimore. His CB station includes a Cobra 142GTL, Cobra 29LTD, Johnson 123, Bearcat 300 and Regency Monitoradio and Z-60 scanners, a Kenwood R-100 communications receiver, plus tape decks, weather data instruments, emergency power equipment, clocks, all sorts of antenna switches, and much more going together to produce a really beautiful installation. Nick looks forward to our column each month and was happy to see that POP'COMM is providing CB coverage.

Tracy Sands, P.O. Box 2425-119, Anaheim, CA would like to hear from people who collect antique CB QSL cards having those old-timey, pre-1962 call signs, with the digital prefixes such as 12Q1747, 2W1965, 18A6171, etc.

Bill Coolbaugh needs a manual for an old Royce transceiver he purchased used recently. Although he didn't specify the model number, he is looking for the address of the company. The last address I have in my files is Royce Electronics, 1746 Levee Road, North Kansas City, MO 64116. That address is several years old and I don't know if it's still good, nor the present status of the company. If anybody out there in Readerland has better information, contact Bill directly at Bill's Defensive Firearms, 1304 Fairlane Drive, Bettendorf, IA 52722.

CB radio does really seem to be experiencing a very healthy rebirth. I'd say that there seems to be two to three times as much activity on the air now as there was only a year ago. Three years ago the band was really quiet, but lately it's buzzing away. Lots of stations coming on of late are saying that they were on several years ago but eventually put away their gear, but they've heard that things are again getting busy and now they're back on the air again. That's a good sign.

Next month we'll be back with more CB news and views. Maybe we'll even have a photo of your station or your QSL (if you've sent either or both in to us). See you then.

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BROADCAST TOPIK

BY MARK MANUCY, W3GMG

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

This is the time of the year that AM DX'ers commute like the best of them. From October through April, the sunrise and sunset times are close enough to drive time, so that long distance 50 kilowatt stations can be heard driving to and from work. This year, for the first time, there may be more interference than in the past. With many new allocations on clear channels during the daytime, it may not be as easy to hear the distant stations.

Several people in the Baltimore/Washington area have expressed concern over the past year about not being able to hear WBZ (1030) during the late afternoon due to the new 50 kilowatt station south of Washington. It leads me to believe that WBZ had quite an audience in the area that have been blown away due to the new allocations on 1030 kHz over the past year or so.

There probably are other clear channel stations that no longer have the distant radio audience they used to enjoy from the Fall through late Spring, since so many new stations have been assigned to the U.S. clear channels. Maybe now they should be called the "cluttered channels"!

Due to an error on my part several months ago, quite a bit of my mail was inadvertently placed on my desk during a time when I had my computer in for repair. Upon returning the computer to service, it was placed on the mail in such a way as I did not discover what was done for several weeks. As a result, many letters have gone unanswered and some of the loop plans requests were also hidden from me. I apologize and will try to get caught up as quickly as I can.

Hank Rogers has a common problem. Many stations are heard all over the low end of the dial on the FM band and seemingly there is no answer to eliminating the inter-



ference. A Fisher MC-735 is used by Hank with a six element yagi antenna without a preamp. What to do? Well Hank, first let's do some simple math. Most FM receivers, if not all, use an IF frequency of 10.7 MHz. If the front end of the set is broad enough to "see" the entire FM band, then all of the signals that are present at the same time can interact with one another, as well as with the oscillator in the receiver. Any mathematical combination of these frequencies equaling 10.7 MHz is free to come through the IF system and be heard. The first thing to check is the alignment of the receiver. Things to try: An attenuator to drop the level coming into the front end of the set. If the front end is overloaded, preamp or not, it will do strange things. A switchable attenuator would be the best thing to have, then one could add, or subtract attenuation, as is needed to control interference. I mentioned one in a column some months back, so

check your back issues. Maybe, an antenna tuner for the FM band might be in order. This would allow the frequency you are listening for to be peaked, and all the others rejected. I don't recall ever seeing one, but maybe someone else has, and will tell us about it. This would also reject the aircraft band that some other readers might be hearing between 88 and 108. To determine where the interference is coming from, try turning the yagi and see if it changes in level at all. It might be when the antenna is pointed toward a certain station, the set is overloaded, and goes bananas. By avoiding this direction, or using the attenuator when pointed in this direction, then, the problem can be lived with. A notch filter can be used if the problem station(s) is identified. However a notch is generally pretty broad and is apt to zap a good portion of the band on either side of the problem station.

We always love to hear from a died-in-



"Here's the way to hold a Sony ICF-2010"

Station Update

Call	Location	Freq	Pwr	Ant
AM				
KCHG	Somerset, TX	810	.25/0	DA-D
KIRS	San Diego, CA	1040	4.5/5.0	DA-2
WIXC	Hazel Green, AL	1140	20/0	DA-D
FM				
KUNY	Mason City, IA	91.5	80	360'
KRDC-FM	St. George, UT	91.7	.105	312'
WYFL	Henderson, NC	92.5	100	989'
WWWO	Hartford City, IN	93.5	1.55	442'
KLTG	Corpus Christi, TX	96.5	100	955'
WZLD	Cayce, SC	96.7	1.91	404'
WKRL	Clearwater, FL	97.9	100	580'
WZLQ	Tupelo, MS	98.5	100	960
WJML-FM	Petoskey, MI	98.9	100	970
WQCR	Burlington, VT	98.9	100	297
KSKB	Brooklyn, IA	99.3	3.0	169'
KLZX	Bountiful, UT	99.5	22	3874'
WEMI	Neenah-Menasha, WI	100.1	3.0	328'
WHOT	Youngstown, OH	101.1	24	710'
KEZV	Spearfish, SD	101.1	100	1606'
WDNL	Danville, IL	102.1	50	356'
WYCQ	Shelbyville, TN	102.9	100	820'
WMRQ	Boston, MA	103.3	16	890'
KESY-FM	Omaha, NE	104.5	100	1052'
KWTD-FM	Lonoke, AR	106.3	2.5	353'
WSKX	Suffolk, VA	106.9	100	954'
WCTD-FM	Federsburg, MD	107.1	1.93	1294'

Key: D = Daytime, N = Nighttime, DA = Directional Antenna, DA1 = Same Pattern Day and Night, DA2 = Different Pattern/Power Day/Night, NDA = Omni Antenna Day and/or Night, * = Special Operation or Critical Hours, N/C = No Change.

the-wool AM listener such as Mike Landkamer. He recently decided to upgrade his stereo system by buying all new! Being determined to get a good AM section this time around, Mike found he had to hunt far and wide to get what he wanted. Finally buying a separate tuner/amplifier since it was difficult to find a receiver with a good AM tuner, Mike settled on the Carver TX-2 tuner, even though it was only a mono AM tuner. Mike now spends evenings listening to old radio on WBBM instead of watching TV!

Last month I mentioned the poor quality AM section of the newly acquired radio in the vehicle I'm presently driving. Several days later I ran across a new magazine put out by STEREO REVIEW called CAR STEREO REVIEW (Fall, 1987; Vol. 1, issue 1). In searching the magazine I was able to find very few quality AM receivers and only fifteen with AM stereo. Not bad you say? Not good I say! It was only 5% of the models reviewed. Most of the quality AM sections were in very expensive systems. I did find one reasonably priced unit which fit the specifications I laid out last month in this column which I'll go over in the future. The set was so new that I couldn't find one when I called around Washington and Baltimore. Everyone said, "It'll be in next week." Hope so!

Other comments about AM and AM stereo,

come from Philip Galasso, who complains about the poor programming available on the AM band today. Of the stations he has compared, stereo AM versus FM, he says the AM has a better sound. Maybe not the brilliance, but generally the quality is better. The brightness will be coming too, Philip, as the stations convert to the new NRSC standard which gives the AM station a pre-emphasis curve similar to the FM stations. Done correctly, the difference is dramatic. One other question from Philip, why are news and talk stations using stereo? Some are doing a good job with it while others are not. A stereo commercial on a talk station would really stand out and draw the attention of the listener. The participants on a talk show would be placed slightly to either side of center to provide a spatial effect. The sports broadcast, in stereo, would place the listener right behind home plate, where he could hear the crack of the bat, as if he were there. It is these directions that AM radio is taking with stereo that will help to draw the audience back into its ranks.

People in the print business must be second only to radio people as BCL's. Within a couple of weeks of one another, Dean Kazmierczak and Jeffrey Jarosz, both sent me hot releases of information they had just printed for radio stations.

Lloyd Kantor read what we said about the



Navajo station some months back and sent me some information on the Apache Indian station, KNNB. He never saw the station but the arrow points the way!

M.H. Schneider has the right idea for his 2010. See the enclosed photos showing how he adapted a computer printer stand to work with his Sony!

A month or so ago, mention was made of a recent purchase of the Radio Shack AM Stereo tuner during a closeout sale. This has turned out to be a pretty good little tuner when used with a booster antenna such as the Select-A-Tenna. As with most AM tuners that are inexpensive, the low and high end audio response is rolled off. However, with the NRSC standard taking a good hold, the average sounding station sounds much better on the inexpensive radios. The R-S tuner must not have sold too well or I'm sure it would still be available. It has strong, but smooth analog tuning, and a good stereo section. The bandwidth is adequate and for the \$30.00 I paid it was a good deal.

The NRSC standard for AM stations I just mentioned seems to be catching on in a big way. According to a spokesperson at CRL, one of the companies offering a retro-fit kit for their processors, they can't keep parts in stock to build them. Contrary to the stereo dilemma, it seems as if broadcasters are anxious to improve the quality of sound coming from the transmitters. The cost for this NRSC model is under a kilobuck, whereas a stereo can cost up to \$10,000. Basically, the NRSC standard is a pre-emphasis curve, similar to the FM pre-emphasis curve. The AM curve was figured using the average bandwidth of an AM radio. The bandwidth of the AM radio rolls off very quickly above 2 to 3 kilohertz. The NRSC standard starts to emphasize the audio frequencies from this point out to 10 kHz. The boost at 10 kHz is 10 db, followed by a very sharp cutoff filter at 10.5 kHz, similar to the cutoff used for FM stereo at 15 kHz to prevent interference to the stereo pilot at 19 kHz.

The AM filter is used to reduce adjacent channel interference. It would seem that with 10 db boost at 10 kHz, the adjacent channel interference would be greater, but, in reality, tests have shown interference is actually reduced. I saw a demonstration of this at Delta Electronics when used with C-Quam stereo. They had a storage spectrum analyzer and a before and after picture, with, and without the filter, using actual

Call Letter Changes

Location	Old	New	FM Stations	New	FM Stations
AM Stations					
Hanford, CA	KNGS	KCLQ	Modesto, CA	New	WAGH
Colorado Springs, CO	KPIK	KWYD	Hanford, CA	KCLQ	KCLQ-FM
Westport, CN	WMMM	WCFS	Georgetown, DE	WSEA	WSEA-FM
Georgetown, DE	WJWL	WSEA	Marseilles, IL	New	WAEM-FM
Coleman, FL	WMHI	WWLW	Crawfordsville, IN	WLFQ	WIMC
Brunswick, GA	WBGA	WGIG	Delhi, LA	New	KKRR
Chicago, IL	New	WMXA	Bastrop, LA	KJBS	KMYQ-FM
Radcliff, KY	WHOO	WYCP	Muskogee, MI	KRLQ	KKWK
Bastrop, LA	KVOB	KMYQ	Ithaca, NY	WHCU-FM	WXYL
Skowhegan, ME	WQMR	WSKW	Washington, NC	WFXI	WFXZ
Lancaster, NH	New	WLGW	Hardeeville, SC	New	WWDR
Morgantown, NC	New	WCIS	Allendale, SC	WYXZ	WDOG-FM
Mount Pleasant, SC	WIXR	WZJY	Oak Hill, WV	WOAY-FM	WVMA

compact disc programming. Using the same musical selection which had a lot of high-end audio, the spectrum was less with the NRSC standard. Skeptics were convinced. The end sound in the Carver receiver was brighter with the NRSC. However, with this particular receiver, the audio was flat to about 10 kHz to begin with, so I would have had to reduce the treble a bit to listen over a long period of time. I must say that it was a pleasure to hear AM sounding so good through a home receiver.

Many AM stations have excellent audio.

It's been a shame, that over the years, we have had such poor receivers and radios to listen to what has probably been outstanding, quality sound, and never hearing the real thing. The rest of the stations will now have to play catch-up, not only to the FM band, but now to their better sounding competition in the same band.

Better AM receivers are just around the corner. Because of the activity on the part of the broadcaster to install the NRSC standard, receiver manufacturers said they would match the NRSC standard with a de-

emphasis curve, just as they have been doing forever with FM receivers. What this means to the AM stations using the NRSC standard is they will have a flat audio response coming from the NRSC receivers out to 10 kHz. The other stations will sound the same as they do now, dull! Those engineers I've talked to are excited about having their stations finally sound the way we've known they've sounded all along!

So, if you've noticed your favorite station sounding a bit better lately, NRSC is probably the reason why.

The sunspot cycle bottomed out last Fall and that means nothing but improvement ahead in the short wave bands. So, if you've been promising yourself to try and log some real DX on the AM band, the best time is right now. Skywaves were so hot the other night, that the local channels were being hit with heavy interference real close to home, giving only a few miles of interference free coverage. In the Spring, no doubt the FM band will be better than it has been in many a year and the summer skip should be better as well.

The other day, I heard a station I want to compliment. WMZQ simulcasts country music on both their AM and FM. They are 1390 and 98.7 on the dials. The station gives equal billboarding to both stations, but, its the AM, with stereo, which is the more heavily promoted. The coverage on the AM seems to be better than I remember in past years. So, WMZQ is now part of the AM revolution joining the station I mentioned last month, WFIL. All should take heart, as there are some concerned AM broadcasters out there who are making an effort to improve their facilities. I've talked with four managers in the last month that will be installing the NRSC standard or are interested in improving their air sound. Just to get managers to discuss this type of thing is enough to keep an engineer on a high for a month!

Well, that brings us to the end of another tape, remember the mailing and photo address is P.O. Box 5624, Baltimore, MD 21210.

YOU AIN'T HEARD NOTHIN... YET!

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SCANNER SCENE

BY RICK MASLAU, KNY2GL,
GUEST COLUMNIST

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

Regency Electronics has announced the winners of their "Scanner Answer" Giveaway Contest.

Charles Tenwick of El Cajon, CA, was the Grand Prize winner. Tenwick correctly answered the questions listed on the coupon and his entry was selected at random from more than 25,000 entries. As the Grand Prize winner, Tenwick receives a complete monitoring package, including one Regency Z-60 Base Station Scanner, one Regency HX-1500 Handheld Scanner, one Regency R-806 Mobile Scanner and one Lunar GDX-4 Antenna.

Five first place prizes, which included one Regency Z-60 Base Station Scanner and one Regency R-806 Mobile Scanner, were awarded to: Wade Holland, Greenville, SC; Jimmy Cashatt, Denton, NC; Roy Peck, Missisauga Ontario, Canada; Allan Claunch, Oklahoma City, OK; and Terry Petrarca, Fort Lauderdale, FL.

Five second place prizes, which included one HX-1500 Handheld Scanner, were also awarded. The winners were: Gary Oxford, Waco, TX; Michael Baldasano, Las Vegas, NV; Glenn Wilkinson, Arleta, CA; Joe Bonfanti, Cleona, PA; John Relf, Minneapolis, MN.

The Z-60 Scanner receives all standard public service bands, FM broadcasts and aircraft transmissions. It has a built in digital quartz clock with alarm. Other Z-60 features include; 60 channels, keyboard programming, priority control, digital display and permanent memory.

Regency's HX-1500 is ideal for scanning on the go. It features 55 channels, 4 independent scan banks, a top mounted auxiliary scan control, liquid crystal display, rugged die-cast aluminum chassis, covers ten public service bands, including aircraft, and it is keyboard programmable.

Regency R-806 is a compact mobile scanner, just right for today's smaller cars. It is the world's first microprocessor controlled crystal scanner and features 8 channels, programmable priority, dual scan speed and bright LED channel indicators.

Rounding out the Grand Prize package is the Lunar Electronics GDX-4 Broadband monitoring reference antenna. The GDX-4 covers 25-1300 MHz and includes a 6 foot tower.

Reader Inquiries

A letter from Hayden Johnson, Manager of B-In Touch, Inc., Lebanon, KY informs us of the communications facilities at Kentucky LifeCom, an organization housed in the HQ's of the Campsville-Taylor County Rescue Squad. KLC dispatches for area



The Regency "Scanner Answer" Giveaway winner, Charles Tenwick of El Cajon, California, was selected from more than 25,000 entries by: Elaine Lee, Regency Electronics Marketing Services Assistant; Ron Cooper, Vice President of Sales and Marketing for Regency Electronics, left; Joseph E. Boone, Regency President and CEO, right.

FD's, ambulances and rescue squads, plus doing medical and business paging. In addition, they assist medical helicopters. The KLC communications cover south central Kentucky using repeaters on numerous frequencies.

In addition to all ten UHF Med channels, KLC uses: 152.005, 152.48, 154.25, 154.325, 155.16, 155.22, 255.28, 155.295, and 155.34 MHz.

How 'bout an inquiry from Leon Kelln, Jr., KB5BYB, of Amarillo, TX who asks if we can give him the frequency used by the

Texas Department of Corrections. Take a listen on 37.18, 37.22, and 37.26 MHz and you'll probably be able to tune in on the new maximum security prison to be built in your hometown. In fact, those frequencies should work throughout the entire state for monitoring the busy and crowded penal system.

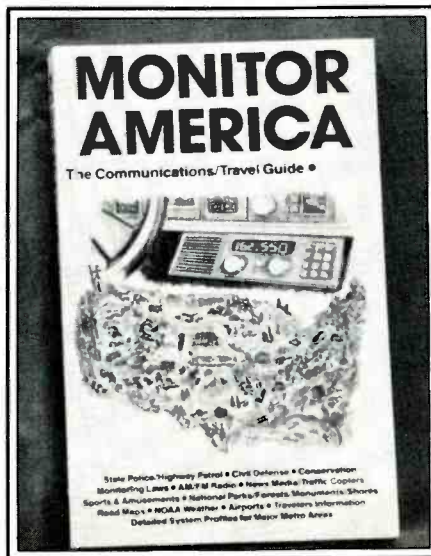
Robert Grenlie, registered monitor KIL9HB, of Chicago writes to tell us that the Chicago Police Department at Chicago O'Hare Airport have recently changed frequency. There are two separate police units assigned there, the "050" is for traffic enforcement, while the "049" unit is for flight screening. The traffic unit switched from 155.835 MHz to 813.766 MHz. The "049" unit remains on 155.835 MHz. The O'Hare Security Department has also moved to 813.766 MHz.

It's probably an academic question, but Ben Carlucci of California wants to know the frequencies used for highway radio callboxes, and if they need to be FCC licensed. They are licensed in the Local Government radio service and operate in the 72 to 76 MHz band. Some older callboxes are still authorized on 458.025, 458.075, 458.125, and 458.175 MHz. Communications are non-voice.

Frenchie, of Indiana, says that he read in last month's *Books You'll Like* that we felt the *Scan America* directory was a poor excuse for a frequency guide. Says he couldn't agree more, and identifies its anonymous author as Dave Jones of Ohio. He suggests that we tell readers looking for a useful national frequency guide about *Monitor America*—that we can do since we have happily used the excellent *Monitor America* directory here.

Monitor America is a fat book containing almost 600 pages, showing systems in all states. These systems include state police, CD, forestry, the news media, traffic 'copters, sports and amusements, and more, plus detailed system profiles for many major metro areas (frequencies, signal codes, district/precinct into, etc.). It's an enormous amount of information that every scanner owner will find invaluable. The 1st Edition (that is, the currently available edition) is available at \$12.95 per copy (plus \$2 postage/handling). It's available from CRB Research Books, Inc., P.O. Box 56, Com-mack, NY 11725. (NY residents include sales tax).

Lastly, Bill O'Connor, Saugus, MA asks for information on monitoring ship-to-shore telephone calls. These frequencies (nationally) are: 161.80, 161.825, 161.85, 161.875, 161.90, 161.925, 161.95, 161.975, and 162.00 MHz. **PC**



Almost 600 pages of vital frequency information from coast-to-coast is in the fat *Monitor America* directory, First Edition.

NEW AND EXCITING TELEPHONE TECHNOLOGY

It's For You!

Having phones all over the house, even in the basement and garage, is one of the conveniences of modern life. Having to schlep all around the house trying to find a missing spouse to announce that the phone is for them is a major inconvenience. Businesses have intercom lines and pagers to announce that line three is for accounts. Why not a home system so ol' meathead knows that line one is for him?

There are various solutions to the problem. The obvious solution is to install a business key system such as the Comdial Executech. This is a favorite system used in Beverly Hills mansions. With simple modification, it can be used to open the front gate and talk to people at the front door. More than a telephone, a home control center. This type of system can cost anywhere between fifteen hundred and six thousand dollars.

The other solution is to install a "squawk box" intercom in the house. A simple two station intercom will cost about forty dollars. Better intercoms and more stations will cost more. Some intercoms are "wireless," they send a low frequency (about 100 kHz) FM signal through the house AC circuits. The non-wireless intercoms require wiring. Those wired intercoms requiring two to four wires can "borrow" the unused pairs on the house phone wiring circuits.

The third solution is the cheapest and most simple. It consists of a buzzer that lets the person know that the phone is for them. It can be made more sophisticated as well. Buzzers can be added. Codes can be thought up—one beep = Dad, two beeps = Mom, three beeps = number one son. To save the house "operator" the inconvenience of keeping the phone off the hook until the beeped party gets on the line, there is another accessory—a hold circuit. The hold circuit can be used on any phone and is also handy in putting the phone on hold while you dash to another phone.

The trick to this buzzer circuit is to use the spare pair on the telephone wire. If you have only one line it should be on the first pair—either Red and Green or White/blue and Blue/white. The second pair are Black and Yellow or White/orange and Orange/white. If you have two lines, the second line should be on that second pair. If you have three pair wire in the house, you are still in luck. Even if there is no spare phone wire, some new wire can be installed. It just means more work.

Before you start using any apparently unused wire, check very carefully. On that second pair you may find one or more of the

Figure 1.
Parts List For Buzzer Circuit.

- B1 Buzzer or peizo beeper (RS # 273-071)
- BAT1 Battery to match voltage required by buzzer
- S1 SPST momentary switch (Normally open) (RS # 275-1547)

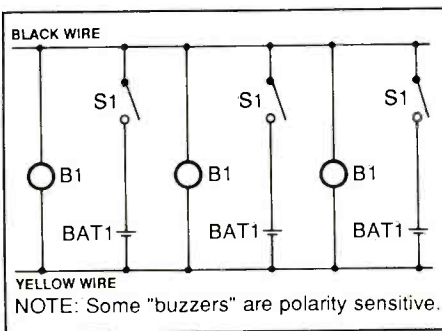


Figure 2: Call alerting circuit.

following: A second line—it may not be yours, it could be the apartment's next door. A voltage to light the dial of a Princess telephone. If the Princess phone is no longer connected, look for a small plug in wall transformer with the Bell logo on it and remove. The Yellow wire may be grounded.

Another thing to check before installing the buzzer circuit is continuity. Often, when the phone company installs phones, they only connect the first pair. The second pair are left unconnected in junction boxes. Don't forget that jacks are often used as junction boxes. If you see a wire coming in

Figure 3.
Parts List For Hold Circuit

- R1,2 10 to 22 Ohms 0.5 watt carbon composition resistor (RS # 271-005)
- R3 1 kilo Ohm 0.5 Watt (RS # 271-023)
- R4 470 Ohms 0.5 watt (RS # 271-019)
- VR1 Varistor. GE V130LA20A Panasonic ERZC20DK201U (RS # 276-570 or 276-568)
- D1-4 1N4007 1 KV 1 Amp diodes (RS # 276-1114)
- D5 1N4148 small signal diode (RS # 276-1122)
- SCR1 600 V 800ma SCR Motorola MCR 100-8 (RS # 276-1020)
- LED T1 3/4 LED any color (RS # 276-041)
- S1 SPST momentary switch (Normally open) (RS # 275-1547)

Note: All of the Radio Shack part numbers (RS #) given in the parts lists may not be for the actual part called out in the parts list. Some are for the closest parts substitute available in the Radio Shack catalogue.

and going out of a jack, you can be sure the wires are joined at the screw terminals. To use the second pair, you are going to have to get down on your hands and knees, screwdriver in hand, and connect all those wires. Now you should have a spare pair of wires at every jack and in every position where you have a phone.

Looking at Figs. 1 and 2, you can see the

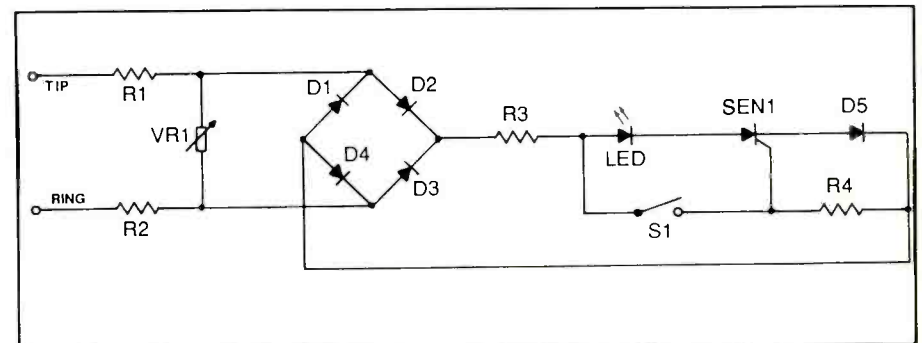


Figure 4: Telephone hold circuit.

schematic and parts list for the call system. You may add as many beepers as you wish. You may also add as many call buttons as you wish. When you push a button, all the buzzers will sound. Note that each call button has its own battery. Instead of batteries, you can use low voltage power supplies. The surplus wall plug power supplies that are supplied with calculators are ideal. In the parts list, a Piezo beeper is called out, but this is not your only choice. You may use regular doorbells, buzzers, flashing lights, anything that gives a signal when a voltage is applied. You may even use a relay, what the relay switches, is up to you.

The hold circuit is relatively simple to build and use (see Figs. 3 and 4). Telephone circuits can produce some surprising transient voltages, which explains why high voltage components are called out for use on a circuit that usually only sees 48 volts. You can use lower rates components, but if the circuit dies one day, you will know why. The two 10 Ohm resistors are surge absorbers to protect the semiconductors as is the Metal Oxide Varistor. These two resistors should be carbon composition not carbon or metal film. Carbon composition resistors are the old style and may be hard to find. Although modern carbon film resistors are built to a higher tolerance and are more stable, they tend to go up in smoke when faced with telephone line transients.

To use the hold circuit, press down the button and hang up the phone. The LED will light and stay lit as long as the call is on hold. If another extension is picked up, the light will go out. If the calling party gives up then hangs up, after awhile, the light will go out. Should someone push the button while the phone is not in use, the LED will come on. The LED will stay on for under twenty seconds while the dial tone is fed down the line. When the dial tone times out, the battery voltage will be momentarily dropped, at which point, the LED will extinguish. Using this hold circuit will not put the line out of commission if it is forgotten. Leaving a forgotten extension off hook will busy the line out until someone notices it.

The hold circuit can be built into a phone, or built into a box and attached to the line with a modular plug. The circuit could be hard wired to the line, but this is not appreciated by the FCC and the local phone company. All customer devices should be modular so they can be removed should the malfunction. The other advantage of using modular jacks is that it is easy to move things around.

Either of these circuits should come in handy for anyone with more than one extension. Using them together adds the convenience of a business system. Although not a real intercom, by hitting the beeper button and picking up the phone, the system can be used as an intercom. The phone company may not be too happy about you using their battery to power your intercom, but you are not going to be arrested for doing it.

PC

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THE EXCITING WORLD OF RADIOTELETYPE MONITORING

A new news agency, apparently operated by the rebel forces in Angola, was found transmitting using RTTY over HF radio beginning last September. Called Kwacha UNITA Press (KUP), the agency claimed it was sending dispatches from Jamba, "the provisional capital of liberated Angola."

News items were in French, Spanish and English. Daily transmissions lasted about 30 minutes. Each day one news item of an anti-Soviet, anti-Cuban nature was aired in the three languages and was repeated throughout the broadcast period. A test tape of RY's, along with an ID and transmission schedule, separated each foreign language dispatch.

UNITA, or National Union for the Total Independence of Angola, is the rebel group that is supported by the United States against the Marxist government of Angola in a civil war that has been waged since 1976.

The Soviet-supported government is controlled by the People's Movement for the Liberation of Angola (MPLA), which you'll see mentioned in many of KUP's dispatches.

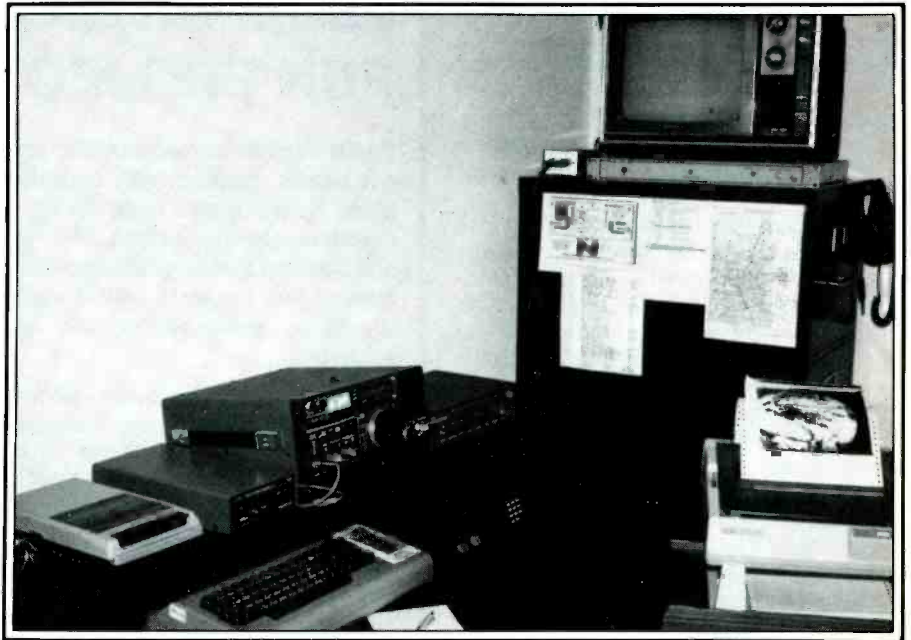
When I first came across this station it was transmitting on 7312.3 kHz shortly after 2300 hours UTC. RTTY settings were 170/50N. The announced frequency on the test tape was given as 7310 kHz. Early in October, KUP moved to 7307.5 kHz and sent news copy at 100 bauds, although the test tape still gave the 7310 frequency.

Here is KUP's transmission schedule as recorded from its test tape sent last September. The reader should be aware that KUP now could be sending at different times and frequencies than what was noted, or even could be off the air. At 0600 UTC on 10900 kHz to South Africa and Australia, 1130 on 15524 to Europe, 1200 on 18333 to the United States, 2000 on 12700 to Africa, and 2300 on 7310 to the U.S. and Europe.

I don't know the actual transmission site of KUP, but found it odd that for several hours preceding its broadcast, the French military, from its headquarters in Paris, would occupy 7308 kHz and send traffic via the TDM mode until about 2300 UTC and then would go off the air. KUP would then come on the air at 7307.5 kHz and send its news reports. Shortly after KUP closed down for the day, the French military would return to the air waves and resume sending TDM traffic. Is this just a coincidence?

On the 18-MHz band, I found KUP's transmission on 18330.5 instead of the announced 18333 at 1200 UTC. It was running at 170/100R.

It was the "Green" forces versus the "White" forces as Chile hosted the annual



The listening post of Bill Smith of Wylie, TX, consists of a tape recorder, RTTY demodulator, SW radio receiver, FAX demodulator, microcomputer, scanner, TV set with an amateur TV signal processor beneath it, and a printer showing a FAX printout. Bill didn't tell us if he uses the file cabinet to house all his RTTY loggings.

Inter-American War Games last October. Other participants in IAWG-87 were the navies of Argentina, Brazil, Colombia, Ecuador, Paraguay, Peru, the United States, Uruguay and Venezuela. Canada's navy acted as an observer of the events.

NBA, the U.S. Navy facility at Balboa, Panama, acted as the communications relay center during the war games. NBA used 11570, 16194, 16265, 18550, and 20350, and probably other frequencies as well. CCS, Santiago Navrad, Chile, used 16200 as "canal uno" to send IAWG-87 traffic.

When I last monitored the war games, just before writing this column, the White Pact had set up a 400 nautical mile security zone around its coastline. The Green Government claimed this action was in violation of international maritime law, and that it planned to continue to exercise its rights of free passage and fishing within the security zone. If Green was denied its rights it would consider this to be "an act of aggression and therefore reaction may be expected."

If you ever monitor Jamahiriyyah News Agency (JANA) from Tripoli, Libya, then you know that its news broadcasts often have to be taken lightly. Take for instance a story datelined Tehran, Iran, last October with the headline, "**AMERICAN HELICOPTER AND WARSHIP DESTROYED.**" The news copy read, "Iran

has announced today that its armed forces have shot down an American helicopter and damaged an American warship. An urgent communique reported by the Iranian news agency has said that this attack comes in retaliation against the aggression launched yesterday by U.S. helicopters against Iranian boats in the Arab Gulf."

This item never made the evening news on the three major television networks. Why? Because it never happened.

It seems as there are a few stations that are popping up using oddball shifts for ARQ and FEC, usually found with a 170-Hz shift. A few months ago I found an unidentified station on 18032.2 using 425-Hz shift ARQ at 1246. Fred Hetherington of Florida has logged it at 2000 with a 400-Hz shift. No particulars about this station has been found in frequency guides or ITU files, so reader input is welcomed.

An interesting RTTY transmission apparently from a U.S. Army base was found on 14936.3 at 1850 UTC. At 75/700R were reams of THE VERY QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK. Then suddenly at 1851 the test tape appeared with rows and rows of NRKNSOHVBRTDXWYTWGUJEIFYKP. The tape reverted back to foxes at 1856, then to NRKNS . . . at 1906, to foxes at 1911, to NRKNS . . . at 1922, etc. As you

may notice, the foxes lasted for 10 minutes each time, with a 5 minute separation by NRKNS . . . Maybe one of our readers in the military could explain what is happening.

Occasionally I have come across RTTY signals putting out a repeated pattern on the video monitor. The pattern apparently is made while the TTY machine is in the crypt-to mode. But the pattern is regular and each machine shows its own footprint. These machines are apparently operated by the U.S. military.

For instance, tuning to 14971.2 at 1934, I have found at 425/75R this sequence being repeated: WM GTZVQMR42./4.)-(7-9:9/9:?) (with apologies to the typesetter). On 16331.3 at 1408, 850/75N, this pattern was observed being repeated: WQSAPJWWVCXJQHBTDDTYFEZN"/(.3) & ZPJ UTLYULZWQKVN5.

This same pattern was observed a couple of weeks later on the same frequency at 1600, but at 850/75R.

There are numerous other examples. What causes these repeated patterns and how would they appear unencrypted, if they are sent in crypto mode?

As you'll notice from the logging this month the bands from 20 MHz upward have been opening up slowly after a long dry spell. With Spring fast approaching, it would be a good time to examine your outdoor antenna system for wear and tear, replace what is necessary, and join us for some of the best DX'ing seen in years. Now on to the loggings.

Abbreviations Used In The RTTY Column

AA	Arabic
ARQ	SITOR mode
BC	Broadcast
EE	English
FEC	Forward Error Connection mode
FF	French
foxes	"Quick brown fox..." test tape
GG	German
ID	Identification/led
MFA	Ministry of Foreign Affairs
nx	news
PP	Portuguese
RYRY	"RYRY..." test tape
SS	Spanish
tfc	traffic
w/	wlth
wx	weather

RTTY Loggings (Settings= Shift/Baud/Polarity)

518: NMN, USCG Portsmouth, VA w/Navtex navig info at 0000, FEC. Some QRM from beacon FN (517 kHz) in Clinton, IA (Ed.).

2547.4: "IP RETL DE CTF90 - SS tfc at 0015, 850/75R. INTERPOL? (Fred Hetherington, FL). My guess is the Portuguese Navy in contact w/Spanish Navy-- Ed.

3209: NMG, USCG New Orleans, LA w/wx for NOAA ship Oregon II (WTDO) at 0533, 170/75R. Ship was on 4316 kHz (J.M., KY).

3564.4: 98)QJ of the Spanish Navy w/foxes & RYRY at 2345, 850/75R (Hetherington, FL).

4242.5: Y5M, Ruegen R., GDR w/nx & wx in GG to ships, 170/50R at 0145 (Hetherington, FL).

4271: CFH, Canadian Forces, Halifax, NS w/coded wx at 0350, 425/75R; usually sends at 850/75R (Ed.).

4316: NMG, USCG New Orleans w/severe wx info to NRCC, USCGC Eagle at 0519, 170/75R (J.M.).

4813: LZAB, Sofia Meteo, Bulgaria, w/coded wx at 0400, 425/50N (Ed.).

5460: VOA Tangier, Morocco, w/nx in EE at 0245, 425/75R (Tom R. Sundstrom, NJ).

6243: Un-ID w/foxes at 0459, 850/75N (J.M., KY).

6504.5: WCC, Chatham R., MA w/plaintext wx at 0456, FEC (Ed.).

6621: Un-ID dipia sta w/SS tfc, ARQ at 0001, some mention of Venezuela (J.M., KY).

6816: VOA Kavala, Greece w/nx in EE at 2345, 425/75R (Ed.).

7423: 5YD9, Nairobi Meteo, Kenya w/coded wx at 0100, 425/50N (Ed.).

7426: 5NL, Lagos Aero, Nigeria, w/RYRY at 2347, 425/50N (Sundstrom, NJ).

7552: 6VY41, Dakar Meteo, Senegal, w/RYRY & CQ at 0255, 425/50R (Ed.).

7560: RPT30, TASS Moscow, USSR w/nx in FF at 1319, 425/50R (J.M., KY).

8107.45: RFQP, French mil, QTH unknown, w/RYRY & tfc, TDM2 at 2100 (Sundstrom, NJ). Shift/baud/channel not given. Location is Djibouti-- Ed.

8116.7: Egyptian embassy, Washington, DC, w/5L grps to MFA Cairo, ARQ at 0040 & 0400 (Ed.).

8165: 5YD, Nairobi Aero, Kenya w/RYRY at 0334, 425/50N (Ed.).

8350: A8YO, Liberian flag ore carrier Sequoia w/tfc in ARQ at 2024. Also GBVC, British passenger liner Canberra wkg GKP4, ARQ at 2043 (Ed.).

8527: CTWB, Lisbon Navrad, Portugal, w/apparently coded wx, 170/50R at 0603 (J.M.).

8709: CBV, Valparaiso R., Chile wkg ships at 0128, ARQ (Ed.).

9041: 5YE, Nairobi Aero, Kenya w/coded wx at 0200, 850/75N (A. Nonymous).

9274.3-9276.4: VDD, Canadian mil, Debert, NS w/foxes, 170/75N on 6 freqs at 0100. Circuit is linked to VER, Ottawa (Ed.).

9396.3: FTJ39A, AFP Paris, France w/nx in EE at 1850, 350/50R. Also on 9397.68 same time w/nx in FF (Sundstrom, NJ).

10224: Un-ID w/RYRY, 425/50R at 0512 (J.M.).

10247: SOK224, PAP Warsaw, Poland w/RYRY at 1724, 425/50R (Carol Kirk, CT).

10510: Un-ID w/RYRY + DE 60M 60M at 2308, 425/50N (J.M., KY). This is 60M, Muqdisho Aero, Somalia. This sta & 70C (Khormaksor Aero, S. Yemen) sometimes substitute the digit zero for the letter O in their callsigns-- Ed.

10805: NA Buenos Aires, Argentina w/horse race results in SS at 2235, 850/75R (Ed.).

11150: VOA, Greenville, NC w/nx in SS at 2145, 425/75R (Sundstrom, NJ).

11423.5: SPW, Warsaw R., Poland w/nx in Polish at 1824, FEC (Ed.).

1144E: KNY37, GDR embassy, Washington, DC w/RYRY & ID at 1713, 425/50R. Followed by GG translations of nx items from WT (Washington Times), WP (Washington Post), & WSJ (Wall Street Journal), the lengthy 5L tfc (Ed.).

12110: YOM21, Agerpress, Bucharest, Romania w/nx in EE at 1145, 425/50R (Ed.).

12211.5: YZ07, Tanjug Belgrade, Yugoslavia w/nx in EE at 1207, 425/50N (Ed.).

12501.5: YCTF, Indonesian cargo ship Baah Ullah w/pos report via KPH, ARQ at 1732; BOKV, Chinese cargo ship Kang Su Hai w/Telex via WCC at 1748 (Ed.).

12313: 5YE, Nairobi Meteo, Kenya w/coded wx at 0100, 425/50R (B.R., IL).

12314: RVW57, TASS Moscow, USSR w/nx in EE at 1400, 425/50R (B.R., IL).

12510: UNVH calling CLJ at 0116, 170/50N (Kirk, CT); UNVH is the Soviet cargo ship Lyudinovo-- Ed.

13517.5: MKD, RAF Akrotiri, Cyprus, w/RYI's & foxes, 170/50R at 1534 (Ed.).

13540: LRO81, Telam Buenos Aires, Argentina w/nx, 850/50R (A. Nonymous).

13629: KNY26 clg HGX21, 525/50 at 1319 (Kirk, CT). KNY26 is the Hungarian embassy, Washington, DC. rHGX21 is MFA, Budapest, Hungary-- Ed.

13655.3: NiCHE sent over & over. Was ASCII 200/100R at 0010 (A. Nonymous). This was TDM mode, not ASCII. Sta is RFQP, French mil at Djibouti. TDM setting is 425/95-- Ed.

14370: HZJ, Jeddah Meteo, Saudi Arabia w/coded wx at 1145, 50R (Paul Spurlock, Saudi Arabia). Also RCF, an un-ID Soviet sta w/RYRY & 5L tfc at 0843, 425/75N (Spurlock, Saudi Arabia; Wolfgang Palmberger, FRG).

14376: BZT34, Xinhua Beijing, PRC w/nx in RR at 0838, 425/50R (Palmberger, FRG).

14406.3-14407.6: MKD, RAF Akrotiri, Cyprus w/RYI's & foxes on 4 freqs R & N at 1509 (Ed.).

14442: Un-ID sta w/RYRY at 0840, 425/75N, no ID's sent (Palmberger, FRG). Just a guess, but IRL44 in Rome has an RTTY circuit here to Jeddah, Saudi Arabia, may be IINA nx-- Ed.

14456: MFA Cairo, Egypt w/tfc in AA, ARQ at 0843 (Palmberger, FRG).

14625.5: OBRD sent repeatedly at 2320, ASCII 2000/130R (A. Nonymous). Same sta & comment as 13655.3 kHz, TDM setting 600/96. You'll seldom run into ASCII except in the ham bands-- Ed.

14640: KPL, Vientiane, Laos, xmtng in EE at 0939, 425/50R (A. Nonymous).

14795.7: FTO79AH1, AFP Paris, France w/nx in FF at 1408, 425/50R (Ed.).

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DEALER INQUIRIES, PLEASE CALL

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14800.5: Y2V24, ADN Berlin, GDR w/nx in EE to Africa & Near East at 1400, 425/50N (Ed.).
 16234.3: 4UZ, UN Geneva, Switzerland, w/RURY at 1429, 425/75R (Ed.).
 16265: Apparently SDK3, Varberg R., Sweden relaying Telex from GXPL, British cargo ship Boston Crusader. Was ARQ at 1530 (Ed.).
 16280.8-16281.5: MKD, RAF Akrotiri, Cyprus w/RYL's & foxes on 3 of 4 freqs, the 4th freq had crypto t/c. Were 170/50R & N at 1424 (Ed.).
 16387: T/c in Czech from Czech embassy, Havana, Cuba, 425/75N at 1402 (Ed.).
 16394: OMZ, MFA Prague, Czechoslovakia w/t/c in Czech at 1355, 425/75N (Ed.).
 16414: BWD, MFA New Delhi, India w/RURY to Indian embassy in Rangoon, Burma, 50N at 0330

(Spurlack, Saudi Arabia).
 16684: Un-ID w/RR telegram containing the strange header "MB0017 MRM/4# NR 326 16 30/; 2200." Was 170/50N at 2043 (A. Nonymous, CA). In the header, MB 17 is a Soviet tug, MRM is the abbrev for Murmansk-- Ed.
 17426: GPA6, Portishead R., England w/ID in CW - ARQ phasing sig at 1532 (Ed.).
 17468: PWZ33, Rio de Janeiro Navrod, Brazil w/unclass msgs at 2305, 850/75R (J.M., KY).
 17605.3: GYU, RN Gibraltar w/RURY & advising MUL to QSY to F32 Kilo, then later to QSY to F54. Was 850/75R at 1705 (Ed.).
 18121-18122.6: MKK, RAF London, England w/RYL's & foxes on 6 freqs, 170/50N & R at 1600 (Ed.).

18193.5: CLN603, PL Havana, Cuba w/nx in EE at 2332, 425/50R (Ed.).
 18266.5: HBD20, MFA Berne, Switzerland w/t/c in GG at 1614, ARQ (Ed.).
 18279.3: HBD20, MFA Berne, Switzerland in GG w/t/c mentioning UNESCO, ARQ at 1518 (Ed.).
 18316: Indonesian embassy, Tehran, Iran w/passport info (to MFA Jakarta?-- Ed.) at 1003, 50R (Spurlack, Saudi Arabia).
 18337.3: OBC, Callao R., Peru, w/RURY & SGSS & "cinta de prueba" at 1225, 850/75N (Ed.).
 18502.4: RFFA, French Navy HQ, Paris, France w/t/c to RFLI at 1432, TDM 850/96A (Ed.).
 18614: CLP18, Embacuba, Tanzania w/RURY to CLP23, Embacuba Addis Ababa, Ethiopia, 425/75N at 1813. Also uses CW (Ed.).
 18785: FTS78, Diplo Le Vernet, France w/nx in FF at 1238, 425/50N (Ed.).
 18965: FUF, French Navy, Fort de France, Martinique (a/k/a RFLI) w/wx at 2210, TDM 850/96B. Says it's in control of the circuit at 2237 (Ed.).
 19100: S2M33, BSS Dhaka, Bangladesh w/nx in EE at 0915, 50N (Spurlack, Saudi Arabia).
 19529: JMG5, Tokyo Meteo, Japan w/coded wx at 0106, 850/50R (A. Nonymous, CA).
 20020: Y7A80, MFA Berlin, GDR w/nx in GG at 1507, 425/50R (Ed.).
 20080: FTU8B, Diplo Le Vernet, France w/nx in FF at 1422, 425/50N (Ed.).
 20085: ISX20, ANSA Rome, Italy w/nx in EE at 1246, nx in FF at 1422, 460/50N (Hetherington, FL).
 20118.5: Un-ID sta w/IKB circuit indicator, TDM 170/96A, 1400-1600. Both Fred Hetherington & I have monitored copy w/designations of Peshawar City, Kabul & Karachi. Once I saw a Telex in Vietnamese on Channel B. This one's not listed anywhere at all (Ed.).
 20312: FTU31B1, AFP Paris, France w/nx in EE at 1554, 425/50N (Ed.).
 20313.5: FTU31B2, AFP Paris, France w/nx in FF at 1554, 425/50N (Ed.).
 20330.8-20332.5: MKD, RAF Akrotiri, Cyprus w/RYL's & foxes, 170/50N & R on 5 freqs at 1445 (Ed.).
 20415: CLP1, MFA Havana sending crypto w/ZZZZZ, 425/75N at 1620 (Ed.).
 20420: Y2V20B, ADN Berlin, GDR w/RURY beamed to southeastern Asia at 1259, 425/50N (Ed.); Nx in EE at 1405 (Hetherington, FL).
 20430: IRS24, ANSA Rome, Italy w/nx in EE at 1508 & in FF at 1624, 425/50N (Ed.).
 20445.3: Un-ID sta w/t/c in SS, 425/50N at 1612, might be RDK27, Tbilisi R., USSR listed here in CW w/circuit to Havana (Ed.).
 20469: CXR, Montevideo Navrod, Uruguay w/RURY, 850/75R at 1313 (Hetherington, FL).
 18670.5: CLP1, MFA Havana, Cuba sending crypto w/ZZZZZ, msg in SS, 425/50R at 1340 (Ed.).
 20517.5: CXR, Montevideo Navrod, Uruguay w/t/c in SS to NBA at 1358, 850/75R (Ed.).
 20560: SAQ88, JANA Tripoli, Libya w/RURY at 1618 (Ed.). Same w/nx in EE at 1725 (Hetherington).
 20632: RFVIC, French Navy, Le Port, Reunion w/wx bulletin in FF at 1408, TDM 850/96B (Ed.).
 20718: Un-ID sta (probably CLP1, MFA Havana) sending crypto w/ZZZZZ, 500/50N at 1420 (Ed.).
 20742: Un-ID sta w/BAR BAR GRU BAR - RURY at 2200, 425/50R (J.M., KY).
 20855: 6WI, French Navy, Dakar, Senegal says it controls this circuit at 2035. Was TDM 850/96B. Station RFQP, French Navy, Djibouti, controls the circuit at 2134 (Ed.).
 20869.8: ZAY, ARA Tirana, Albania w/nx in FF at 1540, 1020/50N (Hetherington, FL).
 22040: CLP23, Cuban embassy, Lagos, Nigeria w/crypto t/c to Havana, 510/50R (Hetherington, FL). Time not given-- Ed.
 22200.4: CCS, Santiago Navrod, Chile, w/RURY to NBA at 1455, 850/75N (Hetherington, FL).
 22562: GKE7, Portishead R., England w/ID in CW & ARQ phase sig at 1336 (Ed.).
 22565: PCH Schevenigen R., Holland w/CW ID - ARQ phasing sig at 1335 (Ed.).
 22589.5: DCF, Norddeich R., FRG w/Telex in GG to DJJF, the FRG tanker *Brigitte Jacob*. Was ARQ at 1337 (Ed.).
 22593: ZSC65, Cape Town R., RSA w/plaintext wx for RSA coastal areas, FEC at 1730 (Hetherington, FL).
 22865: 5YE, Nairobi, Kenya w/coded wx at 1820, 425/50R (Hetherington, FL).
 22914.7: FTW91, DIPLo LeVernet, France w/nx in FF at 1700, 425/50N (Ed.). Same w/nx in SS from AFP at 1830 (Hetherington, FL).
 22975.5: British embassy, Buenos Aires, Argentina w/crypto & 1 mgs in EE to London, ARQ, 1310-1340 (Hetherington, FL).
 23030.2: GYA, RN London, England w/lengthy freq chart, 850/75R at 1412 (Ed.).
 23405: SPW, Warsaw R., Poland w/nx in Polish at 1430, FEC (Ed.).
 24326: Un-ID USSR sta w/DE RPG 43 43 43 C/P C/X C/X RPQ RPQ OK OK OK??? Was 850/75 at 2013 (Kirk, CT). Carol's, ham call is KA5GIS-- Ed.

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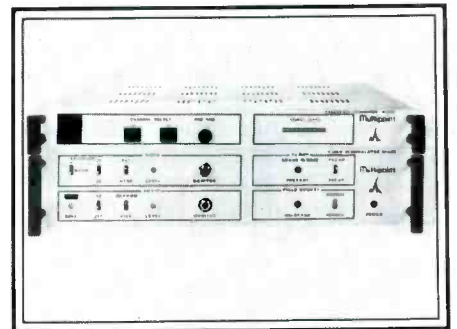
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The Multipoint ultra low threshold receiver operates at 5 dB carrier/noise ratio representing a reduction of 30% in the size of the dish antenna required. It contains 3 Internationally patented methods of threshold extension and was developed for use with European Ku band satellites, however, a C-band version has been produced in response to considerable International demand.

This means that the ultra low threshold TV receiver can now be used in the U.S.A., Central America, Caribbean, Pacific, Africa and the Middle East.

The receiver which is currently being used by many organizations including British Telecom in the U.K. and TDF in France, operates with the following International television standards:

1. PAL
2. SECAM
3. NTSC

This TV system should allow many developing countries in the world to receive satellite TV transmissions of re-broadcast quality, where previously this has not been practical.

The system is manufactured in the U.K. by Multipoint Communications Ltd.

If you require any further information, please write Mr. Gareth Littler at Multipoint Communications Ltd., 93 Grove, London, England or circle number 105 on the reader service card.

INSIDE THE WORLD OF SATELLITE COMMUNICATIONS

TVRO Info

Over 100 commercial TV and telecommunications satellites are encircling the earth in a geostationary orbit. Another 100 satellites are scheduled for launch before the turn of the century. These include new satellites from such well known companies as Western Union and Intelsat, to new arrivals to the space age like Indonesia and New Guinea.

The satellites already in orbit carry more than standard TV programming and international telephone services. For example, the major news networks distribute radio broadcasts to their affiliates through the satellites. National Public Radio (NPR), rock concerts, sporting events, and aviation news can be distributed through the audio services of commercial satellites. These services are most often located on separate transponders dedicated to audio feeds. These channels are known as Single Carrier Per Channel or SCPC.

SCPC can only be monitored if you are equipped with both a satellite TV receiver and a continuous coverage programmable scanner. While you are tuned to a standard satellite channel on a spacecraft which carries SCPC, you will not usually find any indication of the presence of any signal at all. But, if you connect your scanner to the IF output of your TVRO, you can scan the IF frequency range of your receiver to find the SCPC signal. They are usually wideband FM signals. Some receivers use a 70, 134 or 950 to 1450 MHz IF or downblock frequency range. Scanning these frequencies will allow you to receive whatever special audio

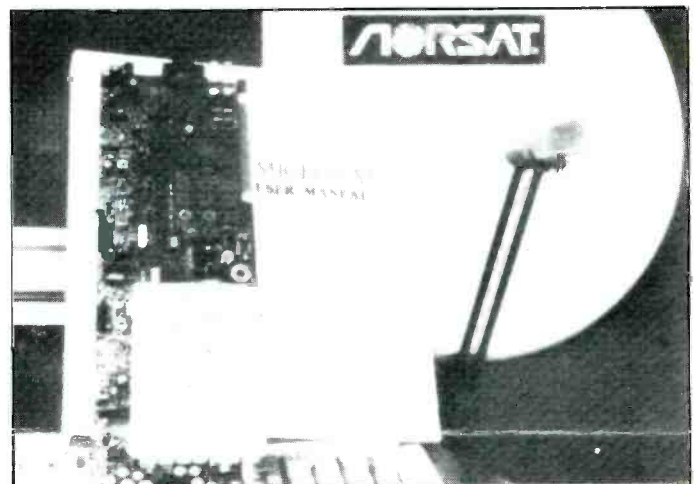
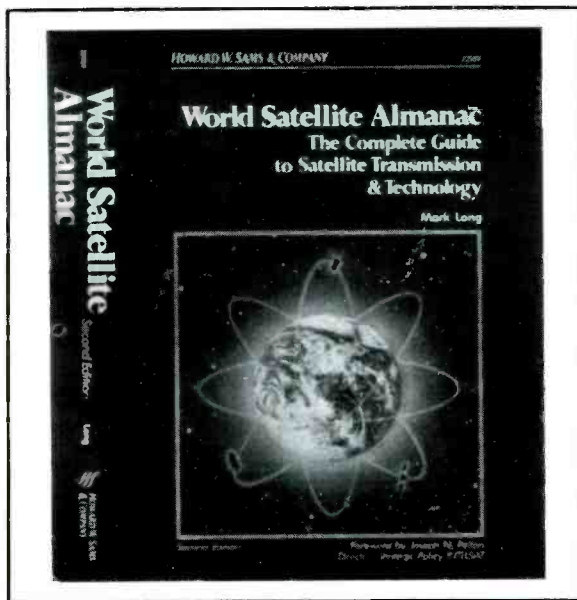
services that happen to be on that particular transponder. An IF output, or a small jumper on the back of your satellite receiver, is the connecting point for your scanner. Simply connect a through tap, or wire direct from the IF output into the antenna terminal of your scanner.

A similar technique can be used to pick up FDM or Frequency Division Multiplex channels. Some audio signals are fed separately from the video signals on TV satellites. Most often, the audio is carried on the sync signal of the TV picture. FDM is a method of transmitting the audio on a frequency between 5.5 to 10.0 MHz. This signal is superim-

posed on the carrier. The same method of tuning and connecting the equipment is used as when tuning SCPC. But in the case of FDM, use a HF receiver with SSB capability, in place of the scanner.

Equipment

STS, Satellite Technology Services, has introduced a new C/Ku band satellite receiver, the SR-100. This unit is quite compact for a receiver which comes equipped with a VideoCipher II descrambler. The SR-100 features include stereo, matrix descramble, and digital on VideoCipher II. It's capable of storing 34 channels, 54 satellite lo-



cations and 7 pre-programmed polarity formats. One of its nicest features is its Smart remote control. This unit not only gives you complete control of the receiver, but it can be programmed to control your TV, stereo, VCR or disc player, regardless of their make and model. This single remote can give you control of your entire entertainment center.

A new product from Norsat should interest some IBM PC owners. It's called Micro-sat. According to Norsat, a single circuit board and small dish antenna can convert your IBM computer into a versatile satellite data system for business or personal use. The single circuit board which will fit in the IBM's accessory slot contains all the components needed for operation. No additional power supplies, modems or cable is required. Micro-sat will operate on both C and Ku band satellites and is compatible with VideoCipher II, B-Mac and Oak descrambling systems. It uses a 950 to 1450 MHz downblock. Frequency, bandwidth, video and audio formats are selectable from the keyboard. The Micro-sat's maximum baud rate is 9600.

Information

As many of you know, the development of the Ku satellite band has been less organized than that of the C band. Standardization of channels, polarity and split transponder use has been uncoordinated. Chaparral communications, a major manufacturer of TVRO equipment, is pushing a standardized Ku band scheme which will help eliminate some of these inconsistencies. The 12 GHz channel designations can be seen in the chart below. Chaparral has also added a new viewer photo feature to their weekly one hour Satellite Show. This program can be seen on Westar 5, channel 3 on Tuesday at 9:00 p.m. EST and Saturday at Noon EST.

One other important bit of information to pass along this month. Bruce Weirauch, a TVRO tech and Satellite View follower, has a service you may need to take advantage of. Because many dish antenna manufacturers have gone out of business in recent years and since you may own one, or are thinking of buying a used one for your station—the antenna specifications are; Focal point, F/D of the feed horn and gain figures are often next to impossible to come by and are critical to your station's operations. Bruce, has, over the years, compiled these specifications for a great many antennas and offers a complete list of specs for a very modest fee. If you think he may have the information you've been looking for, write him. Bruce Weirauch, N-946 Co. Rd 12, Napoleon, Ohio 43545.

If you have any questions about the equipment or services you see in Satellite View or have questions about space communications write me C/O Popular Communications, 76 N. Broadway, Hicksville, NY 11801. Be sure to include a business size SASE and let me know what you are hearing from space . . .

PC

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The hand-held TD-17 weighs less than 7 oz. and is housed in a high-impact plastic case. Furnished complete with battery, antenna, instruction manual and one year Limited Warranty. Save \$100 to \$200 and order at our factory direct price of only \$98. Satisfaction guaranteed or your money back. Catalog \$1 or FREE with order.



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By Bob Grove
WA4PYQ

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CIRCLE 137 ON READER SERVICE CARD

LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

The relay games continue. The BBC's East Asia relay came on the air from Hong Kong. A pair of 250 kW transmitter beam BBC programming to China (and the Chinese welcomed the improved reception of the BBC). Mentions of the "East Asia Relay" come only as the transmitters sign on or leave the air. The station has been heard by a number of U.S. DX'ers, between 0815-1615 on 7180 or 1300-1615 on 7160.

The BBC has been busy in Africa, too. The Lesotho relay station has been upgraded with a 100 kilowatt transmitter. Careful tuning may turn up this one around 0400 on 3340.

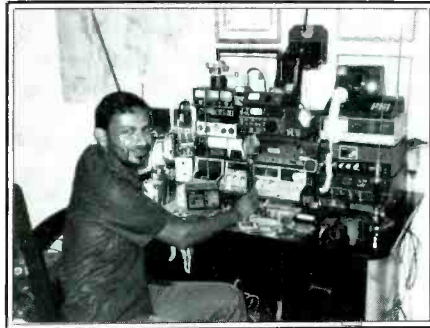
The programs of Swiss Radio International are now riding Chinese carrier waves. SRI is currently being relayed via Radio Beijing facilities from 1310 to 1500 on 11695 and 15135 (the latter transmitter in Kunming, China). On the reverse of the coin, Swiss transmitters on 3985 and 6165 are carrying Radio Beijing for European listeners between 2100 and 2300.

In its winter-spring program guide, Radio Canada International confirms that RCI broadcasts to Asia and the Pacific will begin on April 4, 1988, via the Yamata transmitters of Radio Japan. Last summer, Radio Japan began using the RCI-Sackville transmitters to put better signals into North America. The transmitter swap was delayed due to the need for some law changes in Japan.

For a brief time back in 1981, shortwave listeners could hear the programs of the Israeli military station, Galei Zahel, which was carried as a replacement for Kol Israel's programming during a strike at the government broadcaster. In 1987, it happened again. Hebrew language broadcasts of Galei Zahel were carried on 13750 when Kol Israel employees went out on strike in October. The strike has been settled and things have returned to normal.

In Costa Rica, Radio for Peace International, which began broadcasts on September 17, were still having some problems long after the start. Initial broadcasting was accomplished with powers as low as 40 watts. The 7380 frequency proved to be a dragon's nest of interference so 7375 was tried. But, on many occasions there is no signal on the air. We hope RFPI is able to solve their problems soon.

High Adventure Ministries, which operates KVOH in California and the Voice of Hope in Southern Lebanon reports that after nine years of waiting, the Israeli government has granted them a license to operate the Voice of Hope from within Israel's borders. High Adventure wants to accomplish this as soon as possible, since the Voice



Here's DX'er Nazim Mohammed of Rio Claro in Trinidad in his shack. Looks like he does some hamming, too.

of Hope has been bombed, put off the air once, and been "under the gun" since it went on the air. They'll move as soon as the necessary funds to cover the move can be raised.

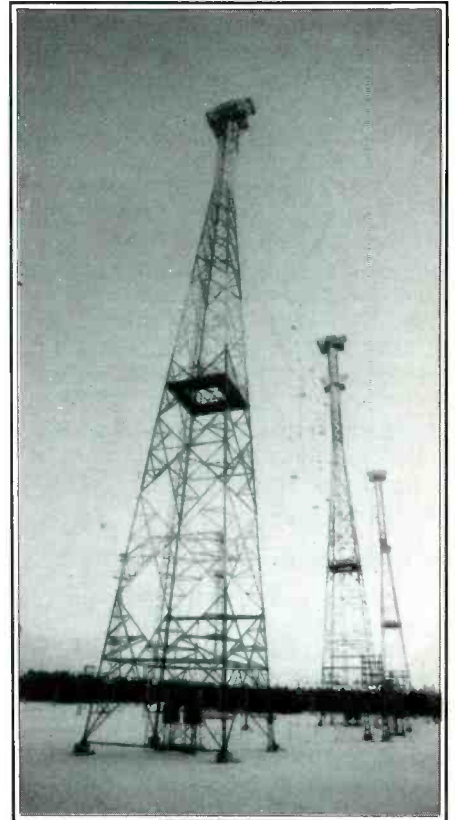
Now is a good time to start thinking about attending ANARCON-1988, this year's convention of the Association of North American Radio Clubs. The event, as always, is open to all radio listeners and DX'ers no matter what their particular radio interest. The convention this year will be held at the Huntington Beach Inn, Huntington Beach, California. And, if the brochure is any indication, this may be one of the most beautiful settings ever for an ANARCON meet, as the Inn is right across the road from the Pacific Ocean!

You can get more details, prices, and registration information by writing to: ANARCON Convention Committee, 16182 Ballard Lane, Huntington Beach, CA 92649-2204.

Let's peek into the mailbox: Steve Homer, a freshman at Duquesne University in Pittsburgh, was introduced to DX'ing by his brother Mike. Steve, it's s.o.p. for West



Michelle Shute of Pensacola, Florida finds time in her busy college schedule to report to *Listening Post* every couple months.

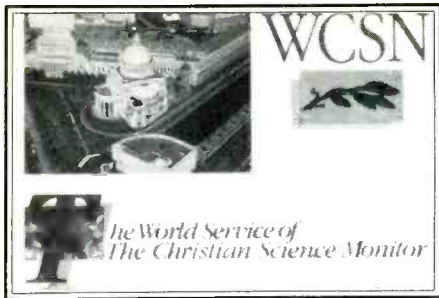


Stronger signals from Radio Finland International are thanks in part to this new antenna installation—part of the new 500 kw complex at Pori.

Coasters to generally get better reception of Asia and the Pacific, but suffer poorer reception of Europe and Africa. And just the opposite for those living in the eastern part of the country. Your receiver, with its indoor antenna, shouldn't need to be grounded. Hope you'll check in with reports as often as your studies will allow.

Joe Rutledge, WB4ESE in Dallas, hears the VOA on 6873.3 with one program on lower sideband, another in upper sideband, and wonders what gives. This is just a VOA "feeder" station, beaming to one of the relay stations. It's intentionally carrying two separate programs at the same time. This way, one transmitter does the work of two.

Speaking of the VOA, Steve Pellicciari in Norwalk, CT complains that it took seven months to get a QSL back from Washington and wonders if this is "policy." Nope. It's just bureaucracy, Steve. Generally, the VOA is pretty good with replies to its listeners all over the world. Steve keeps track of the dates reception reports are mailed, and says "most replies come back within 3 weeks to 2 months." Steve also complains about poor reception from Asia. That's probably the



SWLs have been enthusiastic about the quality programs coming from the new Christian Science station, WCSN.

hardest area of the world for a U.S. listener, especially in the Eastern half of the country, to get a good signal out of, Steve.

Until this month, this column hadn't heard from anyone in Trinidad, now we suddenly hear from two! Nazim Mohammed of Rio Claro sends in his shack photo. We can show you, but can't tell you anything about Nazim, as the photo was all he sent. Keith D. Saunders who lives in San Fernando, Trinidad, uses a couple of Sony portables. Keith wonders if we only take loggings from U.S. listeners. Nope! We've had reporters check in from a number of countries and Trinidadians are very welcome. Keith notes that, in contrast to the listener in Chicago, who was having trouble receiving Radio Polonia. Keith's been getting them consistently for years.

Jack Linonis in West Middlesex, PA checks in after a rather long absence caused by job time demands. Glad to have you back with us, Jack.

Remember, we want your letters with your comments, questions, shack photos, schedules, clippings and what-have-you related to shortwave radio. And, of course, your log reports are always welcome—and needed—as gist for this monthly mill. Just leave some space between each one and tag each with your last name and state abbreviation—that makes our job a whole lot easier! Please check in as often as you can. We appreciate it!

Here are the logs:

SWBC Loggings
(All Times Are UTC)
(All Pgm. EE Unless Noted)

- Albania:** R. Titana at 2330 on 6200 (Linonis, PA); 7065 at 2320 s/on and at 0000 to Brazil (Saunders, Trinidad).
- Algeria:** R. Algiers, 17745 in SS at 2013 (McDonough, PA).
- Angola:** R. Nacional in PP at 0337 on 3353/3376/4953. ID at 0403 (Ross, ONT); 3354/3375 in PP at 0430 (Waller, OH).
- Antarctica:** R. Nacional Arcangel San Gabriel, 15474 w/YL anncr & mx 2230-2330 fade. Weak, seemed all SS (Waller, OH).
- Argentina:** RAE 11710 at 7245 w/talk on Argentina (Brossell, WI); 2301 s/on w/anncs in several languages (Gilbert, CA).
- Ascension Island:** BBC Atlantic Relay, 15400 at 1610 w/nx (Homer, PA).
- Australia:** R. Australia w/mx & nx at 1330 on 9580 (Linonis, PA); 9655 at 0800 (Saunders, Trinidad).
- ABC Sydney, 9610 at 1000 w/nx, wx, sports scores (Gilbert, CA).
- ABC Brisbane, 4920 at 0830 (Johns, TX).
- Austria:** R. Austria Int'l., 6155 at 0430, fades (Linonis, PA).

Abbreviations Used in Listening Post

AA	Arabic
BC	Broadcast/ing
CC	Chinese
EE	English
FF	French
GG	German
ID	Identification
IS	Interval Signal
JJ	Japanese
mx	Music
NA	North America/n
nx	News
OM	Male
pgm	Program
PP	Portuguese
RR	Russian
rx	Religion/ous
SA	South America/n
SS	Spanish
UTC	Coordinated Universal Time (ex-GMT)
v	Frequency varies
w/	With
WX	Weather
YL	Female
//	Parallel frequencies

Belgium: BRT, 9765 at 0120 w/"Brussels Calling" (Linonis, PA); 1330 on 15590 w/nx & "P.O. Box 26" (Pellicciari, CT).

RTBF at 1120 on 17680 in un-ID language (Northrup, CT).

Bolivia: R. Santa Ana (tentative), 4649 in SS at 0138. No. noted on listed 4749 (Ross, ONT).

Botswana: R. Botswana, EE & Setswana on 4820 //7255 at 0400 (Johns, TX); 0415 Africa mx (Zirkelbach, CA).

Brazil: R. Globo, 11805 in PP at 0100 (Johns, TX); at 0225 (Brossell, WI).

R. Inconfidencia, 0030 in PP on 15190 (Johns)

R. Universo (tentative), 9565 at 0015 in SS (Homer, PA). Not PP?? - Ed.

Radiobras, 11745 w/listeners' letters at 0200 on 11745 (Pellicciari, CT).

Bulgaria: R. Sofia, 0000 on 9700 (Johns, TX).

Burkina Faso: R. Burkina (tentative), 4815 at 0525 w/mx & talk in presumed FF (McDonough, PA).

Cameroon: R. Cameroon, Yaounde, 4850 at 2253 w/political talk (Ross, ONT).

Canada: RCI, 15260 w/African Svc (Linonis, PA) Time? - Ed; at 2015 on 11945 (Homer, PA); 2354 on 5960 (Carlson, MA).

CFXC Montreal, 6005 at 1601 w/nx (Carlson, MA); 1125 w/tfc report (Northrup, CT).

CFRX Toronto, 6070 w/tfc & sports at 1235 (Northrup, CT); at 1230 (Homer, PA)

CKZU Vancouver, 6160 at 0606 w/sports nx (Gilbert, CA).

Canary Islands: R. Exterior de Espana relay in SS at 2230 on 15365 (Homer, PA).

Central African Rep.: R. Centrafricaine, 5035 at 0500 in FF w/ID then hi-life mx (Brossell, WI).

Chad: R. Moundou, 5268.3 in FF at 0543 tune-in w/mx, ritums, vernacular songs, possible nx at 0550-0555 (Ross, ONT).

Chile: R. Nacional (the "Sistema") seems to have been dropped - Ed. 15140 at 0235 in SS, ID (Northrup, CT).

China: R. Beijing, 9700 at 0930 w/nx (Saunders, Trinidad).

CPBS in CC on 5860//5880 at 1515 (Zirkelbach).

Colombia: R. Sutatenza, 5095 at 2300 w/mx, nx, ID in SS (Homer, PA).

Cook Islands: R. Cook Islands, 11761 around 0430 w/drink ads (Waller, OH); 0630 w/island mx, American pops, talks in un-ID language (Homer, PA)

Costa Rica: R. Impacto, 6150 at 0514 w/mx, talks in SS (Gilbert, CA).

Cuba: R. Havana Cuba, 6090 at 0555 w/IS, ID, freqs, anthem, mx, SS anncs (Zirkelbach, CA); 9550 at 2310 in SS (Homer, PA).

R. Rebelde, 5025 at 0100 in SS (Brossell, WI).

Czechoslovakia: R. Prague, 5930 to NA at 0130 (Linonis, PA); 17840 at 1130 but heavy QRM. In an East European language (Northrup, CT).

Dominican Republic: R. Amanecer, 6025 at 0157-0231 in SS w/tx pgm, ID in EE w/address as Box 1000, Santo Domingo (Ross, ONT).

East Germany: R. Berlin Int'l., 0355 on 9560 (Gilbert, CA).

Ecuador: HD2IOA time station, 7600 at 0300-0500, then it switched to 3810 kHz (Chudy, IL)

R. Quito, 4920 at 0200 in SS (Brossell, WI); 0430 w/ID for "Radio Quito, La Voz de la Capital" (Gilbert, CA).

La Voz del Upano, 5040 at 0200 in SS w/talks, mx (Brossell, WI).

Egypt: R. Cairo, 9475 at 0200 (Johns, TX); 2030 in AA on 12050 (Homer, PA); 15210 at 1225, also 17800 at 1230 (Northrup, CT).

England: BBC, 3955//9600//9640 w/"The World Today" (Pellicciari, CT); an 5975 at 0103

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CIRCLE 120 ON READER SERVICE CARD

w/"Outlook" (Carlson, MA); 9510 at 0508 in World Svc; 11820 w/SS lesson at 0230 (McDonough, PA); 12095 at 2000 w/nx (Homer, PA).

Equatorial Guinea: R. Malabo, 9553 at 2106 w/tx pgm, ID at 2147 & address in USA (Homer, PA). Think this more often would ID as "Radio Nacional" or "International Service." The USA address mentioned is only that of the rx pgm, not the station itself-- Ed.

Finland: R. Finland Int'l., 1300 on 15400 w/"Pless Review" & "Airmail" (Pellicciari, CT).

France: R. France Int'l., 11965 in FF at 2010 (Homer, PA).

French Guiana: RFI relay, 9790 at 0200 w/nx (Linonis, PA); 0330 on 9800 (Johns, TX).

Gabon: Africa #1, in FF at 0520 on 4830, Afro mx, drums (Zirkelbach, CA); 15200 at 1258 w/commercials, nx till 1302 (Saunders, Trinidad).

Ghana: GBC on 3366 at 2245 w/national nx (Ross, ONT); 4915 at 2245 w/nx (Homer, PA); 0600 s/on w/drums IS, nx (Linonis, PA; Johns, TX; Gilbert, CA).

Greece: V. of Greece, 9420 at 0115 w/mx, nx at 0130 (Saunders, Trinidad); 2030 in Greek on 11645 (Homer, PA); 1900 w/mx & talks in Greek (Gilbert).

Guatemala: TGNA R. Cultural, 3300 kHz at 0710 w/light mx (Gilbert, CA). Presumed SS?-- Ed.; at 0635-0647 (Ross, ONT).

R. Maya de Barillas, 3325 at 1100 in SS (Johns)

La V. de Nahuola, 3360 at 0210 w/fast paced mx, anctns in SS (Brossell, WI).

Guinea: Radiodiffusion Nacional, 4900 in FF at 2315, YL anct, instrumental mx, ID as "La Voix de la Revolution, Radiodiffusion National" (Ross, ONT).

Honduras: La V. de Mosquito, Puerto Lempira, 49104910 at 0130-0150 w/rx pgm, asked for reports (Brossell, WI).

Hungary: R. Budapest to NA at 0230 in Hungarian, at 0100 in EE, all on 9520 (Linonis, PA).

India: AIR, 15120 at 1230 w/nx (Waller, OH).

Indonesia: V. of Indonesia, 11790 at 1510 (Gilbert)

Iran: VOIR, 15084 at 1536 (Homer, PA).

Israel: Kol Israel at 0000 on 7465//9435//9855 w/trone sig instead of regular bc (Rabinowitz, MI). Probably related to the strike at the station-- Ed.; 9435 at 0100 w/nx (Pellicciari, CT); 11605 at 2000 w/nx (Gilbert, CA); 2030 in FF on 11610 (Homer)

Ivory Coast: R. Core D'Ivoire, 0600 in FF on 4940//4015 (Johns, TX); 2250 in FF on 4940 (Homer, PA); 4940//7215//11920 at 2158 in FF (Ross, ONT).

Japan: R. Japan (via Gabon) at 1500 on 21698 (Saunders, Trinidad); 5960 (via Canada) at 0330 (Linonis, PA); 0300 w/nx (Pellicciari, CT).

R. Tanpa at 0900 in JJ/EE on 3925 (Johns, TX).

Kampuchea: V. of the Kampuchean People, 11938 in possible Laotian from 1245, into Vietnamese after YL ID at 1258, s/off 1316. Not hid in EE yet. (Weller, OH).

Kiribati: R. Kiribati (tentative), 14802 at 2227 w/piano mx, YL in un-ID language, then lost under RTTY at 2230 (Ross, ONT).

Kuwait: R. Kuwait, 9880 at 2054 w/mx, nx in AA at 2100 (Homer, PA); 11665 at 1800 (Saunders, Trinidad). Replaces 11675-- Ed.

Lebanon: V. of Lebanon, 6550 weak w AA mx at 0500 (Waller, OH).

Lesotho: BBC Relay, 3340 at 0358 w/IS, s/on 0400 w/World Svc ID. New freq for this one (Ross, ONT). New transmitter, too-- Ed.

Liberia: VOA relay, 15445 at 2125 w/World Report (Zirkelbach, CA).

Libya: R. Jamahiriya/V. of the Arab Homeland, 7245 at 0125 in AA w/speeches (Gilbert, CA).

Lithuanian SSR: R. Vilnius, 7260 at 2325 w/address in EE, ID in un-ID language at 2330 (Homer, PA).

Madagascar: R. Madagaskara, 3288 in an African language w/FF ID at 0259 (Waller, OH).

Malaysia: R. Malaysia, Kuching, Sarawak, 4950 at 1510 w/hit records (Zirkelbach, CA), at 1400 (Gilbert, CA).

Mal: RTM Bamako, 4835 at 2245 in FF (Homer, PA); 0607 in Swahili, //4783 (Ross, ONT).

Marshall Islands: WSZO, 4940 at 0545 w/island mx, Marshallese (Zirkelbach, CA); 0730 in Marshallese & EE, pops (Johns, TX); 1000 s/off (Waller, OH).

Mauritania: ORTM Nouakchott, 4875 at 2345 in AA w/chanting (Homer, PA).

Morocco: RTM, 17590 at 1405 w/mx, AA (Northrup, CT).

Mozambique: R. Mozambique, 9619.6 at 0448 in PP & EE, ID as "Emissao Nacional," mention of Maputo. Also 3210.5 at 0308 in PP w/mx on bamboo xylophone, mentions of Maputo, Nampula, "Musica Juluka" (Ross, ONT); 3211//4865 at 0300 (Waller, OH).

Emissor Provincial de Sofala, Beira, 3280 in PP at 0318, mx, OM in PP (Ross, ONT).

Namibia: R. South West Africa, 3295 at 0430 in GG/EE (Johns, TX).

Netherlands: R. Netherlands w/"Media Network" at 0530 on 9715 (Pellicciari, CT).

Netherlands Antilles: TWR Bonaire on 9535 at 0445, easy listening mx, tx pgm (Zirkelbach, CA).

R. Netherlands relay, 15560 at 2100, nx in Dutch (Homer, PA).

New Zealand: R. New Zealand at 0540 on 11780 (Waller, OH); 17705 at 0220 (Zirkelbach, CA).

Nigeria: R. Nigeria, Lagos, 3326 at 2255 w/classical mx pgm, YL ID's, nx (Ross, ONT).

V. of Nigeria, 7255 at 0500 (Johns, TX).

R. Nigeria, Kaduna at 0445 on 4770, ID & time as 6-o'clock at 0500 (Waller, OH).

N. Korea: R. Pyongyang, 9977 at 1535 w/talk about living in N. Korea (Zirkelbach, CA); 11735//13650 ending at 2350 (Waller, OH).

N. Maritonia: KFBS Saipan, 5985 at 1135 w/rock mx, no ID's (Northrup, CT). What makes you think this is them? Not listed here-- Ed.

Papua New Guinea: NBC Port Moresby, 4890 at 0900 (Johns, TX).

Paraguay: R. Nacional, 9735 at 0200 in SS (Gilbert, CA).

Peru: R. Ancash, Huaraz, 4990 in SS, pop mx, DJ, ID's mentioning "Tropical" (Ross, ONT).

Philippines: FEBC in CC at 1105 on 9800 (Zirkelbach, CA).

VOA relay, 15290 at 2215 w/world nx (Zirkelbach, CA).

R. Veritas Asia, 7190 at 1200 w/ID in EE, then into JJ (Waller, OH).

Poland: R. Polonia, 7125 at 2230 s/on w/nx (Saunders, Trinidad).

Portugal: R. Portugal, 9680 at 0035 w/nx (Gilbert, CA); 9705 w/travelog at 0320 (Zirkelbach, CA); at 0300 (Johns, TX); 15285 in PP at 1745 (McDonough, PA).

Qatar: QBC, 15265 in AA at 1448 w/talks, local mx, nx 1530 (Ross, ONT).

Saudi Arabia: BSKSA, 9870 in AA at 2050 (Homer, PA).

Seychelles: FEBA, 11870 at 0257 w/tx IS, into Farsi pgm (Ross, ONT).

Singapore: SBC on 11940 at 1500 w/ID, time check, nx soft mx (Zirkelbach, CA).

BBC relay, 11750 at 1500 w/nx in World Svc (Brossell, WI).

Solomon Islands: SIBC, 5020, nx by OM at 1000 (Waller, OH).

S. Africa, Rep. of: Radio RSA to NA, 11730 at 0200 (Linonis, PA).

Radio 5, 4880 at 0400 w/nx, mx (Johns, TX; Zirkelbach, CA); 4950 at 0330 (Linonis, PA).

S. Korea: R. Korea, 9870 at 1515, mx, Korean language lessons (Zirkelbach, CA); 15575 w/nx at 2230 (Pellicciari, CT).

Spain: R. Exterior de Espana, 9630 at 0000 w/nx (Homer, PA); 11880 at 0038 (McDonough, PA); 15125 at 2045 (Zirkelbach, CA).

Suriname: R. Suriname Int'l. (via Radiobras, Brazil), 17755 at 1700 w/Dutch, EE ID at 1721, nx

in EE 1727-1735 (Saunders, Trinidad).

Swaziland: TWR, 4760 at 0355 in vernaculars, music box IS, s/on 0400, into tx pgm in local language (Ross, ONT).

Sweden: R. Sweden Int'l., 11785 at 1400 w/nx (Gilbert, CA); 11950 at 2015 in FF, USB mode via Varberg xmtr (Homer, PA); 15345 at 1400 w/DX pgm (Pellicciari, CT).

Switzerland: Swiss R. Int'l., 6135//9725 w/polkas, into SS at 0230 (Zirkelbach, CA); 15570 at 2100 w/nx (Homer, PA).

Syria: R. Damascus, 12085 at 1950 w/FF talks (Homer, PA).

Taiwan: VOFC (via WYFR), 9555 at 0215 w/talks on CC gods/goddesses (Brossell, WI); 5985 (via WYFR) at 1545 (Zirkelbach, CA); at 0323 (McDonough, PA).

Tanzania: R. Tanzania, 9685 at 0345 w/pops & African mx, blasted by jammer at 0356. My 139th country! (Ross, ONT). Nice going, Bob!-- Ed.

Togo: RTT, 5047 in FF at 2300 (Homer, PA).

R. Kara, 3222 at 0554 in FF, mx, singing ID, "Ici Kara" & FF nx (Ross, ONT).

Tunisia: RTT Tunis, 7475 at 0430 in AA (Brossell, WI); 15450 at 2100 in AA (Homer, PA).

Turkey: V. of Turkey, 9445 at 0345 w/pgm about Turks from Bulgaria (Brossell, WI); 9560 at 2315 w/local mx, nx (Homer, PA).

Ukrainian SSR: R. Kiev, 7260 at 2330 w/"Ukraine Today" (Pellicciari, CT).

Unidentifieds: 3261 in SS w/soccer game at 0309-- could it be La V. del Rio Carrizal, Ecuador? (Ross, ONT). Likely-- Ed.

4820 w/bells & barnyard IS at 0400 (Linonis, PA). Obviously Batswana-- Ed.

9465 in SS at 0300 (McDonough, PA). Probably VOA-- Ed.

4905 in CC at 2250, perhaps CPBS1 but unusual time (Waller, OH).

USA: WRNO, 7355 at 0045 (McDonough, PA); 9852 at 0059 (Carlson, MA); 15420 at 1800 (Pellicciari, CT).

KVOH, 17775 at 2015, "Unshackled" at 2020 (Saunders, Trinidad); 2224 gospel mx, ID, address (Ross, ONT); at 2045 (Homer, PA).

WYFR, 11830 at 2025, rx talks (Homer, PA).

AFRTS sports at 0251 on 15345 (McDonough, PA); 2115 w/nx on 15430 (Homer, PA).

VOA, 15290 at 1627 w/editorial (Carlson, MA); 2045 on 17785 (Homer, PA); 19479 USB feeder at 1700 (Zirkelbach, CA).

WCSN, 9795 at 0230, clear sigs, good pgms (Linonis, PA).

USSR: R. Moscow, 7400 at 0000 w/nx (Homer, PA); 1900 on 9720 w/nx (Pellicciari, CT).

R. Station Tikhiy Okean, Vladivostok, 9810 in RR (Homer, PA).

Uzbek SSR: R. Tashkent, 7325 at 1200 & 1330 (Johns, TX).

Vatican: Vatican R., 9605 at 0107 w/nx (Carlson)

Venezuela: Ecos del Torbes, San Cristobal, 4980 at 0345 in SS (Gilbert, CA); 2345 (Homer, PA).

R. Rumbos, Caracas, 4970 at 0342 in SS, no shortage of ID's (Gilbert, CA).

R. Valera, 4840 at 0930 in SS (Johns, TX).

Vietnam: V. of Vietnam, 9840 at 1610 w/"Tropical Opinions" (Zirkelbach, CA); 10010 at 1503 in CC (Gilbert, CA); 12035 at 1639 w/talks (Homer, PA).

W. Germany: DW in GG, 7130 at 0000 (Homer, PA); 15410 in GG at 2248, IS/ID 2300 (McDonough, PA); 17810 at 2025 in GG (McDonough, PA).

RFE (tentative), 17735 at 2050 in un-ID language, off ably 2055 (Homer, PA).

RL in an East European language, 2127 on 15290 (Homer, PA).

Yemen PDR: Democratic YBC, 7190 at 0300-0350 in AA, anthem AA ID, freqs, mx, nx (Ross, ONT).

Yemen Arab Republic: Radio Sana'a, 9780 at 2028 in AA (Homer, PA); 0314-0335 in AA, flute mx (Ross, ONT).

Zambia: R. Zambia, 4910 at 0340 w/fish eagle IS (Johns, TX); 0335-0405 w/IS, anthem at 0349, vernacular, choir: mx, drums (Ross, ONT).

A lifting of the goblets in salute to:
 Robert Brossell, Pewaukee, WI; Bob Zirkelbach, Pleasant Hill, CA; Douglas A. Waller, Bay Village, OH; Sander J. Rabinowitz, Farmington Hills, MI; Mark A. Northrup, Danbury, CT; Keith D. Saunders, San Fernando, Trinidad; Andy Johns, Tyler, TX; Pat McDonough, Pittsburgh, PA; Jack Linonis, West Middlesex, PA; Robert Ross, London, Ontario; Robert Carlson, Mansfield, MA; Warren Gilbert, Sherman Oaks, CA; Steve Pellicciari, Norwalk, CT; Jason Chudy, Lisle, IL and Steven Homer, Pitts-
 burgh, PA.

Til next month, good listening! **PC**

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FOCUS ON FREE RADIO BROADCASTING

One of the most famous of the sea-going European pirate radio stations is **Radio Caroline**, which began broadcasting back in the early 1960's. Caroline's ship, the **Mi Amigo**, was anchored in the North Sea, near England. The station's rock and pop music format and commercial advertising reached a potential audience of 12 million people in various countries of Europe. Even through the difficult times, when the British government passed laws aimed at cutting off the pirates' source of supply, its advertising funds, Radio Caroline "hung in there."

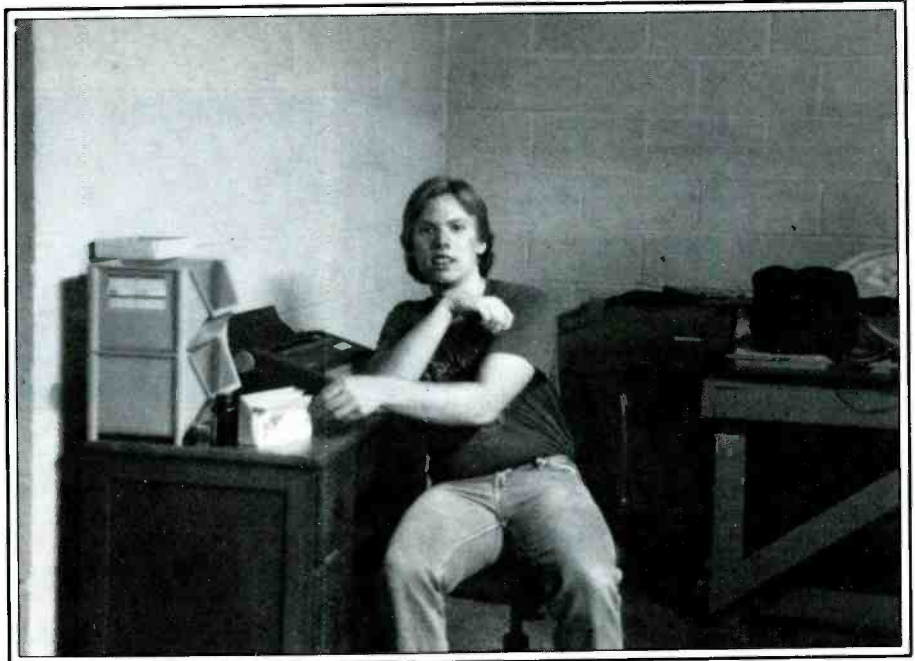
Eventually the station did go off the air, but not until 1981, and even then, only as a result of some unusual circumstances. It seems the ship's motors were in disrepair and hadn't been fixed as there seemed no need ever to use them. Then, the anchor chain snapped. The ship drifted, then ran aground on a sandbar and turned over on its side in 60 feet of water. Caroline went silent.

But that wasn't the end. By December, 1982, a new **Radio Caroline** was on the air from a new ship, had two AM transmitters, one on 558 kHz, the other using 963, and was reaching virtually all of Europe.

Over the past couple of years there have been reports that Radio Caroline would eventually add a third transmitter, this one on shortwave. That's just what's happened! In October last year, there were reports of Caroline being heard by European monitors listening on the shortwave frequency of 6220. The first broadcasts were with only a couple of hundred watts, but that was supposed to increase to 3.5 kw, which would make reception of Radio Caroline on shortwave a good possibility throughout much of the United States, given decent reception conditions. Alternate frequencies to check are 9940, 6210 and 6230. As of this writing, there've been no reports of Caroline being heard here, but if the power boost goes into effect, it's a sure thing someone will log them on this side of the pond. No schedule is available, but check during the late evening hours. And thanks to Roy Hafeli of CJNO Radio, Merrittim, BC for the background info on Caroline which appeared in an article in "Broadcast Information Dissemination" magazine.

Let's clear up a couple of things from previous columns. Last month Bradley Lucken was running into problems in getting a reception report to the **Voice of Tomorrow**, with two different addresses proving to be duds. Here's a new one: Box 314, Clackamas, Oregon 97015.

Readers Steven Barnes in Thornton and Dennis Leone in Englewood, both Colora-



William Blight of Baltimore uses a DX-360, DX-100 and Mosley CM-1 receivers to check on pirate broadcasting activity.

do, say that Keith Baker of Waterloo, Iowa did, indeed, hear **KRXY-108**, a legit FM station in Denver (actually Lakewood). It often IDs as "Y-108" though the FM frequency is actually 107.5. It's on 1600 on AM. Thanks for the help guys.

Tim Tromp in Michigan found **Radio Clandestine** using 3445 to 0442 sign off, and featuring the usual characters "R.F. Burns," "Drool, the Cabin Boy" and "Boris, the Chief Engineer." In answer to your question Tim, I'd consider **The Voice of Free Long Island** as a pirate, rather than a clandestine.

Roger Whitford of Lancaster, PA, heard his first pirate in the form of KFBA **Radio Free America** from 0217 to 0245 on 8001. The frequency around 8 MHz seems to be gaining popularity as an operational frequency for pirates.

Yes, Steve Sachs in Illinois, I have received your letters and by now you should have seen some of the things you've written about appear in the column. It takes awhile and I can't always get to all of the background material every month. Thanks for the offer of tapes but I have no real use for them.

Steve sends some information about "DX-Soft Publications" (Lobeliastraat 33B, 3203 HR Spyjenisse, The Netherlands) which offers cassette tapes of pirate stations

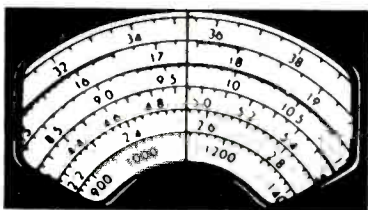
dating all the way back to 1957! The firm says it has more than 80 such tapes available at \$5 for 60 minute lengths, \$7.50 for 90 minutes. Two IRCs or \$1 will bring you a detailed list of what they have available.

William Blight of Baltimore was not likely the only one to count **Radio Newyork International** as his first pirate logging. Bill wonders about the availability of a list of pirate stations and addresses. That's not something which I am able to supply and I don't know of any such list that isn't three or four years old. Let me see what can be done here. Incidentally, that's Bill in the photo this month.

More and more readers are checking in with clippings and background information on stations and, actually, more station operators are doing so as well and, believe me, that is greatly appreciated. Not too much in the way of logging activity lately, though the winter season should bring increased activity by both stations and monitors which, in turn, should bring on the reports. Whether you have background info, loggings, news of pirate station activities, or copies of pirate QSLs as long as it relates to pirate broadcasting, please sen it into the column. Rest assured it's all very welcome.

Be sure to check in soon and often. Meantime, I'll be back with you again next month.

PC



COMMUNICATIONS CONFIDENTIAL

BY DON SCHIMMEL

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

Another batch of jammer loggings (see Table 1) was sent in by Jeff Hall, WA plus an explanation regarding his monitoring of a net between the NASA Base in Antarctica and some scientists in Boulder, Colorado. (See logging for 14408 kHz.) After a phone call to the NASA Public Relations Office in Washington, DC, after being shunted from one person to another, Jeff did finally learn that NASA does indeed have a camp in Antarctica where they were studying the ozone layer in conjunction with a number of Universities and they were flying U-2's out of Punta Arenas, Chile in connection with this project.

Colyn Brookes, South Africa monitors with a JRC NRD-515, HAL ST 6000, HAL DS 3000 KSR plus 4 long-wire antennas of various lengths. Colyn asked me to mention the birth of a new radio club on the African Continent called the "34 DX CLUB" (so called because of its location on the 34 degree line.) Their monthly publication entitled "Wave Dial" is full of up to the moment MW and SW loggings, especially Tropical Band and Utilities. Further information can be had from Club HQ by writing to Colyn Brookes, 57 Bedford Street, Parow 7500, Cape Town, South Africa.

An anonymous contributor from MO furnished additional frequencies for MYSTIC STAR (See Table 1, October 1987 POP' COMM). 6757 USB; 6812 USB this frequency is usually used by stations before they take-off and are then assigned other primary and secondary frequencies; 6817 USB; 8989 USB MacDill sometimes runs patches for SAM aircraft on this frequency; 11179 USB same as 8989. Mr. Anonymous also mentioned he believed the channel designators are changed from time to time, none of them he had agreed with those in the table.

Patrick O'Connor, NH very kindly gave some addresses for QSL'ing. The French Naval Radio, FUE, in Brest, France is rarely heard these days he said, but it does pop up from time to time.

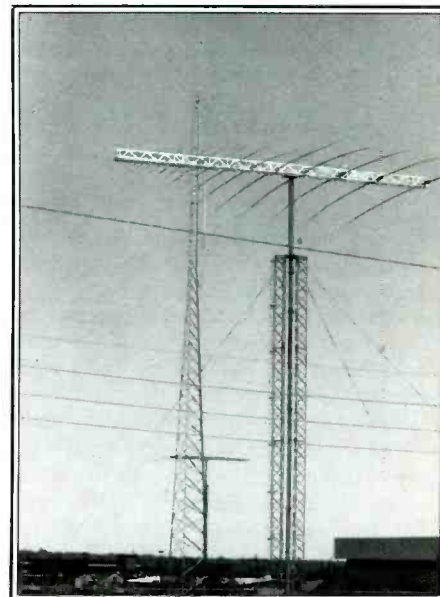
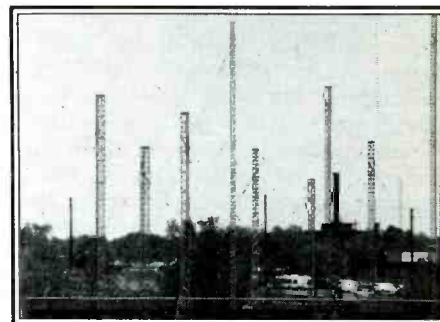
Station Radionaval Brest - FUE
Poste Emetteur
Escadron Arsenal Maritime
F-29240 Brest - Naval
France

NOTE: If possible, a report in the French language is recommended.

Patrick also advised that Shanghai station



This photo, taken by Patrick M. Griffith, CO shows some of the HF, VHF, and microwave antennas at the Denver Air Traffic Control Center in Longmont, CO.



Antennas at the Federal Center, Denver, CO. Photo by reader Patrick M. Griffith.

XSG will QSL and although the QSL is a full-data one, it is only the size of a business card!

Shanghai Radio - XSG
Shanghai Marine Telecommunication
and Navigation Aids Co.
20 Guangdong Rd.
Shanghai
Peoples Republic of China

George Osier, NY reports he continues to hear Time Station VEB2 but still has been unable to come up with an ID. Sorry George, I am in the dark also. None of my references contain any information relating to this station. The callsign allocation is Canada so I wonder if this is a time service run by the Canadian Military? George stated the frequency was 4625 kHz.

Reader Erin Krol, MA asked whether there was any information available concerning the yacht "The Drum of England" which had capsized during a race in August 1987. Erin, in going through the loggings, I do not recall seeing any specific mention of that incident.

From Switzerland, we heard from Kurt Mueller who pointed out that German Nordeich Radio station DAN is still on the air on 2614 kHz. The corresponding receive frequency is 2023 kHz. German language wx forecasts can be heard on 2614 at 0810 and 2010 UTC. Kurt referred to the QSL received by George Osier which appeared in this column (August 1987) and the comment which stated the service had been discontinued. Kurt, the info supplied by George, applied only to the Time-Signal service of that station.

Four numbers messages were submitted

by D. White, ME along with his observation that one of the messages seemed to contain characters that served as nulls. I studied the text very carefully and came to the conclusion the text was cut numbers utilizing the ANDUWRIGMT = 1-0 system. The three extra characters suspected of being nulls were apparently just garbled characters caused by sloppy sending of the hand-sent groups. A week later on the same frequency (12175 kHz) another 5F (cut numbers) message was copied with this one being auto-sent. The cut number system was identical to the one described above but with no extra characters noted.

To all who have sent in newspaper clippings and photos of a variety of communications related subjects, I thank you. I regret

TABLE 1

JAMMERS

Frequency	Mode	Time	Details
6950	AM	1645	Very strong fluttering warble jammer presumably working on Iranian presumably working on Iranian Clandestine stn "Voice of the Iraqi People"
9520	MCW	1717	Russian jammers RA and NU wrkg on Radio Liberty.
9715	MCW	1719	Russian jammers RA, LD and WQ all over Deutsche Welle USSR svc.
11725	MCW	1732	Russian jammer NJ (also noted on 9520) wrkg on Radio Liberty FRG outle: with powerful results.
11885	MCW	1733	Russian jammer RA (noted on 9520) and ML over RFE/RL FRG svc.
11905	MCW	1735	Russian jammers RA and VI as well as a "K" Beacon all over Radio Free Europe's Turkheim-Wertach'l xmsns.
15200	?	1738	Warbling jammer seems aimed at VOA Mideast svc in Arabic but it is in fact filling a SS Domestic stn.

it is not possible to utilize all of the material received but I do want you to know that all is appreciated and whenever space permits, I do try to use them.

**Ute Loggings
(All Times Are UTC)**

- 205: Beacon ESU, un-ID, at 1500 (Lee, LA). None of my references list it either-- Ed.
- 209: Beacon ILZ, Newport, RI at 1936 (Pot O'Connor, NH).
- 212: Beacon HP, Hammond, LA at 1556 (Lee, LA).
- 221: Beacon ACI at 2352 (Lee, LA). If freq is

- correct, ID is probably AYI, Bay St. Louis, MS. If ID ACI is correct, freq should be 229 kHz & is an Arco offshore rig in Gulf of Mexico-- Ed.
- 236: Beacon GNI, Grand Isle, LA at 0001. At 0314 a wx bc (Lee, LA).
- 245: Beacon PTN, Patterson, LA at 1623. Another beacon (un-ID) also noted weakly (Lee, LA).
- 300: Beacon C, Mobile Point, AL at 0009 (Lee).
- 316: Beacon M, Southwest Pass West Jerry Light Station, LA at 1646 (Lee, LA).
- 320: Beacon W, Cape San Blas, FL at 0320 (Lee).
- 326: Beacon PKZ, Pensacola, FL at 0334 (Lee).
- 330: Beacon SQQ, un-ID, at 0645 (Szalory, CA).
- 338: Beacon MS, New Orleans, LA at 0340 (Lee).
- 340: Beacon DDP at 0330 (Roslawski, NJ). My refs show DDP as San Juan, PR on 391 kHz-- Ed.

Abbreviations Used For Intercepts

- AM Amplitude Modulation mode
- BC Broadcast
- CW Morse Code mode
- EE English
- GG German
- ID Identifier/location
- LSB Lower Sideband mode
- OM Male operator
- PP Portuguese
- SS Spanish
- tfc Traffic
- USB Upper Sideband mode
- w/ with
- wx Weather report/forecast
- YL Female operator
- 4F 4-figure coded groups (i.e. 5739)
- 5F 5-figure coded groups
- 5L 5-letter coded groups (i.e. IGRXJ)

- 336: Beacon NBB, New Orleans NAS at 0047 (Lee, LA).
- 371: Beacon FNA, Slidell, LA at 0034 w/voice anct "Slidell Municipal Airport" + wx (Lee, LA).
- 396: Beacon ZBB, S. Bimini, Bahamas at 0054 (Lee, LA).
- 401: Beacon DUN, Dunsfold, England at 0550 (Mueller, France).
- 407: Beacon LAB E, Swan Island, Honduras at 0356 (Lee, LA).
- 412: Beacon CTZ, Clinton, NC (O'Connor, NH).
- 432: Beacon IZN, Lincolnton, NC at 0415 (O'Connor, NH).
- 2670: USCG Commsta Cape Cross, San Francisco, CA in USB 9010-0927. Search for missing boat. QSY'd to 6200/6506. Overturned hull located (Amaroso, CO).
- 2697: GLD3, Lands End, England w/CW ID & data bursts at 0520 (Brookes, RSA).
- 3217: YL/GG in AM-mode w/BF grps having definite space between grps, then 5F grps repeated X2 at 0334 (Fernandez, MA).
- 4080: Active digital scrambled USB comms at 0345. Believed paired with 8229 kHz (Hall, WA).
- 4143.6: WTN5660, fishing vessel New West in USB at 0550 w/other skippers off Wiongell, AK talking about fog, submerged rocks, severe currents, & other horrors in the area. Also WIN25, Sward AK hrd wkg WNTW, Tuscania (Hall, WA).
- 4251: GKCC, Portishead, England w/CW marker at 0026 (Osier, NY).
- 4312: FUG3, LaRegine, France w/FF tfc in CW at 0307 (Osier, NY).
- 4332: JCK, Kobe, Japan clg CQ under bad QRM from Fujian Front SWBC sta in PRC at 1407 (Hall).
- 4385: Vancouver CG Radio w/maritime wx at 0604 in USB, then ID & off. Another bc anctd for 1800 (Sabo, CA).
- 4443: Possible Canadian Wildlife net in USB at 0321, USB. An OM said his cabin window blew out in a storm, also he had been stalking a Doh's Sheep. No ID's. One sta seemed to be in Canadian Rockies (Hall, WA).
- 4585: CAP net in USB at 0308, Western US Region. NCS was Eagle 598 had comms w/Northwind, Eagle 44 & White Bear 69 re SARCAP (Hall, WA).
- 4623: NGR, Kara Savi Navrad, Greece w/encrypted CW tfc at 0321 (Osier, NY).
- 4633: Firefighting ops in ID, USB at 1420. YL op at NCS gave ID as KNID355, wkg WSJ371, -374, -375 w/orders for eqpt., food, cases of "Black Velvet," & 200 lbs. of dog food (Hall, WA).
- 4675: Caledonian 223 w/pos rpt to Shanwick, USB at 1315 (Mueller, France).
- 4746: Mainplate to McClellan AFB in USB then into RTTY at 0650 (Amaroso, CO).
- 4750: Call up of A7A tptd then 506 30 BT foll by 5F grps, CW at 2205-2220 (White, ME).
- 5000: ZUO, Pretoria, RSA w/time sigs at 0530, CW ID (Alpert, NY).
- 5320: USCG Key West Group wkg Dry Tortugas Light Sta, USB at 0652 w/wx data (Halstead, WV).
- 5541: Continental 028 wkg Stockholm in SSB at 0412, asking for wx (Halstead, WV).
- 5600: Gander, NY, Shanwick, Santa Maria, all handling aero tfc, USB at 0450 (Scalzo, Canada).
- 5696: CG Rescue 2128 wkg CG Commsta Kodiak, USB at 0501 w/strong ELT sig. Said it was attempting to establish contact w/USS Vandergrift on UHF 277 MHz (Halstead, WV). Actual UHF freq used probably 277.8 MHz-- Ed.
- 5812: YL/EE in AM-mode with 3/2F grps at 1915 (Alpert, NY).
- 5918.5: AOK, Maron de la Frontera, Spain w/wx in CW at 0348 (Osier, NY).
- 6100: YVTO, Caracas, Venezuela time sigs w/AM-mode ID at 0733 (Scalzo, Canada).
- 6280: H27 telling H28 that their KW-7 not wkg, USB at 1904 (J.M., KY).
- 6390: IDQ3, Rome Naval Radio, Italy w/CW tfc at 0310 (Osier, NY).



**SHANNON AERADIO EIP
AERONAUTICAL COMMUNICATION STATION**

Location: The Station is located on the estuary of the River Fergus close to the River Shannon, on the south-west Irish coast: 27 km (17 miles) from Limerick City, 8 km (5 miles) from Ennis, County Clare, and 10 km (6 miles) to the north of Shannon Airport.

General: Shannon Aeradio operates a computer based aeronautical mobile and aeronautical fixed telecommunication network system, providing facilities to serve international air transport flying on the North Atlantic routes.

Frequencies: Aeronautical Services.

Voice Weather Radio Telephony:
Broadcasts 11 00+25 and 11 30+55 minutes each hour.
Night 3415 5640 8957 kHz
Day 3430 8957 1284 kHz
127.0 MHz continuous.

R. T. Air-Ground Air Communication:
2884 2862 2971 3016 kHz
4675 3598 3616 3649 kHz
8825 8864 8870 8891 kHz
13241 13306 kHz
127.9 MHz

General: Transmitter power is 1kW P.E.P.

Aerials: Directional log periodics and rhombic, non-directional monopoles and dipoles.

SHANNON AERADIO EIP QSL

To: K. Rath

Your reception report on:

**SHANNON AERADIO
AVIATION WEATHER BROADCAST**
is confirmed

on 2357 kHz at 0430/0445

on _____ at 21/3/84

735 de EIP.

Thank you for *EIP*

letter.

Officer in Charge
Eamon Mc Barn
9-4-84



Krishna Rath, MD has been a SW DX'er for 12 years and into Ute DX'ing for about seven years. He uses a Panasonic RF2900 and a Sony ICF-2002. He has not as yet been able to install any outdoor antennas. Here is a QSL he received from Shannon Aeradio.

TABLE 2

Frequency	Mode	Time	Details
H3KS	CW	12606	MV SALLY OCEAN - 12,963 GWT General Cargo Freighter built in 1977; Panamanian reg; w/ JCT (McDONALD-BC)
9VGE	CW	12535	MV NEPTUNE ALTAIR - 32,340 GWT Bulk Carrier built in 1983; Singapore reg; w/ JCU (McDONALD-BC)
3EAW4	CW	12574.5	MV ORIENT EAGLE - 4,476 GWT General Cargo Freighter built in 1985; Panamanian reg; w/ JDB (McDONALD-BC)
PGDJ	CW	12589	MV NEDLOYD MARSEILLES - 10,186 GWT General Cargo/Container Ship built in 1978; Netherlands reg; w/ PCH52 (McDONALD-BC)
HPCW	CW	12627	MV GLORY OCEAN - 10,109 GWT General Cargo Freighter built in 1977; Panamanian reg; w/ JDC
DNKL	CW	12566 (McDONALD-BC)	MV COLUMBUS LOUISIANA - 19,193 GWT Container Ship built in 1979; German (W) reg; w/ WCC
WPGK	USB	12429.2 (McDONALD-BC)	MV AMERICAN ENVOY - 28,087 GWT Container Ship built in 1972; USA reg; w/ WRD826 Oakland; QSL and large color photo of vessel rc'd
DUZJ	CW	12567	MV BELSTAR - 22,494 GWT Bulk Carrier built in 1972; Phillipine reg; w/ KFS w/ QTC 3 (McDONALD-BC)
D7RY	CW	12582 (McDONALD-BC)	MV REEFER NO. 5 - 3,008 GWT Refrigerated Cargo Cargo Ship built in 1973; S. Korean reg; w/ KPH
VRFV	CW	12605	MV MALAHAT SAGA - 23,569 GWT Bulk Carrier built in 1971; Canadian reg; w/ VAI (McDONALD-BC)
KIRH	USB	12429.2	MV AMERICAN ENTENTE - 28,087 GWT Container Ship built in 1973; USA reg; w/ WRD826 (McDONALD-BC)
ELAC5	CW	16772	MV ALBERNI DAWN - 18,258 GWT Bulk Carrier built in 1983; Liberian reg; w/ VAI (McDONALD-BC)
D8PX	CW	12576	MV HYUNDAI NO. 12 - 14,836 GWT Bulk Carrier built in 1980; S. Korean reg; w/ VAI (McDONALD-BC)
BKHC	CW	16813	MV EVER GENIUS - 37,023 GWT Container Ship built in 1984; Chinese reg; w/ JNA w/ AMVER; 31-34°N/154-49°E steering 259 deg at 20.0 knots (McDONALD-BC)
5BDV	CW	12586	MV AZALEA - 17,850 GWT Bulk Carrier built in 1976; Cyprus reg; w/ JCU (McDONALD-BC)
OYBG	CW	12586	JSS FALSTRIA - 20,325 GWT Container Ship built in 1971; Denmark reg; w/ KPH (McDONALD-BC)
ELEI3	SITOR	12498	MT OSCO SPIRIT - 20,511 GWT Tanker built in 1974; Liberian reg; w/ SITOR t/c to SYDNEY RADIO (McDONALD-BC)
ELFT	CW	16770	MV CHEVRON STAR - 76,547 GWT Tanker built in 1977; Liberian reg; w/ IAR (McDONALD-BC)
WHRN	CW	12639	MV PRESIDENT WASHINGTON - 40,626 GWT Container Ship built in 1983; USA reg; w/ NMN (McDONALD-BC)
ELEZ9	CW	12615	MV SEA CHALLENGER - 24,943 GWT Bulk Carrier built in 1985; Liberian reg; w/ NMO (McDONALD-BC)
JPDI	CW	16788	MV ORIENTAL QUEEN - 23,663 GWT Bulk Carrier built in 1984; Japanese reg; w/ JNA w/ AMVER; 45-20°N/166-16°W steering 073 deg at 12.6 knots (McDONALD-BC)

banding that seems to permit scientists to cut out a window in RF spectrum for same reason or other. Talk of sonobuoys, etc. Might be something to do with submarine comms via ELF, don't you think? (Hall, WA). Don't look at me, it's over my head-Ed.

7485: NOTC, USS *Caron* (DD-970) w/all-mode test to Charleston test control, orig comms estab in USB mode at 1740 (J.M., KY).

7527: AFEZ, Eglin AFB, FL rescue ops to Jolly 97 in USB at 1240 (J.M., KY).

7532: FSB, Interpol Paris, France in CW at 0320. Seems to be //6792 kHz (Kirk, CT).

7535: NJZK, USS *Josephus Daniels* (CG-27) w/all-mode test to Norfolk at 1253, then QSY to UHF at 1311 (J.M., KY).

7648: Un-ID sta w/VVV VVV 8BY 8BY 461/017/190 /75 in CW at 0552 (J.M., KY).

7906: Beacon K in CW at 2253, switched to ID of S at 2255 (J.M., KY).

8055: YL/SS in AM-mode at 0710 w/5F grps (Scalzo, Canada).

8137: Beacon S at 0000, letter sent every 5 seconds (Scalzo, Canada).

8219: WTP4697, tug *American Pager* wkg another vessel, USB at 0250 (Hall, WA).

8241.5: WVMF, NOAA ship *Albatross IV* in USB at 1955 to USCG Commsta Boston. QSY'd to 6200 kHz (O'Connor, NH).

8291.1: WGW in PR, in comms w/WYK4296, vessel *Defender* in USB at 0616 (Brookes, RSA).

8300: New Star Radio Station #4, YL/CC w/4F grps, each X2, AM-mode at 0705 (Saba, So. Korea).

8363.6: WMRJ, ship *American Vega* in CW at 0319 to NMN (O'Connor, NH).

8454.5: SVG, Athens, Greece w/CW call marker at 0115 (Ross, Canada).

8502: PPL, Belem, Brazil w/VVV in CW at 0009 (J.M., KY).

8532: LZW, Varna, Bulgaria w/CW call marker at 0130 (Ross, Canada).

8581.4: X-C, Cozumel, Mexico in CW clg CQ at 0025 (Ross, Canada).

8649: PKM, Bitung, Indonesia w/call marker in CW at 1315 (Brookes, RSA).

8656.5: FUJ, Noumea, New Caledonia in CW at 1303 w/call marker (Scalzo, CA).

8690: 3DP3, Fiji clg CQ in CW at 0520 (Brookes).

8717: ZSC, Cape Town, RSA w/call marker in CW at 0510 (J.M., KY).

8749.9: WOO, Marine Operator, Ocean Gate, NH wkg ship *World Viking Sky*, USB at 1815 (A. Nonymous, MO).

8828: Auckland R., New Zealand w/VOLMET bc, USB 0450-0454 (Amarosa, CO).

8843: San Francisco Center wkg a/c N9090Q in distress, USB at 0453. Helping out on freq was Hawaiian 22, CG Rescue 1704, & a USN vessel w/ID Golden Eagle (possibly USS *Carl Vinson*). Many mentions of estimated splash time (Halstead, WV).

8864: Iberia 371 in USB at 1436 in comms w/Santa Maria (Mueller, France).

8879: Alitalia 65 in USB at 1255 in comms w/Shannon (Mueller, Switzerland).

8891: Clipper 61, USB at 1534 in comms w/Gander (Mueller, France); Cambridge Bay, Canada in USB at 2211 wkg Canadian 46 (Ross, Canada).

8903: Kano, Nigeria in USB at 0257 wkg Brazzaville, Congo (Ross, Canada).

8933: Springbok 253 in USB at 0158 wkg Johannesburg (Halstead, WV).

8974: J4H to K95 w/lfc, USB at 0247 (Scalzo)

9006: Canadian Military Search & Rescue ops, USB at 1555. Heard were Trenton Military, Edmonton Military, Rescue 315, -335, -801, -804, -805, -815, & Thunder Bay Search. (A. Nonymous, MO).

9431: YL/SS in AM-mode w/4F grps at 0510 (Fernandez, MA).

9459: ZKLF, Auckland Metea, New Zealand clg CQ & wx in CW at 0517, then shift to FAX at 0546 (J.M., KY).

10155: CW xmsn of 01 444 (rptd) BT 27 BT then into 5F grps. Text has remained the same since 1st hd last August. Noted at 1944 (White, ME).

10390: FSB, Interpol Paris, France at 0335. See 6792 kHz listing. (Kirk, CT).

10540: YL/CC w/4F grps, each X2, USB at 1206 (Saba, S. Korea).

10722: Two OM/RR in comms distinguished by a long series of 1-0 tuning counts, USB at 0657 (Saba, S. Korea).

10780: Cape R., FL in USB at 2140 wkg Teal 31. QSY'd to 14397 kHz (Alpert, NY).

11082: OM/RR w/5F grps in AM mode at 1937 (Saba, S. Korea).

11120: Narcotics w/coded t/c. Tried to contact Old Crow but no joy. Worked Delores. USB at 0445 (Scalzo, PQ). Could this be the SAC on 11118?--Ed.

11214: Raymond 24 (Tinker AFB, OK) to Dragon 12 at 0200 (Amarosa, CO).

11267: SES200 clg Cinclant fleet in USB at 0802. At 1447, 9LW told 9VA & 1VC to QSY (Kirk, CT).

11400: YL/Korean w/5F grps, each X2. AM-mode at 1607-1611 (Saba, S. Korea).

11430: YL/CC w/4F grps (X2), AM-mode 0833 (Saba, S. Korea).

Steve McDonald, Canada has given us some additional maritime loggings with callsign/ vessel ID information included.

6462: FUM, Papeete, Tahiti w/VVV tape in CW at 0445 (Brookes, RSA).

6465.5: KLB, Seattle, WA w/CW VVV tape at 0121 (Szalony, CA).

6506: USCG Guam Commsta w/wx bc, USB at 1539 (Saba, So. Korea).

6509: WTD0, NOAA ship *Oregon II* w/report to KHW, Pascagoula, MS, USB at 1738 (J.M., KY).

5415: KRV, Pance, PR w/ship t/c in SS, 0246 (Osier, NY).

6693: Halifax Military Radio, Canada to a/c 1311 in USB at 0546 about refueling. Freq specified as primary w/5718 kHz secondary (Saba, CA).

6697: Swallow & Zebra (helicopter) in USB 0300-0400 w/ASW exercise w/beatings given for dropping sonobuoys. Zebra reported sighting of a Scripps Oceanographic vessel & said he would try to avoid hitting same. Many other stas, too including L4K, Z7C, K2F (Ambrose, CO).

6720: QBE w/alphanumeric t/c, USB at 0757. This is a USN PacFleet freq (Saba, S. Korea).

6740: Head Dancer to un-ID ground sta w/wx at 0721, USB (Scalzo, Canada).

6753: Trenton Military Radio, ONT w/VOLMET bc at 0334. Also Edmarion Military, Aita., at 0522. All USB (Saba, CA).

6759: DAC clg MLO (both un-ID) in CW atr 0300. DAC had a pretty bad fist (Kirk, CT).

6761: K10 in USB at 0342 asked Serenade for immediate 'patch w/Blackwater (Kirk, CT).

6792: FSB, Interpol Paris, France in CW at 0320 w/ARQ & alternating tone sigs (Kirk, CT).

6783: YL/SS in AM-mode w/5F grps. Off at 0320 (Scalzo, Canada).

6874: Beacon E (un-ID) at 0135 (Szalony, CA).

6918: Interesting t/c in USB at 1534 involving scientific obs posts Alpha/Omega/Delta. All wkg Great Circle who appears to be head hancho located either in San Diego or at JPL Pasadena. Much talk of sending tonals by ELF (17 Hz, 20 Hz, etc.), various 'arrays' & the quality of data rcvd from them, also Fleet Messages. Talk of complex base

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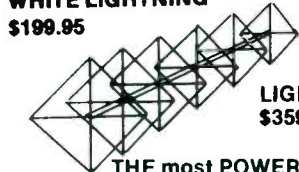


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11473.3: KKN44, US Dept. of State in CW at 4300 clg KQY21 (un-ID) (A. Nonymous, MO).
11607: OM/RR w/5F grps, AM-mode at 1911 (Sabo, S. Korea).
12175: OPR (un-ID) clg JML on 1400 sked. On 2 days sent QRU NIL. Another day, OPR(?) sent cut #'s w/header of 953 110 BT. Xmsn was hand keyed. On yet another day, at 1600, machine sent cut # t/c sent w/header NDG ATT BT followed by 100 grp mag (White, ME).
12413: GBBM, cruise liner *Island Princess* w/kg KMI w/patches while located near AK coast (Hall).
12432: WGWC, vessel *Ogden Wabash* in USB at 0006 w/kg KHT w/patch (Dale, MA).
12528: SI clg KE, then VVV DE SI SI OJ/OG/OM/AZ/OI/KE//OL/FT3/RX DE SI SI HW IMI. Then sent same call up but in different order. Did it 8 times & stopped. CW at 1423 (Kirk, CT).
12551.4: D9HR, ship *Hyundai No. 21* in CW at 1851, clg FFL (O'Connor, NH).
12555: OWLA, ship *Torm Rask* in CW at 0320 clg KFS (O'Connor, NH).
12552.8: VCWX, ship *Irving Canada* in CW at 1905 clg VCS (O'Connor, NH).
12606: 7JQH, Japanese vessel *M/V Kotaku Maru* w/kg KPH in CW at 2119 (Hall, WA).
12615: IMYT, Italian ship *M/V Fuhwoven Ture* w/kg KPH w/telegams in CW at 0052 (Hall, WA).
12662: 7TAB, El Djazaair, Algeria in CW at 1444 w/maiker (Lusk, CT).
12709: A7M, Manama, Bahrain in CW at 0314 w/call marker (O'Connor, NH); 8PO, Barbados, w/CW call marker at 2125 (Ross, Canada).
12750: CWA, Cerrito, Uruguay in CW at 2125 clg CQ (Ross, Canada).
12790: XFFZ, Coatzacoalcos, Mexico in CW at 0237 in comms w/ELAD7 (Kirk, CT).
12994: VIP4, Perth, Australia in CW w/VVV marker (Ross, Canada).
13038: VVC, Calcutta, India in CW at 0251 w/t/c list (Kirk, CT).
13073: ZSD, Durban, RSA in CW at 2224 w/marker anncing ship telex (O'Connor, NH).
13193.8: An OM in LaPaz, Bolivia, USB at 0354, in comms w/unheard sta re operation of a transceiver. QRM from scrambled voice on adjacent freq (A. Nonymous, MO).
13241: Suitable at 0524 w/alphanumeric t/c; Firelane w/similar t/c at 0534, then Suitable back on w/Skyking Do Not Answer bc. This is SAC's Channel 5 (Sabo, S. Korea).
13248: German Navy 4777 clg DHM91 in EE, USB at 1834, negative contact. Two days later at 1500

REPUBLICA DE VENEZUELA
MINISTERIO DE LA DEFENSA
COMANDO EN JEFE FUERZA ARMADA NACIONAL
OBSERVATORIO NAVAL "SAN MANUEL LABAN"

Y V T O

FRECUENCIA DE 6.100 Kc/s

ESTACION EN PORT EMBEN
NOMBRE WALTER WITKOWSKI
DIRECCION _____

Agradece el reportaje desde El Observatorio Naval "Juan Manuel Cagigal" sobre la recepción de las pruebas de Transmision de la Hora Legal de Venezuela en la Frecuencia de 6.100 Kc

Caracas, 30 de MARZO 1987.

CN: EDUARD WENZEL PEREZ

Walt Witkowski, NY forwarded a copy of the QSL he received from the Venezuelan "Time" station. Walt says he uses a Radio Shack DX-400 with a 75' longwire for listening.

noted Navy 4786 clg DHM91-- a vessel prob off coast of Venezuela (A. Nonymous, MO).
13270: New York Radio VOLMET at 1105, USB. Excellent sigs (Mueller, Switzerland).
13729: FPN72, AFP Paris, France in CW w/call marker (//FTJ39A/F) at 1800 (Alpert, NY).
13860: OM/RR w/repeats of 629 629 629 2, then a single 629 at 1455, foll by 5F grps. Msg rptd at 1508. Am mode (Sabo, S. Korea).
13910: CLP, Minirex Havana, Cuba in CW w/telegram to Embacuba Brazzaville re visit by a Cuban big cheese. Really lousy CW (Hall, WA).
13916: CLP1, MFA Havana, Cuba w/t/c for CLP41, an Embacuba somewhere, in CW at 1858 (J.M., KY).
14408: Simplex USB at 2150 w/K57586 at Univ. of Colorado w/kg NASA base in Antarctica w/relay of scientific info, plus sports scores, ex, etc. to those studying what's left of the ozone layer. Lots of mentions of flights to Punta Arenas. Op sez will be calling up McMurdo after work. Phone call to NASA in DC confirms location (Hall, WA).
14485: Army MARS net-- AAT9SY (stoteside) in comms w/ABM4CG, Camp Red Cloud, Uijoncbou, S. Korea. Sez he checks Soviet beacon K on 14478 kHz as a propagation guide across Pacific (Hall, WA).
14775: Peacock w/Skyking bc & calling Cracker-box & Rainbow, USB at 0901. This is SAC's Channel M (Sabo, S. Korea).
15024: RPNDZ, Aeroflot 4131, w/kg COL in CW at 1605 over Nassau enroute Washington. Aeroflot 1339 w/kg RFNV (Moscow) in CW at 1723 over Bermuda enroute Havana at 2025 (Halstead, WV).
15390: YL/CC in AM mode at 0920 w/4F grps, each X2 (Sabo, S. Korea).
15490: Half of a 2-way patch from Ascension Island, LSB at 1754. Also same or. 19961 kHz (J. M., KY).
15880: OM/RR in AM-mode at 1356 w/5F grps (Sabo, S. Korea).
16727.2: KP5B, ship *Coronado* in CW at 1720 clg PCH60 (O'Connor, NH).
16730: VPS, Cape D'Aguilar, Hong Kong in CW at 2204 w/marker (Kirk, CT).
16805: 3EUD5, *M/V Caribbean Highway* w/kg un-ID shore sta (Hall, WA). Time not given-- Ed.
16849: DHCW, FRG-flag vessel *Columbus Wellington* w/kg VAL, CW at 2000 (Hall, WA).
16861.7: PKB, Belawan, Indonesia clg CQ at 1432, CW (O'Connor, NH).
16909.7: TFA, Reykjavik, Iceland clg CQ in CW at 1406 (Ross, Canada).
16911.2: JNA, Tokyo, Japan w/CW marker at 2053 (Ross, Canada).
16918.1: VHP, Commsta, Canberra, Australia w/VVV marker at 0237 (A. Nonymous, MO).
18432: Reuter FAX, Argentina at 2000 (Alpert, NY).



ANTENNAS AND SIGNAL IMPROVING ACCESSORIES

Band and Bandwidth Antenna Improvisations

In general, low-band antennas for ham and SWB operation have limited bandwidths. For example, in ham application, a tuner is often needed to obtain entire-band matching on 80 and 160 meters, and, sometimes, on 40 meters, too. A tuner is an added expense and must become a part of the tune-up procedure for the transmitter. An antenna cut as a dipole on one band performs poorly on two adjacent bands because they ham or tropical SWB bands. A tuner can help in matching an antenna but does little in improving the performance of a miscut antenna itself.

There are ways of using jumpers and add-ons to devise more benefits from a given antenna with good results. In this column, we will use the W9INN-40-80-160M broadbander, Fig. 1, as an example. This antenna was detailed in the column of the previous issue. The same ideas covered this month can also be used with other low-band ham, SWB and MW/LW antennas.

Operation At Both Ends Of A Ham Band

In the first example, a jumper of proper length will be added to the 40M wire of the

W9INN antenna which will permit low SWR, no-tuner operation on the CW portion of the 40M band. If you recall, our W9INN antenna was cut for sideband operation with a mid-frequency of 7.22 MHz. In the modification, the first step is to place an insulator, Fig. 2, into the 40M wire about 9' up from the feed point. A jumper directly across the insulator permits sideband operation in accordance with a frequency centered about 7.225 MHz.

The 40M wire is made resonant at the CW end of the band by removing the jumpers and substituting a 20" stiff wire loop across the insulator, Fig. 3. An antenna bridge can be used to advantage in cutting this loop for resonance on a specific CW center frequency. The set up is ideal for the SSB operator who, on occasion, likes to do a bit of CW DX'ing. Similar ideas can be used to do some occasional DX'ing on the 80M and 160M CW bands. On 80 meters, a straight 1'10" length of stiff wire is clipped to the 80/160 wire at the resonator, Fig. 4, for CW operation. Use a stepladder or lower the antenna wire a bit by releasing the rope that pulls up on the antenna at the end stake.

Keep the loop and the add-on you make.

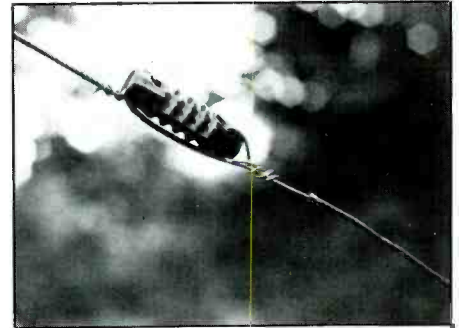


Fig. 2. Insertion of insulator in 40M wire.

Anytime you want to do some CW operation you will have the items that will permit you to operate on the ends of the bands with a low SWR and no tuner.

In the installation, a permanent set up was made for 160M operation. First, the wire end was cut back and resonated to 1950 kHz at the high-frequency end of the 160M band. An appropriate jumper and clip was prepared, along with an experimental length of wire, and attached to the end insulator, Fig. 5A. The opposite end of the wire was attached to a second insulator,

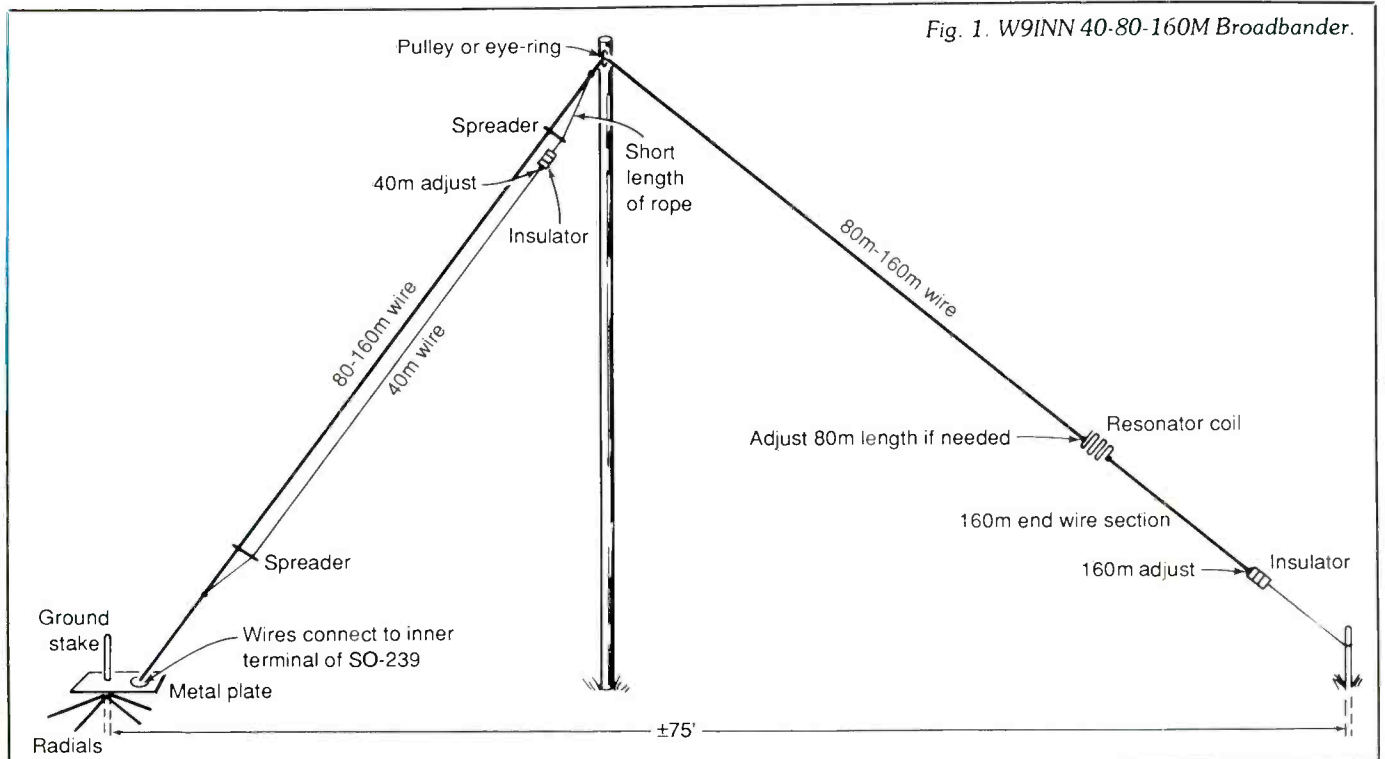


Fig. 1. W9INN 40-80-160M Broadbander.

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- Experience gained over the years in producing high power transmitting antennas led to the introduction of the DX-SWL—the first commercially available world band sloper combining AM broadcast, tropical bands and 60 thru 13 meters.

What does transmitting experience have to do with shortwave reception? Plenty! If a transmit antenna is not designed to precise parameters, it will not pass the RF "smoke test"—there will be burned connections, shorted components, high standing waves and generally lousy performance. On the other hand, a receive-only antenna of shoddy design can go unnoticed—except by your receiver and the weak DX signal you're trying to receive. DX-SWL antennas are used daily in 2 kw transmit service, as well as for world class reception.

- We recognized early on that a **Sloper** can outperform a dipole at the same height, for many incoming wave angles. The **Sloper** really shines on weak, low angle DX signals. A **Sloper** also requires only a single, elevated support—it's easier to install than a dipole.

- The model DX-SWL is designed with specially coated 12 ga. solid copper wire elements which are 25% greater in diameter than the more commonly used 14 ga. wire. Engineers know that a larger diameter yields less resistance, and thus less loss per unit length. Even though 14 ga. wire is cheaper, it is not acceptable for use in any Alpha Delta antenna.

- Because DX-SWL antennas are used worldwide in less than ideal environments, only high quality stainless steel hardware is used. Even though it is more costly than plated hardware used in other cheaper brands, we know that you want to put an antenna up once, and forget it. Climbing great heights to replace rusted connections is no fun. Due to the direct sun, high heat environment of some DX-SWL installation sites, we use only specially selected white coil form material. Black forms used by other brands are not acceptable due to heat absorption and possible coil distortion.

- Before you buy any shortwave antenna, check out the design details and transmit capabilities thoroughly—even if you're not going to transmit. We don't want your investment to go up in smoke!

Model DX-SWL Sloper Antenna is available for **\$69.95** at your **Alpha Delta Dealer**. For direct orders send \$69.95 plus \$4.00 shipping (USA only). Call for export order prices.

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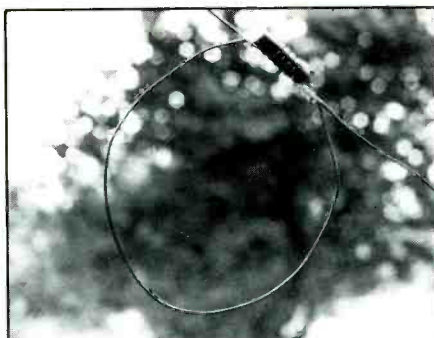


Fig. 3. CW loop across insulator



Fig. 4. Clip-on wire for tuning 80M wire to CW portion of band.

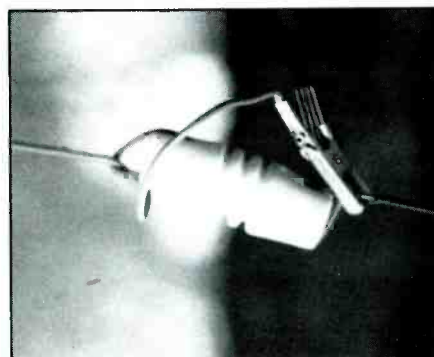


Fig. 5A. Use of jumper to lower resonant frequency on 160.

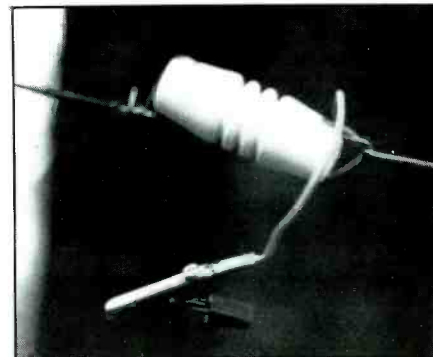


Fig. 5B.

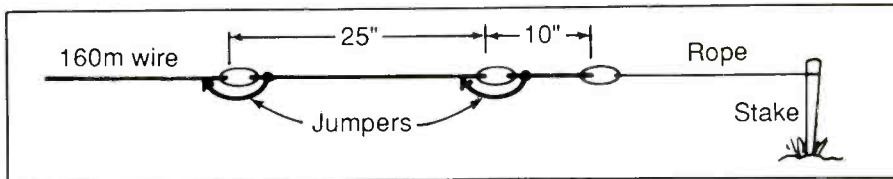


Fig. 6. Jumpers for selection of three portions of the 160M band.

Fig. 6. A length was chosen experimentally to resonate the antenna to 1845 kHz with the jumper closed, Fig. 5B. Finally, a third insulator was attached in the same way to permit low-SWR CW operation at the very low frequency end of the 160M band. An antenna bridge such as the MFJ-204B is a big assist in cutting the wire for a particular band segment.

**Adding 20M To
The W9INN Antenna**

The addition of a 20M wire permits operation on this DX band and sets up a good performing 15, 20, 40, 80 and 160M antenna system. With wires resonated on the appropriate sideband frequencies you can change bands by only retuning your receiver. You will have a low SWR on each of the bands and each antenna will be tuned for resonance.

The 20M antenna operates as a 3/4 wavelength element against ground and has a physical length of 51'7". Our exact resonant frequency was 14.225 MHz. The 20 meter addition was mounted on a second plastic pipe the same height as the first one, Fig. 7, and was spaced approximately

7' from the first mast. The presence of the 20M wire had no influence on the W9INN 80-160M wire. The resonant frequency of the 40M wire was shifted slightly an unimportant amount.

**Shortwave
Broadcast Results**

The basic W9INN antenna performs well as a receiving antenna on the 13, 41 and 75M SWB bands because each is on, or near, to the resonant 80, 40 and 15M ham bands. Results are good on the 120M band as well when the 80/160M wire is resonated near the high frequency end of the 160M band. Also, 80/160M wire has odd-order harmonics that produce resonance and fine performance on the 19M and 31M SWB bands. The presence of the 20M wire also helps to frequency spread the SWB reception capability of the antenna.

It is possible to peak the 49 or 60M pick up, if you wish to do so, by temporarily adding either an 8'4" or 12'3" length, respectively, across the 40M wire at the newly installed insulator for adding CW capability on 40M, Fig. 3. By adding one of the two wires you can set up a quarter wavelength wire on

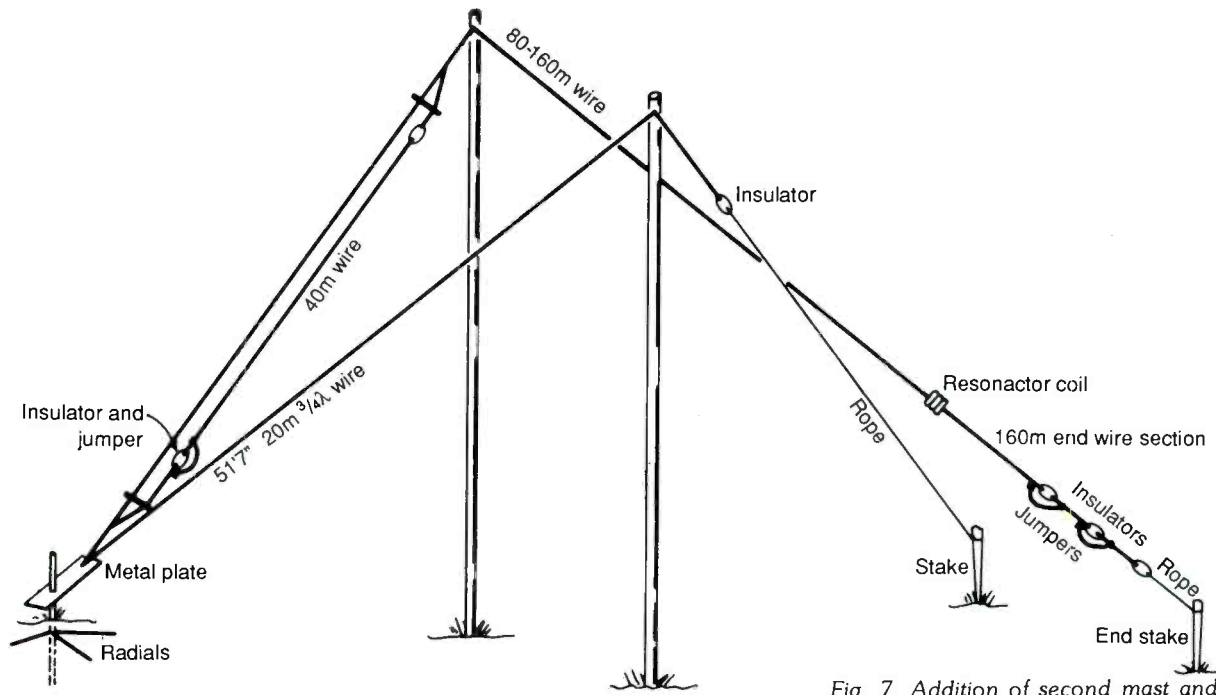


Fig. 7. Addition of second mast and $\frac{3}{4}\lambda$ 20M wire plus other changes.

either the 49M or 60M SWB bands. You can use two short wooden stakes to set up a small triangular support for the wires as they come away from the insulator ends. Don't let the wires curl or lay on the ground.

Broadcast Band (BCB) Reception

If you are a BCB enthusiast you can easily add broadcast band capability to the antenna. As you know, more people now share an active interest in all-band radio reception, and ham radio, than ever before. It is a good thing. The AM broadcast band addition to the installation is a wire that connects to the very end insulator of the 80/160M wire with a jumper, Fig. 8. What you see is the last insulator of the three associated with the 160M band operation, Fig. 6. A jumper clip is associated with a length of #16 plastic covered hook-up wire. This wire is wrapped tightly around the rope that extends between the last insulator and the support stake, Fig. 8. A 25' length of wire is wrapped tightly around the rope attaches to the



Fig. 8. Adding BCB capability to the 160-80-40 broadbander.

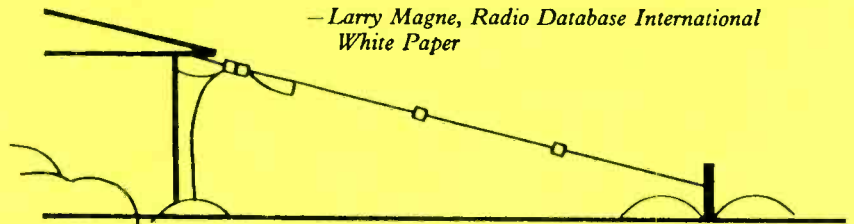
end support stake, Fig. 7. When all the clips associated with the end antenna are closed, the antenna resonates well up into the broadcast band. You have a resonant antenna on the AM broadcast band which is

good in picking up the weaker broadcast signals for identification.

The total length occupied by this modified antenna from feed point to end stake is 116'. It's really an all-bandier. **PC**

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Beaming In (from page 4)

to bring in complaints that they are either too technical, or not sufficiently technical. Moreover, those who review the equipment have sometimes been described in the most scurrilous terms, accusing them of being liars and/or morons whose opinions are wrong. My feelings are that an opinion is a very personal and subjective perception. It can't properly be described as either right or wrong, only as a perception with which you either agree or disagree. Can you imagine complaining to a movie reviewer that he was "wrong" for liking a film you thought was a bomb?

Letters are also received at times squawking that this or that author has dared to write

something that failed to adequately pay homage to some particular belief, philosophy, or pet theory of the complaining reader. In addition to this category of letter, you'd be surprised at how many people feel that we would best appreciate their concepts if they tagged on a "little convincer" to the effect that they'll certainly "never read another issue" if we don't agree to speak out or shut up about their pet project or peeve. It's strange that anybody would think that such an approach would be effective.

Still, all letters (regardless of the degree of annoyance and hostility) are read. The fact that someone sends a bellicose letter doesn't mean that their views aren't of interest, even though expressed in an unappealing manner. There are times, usually when the writer has no point to make and simply wishes to

express hostility for its own sake, I'll write back a letter that is roughly equivalent to the one received. Those who receive such replies frequently write back to say that they were at a total loss to comprehend how I felt that I had the right to write to them in a tone so callous—apparently feeling that I would have been thrilled at having received their nasty tirade and was expected to soothe them with an expression of deep contrition for whatever triggered their original letter.

Of course, while readers are invariably most serious about the complaints they send to magazines, some we have received here do seem, I must admit, pretty far out. Like the reader in Poway, CA who complained about what Alice Brannigan wears in her photos. There was a reader who complained that the magazine seemed "to be out to make a buck," although I had assumed that was supposed to be an honorable aspiration. A story we ran on American military communications in Central America (written by the army officer in charge of same) brought a lengthy scolding from a reader who wanted us to know that his political views caused the story to offend him. Recently a reader complained that the magazine uses too many exclamation points! Another reader didn't like coverage we had of communications systems used to locate drug smugglers. Yet another reader continually writes to let us know about any spelling and grammatical errors he spots; he's been writing to us for years.

Nevertheless, the preponderance of mail that comes in doesn't fall into any of these categories, it is genuinely friendly, articulate, and often humorous. Whether it offers assent or dissent to something in *POP COMM*, or suggestions for future coverage, it is a pleasure to receive and read, and is extremely valuable to us. As for the other mail, when you're in a position where you receive a large amount of mail from the public, you get a totally different view of the world than most folks. The majority of people receive mail that consists mostly of bills, ads, catalogs, plus letters and greeting cards from friends and relatives. That's a far cry from the kind of mail that's received at a magazine, newspaper, radio or TV station, especially one that is prone to expressing opinions on controversial topics.

Besides, some folks are just plain angry, cranky, and grumpy for reasons of their own. Others can express their thoughts only in terms of threats. Some letters are so totally freaky that its impossible to know why they were written except to ramble on about sinister plots by secret agencies or unseen forces from this or other worlds.

For years now, I've saved the most illogical, funny, angry, and perplexing letters I've received. People who have gotten a look at my large collection find it astonishing, even amusing. Some have suggested that I publish them in book form entitled, *Letters To The Editor*.

Nah, nobody would believe any were authentic.



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SATISFACTION GUARANTEED

SCANNING TODAY

(from page 9)

cal area, but with a car, you can obviously travel to other cities. This is called "roaming" in the cellular business, and most radiotelephones automatically search between block A and block B systems in the area for an active system to connect to (see definition of blocks, below). In most cases, the "roamer" must first call the cellular system in the area to get signed on, but in some areas, the sign on is completely automatic. Roaming is what got the old IMTS system into big trouble. After IMTS became too busy in big cities, the phone company stopped issuing phone numbers. But creative types soon found out they could get numbers assigned in smaller cities and then become "permanent roamers" in their home city. It clogged the IMTS system so badly, that it became nearly useless during some times of the day.

AMPS—This is the "Advanced Mobile Phone Service" that was installed on an experimental basis in Chicago by AT&T to test the cellular concept. After the experiment ended, users had to give up their phones but were soon able to switch to the current cellular system.

Block A—This is the frequency block assigned to the "non-wireline" carrier in each market area. There is one "non-wireline" and one "wireline" carrier licensed by the FCC in each area. The wireline carrier is the local phone company. The non-wireline carrier can be anyone, even a phone company from another state. It is designed to have two competing systems per area.

Block B—As you might guess, this is the frequency block assigned to the wireless carrier. All cellular frequency blocks are in the 800 MHz range.

RSA—This is FCC lingo for "Rural Service Area", or the gaps in the current system between larger cities that the FCC hopes will be filled in with systems. Whether or not a costly cellular system in America's farmland and smaller towns is economically sound, remains to be seen. Many SCAN members live in RSA's.

There are undoubtedly some things you'd like to know that we haven't covered, so please write to us at SCAN, P.O. Box 414, Western Springs, IL 60558. We'll try to cover them in a future column.

SCAN

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There still is understandable confusion about what to send to SCAN and what to send to *Popular Communications*. Even we were confused at first, so don't feel alone! Here's a brief rundown you may want to save for reference.

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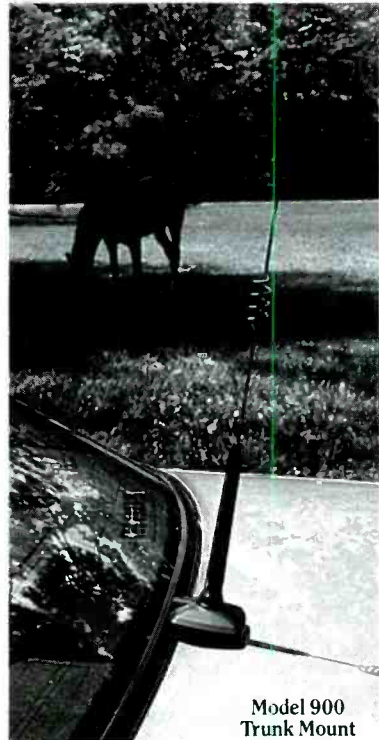
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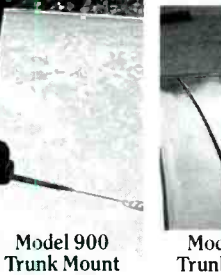
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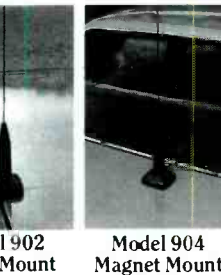
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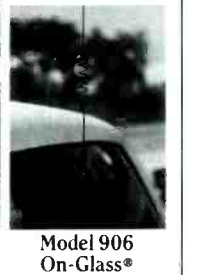
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POP'COMMS August 1983-August 1986 (Sept. '85 missing), all 36 issues, \$55 postpaid includes 2 POP'COMM binders. SASE. David Wilson, 22 Willow Park, Wellesley Hills, MA 02181. 617-235-0986.

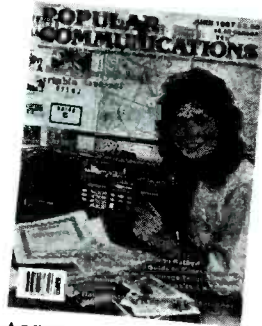
WANTED: Tech manual for RCA AR-8516. Also would like to purchase national LF10 preselector; HRO-600 receiver. Write: Ed Kowalski, K3PRE, 3300 Chesterfield Road, Phila., PA 19114.

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