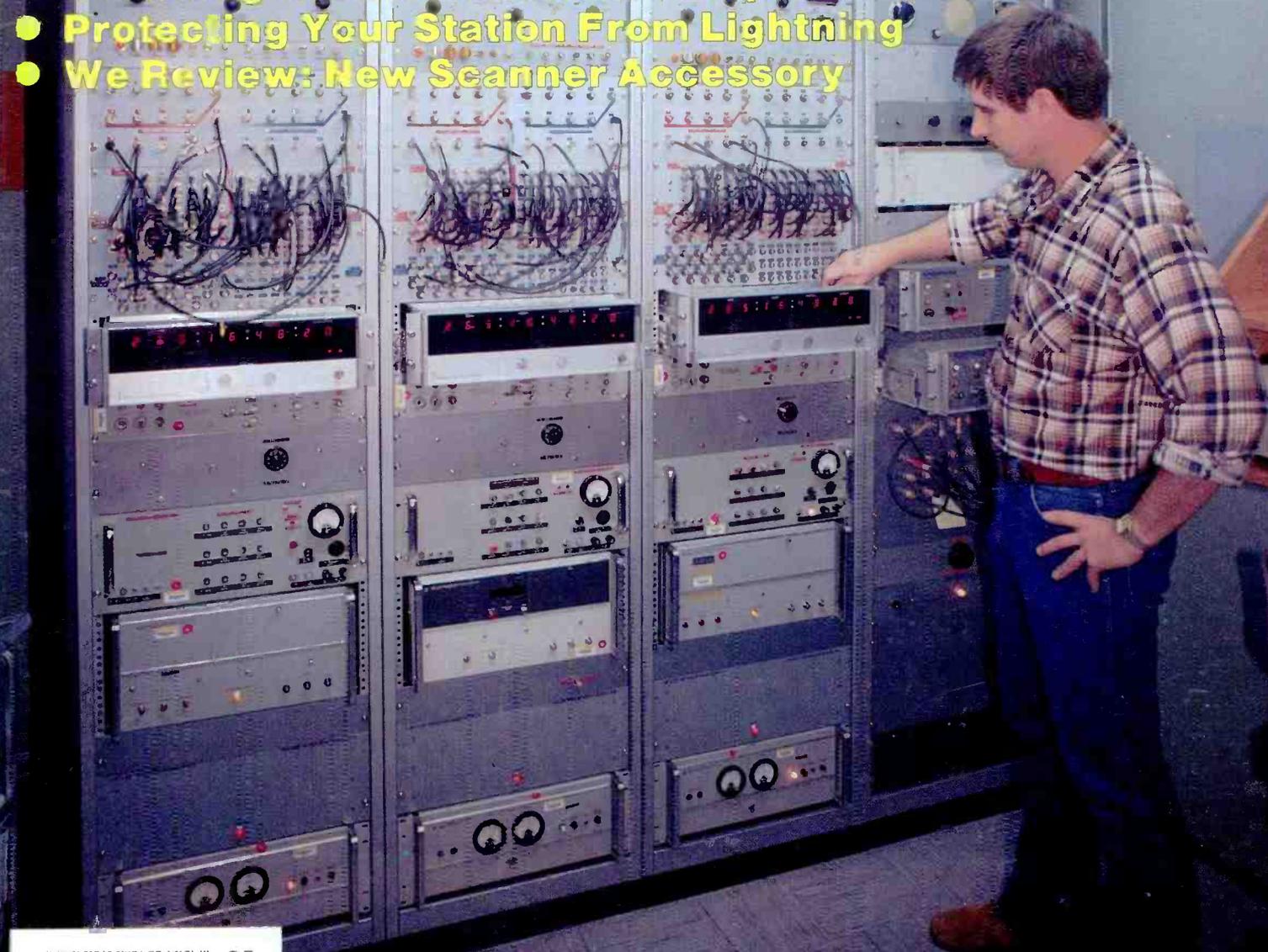


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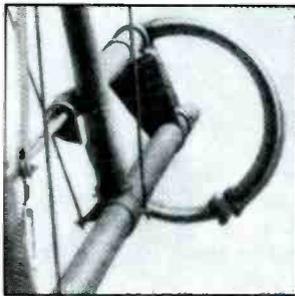
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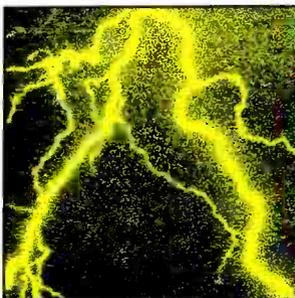
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JULY 1990

VOLUME 8, NUMBER 11



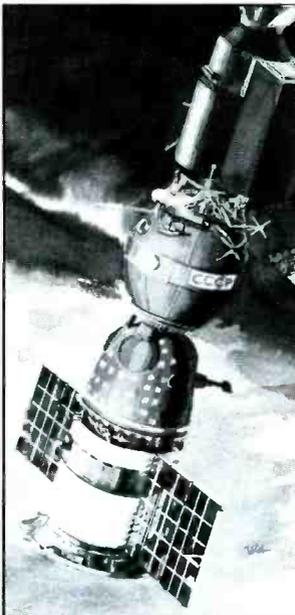
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This month's cover: Matthew Deutch, Electrical Engineer at WWV, checks out time code generator. Photo By Larry Mulvehill.

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My Hang-Ups

When I first came across the term *Caller ID*, it was contained in a barrage of letters that began arriving here demanding that I stand up and comment on the latest development in telecommunications technology. Some readers felt that *Caller ID* was the greatest thing to emerge from Ma Bell's labs since Alexander Graham Bell first uttered "Mary Had A Little Lamb," or said, "Come here, Mr. Watson, I want another Coors," or whatever it was. Of course, other readers saw *Caller ID* as the latest and strongest evidence that America is tottering on the brink of a total loss of privacy.

As soon as impassioned letters first began arriving, I realized that it was obviously something that needed personal attention. On the surface, the name of the thing made me think that it had something to do with the *id* of the caller. What little memories I have left of my Psych 101 class at the University of Miami made me think that this was probably the very last information I'd like to have about those people who call me, many of whom are tradespeople or, at best, computers selling Lambda instructions.

It turns out that *Caller ID* is an option that some telcos around the country will be or are offering their customers as an optional attachment to their phone instruments. It's a little box with some LCD's. When the person's telephone rings, they can look at the box and get a readout of the number that's calling and then decide if they want to answer the call. Naturally, there is an extra monthly fee for the ability to have this information.

Among the reasons that telcos feel that people might wish to have this service are to pre-screen incoming calls so they won't have to deal with junk calls, bill collectors, relatives they dislike, and others of that ilk. One recent TV commercial for *Caller ID* primarily touts it as a weapon to detect the phone number of an obscene caller. It made me think that perhaps Ma Bell was making a rare pun when it came to the caller's *id*!

On the other side of the coin, a large number of Americans say that telco charges a customer an extra monthly fee for having an unlisted number with the idea that this will eliminate a lot of unwanted incoming calls. All well and good, except that those who have unlisted numbers just realized that every time they call someone who has *Caller ID*, their private phone number will be revealed and the entire purpose of the unlisted number will be defeated. They claim that telco sold them a cure for the unwanted-call disease, and now has the gall to sell the anti-

dote for the disease to the very same people they were trying to avoid.

Frankly, it's not difficult to see why some people are intrigued by *Caller ID*, and why just as many think it's a rotten idea. Those who head the vanguard of those disliking *Caller ID* are persons with unlisted numbers, also bill collectors, telemarketing companies, and maybe obscene callers.

Telcos, of course, love the idea because it promises to rake in lots of revenue. It's not easy to devise and then get away with selling diametrically opposed concepts to the same group of customers. This is one of the great advantages of being a monopoly; you can do things like this and come out ahead. Telco's position is that customers don't "own" the numbers assigned for telephone service, they are merely on loan and remain property of telco. As such, customers don't have reason to object if the number shows up on *Caller ID* boxes. Essentially, if you are paying to have an unlisted (or, as they say, *unpublished*) number, about all you have the right to expect is that it will not appear in the phone book, or be given out by the Directory Assistance operator. Beyond that (and it isn't much) telco seems to feel your number is open for their exploitation. The public perception that having an unlisted number assures some heavy duty expectation of privacy is merely a fantasy telco has never done very much to dispel, much the same way as the expectation of privacy for car phone calls.

To be sure, steps have been taken to get some control on *Caller ID*. In California, they passed a law that permits this service to be offered only of callers not wishing to reveal their numbers can dial a couple of extra digits and thereby defeat *Caller ID*. The person with the *Caller ID* box is shown only a code letter ("P") indicating that the caller doesn't want the number revealed. A federal law specifying something similar is in the works. When a person with *Caller ID* sees the "P" on the LCD readout, they can then decide if they want to respond to the caller who wants to keep their phone number a secret, or if they just want to let the phone ring for an indeterminate period of time. Maybe if it rings long enough, the caller will then show up at their front door.

If you think about it, a person wishing to screen their incoming calls could accomplish the same ends by just getting a good answering machine. In the long run, it would cost a lot less than the continuing monthly fees that will roll up for *Caller ID*. Besides, I still don't know if there is any kind

of readout if someone calls from a car phone or a boat; my suspicion is that such calls may not register on *Caller ID* equipment.

I also figured out how most people are really expected to instantly recognize phone numbers and determine their owners in order to decide if they want to pick up the phone. While my memory banks can store zillions of radio frequencies and obscure trivia, there appears to be a maximum limit of perhaps ten phone numbers that can be retained at any given time. I would need to have a reverse-order phone book available in order to look up just about every caller whose number showed up on one of these machines. By the time I got the number looked up, most callers would have probably figured I wasn't going to pick up. Still, it offers a good opportunity for telco to sell reverse listing phone books—for a slight extra fee.

I figure that as soon as *Caller ID* gets around to enough customers, the next step in the development of the technology will be for callers to get their messages through to those who refuse to answer selected calls. This way, if they don't pick up, then the caller can use a keyboard to program in an alphanumeric message that will show up on the *Caller ID* readout—"Last two car payments not received. Demand certified check 24 hours or will repossess."

Or, maybe they'll offer the extra option of a hardcopy printout of all incoming calls, showing the number along with the date and time. Sounds like an obvious development, doesn't it? Maybe they could combine it with the alphanumeric readout, so in addition to the time and date, you could also get a printed message, like, "Called for a week but no answer. Arriving at airport Friday 7 PM for month visit. Aunt Hilda and Uncle Edgar." If *Caller ID* catches on, you'll see this, or something like it, soon enough.

One reader in New Jersey, where *Caller ID* is now in use, wrote to say he has solved the problem by using two phones with different numbers. One phone is unlisted (for whatever that may be worth) and is used only for incoming calls from friends. The other phone has the bell shut off and is used only for outgoing calls. Anybody who determines that number and calls him back won't get an answer. He figured that he beat the system, although telco still got him to add an extra phone line and I don't suppose they think they lost anything in the deal.

(Continued on page 76)

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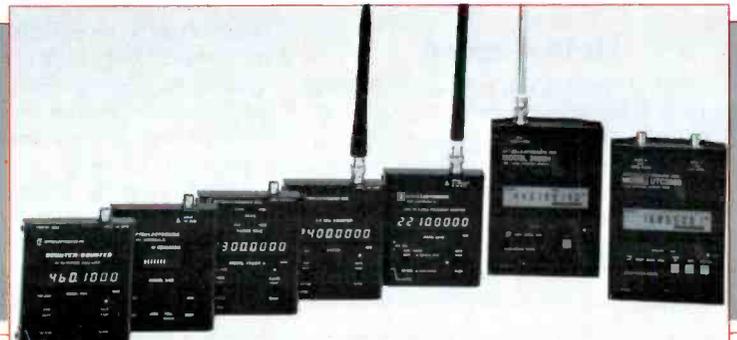
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MAILBAG

LETTERS TO THE EDITOR

Each month we select representative reader letters for our Mailbag column. We reserve the right to condense lengthy letters for space reasons. All letters submitted for consideration must be signed and show a return address. Upon request, we will withhold sender's name should the letter be used in Mailbag. Address letters to Tom Kneitel, Editor, Popular Communications Magazine, 76 North Broadway, Hicksville, NY 11801.

He Caught A Code

In your book *Guide To Embassy & Espionage Communications*, you presented a message in a 5-digit code, challenging readers to crack the code and submit their results to you. I have worked on it a while without finding the key. How have other readers fared?

E. Lazzaro, Sr.
Queens Village, NY

Readers were told the code was simpler than it first appears, and I have received hundreds of letters from around the world about the encoded message. Some letters contained lengthy computer computations, others attempted to broach it by using astrological keys, apparent references elsewhere in the book, as well as several other obscure methods. Most of the mail has come in from readers asking that I end the hours they've put into failed attempts to crack the code by just sending them the solution. It's too simple to be broken by anything as sophisticated as a computer. The deeper one delves into apparent esoteric solutions, the further one gets from the clear text. I have, in fact, heard from only three people who submitted correct decoded texts and the information on how it was done. One was sent in by a retired Army cryptographer, another a government employee. Recently, a complete text was submitted by Martha Wood of Cleveland, OH who reported a breakthrough after only five minutes without any calculations. She thought it was a lot of fun. So do I. —Editor

Help Needed

A friend brought me a Realistic DX-440 receiver from Miami because it is very difficult (under Brazilian laws) for us to get imported products such as receivers, components, etc. Several months after I acquired the receiver it began having problems and now it is completely inoperative. I took the set to a technician, but he said it needed a schematic. I wrote to Radio Shack but have

not received a reply. Would any POP' COMM reader possibly be able to furnish me with a copy of a schematic and other documentation relating to the DX-440? Any help would be sincerely appreciated by a fellow hobbyist.

Jose Eduardo Fornazari,
P.O. Box 3404,
01051 Sao Paulo (SP), Brazil

Phantom Empire

While listening to my scanner, I copied a station with the callsign KDE608. In an effort to identify this station, I contacted the FCC and asked them to let me know the name of the licensee. They said that they had no record of the station in their computer. Subsequently, I've copied this station several times and I'm sure that I copied the callsign correctly. How can it be that it's not in the FCC's computer?

Len Binns
Las Cruces, NM

The station is operated by the federal government, and such stations can't be run through the FCC's computer with any success. Just the same way that many federal agency vehicles have state license plates that come up blank when run through state DMV computers, and many federal aircraft have "N" tail numbers that come up a no hit in the FAA's computer. I'll admit it's confusing, but that's the way it goes. However, just between you and I, KDE608 is a station operated by the International Boundary and Water Commission, and it's located in your hometown — Editor.

A Discrete Question

From time to time I come upon frequency listings that make reference to "discrete frequencies." This term seems especially common to aeronautical communications. What does the term mean?

Barbara Christiansen
Akron, OH

A friend of mine who works at an aeronautical station says that while his facility has a number of frequencies used for its normal operations, it has operational capabilities on additional air/ground frequencies that can be used only at the discretion and instructions of the air traffic controller. These are referred to (at his facility) as "discrete frequencies," and they aren't shown on flight charts or publications. He says that if, for instance, an approaching aircraft was having a problem of some sort that required an ex-

tended exchange of communications with the ground, the ground controller would instruct the pilot to switch to one of the discrete, or spare, frequencies so as not to tie up any of the facility's normally busy primary frequencies. The term may have other meanings in other applications, but you mentioned aeronautical communications and that's what it means in at least one facility — Editor.

Turned On, But Not Tuned In (Yet)

El Salvador has been in the news these past few months. Often, when the country's National Guard/Police is shown in TV, the personnel are using two-way radio. How can I find out the frequency? I have family there that who want to listen in, but can't learn the frequency.

P.E.F.
Guatemala City, Guatemala

The last information I had was that it was a repeater with the output on 148.60 MHz (151.745 MHz input). They don't encourage the use of scanners among the local citizenry — Editor.

Gone But Not Forgotten

After listening to AFRTS on SW for 20 years, I was overwhelmed by its removal from the airwaves a few months ago. I came to depend on AFRTS as a source of news and entertainment, especially when so many commercial stations pay little attention to the network news and features available. I also found it useful in my research in the study of severe weather. The spectrum of AFRTS news items rapidly made me aware of the significance of various weather events. Do you think there's any chance AFRTS will return? Thank you for your magazine.

Richard E. Peterson,
Chairman, Atmospheric Science,
Texas Tech University,
Lubbock, TX

Many listeners were surprised and saddened when these well-liked stations left the air last fall. It appears that there's "more to the story" of these events than has been told in the news media. In any event, my best guess is that there's almost no chance that the foreseeable future will see AFRTS resurrected, at least not in any form that will remind its old friends of what it once was. AFRTS had a large worldwide audience that found it far more entertaining and credible than the VOA. Perhaps that was part of the problem. —Editor

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BC-70 XLT	Hand-held, 20 channel	\$169.99	(\$7.00)
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2. INPUT DESIRED FREQUENCY	8. WRITE MEMORY TO VFO	VFO A	
3. 500 KHZ. UP	9. UTILITY MENU		
4. 500 KHZ. DOWN	ALT-F. CHANGE MENU PAGE		
5. ACTIVATE/DEACTIVATE CLARIFIER	ALT-Z. DISPLAY OR PRINT LOG		
6. SWEEP BETWEEN 2 LIMITS	ALT-Q. END		
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Back In The USSR

Tuning In On Change In the Soviet Union

BY GERRY L. DEXTER

In March, Mikhail Gorbachev celebrated his fifth year at the helm of the Soviet government. He did so as the Soviet parliament went along with his ideas on a new and more powerful presidency, to which he was then elected. He did so as the parliament of the Lithuanian Soviet Socialist Republic voted unanimously to secede from the Soviet Union.

In a mere five years' time, Gorbachev's policies of *glasnost* and *perestroika* have been instrumental in bringing non-communist governments (or something very close to it) to power in all of the east bloc countries which had been so closely tied to Moscow.

We've watched this drama unfold on the nightly TV news over the past year. Watched as the two Germanys march towards reunification. Watched as Lenin's statue was pulled down in Bucharest. Watched as the Kremlin introduced the beginnings of a more democratic system, even the increased privatization of its economy.

Soviet troops, now beginning to depart their postings in the east bloc countries, are said to have neither jobs nor housing waiting for them. Store shelves offer few goods, little food, but always high prices. Someone said vodka is as good as rubles. The Estonian Congress has called for the restoration of a free and independent Estonia. Latvia is said to be close to making the same kind of proclamation. Non-communists won many local elections in March in Byelorussia, The Russian SFSR. Dissatisfaction with the pace of change (read Gorbachev) is said to be on the increase everywhere.

Our own broadcast media supply coverage if the big events but the day to day march of change tends to get much less attention. Fortunately, we all own shortwave radios and are thus equipped to monitor the evolving Soviet system for ourselves. Certainly there is no shortage of broadcasts from the Soviet Union. In fact, they can be heard around the clock.

The ticket isn't good for every dance, however. While all of the Soviet republics have broadcasts on the shortwave bands only some have a foreign service and only a few of those broadcast any programs in English. Since the focus of this article is on tuning in to follow events in that country, we're only covering those which have programs in English.

The Soviet Union has what is arguably the world's largest and most complicated

RADIO STATION

**PEACE and
PROGRESS**

**THE VOICE
OF SOVIET
PUBLIC OPINION**

Moscow, USSR

Radio Peace and Progress has 3 hours of English each day.

broadcasting system—all of it government run, of course. The biggest of these Russian broadcast bears is Radio Moscow which beams to all corners of the world in 62 languages over about as many different transmitting points, using powers ranging from 100 kW to 500 kW. We don't know how many frequencies Radio Moscow has in use at any given hour but it's in the dozens—and not just two or three dozen, either!

The **Radio Moscow World Service** is in operation virtually around the clock. The English language schedule includes several programs which focus on the current and developing situation within the country.

Here are a few World Service programs to check out: *Perestroika* (Wednesdays at 0230) offers insight into "where the Soviet Union is going." *Update* (0200 Tuesday through Saturday) comments on world events as well as Soviet home and foreign policy. *Inside Report* (Monday-Saturday at 0300) is similar to "Perestroika". *Newmar-*

ket (0100 Sundays) pitches Soviet products and tries to promote foreign investment in the Soviet Union. *Vasily's Weekend* (Sundays 0530) features an American style disc jockey (albeit perhaps a bit outdated) with pop (music), chatter and phone-ins.

These programs are on the air several times throughout any given day. We've listed the peak North American listening times here. The World Service in English is beamed to Europe, Africa, the Middle East, South and Southeast Asia, Australia/New Zealand and North America at different but often overlapping times. The North American segment runs from 0400-0600 and 1100-2300. Here is the current schedule:

0500-0600—7150, 7310, 9530, 9765, 11950, 12060.
1100-1200—6000, 9600, 17810, 17840, 21660.
1200-1300—6000, 9600, 17810, 17840, 21660.
1300-1400P 11840, 17810, 17840, 21660.
1400-1500—5980, 7170, 7260, 7345, 9540, 9755, 9795, 9825, 9895, 11840, 12010, 17810, 17840, 21660.
1500-1600—9540, 9755, 9795, 9825, 9895, 11840, 12010, 17810, 17840.
1600-1700—5980, 7170, 7260, 7345, 9540, 9755, 9795, 9825, 9895, 11840, 12010, 17810, 17890.
1700-1800—5980, 7260, 7345, 9540, 9685, 9755, 9795, 11840, 12010, 12050, 15405, 17810, 17840.
1800-1900—5980, 9685, 9755, 9795, 9860, 9895, 9895, 11840, 12010, 12050, 15405, 15425, 17810, 17840.
1900-2000—9685, 9755, 9795, 9860, 9895, 11840, 12010, 12050, 15405, 15425, 17810, 17840.
2000-2100—7290, 9685, 9755, 9795, 9860, 9895, 11840, 12010, 12050, 15405, 15425, 17840.
2100-2200—9755, 9795, 9860, 9870, 11655, 11840, 11950, 12050, 15425.
2200-2300—7150, 9530, 9755, 9860, 9870, 11655, 11950, 12050, 15405, 15425, 17700, 17720.

The Soviets make adjustments in their frequency line-up even more often than the 2 or 4 times per year followed by most international broadcasters. Thus, not all of the frequencies given for a particular hour will be in use during that hour. Even with major changes, however, some should be active. Try them all to find those which provide you with the best reception. A complete frequency and program schedule can be obtained by writing to Radio Moscow World Service, Moscow, USSR.



Radio Moscow occasionally provides pennants to its listeners.

Even though the World Service offers 14 hours of English programming beamed at North America, the old reliable **North American Service** is still doing business at the same old stand. Oldtimers like Joe Adamov can still be heard on *Moscow Mailbag* (he's been doing that show for 30 years!). It's heard at 2310 Wednesday, Saturday and Sunday. The long-running *Sidelights on Soviet Life* can be heard at 2330 on Monday, Tuesday, Thursday and Friday. *Newmarket*, carried on the World Service, is also heard in the North American Service, perhaps a measure of the importance the Soviet government places on the goals of this program. Everybody's favorite Russian (next to Gorbachev) is Vladimir Posner. He co-hosts (with Pavel Kuznetsov) *Top Priority* (Fridays at 2310)—a panel discussion on Soviet foreign and home policies. *Home in the USSR* (Wednesdays at 0200) looks at domestic policy, the Soviet people, customs and traditions.

Again, all of these programs are aired more than once during the evening's multi-hour run and are repeated during the week. The times given here are first airings of the evening and/or for the week. Many time blocks are untitled and contain "flexible" programming devoted to interviews, reports, outlooks and music. A complete program/frequency schedule is available from the North American Service, Radio Moscow, Moscow, USSR.



Red Square in Moscow.



The World And North American Services of Radio Moscow originate in this building.

The North American service is divided into east coast west coast feeds. Here's the current schedule which—like the others—is under constant adjustment. Not all the frequencies will be in use at any one hour.

0000-0100—6000, 6045, 7115, 7150, 7310, (East Coast) 9635, 9685, 9720, 11655, 12050, 15425, 17655, 17700, 17720.
 0100-0200—6000, 6045, 7115, 7150, 7310, 9635, 9685, 9700, 9720, 11655, 12050, 15425, 17605, 17700, 17720.
 0200-0300—6000, 6045, 7115, 7150, 7310, 9635, 9685, 9700, 9720, 11655, 11710, 12050, 15425, 17605, 17700, 17720.
 0300-0400—6000, 6045, 7115, 7150, 7310, 9635, 9685, 9700, 9720, 9895, 11655, 11710, 12050, 15425, 17605, 17700.

0400-0500—9505, 9625, 9635, 9825, 9835, West Coast) 9895, 11710, 11770, 11785, 12010, 12050, 12055, 13715, 15180, 15320, 17665.

0500-0600—7230, 9505, 9635, 9825, 9895, 11790, 15180, 17655, 17690, 17770.

0600-0700—7230, 7345, 9505, 96335, 9825, 11770, 17790, 15180, 17655, 17690.

0700-0800—5905, 7175, 7185, 7230, 7260, 7270, 7310, 7345, 9505, 9635, 9825, 11770, 15180, 17665.

Radio Peace and Progress is billed as the "Voice of Soviet Public Opinion" and is ostensibly supported by various Soviet cultural and other groups. In practice it serves as a good way for the government to say things it might not want to broadcast on the more official Radio Moscow. Peace and

Progress airs three hours of English daily. None of this is directed to North America although it is still heard here with fair reliability.

The programs on Peace and Progress are largely news, commentary and opinion. The station name, one might observe, has more meaning to it these days!

The current schedule of Radio Peace and Progress is:

2200-2300—	4795, 6145, 7205, 7215,
(to Europe)	7360, 9580, 9610.
1300-1400—	11870, 15130, 15420,
(to Southeast Asia)	15520, 15535, 17635,
	17840, 17870.
1600-1700—	6005, 7325, 9705, 9715,
(to Southwest Asia)	11850, 11910, 11980,
	12065, 15320, 15585,
	17565.

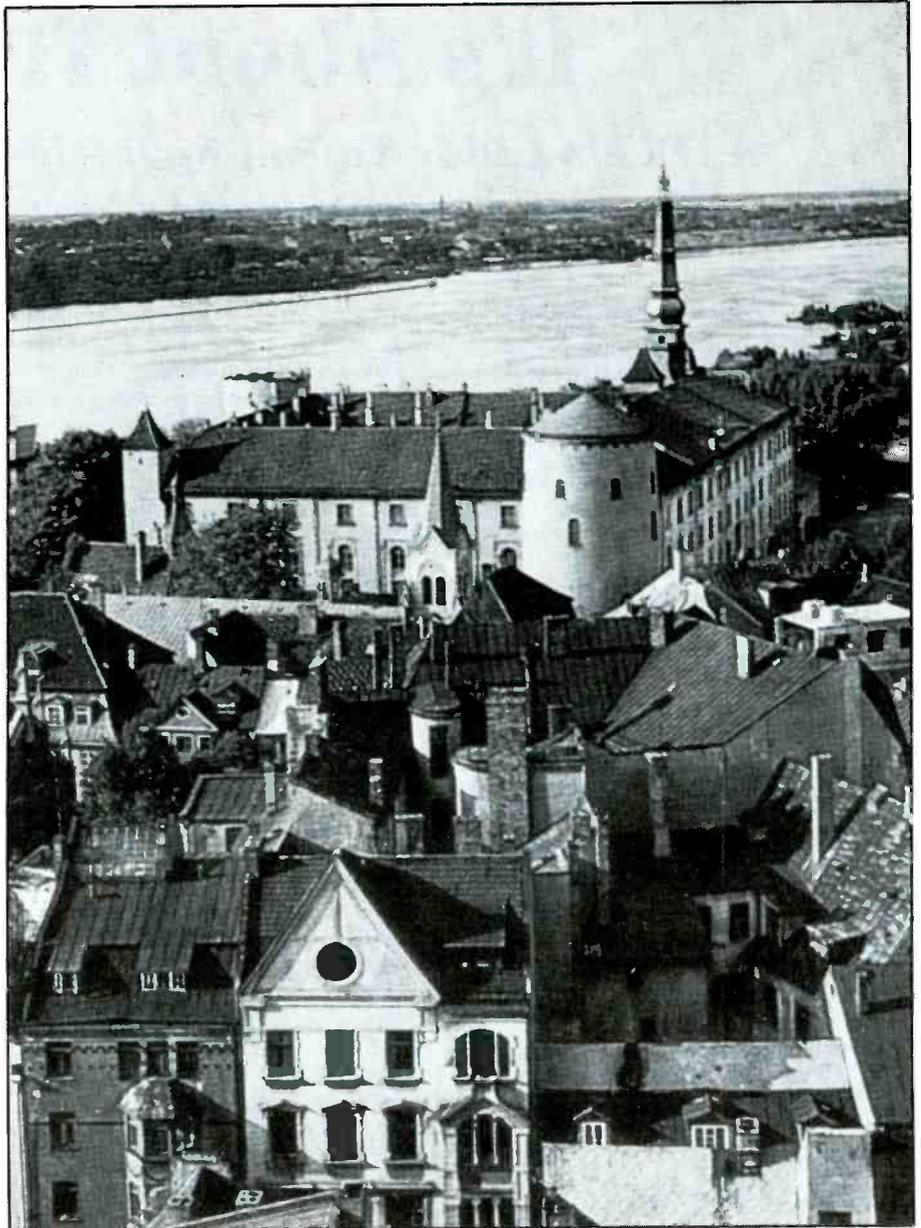
As with the rest, frequency changes are made often. Schedules are available by writing Radio Peace and Progress, Moscow, USSR.

The 52 million people who live in the Ukrainian SSR and provide one-fifth of the Soviet Union's industrial and agricultural output. Even here, there are growing calls for greater sovereignty, even independence. Radio Kiev has two half hour English broadcasts for North America each day. The schedule includes *Home News* (daily), *Comment* (Monday, Thursday, Saturday), *Open Studio* (Wednesday), *Society* (Wednesday) and *Dialogue* (Sundays). Broadcasts are aired via the Soviet government's transmitting facilities in various parts of the country and, more often than not, do not originate from transmitters within the Ukraine. This, incidently, is the case with all of the foreign shortwave services of the various republics.

Radio Kiev's broadcasts in English for North America are aired at 0030-0100 and 0300-0330 (one hour earlier during the summer months) on 11770, 12005, 12060, 15180, and 17665 and 17790. Schedules are available from Radio Kiev, Radio Centre, Kiev, Ukrainian SSR, USSR.

Uzbekistan is another Soviet Republic that has seen unrest and violence in the streets recently. Broadcasts from the government station, Radio Tashkent, are not as easily heard here since they are directed to Southeast Asia and not North America. Still, they can sometimes be heard fairly well here. Broadcasts air at 1200-1230 and 1400-1430, currently on 5945, 9540, 9600, 11785 and 15470. Chances of getting a recent schedule out of this station are a bit less and when the station does reply it usually takes awhile. The address is Radio Tashkent, Khorezmskaya 49, Tashkent 7000047, Uzbek SSR, USSR.

Lithuania, which unilaterally declared itself the Lithuanian Republic back in March, takes a decidedly anti-Soviet, pro-Lithuanian line in its broadcasts. *News About Lithuania* leads off each broadcast of Radio Vilnius. Other shows which focus on the situation include *Press Digest* (Sundays), *Around Lithuania* (Mondays) and *Today in Lithuania* (Wednesdays). If the republic does, in-



A view of Riga, capital of Latvia which is expected to declare its independence eventually.

deed, get its independence at some future time it may not continue to have access to the powerful Radio Moscow transmitters.

Radio Vilnius is on the air to North America daily at 2300 (2200 in the summer) on 6100, 7400, 9700, 9765, 15180, 15455 and 17655. Schedules can be had from Radio Vilnius, Vilnius, Lithuanian SSR, USSR. Mail addressed that way will probably be considered an insult at the station but, at present, for postal purposes that's the required form.

Because of the volatile nature of the action taking place in Lithuania, the status of Radio Vilnius can change from day to day. Keep this in mind while trying to pick it up.

The Armenian SSR is another trouble spot on the map in the Kremlin. Radio Yerevan's foreign service is a small affair. There's a half hour a day for North America but most of that is in Armenian. There is a brief news

segment in English which airs around 0350. Current frequencies for Radio Yerevan to North America are 7400, 9765, 15180, 15455, 17665, 17690 with the usual asterisk about change.

Lastly, there is a five minute newscast in English aired daily on Radio Tikhy Okean (Radio Pacific Ocean) based in Vladivostok and beamed to Soviet seamen in the Pacific. North American listeners, especially on the west coast, can sometimes pick this up around 0825 UTC on such frequencies as 4485, 7175, 7210, 7260, 7270, 7300, 7345 and 7493, the latter on upper sideband. These frequencies are changed often.

All these English language broadcasts from the Soviet Union are worth checking out on an occasional if not regular basis these days, as this huge country—so long our cold war enemy—undergoes momentous change.

It's About Time

A DX'er's Guide To Tuning In The Correct Time

BY ALAN SMITHEE, KCA6WV

Scientists, military forces, broadcasters, transportation companies, and many other interests need to know the correct time. Not correct to within a minute, or even to the second, but correct to parts of a second that are infinitesimally brief such as one part in 100-billion. They may also require the use of frequency standards with similar accuracy tolerances. This information is required to calibrate clocks, musical instruments, transmitters, satellite tracking devices, laboratory equipment, telescopes, certain security equipment, industrial equipment, and a thousand other purposes.

Most governments maintain measurement standards relating to weights, lengths, and the purity of elements, and many also engage in official broadcasts of highly accurate time and frequency standards. While it may require special laboratory receiving equipment to make the fullest use of all the potentials of some of these transmissions, listeners in North America can easily hear a number of them. Moreover, it's often possible to get a QSL card as a reward for sending them your reception report.

Here are stations you might like to keep track of. Of course, when you are setting your official station clock or your wristwatch, or checking the accuracy of your receiver's calibration, they will serve a very practical purpose for you.

Homegrown Stations

Certainly, if you tune the shortwave bands you have come across the standard time and frequency transmissions of the National Institute of Standards and Technology (formerly known as the National Bureau of Standards).

Their station WWV, in Fort Collins, CO operates on 2500, 5000, 10000, 15000, and 20000 kHz with 2.5 kW (on 2500 kHz and 20000 kHz) and 10 kW. Their station WWVH is at Kekaha, Kauai, HI and operates with 5 kW on 2500 kHz, and 10 kW on 5000, 10000, and 15000 kHz. A low frequency station, WWVB, operates with 13 kW on 60 kHz from CO and duplicates some of the services sent out on shortwave.

WWV and WWVH broadcast continuously, and propagation conditions will generally permit you to receive at least one (or two) of the transmitted signals at any time of the day or night.

WWV and WWVH station identification is made by voice announcement in English every thirty minutes approximately on the hour and half hour. Periods with no audio

tones or special announcements during which the signal carrier, clock tick each second, time announcements (in UTC), and 100 Hz IRIG H time code continue, take place from 45 to 50 minutes after the hour at WWV, and from 15 to 20 minutes after the hour at WWVH.

The UTC (Coordinated Universal Time) is expressed in terms of a 24-hour clock, and is given in a voice announcement every minute at the return of the audio tone. UTC is the same as what used to be called Greenwich Mean Time. The announcements on WWV are made by a man, the WWVH announcements are made by a woman. A typical voice announcement at 1225 UTC would be, "At the tone, twelve hours, twenty five minutes, Coordinated Universal Time."

For the record, 2400 UTC is the equivalent of 7:00 p.m. EST (8 p.m. EDT); also 4 p.m. PST (5 p.m. PDT).

The audio tones you'll hear transmitted are 500 and 600 Hz, and are broadcast on alternate minutes. A short 1500 Hz tone is heard at the start of each hour.

If you wish to send a report to WWV or WWVB, address your report to either station at 2000 East County Road 58, Fort Collins, CO 80524. Station WWVH may be written to at: WWVH, P.O. Box 417, Kekaha, Kauai, HI 96752.

You're probably also familiar with CHU in



This QSL from Canadian station CHU is an oldie.



Radio Shack offers this inexpensive WWV receiver to give you reception on three frequencies. It also has the 162 MHz NOAA channels. Sells for less than \$40.

NATIONAL PHYSICAL LABORATORY TEDDINGTON	DIVISION OF ELECTRICAL SCIENCE ENGLAND
MSF time signals are transmitted on 2.5, 5.0 and 10 MHz with a power of 5 kW PEP and on 60 kHz with a power of 50 kW.	
On the H.F. service second pulses are indicated by 5 cycles of 1 kHz modulation and minutes are prolonged.	
On the L.F. service second pulses are indicated by interruptions of the carrier for 100 ms, and of 500 ms for the minute. The signal is given by the beginning of the interruption. DUT 1 is indicated on both services by the CCIR double pulse code.	
This QSL confirms your reception of MSF on	
60 kHz / 25 / 50 / 10.0 MHz dated 30 March 1987	
timed at 18:10...UTC.	
Thank you for a most interesting report! Signed B.R. Swabey	

The British signals are sent from station MSF. (Courtesy J.D. Stephens, AL.)


 Confirmamos su reporte del
28 de Septiembre de 1983

ESTACION HD210A

Horario de Transmision	Frecuencia
00 00 h — 12 00 h	3.81 MHz
12 00 h — 13 00 h	5.00 MHz
13 00 h — 24 00 h	7.60 MHz

En 3.81 y 7.60 MHz se anuncia el tiempo cada minuto, con identificación de la Estación (HD210A) en el intervalo comprendido entre 59 m. 15 s. y 59 m. 50 s.

En 5 MHz se anuncia también el tiempo cada minuto, pero se proporciona adicionalmente un Servicio de Frecuencia Patrón, con la siguiente programación:

12 00 h — 12 15 h	Tonos de 600 Hz
12 15 h — 12 30 h	Tonos de 440 Hz
12 30 h — 13 00 h	Portadora de 5 MHz, sin modulación.

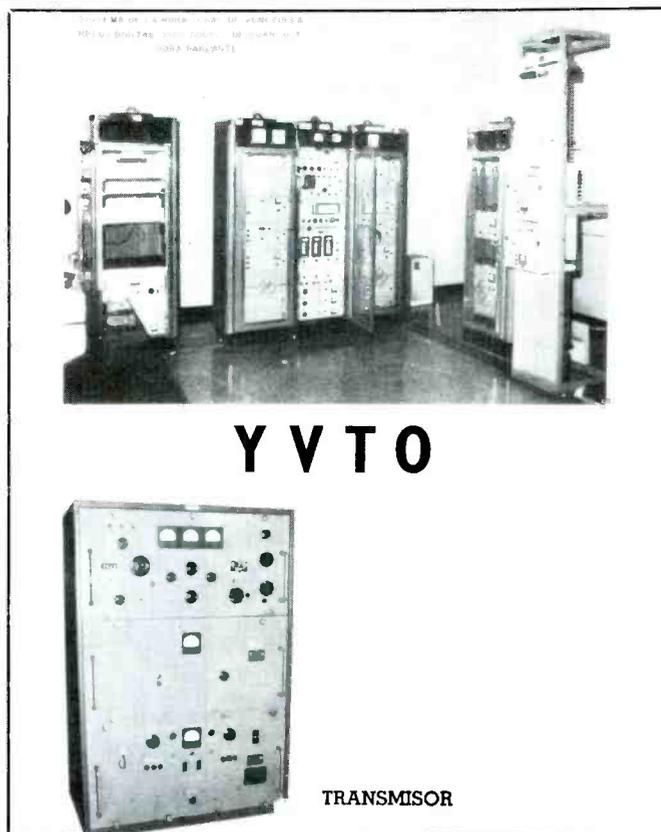
Octubre 18/83

PARA RADIOAFICIONADO
HAROLD ORT, JR.

FORT WADSWORTH
STATEN ISLAND, N.Y. USA

HD210A, in Ecuador, sends a good QSL. (Courtesy Harold Ort, FRG.)

The verification folder is sent by YVTO in Venezuela.



Ottawa, Ontario. This station operates continuously with 3 kW on 3330 and 14670 kHz, also 10 kW on 7335 kHz.

The second pulses ("pips") consist of 300 cycles of a 1000 Hz tone with certain omissions and identifications. Omission of the 29th pulse identifies the half minute and omission of the 51st and 59th pulse provides an opportunity for a voice announcement. Zero pulse of each minute is 0.5 second long and the hour is identified by a pulse of one full second followed by 40-seconds of silence.

Voice announcements each minute are bilingual and give the station identification and the time stated in terms of Eastern Standard Time.

Write to CHU at: Station CHU, National Research Council, Ottawa, Ontario, Canada K1A 0R5. Reports are invited, and CHU verifies.

Elsewhere

Station JJY, Tokyo, Japan operates with 2 kW on 2500, 4000, 5000, 8000, and 10000 kHz. The time signals are in the form of a brief interruption of the signal before the second and a slightly longer one before the minute. The end of each interruption is the exact time. The standard 1000 Hz audio tone is omitted 4 minutes at 0000 UTC. The 5th minute, between the 23rd and 57th second, the station sends its callsign twice in CW, followed by the time (in Japanese Standard Time) sent once, plus a single CW letter (W, U, or N) sent five times.

On all frequencies (except 4000 kHz) these CW signals are followed by a voice announcement with the callsign given twice and the time sent once in Japanese and once in English.

JJY will send a QSL in response to your reception report. The address is Communications Research Laboratory, 2-1 Nukui-Kitamachi 4-chrome, Koganei-shi, Tokyo, 184, Japan.

Station VNG, Australia offers a time signal broadcast with 10 kW on 4500 kHz (0945 to 2130 UTC), 7500 kHz 2245 to 2230 UTC); and 12000 kHz (2145 to 0930 UTC). The callsign is given in the minute just before each quarter hour. The start of each minute is marked with a 500-millisecond pulse. Normal second markers are 50-milliseconds long. Seconds numbers 55 and 58 have pips only 5-milliseconds long. Second number 59 has no pip.

You can write to VNG at Orroral Observatory, P.O. Box 2, Belconnen, A.C.T., Australia. The actual location of the transmitter is Llandilo, N.S.W.

Briefly, other standard time and/or frequency stations often reported by North American listeners include:

Station HD210A, Guayaquil, Ecuador, which runs 1 kW from 0500 to 1700 on 3810 kHz, from 1700 on 5000 kHz; and from 1800 to 0500 on 7600 kHz. The station ID's in Spanish (male announcer) just before the beginning of each hour. A QSL is available. Send your report to, Naval Oceanographic Institute, Casilla 5940, Guayaquil, Ecuador.

Station ZUO, Olifantsfontein, RSA operates with 4 kW on 5000 kHz from 1800 to 0400 UTC, and on 5000 kHz continuously. ID's are in CW only and are sent every five minutes. This station verifies. Address your report to Electromagnetic Metrology, Division of Production Technology, Olifantsfontein, Republic of South Africa.

Station YVTO, Caracas, Venezuela operates on 5000 kHz with 1 kW continuously. A voice announcement is Spanish is given once each minute. The station will QSL reports sent to: Cagigal Naval Observatory, Apartado 6745, Armada 84-DHN, Caracas 103, Venezuela.

Stations OMA/OMB5, Liblice, Czechoslovakia. On 2500 kHz, OMA runs 1 kW continuously, but you will have better luck hearing 5 kW OLB5 that operates continuously on 3170 kHz, even though it doesn't usually identify. QSL's are sent, however, if you send a report to Astronomical Institute, Czechoslovak Institute Academy of Sciences, Budecska 6, 12023 6, Prague 2, Vinohrady, Czechoslovakia.

Station MSF, Teddington, England. Listen on 2500, 5000, and 10000 kHz for their continuous 5 kW transmissions. This station also QSL's. Reports may be sent to National Physical Laboratory, Division of Electrical Science, Teddington, Middlesex, Great Britain TW-11 0-LW.

There are many other stations, but if you haven't thought of DX'ing standard time and frequency stations, these are a good place to start. Part of the challenge is trying to pull some of them through WWV. **PC**

Scanning North America

From Alabama To Alberta, Mexico To Manitoba, And From Sea To Shining Sea, It's Scanner Skip Season!

BY CHUCK ROBERTSON

Summer is here! Sporadic-E skip and honeysuckle fills the air. The honeysuckle shows up best in the early morning and early evening, but Sporadic-E skip can pop up just about any time, day or night. Mid-morning and early evening seem to be best bets. Skip reception distances of 450 to 1,500 miles are common, with multi-hop exceeding 2,500 miles. This means that if you're located in North America, you've got a good shot at tuning in a large portion of Mexico, Canada and the 48 contiguous states.

July is a peak Sporadic-E month, so don't spend too much time outdoors enjoying the weather or you'll miss all of the action. Program your scanner for 25 to 76 MHz range and wait till that DX begins to rain down upon you.

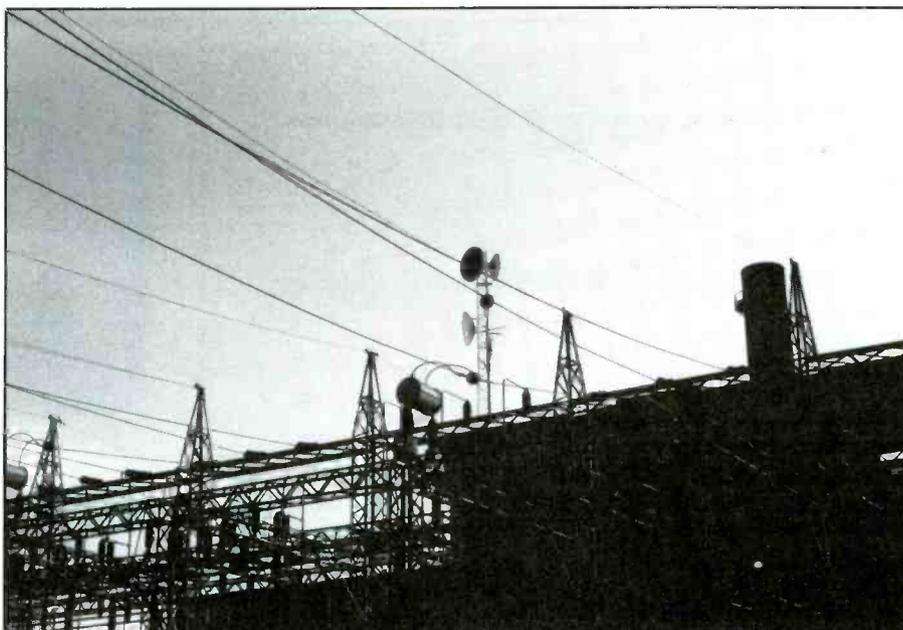
Canadian Capers

At first glance, it almost seems as if there's no coherent VHF low band allocation plan in Canada. Business and public safety services seem to turn up helter skelter between 29.70 and 50 MHz. You usually encounter 20 kHz channel spacing on even numbered frequencies (such as 30.46, 30.48, etc.), but there are exceptions. Exceptions, for example, are in the hydroelectric and conservation services which use 10 kHz spacing. In all, Canadian stations show up in a number of different places that are exciting to discover. For the U.S. monitor, accustomed to the highly structured and familiar FCC allocation plan, scanning Canada is new, challenging, and as refreshing as the ocean breeze in Nova Scotia or British Columbia. Let's take a closer look. Actually, it's well structured!

Recently, scanner fans have been puzzling over odd-sounding and supposedly mysterious pulse tones that have appeared on the U.S. fire service frequency 33.92 MHz. Some have opined that these may be from bumper beepers covertly tracking target vehicles.

Other listeners have speculated that the four digit numbers heard on frequencies like 30.02 and 30.42 MHz are the latest manifestation of the "spy numbers" stations long monitored on the HF bands (presumably) to send messages to espionage agents.

Scanner owners are sometimes too quick to generate the suspicion of an intrigue



Canadian hydroelectric plants use low band channels with frequencies spaced at 10 kHz.

where none deserves to exist. All of these transmissions are coming from Canada. I first identified them back in 1983, but since the frequency allocations seem unusual to American listeners, they continue to see spooks and sinister plots with each pulse number they hear.

These are Canadian paging radiopaging signals. Look for them in profusion on: 30.02, 30.22, 30.42, 31.92, 32.42, 33.42, and 33.92 MHz. Less active frequencies include: 30.46, 30.76, 31.66, 33.48, 33.62, 33.86, 33.90, 33.94, 33.96, 36.06, 36.26, and 42.50 MHz. Emissions may be AM or FM, and consist of voice or non-voice paging.

Pirates & Scramblers

The reason it seems as though Canadian business radio users create their own allocation plans is because that's actually what some seem to be doing. Consider the Canadian fishing trawlers you'll monitor in the VHF low band on all sorts of weird frequencies. These are all illegal operations because Communications Canada (analogous to the

CANADIAN SCANNER HANDBOOK



*"A Comprehensive Guide
To Communications Monitoring
Across Canada"*

CANSCAN

by BRIAN KEEGAN

The Canadian Scanner Handbook provides plenty of frequency listings and does a good job of explaining the Canadian allocations that confuse many scanner monitors.

THE WORLD RADIOSPORT TEAM CHAMPIONSHIP

BE A PART OF HISTORY

In July and August, 1990, 2,500 invited world-class athletes from around the world will gather in Seattle for the 1990 Goodwill Games™. "Uniting the world's best™" is the motto of these Games.

In keeping with the spirit of the Goodwill Games, a similar competitive event with world class amateur radio contesters has been planned. The World Radiosport Team Championship, held in cooperation with the Goodwill Exchange Program of the 1990 Goodwill Games, is endorsed by the Radio Sport Federation in the Soviet Union and the American Radio Relay League in the U.S.

On July 20th, 1990, up to 23 international teams of the world's best HF contesters will participate in the historic World Radiosport Team Championship.

By contacting these teams you too can be part of history. Make 5 contacts during this ten hour event with the World Radiosport Team Championship contesters and you will receive an official WRTC participation certificate, contact 30 of the official teams and receive a WRTC commemorative pin, and the top 500 scores submitted will win the official WRTC T-shirt FREE!

"In all my years of contesting, there have always been geographic advantages that couldn't be overcome no matter how hard you tried," comments Operating Event Chairman, Martti Laine, OH2BH. "For the first

time, all of the competitors will be gathered in the same area and will play on a level playing field to establish the true champions."

In addition to the four US and four USSR teams, competitors have been invited from Japan, Canada, Spain, Yugoslavia, Hungary, Bulgaria, England, Sweden, Finland, Italy, France, Germany, Czechoslovakia, Brazil and Argentina. All teams will use fully equipped ICOM stations.

Members of the American team include K1AR, KQ2M, K7JA, K1DG, KRØY, W9RE, W7EJ and AA4NC. The Honorary U.S. Team Captain is Katashi Nose, KH6IJ, and the alternates are K1CC, N2AA and KNØE. The international teams are now being finalized.

The ten-hour competition begins on July 20, 1990, at 2100 UTC. All standard contest bands from 80-10 meters will be used on both CW and SSB. Official WRTC stations will be identified by having /WG (World Games) after their call. Check the July issue of most ham magazines for complete rules.

In addition to our sponsors, the WRTC is also supported by CQ Magazine & Joe Mullan, W3RLR.

Be a part of history! For more information and log sheets, send an SASE to: WRTC, 4821 - 51st SW, Seattle, WA 98116. We'll see YOU on the air!



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MFJ ICOM

To meet the competitors, plan on attending the Pacific Northwest DX Convention in Portland, OR, July 20-22. For more information, write to PNW DX Convention, c/o W7ZR, Rt. 1, Box 518, Beaverton, OR 97007.

North American Skip Suggestions

27.80: Regina (Saskatchewan) Emergency Measures Organization.

28.00 to 28.30: Outlanders in Los Angeles area intruding on 10 meter ham band; also some truckers noted here too; AM & SSB modes.

29.71: Loggers in the Sierra Nevada Mountains of CA: "Fresno Base" in EE & SS.

29.74: Griffin Bros. Construction, Gananoque, Ontario. Also Outlander ops.

29.76: Quebec Ministry of Public Works; FF language.

29.82: Canadian trawlers in clear voice. Also on 29.94 30.04 30.06 30.20 30.89 32.34 34.38 35.04 35.74 37.30 42.30 MHz.

29.84: Mexican petro ops. Listen for "bombas" (pumps) & "lineas" (lines).

29.90, 49.90: Canadian Forces, all areas.

29.93, 29.96, 29.98: Calif. Outlanders channel hopping with use of computers. Listen for "Fast Eddie" & "Loudmouth Lorain," two real winners.

30.00, 30.25, 32.35, 32.40: U.S. mil orderwires. These nets are half-duplex systems with Autovon capabilities, & are used by ground stations at missile ranges & other fed facilities to contact air & mobile units. A constant guard tone is transmitted, even during the comms.

30.09, 30.69, 31.29, 31.48: Canadian trawlers using speech inversion.

30.16: Mobilephone in Quebec.

30.18: Canadian trawlers. "Vanfield" mentioned.

30.35: U.S. mil maneuvers: "Tank Delta 66," "Werewolf 71" & "M-1," all tanks.

30.48: Repeater out (30.14 in) at Minisaga Probation, Manitouline Isl. (in Lake Huron), Ontario. This is a camp for delinquent youths. Officers use ID's with animal names (like "Lobo").

30.54: Graham Bros. Construction, Brampton, Ontario. Phone patch, too.

30.70: Ocean Drilling & Exploring Co., Gulf of Mexico. Vessels & rigs.

30.71: Wrecker service bootlegging on this freq. Believed in/near W. Nyack, NJ.

30.78: Mexican business station "Planta Tres" (Plant 3).

31.02: "Gypsy cabs" in NY City pirating here in SS.

31.08: Water pipe work in Medicine Hat, Alberta. Truck ID: "Gravel Gertie."

31.09: NY City gypsy cabs bootlegging here in EE & SS.

31.12: More NY City gypsy cab pirate radio ops, EE.

31.16: A Los Angeles taxi service.

31.18: Repeater out (31.98 in) fire ops, Perris, CA. These are state conservation freqs so this busy EMS operation might be in the Lake Perris State Recreation Area, south of March AFB.

31.25: Canadian trawlers in Strait of Georgia, near Hornby I., BC.

31.38: Canadian trawler, Vancouver area. Others with TD scramblers are on East Coast.

31.48: Gulf Fleet vessel "Liberty Service" at Midway Island (Pacific) enroute Guam in contact with Harvey Base, Louisiana. Also listen HF 4125 kHz for these ops.

31.59: Whistler-type radiophone in Acapulco, Mexico. Others use 29.70 to 29.875 band, also 15 kHz steps in 31.365 to 31.695 band.

31.85: Repeater out (32.20 in) Mexican federal & state police agencies.

31.90, 32.36, 42.98: Remote broadcast pickup, Ontario.

32.06, 32.48, 32.50, 32.52, 32.54, 32.56, 41.42, 49.94: Nationwide use in Canada. Temporary uses (demos, testing, etc.). Have heard various businesses & radiophones here.

32.10, 33.00, 34.95: US mil maneuvers: "Hasty Minefield," "Vismod," "Pray Pass," "India 3," & "Lima 02."

32.15, 33.15: Task Force net, wargames, "I'm due north of Chinaman & the Colorado." Units were: "Miller's Hole," "Scorpion 7," "Spearhead 6," "Lizard 3," "899 Complex," & "Alpha 1."

32.16: Repeater out, school buses around Ottawa, Ontario.

32.25: Tank range control, Camp Wilson: "Veramet," "Lava Lake," "Gypsum Ridge," "Range 113," "November 510." Clear & DES.

32.30: USN, "Green Catskill," "Green 2" were the ID's heard.

32.33: Someone saying they were on their way to Las Vegas.

32.50: US mil aircraft "Musket 123."

32.70: Mil target practice (Canada?). Base in Vineland, "Bus, this is Fireline. Put up target 11."

32.90: US mil security patrols, "Rat Patrol," "Team 1," "Team 2," "Mercury Net," & "Enterprise." Said, "Keep your head down."

33.025: Cuban business ops, SS.

33.14: Two NY city taxi companies (SS & EE) bootlegging on this low-power freq.

33.44: Repeater out (30.40 in). Trucking operation in area of Calgary, Alberta discussing problems facing drivers trying to get through weigh station without necessary permits. One driver was told, "Just put \$25 in his hand!" Also output (35.20 in) of shared business repeater, Bancroft, Ontario. This repeater sometimes rebroadcasts skip from US station on 35.20 MHz. Some Canadian trawlers near Vancouver here, too.

33.46: Public mobilephone base, Formosa, Ontario.

33.50: Mexican mil: "Campo Rosa."

33.55: Ft. Rucker crash inspectors at Ft. Irwin (CA) with wreckage of Blackhawk helo. Also here (& 33.76) mining or petro ops at Zacatecas, Mexico: "Planta Norte" & "Planta Sur."

33.60: Repeater out (37.125 in) of Cuban business: "Havana 4." Sometimes replays US skip from 37.12 MHz.

34.40: National Guard at Stockton Metro Airport, CA: "Schooner Ops," "Oscar 92," "Oscar 98." Clear & DES.

34.52: Arnold Bros. Transportation (barges & trucks). Bases at Dundas (Ontario), Calgary & Edmonton, (Alberta). Another base at Regina (Sask.) on 34.38 MHz.

34.38: A realty company, Alberta.

34.48: Repeater out, truckers in Montague, Prince Edward Island.

34.60: "Whisky 24 to Bulls Eye Control. I have arrived at Tonopah." Nellis AFB Range, NV. "Bulls Eye" is airspace control, also logged on 40.30 (repeater out, so it could be a foreign repeater picking it up from 34.60 MHz). Related units: "Olympia," "E: Guitar," "Area Roger," "Abbey Rainier," "Groom Lake," "Grey Tower" (airspace control), aircraft "Kiowa 501" & "Iroquois 511."

34.70: Canadian Forces, "I am next to the CanAm" (Canadian/US border). "Charlie 1" & "Charlie 4."

34.95: US wargames infantry ops: "He can't hide forever." "White Flag", "Blue 1," "Blue 4," "Red Dragon."

35.04: Garbage barges in Connecticut.

35.14: A wrecker service in California.

35.34: Voice pager, St. Thomas, VI.

35.36: Shrimpers off Louisiana coast, EE & Cajun.

35.40: Fishing fleet, Gulf of Mexico.

35.98, 36.70: Wireless microphones, all areas of Canada.

36.80: Someone at Eureka, heading to Walla Walla.

36.86: Repeater out (38.44 in) for a towing company, Alton, Ontario.

36.90: "Dust Off 6" telling "Dust Off Control" that he's 30 mi north of Madisonville. Maybe Ft. Campbell, KY.

38.00, 38.30, 38.50, 38.60, 38.90: Petro ops, Gulf of Mexico.

38.42: Provincial Parks, Quebec.

38.45: Metro ops (weather reports to a/c) in Seattle area, maybe McChord AFB.

38.55: Repeater out, "Helicopter 474 returning to Nevada County Airport." Base ID is KNB789.

38.80: US mil "Snake Eater" & "India-9-Gulf." Clear & DES.

38.86: "Mendoza Oil," Mexico.

38.90: US mil "Bulldog COC" & "Bulldog 6100."

39.44: Mexican business, "Yucatan."

40.06: Atmospheric Environment Service, Lundy, Nova Scotia. Also a Cuban business repeater out, "Santa Clara."

40.20: US mil range control, missiles.

40.25, 40.36: Petro ops, Poza Rica, Mexico.

40.30: Repeater out (32.20 in), "Are you in a position and to roll?" This US mil retrans net was part of a larger comms system with at least 6 freqs. The 32.20 MHz input was Channel 3, while 40.80 MHz was Channel 6. These freqs also had names like Bonus Burden, Samurai Castle, Local Days, & Service Aluminum. ID's include: "Zero" (net control), 0-Alpha, 0-Bravo, 91-Alpha, 91-Gulf, 91-Hotel, Headquarter 28, & Charlie 25. What's this all about?

40.39: Secretary of Agriculture, Mexico.

40.56: Mexican petro ops, "Campo la Jolla."

40.82: Fire Dept., Mexicali, Mexico.

41.00: US mil (possibly National Guard) convoy on #10 road at Langley Bypass & Glover Road, Told other station to switch to 33.30 MHz.

41.86: Provincial jails, Ontario.

41.96: Base (42.02 mobile), one of several freq pairs used by Ontario Provincial Police (OPP).

42.10: Ontario Emergency Planning.

43.35: Repeater out, Mexican petro ops, sometimes repeats US pagers.

43.74: AM paging, Mexico.

44.275, 44.30, 44.325, 44.55: Petro ops, area of Veracruz & Tampico, Mexico.

44.325: Poza Rica, Mexico. Maybe mining.

44.35: Repeater out. Mexican petro ops in Gulf of Mexico. Sometimes repeats US pagers.

45.30: Radiophone. A computerized voice with stock market reports also heard.

46.15: Voice paging, Canada.

46.54: Fanshaw Park Security, London, Ontario.

46.70: Fire service, Ontario.

46.74: Fire service, all Canada.

46.87: Repeater out (46.47 in), Min. of Natural Resources, Ontario. Ops at Doherty Recreation Area. Check 46.75 to 46.89 MHz for this agency's repeaters spaced every 10 kHz. Inputs are 400 kHz lower (46.35 to 46.49).

47.26, 47.56: Personal radiophones, Canada.

47.97: Repeater out (48.97 in), Canada General Electric Co., Ottawa, Ontario.

49.05: Ft. Irwin, CA "Bike Lake Metro". This is a secondary freq. Primary is 32.45.

49.41: Hydroelectric ops, Niagara area. Look from 47 to 50 MHz for many Canadian hydro freqs, especially above 49 MHz. Spacing is 10 kHz.

49.68, 49.70, 49.80: Mexican radiophones, base.

49.75: Mobile (72.44 base). Mobilephones.

American FCC) doesn't license maritime businesses in this band.

In addition to pirated frequencies, voice scramblers are also used by many trawlers to keep secret the location of their fishing grounds. A freaky new type of scrambling never before logged has recently turned up

on 30.36 and 31.98 MHz. It defies description except to say that the voice is highly distorted and there is a marker beat about every half second. Nobody who has heard my tapes can identify that type of scrambling being used.

One station on 31.98 has a scrambler, but

the station he speaks to transmits in the clear. The vessel using clear-voice is equipped only with a descrambler, the one transmitting the scrambled speech didn't have a descrambler. This technique saves equipment costs, and it's effective so long as the guy talking in the clear watches what he

says. Some federal and state agencies in my own area have been monitored using this same idea.

My observations put these trawlers off the coast of British Columbia, with possible base operations in the city of Campbell River.

While Time Domain scrambling has been monitored, too, it is a low-tech version that provides rather poor security. Many Canadian trawlers simply opt for inexpensive speech inversion scramblers since they are readily available.

U.K Forces In Canada

There are several U.K. military bases in Canada. The one in Halifax, Nova Scotia, has long been a regular on 34.30 MHz. The frequency is used for communicating with vessels and other distant units. One vessel mentioned being near Ramea Island, Newfoundland; a mobile unit mentioned Bedford Park, Nova Scotia. There are also maintenance orders dispatched on this frequency (those with a "Zap" designator are given priority).

Range control and tactical comms are on 31.30, 31.55, 31.60, 31.80, and 32.10 MHz. Some ID's heard are *Rattlesnake Creek* and *One Decimal Charlie*.

U.K. military ops in western areas of Canada are heard on: 30.00, 34.40, 36.10, 36.25, 37.05, 37.30, and 37.65 MHz. ID's include *Slingshot* (range control), *Zero Alpha*, *Callsign Zero*, and *Bravo-10-Alpha*.

An ideal source of scanner information and listings relating to Canada is the *Canadian Scanner Handbook*, by Canadian scanner enthusiast Brian Keegan. There are hundreds of actual frequencies in all bands listed for each province, and detailed allocation charts let you finally make some sense out of a system which most monitors have had problems trying to figure out. The directory lists RCMP, police, fire, medic, weather, marine, Coast Guard, and more. A very handy reference to have near the scanner. It's available for \$12.75, (plus \$2 postage and handling) from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. Residents of NY State add 96 cents sales tax. Canadians, please submit payment only by a bank or postal money order drawn in U.S. funds.

In Old Mexico

Frequency allocations in Mexico remain in the realm of the unexplained. My own observations and checking lead me to believe that the majority of two-way systems in Mexico are impromptu activities established without benefit of a license, and/or little enough regard for frequency usage practices in North America. For example, the police in Mexico City (and possibly Guadalajara) have been heard in the 6 meter ham band on 50.10 MHz. Radiotelephones operate freely in the 10 meter ham band on:

29.615, 29.625, 29.655, 29.67, 29.685, and 29.70 MHz.

Caribbean Callings

Cuba's frequency allocations are no less topsy turvy. Their systems turn up on all sorts of strangely creative frequencies. Check band openings to Cuba by listening for repeaters on: 33.35, 33.375, 33.60, 35.15, 40.28, 41.84, 42.125, 43.435, 43.625, 44.04, and 49.525 MHz.

Security patrols at the large American

Naval/Marine Corps base in Guantanamo Bay operate in the 35 to 43 MHz range, in 50 kHz increments. The frequencies are changed regularly.

Listen for band openings to the Bahamas by checking the radiophones on: 48.00, 48.08, 48.20, 48.28, 48.42, 48.82, 48.96, 49.90, 49.92, and 49.62 MHz. These stations leave their carriers on at all times, even when not in active use.

Some interesting skip stations to try for this month are listed in the accompanying log. Good hunting!

PC

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Nearly all Police, Fire & Rescue broadcasts will be moving to the 800MHz band during the next few years. Don't risk losing your ability to scan these exciting channels due to equipment frequency limitations.

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Recalling Radio

Time To Give A Thought To Major Armstrong, The Unusual Man Who Invented FM

BY ALICE BRANNIGAN

Inasmuch as 1990 marks the 100th anniversary of the birth of Edwin H. Armstrong, the time seems especially appropriate for us to pause to remember this most gifted man. Few in the field of electronics have contributed more, yet Armstrong died disillusioned and broken hearted.

"Genius" is a term often tossed around with far too much freedom, but all who were ever connected with him seemed to be convinced that this summed up Armstrong. He was an electrical engineer who studied and later taught at Columbia University. Perhaps more than that, he was an inveterate tinkerer who was constantly designing, developing, and improving early radio circuits. He had achieved the rank of Major in the U.S. Army Signal Corps.

In 1912, while at Columbia, Armstrong was experimenting with audio on vacuum tubes. Dr. Lee DeForest, of Federal Telegraph, was also working with the audion, attempting to enhance its ability to amplify sound. Connecting three of the tubes "in cascade," he found that amplification was increased, also noting that if the output signal of a tube were fed back into the tube's input, he heard a howling sound reproduced in his headphones. He worked at eliminating the annoying howl because he felt it would diminish the amplification possibilities of the audion.

Armstrong had noticed the same howl present during his own independent experiments, but also realized that the audion was more than merely a signal detector or amplifier (as viewed by DeForest). He found that it could radiate signals as well, and that it could be used in this manner in what he called a feedback or regenerative receiver circuit that would let the audion provide far greater sensitivity in the detector stage. Armstrong wanted to take out a patent on the discovery but couldn't get the funds. In January of 1913 he had copies of his circuit notarized, then was able to file for the patent in October of that year.

DeForest had stumbled upon the howl earlier than Armstrong, but had no idea of how to put it to work in a positive way. It was only after Armstrong's discovery that DeForest realized that the phenomenon that caused the howl could be used in a feedback receiver circuit. In March of 1914, DeForest filed to patent the audion as an oscillator; in



Major Edwin H. Armstrong, the unique and gifted inventor who developed FM as well as the original designs for regenerative, superregen, and superhet receivers. He deserves a more prominent spot in our memories than fate has given him, don't you think?

September of 1915 he filed for a patent for the feedback receiving circuit.

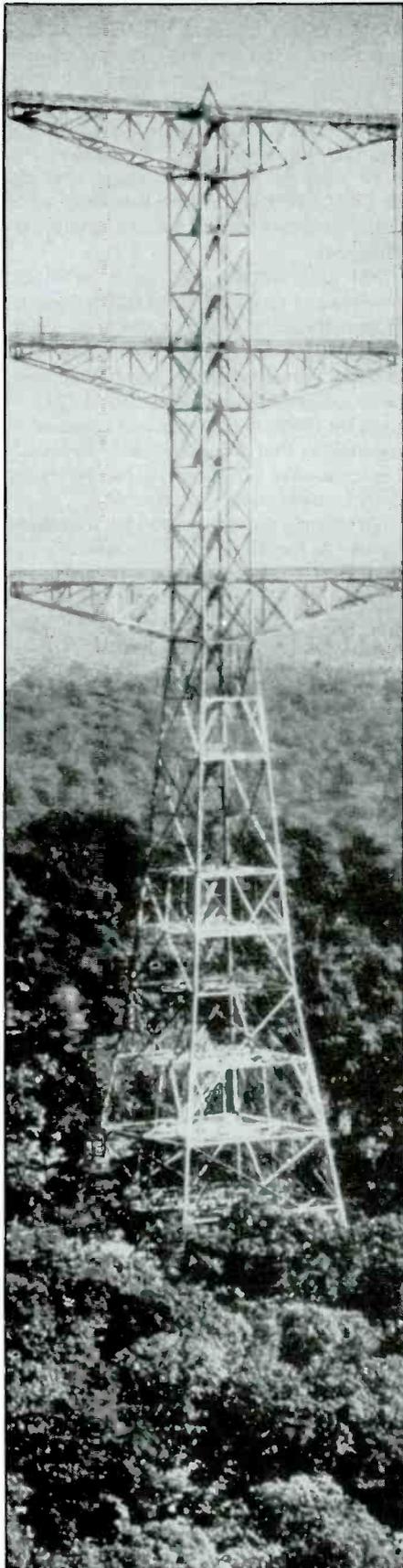
This triggered a lawsuit by Armstrong against DeForest that rattled on until 1934, cost \$1.5-million in legal fees, and went to the U.S. Supreme Court twice. It was as bitter and nasty a situation as imaginable, with Armstrong ultimately losing his suit. Regardless of the court decision, historians and engineers regard Armstrong as the person who deserves the credit for the invention. Still, the entire long and unfortunate experience of the legal action left a mark on how Armstrong would later regard the vulnerability of his inventions to being pulled out from under him by others.

As early as 1915, Armstrong realized that radio waves and static had the same electrical characteristics. He eventually knew that any attempt to eliminate static without some radically new principle would be useless, and that the hundreds of patents that had been issued for static eliminating devices

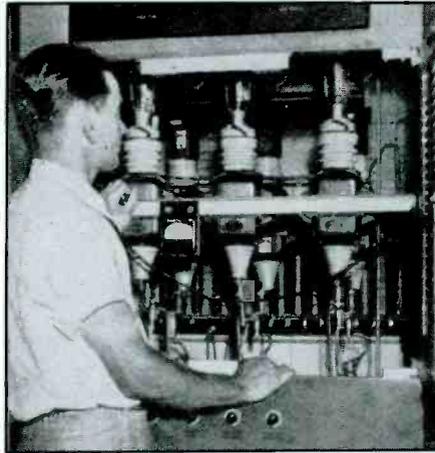
and circuits could not be more than partially successful. By 1924, he had invented the three basic radio circuits in general use—the regenerative, superregenerative, and superheterodyne. By then, he had spent countless hours in his laboratory seeking an approach to radio that would be free of static. That's when he got on the track of FM, frequency modulation.

Other radio experts had just about given up any hope of licking static. They recognized that static was essentially just what an AM signal was, and they couldn't figure out a way of getting the two disentangled. Their only recourse was to pass an ever-narrower AM band into the receiver and to increase the power of AM transmitters. Armstrong was seeking a different approach.

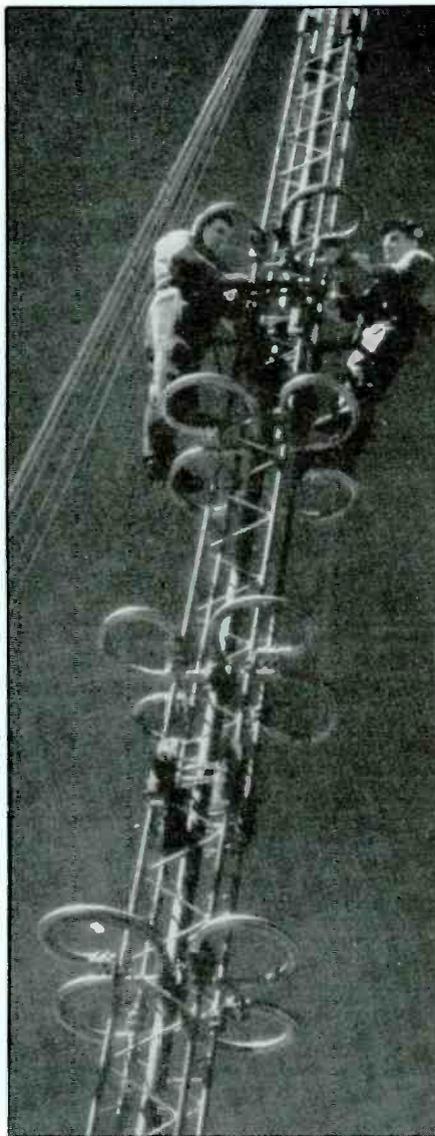
To conquer static, he discarded mathematical equations in favor of physical concepts. Instead of trying to narrow the bandwidth, he deliberately widened it. And to impress music or speech on this signal, he fixed on



The 400 ft. antenna tower at Alpine, NJ used by Armstrong's station W2XMN. No swivel-chair supervisor, Armstrong dangled in a bo'sun's chair from the crossarms to get the antenna elements tuned to perfection.



A rectifier unit in Armstrong's W2XMN experimental FM station.



Another mid-1940's experimental FM station was 400 watt W3XN, operated on 42.98 MHz by Bell Labs in Whippany, NJ. This is their 50-ft. tall "cloverleaf" antenna system being installed. In prewar years, this was W3XPY on 49.10 MHz.

frequency modulation, an idea at which most experts had long sneered. They said it would knock out high frequencies and produce unbearable distortion.

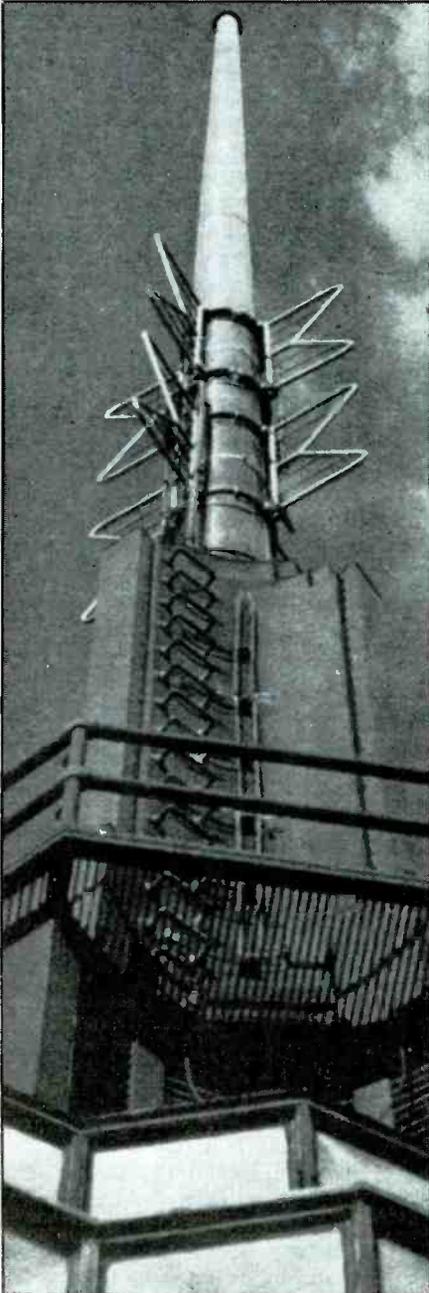
By 1933, Armstrong was ready with wideband FM. The four FM patents for which he had applied in 1930 were granted just after Christmas of 1933. In early 1934, Armstrong demonstrated FM for RCA's David Sarnoff, who was impressed. Although RCA had a huge sum of money invested in AM radio, Sarnoff suggested that Armstrong was free to install his FM transmitter in RCA's leased space atop the Empire State Building in New York. This would allow a public demonstration of FM, and let Armstrong work with RCA engineers to begin experimental broadcasts. These broadcasts were sent out under the experimental callsign W2XF.

Armstrong soon became uneasy about what he perceived as Sarnoff's lack of enthusiasm for FM, feeling that Sarnoff was paying too much attention to other forthcoming technologies, namely TV and radiofacsimile. Actually, Armstrong was right, for in April of 1934, Sarnoff had become disinterested in encouraging a possible competitor for RCA's AM audiences (RCA owned NBC), whereupon he told Armstrong to please get his FM gear out of the RCA digs in the Empire State Building.

Armstrong had no choice but to remove the equipment, but in November of 1935 he put on a demonstration of FM over a 17-mile path between New York City and Yonkers, NY. The demonstration, for the benefit of the Institute of Radio Engineers, was a great success. Those in attendance were astonished by the clarity and fidelity, which far exceeded that of any clear channel AM powerhouse stations. This demonstration coincided with the FCC, at Armstrong's request, allocating spectrum for thirteen 200 kHz-wide channels, although Armstrong felt that only five of those were suitable. Sarnoff, for his part, was not at all pleased that FM was fighting for the same frequencies that he felt should be allocated for TV use.

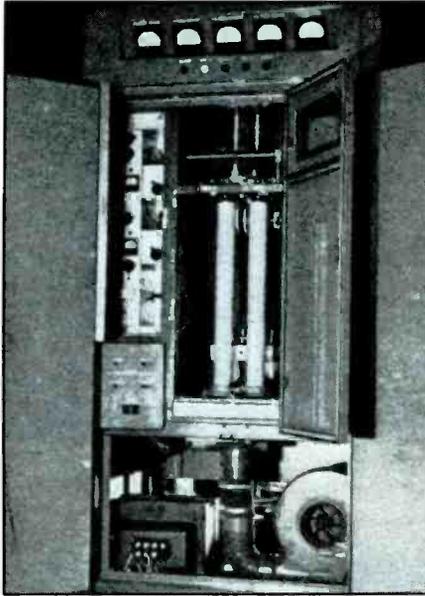
Although many broadcasters viewed FM with doubt and indifference, some felt it had definite potential. In January of 1938, the Yankee Network started building a \$250,000 FM station to run 50 kW from Mount Wachusett, Princeton, MA. This was W1XOJ on 44.80 MHz.

Despite the coolness with which FM was regarded by broadcasters, Armstrong's faith in the system remained strong. Had he been a poor man, he might have been squelched, but in 1938 he announced that he was going to spend more than \$500,000 to construct his own 50 kW experimental FM station at Alpine, NJ just across the Hudson River from New York City. The station was licensed as W2XMN on 42.80 MHz. Low power tests started in April of 1938. The antenna structure (which is still standing) was a 400-ft. tower with three 150-ft. crossarms.



Antenna system used in 1946 by New York City FM station WGYN, on 99.3 MHz in the newly allocated band. The RCA superturn-style "batwing" antenna was mounted on the city's third tallest building, 950 ft. above sea level.

A year later, W1XOJ was running a 16-hour daily FM schedule. W2XMN, which was relaying the classical music programs of New York City's WQXR, was up to full power by the fall of 1939. By then, it was difficult for the industry to continue to cold-shoulder FM, and there were applications for 150 more FM stations on file with the FCC, including an application from CBS. W1XOJ's owners were seeking an FCC license for an FM station in New York City. GE and others were working up plans to pro-



A complete 1 kW FM package made by REL in 1946. Plug in the power, hook up an antenna, and you had an instant FM station.

duce receivers. In 1940, Zenith also announced plans to produce FM receivers, and thereupon commenced FM'casting via its own station, 5 kW W9XZR on 42.80 MHz in Chicago, IL.

As of 1941, there were 48 experimental and commercial FM'casters on the air across the nation. These were operating on 23 channels located between 42.60 and 47.50 MHz. FM outlets were owned by Westinghouse, Stromberg Carlson, Yankee Network, Don Lee, NBC, GE, CBS, plus AM stations WQXR, WHEC, WBNS, WOR, WEAJ, WDRC, KSL, WJJJ, WGN, KDKA, and others.

The outbreak of WWII put the development of FM'casting on "hold," however FM technology was widely used in military communications systems. This opened the way for FM's use in commercial two-way systems after the war ended in 1945.

Upon the end of the war, FM'casting began getting lots of media attention since, like TV, it said "tomorrow's technology is finally here" to the public. Plans were for FM receivers to sell for \$350 to \$400, down to about \$275 for no-frills models. Tuners that could be used with AM receivers were also available for those who weren't too fussy about fidelity.

The summer of 1946 saw the number of FM broadcast applications on file at the FCC exceeding the number of AM stations operating at the time the war ended. The FCC recognized that the existing 42 to 50 MHz FM band couldn't possibly accommodate the number of stations that would be taking to the air, so the band was moved to 88 through 108 MHz, with 200 kHz channel spacing. The FCC said that 5,000 FM stations could be accommodated in the new

band. Manufacturers of FM'casting equipment were cleverly selling completely packaged FM broadcast transmitters in all power ranges from 250 watts to 50 kW. Some media pundits were predicting (in 1946) that within a few years FM would mostly have replaced AM broadcasting, with the only AM stations remaining in operation being a few clear-channel stations serving certain areas.

FM programming, in many instances, consisted of simulcasting of AM programs. However, going back as early as 1940, there had been regional FM-only networks of classical music stations. This concept continued to gather momentum. For the FCC's part, by 1946, the agency was considering regulations that would require FM broadcasters to offer a minimum of two hours per day of independent programming.

Armstrong's invention had been adopted for use as the audio in TV broadcasting in the US, it had become the accepted mode for land mobile radio systems, and the future of FM'casting was rosy. You'd think that it would have been smooth sailing from there for Major Armstrong. Not so.

Perhaps still smarting from the DeForest incident almost fifteen years earlier, or nursing some hostility at Gen. Sarnoff for evicting W2XF from the RCA facilities in the Empire State Building, Armstrong took action that would have heavy repercussions. In July of 1948, he brought suit against both RCA and NBC, alleging infringements of several of his FM patents. The suit alleged that RCA/NBC were deliberately trying to retard the growth and development of FM by attempting to influence the FCC to allocate too little spectrum space for FM'casting. He also strongly implied that RCA was attempting to force him to transfer control of FM to them.

But there was more trouble. Perhaps overshadowed by the advent of TV, the public simply had not responded to FM'casting as strongly as had been expected. In 1949 there were 700 commercial FM stations (242 more than a year earlier), and \$7-million in commercial air-time sold. Still, in those days, \$100 was considered a good weekly salary, and those who had extra cash to spend on home entertainment were most likely to consider buying a new AM radio or even a TV set. Sales of the pricey FM receivers were disappointing (875,000 FM receivers sold in 1949 vs. 6.5-million AM receivers). Armstrong (and others) accused receiver manufacturers of not doing their share to help FM grow and develop.

Besides the price factor working against FM, in some ways it was working against itself. With a fidelity range of 30 to 15,000 Hz, it seemed a natural for broadcasts of classical music, and that's how it was being hyped to the public. The public, however, was not enthusiastic about kicking out big bucks to hear Beethoven on FM, not when the same money could buy a TV set to see

R PRESS
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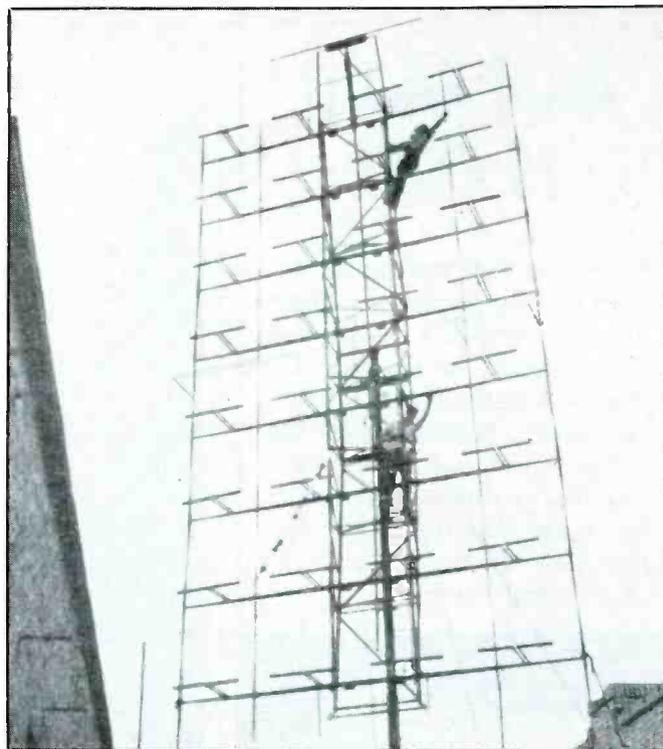
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Among the more innovative FM stations in 1946 was New York City's WGHF, 99.7 MHz. It broadcast regular programs, but in a one hour daily FAX transmission it also sent out a 22 page tabloid-size newspaper, complete with photos, comics, market reports, and ads. WGHF's own ads said it was the station you could see, hear, and read.



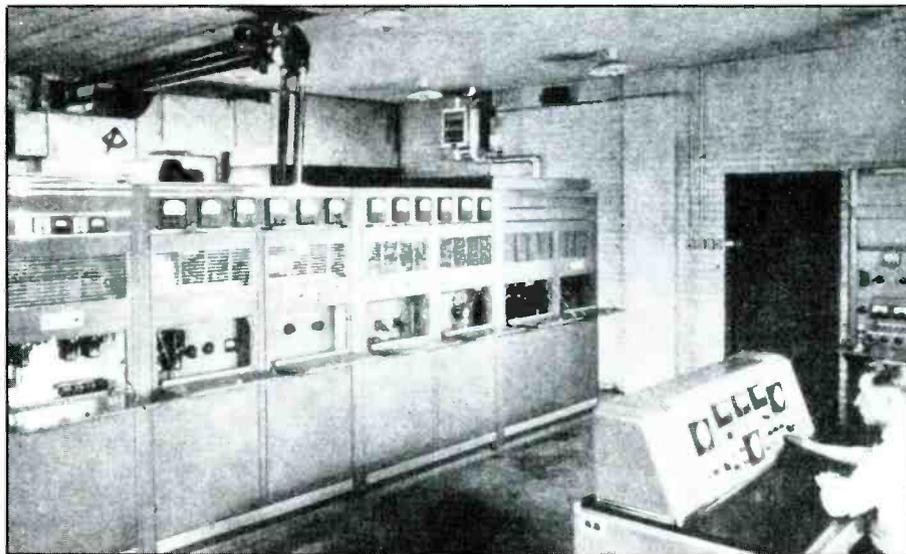
Among the more bizarre postwar FM antenna designs was this one, inspired by a WWII radar antenna. In 1946 it was used by New York FM'er WBAM on both the old band (47.10 MHz) and the new band (106.5 MHz) to test the effects of weather, sunspots, seasonal changes, and cosmic and magnetic storms on the two bands. It was 500-ft. above sea level. Note the two technicians waving from the grid.

weekly programs like NBC's sensational and highly promoted *Uncle Miltie* comedy hour. You could hear Beethoven on your record player in high fidelity, but the old *Victrola* couldn't bring you Milton Berle; it was as simple as that.

A 1949 suggestion by the FCC's Chairman went a long way towards instilling horror in the FM broadcast industry. Only a few years earlier the FCC was encouraging FM stations to create programs independent of their AM affiliates. Now the agency had done a flip-flop and seemed to be considering making it a requirement that FM stations simulcast the programs of their AM outlets. Such an attitude was thought of as definitely hostile towards the evolution of FM, perhaps even the FCC's way of saying it was all over for FM broadcasting.

Armstrong was having grave doubts about the future of FM as a viable medium for commercial broadcasting. Moreover, he wasn't at all pleased about the status of the litigation he had brought against RCA a year earlier. As of December (1949), RCA had not seemed to have gotten any further than taking some depositions, which Armstrong perceived as a deliberate delaying tactic on their part. Besides, RCA was refusing to pay Armstrong royalties for their use of his FM receiving circuits in the TV sets they were building and selling.

In 1954, FCC records showed that there



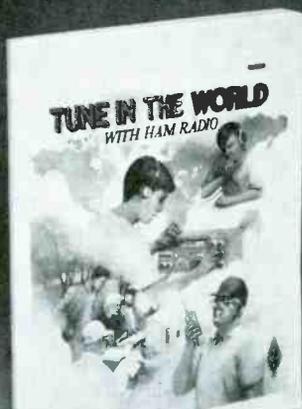
Early commercial FM station W85A (48.50 MHz) was operated by GE at Schenectady, NY. This later evolved into WGFM on 100.7 MHz, is presently WGY-FM on 99.5 MHz. It began broadcasting in April of 1940.

were only 552 active in FM broadcast stations. That meant 148 of the FM stations full of hope and enthusiasm only five years earlier had gone belly-up. This, and the general lack of interest in FM by the public, was the cause of extreme disappointment to Armstrong. Furthermore, he had become dis-

couraged and increasingly fanatical about his lawsuit, which had appeared to him to have bogged down to a complete standstill. These problems were overwhelming to the point that he and his wife separated. The \$15-million he had already made from FM apparently seemed relatively unimportant

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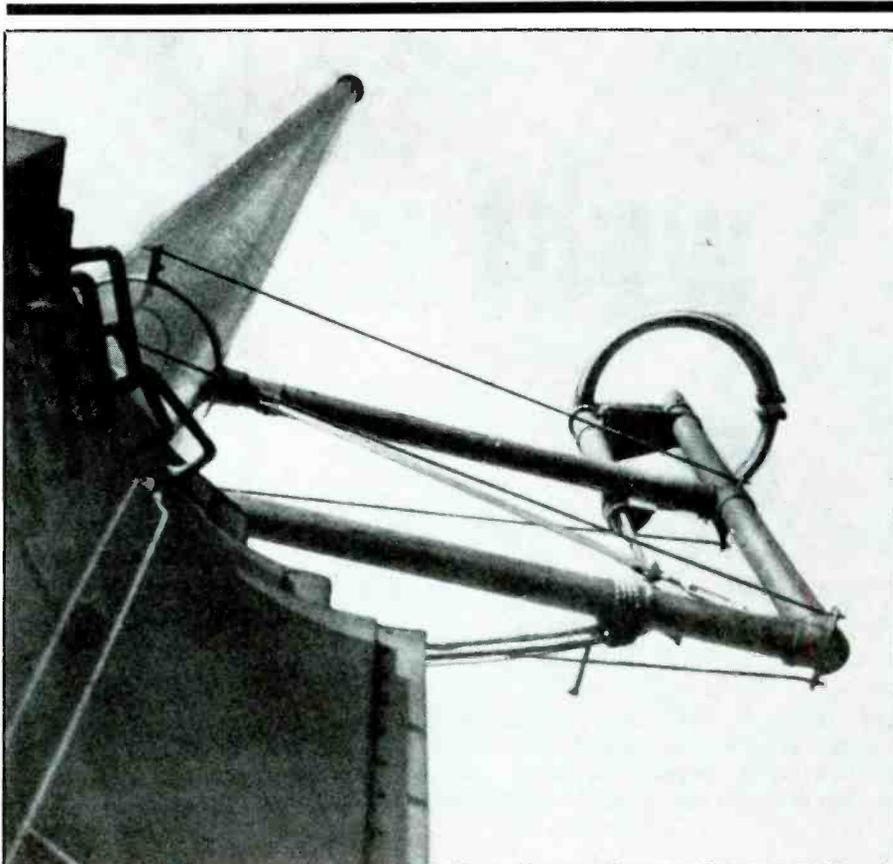
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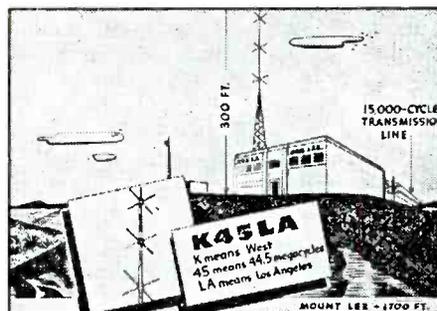
This 1943 photo shows the "doughnut" FM antenna used by station W47NV (44.70 MHz) in Nashville, TN. The station was owned by the National Life & Accident Insurance Co. Looks like a present day "halo" type ham antenna, doesn't it? W47NV was the world's first commercial FM station, and later became WSM-FM on 100.1 MHz (presently 99.5 MHz).

when viewed against a backdrop of other factors affecting his life.

In 1954, at age 63, Edwin H. Armstrong, plunged out of a window of his 13th floor apartment in New York City. The police listed it as a suicide.

A year after his death, RCA/NBC reached a \$1-million settlement with Armstrong's widow on the old lawsuit. Other monies and royalties on the heels of the settlement added \$4-million to the amount his widow received. At that time (1955), the roster of American FM stations had dropped by another twelve stations from the previous year. At that point the FCC authorized FM broadcasters for a trial run at utilizing their subcarriers for subsidiary purposes such as background music; this, in an effort to prop up the sinking FM industry.

Today there are 5,700 FM stations in the U.S., plus more than 1,800 FM boosters and translators, and an ever-increasing flow of applications for new stations. One might conjecture that Major Edwin H. Armstrong was a man ahead of his time, just as his invention and dreams for FM broadcasting were also ahead of their time. I prefer to see Armstrong as a man who arrived right on schedule, but it was the clouded vision of the industry and the public that flawed their perception and appreciation of FM broadcasting. Now that Armstrong's dream has



FM station K45LA (44.50 MHz), operated by Don Lee in Los Angeles, was the first FM station in the far west. It began operating on August 11th, 1941 from atop 1,700 ft. Mt. Lee. The station ran 1 kW and broadcast KHJ and special programs twelve hours each day. It became KHJ-FM on 101.1 MHz when the new FM band opened; was the original version of present KRTH-FM.

finally caught up with the technology he devised, and on the centennial of his birth, it seems proper and fitting to look back and remember the man and all of the fireworks he created. Perfect for our July issue!

Next month we'll be back with our usual format of odds and ends, but we just didn't want to make Armstrong share the stage this time 'round.

PC

NEW PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS



Radio Frequency Finder Measures Sub-Audio To 2.4 GHz

Optoelectronics, Inc. announces a new breakthrough in personal test instrumentation. New Model 2210-A Personal Frequency Finder/Counter is a very advanced instrument. It fits in a toolbox, or in the palm of your hand.

Despite its small size, new Model 2210-A specifies an operating range from 10 Hz to 2.4 GHz, and is useful to 2.8 GHz. It measures $4.0 \times 3.5 \times 1.0$ inches (14 cubic inches), and weighs only 9 ozs. It detects and displays two overlapping frequency ranges, from 10 Hz to 12 MHz, and from 10 MHz to 2.4 GHz; resolution is 1 Hz and 100 Hz, respectively. Accuracy is ± 1 PPM. Priced at a mere \$219, Model 2210-A easily outperforms other instruments costing ten to 20 times more.

Model 2210-A's phenomenal range is accomplished by using a unique input pre-scaling technique similar to television receiver design. Rather than divide the incoming signal by a decade number, the instrument divides it by 256; this extends upper range and uses low cost TV parts. Because of the binary scheme, the internal time base is referenced to a popular 3.90625 MHz crystal, which is the correct frequency to divide by 256. This approach reduces the pre-scaler time base to just four parts, and affords it a 10 mV input sensitivity. At the low frequency range, Model 2210-A uses a 10 MHz crystal and a divide-by decade technique to get down to sub-audio 10 Hz.

To keep its parts count low, Model 2210-A incorporates a high performance CMOS VLSI frequency counter chip. Two high

performance monolithic microwave IC's (MMIC's) are also used to boost performance and reduce board space.

Front panel features include an eight-place LED display, range select switch, power select switch (external 9-12 VDC or four rechargeable NiCad batteries), and a gate-control switch and indicator LED for long or short sampling times. The single input BNC connector feeds through a microwave relay according to the range selected, and automatically sets input impedance at either 1 Mohm for the low-frequency input range or 50 ohms for the high range.

Model 2210-A is encased in a high-impact aluminum housing for maximum emi/rfi shielding and rugged field use. It is

manufactured domestically and carries a unique full year warranty.

Available options include a selection of five different antennas for use at select frequency bands, a laboratory-use probe for printed circuit work, and a high-accuracy time base for better than ± 1 PPM accuracy.

New Model 2210-A Personal Frequency Finder/Counter is priced at \$219 each, and delivery is quoted off-the-shelf. Dealer inquiries are invited. For more information on this and other personal rf instrumentation, contact:

Optoelectronics, Inc., 5821 NE 14th Ave., Fort Lauderdale, FL 33334, or circle 101 on our Readers' Service.

Three-Band Radar Detector With Dual-Horn Antenna

The first three-band radar detector to carry the Cobra TRAPSHOOTER name is a state-of-the-art model that has an innovative dual-horn antenna design to reduce interference and enable precise reception of the new "Ka"-band photographic traffic radar system.

"This new Cobra model represents the ultimate in radar detector design, technology and performance, stated Tony Mirabelli, Cobra's Vice President of Marketing. "With its three-band capability and unique antenna design, Cobra is once again setting new standards for the radar detector marketplace."

The newest Cobra TRAPSHOOTER radar detector is Model RD-3173 with a suggested retail price of \$299.95.

The model is a sophisticated, miniaturized unit with separate audible and visual alarms for "X"-, "K"- and "Ka"-band signals. RD-3173 offers such advanced features as

Cobra's exclusive anti-falsing circuits, high/low/off switch for visual displays, highway/city switch, test/mute function with automatic mute reset, front-firing speaker with adjustable volume, and a five-segment LED signal-strength meter.

Accessories include visor/dashboard and suction-cup windshield mounting brackets, two power cords (6' coiled, 9' straight for "hard" wiring use), self-adhesive power-cord retaining clips, hook-and-loop pad for dashboard mounting, spare fuse, and a leatherette carry case.

The new Cobra TRAPSHOOTER RC-3173 is now available at Cobra dealers. Cobra maintains a toll-free consumer hotline—1-800-COBRA 22—to provide dealer locations and product information about its radar detectors, CB radios, scanner radios, cordless and corded telephones, answering systems and FAX/copier systems. If you call, please let them know you read it in POPCOMM. Or, you can circle 102 on our Readers' Service.



General Mobile Radio Service
(Class A Citizens' Radio)

NATIONAL REPEATER GUIDE

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January 1990

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GMRS Repeater Guide

The General Mobile Radio Service used to be known officially as Class A CB. In an effort to thwart Class A from evolving into the type of *Goodbuddy* chaos that Class D CB turned into, the FCC decided to change its name to something that didn't contain the appellation "CB." This was a good idea.

Located on 462 MHz (mobile channels on 467 MHz), GMRS stations use FM repeater technology and have become very popular with the public. New GMRS licenses are now available only to private individuals for their personal, family, and business communications. But, if you've got a GMRS mobile unit, you are permitted to use the repeaters belonging to other licensees. This becomes useful on a long-distance trip because the GMRS unit can be used to obtain repeater service for motorist aid. Many repeaters are operated by non-profit community service radio teams, user cooperatives, and local government (and quasi-governmental) services. For instance, in Chicago, nearly two dozen hospitals, ambulance companies, and law enforcement agencies are licensed in the GMRS.

The *GMRS National Repeater Guide* (9th Edition) is an 80-page directory listing details on more than 1,100 GMRS repeaters and their monitoring watches in all fifty states, plus DC and PR. Listings are arranged by state/city, and provide information on frequencies, access tones (if any), exact location, identifier, callsign, telephone number, licensee name and address, etc.

The book also features an extensive introduction about and explanation of GMRS, including its history and capabilities. I was surprised to find in the listings that my local police department has a GMRS repeater, and that provided me with some information that didn't show up in any listings I had seen of the agency's frequencies.

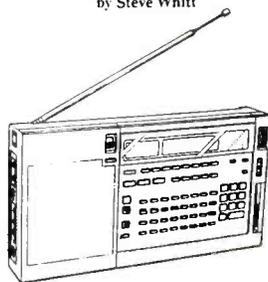
Looks like this book has information of interest to present or potential GMRS users as well as scanner owners.

The *GMRS National Repeater Guide* is \$10.00 (postpaid) from the Personal Radio Steering Group, P.O. Box 2851, Ann Arbor, MI 48106.

GET THE BEST FROM YOUR SONY ICF-2001D

(or ICF2010)

by Steve Whitt



1990

Popular World Band

The SONY ICF-2001D/ICF-2010 must surely be one of the most popular world band portables ever produced. That inspired Steve Whitt, G8KDL, to write a book entitled *Get The Best From Your SONY ICF-2001D or ICF-2010*. This is a 28-page users' guide to all aspects of operation, modification, and repair of this unit (despite the two different model numbers, the two units mentioned are virtually identical).

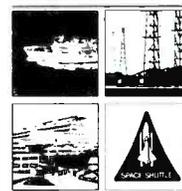
Steve's book also addresses in detail the set's weaknesses and provides tried and tested improvements using low cost external accessories and also internal circuit modifications.

The booklet includes a general intro to communications receivers, Q&A, hints, tips, the rarely-seen SONY tech specs for the receiver, and a bibliography of magazine articles on the receiver.

Steve lives in the U.K., so the book is priced at 6 Pounds Sterling, including air-mail postage. It might be easier for customers in North America to order the book by simply sending Steve 15 International Reply Coupons (IRC's); you can buy IRC's at most Post Offices. Order the book from Steve Whitt, 21 Cauldwell Avenue, Ipswich IP4 4EB, England.

SHORTWAVE DIRECTORY

A FREQUENCY GUIDE FOR THE
10 MHz - 30 MHz SPECTRUM



BY BOB GROVE • SIXTH EDITION • COPYRIGHT 1990

Wide-Spectrum Frequency Guide

Bob Grove has updated his useful and popular *Shortwave Directory* into a large, new 270-page 6th Edition. Bob has extensively revised the data in this book, thus giving the serious monitoring enthusiast a viable, up-to-date handle on listings between VLF and 30 MHz, for voice and non-voice modes.

The *Shortwave Directory* provides by-agency listings of U.S. and foreign land, sea, and air military forces. There are listings for federal agencies, scientific installations, mystery stations, pirates, smugglers, clandestines, aero, maritime, NASA, espionage, and numerous other *ute* stations. If it's a *ute* station, there's a chance you'll hear from a vantage point in North America, it's probably listed in the 6th Edition of Grove's *Shortwave Directory*. All comms stations are cross-referenced by frequency.

Although this reference volume is primarily intended for *ute* monitoring enthusiasts, there's the bonus of listings of worldwide English language broadcasts. When world events start heating up, even *ute* type listeners like to zip over to the SWBC bands from time to time just to keep abreast of what's happening. This section helps you do that.

When you look through a massive reference source such as this, you get a good picture of the enormous number of goodies

you can tune between 1 kHz and 30 MHz, taking into account SSB/AM/CW/RTTY modes, and given the widely varied assortment of station categories. It's practically an endless smorgasbord of exciting fare that offers enjoyment around the clock, throughout the year. One minute you're copying time signals from Moscow, then you hear a B-52 bomber, a cruise liner, followed by what may be a spy station.

This hefty book is jam-packed with frequencies, call signs, station locations, networks, and much other vital information for stations around the world. The information on U.S. and Canadian governmental comms below 30 MHz is well prepared and most valuable to dial twirlers. No matter what your interest specialties are, in a 270-page directory, your going to find a cornucopia of new information to aid you in your quest for DX.

The *Shortwave Directory, 6th Edition*, is \$19.95, plus \$2 postage/handling to North American addresses (residents of NY State add \$1.50 sales tax) from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. **PC**

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POP'COMM Reviews: The Radio Shack Discone Antenna

When I started monitoring public service communications in the early 60's, everything I could have ever wanted to listen to was on VHF. The police precincts that I monitored covering southeast Brooklyn in New York City were all on 151.370 MHz; the Fire Department maintained their vigil on 154.370; mobile telephones commanded the 152 MHz range; even agencies of the federal government like the FBI and Secret Service were all relegated to VHF in the 163-172 MHz range. And sprinkled throughout the VHF range were an assortment of businesses, railroads, ship-to-shore and other services that I would frequently monitor.

A single-band receiver was all I needed to satisfy my curiosity, and connected to my one radio was my dependable antenna—a simple VHF ground plane which performed admirably in the whole 150-174 range.

Suddenly, first in major metropolitan areas like New York City, and then spreading across the country, station allocations were being made in both the 450-470 "UHF" and the 470-512 "UHF-T" bands. The crunch for frequencies had taken its toll on the VHF spectrum—room was running out and many agencies requiring more frequency allocations due to an increased radio traffic found their havens in the UHF spectrums.

Dual band receivers and dual band antennas became the order of the day and I can remember having to replace my topside VHF ground plane with a shiny new 150-170/450-512 dual band antenna.

VHF/UHF dominance was not to last long. It seemed that almost overnight, as computer and communications technology were merged, frequency allocations were being authorized in the 800 and 900 MHz range; even amateur radio signals were starting to pop up on these higher frequencies—some in the 1200 MHz range!

The advent of new communications technologies and the accompanying expanded frequency allocations have led hobbyists to the super-wide band communications receiver. Most typically covering 25-1300 MHz, these receivers are often manufactured with only one antenna jack—and that can be a headache for the listener who wants to take advantage of this full spectrum coverage.

One way to handle this situation would be with special antenna splitters inserted in-line. Of course, one would need an entire antenna farm to accommodate this type of operation and most likely the splitters would cause unwanted signal loss, especially at the higher frequencies.

A solution has been devised in the new, wide-band, general coverage discone antenna. Deriving its name from its shape (the top portion a disc; the lower portion a cone), the antenna we set up and field tested is the Radio Shack Discone Antenna. (Radio Shack stock #20-013, 1990 Catalog page 75, List Price \$59.95). The frequency coverage of the Radio Shack discone is 25-1300 MHz.

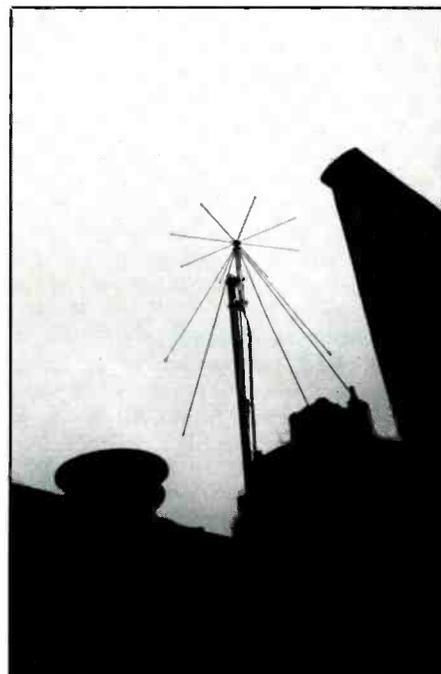
The Radio Shack discone is one of the less expensive discone antennas currently on the market. While similar to others that are available, I liked the fact that the Radio Shack is configured with an SO-239 connector. I would not have to replace my cable connectors with other types of connectors or purchase adapters.

The Radio Shack unit is a sturdy antenna which should provide many years of dependable operation. Quick and easy to assemble, I put the Radio Shack discone through its paces in the midtown Manhattan area of New York City.

At the other end of the antenna were a number of receivers being fed at different times by Belden 9913 coax cable. One receiver, the ICOM R-7000, has an S-meter which allows me to accurately gauge antenna capabilities; my other radio was used for signal evaluation—the very popular Radio Shack PRO-2004.

Putting the antenna up was less of a project than I had originally envisioned. The antenna radials (both the disc and cone portions) are screwed into the main housing hand-tight and then are secured in place by small nuts which are supplied with the antenna. The antenna is also supplied with small rubber protectors for the end of each radial and for the top of the antenna housing. I would recommend putting a dab of white glue at the tip of each radial before affixing the rubber tips just to be sure that none are lost.

The feedline is connected via an SO-239 which is fed through a tubing which helps protect the connector from the elements



and serves as the mast mounting. While coax cable is not included, all the necessary hardware is supplied to attach the antenna to this tubing and to the mast. The instruction booklet covers both the assembly of the antenna and the necessary safety precautions which should be observed during installation and operation.

Operation

In order to test the effectiveness of the Radio Shack discone, I first took S-meter readings from the ICOM-7000 of stations that I generally monitor with a tri-band ground plane. For reference purposes, I used frequencies around 47 MHz, 118 MHz, 154 MHz, 440 MHz, 470 MHz, 850 MHz, 880 MHz, and 1290 MHz.

Although my tri-band was not designed for use above 512 MHz, I had been using it to receive some signals in portions of the 800 MHz.

After I had completed my tally of signal strengths, I went topside and took down the tri-bander and put up the discone.

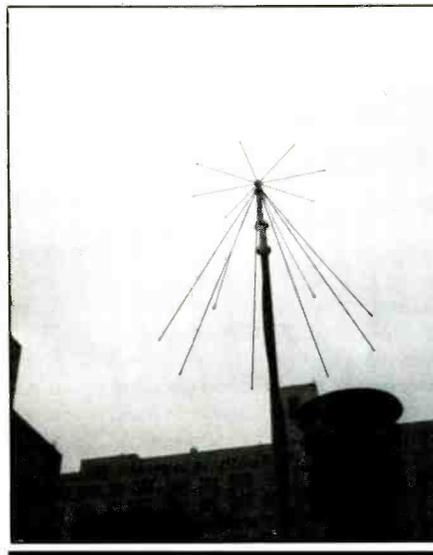
I was pleasantly surprised with the operation of the Radio Shack discone antenna.



On frequencies from 30 MHz right through 500 MHz, the discone at least equaled, but generally did better (and in some cases MUCH better) than my old tri-bander. I spent several hours appreciating the difference that the discone made on the VHF and UHF bands, and I managed to log a few new stations in the South Jersey/Philadelphia area which had been very elusive with my old antenna.

I was hoping that the discone would also perform its magic on the higher 800-1300 MHz frequencies and there, too, I was not to be disappointed. The Radio Shack discone really shined on these super high freqs, and I was amazed at the amount of activity that I had been missing with my old antenna setup.

I was especially interested in the 800 MHz cellular frequencies (for purely technical reasons, of course) and managed to monitor many cells I had not previously heard.



Reception was so good, I even heard weaker cells on the same frequencies as stronger cells, once the stronger cells cleared the air!

I was also able to receive a lot more radio traffic on the cellular inputs (approximately 825-845 MHz). This excellent performance was equaled on the public safety and business portions of the 800 and 900 MHz bands.

And I was now finally able to monitor traffic in the 1240-1300 MHz amateur band, a frequency range which had completely eluded me with my old antenna setup.

Other Experiments

I also connected my Radio Shack discone to a 2 meter amateur FM rig and got great reports on my simplex and repeater contacts. I was able to access repeaters and have good contacts on machines which I could not even hear with my old antenna!

I did one more experiment with the discone antenna. Because of its shape, the discone can be free standing antenna when assembled and placed on a flat surface. Al-

though I would not recommend this setup for normal operations during amateur radio transit because of the possibility of higher SWR readings, this would seem to make it ideal for low to medium power two-way communications and monitoring in emergency situations. I did manage to make several contacts with the antenna in this configuration using my portable 2 meter rig, and would recommend this setup in the event that you are called on to provide emergency communications to groups or organizations in pinch situations.

The Bottom Line

Getting a new antenna—the right kind of antenna for the equipment you are using—is almost like getting a whole new radio. The quantity and quality of radio traffic you can monitor can really increase dramatically when you use the right antenna. I recommend the Radio Shack discone antenna wholeheartedly.

Reviewed by Michael Stevens.

PC

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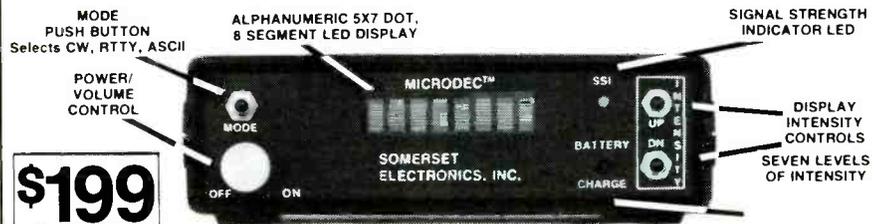
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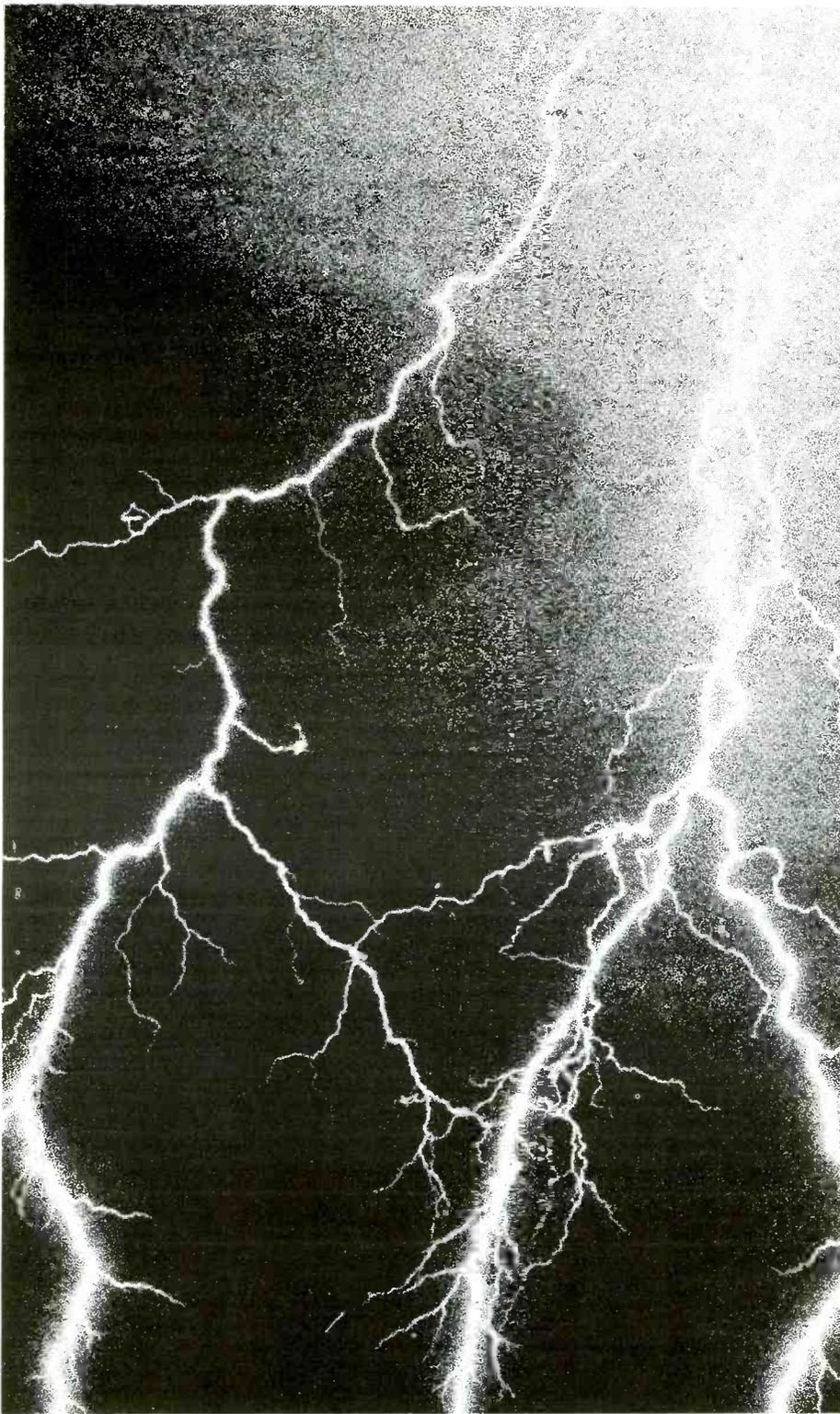
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CIRCLE 86 ON READER SERVICE CARD



BY WARREN KELLER

The lightning season is here and each year numerous injuries and deaths, as well as countless millions of dollars of equipment damage is caused by lightning. While there is still much we do not know about lightning, it is a fact that a lightning stroke can generate as much as 300,000 amperes of current.

Basically, a lightning stroke is generated when a lower portion of a thunderstorm cloud, through friction with the air, develops a negative charge by gathering up too many electrons from the surrounding air. When the cloud cannot hold any more electrons, the electrons head downward toward the earth seeking the path of least resistance about every 200 to 300 ft. This is what gives lightning its zig-zag look. Near earth, this negative charge is often met with a positive charge from the ground. This upward and downward path may repeat as many as 20 times in rapid succession, producing a spectacular light show.

Since a 300,000 ampere charge produced by a single lightning stroke far exceeds the safety level for humans as well as electrical and electronic equipment, precautions must be taken to safely conduct this energy to the ground. Since conductive materials attract lightning, this places antennas, and their supporting towers, control towers, water towers, metal buildings, etc. in jeopardy of being struck by lightning.

Two techniques are commonly used to protect personnel and equipment from lightning. The first and oldest is to let lightning strike the object and then try to conduct the energy safely to the ground before equipment damage or personnel injury can occur. This requires installation of lightning arrestors or suppressors at the antenna base and/or building entry point to drain off such charges. While such arrestors successfully drain off the major charge, usually small leading or ringing currents and voltages still are conducted into the equipment which, in turn, can produce outages especially to modern equipment which is more sensitive and, unfortunately, more susceptible to such charges.

The second and more accepted method is to protect the antennas, towers, etc. with a lightning rod, or a collection of lightning rods whose sole purpose is to intercept lightning strikes and conduct them to the ground. This method is rapidly becoming very popular since all dangerous energy is kept away from susceptible antennas, transmission lines, etc. and from being conducted into buildings or equipment areas where injuries or damage can occur. This approach requires that all susceptible external equipment be placed in a cone of protection of one or more lightning rods. A cone of protection is the space surrounding the lightning rod that is substantially immune to direct lightning flashes. A single antenna can be protected by installing a lightning rod 24 inches above the antenna. This lightning

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***Protect Yourself And Your Equipment
From The Dangerous Effects
Of Lightning***

rod should be connected to a down conductor (2/0 or -2 AWG copper) and run as straight and direct as possible to a ground rod.

Antennas in clusters like those installed on control towers are often protected by several lightning protection methods. A single lightning rod can be installed at the center of the tower to protect all antennas. The advantage of this method is that only a single lightning rod is required to protect all antennas. The disadvantage is the height required will be greater, which in turn, will require additional support to protect it from strong winds and ice build-ups.

A more popular method to protect antennas on control towers is to install lightning rods at every other corner of the six sided control cab. These rods are interconnected at the edge of the roof with a conductor and in turn connected to the two conductors (on opposite sides of the tower) to ground rods. The advantage of this system is the lower height of the lightning rods to provide the cone of protection for the antennas.

As noted above, there are numerous preventive procedures which can be taken to reduce the hazards of a lightning flash. Additionally, there are actions which should be taken during thunderstorms for your own safety.

a. Do not go out-of-doors or remain outside during thunderstorms unless it is necessary.

b. Seek shelter as follows:

- (1) Dwellings or other buildings that are protected against lightning.
- (2) Underground shelters such as basements, subways, tunnels, or caves.
- (3) Large metal-frame buildings.
- (4) Large unprotected buildings.
- (5) Enclosed automobiles, buses, or other vehicles with metal tops and bodies.
- (6) Enclosed metal trains.
- (7) Boats that are protected against lightning.

c. If possible, avoid the following locations which offer little or no protection from lightning:

- (1) Small unprotected buildings, barns, sheds, etc.
- (2) Tents or temporary shelters.
- (3) Automobiles (nonmetal top or open).
- (4) Trailers (nonmetal or open).

d. Certain locations are extremely hazardous during thunderstorms and should be avoided if at all possible. Approaching thunderstorms should be anticipated and the following locations avoided when storms are in the immediate vicinity:

- (1) Hilltops and ridges.
- (2) Areas on top of buildings.
- (3) Open fields, athletic fields, golf courses.
- (4) Parking lots and tennis courts.
- (5) Swimming pools, lakes and seashores.

(6) Wire fences, overhead wires, and railroad tracks.

(7) Isolated trees.

(8) Contact with electrical appliances, telephones, and plumbing fixtures.

e. In the above locations, it is especially hazardous to be riding in any of the following during lightning storms:

- (1) Open tractors, or other machinery operated in open fields.
- (2) Golf carts, lawn mowers, scooters, bicycles or motorcycles.
- (3) Open boats (without masts).
- (4) Automobiles (nonmetal top or open).

f. It may not always be possible to choose a location that offers good protection from lightning. These rules should be followed in selecting the most suitable available location:

- (1) Seek depressed areas—avoid hilltops and high places.
- (2) Seek dense woods—avoid isolated trees.

(3) Seek buildings and shelters in low areas—avoid unprotected buildings in high areas.

g. If you are hopelessly isolated in an exposed area and you feel your hair stand on end indicating that lightning is about to strike, drop to your knees and bend forward, putting your hands on your knees. Do not lay flat on the ground or place your hands on the ground. **PC**

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CIRCLE 3 ON READER SERVICE CARD

Product Review:

An Automatic Power Search & Store Module

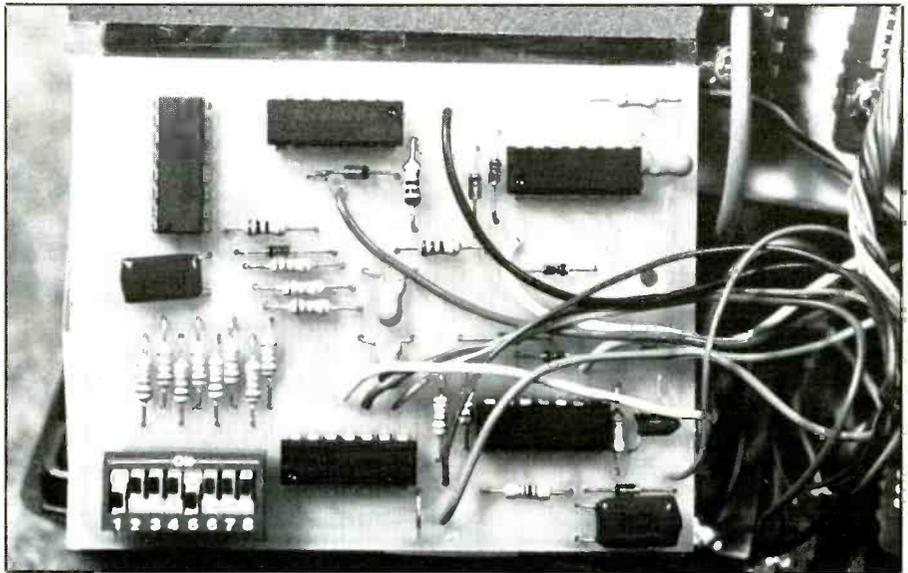
For Your PRO-2004 Or PRO-2005

POP'COMM readers were recently introduced to an innovation for the Realistic PRO-2004 and PRO-2005 programmable VHF/UHF scanners, the *Model SS-45 Search & Store Module*, by Key Research Co. You will recall from my last review how the SS-45 provides a special SEARCH mode to STORE new found frequencies in the scanner's ten MONITOR channels. The S-45 Search & Store Module allows the scannist to "discover" up to ten new frequencies in a "hands-off," unattended mode while asleep or at work. The main limitation of the Search & Store Module is that a *maximum of ten* new frequencies can be found and stored in one session because there are only ten MONITOR CHANNELS available in the PRO-2004/2005.

Key Research Co. has done it again! There is now a Power Search & Store Module, Model PS-90, which takes up where the SS-45 leaves off. The PS-90 has two separate modes of operation, the first being a SEARCH & STORE function *exactly* like the SS-45 module. In that mode, the PS-90 can find and store up to ten new frequencies in the MONITOR CHANNELS, completely hands-off while the operator is away from the scanner. But then the PS-90 takes off into uncharted territory with its unique second mode, the POWER SEARCH & STORE function.

This mode allows up to 255 newly found frequencies to be stored in the *permanent MEMORY channels*, the exact number of which is determined by the operator! In other words, the POWER SEARCH & STORE function transfers each new found frequency to a predesignated permanent MEMORY channel. When the allocated MEMORY channels are filled by the POWER SEARCH & STORE function, operation automatically stops until the operator intervenes. Like the SS-45, the PS-90 is designed to work *only* with the Realistic PRO-2004 and PRO-2005 scanners.

Electronically speaking, the PS-90 Power Search & Store Module performs the same actions that the operator would manually perform during a conventional SEARCH operation. For example, the conventional SEARCH mode halts on an active frequency for the time a signal is present. To store that frequency, the operator must first press the MONITOR button on the keyboard.



The PS-90 Dip Switch is set for 238 channels as shown.

Then the operator must press ENTER to store that frequency in a permanent MEMORY channel. SEARCH automatically resumes after the ENTER key is pressed. At that same time, the MONITOR channel and the MEMORY channel each advance by one to await the next operation. That's the manual way to fully utilize the SEARCH function of the scanner, but the PS-90 does it for you.

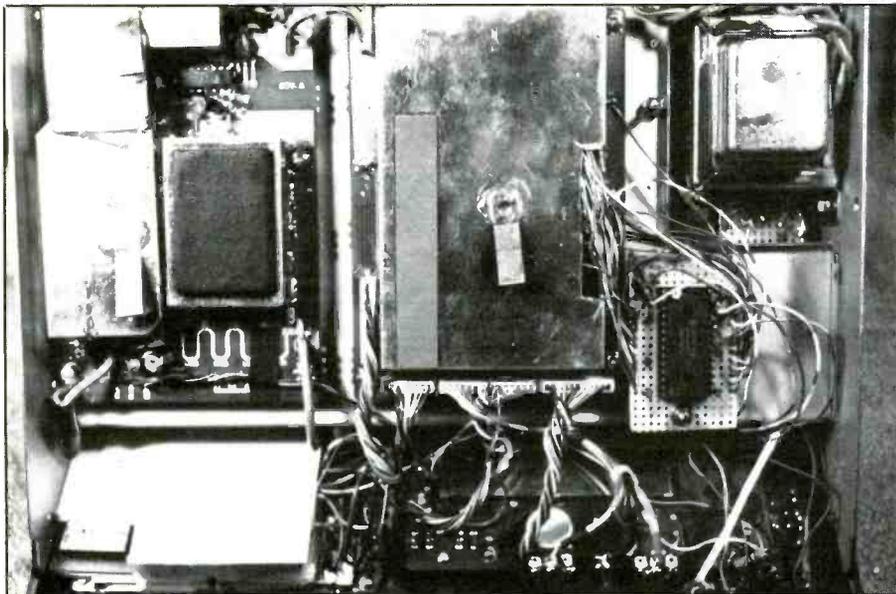
Drawbacks or disadvantages of the Power Search & Store Module, like with the SS-45, are practically nonexistent, but there are limitations. One is that the PS-90, like the SS-45, will sometimes "hang up" or stop in the middle of its sequence if and when a *very short* burst of RF signal breaks the SQUELCH at the moment the SEARCH mode scans that frequency. If the RF signal disappears before the SEARCH & STORE sequence is completed (about a tenth of a second), the SEARCH & STORE operation will stop until the SQUELCH breaks again. It could be seconds, minutes, or even hours on quiet frequencies before another signal comes in to restart the SEARCH & STORE sequence. The operator can, of course, in-

tervene at any time to manually restart the sequence. This limitation, as with the SS-45, is more a function of receiver and external factors, than any inherent shortcoming of the PS-90.

Operation of the PS-90 Power Search & Store Module is solely from the keyboard (at the touch of a key) and can be activated or deactivated at any time by the operator. All functions of the scanner remain normal and intact. There are no external switches or controls.

The PS-90 circuit board comes fully sealed, fully assembled and ready to install. The photo shows what the PS-90 module looks like under the seal wrap. Five integrated circuits, seven diodes, twenty resistors, six capacitors, an 8-segment DIP switch and ten interconnect wires make for a sophisticated package of high technology!

Installation is incredibly easy with ten wires to solder, and the solder points are very accessible. There is no major disassembly required; no holes to drill; no wires or circuit patterns to cut; and no controls to install. The installation process took me maybe twenty minutes, but it took *that long* be-



The PS-90 installs flat against the back of the keyboard in the PRO-2204.

cause I was very careful and critical as I went along!

The PS-90 lays flat against the back of the angled keyboard in the PRO-2004. In the PRO-2005, the PS-90 is installed behind and perpendicular to the keyboard panel. The installation instructions and procedures

are clear and straightforward for both radios.

When I installed the PS-90 Module in my PRO-2004, a problem was first encountered that caused considerable dismay to Key Research Co. and me until we figured it out. Most hobbyists will not encounter this,

but the details are related here for those scannists who have "turbocharged" their PRO-2004's or 2005's. One modification for increased SCAN and SEARCH SPEEDS calls for the 7.37 MHz clock oscillator resonator, CX-501, to be replaced with a certain frequency quartz crystal. I had previously done this to obtain turbo speeds of 15 & 30 channels per second for my PRO-2004.

Then, when my PS-90 module didn't work properly, it took some time to determine that the turbo speed wasn't compatible with the electronic timing requirements of the PS-90 Module. When I removed the new crystal and reinstalled the stock CX-501 resonator, voila: *perfect operation* of the POWER SEARCH & STORE function! Subsequent experimentation revealed that a milder turbo speed was OK and I finally settled on another crystal which yielded SCAN and SEARCH speeds of 12.5 & 25 channels per second, and the PS-90 Module still works great.

My PS-90 works fine now, but those who have modified their PRO-2004/2005's should be aware that some modifications might not be compatible with the POWER SEARCH & STORE function.

There is a 30-day "no questions" guarantee and a 90-day guarantee against defects in parts or workmanship. The PS-90 Power Search & Store Module is available from: Key Research Company, P.O. Box 5054, Cary, NC 27511.

Reviewed by Bill Cheek.

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Personal Emergency Locator System

As an emergency communications specialist, you need to know all about our present EPIRB systems, as well as the new proposal for a personal emergency locating band on 220 MHz. This article will bring you up to date on EPIRBs, plus review the new 406 MHz EPIRBs, and then tell you all about PELTS.

An EPIRB sends out a distinctive warbling tone on 121.5 MHz and 243 MHz. Mariners will manually activate a Class B EPIRB in times of an emergency. Mariners may also operate float-free, automatic, Class A EPIRBs that self-activate in case of an immediate sinking. Most commercial vessels that carry passengers for hire are required to carry Class A and Class B EPIRBs on-board.

Aircraft pilots call the EPIRB simply ELT, emergency locator transmitter. The aircraft ELT operates similar to a marine EPIRB, but it self-activates on sudden impact. It may also be manually activated, too.

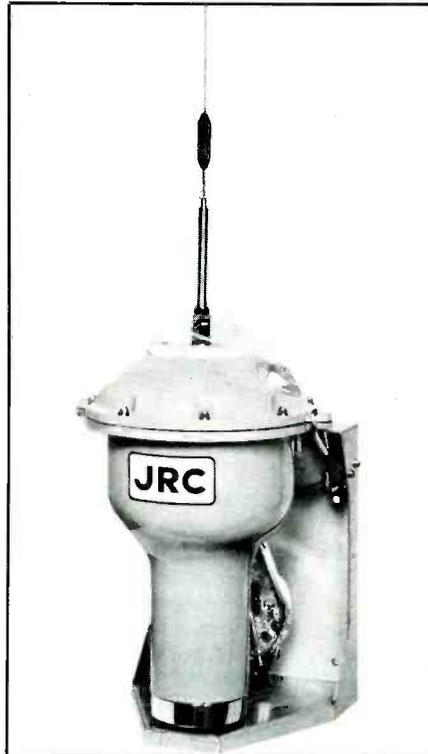
The big problem with marine and aviation EPIRBs is accidental activation. Over 98 percent of all EPIRB activations are simply false alarms.

This is a major problem to the COSPAS-SARSAT system that employs overhead satellites to relay EPIRB calls. The satellites don't know the real thing from a false activation, and rescue agencies must track down the EPIRB to find out whether it's a crash, or simply an accidental activation from a hard landing, or a wet duffel bag.

Class A and Class B EPIRBs depend on a line-of-sight transmission to polar-orbiting satellites, or to aircraft or search parties. And for the satellites to be effective, an EPIRB emergency coordination center must also be line-of-sight to that same satellite because satellites on Class A and B EPIRBs do not store and forward data. They will on the new 406 MHz system, but not Class A and Class B EPIRBs.

Class C EPIRBs were a giant flop in the marine community. They were designed to emit a warbling signal on Channel 16, 156.8 MHz. Channel 16 is such a mess these days that all of the interference actually sounds like an activated Class C EPIRB! Class C is a flop, and I can't remember a single rescue from a Class C signal on 156.8 MHz.

The new 406 MHz EPIRB is being adopted as a global standard, and provides much more accurate locations and coded search and rescue information. Category I 406 MHz EPIRBs float free and automatically activate, and Category II must be manually set. on.



The JQE-2A 406 MHz satellite EPIRB from Raytheon.

The big improvement on 406 MHz EPIRBs is the ability to send up to a satellite encoded information about the type of vessel it was on, and possibly what the nature of the distress is in case of manual activation. The satellite will then store this information, and will downlink itself when commanded by a ground station in another part of the world. This means that the ground station does not need to be in simultaneous line-of-sight with the satellite when the EPIRB goes off. The encoded information will also allow ground stations to better track down false activations, and pinpoint the culprit.

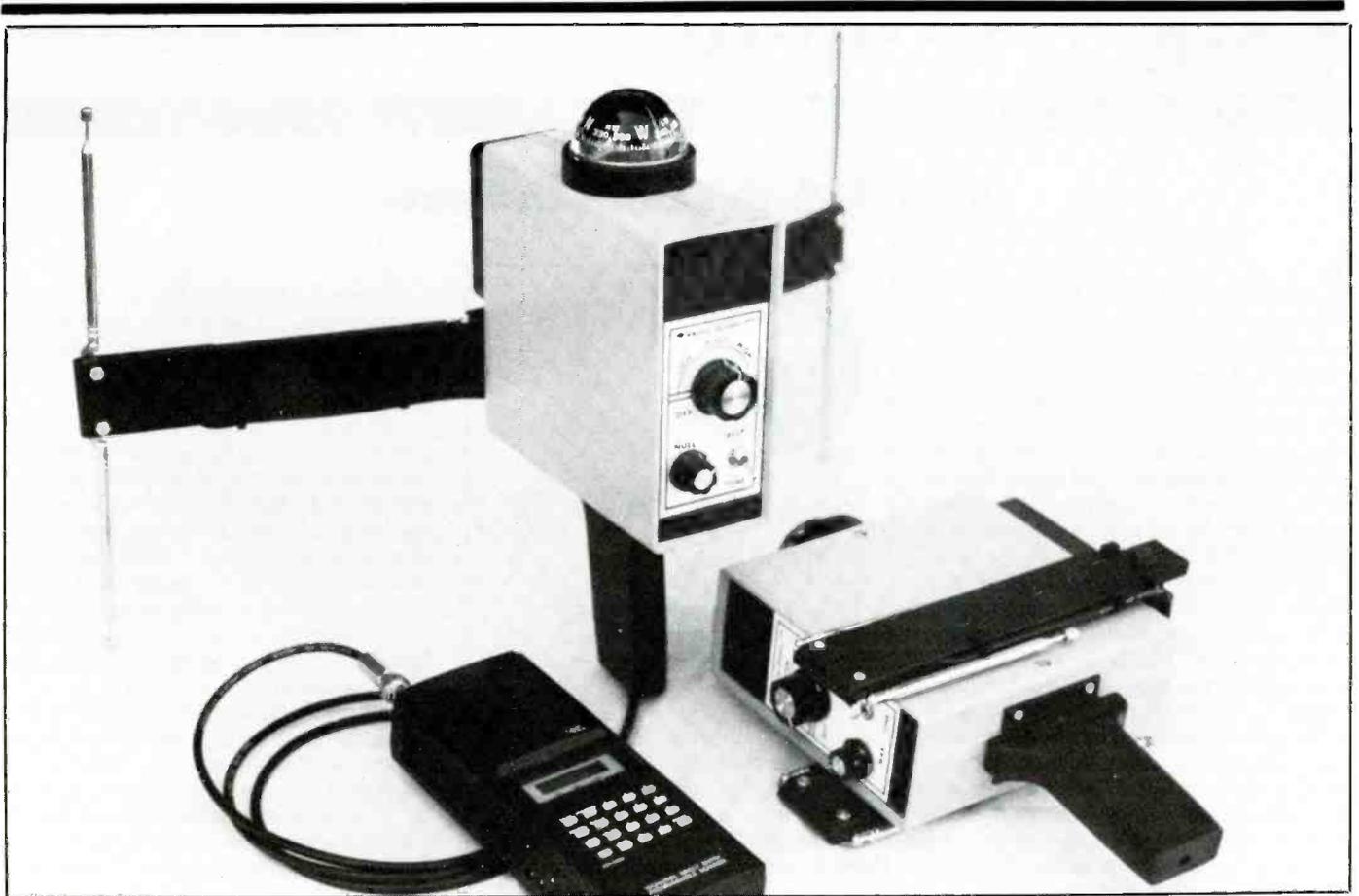
406 MHz EPIRBs are just arriving on the scene, type-accepted by the FCC. It will still be several more years before the entire marine community fully adopts the 406 MHz EPIRB system. When it does, chances are traditional Class A and B EPIRBs at 121.5 may be relegated for extinction—or possibly only used as an ELT aboard small aircraft. Presently, there are 80,000 121.5 MHz EPIRBs in service aboard boats. There have been a few hundred good saves with the older EPIRB system, but literally thousands of false activations costing over millions of dollars to track down through search and rescue efforts. Hopefully, 406 MHz will cure this!

WARNING

THIS TRANSMITTER IS AUTHORIZED FOR USE ONLY DURING EMERGENCY, LIFE THREATENING SITUATIONS. THE USER IS CAUTIONED THAT CARELESS ACTIVATION OF THIS TRANSMITTER COULD INTERFERE WITH AN ACTUAL DISTRESS SITUATION THAT COULD RESULT IN A FINE AND POSSIBLE LIABILITY FOR DAMAGES FROM THE INJURED PARTY.

REGISTRATION OF THIS SATELLITE EPIRB WITH THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) IS NECESSARY TO ENSURE EFFECTIVE ACTION BY SEARCH AND RESCUE AGENCIES IN THE EVENT OF A DISTRESS SITUATION. USE THE REGISTRATION FORM PROVIDED OR CALL THE NOAA TOLL-FREE NUMBER 800-XXX-XXX

Warning label on new 406 MHz EPIRB.



220 MHz PELTS locator direction finder unit (Prototype, Radio Engineers, San Diego, CA; (619) 565-1319).

Proposed Frequencies

1. 220.9775 MHz Assistance/Emergency Bases
2. 220.9825 MHz Assistance/Emergency Bases
3. 220.9875 MHz Information Channel Bases
4. 220.9925 MHz Short Distance Mobiles
5. 220.9975 MHz Short Distance Mobiles
6. 221.9775 MHz Assistance/Emergency Mobiles
7. 221.9825 MHz Assistance/Emergency Mobiles
8. 221.9875 MHz Short Distance Mobiles
9. 221.9925 MHz Short Distance Mobiles
10. 221.9975 MHz Emergency/Notification/Homing Beacons

A brand new system called PELTS is under consideration by the Federal Communications Commission. It is designed for local tracking and search and rescue activities for hikers, skiers, and local mountain and river rescue squads. These tiny units, resembling a handheld walkie-talkie, would have capabilities of 2-way FM voice, emergency activation for homing capabilities, and a host of options to further its line-of-sight range to incoming rescuers.

Five frequency pairs in the new 220-222 MHz band are proposed for the PELTS system. Amateur radio operators are presently vacating these frequencies that have been

reassigned to the land mobile radio service.

The personal ELT system would have 50 kHz of proposed spectrum, and this would allow hikers, as well as search and rescue agencies, plenty of "elbow room" to establish communications with lost parties with the PLT transmitter, and then home in on them using handheld radio direction finding equipment.

The new PELTS system would have nothing to do with satellites—it would only be ground-based, so as emergency communicators, start thinking about homing capabilities on the new 220 MHz band for PELTS.

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Search & Rescue – In Space

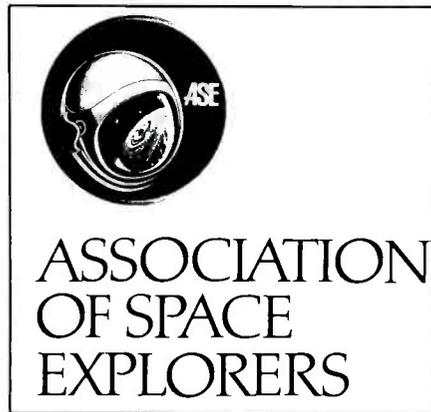
It was 15 years ago this month, that the first and only joint US-Soviet manned space mission took place. The mission was Apollo-Soyuz. It was hoped, by many, that this mission would open a new chapter in international cooperation in space. This, however, was not to be. The cold war was still very cold. Looking back and seeing how little cooperation has taken place in the intervening years, it is all the more amazing the mission took place at all.

Today, even the most conservative anti-communist in this country will admit that the cold war is not what it used to be. In reality it no longer exists. (I do, however, believe we have entered a far more dangerous period.) With the earth shaking changes taking place in the Soviet Union and East Bloc, the current international economic instability, the weak post-crash dollar, defense cuts and the astronomical cost of space exploration all lend themselves to the idea of more international cooperation in space. If nothing else, space cooperation is cost effective, that makes it smart. With a destabilized, and therefore more dangerous Soviet Union, an expanding program of cooperation in space could help stabilize our relationship on a positive note. An international moon base and a joint mission to Mars could provide a common cause for a unified space program which could include all space-faring nations.

Because of the significance of the Apollo-Soyuz mission, I thought a nostalgic look back might be interesting. With our rapidly changing world heading toward 2001, a look to the future may be a more fitting tribute to the crew of Apollo-Soyuz. It was their historic mission that put the first crack in the cold war ice. It is to the crew of Apollo-Soyuz that this look to the future is dedicated.

In order to have an international space organization you must first bring the interested parties together. Before they will talk, they will want to know "What is in it for them?" There has to be a profit motive. Self-interest is perhaps the best motivator. I believe the benefits of an international search and rescue capability for manned spaceflight may just be the motivation needed to bring the space-faring nations together. Any nation would be glad to boast of such a system. An international space organization could be developed to oversee the expanding communications needs for such a search and rescue system.

One organization that is taking a leadership role in promoting international cooperation in space is the Association of Space Explorers (ASE). ASE is a think tank whose

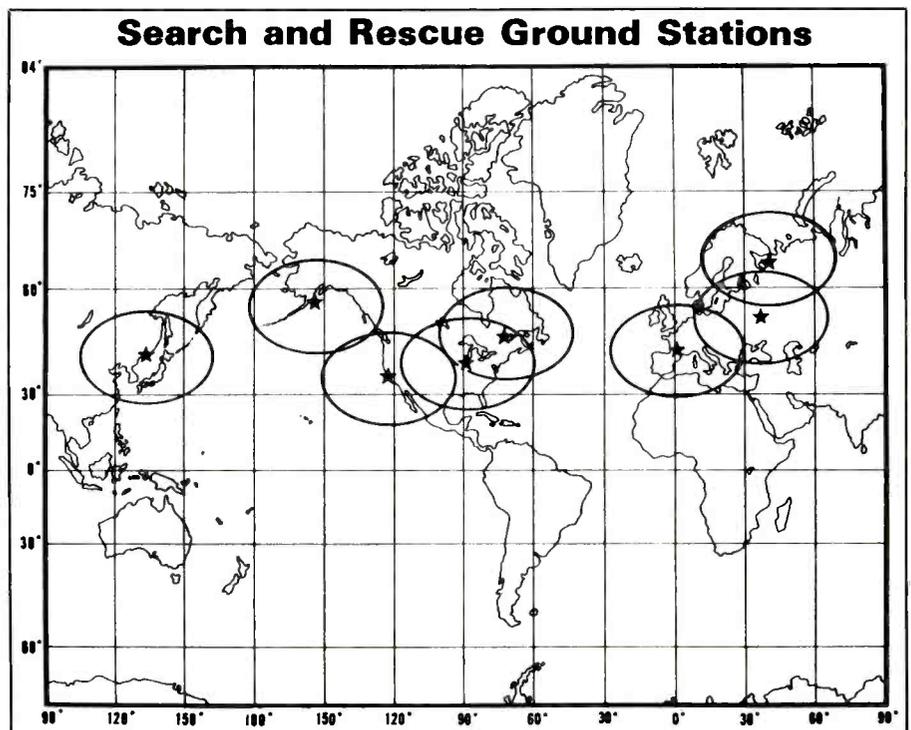


membership is made up exclusively of seasoned space travelers. Currently 72 of the eligible 200 men and women who have been in space are members. Of the 20 space-faring nations, 17 are represented. Members of the Apollo and Soyuz programs were instrumental in the formation of ASE. Astronaut Russell (Rusty) Schweickart and Cosmonaut Alexei Leonov (a member of the 1975 Apollo-Soyuz mission) are its co-founders. ASE is a privately funded organization with no political agenda. "We are not a peace group" Schweickart is quick to point

out. Though the White House, State Department and NASA are regularly briefed on ASE's activity, unlike the Soviet's, NASA will not let any of its current astronauts join.

Last year's conference focused on International Search and Rescue. It is only a matter of time before the US and USSR both experience their first casualties in space. Cooperation is going to be necessary if a stranded or dead crew is to be retrieved. Engineers and planners from all space-faring nations will need to decide on international standards for such things as docking ports, space suits, hatches, safety equipment and of course communications gear.

Let's take a look at some of the requirements of an international search and rescue communications network. We already have a system of search and rescue satellites in orbit. They are used to locate downed aircraft and ships at sea through the use of low powered emergency transmitters. Three countries, France, the US and the Soviet Union have placed search and rescue transponders on their weather satellites. When an emergency transmitter is turned on, the waiting satellite relays the signal to ground stations. They dispatch air and sea rescue units from coastal and military installations.



Both the US and Soviet EVA packs (space suits) are equipped to transmit emergency signals on 243 MHz. 406 MHz is another frequency used by this search and rescue system. The combined fleet of French, Soviet and US satellites can simultaneously detect and locate over 500 emergency beacon signals to within 4 km. This, or a similar satellite system, could be used to locate and communicate with stranded crews. Voice communications would be critical during an emergency. Any of the space centers or ground stations could talk to a crew, if they kept translators on hand. However, this is impractical. A better method would be to have a common language. For example, English is a worldwide standard in international air traffic control. In an emergency, language barriers could be overcome with the use of a precise system of codes. This would allow the crews to communicate without the language problems. An international code for space travel, much like the Q-codes could be developed. This would allow error free communications and avoid the language problems during emergencies.

The next step would have a standardized radio transceiver placed on board the spacecraft to allow direct communications between the crews of different nations. If each nation, or at least the US and USSR would equip their spacecraft with radios that would cover the other nations frequency bands, a redundancy would automatically be built into the system.

A comprehensive system for air to air and air to ground communications will need to be established to connect search and rescue ground stations with military installations, coastal stations and launch sites. This could be a complicated and expensive network to set up. In the beginning, it need not be. A simple FM transceiver can be carried on board. One with a common frequency range. You may recall that the Soviets carried a hand-held Amateur radio transceiver to the Mir space station last year. The first contact with ground stations outside of the USSR was with another hand-held transceiver at the '88 AMSAT convention in Atlanta, Georgia. Basic communications can be established with little difficulty once the decision is made to do so. Spacecraft could also be equipped to use Soviet or American satellites. The US Fltsat or syncom and the Soviet Molniya or Gorizont could be used. Better yet, commercial satellite companies like Intelsat or Intercosmos could provide a transponder for such a system. A network of ground stations, including Johnson Space Center and the Kaliningrad control center could be linked. Ground stations in both countries, however, are being replaced by satellites. The few that remain in use are the TDRS (Technical Data Relay Satellite) and SDRN (Satellite Data Relay Network) satellites systems. These and the military satellites could be used to connect the military and coastal installations for terrestrial rescue and the space centers for outer space res-



Deke Slayton, Vance Brand, Commander Thomas Stafford with Soviet counterparts Alexei Leonov and Valeriy Kubasov.

cue. Of course, trying to get the cooperation of several governments and many different agencies for such a project would be difficult at best. This being the case, an independent organization might better be able to provide the leadership necessary to see the project succeed.

In 1985, the Soviet Union presented to the United Nations a proposal for a World Space Organization (WSO). According to Nicholas Johnson, author of the Soviet Year in Space, Mikhail Gorbachev and other officials in the Soviet government have been promoting the WSO vigorously. It has received little press in this country, however. Mr. Gorbachev has even proposed using the unfinished Krasnoyarsk radar site as a new international space surveillance radar for the WSO. You may recall Krasnoyarsk was originally an antiballistic missile site, one which violated the 1972

ABM treaty. Shortly after coming to power Mikhail Gorbachev stopped construction at the site. In 1988, the USSR further proposed an international satellite monitoring agency. This could be an independent agency or part of the WSO. Not only would the WSO work on international cooperation, it would also monitor compliance with weapons treaties and monitor satellites to try to prevent new weapon systems from being placed in orbit. The World Space Organization could become a civilian controlled international space force. I can already hear my trekkie friends calling it the Federation.

If we have learned anything about Mikhail Gorbachev it is that he is serious about his proposals. He has met and exceeded his goals for arms and troop reductions, as well as opening the Soviet economy and society. He has even given Eastern Europe its freedom, why should we take his proposal for a

Space Communication Frequency Allocations Up To 1.7 GHz

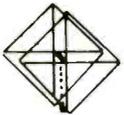
267.0 -273.0	MHz	Space to Earth (downlink) Military
328.6 -335.4	MHz	Aeronautical Navigational Aids
399.9 -400.0	MHz	Navigational Satellites
400.0 -400.15	MHz	Standard Time Signal Satellites
400.15-402.0	MHz	Meteorological & Research Satellites
402.0 -403.0	MHz	Uplink to Research Satellites
403.0 -405.0	MHz	Radiosonde (radio equipped research balloons)
406.0 -	MHz	International Distress Freq. (uplink) SARSAT/COSPAS
460.0 -470.0	MHz	Meteorological Satellites

World Space Organization any less seriously? Unfortunately, our government is lagging far behind the rapid changes we are witnessing in the world. Just as our government will now allow our astronauts to join the ASE, we seem incapable of responding, much less taking advantage of what might prove to be short lived opportunities to exploit Mr. Gorbachev's concessions. So far, we seem content to sit back and watch. No matter whether Mr. Gorbachev has a long reign or not, why not strengthen our position in the area of international cooperation in space. It is economical and could help stabilize our countries' relations during this time of rapid change. So far, there are enough old cold warriors in positions of power to prevent us from exploiting this situation to our advantage.

The French and the European Space Agency (ESA) are without a doubt the world's leading experts in international cooperation in space. Not only do the fourteen member nations of ESA know how to cooperate, but French spacemen have flown on the US space shuttle and twice aboard the Soviet's Mir space complex. France provides much of the funding and leadership for ESA. NASA's French counterpart is CNES, located in Toulouse, France. With the French Leadership, experience and independence, Toulouse might be a reasonable site for the Headquarters of the World Space Organization.

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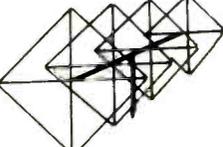
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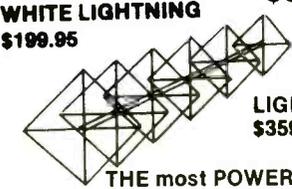
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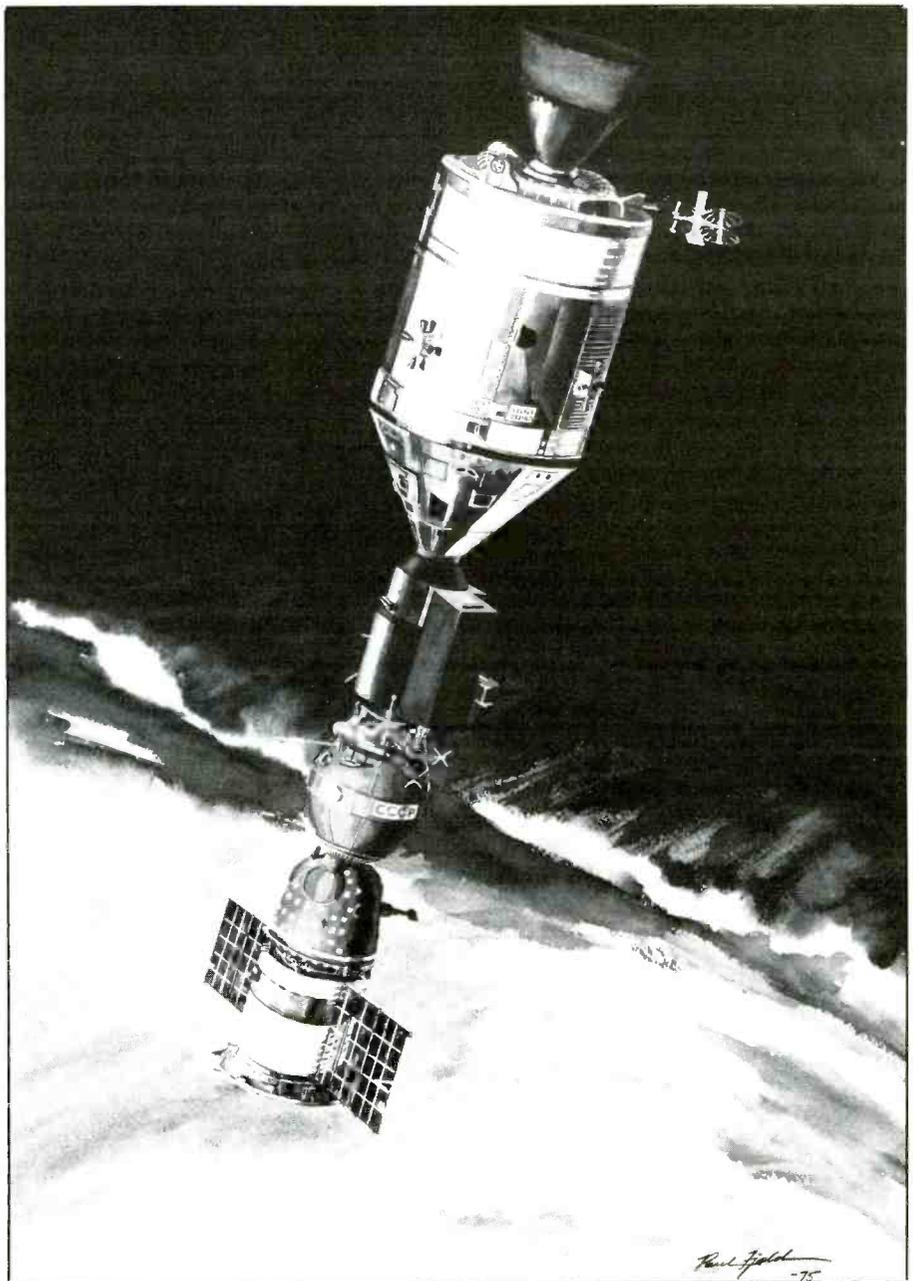


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Artist's conception of the Apollo-Soyuz test docking project.

You could establish a WSO communications network in several ways. One, you could plan a network of ground stations and satellites dedicated to the WSO mission. Second, you could have civilian WSO employees work at various military stations that could be pressed into service. Third, a manned space section could be added to the current search and rescue satellite and ground station network. The same or similar protocol could be used to dispatch rescue personnel from military installations and launch sites, depending on the nature of the emergency.

Frequency allocations for manned spaceflight search and rescue already exist. These and other satellite bands could be set aside

for search and rescue operations. The need for an international search and rescue system already exists. I close with a statement from Astronaut Rusty Schweickart, "The reality, nevertheless, is that one day there will be lives lost in space needlessly if such a capability does not exist. That is the fundamental thing which we recognize and call to the attention of space-faring nations. The scheduling and cost issues are things that must be taken in account of in terms of the practicalities, but the principal of adopting a universal rescue capability to save lives in space need not wait any longer." The economics are right, the politics are right, the time is right. We must look to the future, the cold war is over . . . See you next month.

Tuner And Untuned Pre-Amp Help Reception

The modern world band radio receiver usually covers a span of frequencies between 100 kHz and 30 MHz. A resonant antenna tuned to the frequency that is to be received and having a resistive impedance of 50 ohms extracts a maximum signal. A practical antenna cannot be resonant over such a wide span of frequency spectra. However, it does not mean the antenna can not pick up signals on other frequencies that are strong and usable.

A dipole, Fig. 1, is an example of such an antenna consisting of a half-wavelength antenna wire. Maximum signal is picked up by a dipole when its half wavelength electrical length compares to a half wavelength in free space of the incoming signal. Such an antenna fed at the center and connected to a 50-ohm coaxial cable is a common combination. When your antenna has a 50-ohm input impedance, maximum signal current is transferred to the input of the receiver. A popular dipole length for multi-band receptions is 65 feet and resonates on the 41 meter band.

Even a single-wire antenna is resonant and displays a low end impedance of a practical value when cut to a quarter wavelength, a three-quarter wavelength or a five-quarter wavelength. These are all ideal situations and efficiently utilize the signal that is on the antenna. So, it would seem that antennas leave much to be desired when they cannot be made resonant over the spectrum tuned by the receiver. Wrong!

Modern worldband receivers are sensitive and, although the signal present on the antenna may not be as high off of its resonant frequency, it is still adequate and can deliver a strong signal to the receiver input. Its length must be within reason to do so or, if not, appropriate amplifiers can be used to boost the signal. Furthermore, modern worldband radio stations operate at high power and their directional antennas give additional power to the signals that are delivered to your receiving antenna, be it resonant or not.

Many shortwave broadcast stations operate relay stations that are near the target area to which they wish to direct their signal on a scheduled time, giving a further zap to the signal on the receiving antenna. Consequently a worldband receiver in most locations and situations will intercept excellent signals for receiving many programs with a very simple, short and uncomplicated antenna.

Things become more troublesome when the program listener must use an indoor an-

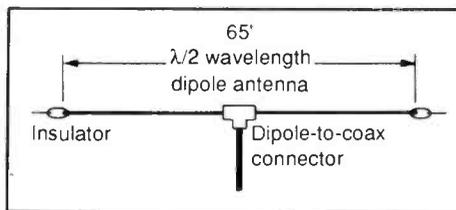


Fig. 1. Basic Halfwave Antenna.

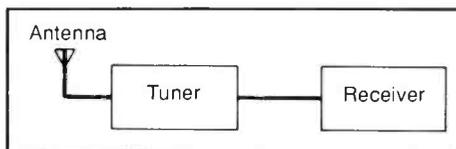


Fig. 2. Tuner in position between antenna and receiver.

tenna, or is stuck with a poor location with too little space for an antenna of reasonable length. Things are also more complex for the DX'er who goes after the weak and hard to hear broadcast stations, or other stations in other radio services that operate with low power in the shortwave, medium and long-wave radio services. The above listeners can make good use of antenna accessories such as tuners and antenna pre-amplifiers.

A tuner is a simple variable compactor and adjustable inductor combination, Fig. 2, that tunes an antenna to make certain that signals present on the antenna are delivered to the receiver more efficiently. It is not an amplifier and does not put more signal on the antenna. The signal rise on your S-meter is a result of better matching. Tuners are a considerable aid when a short antenna must be used, especially in tuning in the lower frequencies which require much longer antennas to obtain a resonant condition. Tuners also assist in reducing off-channel interference, images and some intermodulation distortion components. Images are generated within a receiver in the mixing processes. Intermodulation components are spurious beats that result when a too strong signal from some high-powered station on another frequency enters the receiver input and produces an interfering signal on the frequency of the station you are trying to receive.

A tuner often reduces background noise level, working in conjunction with the AGC system of the receiver. Only a 23 or 3 S-unit rise in signal level can make a significant difference in the signal-to-noise ratio (S/N). Such can make a more satisfying performance for even the program listener and

more readable signal for the DX'er.

Do not expect too much in the way of improvement from a tuner when you have a good location and an adequate antenna. In fact, such a location is not even the proper place to judge the performance of a good tuner and what it can do under adverse conditions. However, for the ardent weak signal DX'er, a couple of S-units rise can make the difference between a positive identification (ID) or no ID.

A typical tuner set-up using the MFJ-956 is shown in Fig. 3. A random length, single wire antenna (~20 insulated hook-up wire) stretched around the baseboard of a small bedroom on the 5th floor of a high-rise apartment was an example of a situation that was helped with a tuner, Fig. 4. There is lots of shielding in a building and signals can be very weak. In the example, a banana plug was used to supply the signal from the receiver end of the antenna wire to the inner conductor of the tuner's SO-239 coaxial input.

Results vary from location to location and are influenced by the length of the wire and the surroundings. Only on two bands, 16 and 49 meters, was the tuner of no value.

(Continued on page 42)



Fig. 3. MFJ-956 SW, MW, and LW tuner.

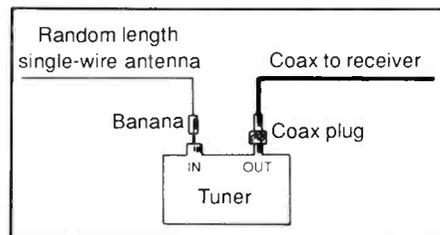


Fig. 4. Tuner connected to an indoor single-wire antenna.

POP'COMM's World Band Tuning Tips

July, 1990

This Pop'Comm feature is designed to help you log more shortwave stations. Each month this handy, pull-out guide will show you when and where to tune to hear a wide variety of local and international broadcasters on shortwave.

Note that languages used will not always be English and that many broadcasts are not beamed to North America. Further, stations often make changes in the times and frequencies of their broadcasts. Changes in propagation conditions and your own receiving location will also have a bearing on what you are able to hear.

All times are in Coordinated Universal Time UTC.

Freq.	Station/Country	UTC Notes	Freq.	Station/Country	UTC Notes
2390	LV de Atitlan, Guatemala	1130 indian languages	6230	HCJB Ecuador	0500 EE
3215	R. Oranje, S. Africa	0300 sign on, Afrikaans	6248	Vatican Radio	0300
3395	R. Zaracay, Ecuador	0200 SS	6280	V of Hope, Lebanon	0500
4753	RRI Ujung Pandang, Indonesia	1200 II	6305	LV del CID	0400 SS, anti-Cuba
4755	Sani Radio, Honduras	0100 SS	6840	CPBS, China	1100 CC
4760	Yunan PBS, China	1300 CC	6900v	Turkish State Meterological Service	0500 Turkish
4765	R. Moscow, etc.	eves via Cuba	6937	Yunan PBS, China	1130 CC
4780	RTV Jibouti	0300 sign on, FF	7105	TWR Monaco	0630 EE
4810	Yerevan Radio, Armenia	0200 sign on, RR	7110	V of Ethiopia	0330 sign on, Amharic
4830	R. Tachira, Venezuela	0145 SS	7135	R. France Int'l	0300 FF/EE
4835	R. Tezulutlan, Guatemala	1130 sign on, SS	7145	R. Polonia, Poland	0100 Polish
4840	R. Andahuaylas, Peru	1050 SS. R. Valera from 1100	7170	RFO New Caledonia	0700 FF
4845	R. K'ekchi', Guatemala	0130 SS & indian languages	7189	R. Africa, Eq. Guinea	2230 EE
4850	CRTV, Cameroon	0500 EE	7205	TWR Swaziland	0400 German
4870	R. Rio Amazonas, Ecuador	0430 sign off, SS	7205	R. Australia	1430
4885	Ondas del Meta, Colombia	eves SS	7245	R. Jamahariya, Libya	2200 AA
4900	Rdf Nationale, Guinea	0600 sign on, FF	7265	Sudwestfunk, W. Germany	0800 GG
4904.5	R. Nationale, Tchadienne, Chad	0500 FF	7300	R. Tirana, Albania	0100 SS
4910	R. Zambia	0400	7315	LV de Fundacion via WHRI	0100 SS
4915	GBC, Ghana	0600 EE	7325	BBC	eves
4920	R. Quito, Ecuador	0330 SS	7345	R. Prague, Czechoslovakia	0200 EE
4945	Caracol Neiva, Colombia	0530 SS	7365	KGEL, California	0200 SS
4960	R. Federacion, Ecuador	0100 sign off, SS	7370	Turkish Police Radio	0500 Turkish
4975	Ondas del Ortagueza, Colombia	0300 SS	7375	R. for Peace Int'l, Costa Rica	eves
4980	Ecos del Torbes, Venezuela	0300 SS	7400	R. Kiev, Ukraine	0030 EE
5020	ORTN LV du Sahel, Niger	0600 FF	7430	V of Greece	eves GG/EE
5025	R. Rebelde, Cuba	0400 SS	7445	V of Asia, Taiwan	1100 CC
5030	R. Catolica, Ecuador	1100 SS	7475	RTT Tunisia	0500 AA
5045	R. Cultura do Para, Brazil	0030 PP	7525	CPBS China	1300 CC
5066	Radio Candip, Zaire	0400 FF	9022	VOIRI, Iran	eves Farsi, others
5260	Kazakh Radio, USSR	0200 RR	9345	R. Pyongyang, N. Korea	1300
5560	R. Miscut	2300 SS, anti-Sandinista	9395	V of Greece	eves Greek/EE
5661	LV de Curtervo, Peru	0145 SS	9410	BBC	0500
5900	Kol Israel	0400 sign on, Hebrew	9445	V of Turkey	0400 EE
5930	R. Prague, Czechoslovakia	0200 EE	9475	R. Cairo, Egypt	0200 EE
5935	R. Riga, Latvia	0700 RR	9505	R. Record, Brazil	0030 PP
5950	V of Free China, Taiwan	eves CCEE via WYFR	9525	R. Marti	0200 SS to Cuba, via VOA
5960	R. Japan	0100 EE via Canada	9535	R. Algiers, Algeria	2200 FF
5975	BBC	eves via Antigua	9540	R. Prague, Czechoslovakia	0200 EE
5999	LV de Nicaragua	eves SS/EE	9545	V of Germany	0300 EE
6000	R. Guiaba, Brazil	0100 PP	9550	R. Juba, Sudan	1400-1500 via Omdurman Radio
6015	R. Austria Int'l	0530 EE, via Canada	9560	R. Jordan	2000 EE
6020	R. Netherlands	0130 EE	9570	RAI, Italy	0100 EE
6030	CFVP, Canada	0800 EE	9580	R. Australia	mornings
6060	R. Havana Cuba	0400 SS	9600	R. Portugal	0230 EE
6070	CFRX, Canada	24 hrs EE	9615	R. RSA, South Africa	0200 EE
6090	R. Luxembourg	2330 GG	9625	CBC No. Quebec Service, Canada	0100 FF
6105	R. Panamericana, Bolivia	1000 sign on, SS	9630	RNE, Spain	0000 EE
6105	Tus Pantaras, Mexico	1200 sign off, SS	9640	Ecos del Torbes, Venezuela	1230 SS
6116	LV del Llano, Colombia	0230 SS	9660	ABC Australia	1200
6135	R. Santa Cruz, Bolivia	1000 sign on, SS	9675	R. Cairo, Egypt	0200 EE
6140	R. Havana Cuba	0300 EE	9680	VPFC, Taiwan	0200 EE, via WYFR
6165	R. Netherlands	0130 EE	9695	R. Sweden	0230 EE
6185	R. Educacion, Mexico	1200 SS	9705	Radio Nacional, Brazil	0100 PP

Freq.	Station/Country	UTC	Notes	Freq.	Station/Country	UTC	Notes
9720	SLBC, Sri Lanka	1300		15335	RTM Morocco	1900	AA
9725	AWR Costa Rica	1145	EE	15345	RAE, Argentina	2100	EE
9735	R. Nacional, Paraguay	0100	SS	15375	RNE, Spain	1900	EE
9750v	R. Minería, Chile	1145	SS	15400	R. Baghdad	1730	AA
9770	R. Beijing, China	0000	EE, via Mali	15400	R. Finland Int'l	1730	AA
9800	R. France Int'l	eves	FF	15405	Vatican Radio	1330	SS
9835	R. Budapest, Hungary	eves	HH/EE	15410	Voice of America	1500	via Philippines
9870	R. Austria Int'l	0130	EE	15445	R. Veritas, Philippines	1330	EE & unidentified
9885	Swiss R. Int'l	eves	various languages	15445	TWR, Bonaire	2200	PP
9910	All India Radio	0000	EE	15450	R. Jamahirya, Libya	2230	AA
9965	R. Caiman	eves	SS to Cuba	15470	R. Tashkent, Uzbek SSR	1300	EE
11580	Voice of America	0100		15475	R. Moscow	1700	
11605	V of Israel	eves	various languages	15475	Africa No. One, Gabon	1900	FF
11660	Horizont, Bulgaria	eves	Bulgarian	15476	R. Nac. San Gabriel, Antarctica	2330	SS, Off 2337
11670	R. France Int'l	eves	various languages	15540	BRT, Belgium	1900	EE, sign off
11685	R. Beijing, China	0000	CC, others	15550	CPBS, China	0100	CC
11710	RAE, Argentina	0200	EE	15560	R. Netherlands	1900	EE, via Madagascar
11715	R. Beijing, China	0000	EE, via Mali	15575	R. Korea, S. Korea	1400	EE
11725	R. Havana Cuba	0000	SS	15580	Voice of America	0200	
11734	R. Tanzania, Zanzibar	1800	Swahili	15630	V of Greece	1830	Greek
11735	R. Oriental, Uruguay	0000	SS	15640	Kol Israel	1500	unidentified language
11735	R. Yugoslavia	0100	EE	15710	CPBS Taiwan 1, China	0100	CC
11740	V of Free China, Taiwan	0200	EE, via WYFR	17545	V of Israel	1600	Hebrew
11750	R. Baghdad, Iraq	2100	AA	17550	V of Greece	1300	GG/EE sign off
11780	R. Nacional Amazonia, Brazil	eves	PP	17560	BRT, Belgium	1900	sign on, Dutch
11805	R. Globo, Brazil	0100	PP	17570	R. Moscow	0200	EE
11810	All India Radio	2000	EE	17575	R. Netherlands	1830	signon, FF
11830	R. Anganguera, Brazil	0200	PP	17580	Voice of America	1630	EE
11830	V of the OAS	0000	SS, via KGEI	17595	RTVM, Morocco	1500-1700	FF/EE/AA
11855	R. Canada Int'l	1300	EE	17600	R. Moscow	0000	EE
11870	AWR, Costa Rica	0100	SS	17610	RTT Tunisia	1600	AA, sign off
11880	RNE, Spain	0000	EE	17612.5	WYFR, Florida	2100	EE
11895	R. Free Afghanistan	0230	Pashto/Dari, via RFE/RL	17630	Africa No. One, Gabon	1530	FF
11905	R. Universo, Brazil	2200	PP	17635	R. Peace & Progress, USSR	1300	EE
11925	R. Bandeirantes, Brazil	2330	PP	17665	R. Vilnius, Lithuania	2300	EE
11940	SBC, Singapore	1215	EE	17670	R. Cairo, Egypt	1800	AA
11955	R. Nacional, Angola	1730	PP	17680	R. New Zealand Int'l	0400	EE
11960	HCJB, Ecuador	0100	SS	17680	R. Beijing, China	1400	Indonesian
12000	R. Moscow	eves		17695	R. France Int'l	1600	FF
12015	R. Ulan Baator, Mongolia	1200		17705	Voice of America	1800	PP, via Liberia
12035	Swiss R. Int'l	0200	EE	17715	RNE, Spain	2200	sign on, SS
12070	R. Moscow	0200	EE	17725	R. Free Europe, W. Germany	1500	Bulgarian
12085	R. Damascus, Syria.	2230	AA	17730	Vatican Radio	1000	A
12095	BBC	2100		17730	Radio Norway	1900	Norwegian
12120	CPBS, China	0100	CC	17740	R. Sweden	1230	EE
13605	V of the UAE	2200	EE	17755	R. Japan	0100	EE
13610	RBI, E. Germany	0230	EE	17770	R. Oman	0400	AA
13645	R. Kiev, Ukraine	0030	EE	17775	KVOH, California	1500	sign on, SS
13655	R. Jordan	2100	EE	17780	R. Sofia, Bulgaria	1200	Bulgarian
13660	R. For Peace Int'l, Costa Rica	2230	EE	17790	Voice of America	1100	sign on, CC via Philippines
13675	R. Pakistan	1600	EE	17795	R. France Int'l	1600	EE
13680	R. Baghdad, Iraq	1900	AA	17800	R. Finland Int'l	1030	Swedish
13695	WYFR, Florida	0000	SS	17800	RAI, Italy	1400	II
13700	RBI, E. Germany	1600		17800	QBS, Qatar	1930	AA
13715	R. Prague, Czechoslovakia	eves	various languages	17810	Deutsche Welle	1900	EE, via Sri Lanka
13720	AWR, Guam	1200	various languages	17820	R. Canada Int'l	1545	EE (not 7 days)
13730	R. Austria Int'l	eves	various languages	17830	WHRI, Indiana	2100	EE
13740	Voice of America	0000	SS	17840	R. Prague, Czechoslovakia	1730	EE
13750	R. Pyongyang, N. Korea	0800	Korean	17845	R. Japan	0100	EE
13760	Deutsche Welle, W. Germany	1200	CC	17855	R. Beijing, China	0000	EE
13770	R. Netherlands	1430	EE	17860	Deutsche Welle, W. Germany	1800	GG, via Rwanda
13790	Deutsche Welle, W. Germany	0000	SS	17865	R. Nacional, Colombia	2100	SS
13855	ISBS, Iceland	1410-1450	Icelandic	17870	Vatican Radio	1500	EE
15010	V of Vietnam	1200	various	17875	BBC	2300	sign on, via Hong Kong
15020	All India Radio	1400	unidentified language	17875	HCJB	2100	sign on, PP
15060	BSKSA, Saudi Arabia	0300	AA	17890	UAE Radio	0230	sign on, AA
15070	BBC	1600		17890	RNE, Spain	1900	SS
15084	VOIRI, Iran	2100	Farsi	17895	R. Kuwait	1730	Urdu
15095	R. Damascus, Syria	1500	AA	17895	R. Moscow	0000	EE
15100	Iran's Flag of Freedom	1400	Farsi, clandestine	21470	HCJB	1900	EE
15115	HCJB, Ecuador	1200		21490	R. Moscow	1630	RR
15120	R. RSA, South Africa	0200	EE	21495	R. Portugal	1930	PP
15125	RBI, E. Germany	0330	sign off	21500	IRRS, Italy	1242	sign on, tests
15125	R. Beijing, China	1200	various languages	21566	RFPI, Costa Rica	2230	
15135	R. France Int'l	0500	FF	21525	WYFR, Florida	2200	EE, close
15140	R. Nacional, Chile	0030	SS	21535	R. RSA, South Africa	2000	SS
15160	Voice of America	1400	via Philippines	21550	R. Bucharest, Romania	1330	EE
15171v	R. Tahiti	0315	FF	21580	R. France Int'l	1645	FF
15180	R. Kiev, Ukraine	0030	EE	21605	UAE Radio	1530	AA
15185	WINB, Pennsylvania	2000		21610	R. Sweden	1530	EE
15230	HCJB, Ecuador	0030	EE	21675	R. Kuwait	1000	AA
15250	R. Bucharest, Romania	1500	EE	21685	R. France Int'l	1800	FF, close
15275	R. Bangladesh	1400	Urdu	21700	R. Norway Int'l	1230	Norwegian
15300	WCSN, Maine	2200		21735	V of the UAE	1445	AA
15305	R. Norway Int'l	0230	Norwegian	21810	BRT, Belgium	1700	Dutch
15325	R. Japan	0300	EE, via Fr. Guiana	25750	BBC	1545	

(from page 39)

On seven bands there was a significant improvement in the received quality. Also, it peaked the medium wave broadcast band considerably as well as the time signal frequencies of 3330, 5000, 73350, 10000 and 20000 kHz. A wire of a different results. At any rate you can expect some reasonable improvement on a majority of the bands.

The Untuned Pre-Amplifier

An untuned pre-amplifier by itself can give you a substantial signal boost. This applies whether a tuner is present or not. However, there are some advantages to placing a tuner ahead of the pre-amplifier. An ECI pre-amplifier connected into the circuit is shown in Figs. 5 and 6. The indoor antenna wire connects to the same tuner input. A single short wire also links the output of the tuner to the input of the untuned pre-amplifier. A 2-foot length of coaxial cable connects the amplifier output to the receiver input. The pre-amplifier builds up the signal from the tuner and provides exceptional help in building up the strength of weak signals to the point where you can hear them well in a troublesome location. Some stations may come in strongly and you may need to decrease your receiver radio-frequency gain with the attenuator switch.

Despite the gain improvement offered by the pre-amplifier, the tuner was of benefit in

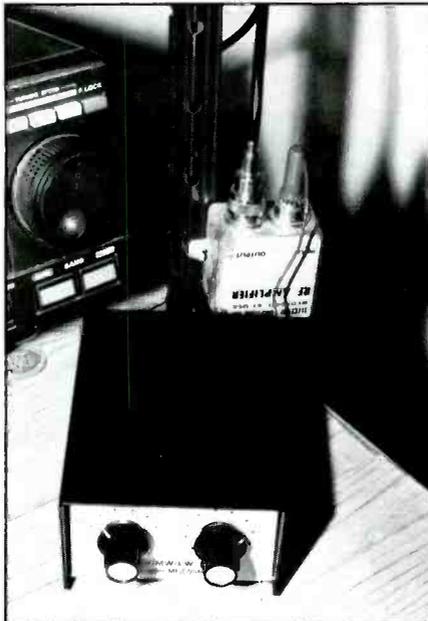


Fig. 5. Tuner and untuned pre-amp in circuit.

bringing out the weaker signals in a significant manner on five of the shortwave bands. It was also useful in reducing the level of background noise, images and some intermodulation distortion on the shortwave bands because of strong incoming signals. Remember, the amplifier is not tunable and some very strong signals can get into

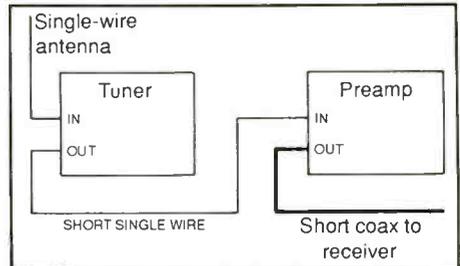


Fig. 6. Untuned pre-amp in circuit.

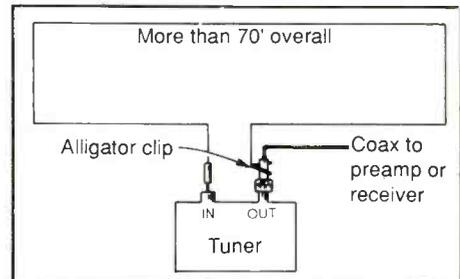


Fig. 7. Loop for use with tuner permits single-wire or loop operation.

the receiver. A tuner set on the desired frequency can offer some significant attenuation to signals trying to enter on some other frequencies. Thus its presence lets the desired signal pass to the amplifier without loss and attenuates some signal operating on other frequencies which may have the potential to produce interference.

THE FUTURE OF AMATEUR COMMUNICATIONS

Once in a lifetime, a transceiver is introduced that's so extraordinary and innovative that it opens a totally new era in HF communications. ICOM's pacesetter IC-781 proudly exhibits that hallmark achievement with futuristic designs and features of true legendary proportions. Whether DX'ing, contesting, pioneering new interests or enjoying unquestionable top-of-the-line performance, the IC-781 is indeed today's standard of excellence!



Multi-Function Five Inch CRT. Displays frequencies, modes, memory contents, operating notes, RIT, two menu screens, plus a panoramic view of all signals in a selected range. A portion of the screen also serves as a display for data modes like RTTY, AMTOR, and PACKET.

Dual Width Noise Blanker includes MCF filter plus level and width controls to eliminate pulse and woodpecker noise with minimum adjacent-signal interference.

Unique Spectrum Scope. Continuously indicates all signal activities and DX pileups with your operating frequency in the center. Selectable horizontal frequency spans of 50, 100, and 200kHz for each side of the frequency you're listening to. Vertical range indicates relative signal strengths. A contesters dream!

Incomparable Filter Flexibility. Independent selection of wide and narrow SSB filters plus CW filters. Second and third CW IF filters are independently selectable!

Dual Watch. Simultaneously receives two frequencies in the same band! Balance control adjusts VFO A/B receive strength levels. You can check additional band activity, even tune in your next contact, while in QSO without missing a single word!

DX Rated! 150 watts of exceptionally clean RF output. Easily drives big amplifiers to maximum power.

Twin Passband Tuning with separate controls for second and third IF stages! Increases selectivity and narrows bandwidth, independently varies low and high frequency response, or functions as IF shift. **It's DX'ing Dynamite!**

A Total Communications System! Includes built-in 100% duty AC supply, high speed automatic antenna tuner, iambic keyer, semi-automatic or full QSK CW break-in to 60 wpm, Audio Peaking Filter (APF), RF speech processor, multiscanning, 105dB dynamic range, all-band/all-mode receiver with general coverage, and much more!

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BROADCAST DX'ING

BY ROGER STERCKX, KVT1JH

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

“What was it?” That’s what we were asked by Dick Lupo of CA. Dick went to a concert that was being broadcast and noticed an engineer seated near the stage using a piece of broadcast equipment which he had never before seen. He described it as a portable case with a row of control pots, with two rubber duckie antennas sticking out of the case. He had equipment strapped to his chest.

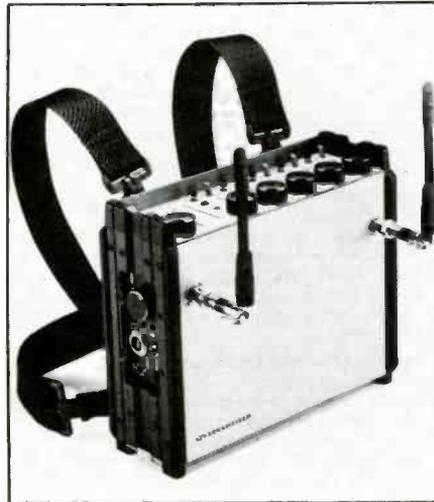
From the description, my guess is that it was a Sennheiser wireless mixer (made by Sennheiser Electronic Corp. of Old Lyme, CT). This is a new device used for remote audio mixing. It simultaneously receives up to five wireless microphone input frequencies so that the engineer can mix them, then it transmits the mixed audio as a single signal. The signal can then be received by the station’s remote van where it can be recorded and/or retransmitted to the studio.

One antenna is used for receiving (450 to 960 MHz), the other for transmitting (138 to 240 MHz and 450 to 960 MHz). It will operate for five hours on internal batteries. Weighs less than 9 lbs.

At Uncle Charlie’s Place

FM station WBBY, Westerville, OH was refused a renewal of its license by the FCC. WBBY asked for a review of the decision, but the FCC turned down the request. The whole flap was over the station’s claim to the FCC that one of its stockholders (owning about 25% of the station) serves as WBBY’s full time station manager. The FCC, however, was of the opinion that WBBY neglected to mention in its paperwork that this gentlemen had what the agency felt was “extensive outside responsibilities in connection with a family-owned business,” namely his position as manager of a new car dealership located 120 miles distant from WBBY. The FCC said that this was a misrepresentation, and that the record indicated a pattern “of deliberate concealment and false statements regarding a matter of potentially crucial importance.”

A situation in connection with various parties attempting to secure FCC approval to build a new FM station on 92.7 MHz in Marco, FL points out a sticky problem that turns up on occasion. There were seven competing applications for the proposed station filed with the FCC. A company came along and made arrangements with one of the applicants to amend its applications by substituting the new company’s name on their application instead of their own. The new company also agreed to pay the other six applicants to drop their competing applications.



The Sennheiser WM-1 wireless mixer receives as many as five wireless mike signals, then retransmits one signal of all of the fully-mixed audio.

At first, the FCC agreed to these arrangements. But, on second thought, the agency decided to reverse its approval because it became concerned that approval would encourage the filing of sham applications “conceived only for the purpose of entering into profitable settlement agreements.” In other words, it might create an economic incentive for individuals with no real interest in building and operating broadcast stations to file sham applications for the sole purpose of obtaining a payment from a competing applicant on the condition that the application be withdrawn. Although the FCC didn’t claim that any of the applications for the



The AM-106 sticker is from CFCN, Calgary, Alberta. Thanks to Bob Combs, Campbell, CA for sending it to us!

New FM Call Letters Assigned

KGZC	Folsom, LA
KGZD	Newport, OR
KGZE	Roze, KS
KGZF	Emporia, KS
KGZG	Burnett, TX
KGZH	Nyssa, OR
KKJJ	Campbell, MO
KKLK	San Angelo, TX
KLPR	Springfield, MN
KMAZ	Hereford, TX
KPQA	North Bend, OR
KPQB	Omaha, NE
KRAM	Eddyville, IA
KYRH	Palm Desert, CA
WBYO	Sellersville, PA
WCLE-FM	Calhoun, TN
WNRJ	Marysville, OH
WPFC	Monticello, KY
WPFE	Ogdensburg, NY
WPFJ	Sturgeon Bay, WI
WPFK	Simons Island, GA
WPHF	Wiggins, MS
WPHG	Exmore, VA
WPHH	Dublin, VA
WPHJ	Elizabethtown, KY
WPHO	Pamplico, SC
WPHQ	Bloomer, WI
WQNJ	Ocean Acres, NJ
WRBX	Reidsville, CA
WSSY-FM	Talladega, AL
WWRT	Scotland Neck, NC

New AM Call Letters Assigned

KGZA	Boulder City, NV
KWXL	Hudson, TX
WBLU	Moneta, VA
WPIP	Winston-Salem, NC

AM Call Letter Changes Requested

Present	Seeking	
KDAN	KTRN	Williams, AZ
WBOB	WWOL	Forest City, NC
WSSG	WZCT	Scottsboro, AL

FM Call Letter Changes Requested

Present	Seeking	
KJKC	KISQ	Portland, TX
KODK	KNGV	Kingsville, TX
KSRZ-FM	KJLT-FM	North Platte, NE
KZAM	KERT	Creswell, OR
WBWA	WEGZ	Washburn, WI
WLKC	WAIA	St. Mary’s, GA
WLRO	WTLT	Circleville, OH

Requests Withdrawn For Changed Call Letters

Present	Wanted	
KLKT	KZRK	Incline Village, NV
WCHB	WMKM	Inkster, MI

Changed AM Call Letters

New	Former				
KBYO	KZZM	Tallah, LA	WAXU	WBBE	Georgetown, KY
KCEO	KVSD	Vista, CA	WBCP	WJTX	Urbana, IL
KCTC	KGNR	Sacramento, CA	WHWY	WAIA	St. Augustine Bch., FL
KDOK	KZAK	Tyler, TX	WLIF	WFBR	Baltimore, MD
KIOV	KACY	Payette, ID	WLKQ	WJYA	Buford, GA
KIXA	KKIS	Pittsburg, CA	WKTX	WLND	Cortland, OH
KLLB	KZZI	West Jordan, UT	WMKM	WBTI	Taylor, WI
KNUS	KBXG	Denver, CO	WNBW	WVSG	Cornwall, NY
KSCR	KBMO	Benson, MN	WOTA	WJFL	Vicksburg, MS
KSKE	KSPN	Vail, CO	WQIC	WMDN	Meridian, MS
KTLG	KHYM	Gilmer, TX	WQKC	WJCD	Seymour, IN
KWIC	KJUS	Beaumont, TX	WRMM	WEZO	Rochester, NY
KXAM	KZZP	Mesa, AZ	WROQ	WAES	Charlotte, NC
KYZS	KDOK	Tyler, TX	WSMD	WCMD	La Plata, MD
KZBO	KUUS	Billings, MT	WSYW	WGRT	Indianapolis, IN
KZEP	KRNS	San Antonio, TX	WXLX	WWWX	Albemarle, NC
KZMQ	KMMZ	Greybull, WY	WYGO	WQXM	Gordon, GA
KZSN	KLEO	Wichita, KS			

Changed FM Call Letters

New	Former				
KBYO-FM	KBYO	Tallah, LA	WHUM-FM	WHOE	Avis, PA
KCRS-FM	KWMJ	Midland, TX	WJKX	WBSJ	Ellisville, MS
KCTC-FM	KCTC	Sacramento, CA	WJLS-FM	WBKW	Beckley, WV
KCUB	KVQC	Stephansville, TX	WJMA-FM	WVJZ	Orange, VA
KEDT-FM	KKED-FM	Corpus Christi, TX	WKNK	WSRG	Edmonton, KY
KOJO	KQEA	Lake Charles, LA	WKTX-FM	WKTX	Mercer, PA
KOLZ	KBCV	Bentonville, AR	WLCL	WGGG-FM	Micanopy, FL
KOLT-FM	KNMQ	Santa Fe, NM	WLIF-FM	WLIF	Baltimore, MD
KOVC-FM	KLPR	Valley City, ND	WLKQ-FM	WLKQ	Buford, BA
KQXR	KQPD	Payette, ID	WLKW	WOTH	Surgionsville, TN
KSKE-FM	KSKE	Vail, CO	WLQE	WLIL	Villas, NJ
KWWN	KHTN	Placerville, CA	WMJE	WCHM-FM	Clarksville, GA
KYMX	KCTC-FM	Sacramento, CA	WMXZ	WQXY	New Orleans, LA
KZEP-FM	KZEP	San Antonio, TX	WOBB	WTGQ	Cairo, GA
KZSN-FM	KZSN	Hutchinson, KS	WOKO	WQCR	Burlington, VT
KZSP	KESO	South Padre Isl., TX	WOSX	WMJA	Spencer, WI
WACO-FM	TKTS	Waco, TX	WQVE	WOFF	Camilla, GA
WAKS	WRCC	Cape Coral, FL	WRMM-FM	WRMM	Rochester, NY
WCAS	WAZO	Tarboro, NC	WUJM	WWHT-FM	Harrisburg, PA
WDAR-FM	WMWG	Darlington, SC	WXBB	WHO-FM	Harrisburg, PA
WEEL	WBJY	Shadyside, OH	WYGO-FM	WYGO	Gordon, GA
WEZO	WURG	Orlando, FL	WZMP	WQIC-FM	Marion, MS
WGCO	WZKS	Jesup, GA	WZZB	WJCD-FM	Seymour, IN
WGGD-FM	WMMY-FM	Melbourne, FL	WZZG	WROQ-FM	Charlotte, NC

Applications For New FM Stations

AK	Talkeetna	88.5 MHz
AL	Warrior	98.7 MHz
AR	Wilson	103.7 MHz
AZ	Colorado City	107.1 MHz
AZ	San Carlos	103.7 MHz
CA	Big Pine	93.3 MHz
CA	Groveland	91.7 MHz
CA	Lenwood	107.3 MHz
CA	Yermo	105.3 MHz
CO	Buena Vista	104.1 MHz
CO	Strasburg	102.3 MHz
CT	Litchfield	89.9 MHz
DE	Dover	91.7 MHz
FL	Baldwin	105.7 MHz
FL	Santa City	91.7 MHz
GA	Fitzgerald	96.5 MHz
GA	Lumpkin	99.3 MHz
IA	Des Moines	89.3 MHz
IA	Fairfield	90.5 MHz
IA	Keokuk	105.9 MHz
IL	Hillsboro	99.7 MHz
IN	Salem	97.7 MHz
IN	Santa Claus	103.3 MHz
KY	Paintsville	94.6 MHz
KY	Virgie	107.5 MHz
KY	West Liberty	102.9 MHz
MI	Hillman	94.9 MHz
MI	Stephenson	102.3 MHz
MN	Faribault	107.5 MHz
MO	Potosi	97.7 MHz
NJ	Manahawkin	105.7 MHz
NJ	Ocean City	91.3 MHz
NJ	Tuckerton	99.7 MHz
NM	Gallup	91.7 MHz
NY	Jamestown	89.7 MHz
NY	North Creek	89.9 MHz
OH	Ashtabula	98.3 MHz
OH	Mount Gilead	95.1 MHz
OH	Portsmouth	88.3 MHz
PA	Mansfield	92.3 MHz
SD	Canton	102.5 MHz
TN	Dyersburg	90.7 MHz
TX	Claude	106.5 MHz
WA	Yakima	90.3 MHz
WV	Fisher	103.7 MHz
WV	Montgomery	93.3 MHz
WY	Jackson	90.3 MHz

Applications For AM Facility Changes

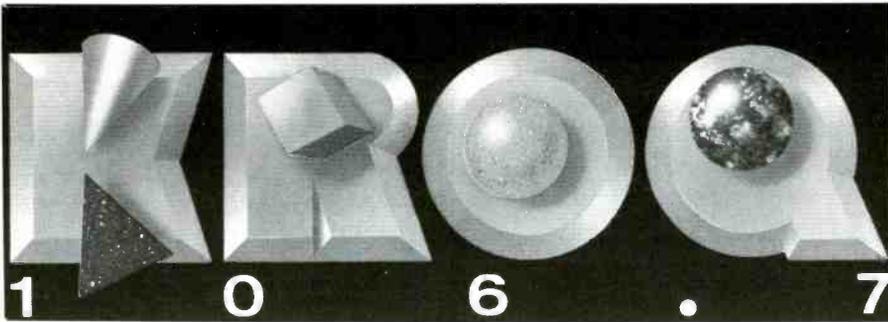
KBOP	Pleasanton, TX	1380 kHz Increase to 4 kW
KDFT	Ferris, TX	540 kHz Increase to 220 w. nites
KFRD	Rosenberg, TX	980 kHz Increase to 5 kW day/nite
KHDL	Opportunity, WA	630 kHz Move to 840 kHz, 50 kW/250 w.
KIQI	San Francisco, CA	1010 kHz Increase to 10 kW nites
KSSA	Plano, TX	1600 kHz Drop to 215 w. nites
KTER	Terrell, TX	1570 kHz Increase to 600 w.
WDDD	Johnson City, IL	810 kHz Increase to 400 w. nites
WGNN	Lawrenceville, GA	1360 kHz Move to 610 kHz, 1.5 kW
WHUM	Hughesville, PA	1190 kHz Move to 1200 kHz, 10 kW/250 w.
WMTI	Morovia, PR	1580 kHz Synchron. transmitter 1.6 kW nites
WRSJ	Bayamon, PR	1560 kHz Increase to 750 w. nites

Applications For FM Frequency Changes

KLIQ	Shingle Springs, CA	102.1 MHz Move to 101.9 MHz
KLTW-FM	Lebanon, MO	92.1 MHz Move to 107.9 MHz
KMZU	Carrollton, MO	101.1 MHz Move to 100.7 MHz
KQNC	Quincy, CA	101.9 MHz Move to 102.1 MHz
WLTK	Broadway, VA	95.5 MHz Move to 96.1 MHz

FM Frequency Changes Approved

KCPI-FM	Albert Lea, MN	95.3 MHz Move to 94.9 MHz
KGKG	Brookings, SD	94.3 MHz Move to 93.7 MHz
KKSR	Sartell, MN	96.1 MHz Move to 96.7 MHz
KNSX	Steelville, MO	96.7 MHz Move to 93.3 MHz
KYOC	Yoakum, TX	102.3 MHz Move to 92.5 MHz
WAAZ-FM	Crestview, FL	104.9 MHz Move to 104.7 MHz
WKLT-FM	Kalkaska, MI	97.7 MHz Move to 97.5 MHz
WMLQ	Rogers City, MI	97.7 MHz Move to 96.7 MHz
WXPB	Philadelphia, PA	88.9 MHz Move to 88.5 MHz



The KROQ-FM bumper sticker was sent in by Kelly Starkey, West Hills, CA.

Marco station were a sham, it felt that sham applications didn't serve the public interest because they delayed the start of service to the public. Also, they wasted the time and money of the FCC and those individuals genuinely interested in broadcasting. Furthermore, sham applicants seeking no more than a financial payoff would discourage qualified persons from filing broadcast applications because of the costs involved in arriving at settlements with sham applicants.

Non-commercial TV station KQEC, Channel 32, in San Francisco, CA was turned down for a renewal of its license, and its request for a review of that decision was turned down. The FCC had asked the licensee to explain why KQEC was dark between January and May, 1980. The licensee claimed that it had been shut down for technical reasons associated with the replacement of switcher equipment. The FCC, on the other hand, felt that the actual reason was related to budgetary problems at KQEC's sister station, KQED, and that KQEC was voluntarily darkened to alleviate the financial problems at KQED. The FCC considered shutting down Channel 32 for financial reasons to be contrary to the public interest, and that they had "committed serious misconduct" by lacking candor about

misrepresenting the reasons KQEC had been shut down. The FCC granted the application of Minority Television Project, Inc., for a new local TV station on Channel 32.

Also in San Francisco, KIQI was ordered to forfeit \$8,000 for failing to light the station's tower lights, and another \$1,000 for false logging entries. The station appealed the tower lighting forfeiture on several grounds, however, the FCC let their decision stand.

On July 21, 1984, the FCC issued a construction permit to build FM station WBPK, Flemingsburg, KY. That permit was to expire in August of 1985, but the permit holder requested and received an extension until April of 1986. A further extension to August 1987 was also given, but WBPK was still not ready for operation by that time. The FCC contended that there was no sufficient justification to explain why the station was not constructed within a 20-month time period. Therefore, a request for further extension was denied and the construction permit was cancelled by the FCC.

We're looking for AM/FM broadcast station bumper stickers, photos, QSL's, and news clippings about AM/FM broadcasting stations.

Applications For New AM Stations

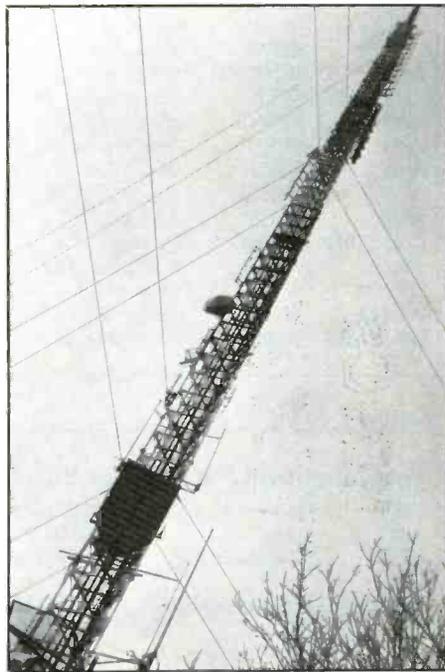
CA	Pismo Beach	1200 kHz
TX	Forney	700 kHz

Permits Granted For New FM Stations

DE	Milford	101.3
FL	Newberry	100.5 MHz
HI	Pearl City	101.9 MHz
IL	Rockford	90.5 MHz
KS	Downs	94.1 MHz
KY	Monticello	93.1 MHz
NE	Bennington	93.3 MHz
NY	Irondequoit	106.7 MHz
OK	Locust Grove	100.7 MHz
PA	Radnor Twp.	88.5 MHz
PA	Sellersville	88.7 MHz
PA	Villanova	88.5 MHz
TN	Calhoun	104.1 MHz
TN	Rockwood	105.7 MHz
TX	Jefferson	104.5 MHz
VA	Rural Retreat	103.1 MHz
WA	Pasco	101.3 MHz

Permits Granted For New AM Stations

AZ	Cortaro	1030 kHz
CA	Rosamond	890 kHz
MD	Pottsville	650 kHz



Some of the many towers at Rib Mountain State Park, south of Wausau, WI. Because of its central location and elevation, it has a lot of equipment on-site. This photo was snapped by Kenny Dicks, KE9CS, who worked at that location for two years for the state public broadcasting system. Although July is a hard time to visualize Kenny's complaint, he says it was not a good place to be during an ice storm. **PC**

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TELEPHONES ENROUTE

BY TOM KNEITEL, K2AES

WHAT'S HAPPENING WITH CELLULAR, MARINE & MOBILE PHONES

The healthy growth of cellular phones has spurred the development of several alternate systems that raise the possibility of various technologies competing in the lucrative and burgeoning portable radiotelephone market. Some of these new systems are being tested, or are being put into use around the world, with tests and the hopes for more being eyed for North America.

A company called PCN America is awaiting FCC approval of its application for a trial run of one of these alternate systems in Washington, DC. The proposed experimental system is described as being highly advanced, using spread spectrum techniques, and able to handle local subscribers.

PCNA proposes to establish 100 microcells within a 35 mile radius of the center of Washington, each being separated from the other by about 6 blocks. The transmitters in the microcells would all use antennas mounted no higher than 18 feet above the ground and would offer a range between 600 feet and 3 miles.

This system would operate between 1700 and 2300 MHz, with low power handsets using 100 MHz worth of spectrum from

1850 to 1990 MHz (bracketed by two 20 MHz guard bands). The handsets would use 1 milliwatt, but 100 milliwatt units would also be tried should the experimental system be approved. PCNA would like to be on line with the tests a year from now.

Several months ago, this column described a British system called CT2, which was already operational there and being touted as a low-cost alternative to cellular. It was somewhat of a hybrid between a cellular system and a cordless telephone. This system seems to be doing well and is generally called Telepoint these days. In the UK it operates in the 864 to 866 MHz band.

In Canada, trials of the Telepoint are hoped to run between April and September of next year, using 864 to 866 MHz, also 944 to 946 MHz. If things go well, the hope is that Telepoint systems could be on line by March of 1992.

Telepoint tests are being planned in the United States, too. By the end of this year, American Telezone hopes to have 500 base stations placed around Houston, TX. The idea is to lease the handsets to Houston residents at \$50 per month. The fee would cov-

er unlimited local calling, with long distance charged at an additional fee. The company projects a roster of 32,000 subscribers after a year of operation.

Other tests in New York City and Elmira, NY are being readied by a company called Cellular 21 under Experimental license KF2XAP, which authorizes operation on 940 to 941 MHz. British equipment is being converted to these frequencies for the trials. The public won't be charged during the test period, but should the system eventually receive approval for commercial operation, present plans call for a charge of \$5 per month plus 35 cents for a 3-minute local call.

Telepoint systems are now testing in Hong Kong, Singapore, Spain, Italy, New Zealand, Thailand, Finland, Malaysia, Australia, and Finland.

As might be expected, various areas of the telecommunications industry are watching these and other emerging technologies with interest and/or apprehension. The FCC is no less interested or apprehensive inasmuch as the agency realizes that all too soon it will be under the gun to allocate spectrum space for these services. Available

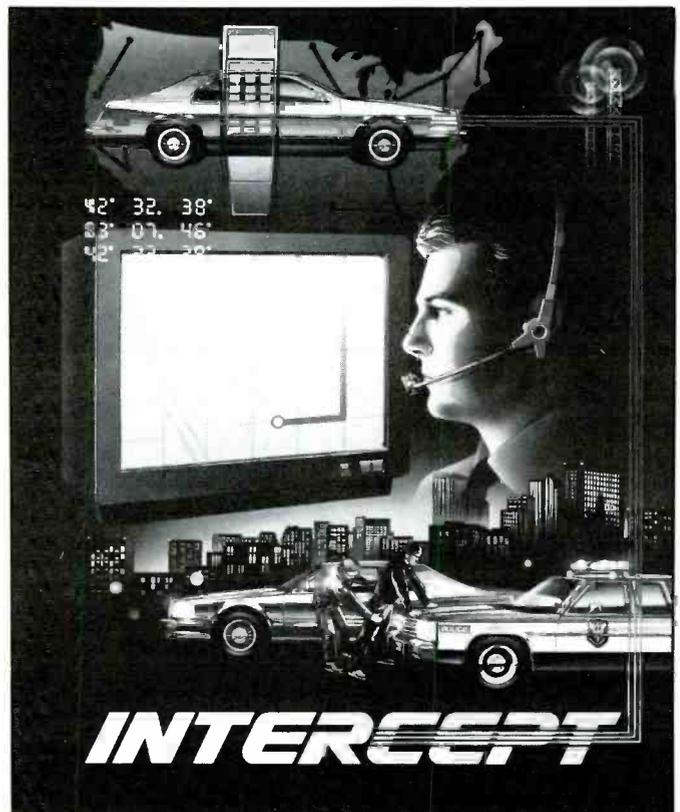
Cellular owners are beginning to get junk calls from high-pressure pitchmen attempting to lure subscribers from one carrier to another. This warning letter was sent out by one cellular carrier to alert its subscribers.

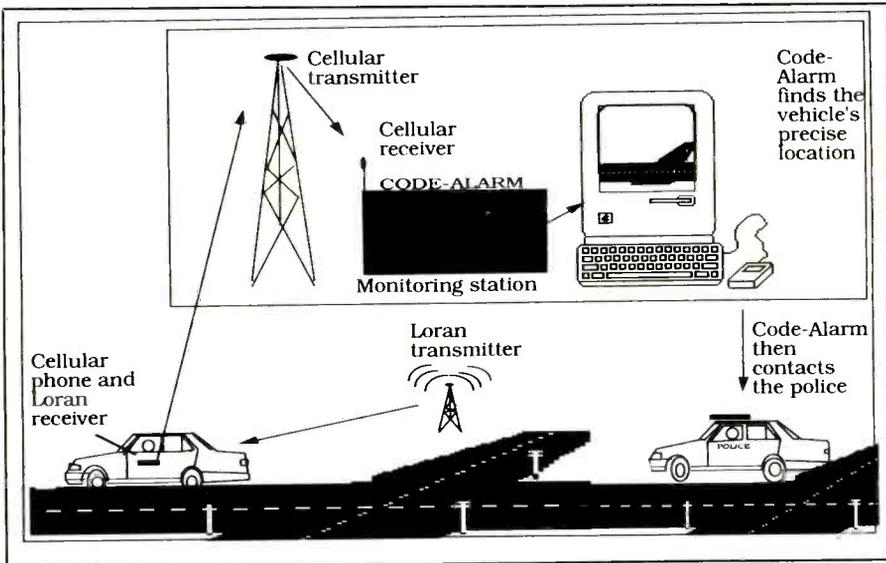
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"Intercept" is a very clever merging of cellular and Loran-C technologies into a potent weapon against auto theft.





How "Intercept" works.

spectrum space is one thing they have in short supply, which is also making services holding underutilized spectrum somewhat jittery.

These Teleport systems are intended to operate somewhere between 800 and 1000 MHz and are going to be knocking on the door seeking a chunk of band between 3 and 6 MHz wide. That leaves open the possibilities of 901 to 902 MHz (paired with 940 to 941 MHz). These frequencies were earmarked four years ago for something the FCC called the General Purpose Mobile

Service, but never did anything about. Lots of other radio services have already cast a beady eye on these frequencies and they'd certainly freak should the FCC decide to give them over to latecomer Telepoint.

There's also 930 to 931 MHz, which is quietly sitting there waiting to be used by advanced paging services. If Telepoint services could work advanced paging services into their offerings, then perhaps they might be permitted to set up shop there.

It will be interesting to see all of these dramas play themselves out.

Junk Cellular Calls

Some cellular service suppliers have found that competition companies are attempting to lure away their subscribers. The way they do this is by the simple expediency of dialing up (in numerical rotation) all of the cellular numbers used by the company whose subscribers are targeted. When they get an answer, they go into a high-pressure sales pitch to convince the subscriber to change companies, promising the sky above and everything else. Of course, the cellular customer pays for the call—although the calling company agrees to pick up the tab if the car phone owner agrees to switch companies.

This column has received several letters about this, including two that contained form letters that cellular companies sent to their subscribers making them aware of the practice and saying that such calls won't be charged if they are reported.

I don't know how widespread this practice is, but it's certainly sleazy.

A Nifty Idea

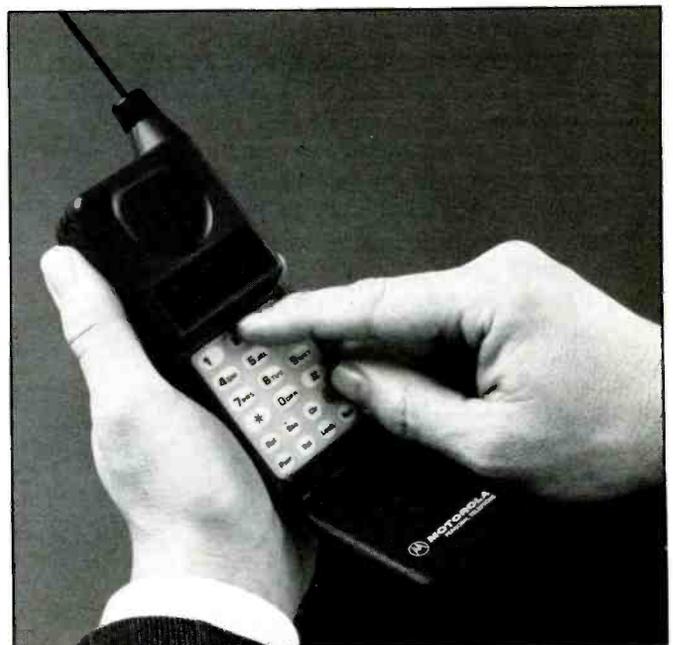
Intercept is a new stolen vehicle recovery system using both cellular and Loran technology, and it struck me as very clever. If the *Intercept's* alarm doesn't stop the theft, then all is still not lost.

As soon as the alarm is activated, the built-in Loran-C receiver dials up the manufacturer's monitoring station to report the vehicle's exact location. The monitoring station then contacts the police. The monitor-



The Shakespeare 4801 fiberglass antenna is suited for marine use.

Cellulars are getting smaller all of the time, as evidenced by the new Motorola PT-500 pocket-sized phone. Imagine the stir you'd cause extracting this from your pocket to make a call in a fancy restaurant.



ing station can also press a button that automatically kills the vehicle's engine and prevents it from being moved from the location pinpointed by Lorán-C.

Intercept uses your cellular phone, but contains everything else required to make it work. The MSRP of the system is about \$995, and it's available through dealers and authorized reps of Code-Alarm, Inc., its manufacturer.

For more information, contact Code-Alarm, Inc., 950 E. Whitcomb, Madison Heights, MI 48071, or circle 105 on our Readers' Service.

Onward & Upward

United Airlines worked out a deal with GTE Airfone to equip more than 400 of United's aircraft with the GTE Seatfone air/ground telephone system discussed in this column a few issues ago. The contract calls for the installations in United's fleet of Boeing 737-300, 757-200, and 727-200 aircraft.

Installations began about three months ago, although some of United's aircraft offered GTE Airfone services to passengers going back to 1985 when four DC-10's had phones installed.

The new Seatfone system offers a telephone in each first class seatback and in the center seatback of each coach row. Calls may be made to anywhere in the world and charged to any major credit card.

Tally

By the end of 1990, there will be more than 5-million Americans using cellular phones, with double that number projected to be in use by the end of 1993. These stats were given to me by NYNEX, the wireline carrier serving the New York metro area. They also told me that their average customer makes more than three cellular calls each business day. In the past six months, the number of calls handled by NYNEX each day has increased by more than 50%, and at the current rate of usage, the company will handle more than 110-million cellular calls per year. By the way, in early 1992, NYNEX expects to have digital cellular facilities available for those subscribers who have digital car phones. This will make NYNEX the first company to offer digital cellular service in addition to analog service.

A recent NYNEX survey revealed that almost 70% of their subscribers purchased their cellars either for purely personal use, or for mixed business and personal usage. In 1986, their average customer was 55 years old, was the president or CEO of a company, and earned more than \$90,000. Presently, the typical customer is 30 years old, a middle manager, and earns \$40,000.

Hardware Department

Shakespeare just brought out the Model 4801 fiberglass antenna, which is suitable for cellular or any other communications services in the 806 to 900 MHz band. This

antenna is 2-ft. in length. Two hand-soldered brass choking sleeves eliminate all pattern distortion due to cable radiation. Brass and copper radiators offer extra high efficiency. The antenna is made with a one piece section of fiberglass. It has a 1"-14 thread chrome plated brass ferrule that fits any standard marine antenna mount. An RG-8/X cable and TNC connector are also included. The MSRP is \$82.95.

For more information, write Shakespeare Electronics and Fiberglass Division, Box 733, Newberry, SC 29108, or circle 106 on our Readers' Service.

As the cellular industry grows, the hardware continues to get more compact. One of the neatest little pocket-sized cellars we've yet seen is the new Motorola PT-500, which looks like it was inspired by the communicators used by Captain Kirk of the Starship *Enterprise*. When folded, it's about the size of a wallet!

The PT-500 offers up to 75 minutes of continuous talk time, or up to 20 hours of standby before it needs a battery change or recharge. Color coded status indicators show operating status and cellular signal strength. It offers storage of as many as thirty phone numbers, with last number redial, plus scratchpad memory. In addition, it has an automatic lock that activates each time the PT-500 is turned off. Accessories that come include an overnight charger, standard battery, and a carrying case. Several optional accessories are also available.

For more information on the PT-500, contact Motorola, Inc., 1475 W. Shure Drive, Arlington Heights, IL 60004.

This column solicits your cellular questions and comments, also news clippings about cellular, radiopaging, and other personal communications. Manufacturers and service suppliers are also invited to submit information. **PC**

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SIDE REJECTION: 50-55 DB True
BACK REJECTION: 40 DB True
WEIGHT: 37 lbs.
LENGTH: 17 ft., 6 in.
SWR: 1:1
HORIZ. to VERT. SEPARATION: 25-30 DB
WIND SURVIVAL: 100 MPH
POWER MULTIPLICATION: 65X
AUDIO GAIN: 22 DB
WIND LOAD: 5.2

SPECIFICATIONS:
TYPE: Horiz & Vert
Polarization: Single Feed
GAIN: 15.5 DB on DX
FRONT TO BACK RATIO: 50 DB True
SIDE REJECTION: 45-50 DB True
BACK REJECTION: 35 DB True
WEIGHT: 24 lbs.
LENGTH: 12 ft.
SWR: 1:1
WIND SURVIVAL: 100 MPH
POWER MULTIPLICATION: 50X
AUDIO GAIN: 18 DB
WIND LOAD: 2.8

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CLANDESTINE COMMUNIQUE

WHAT'S NEW WITH THE CLANDESTINES

With an election victory for the UNO opposition in Nicaragua and increased pressure for the contras to disband and join the rebuilding effort, it's quite possible we may soon see the end of the contra clandestines, if it hasn't already happened. On the other hand, it's also possible that we could see new Nicaraguan clandestine activity in the form of an anti-UNO station operated by the Sandinistas, who had their own clandestine station—Radio Sandino—during the years they worked to oust Somoza. Nicaraguan broadcasting, clandestine as well as legitimate, will be worth keeping an ear on. Check 6214 variable during local evenings for activity from the contra's *Radio Quince de Septiembre* and 5560 to 2330 or later for *Radio Miskut* (aka Miscutani).

Election wins by SWAPO (Southwest Africa People's Organization) have brought the broadcasts of the *Voice of Namibia* programs (which were aired on several southern African stations) to a close. Apparently, SWAPO's own station in Lubango, Angola—also called the *Voice of Namibia*—is still on the air, reportedly on 6200 to closing just past 2300. Although the SWAPO program was heard and QSL'd by a number of North American DX'ers the actual station has not been heard here as far as we know.

Rebels in Loas are reported to be operating their own clandestine shortwave station, although details as to times and frequency are not available. The communist Pathet Lao government, against which the broadcasts are aimed, also used clandestine radio so here is another case of things coming full circle. One of our clandestine contacts confirms this information and says that broadcasting began on about 10 February of this year. Broadcasts are in Hmong and Lao and are beamed mainly to refugee camps, especially those in Loei province in the northwest.

Clandestine broadcast activity continues in Sri Lanka. A station calling itself the *Voice of Freedom* (Nindas Handa) is broadcasting against the People's Liberation Front (JVP) and is thought to be run by Sri Lankan authorities. This one is supposed to be active on 5304 from 133-1415.

The Tamil National Army is operating the *Tamil National Broadcasting Station*, apparently with the assistance, or approval of the Indian army, which is in Sri Lanka to help keep order. This station is said to be on variable 6740 at 1100, in Tamil.

Another station (possibly the same as or connected to the one above) is the *Voice of Eelam* (one of several that have used that name) said to have started in January. It is operated by the Provisional Government of

the North and East Provinces of Sri Lanka and is reported active on 7000 with hour long broadcasts at 0200 and 1300. All three of these stations are probably using very low power, but it would seem there's some chance to hear them in North America during transmissions in our morning hours.

The *Voice of the Khmer*, operated jointly by resistance groups led by Son Sann and Prince Sihanouk, is scheduled on 6325 at 0400-0700, 0900-1400 and 2230-0200, all in Cambodian. Many North American clandestine chasers have heard this one around 1100-1200.

Change has come to the African National Congress, too, with the release from prison of Nelson Mandela. Radio Netherlands'

Media Network reports that the ANC has plans to put a high power station of its own on the air, possibly from Madagascar. Power would be 250 kilowatts. Currently the ANC's *Radio Freedom* program is aired over such stations as Radio Tanzania, Radio Nacional, Angola and Radio Mocambique.

Apparently, there are now two anti-Khadaffi stations in operation. *The Voice of the Libyan People*, run by the National Front for the Salvation of Libya, is scheduled at 0500-0700 on 11825 and 15700, 1400-1800 on 11825 and 2000-2200 on 9450 (sometimes 9500) and 11825. This stations has been heard and confirmed by a number of listeners. *The Voice of the People*, said to be run by the Libyan National



Radio Freedom, run by the African National Congress, may one day have its own high power transmitter in Madagascar.

Movement, is scheduled at 1800-2000 on 11825 and 2200-0000 on 9450. It seems certain that the same transmitters are being used for both services. We'd be interested in more information about the Libyan National Movement!

Clandestine enthusiast Norman Crocker of Iowa notes that religious shortwave broadcaster WHRI carries two clandestine-type programs: The Cuban American National Foundation's *La Voz de Fundacion* at 0100-0200 daily except Sunday on 9495 (and 7315 - and also at 1500 on 21840). It announces an address in Miami (but so far has not responded to mail).

WHRI also carries a Croatian liberation program, *Radio Libertas*, scheduled at 1600 at 1600 on 11790 and 21840, though Norman says he doesn't hear it until 1630.

Robert Ross in Ontario tentatively logged the Voice of the People (a North Korean. Bob also noted *Radio Miscut* on 5560 at 2256-2350 sign off. The broadcast was in Miskito with frequent mentions of Misura (the Miskito resistance group). The only ID's noted were mentions of "La Voz de Atlantica."

We always appreciate receiving information about clandestine radio: loggings, QSL data, address information, news clippings, material from stations or groups and such is always welcome. We can keep your identity confidential if you wish. Thanks to those who checked in this month.

PC

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27 MHz COMMUNICATIONS ACTIVITIES

Our friends at Cobra Electronics gave us a first-hand look at their Model 18RV transceiver, which is one of a group of three new mobile rigs the company has released with the built-in ability to receive the 162 MHz NOAA weather channels. The integration of NOAA weather reception with CB equipment was pioneered by Cobra two years ago.

This useful weather feature permits the operator to use a front-panel switch to select any one of the three most active national Weather Service frequencies. Reception is via your standard CB antenna. We really liked this feature since it provides you with lots of useful data about what type of weather you're heading into. Whether you're on an Interstate, or driving an off-road RV, you'll want to know as soon as possible about approaching severe weather that could affect your plans, schedule, routing, convenience, or safety.

Another thing we especially liked about the Model 18RV is its front-panel speaker. Many mobile units are designed with the speaker on the bottom of the cabinet, facing downwards. With a downward-firing speaker, your mounting locations are limited to under-the-dash or on the overhead, unless you want to run an external speaker or cut extra speaker openings. A front-firing speaker opens up your mounting options so that the rig can also be mounted under the car or truck seat, or custom mounted into dashboards or overhead instrument panels in off-road and recreational vehicles as well as in pick-ups, trucks, agricultural and industrial vehicles. Nothing impedes audio clarity, no matter where you mount the rig.

In general, the Cobra 18RV is a nifty AM rig housed in a small, attractive gray cabinet. There's a front-panel removable mic that uses a five-pin locking type "DIN" connector. An "Instant Channel 9" button is provided, with regular channel selection provided by an up/down pushbutton switch. Separate LED indicators light with transmit and receive, and there's a multi-colored LED signal strength indicator. There's a non-switchable noise limiter, and a channel-saver feature retains the last channel used when the rig is turned off.

From a tech-spec standpoint, the receiver sensitivity is rated at less than 1 uV for 10 db (S + N), with selectivity of 6 db at 7 kHz. Typical adjacent channel rejection is 50 db. The two IF frequencies are 455 kHz and 10.695 MHz.

We took this rig out for a spin on the Interstates and were pleased with it in all respects from ease of operation to performance. It's got good ears and stood up well to the 18-wheelers that were pushing a tad more heat than allowed. Lesser rigs have caved in when exposed to these signals being sent



Cobra's new Model 18RV mobile rig is a real beauty with some excellent features.

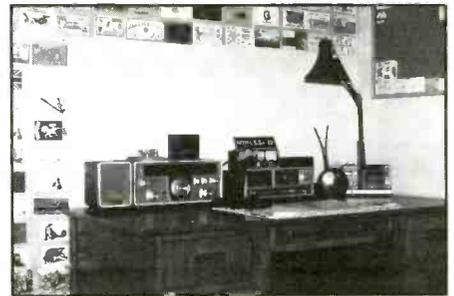
out within a quarter mile and on an adjacent channel. Got good signal and audio reports, too. Y'know, Cobra has been making CB rigs since about 1965, so they've had plenty of experience in coming up with rigs that perform well. It shows in the Model 18RV. Best of all, we thought the MSRP of \$129.95 was most reasonable for what this rig has to offer.

We thought this rig was a winner. You might wish to check it out. It's made by Cobra Electronics Group, Dynascan Corp., 6500 West Cortland St., Chicago, IL 60635. They'll send you more information on request. You can call Cobra toll-free at 1-800-COBRA-22, but be sure to mention you read about it in *Popular Communications*. Or, you can circle 107 on our Reader's Service.

Readers Write

Pat, SSB-349A, of Ft. Wayne, IN writes that in the March column we ran SSB-24F's QSL from Soviet CB'er 50AT101. At that time we complained that we couldn't figure out the Russian's address since it was written on the QSL in the Cyrillic alphabet. Pat tells us that he has corresponded with 50AT101 on many occasions and can pass along his English-language A.D. for those who might like to have the information: Anatol Olgin, Sovetskaj 56-1, Magnitogorsk 455025, USSR.

A sharp-looking photo was sent in by Norm, SSI-22 and SSB-22D, of Calgary, Alberta. Featured on the desk are a President Washington rig and a Realistic SX-190 receiver. The walls are appropriately adorned with colorful wallpaper. Gee, we haven't seen the bare surface of our own base station operating desk in many years. Last time we tried digging down through the stratified layers of papers, we quit halfway down



Norm, in Calgary, snapped a photo of this tidy-looking CB base.

Chris Torns SSB J W I

AW138

Australia

CONFIRMING	DATE	UTC	KHZ	RST	MODE	2-WAY	HEARD/S.W.L

QSL Route: 1/9 Ballinan Road, Leichhardt NSW 2040, Australia

A QSL from "down under" came in from Chris, AW-138.

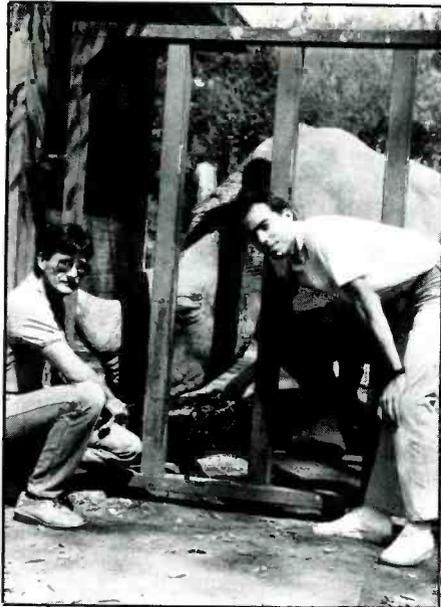
DEBUT CB STATION

ONE HOUR ALL TIME

AKIMOTOS

100% KRM 100% 100% 100% 100%

This dazzling card comes from Akimotos in The Netherlands, via Pat, SSB-349A, of Indiana.



Mark and Nico check in with the White Rhino before embarking on the DX'pedition.

when we began discovering unanswered QSL's and letters from 1978.

In the past, CB was not permitted in East Germany (a/k/a the GDR). However, the recent changes in the political climate there have brought about CB as a reality called *Privatradio*. This comes to us direct from East German readers Adelheid and Michael Schroter. They tell us that the new service calls for licenses to be issued by the post office (takes 4 to 6 weeks). FM is permitted on all 40 channels with 4 watts, although 1-watt AM is also allowed between Channels 4 and 15.

One slight inconvenience is that CB radios aren't made or sold in East Germany at this time, but they can be brought back from West Germany. We hope to hear more about CB there as time goes on. Those who wish to write to these nice people can send a card or letter to Adelheid and Michael Schroter, P.O. Box 884, Berlin 1064, German Democratic Republic.

From 'round the other side of the world, a QSL card was sent in by Chris Toms, CB'er AW-138 (and ham VK2NGE), who lives near Sydney, Australia. Chris is into CB, hamming, scanning, and SWL'ing. He's 27 years old, and says his favorite columns in *POP'COMM* are *CB Scene* and *Communications Confidential*.

Although the QSL shows a Japanese Samurai warrior, it's actually from a station in The Netherlands! The CB'ers handle is Aki-motos, and his card was sent to us by Pat, SSB-349A. Wish we could show you this Dutch QSL in all of its colorful beauty as it's very striking.

Last October, two CB'ers from the RSA went on a four-day DX'pedition to Kruger National Park, which is located near the Swaziland and Mozambique borders. The operators, Mark and Nico, went on the trek to launch the newly founded *White Rhino International DX Radio Group*, P.O. Box 6727, Pretoria 0001, Republic of South Africa. They tell us the group frequency is 27.500 MHz, USB, so you can listen for them there (club ID is 44-White Rhino-0A) and maybe write for their QSL if you hear them.

Less TV Buzz

Television sets near CB transceivers sometimes cause a raspy, buzz-type interference in the CB speaker. The source is harmonics from the television's horizontal deflection system of the television, which generates frequencies into the CB band. It is most easily identified on CB sets with a continuously tunable dial. As the knob is rotated, the buzz appears at about every 15 kHz on the dial.

One cure is to increase the distance between the television and CB sets, if possible. In severe cases, internal shielding of the television cabinet may be done with metal screening fastened to the cabinet sides, bottom and top (inside). All pieces of screening must make electrical contact with each other and also connect to the television chassis.

Of course, always unplug the TV set from the AC when doing anything with it out of the cabinet.

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TO: _____ OPER: _____
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FREQ: 27.500 USB GRM QSB
YOUR S: R: MOD: Z
PROGRESSIVE NO: _____

EQUIP USED:
RX/TX: YAESU FT707
PMR: 100 WATTS
ANT: 3 ELE YAGI
HEIGHT: _____ m
PSU: 14V 40A HOME MADE

GOOD DX'ING
WITH YOUR WR
CALLSIGN



GREETINGS FROM:
MARK & NICO

** REPUBLIC OF **
SOUTH AFRICA

This 3-color QSL was sent to those who reported hearing signals from the White Rhino Group's DX'pedition.

Choosing CB Coaxial Cable

There are two important considerations in selecting a CB coaxial cable—loss and cost. By far, the most popular cable type is RG/58U. It is the least expensive, and signal loss per foot is negligible for cable runs of less than 50 feet between rig and antenna. Another favorable feature is the relatively thin diameter of RG/58U cable. It is the easiest to snake through walls or points of entry.

When the cable run is over 100 feet a cable of lower loss will improve the signal. RG/58U is rated at an approximate 3 db loss per 100 feet, which indicates that half

the signal is lost between rig and antenna. At a cost of about two and a half times that of RG/58U is the more efficient RG8/U. A 100-foot run of this cable reduces power by only approximately 1 db, or one-tenth. For this reason, it may be worth the extra expense to install RG8/U for installations which require about 80 feet or more of cable.

These cable types are also available in a polyfoam version. Although similar in appearance to standard coax, a special plastic foam insulator (dielectric) creates somewhat less loss. Cost is about half-again as high as standard coax. RG8/U in the polyfoam version might prove attractive for ex-

ceptionally long cable runs—over 100 feet—where losses become serious.

Marine Installation

Marine SSB radios operating in the HF band are required to have an extensive ground system, usually a copper plate, fastened below the water line. For CB operation in a boat this is not normally required. Antennas designed for marine CB are generally one half-wave length long, which overcomes the ground requirement. There is, however, much to recommend the use of a ground on small boats of nonmetallic construction (wood, fiberglass, etc.). It is possible for metal items on the boat to pick up and distort the CB signal or to emphasize ignition noise problem.

The simplest kind of grounding is done by running a common ground strap to metal objects on the boat. These might include posts which support lights, other electronic devices such as a depth finder, or decorative metal strips. The material for grounding together these units should be a strip of copper more than 2 inches wide, if possible. (Copper in roll form is generally available in local building-supply stores.) Run the strip among the various metal items, including transceiver and engine, using the shortest possible run between them. There must be good metal-to-metal contact at each point.

The handy CB user might wish to install a conventional grounding system while the boat is out of the water. One approach is to install a system which is available in kit form. One such package includes two 8-foot copper tubes which fasten along either side of the boat's false keel. These tubes provide the equivalent of 14 square feet. Necessary installation hardware and instructions are included.

A home-made ground system, which might help to eliminate difficult cases of ignition noise, is made with roll copper calculated to cover at least 12 square feet of surface under the hull. The position of the strips is not critical, but try to keep at least one section near the CB set. High-grade marine screws are used to fasten the edges of the copper to the hull. It is recommended that screws be spaced at close intervals along the edges of the copper, or at least every few inches. If the copper separates anywhere from the hull, use additional screws to anchor it firmly.

Bringing the ground connection into the boat is generally done with a heavy bronze bolt through the copper and hull. A solder connection is suggested between the head of the bolt and the copper. Inside the boat, nuts and washers are used to connect a strip of copper from the bronze bolt to transceiver, and other metal objects to be grounded. Standard marine techniques, such as caulking and back-up blocks, should be used where the bronze bolt runs through the hull.

This column would like to hear from you with CB photos, QSL's, comments, and questions.

PC

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PIRATES DEN

BY EDWARD TEACH

FOCUS ON FREE RADIO BROADCASTING

Radio New York International reports they are currently investigating "all possible ways" of returning to the airwaves in the near future. The radio ship MV Sarah is "safe and sound," harbored at an unspecified port in New England. The update says that "in a legal and responsible manner we shall return." Allan H. Weiner invites ideas, help and suggestions. He can be contacted at RNI, Monticello, Maine 04760.

A new pirate, using the call **WJB**, was set to go on the air in mid-February with 500 watts from a central New York state location. The operator, who signs himself "JB," is looking to align with other "independent" broadcasters and says an address will be forthcoming.

Pat Murphy in Virginia says **WENJ's** Jack Beane tells him that WENJ was not busted by the FCC. That story was the result of a feud with another pirate. Murphy also says that the address given for pirate **WBST** is not connected with the FCC. "BST" apparently stands for "Beast".

Robert Ross in Ontario heard **Radio Stella International**, Scotland, on 6319.5 at 0511, giving its address as: Jock Wilson, 23 S. Beachwood, Edinburgh 12, Scotland.

KNBS (Cannibis Shortwave) was heard by several. Pat Murphy had them on 7411.5 at 2330 with repeated references to "Mr. Blue Sky" and "KNBS still rocks the world." Chris London in Minnesota heard them at 0340 on 7415. Robert Taylor in Ohio found them from 2233-2313 on 7413 with the slogan "the station with your mind in mind". Richard Falkner in Florida found them on 7412 at 2230 giving the P.O. Box 452, Wellsville, NY 14895 address.

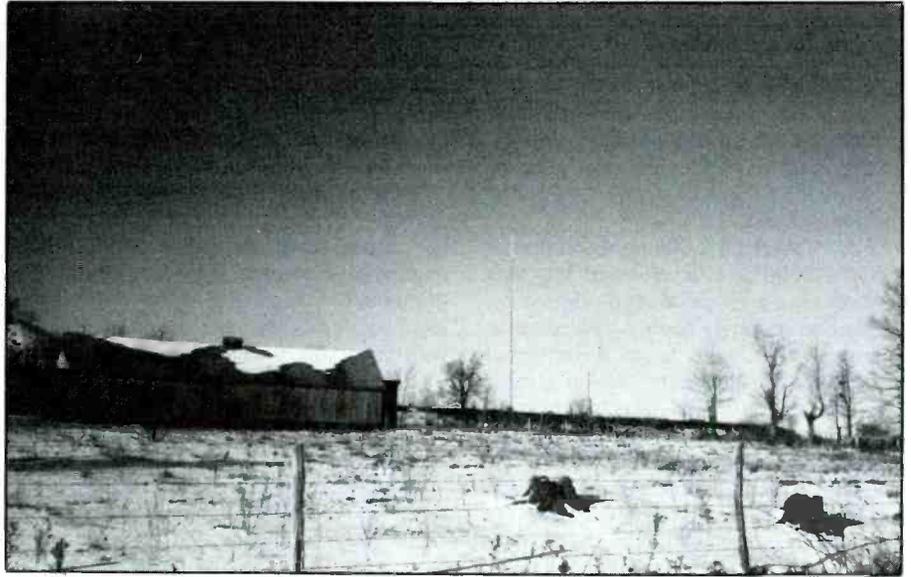
Richard also picked up **WWEO** (We Echo Others) on 7410 at 0310 with a rebroadcast of Zodiac Radio. Address given as P.O. Box 453, Chesapeake Beach, MD 20732.

Several people logged **Radio Free Willy**: Dean Hewlett in Ohio found them on 7416 at 0225 with rock music, mention of the Softball Radio Network, fake commercials and fake newscasts. Ross had them on 7415.6 at 0230 with rock and blues and host Abdul Oman. William Hassig of Illinois got them at 0400 on 7415.

Hassig also heard the **Voice of the Abnormal** on 7415 between 0330 and 0400 with comedy bits, including a Monty Python piece.

Neurological Research Radio, WZXR, was spotted by Robert Taylor on 7420 at 2026. He says the station seemed to be having technical problems as they kept going off the air. Neuralgia?

Robert Ross found **United World Radio** on 7485 at 0423-0433 with rock music, ID and the "Tagar" address given. ID



Future pirate WJB sends this photo of what apparently is their transmitter tower somewhere in central New York state.

as "You are tuned to United World Radio, 7485 in the 41 meter band."

Ross logged **CHGO** on 7410.4 at 2345-0000 with rock, ID, talks about free radio and community broadcasting. The announcer gave the power as 20 watts and mentioned a "low budget operation". This one is supposed to be in the Chicago area, not a Canadian as the call would suggest.

Another Ross logging was a possible **Radio Espiritu** on 7415.5 at 0256-0329 sign off. No talk or ID, just continuous Gregorian chants and medieval church music, similar, says Bob, to a station which used this name back in 1984.

Chris London had a transmitter test from **KBLU** Pirate Radio on 7410.7 USB at 0310. A computer synthesized voice was used and a Ft. Worth, Texas address announced. I think you had **KPLU**, Chris. The address is P.O. Box 123082, Ft. Worth, TX 76121.

Robert Taylor reports **Radio Ody Gody** on 7425 at 2104-2140 with what seemed an old WWII era armed forces show. Robert thinks he heard an FCC bust when, at 2156, he heard this announcement: This is engineer A.C. Ellington, an agent for the Federal Communications Commission. Radio Station Ody-Gody, formerly known as WHOH and Hillbilly Heaven, located in Richmond, Virginia. This station is unlicensed and therefore unauthorized. This station is closed. This station is off." Seems you did hear the real thing, Robert! There's still confusion over the "Ody-Gody" name—others hear it as Oldie Goldie or Oni Goni.

Taylor heard **Radio USA** on 7420 at

2323 with light rock, a mailbag show (including a letter from Robert Ross) and mention of the Wellsville, NY address.

WNEX was logged by Larry Royston in Hawaii on 7434 to 0537 sign off. Format was comedy songs and a man announcer who used the name "Captain Kiloherzt". A female announcer was also heard. Considering its strength in Hawaii, Larry is assuming a west coast location for this one.

Michael McFerrin of Michigan caught **Radio Free Michigan** on 7377 at 0215 to abrupt close at 0300. Featured 50's and 60's music and announcer "Ben Gaye".

Another heard by Mike was **KRAB** on 7167.25 at 0400-0600 with what Mike describes as songs with very negative lyrics and an announcer who was very critical of things in general. Closed with Jimi Hendrix's *Star Spangled Banner* and said he'd be back when he damn well felt like it.

Skip Harwood in California heard **Radio Camelot International** on 7416 at 0245-0348 with technical problems and muffled audio. The address given was P.O. Box 1437, Hastings, New Zealand. Another address was given for Cornwall, England but was not copied. Someone calling himself Frank Morita (with an American accent) signed the station off. It's very likely that this was a US station rebroadcasting the Camelot station.

And that's all there's room for. Keep those pirate logs and other information coming this way! I'd like to hear from more of you pirate station operators, too! Let me know what you're up to so I can pass the information along to your potential listeners!

SCANNING VHF/UHF

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

It's summertime, one of the most popular times of the year for scanner listeners. Vacation places are teeming with activity and the city streets are hot, making lots of news over the airwaves. It's also low-band skip season, so if the action isn't hot locally, you're sure to hear something going on in the world on the 30-50 MHz band.

Chuck Robertson, a frequent contributor to POP'COMM on low band skip, suggests monitors tune in 34.85 during skip season to hear Beaver range control operations in California. Chuck has heard this channel with Fort Irwin National Training Center communications at his listening post in Creal Springs, IL. He also reports that the "Mideastern prayer chant" reported by Doc Quickmatch in the March edition of Scanning UHF/VHF may be a broadcast image of a fifth harmonic. Chuck adds: "Prayer chants are all the rage in such places as Iran. Sort of what you might call Ayatollah rap music."

From one of my favorite areas of Canada, checks in Gilles Thiobodeau of Lac-Mégantic, Quebec, with some UHF fire frequencies for Quebec communities: 413.1375, Montral; 413.3125, St-Eustache; 413.3625, Greenfield Park; 413.5375, Delson;

413.5625, St-Joseph du Lac; 413.6625, Ste-Foy; 413.7125, Blainville; 410.1625, Beauharnois; 410.5375, Kingsey Falls and Waterloo; 412.2375; 412.2375, Longueil, St-Jerome and St-Antoine; 412.5625, St-Eustache, and 412.8125, St-Patrice.

Scott Dygert, Registered Monitor, KCT1CY, of East Lyme, CT writes in to pass along some frequencies used by his employer, Southern New England Telephone in Connecticut. He says the following frequencies are used to communicate with linemen's trucks when on job sites: 451.350, 451.400, 451.450 and 451.500 MHz. He says that the frequencies can be very interesting to monitor during severe thunderstorms. He also adds that Connecticut State Police use 42.64 MHz for communications between airplanes and ground units when running speed traps. In fact, Scott says the CSP use Ford Mustangs, Buick Grand Nationals and Mazda RX6's for chase vehicles.

Steve Fleckenstein of Middletown, NY says that the new phone number for the Red Onion Express computer bulletin board is (914) 342-4585. The board now operates 24 hours a day, every day and no ringback is needed as was with the previous number.

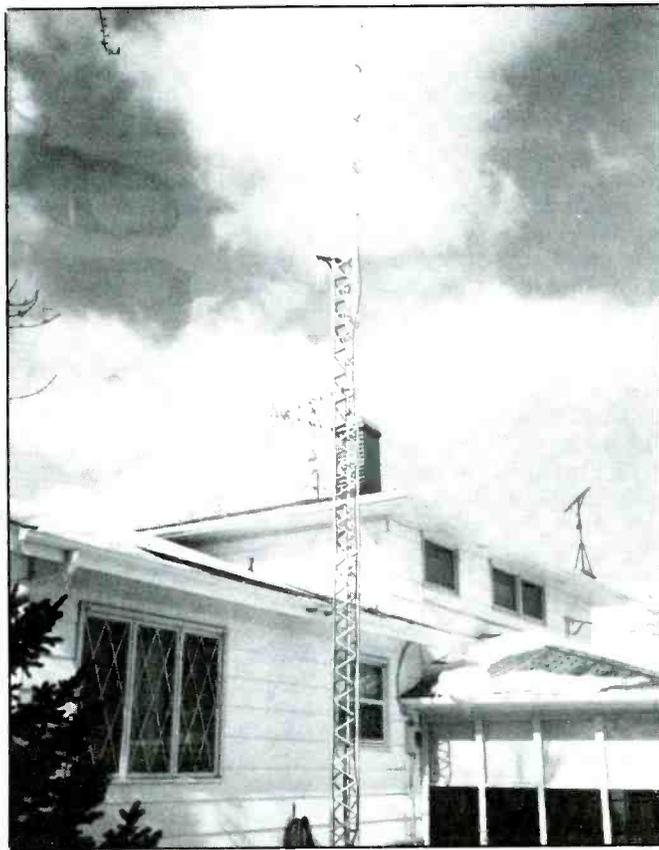
The board accepts 300/1200/2400 baud and you'll find plenty of scanner information on this BBS. Give the Red Onion Express a call!

Ken Fowler of Fairfax, Virginia, sends along some frequencies for his area: 155.700, Vienna police F-1; 154.800, Vienna police F-2; 156.090, Vienna police F-3; 45.24, Vienna public works; 453.850, Herndon police; 45.20, Herndon public works; 453.925, Falls Church police; 45.08, Falls Church public works; 159.105, Fairfax County Highway Department; 159.225 base and 151.250 mobile, Fairfax County Park Authority.

Joe Hedman of Hialeah, Florida, sends along some updates on 800 MHz use in Florida. Joe says that the Miami and Miami Beach police departments have moved to 800 MHz. He says that Miami is using a 20-channel system and Miami Beach is using a 10-channel system. He adds that he has heard the Miami Fire Department on the Miami system as well. He notes that Metro-Dade police are still using VHF, except for District 6, which is using 853.8375 for dispatch, 854.1125 for records and car to car and 853.3875 for simplex car to car communications. Joe says that other Metro-

Here's the scanner tower at the Dombrowski residence in Tonawanda, NY. The 40-foot tower supports a Butternut antenna, a dipole and an Antenna Specialists MON-32.

Here's the tidy and convenient listening post of David F. Dombrowski of Tonawanda, NY. David is a police officer in Tonawanda and a self-confessed "Scannerhead." His wife is a police dispatcher in Kenmore, NY, so it sounds like scanners aren't a problem in this marriage.



Dade districts will be switching to 800 MHz in the future, too. Police in another Miami area town, Medley, also have moved up to 853.5875. Joe uses a PRO-2005 at home with a discone antenna at 35 feet, with a secondary high-gain antenna at the same height. For mobile use, Joe uses a Kenwood RZ-1 and a PRO-34 handheld.

Phil Loper of Memphis, Tennessee, passes along some undercover frequencies used in Memphis and Shelby County, Tennessee: 156.030, 158.790, 159.030, 460.125, 460.250 and 460.400. He says that he has heard such things as vice squads on 158.790 and drug busts, surveillance and speed traps on the other frequencies. Thanks for passing along some interesting frequencies!

From Lynn, Massachusetts, Steve Timmins sends in a list of frequencies used by the Massachusetts Department of Public Works: 47.28, Statewide use; 47.26, District 1 (Berkshire County) and District 2 (Franklin and Hampshire counties); 47.36 District 3 (Worcester County), District 4 (Middlesex County) and District 6 (Norfolk and Bristol counties); 47.14, District 5 (Essex County), District 7 (Plymouth and Barnstable counties) and District 8 (Boston).

Steve also lists Boston traffic reporters channels: 450.1125 and 455.2125, Metro Traffic Control; 455.1125, WHDC/CVS assistance vans; 450.850, WEEI; and 455.650, WBZ.

Are you hungry? If so, Craig Grimm of Ontario, California, has some frequencies of fast-food order windows for you: 457.550, Carl's Jr.; 35.02 McDonald's; 30.84, Kentucky Fried Chicken and Fosters Freeze, and 464.9625, Taco Bell. He also notes that the Ontario Airport has changed its frequency for clearance delivery from 132.05 to 118.1.

Wes Coffin of Bailey Island, Maine, says that he recently searched out the frequencies used by the Blue Angels air show at Brunswick Naval Air Station in Maine. His PRO-2004 helped him find two solo planes on 251.6 and the group formation on 275.35. These frequencies were used throughout the team's six-day stay at the base, including the initial fly-by survey of the air show area, the two practice shows and the two actual air shows. Wes says he also tuned in wargames on the military UHF aero band and definitely recommends tuning in for some fascinating communications. And, as Wes notes, make sure you are listening in the AM mode!

Rod Furman of Catasaqua, Pennsylvania, asks whether we know of a local scanner club he could join. A group that would be of help to a Pennsylvania monitor are the Northeast Scanners. The club publishes a monthly newsletter that is of interest to readers throughout the northeastern United States. For a sample issue, send a check for \$2 made payable to Les Mattson, or for more information, write to: Northeast Scanning News, 212 West Broad Street, Paulsboro, New Jersey 08066-1653.

From Olathe, Kansas, Ray Bardo asks what frequencies are used by emergency locating beacons. For aircraft and marine use, emergency beacons transmit on the marine frequencies of 156.8 or 156.75. In addition, newer generation beacons transmit on 406 MHz with a data signal, as opposed to tones sent other beacons' frequencies. It also should be noted that the FCC has proposed allocating some new channels in the 220 MHz band for personal emergency beacons that could be carried into wilderness areas by hikers and other outdoor folks. The new band was proposed to alleviate all the false signals from non-aero and non-marine

signals on current emergency beacon frequencies. As one who has called out to search for alleged downed aircraft and to find out that it was a beacon that fell off of someone's garage shelf, or somewhere else, I agree with the FCC's plan, even if it does steal some of the hams' valuable spectrum at 220 MHz (which is where I primarily operate).

What questions do you have? We'd like to receive your frequency lists and photos of your listening posts, too. You can write to: Chuck Gysi, N2DUP, Scanning VHF-UHF, Popular Communications, 76 North Broadway, Hicksville, NY 11801.

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CIRCLE 81 ON READER SERVICE CARD

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

As Gabriel Heater used to say on his nightly radio program: "Ah, there's good news tonight!" We recently had the pleasure of meeting Bruce Clark and Bob German, engineers at WCSN and WSHB, respectively. They passed along early word that the Christian Science Syndicate's three stations would soon begin providing SWLs with full data QSL cards, rather than the no data BBC-like acknowledgement cards listeners have been receiving. Apparently the system will be similar to that of Radio Canada International. Listeners will obtain blank cards, send these with their reports to the individual stations and get a full data card in return. Herald Broadcasting deserves a big "thank you!" from all SWL's who enjoy QSL's. Bravo!

The Voice of America ran into a minor sandstorm when it began first work on its new relay site in Israel's Negev desert. Even though the proposed relay has been public knowledge for a couple of years environmentalists, residents of the area and the Israeli Air Force all raised objections, citing supposed dangers to humans and animals from electromagnetic radiation. The air force worried about interference to its operations. Malcom Forbes, Jr., head of the Board For International Broadcasting, which oversees the VOA, noted that the VOA has half a century of experience with radio relay stations and has seen no evidence that they harm birds, animals or humans. The facility will include 16-500 kW transmitters and also be used by RFE/RL. Don't go looking for it before 1993, however!

HCJB is working toward putting a couple of single sideband broadcast transmitters on the air. These will be used for broadcasts to Europe and as backups for beams to the Americas.

Sudan medium wave station Radio Juba, in the southern city of that name, is now being carried over Omdurman Radio for an hour per day, 1400-1500, partly in English. The initial frequency was 9540 but that's since changed to 9550. Sudan has been bouncing back and forth between these two spots for months now so check both. Thanks to Tim Johnson for that info.

Radio Denmark's last broadcast out of its own transmitter facility was on 12 February. Broadcasts via the facilities of Radio Norway began that same day.

Adventist World Radio intends to put a new shortwave station on the air from Italy. It'll use transmitters of 100 and 250 kW. The station will make it unnecessary to rent time on the Sines, Portugal facility and will also supplant the 5 kW AWR-Forli station. It pro-



Chris Kissel, East Islip, NY at his monitoring post which is heavy on equipment that improves shortwave audio.

bably won't be on the air before late 1992, though.

Radiodiffusion TV Congolaise is said to be active on shortwave again, though on an irregular basis—that's been the case for years. Check 6115 around 0600 but let's hope they also get their 15190 unit active. That one has been an easier catch in the afternoons.

Africa Number One now has a fifth 500 kW transmitter in action.

Here's the mail: Bill Walbesser in Revena, New York wonders about the QSL policy of Radio Baghdad. Iraq has a revolving good/bad QSL policy, Bill, and it seems to have been that way forever. Your only option is to shuck them off a report every six months or so and hope things change soon.

While many, perhaps most, SWL's have problems getting mail to and from North Korea, Carl Smith in California seems to have a knack for making postal contact regularly. He says you should use this address: Radio Pyongyang, English Section, The Radio-Television Broadcasting Committee of the DPR Korea, Pyongyang, North Korea. He also puts \$2 worth postage on the envelope—which is some five times more than the ordinary half ounce airmail letter requires and should not make a difference, though Carl insists it does.

Christopher Kissel of East Islip, New York



Maybe the same effect which caused this photo of Egyptian Radio and TV headquarters also causes the poor modulation on Radio Cairo!



Here's Listening Post regular Tim Johnson in his Galesburg, Illinois shack.

sends a photo of his shack. A lot of his equipment is used to increase the fidelity of shortwave signals. He has noise reduction units, an audio limiter, a homebuilt synchronous detector, active audio processor, audio filters and so on in the set up. Nice, Chris. And thank you!

Jim Ross in Washington state would like to set up an SWL/scanner net on 10, 2 and 220 or 440 meters in his area. If you're interested you can call him at (206) 574-1342. Area hams who'd be interested can contact him on the 146.84 repeater in the Portland/Vancouver metro area.

Mike Perry in Corpus Christi, Texas says

"tropical is where it's at." Mike says he spends very little time above 5000 and notes that, while he understands very little of what he hears on the tropical bands (there's not much English) he enjoys it just the same. There are many, many DX'ers who's echo that, Mike. These frequency ranges hold some real hot DX. There's great music on these home service stations, too.

Mark Huemann is a professor of English in Port Arthur, Texas. He tapes a lot of foreign languages on shortwave for use by his colleagues who teach foreign languages. Good show, Mark. One more use for the medium! By the way, your UTC/date conversions are right.

Tim Johnson of Galesburg, Illinois wants a tip or two on where to point his R-5000 to hear Indonesia and Papua New Guinea. The best Indonesian bet is probably Radio Republik Indonesia's regional at Ujung Pandang—sometimes on 4719 or 4753 (one of the other, not both at once) around local sunrise. For Papua New Guinea try the main station from Port Moresby on 4890, also around sunrise. Of the 90 meter PNG's, Radio East New Britain at Rabaul on 3385 is probably the most consistent. Fall and spring are the best periods to hear these.

We appreciate hearing from everyone with comments and questions. Of course, your log reports are not only welcome but necessary. Submit them by country, a minimum double space between items so we can cut them and include your last name and state abbreviation after each item. We also welcome shack photos and extra QSL's you don't need returned to use as illustrations. Program schedules, station brochures, news clippings and whathave you are also welcome. Thank you!

Here are this month's logs. All times are UTC and language English except as noted otherwise.

Alaska: KNLS at 0900 in RR on 9785. (Johnson, IL)
Albania: Radio Tirana, 9480 at 0449 attacking Yugoslavian slander against Albania. (Carson, OK) 9500 at 0534 with news. (Ross, WA) 9760 at 2331. (Huemann, TX)

Algeria: Radio Algiers, 15160 at 1247 with AA music. (Moser, PA)

Antigua: BBC Relay, 5975 at 2213; 0120. (Moser, PA; Walbesser, NY)
 Deutsche Welle relay, 9690 at 0759 with relay ID, into GG. (Johnson, IL)

Argentina: RAE in SS on 11710 with classical guitar. (Wright, MA)

Armenian SSR: Radio Yerevan, 7400 at 0350 in EE, into Armenian with frequencies at 0357. (Carson, OK) 15180 at 0352 with brief EE news for Armenians in America. (Miller, GA)

Ascension Island: BBC Relay on 15400 at 2106, 0515. (Moser, PA; Walbesser, NY)

Australia: Radio Australia, 6060//9580 at 1301. 15320 at 0545. (Huemann, TX) 9580 at 0502; 0800. (Moser, PA; Walbesser, NY) 11720 at 0858, 15285 at 0818. (Carson, OK) 15240 at 1500 sign on. (Yohnicki, ONT) 15425 at 1505, 21490 at 1418. (Johnson, IL) 15465 at 2055, presumed 2100 start. (Wright, MA) 17795 at 0516. (Ross, WA)

ABC Brisbane, 9660 at 0910. (Wittmann, WA)
 Northern Territories Shortwave Service, VLA8, Alice Springs on 2310 kHz; VL8T Tennant Springs, 2325 kHz and VL8K in Katherine on 2485 kHz all heard within the 1030-1130 time frame. (May, SC)

Austria: Radio Austria International, 6015 via Cana-

da at 0555. (Wittmann, WA) 6155 at 0736. (Huemann, TX) 9585 at 2102. (Moser, PA) 9875 at 0142. (Walbesser, NY)

Belgium: BRT on 5910//9925 at 2210 with "Brussels Calling." Also on 21820 at 1330. (Johnson, IL) 9925 at 2058 with IS, sign on in unidentified language. (Moser, PA) 0030 in EE. (Carson, OK)

Benin: ORTB, 4870 at 0638 with African music, woman announcer in FF. (Johnson, IL)

Botswana: Radio Botswana, 4830 at 0358 with IS. (Moser, PA)

Brazil: Radio Brazil Central, 4985 at 0546 in PP with pops and frequent IDs. (Riddle, DC)
 Radio Educacao Rural, Tete, 3385 at 0334-0340 in PP. (Perry, TX)

Radio Aparecida, 11855 at 0719 with PP commercials in PP, music. (Johnson, IL)

Radiobras, 11745 at 0159 sign on; 0204. (Moser, PA; Wright, MA)

Bulgaria: Radio Sofia, 7115 at 0400. (Mead, ME) 9700 at 0001 with news. (Moser, PA) 11660 at 2305 with ID. (Wittmann, WA) 15160 at 0738. (Carson, OK) 15370 at 1840 in African service. (Johnson, IL)

Burkina Faso: Radio Burkina, 4815 at 0645 with native African music, talk in vernacular. (Johnson, IL)

Cameroon: CRTV, Yaounde, 4850 at 2309 in FF; 0455 in EE. (Moser, PA; Johnson, IL)

Canada: Radio Canada International, 5960 at 2354. (Moser, PA) 9635 at 1306, 15315 at 1558, 15325 at 1903. (Huemann, TX) 11945 at 2200, 13670 at 1917. (Carson, OK) 17820 at 1835. (Johnson, IL)

CFCX, 6030 at 0855. (Wittmann, WA)
 CFRX on 6070 at 2339. (Huemann, TX)

Central African Republic: RTV Centrafricaine, 5034.2 at 0435 with music, ID in FF. (Johnson, IL)

China: Radio Beijing, 11695 in CC at 0333 and 17715 (via Mali, ed) at 0449 in EE but CC from 0102. (Huemann, TX) 11840 (via Canada, ed) at 0518. (Ross, WA) 15130 (via Mali) at 1640, also in CC at 0030. (Huemann, TX)

Colombia: La Voz del Cinaruco on 4865 at 0541 in SS, talk, IDs, music. (Carson, OK)

Caracol Bogota, 5075 at 0400 in SS. (Mead, ME)
 Caracol Neiva, 6150 at 0930 with SS ID. (Johnson, IL)

Costa Rica: AWR at 1235 with religious program on 9725//11870. (Johnson, IL)

Faro del Caribe, TIFC on 5055 at 1202 with SS ID. 9645 at 0330 with ID, religious program. (Johnson, IL)

Radio Reloj, 4832 with old Latin songs, clock ticking, frequent IDs in SS. (Riddle, DC) 6005 with music, ID, announcement: "Radio Reloj, numero uno en Costa Rica." (Strawn, TX)

Radio For Peace International, 7375 USB at 0523. (Ross, WA) 21565 (varies to 21566, ed) at 2100 with EE talk. (Wright, MA)

Radio Impacto, 5044 at 0549 in SS. (Riddle, DC)

Cuba: Radio Havana Cuba, 5965 at 0555. (Wittmann, WA) 5985 at 0248 in SS, 11835 at 0754 in EE, 11950 in SS at 0022, 15300//15340 in SS at 1529. (Huemann, TX) 11760 at 0200 in FF, 11820 at 0225 in EE. (Mead, ME)

Radio Rebelde, 5025 at 0029; 0548 in SS. (Huemann, TX; Ross, WA)

Czechoslovakia: Radio Prague, 5930 at 0315. (Huemann, TX) 6055 at 2205, 7345 at 0304. (Carson, OK) 9540//5930 and 7345 at 0325. (Walbesser, NY) 21505 at 1750. (Johnson, IL)

Denmark: Radio Denmark on 15165 at 1745 in Danish. (Mead, ME)

East Germany: Radio Berlin International, 5965 at 0607 beamed to europe, brief EE news and into FF. (Carson, OK) 9720 at 2200. (Mead, ME) 9730 at 0923 with music, sign off. (Johnson, IL) 11785 at 0513. (Ross, WA) 15125 at 0456. (Walbesser, NY)

Ecuador: Radio Catolica, Quito, 5030 in at 1030 sign on in SS. (Strawn, TX) 5055 (alternate to 5030, ed) in SS at 0506. (Ross, WA)

Radio Quito, 4920 at 0305 in SS with ID. (Johnson, IL)

HCJB, 3220 at 0820 Andean music, SS. (Johnson, IL) 6230 at 0600. (Carson, OK) 9745 at 0517. (Ross, WA) 11775 at 0412. (Moser, PA)

Egypt: Radio Cairo, 9475//9675 at 0212. (Moser, PA) 9900 at 0055. (Mead, ME)

England: BBC, 5975 via Antigua and //6005 at 0010, 7150 at 0731, 11775 at 1304, 15400 at 1606 and 21660 and 1245. (Huemann, TX) 7325 at 2219.

Abbreviation Used in Listening Post

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

(Moser, PA) 9915 at 2236. (Ross, WA) 17880//21710 at 1705. (Walbesser, NY) 25750 at 1511. (Zamora, ND)

Equatorial Guinea: Radio Nacional, 5003.7 at 2156 with sign off announcement in SS, national anthem. (Johnson, IL)

Finland: Radio Finland International, On 9560 at 0645. (Wittmann, WA) 15400//21550 at 1204. (Moser, PA) 21550 at 1400. (Miller, GA)

France: Radio France International, 6175//7280 in FF at 0738. 9790//9800 in FF at 0028. (Huemann, TX) 7135//11995 at 0320. (Walbesser, NY) 21770 at 1403. (Zamora, ND)

French Guiana: RFI relay, 9800 at 0334. (Moser, PA)

Radio Japan relay on 15325//15350 at 0327 in JJ. (Huemann, TX)

Gabon: Africa No. One, 9580 at 2215; 0727. (Johnson, IL; Moser, PA) 15475 at 2026 in FF. (Huemann, TX)

Radio Japan via Africa No. One, 9645 with news at 0310. (Johnson, IL)

Ghana: BBC-1 on 4915 at 0538. 0600 in EE and vernaculars at 0615. (Riddle, DC)

Greece: Voice of Greece, 7430 at 0135. (Mead, ME) 9395 at 0031 in Greek. (Huemann, TX) 9420 at 0340 with news. (Wittmann, WA)

Guam: KTWR on 11650 at 1500 with IS and ID. (Johnson, IL) 11805 at 1015. Wittmann, WA)

Guatemala: TGNA, 3300 at 0405 with religious program. (Johnson, IL)

Honduras: La Voz Evangelica, HRVC, 4820 with EE religious program at 0340. (Moser, PA) SS at 0430. (Ross, WA)

Radio Luz y Vida, 3249.5 at 0340. (Johnson, IL) (Presume SS, ed)

Hungary: Radio Budapest at 0030 on 9835//11910. (Miller, GA)

India: All India Radio, 9565//15335 at 1455; 11620//15020 in Sinhalese at 1305. (Johnson, IL) 9910 at 0114. (Ross, WA) 11810 at 2140. (Wright, MA) (11810 is reportedly the new Bangalore site, ed)

Iran: VOIRI, 9022 at 2010 in EE; 9022//15084 in Farsi at 0320. (Johnson, IL)

Iraq: Radio Baghdad, 7290 in EE at 2129. (Wright, MA)

Israel: Kol Israel/Voice of Israel, 7410 at 0500 in AA. (Carson, OK) 7462 at 2205. (Wright, MA) 9435//11605 at 2015. (Johnson, IL) 11655 at 0510. (Ross, WA) 17575 at 1106. (Moser, PA) 21760, tentative, in Hebrew at 1536. (Huemann, TX)

Italy: RAI on 9575//11800 at 0105 with news by a new woman announcer. (Moser, PA) (Is she any better? ed) 11800 at 2121 to 2125 close, no language noted. (Wright, MA)

Japan: Radio Japan, 5960, via Canada, 0250 in JJ, 0300 EE. (Mead, ME) 6120, via Canada, 1118. (Moser, PA) 9505 at 1532 to 1600 when into JJ. (Zamora, ND) 15325 via Canada at 0307. (Huemann, TX) 17825 at 0521. (Ross, WA)

Nippon Broadcasting (Radio Tanpa) 3925//6055 at 0915. (Wittman, WA) (in JJ, editor)

Jordan: Radio Jordan, 11955 in AA at 0500. (Hu-

mann, TX)

Kuwait: Radio Kuwait, 11665 at 1853. (Moser, PA) 13610 at 1950. (Cogan, AL)

Lesotho: BBC relay on 15105 at 0731. (Walbesser, NY)

Liberia: ELWA on 11830 at 0723 with religious talk. (Moser, PA)

VOA relay at 0622 on 11915. (Moser, PA)

Libya: Voice of the Great Homeland, 15235//15450 in AA at 2045. (Johnson, FL)

Lithuania: Radio Vilnius, 7400 and 9700 at 2300. (Carson, OK) 17665 at 2259 with EE ID, schedule. (Strawn, TX)

Luxembourg: Radio Luxembourg, 6090 at 2200 in GG. (Mead, ME) 2354 with rock. (Moser, PA)

Madagascar: Radio Netherlands relay, 15560 at 2034. (Moser, PA) 15570 at 1718. (Johnson, IL)

Mali: RTV Malienne, tentative, on 5995 at 0715 in FF with mention of Bamako. (Wright, MA)

Radio Beijing relay at 0306 on 9770//11715. (Moser, PA)

Malta: Radio Mediterranean on 6110 at 2303. (Moser, PA) (This station has since closed down, ed)

Deutsche Welle relay at 0106 on 11865. (Moser, PA)

Mauritania: ORTM on 4845 at 0650 with Arabic music. (Moser, PA)

Mexico: Radio Educacion, 6185 at 0700 with SS ID, Beatles. (Johnson, IL)

Monaco: TWR on 9485 at 0738 with IS to 0740 sign on. (Moser, PA)

Morocco: RTV Marocaine, 15105//15335 at 2320 with AA music. (Moser, PA)

Namibia: Radio Southwest Africa, 3289.9 at 0445 with several IDs in Afrikaans. (Johnson, IL)

New Zealand: Radio New Zealand International, 9850 at 0800 covering Commonwealth Games. 17680 at 0505. (Carson, OK) 17680 at 1700 with bird call IS, ID in several Pacific languages plus FF. (Johnson, IL)

Netherlands: Radio Netherlands, 13700 at 2030. Heavy WYFR QRM from 13695. (Carson, OK)

Netherlands Antilles: Radio Netherlands Bonaire relay, 6020 at 1056. (Moser, PA) 6165 at 0038. (Heumann, TX) 9590 at 0327. (Walbesser, NY) 9630 at 0745. (Wittmann, WA) 15315 at 0119. (Ross, WA) 21685 at 1900. (Eager, NY)

Trans World Radio, Bonaire, 9535//11930 at 0430. (Wittmann, WA) 11815 at 1125. (Moser, PA) 15380 in SS at 0130. (Wright, MA)

Nicaragua: Voice of Nicaragua, 6100 at 1228 with ID in SS. (Johnson, IL)

Niger: ORTN, La Voix du Sahel, 0708 with African music, FF. (Johnson, IL)

Nigeria: Voice of Nigeria, 7255 with news at 0530. (Ross, WA)

North Korea: Radio Pyongyang, 6540//6560 at 1130 with Asian music. JJ? (Strawn, TX) 9977 at 1126 with EE talk. (Moser, PA)

Northern Mariana Is: KHBI with clear ID at 2155 on 1770. (Wright, MA) 17780 at 0905 with world news. (Carson, OK) (ex-KYOL, ed)

Norway: Radio Norway International, 9565 at 0328 with IS. (Johnson, IL) 9605 at 2300. (Miller, GA) 11840 at 0500 and 15165 at 0805 in NN. (Wittmann, WA) 11925 at 0055. (Mead, ME) 21705 at 1600. (Carson, OK)

Oman: BBC Eastern Relay, 11760 at 0352. (Moser, PA)

Paraguay: Radio Nacional, 9735 at 0745 with music, SS ID. (Johnson, IL)

Peru: Radio Cutervo, 6691 at 1146 with ID, music. (Strawn, TX)

Estacion C, 6323.7 at 1125 in SS with ID. Sign on with anthem at 1121. (Strawn, TX)

Poland: Radio Polonia, 7270 at 2230 with news. Also 9675 at 0630 with news, mailbag, jazz music. (Johnson, IL)

Portugal: Deutsche Welle Sines relay, 6085 at 0342. (Moser, PA)

Radio Portugal, 9630 at 2240 with ID, talk, music. (Wright, MA) 11840 at 0210 in SS or PP. (Moser, PA) 15285 at 1700 in PP. (Heumann, TX) 21495 at 1758 with PP ID. (Johnson, IL) 21532 at 1612. (Walbesser, NY) (PP? ed.)

Qatar: Qatar Broadcasting Service, tentative, 21525 at 1436 in AA with radio play, rooster crowing in background. (Wright, MA)

Romania: Radio Bucharest, 6155 in SS at 0354. (Walbesser, NY) 9750 in RR at 2045. (Ross, WA) 11940 at 2104; 0520. (Moser, PA; Wittmann, WA)

Seychelles: BBC Indian Ocean Relay, 6005 at 2107. (Moser, PA) 9630 at 2025. (Johnson, IL)

Solomon Islands: SIBC, 9545 at 0715 with news, "Birthday Cail." (Wittmann, WA) 0705 with country songs, commercials, ID in Pidgin. EE news at 0730. (Johnson, IL)

South Africa: Radio Orion, 4810 at 0330 in Afrikaans. (Mead, ME)

Radio Oranje, 3215 at 0410 with "Get Up and Go" program. (Johnson, IL)

Radio five, 4880, 0400 in EE. (Mead, ME)

Radio Suid Africa, 3320 at 0350 with EZL music, ID in Afrikaans. (Johnson, IL)

Radio RSA, 9580//11935 at 0200. (Heumann, TX) 9580//9615 at 0227. (Walbesser, NY) 11795 at 0422 in EE, switch to FF 0430. (Carson, OK) 21535 at 2040. (Wright, MA) 25790 at 1512 to east Africa. (Zamora, ND)

South Korea: Radio Korea, 15575 at 0045; 1452. (Wittmann, WA; Carson, OK)

Spain: Radio Nacional Espana/Spanish National Radio, 9360 at 0030 in SS, 1180 at 0018 in EE. (Heumann, TX) 9630 at 0506. (Walbesser, NY) 15110 with 1930 SS sign on. (Carson, OK) 15375//15395 at 1910. (Johnson, IL)

Sweden: Radio Sweden, 9695//11705 at 0232; 0256. (Walbesser, NY; Moser, PA) 17880 at 1645, off at 1658. (Zamora, ND) 21610 at 1536. (Carson, OK)

Switzerland: Swiss Radio International, 6135 at 0258 sign off in SS. (Perry, TX) 6165 at 0735 and 12035 at 0201. (Carson, OK) 9885 at 0400. (Wittmann, WA) 13635 at 1100 sign on. (Moser, PA)

International Committee of the Red Cross, 6135 at 0319 in EE. (Heumann, TX)

Syria: Radio Damascus, 9950//12085 at 2038. (Johnson, IL) 12085 at 2013. (Walbesser, NY)

Taiwan: Voice of Free China, via WYFR, 5950 at 0714. (Carson, OK) 9680 via WYFR, 0334. (Ross, WA)

Tunisia: RTT Tunisienne, 2019 on 7475 in AA, ID in FF? (Wright, MA) 0405 in AA. (Walbesser, NY)

Turkey: Voice of Turkey, 9445 at 0442 with "DX Corner." (Walbesser, NY) 9460 in Turkish at 2020. (Johnson, IL) 9670 in unidentified language at 2019. (Ross, WA)

Ukraine SSR: Radio Kiev, 7400 at 0259; 0300; 0328 sign off. (Carson, OK; Mead, ME; Heumann, TX)

United Arab Emirates: Voice of the UAE, Abu Dhabi, 11985 at 2301 and 2340. (Heumann, TX)

UAE Radio, Dubai, 11940//15435 in AA. (Johnson, IL) 13605 at 2229 in EE. (Ross, WA) 21605 at 1631. (Wright, MA)

United States: Voice of the OAS, 15160 at 2355 in SS. (Eager, NY)

WHRI, 6100 at 0609. (Moser, PA) 7315 at 0302. 17830 at 1930. (Heumann, TX)

WMLK, Bethel, PA, 9465 at 0645, religion. (Carson, OK)

KVOH, Simi Valley, CA 17775 at 1900 in SS, closing in EE at 2204. (Heumann, TX)

WINB Red Lion, PA 15295 at 1900, SS ID. (Heumann, TX)

Radio Marti, 9525 at 0123, 11930//15340 at 1602, all SS. (Heumann, TX)

WWCR, Nashville, 15690 at 2200. (Heumann, TX)

KUSW, Salt Lake City, 6135 at 0850. (Wittman, WA) 9815 at 0344. (Moser, PA) 15590 at 2000. (Carson, OK)

USSR: Radio Moscow, 5905 at 0648, 7345 at 0538. (Carson, OK) 6000//17665//17690 at 0249; 7115 at 0031; 15475 at 1701; 1632 on 17810. (Heumann, TX) 7150 at 0431. (Walbesser, NY) 11840 at 1907. (Moser, PA)

Radio Station Peace and Progress, 7360 at 2239. (Carson, OK)

All Union Radio, second program, 4765 (via Cuba) 0340 in RR. (Perry, TX)

Uzbekistan SSR: Radio Tashkent, 15470 at 1200 with news. (Johnson, IL)

Vatican: Vatican Radio, 6185 at 0600; 15195 at 0503 with African service. (Walbesser, NY) 248 at 0652 with Latin Mass. (Strawn, TX) 9605 at 0100. (Moser, PA) 9645 at 1958 in Latin; 0509 with news. (Ross, WA; Wittman, WA) 11725 at 0324. (Heumann, TX) 11740 at 1300. (Johnson, IL) 15120 at 2045. (Miller, GA)

Venezuela: Radio Rumbos, Caracas, 4970 in SS at 0455. (Ross, WA) 1045 in SS, ID 1047. (Strawn, TX)

Ecos del Torbes, San Cristobal, 4980 with SS ID 1059. (Strawn, TX) 0353 in SS. (Perry, TX)

Radio Valera, Valera, 4840 in SS at 0347 with ID. (Johnson, IL)

Vietnam: Voice of Vietnam, 9840//15010 at 1340 and 15010 in FF at 1945. 10010 in CC dialect at 1320, 10059 in VV at 1315. (Johnston, IL)

West Germany: Deutsche Welle, 6075//6100 at 0238 in GG; 9735 at 0108 in EE; 11795//11965 at 0758 in GG; 15275 at 0813 in GG; 15270//17860 at 0009 in GG; 117810 (via Antigua) 2155 in GG; 17860 at 2206 in GG. Also 6085 at 0319, 9565 at 0100. Direct listener's line is 411-49-221-389-4555. (Heumann, TX) 6145 at 0102. (Moser, PA) 9670 at 0514. (Ross, WA) 21600 at 1503. (Zamora, ND)

Yemen Arab Republic: R. San'a, 9779.4 at 2035 with exotic music, Koran readings in AA. Off with anthem 2109. (Johnson, IL)

Yugoslavia: Radio Yugoslavia, 9660 at 2225. (Johnson, IL) 11735 at 0113; 0122. (Moser, PA; Ross, WA)

Zambia: Radio Zambia, 4910 at 0420 with African music and vernaculars. (Johnson, IL)

Zaire: Radio Candip, 5066.3 at 0443 with FF talk, tentative log. (Johnson, IL)

Let's raise our glasses to the following reporters this month:

Tim Johnson, Galesburg, IL; Mike Perry, Corpus Christi, TX; Larry R. Zamora, Grand Forks, ND; John May, Murrells Inlet, SC; J. Mark Heumann, Port Arthur, TX; Jim Ross, Vancouver, WA; John Miller, Thomasville, GA; John Spencer Carson, Jr., Norman, OK; William Moser, Harrisburg, PA; William F. Walbesser, Ravenna, NY; ?? Eager, New York, NY; Jeremy Wittmann, Tacoma, WA; Mike Yohnicki, London, ONT; Beale Riddle, Washington, DC; Joe Wright, Jamaica Plain, MA; Kevin Mead, Cape Elizabeth, ME; Larry Cogan, Enterprise, AL and Bill Strawn, Graham, TX. Until next month—good listening!

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CIRCLE 85 ON READER SERVICE CARD

THE HAM COLUMN

GETTING STARTED AS A RADIO AMATEUR

Amateur Radio: A Life-Long Pursuit

Not every new Novice is a 14-year-old student or a 28-year-old school teacher, you know. Hams come in all ages, from "8 to 80," and beyond. That's part of its charm—Amateur Radio is enjoyed by those in every conceivable age group. Communicating is communicating, regardless of age, language and so on.

As we move into the '90's, the average American is getting older and older, and so is the ham population. Nowadays, it's not at all uncommon to meet retirement-aged newcomers.

William Divine, KD3OW, a 70+-year-old Advanced class ham from Annapolis, Maryland, has been licensed for a little more than a year. His quest for an Extra Class license, including a somewhat unusual set of trials and tribulations, follows:

Oh, Those ABCs . . .

My first exposure to ham radio was back in the '20s when a neighbor let me observe his operation—at the time I thought it would be "neat" to be a ham radio operator, and that thought stuck with me during the intervening 60-odd years. The 13 WPM Morse code requirement (no 5 WPM Novice test back in the old days) held me back, even though I made several attempts at passing it.

In 1988, my engineering practice began to drop off (by design) so I, once again, looked into ham radio. The Novice license looked fairly simple, so I thought I should be able to pass both the code and the written tests. I had learned the code, to maybe 8 or 10 WPM, early on—maybe in the Boy Scouts, certainly in the Navy.

When I began to study the code gain, however, I got my first surprise—apparently I had a mental block in that I converted the "dit-dah" first to a flashing light—short blink, long blink, then to letter "A".

My last use of the code to any extent was on my Naval Academy midshipman cruise in 1939. My roommate at the Academy was assigned to the *USS Texas*, and I was put aboard the *USS New York*. To keep in touch we kept a "schedule" on the yardarm blinkers at 8 PM each evening the ships were in port. The experience "stuck," and I suspect it caused some of my troubles with the code.

The test session started off with the code tests: 20 WPM first (I couldn't believe anybody could make sense out of that blur), then 13 WPM; followed by the Novice 5-WPM test.

When the 13-WPM test came along I fig-



Catch any big ones? Francis Hinkle Jr, K5PA, from Austin, Texas, set up his Field Day station over the excellent ground plane of this nearby lake. Any problems? Well, the Game Warden did stop by to check his limit . . .

ured I'd take a swing at it for practice—and lo and behold, I passed! I still think it was a sort of fluke—the body of the test was about the Smithsonian Institution in Washington and the University of Maryland in College Park. I was able to "fill in" the spaces that I missed and got credit for solid copy at 13 WPM.

At that point I thought I had everything I needed to be a full-fledged ham, particularly after I passed the written exams for Technician and General class tickets. As I logged more and more contacts, however, I started rag chewing on CW, so I decided to try for my Extra Class license so I could use the added frequencies. Besides, like Mt. Everest, the Extra Class license was there.

I took the Advanced exam and really began to practice for the 20-WPM test. Talk about surprises! I seemed to hit the proverbial brick wall. I listened to WIAW code practice by the hour—and in the beginning I couldn't even separate the letters at 20 WPM, let alone at 35, 30 and 25 WPM.

To get even more practice, I taped WIAW bulletins and played the tapes back in the car while driving to engineering sites. I guess I must have underestimated my level of concentration! Early on, in the process of listening to code tapes in the car, I was headed to Baltimore from my office in An-

napolis—Baltimore is about 30 miles north and little east of Annapolis—when I realized I was almost at Fort Meade, some 15 miles in the wrong direction.

Not to be outdone, Morse code had yet another trick up its sleeve. Just as I was getting to the point where I could almost read the code at 20 WPM, I discovered I couldn't write it that fast! My best combined effort was about 15 WPM.

A solution to the writing problem surfaced soon thereafter. When I was in the Navy, I spent considerable time in the radio shack. That was during WWII, and the Navy's chief means of communicating with ships at sea was through a shore-based CW broadcast called the Fox schedule.

The radio ops on watch could copy the Fox schedule at 18 WPM and, at the same time, carry on a conversation. The 18 WPM code was sent in five-letter groups and had to be accurate to be decoded. Obviously, a "dit-dah" converted directly to the op's left-hand little finger—that "A" key on the typewriter. I've been working on that with my typewriter, but its proving to be difficult.

A computer code course that runs on my PC has been some help in learning to copy

(Continued on page 76)

WASHINGTON PULSE

FCC ACTIONS AFFECTING COMMUNICATIONS

Pirate Radio Station Shut Down Again – Equipment Seized

A Selden, NY pirate radio station was shut down again, and its equipment was seized by the U.S. Government, the FCC said. The seizure of "WQNR" took place under Federal civil forfeiture provisions initiated by the U.S. Attorney for the Eastern District of New York, Andrew Maloney.

U.S. Marshals, with the assistance of FCC investigators, conducted the seizure. The station was located by an FCC Engineer using mobile radio direction finding equipment.

The unlicensed station "WQNR," operated on 87.9 FM from a single family residence. The station called itself "Long Island's Rock and Roll Capital" and played rock and roll music.

In April 1986, WQNR was shut down by the FCC and its operator paid a \$500 FCC fine for unlicensed operation.

"The WQNR seizure was the third time in recent months that the U.S. Government has used the forfeiture provisions to close down pirate stations in the New York area. Unlicensed Radio operators should know that they cannot evade Federal Authority," said Alexander Zimny, Engineer-In-Charge of the FCC New York Office.

Unlicensed West Virginia Station Shut-Down

The FCC's Field Operations Bureau, in a coordinated effort with its monitoring network and engineers from the Baltimore and Detroit offices, shut-down an unlicensed West Virginia pirate broadcast station. Mark R. Leavitt of Beach Bottom, West Virginia, was fined \$1,000 for illegally operating on 3820 kHz which is allocated for the Experimental Radio (ERP) and broadcast a music and talk show format.

Unauthorized operation of a radio transmitter is a violation of Section 301 of the Communications Act, as amended. Sanctions may include administrative fines of up to \$10,000 and/or criminal penalties of up to \$100,000 and/or imprisonment for up to one year. Such misuse of radio frequencies is a serious offense because of its potential for interfering with safety-of-life services such as aviation, marine and law enforcement.

Radio Station Fined \$10,000 For Unlicensed Operation

Crusade Broadcasting Corp. of Norfolk, VA has been fined \$10,000 for operating Trenton, NJ radio station WIMG without a valid station license, the FCC said. Crusade Broadcasting was told in FCC letters dated

9/14/89 and 11/9/89 that its operating authority had expired, yet it continued to operate the station through 2/5/90.

The station was licensed to operate on 1130 on the AM dial. Crusade is the licensee of some 20 other radio stations across the U.S.

Unlicensed operation is a violation of Section 301 of the Communications Act of 1934, as amended. Penalties for unlicensed operation include fines of up to \$100,000 and/or one year in prison.

Previously, Crusade was fined \$7,800 in September 1988 and \$6,200 in January 1986 for FCC rule violations found at WIMG. Many of the violations related to the Emergency Broadcast System which is designed to quickly alert residents to imminent storms, or other man-made situations that could threaten public health or safety. WIMG's equipment to receive and generate the EBS Attention Signal was defective such that it would be unable to participate in the emergency system.

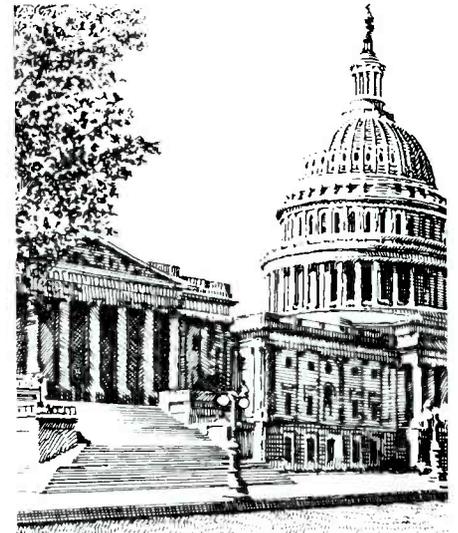
An FCC engineer had inspected the station on 8/1/88 and found the station operating in apparent willful violation of the FCC's rules. The Commission had found similar violations in previous station inspections in August, 1983 and September, 1985.

FCC Proposes Amendment To Amateur Service Rules

The Commission is proposing to amend the Amateur Service Rules to relocate the Novice and Technician Operator Class control operator privileges within the 80 meter amateur service band. The Commission would authorize the frequency segment 3675-3725 kHz in lieu of the current frequency segment 3700-3750 kHz for use by amateur service stations operated by those control operators. The Commission believes that such relocation would reduce interference in the 80 meter Novice segment.

Currently, FCC rules permit an amateur station having a control operator holding a Novice or Technician Class license to transmit only telegraphy on the frequency segment 3700-3750 kHz of the 80 meter amateur service band. Beginning amateur operators in the United States use this frequency segment primarily to polish their telegraphy skills. In Canada, however, this frequency segment is used by amateur stations for telephony.

Consequently, the Commission is asking for comments from the amateur community with respect to the level of interference in the current Novice and Technician segment. Comments are also requested on whether a relocation of the Novice and technician segment to 3675-3725 kHz would



cause interference to any other operations engaged in by amateur stations.

ARRL Requests Federal Pre-emption Of State Laws Concerning Amateur Transceivers Capable Of Receiving Law Enforcement And Other Signals

On November 13, 1989, the American Radio Relay League, Incorporated (ARRL) filed a *Request for Issuance of Declaratory Ruling* requesting that the Commission preempt, on the basis of federal jurisdiction, certain state statutes and local ordinances affecting transceivers used by amateur service operators. In its request, the ARRL cites various statutes and ordinances, many directed toward radio reception within automobiles, that have the effect of prohibiting ownership of amateur station transceivers that are capable of reception on frequencies used for law enforcement and other public safety activities. The ARRL states that, to facilitate adequate reception of the end frequencies of amateur service bands, the receivers of commercially available amateur station transceivers typically overlap the ends of the amateur service bands. The ARRL views this additional reception as technically justifiable and as merely incidental to authorized amateur service frequency band reception. The ARRL seeks a Commission declaratory ruling pre-empting the statutes and ordinances in question.

Amateur Service Beacon Operation

The Commission amended its Amateur

(Continued on page 76)

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Compiled by Geoff Halligey
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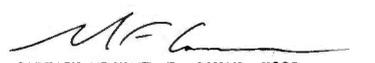
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Noy
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TO: DAVID SABO

**THANKS FOR
TUNING US IN!**

DATE 04OCT89	TIME 0145Z	FREQ 5320 KHZ	MODE VOICE USB	WATTAGE 100 WATTS PEP
TRANSMITTER ANVRC-116	ANTENNA 55FT WHIP	 CAPTAIN MICHAEL F. COWAN, USCG Commander's Signature		

Dave Sabo, CA received this unique QSL from the Coast Guard Station at Galveston, TX.

not locate a breakout for DMDG.

Bob added "I tried to copy the digital bursts (5-10 secs.) with my PK-232 in signal mode, but the best I could get was an indication of "synchronous mode," which the PK-232 will not copy.

Gary Bledsoe, AK says he has returned to Alaska after a two year absence. In his first month of UTE loggings he heard 75 countries. Gary says he is currently using a R-2000 but has ordered the NRD-525 with a 270 Hz CW filter.

David Sabo, CA described his equipment lineup which consists of a Kenwood R-5000 and Pro-34 for VHF/UHF. He is now Registered Monitor KCA6UD.

For those who may wish to log Monaco Radio, 2AC, R. C. Watts, KY has furnished their traffic list schedules which are: 7, 9, 11, 13, 15, 17 & 19 hours UTC consecutively on 4363.6, 8728.2, 13172.1 and 17252.5 kHz. The wx schedules for FF and EE are at 0715 and 1715 on 4363.6 and 8728.2 kHz.

Andy Gordon, CT advises he has noted San Diego CSS1 assisting units in the Atlantic when Norfolk ICSB doesn't respond to them on 4066.1/4360 kHz. CSS1 works on 4360.5 kHz so the Atlantic area ships have a little problem hearing them as they are tuned to 4360 kHz. Andy has gotten his antenna up over 30 feet high now and as a result hears Charleston, Norfolk, Bermuda and Canaveral stations loud and clear.

Table 2 is a list of the Navy tugs (YTB's) most likely to be heard on the East Coast on 2716 kHz. These tugs do often travel beyond their VHF range thus requiring use of their HF capability.

Andy pointed out the YTB's will QSL and the address to use is as follows: Tug Master YTB (hull nbr), send it to the appropriate Navy Base marked Attn: Port Services-Waterfront Operations.

Steve Noonan, Turkey has supplied some changes/additions to the frequen-

cy/callsign list contained in the article "Monitoring Mossad: The Israeli Intelligence Service" which appeared in the July, 1984 POP' COMM.

4781 KPA20, 5630 SYN2, 5230 MIW2, 10125 CI02, 3840 YHF2, 6745 CI02, 6841 EZ12, 4870 KPA2. All freqs in kHz. Steve mentioned that 10125 kHz was paired with 6747 kHz.

David Torres, NY reports that the FAA is trying out a radio system similar to that being used by the DEA. David observed frequencies of 7475, 8125, 13630, and 16348 kHz. He also commented that 10242 kHz, a DEA frequency, is used from time to time by FEMA and 11494 kHz, another DEA frequency, is also used by the Air Force and Navy who ID it as S311.

And now for a rundown on some more contributors and the equipment they use for monitoring.

Russ Hill, MI uses a DX-440 for his receiver.

Dave Morrison, FL wrote "I'm a recent returnee to the world of shortwave radio. I haven't had a receiver since I was in my pre-teens, but I have been having a ball since I purchased a SONY 2010 and hooked it to an Eavesdropper antenna."

Marty Mayfield, NM is a first time contributor who uses an ICOM R-70 with two longwires, one of 100' and the other 30'. My main interests are in military and aircraft communications as well as ship to shore phone traffic.

Guillermo Perez, WI says he has been interested in SWL for about four years with emphasis on utility stations. He uses a Yaesu FRG8800 with a 20' longwire antenna.

George Eager, NY has a SONY PRO-80, Panasonic RF2600, and a Realistic PRO-30 scanner. "I like to travel with my receivers, and take a special interest in "Spy Numbers" stations and DEA and NYPD surveillances.

Bill Kinsland, GA is both a Ham and a

SWL'er. "I have been a licensed amateur for 25 years and an SWL'er for 30 years. Also am a amateur weather observer and particularly enjoy monitoring weather related communications. My SWL gear is simple. A Realistic DX300 receiver hooked to a 120' longwire. Sometimes I switch over to my Cushcraft A-3 beam to get a fix on a station."

Kevin Tubbs, VT sent in loggings made in Georgia and Vermont while he was on leave. He uses a NRD-525 with a 100' longwire. He will return to his duty station in West Germany.

Mark Kaufman, CA has a SONY 2010 and also uses his Kenwood TS-440.

Philip Galasso, NJ has a Drake TR-7 which he uses for SWLing as well as for his ham radio operation. His antenna is an inverted vee fed with 450-ohm twinlead.

Get ready to go through some great loggings. By the way, have you sent in any recently?

- 215: Beacon UIZ, Utica, MI at 2330. (Hill, MI)
- 223: Beacon DM, Detroit, MI at 0345. (Hill, MI)
- 245: Beacon YZE, Gore Bay, Ontario, Canada at 0400. (Hill, MI)
- 277.5: Beacon BOD, Bowman, ND at 1006. (Humes, AZ) My refs show BOID to be on 374 kHz.
- 290: Beacon ADP, Rock Springs, WY at 0956. (Humes, AZ)
- 294: Beacon BMC, Brigham City, UT at 0953. (Humes, AZ)
- 305: Beacon RO, Roswell, NM at 0940. (Humes, AZ)
- 317: Beacon TB, Tybee LS, Savannah River, GA at 0058. (Kinsland, GA)
- 322: Beacon S, Point Sur, CA at 0930. (Humes, AZ)
- 329: Beacon CH, Charleston, SC at 0057. (Kinsland, GA)
- 332: Beacon QT, Thunder Bay, Ontario, Canada at 0425. (Hill, MI)
- 350: Beacon DF, Deer Lake, Nfld, Canada at 0055. (Crabill, VA)
- 353: Beacon FME, Ft. Meade, MD at 1230: Beacon QG, Windsor, Ontario, Canada at 0443. (Crabill, VA)
- 359: Beacon YI, Detroit (Ypsilanti), MI at 0300. (Hill, MI)
- 363: Beacon RNB, Millville, NJ at 0435. (Crabill, VA)
- 365: Beacon JN, Muncie, IN at 0435. (Crabill, VA)
- 374: Beacon SA, Sable Island, NS, Canada at 0416. (Crabill, VA)
- 380: Beacon BBD, Brady, TX at 0920. (Humes, AZ)
- 382: Beacon YPL, Pickle Lake, Ontario, Canada at 0401. (Crabill, VA)
- 385: Beacon EMR, Augusta, GA at 0400. (Crabill, VA)
- 388: Beacon DT, Detroit, MI at 0355. (Crabill, VA)
- 398: Beacon G, Windsor, Ontario, Canada at 0330. (Hill, MI)
- 414: Beacon PCW, Port Clinton, OH at 0300. (Hill, MI)
- 415: Beacon CBC, Cayman, BWI at 0330. (Crabill, VA)
- 417: Beacon HHG, Huntington, IN at 0310. (Hill, MI)
- 435: Beacon ILY, Washington, GA at 0316. (Crabill, VA)
- 521: Beacon GF, Cleveland, OH at 0307. (Crabill, VA)
- 524: Beacon HEH, Newark, OH at 0308. (Crabill, VA)
- 2582: Anthony radio wkg ship Charleston Labrador in USB at 0331. Ship prev on 2182 kHz, then on 2206 kHz and then stns QSY'd to 2514 (shore stn) and 2118 (ship) for better p/p quality. (Pecora, OH) Anthony radio is probably VCM, St. Anthony, Nfld, Canada. (Ed.)
- 2670: NMC, USCG CAMSPAC San Francisco, CA w/ marine info best at 0205 until 0207. NMC11, USCG Humboldt Bay, CA w/ advisory of woverdue 40' sloop Sea Dreamer w/4 POB at 0304. Both USB mode. (Sabo, CA)

2673: USCG Boston Sta w/wx by OM/EE. Off at 0206. (Warrington, OH)

2702: CG 1709, (pos chopper) giving short count in USB at 0250 for NMN, Portsmouth, VA. (Watts, KY)

2716: Calling "Unit on Mike" making rdo check w/ Charleston Navy Tug Control at 0100. Appeared that "Unit of Mike" was the Pier Sentry testing his HF xmtr. They normally use VHF/UHF but have HF capability as well; USS Tennessee, SSBN 734 using classified call 6 Juliet Uniform clg 1 Juliet Alpha (Canaveral Control) at 2350 re permission to enter port; NDDW, USS Hewlett DD966 clg San Diego Control 1 at 1120, NVFP, USS Valley Forge CG50 clg Tug Control Portland, Oregon at 1155; NIDC, USS Valdez FF1096 wkg Newport Port Control Secondary at 0940 re berthing assignment; NNYZ, USS Daniel Webster SSBN626 using call "Inbound Submarine" clg Navy Bermuda Control at 1130. At 1135 Bermuda responded calling Zero Kilo Sierra from Two Zulu Kilo; NBOY, USNS Range Sentinel T-AGM022 using tactical call Hotel 7 Oscar wkg Canaveral Control who using 9 Quebec Whiskey at 1130, The Range Sentinel was built 1944 as an Attack Transport and converted to Missile Range Instrumentation ship in late 60's/early 70's; GUCL, HMS Invincible R-05 (British carrier) clg Roosevelt Roads Port Control at 0955; NASA's "Barracks 7" making rdo checks with "Barracks 11" at 1015. NASA calls this circuit "Net 3." Not certain what type of installation these are, have hrd them make rdo check w/Cape Radio and Canaveral Control. (Gordon, CT)

3130: OWP, CRI, R1N, 3IT, etc in USB at 0610 on net during a FACSAC op. This is Fleet Area Control & Surveillance Facility ops, Virginia Capes, VA 1/air—sea radar tracking. (Fernandez, MA)

3130: 10L wkg A9S in USB at 0233; this if Jacksonville FACSAC. (Hamlin, NY)

3258: 8 chimes rptd until 0530 in AM then Actung and call—up, foll by 5F grps (each grp X2) at 0532. Several short texts followed each about 1—2 min long. (Fernandez, MA)

3262: Unid CW stn (auto) at 0154 in 5L grps. Pause after every 10 grps. (D.P., NC) These msgs are always 120 grps, possible training best?? (Ed.)

3319: MGJ, British Navy, Glasgow, Scotland in CW at 0046 w/VVV mkr. (Ed.)

3378: CW stn rptng 18 3F/L grps. Dropped at 2257 in ttc. D.P., NC This if FEMA. (Ed.)

3820: CW stn sending LOLO x9, 72875 x2 for 10 mins. At 2210 into 5F grps. Next day same LOLO callup but diff 5F identifier. (Mason, England)

3823: YL/GG in USB rptng 752 strish zero zero between 2100-2105 then off. This has two related stns YL/RR and YL/EE. Only the RR bcst has passed any 5F text. (Mason, England)

4009: NNNOCED as NCS on USB at 1401 w/other NNN units on Navy MARS net. (Syminton, OH)

4011: YL/EE (paired w/5137 kHz) w/1—0 count, 507. After ten tones, Count 179 and into 3/2F grps. Warble jammer on 5137 at 1911 and on 4011 at 1913. These 3/2F EE stns are nearly always jammed now by warbles. 3/2F GG stns are not affected?? (Mason, England)

4020: AAR3IQ as NCS in USB at 1354 wkg other AA units in Army MARS net. (Symington, OH)

4030: YL/Serbo—Croatian(?) w/5F grps in progress at 0448, ending 0537 w/twice rptd words. (Eager, NY)

4063: Unid ship clg WLC, Rogers City, MI in USB at 0352. Ship asked who on weekend duty & WLC gave names. The ship opr wanted one of them to call him on "WATERCOMM" because he couldn't hear WLC good on this freq. Anybody know what "WATERCOMM" is? (Pecora, OH)

4066: GDLU, British Warship HMS Cornwall F99 clg Portsmouth Radio at 2340. (Gordon, CT)

4066.1: NHQB, USS Waddell DDG24 in USB at 0430 w/patch thru San Diego CSB1. (Sabo, CA)

4066.1: NAHM, USS Guam LPH9 clg Norfolk ICSB at 0310. As, usual, due to no reply from Norfolk, the Guam was answered by San Diego CSS1 who made their shone patch across the continent!; NOUR, USS Rourke FF1053 wkg San Diego CSS1 at 0300. Rourke had a damaged anchor hawspipe & required industrial engineers for repair. A p/p made to COMDESRON on USS Lang FF1060 at Treasure Island, CA. (Gordon, CT)

4069.2: NNTR, USS Theodore Roosevelt CVN71 wkg WOM, Ft. Lauderdale, FL at 0245. A ship's medical officer called Naval Hospital for update on medivaced

crewman. (Gordon, CT)

4143.6: WTD6931 (something like Lady shallete) to Native—Echo w/Dive Report addressed to various USN PACFLEET Sub Commands, foll by Oscar—12 to Lady Shallete w/advisory that Native—Echo hadn't QSL'd the entire msg. USB from 0432—0446. (Sabo, CA)

4230: A/D, Doha, Qatar in auto CW at 2319 w/callship. (Ed.)

4369.8: WLC, Rogers City, MI in USB giving lake conditions/forecasts to stns requesting them for Great Lakes area. Hrd at 0355. (Fernandez, MA)

4373: 6XJ trying get Alligator Playground up on Alpha India in comms w/1AI. Tried get 2UH up as the more players to better but 2UH was up on another playground. 1AI said she held 6XJ w/1 Hotel, 5 Sierra, & 24 Alpha tracks. 2131. (Willmer, MI)

4395: YL/GG in AM rptng 512 x3 from 2200—2205, then five tones and 71452, 90 and into 5F grps. (Mason, England)

4407: Starship Atlantic wkg High Seas Marine Opr, Miami, FL in USB at 0215; Treasure Grove wkg High Seas Miami, FL at 0239. (Eager, NY, intercepted in FL)

4426: WOM, Ft. Lauderdale, FL in LSB at 0315 wkg cruise ships w/phone patches. (Hill, MI)

4507.5: Several OM/EE oprs talking about hand—helds. Hrd at 0110. This is a CAP freq. (Mayfield, NM)

4561: Canadian Forces; Halifax Military wkg MHCS Porte St. Louis in LSB at 2220. (Hill, MI)

4597: COX30, COX21, in USB 0612—0626. OM/SS w/5F grps. Other calls hrd COX40, COX42, COX44, COX8 and COX9. All w/distinct Cuban accents. (Perez, WI)

4601: Middle East 1 in USB clg Great Lakes 1 at 0024 but no joy. Redfire 1, 12, 33 in USB in net at 0028. (Warrington, OH) This is CAP activity. (ED.)

4637: Off shore Oil Rig in contact w/Houston, TX re fixing a pump. Houston gave step by step instructions re repair. Reig replied they would have to wait til morning because waves were breaking over deck now. USB at 0154. (Pecora, OH)

4730: Cyclops, RAF Cyprus w/wx bcst in USB at 0409. Locations given by 3L designators. (Fernandez, MA)

4740: YL/EE in AM rptng 15521 from 2200—05. Then Ready x2, 35 x2 and into 5F grps. (Mason, England)

4882.5: YL/RR in USB 0540—0553 in 5F. Several short msgs preceded by msg - and grp count, ended w/Russian word for end "Konets." (Perez, WI)

5047: YL/EE at 0014 w/5F grps. YL said Count 84 and Repeat during xmsn and End at 0028. (Eager, NY)

5080: T5V w/unanswered calls to 3AW foll by P6A to PLEAD CONTROL (PMTC, Pt. Mugu, CA) re personnel transfers being complete for medevac to Long Beach & repairs to fishing vessel. Scrambled comms & other clear stns weak underneath all. USB at 0013. (Sabo, CA)

5340: YL/GG in USB w/5F grps for addressees 51120, 00191, and 40735 from 2000—2015 after Swedish Rhapsody music box marker. (Mason, England)

5535: Speedbird London in USB w/requested wx report at 0449. Eastern 414 clg London Radio but no joy at 0535. (Watts, KY)

5573: Unid stn sending 5F grps in CW at 2345. (Hamlin, NY)

5680: Red—18 wkg Churchill w/position report in USB at 0744. (Sabo, CA)

5693: YL/Chinese 2000—2005 rptng San Si Dong (340) and 5F x3, 2F x2. At 2005 into 5F grps. (Mason, England)

5696: Coast Guard 1433 wkg Commsta New Orleans in USB at 0202; Coast Guard 1483 wkg Coimmsta Portsmouth, VA in USB at 0203. (Hamlin, NY)

5696: Rescue 1472 wkg Commsta Boston in USB at 1826. Later Rescue 1472 & 2103 (Falcon jet) on scene of vessel taking on water 70 miles ENE of Boston. 1472 lowered pumps, then left for return to Otis but called back 10 min. later due one pump not wrking and they lowered another pump. Then both a/c returned to Otis. USCGC Chilula was expected on scene for towing. 0542. (Fernandez, MA)

5703: WAR 46, Guide Post, and Stalleto in military type net. Guide Post sent some RTTY and WAR46 said to keep freq voice only. Freq ID given as Papa 381. Also mentioned Xray 904. USB at 0222. (Pecora, OH) This may be a TAC/SAC Intercommunications freq. (Ed.)

5750: YL/GG in RCS w/callup of 713 and 188.3/2F

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
ttc	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)

grps. 2200. (Willmer, MI)

6019: Commsta Miami in USB at 0105 s/off till 0600 at time of intercept & Halifax rdo up on freq within moments w/wx for maritime provinces & New England. (D.P., NC)

6200: USCGC Eagle wkg NMN, Portsmouth, VA in USB at 0020; USCGC Blackhaw in USB clg San Francisco at 0429. (Watts, KY)

6200: NCBG, USS Portland LSD37 at 0155 wkg USCG Portsmouth Commsta re RTTY ttc; NMMJ, USCGC Sherman WMEC—720 at 0515 wkg USCG CAMSPAC San Francisco; NODX, USCGC Sweetbreir, WLB—405 at 0521 wkg Kodiak Commsta; USCGC Orcas WPB—1327 at 0535 to Kodiak re comms w/USCGC Ironwood on Bravo secure; NIEG, USS Guadalcanal LPH7 at 0603 w/calls to USCG Station Chesapeake but answered by Portsmouth; NVES, USCGC Venturous WMEC—625 at 0607 wkg USCG CAMPAC; adn NJSP, USS Scott DDG995 at 0621 w/calls to Portsmouth Commsta. All USB. (Sabo, CA)

6352.1: 3BM2, Bigara, Mauritius in CW at 0133 w/CQ mkr. (GB, AK)

6369: D3E41/51/52, Luanda, Angola in CW at 0445 w/call mkr. (Tubbs, VT)

6415: 7TF, Boufania, Algeria in CW at 0558 w/call mkr. (Tubbs, VT)

6453: YL/GG in AM at 0812, ending a 5F text (Each grp x2) at 0814. (Fernandez, MA)

6460.5: LSA, Boca, Argentina in CW at 0626 w/call mkr. (Tubbs, VT)

6476: KPH, San Francisco, CA in CW at 0645 w/VVV & WSX mkr. (Warrington, OH)

6493.8: URB2, Kloipeda, Lithuania in CW at 0106 w/mkr & ID at URB2/RWWM. (GB, AK)

6502.4: YL/GG in USB at 0608 w/5F grps. (Watts, KY)

6506.4: NMA, Miami, FL in USB wkg vessel Wind-swept at 0155. Ship taking on water. NMA clg units at 0252 including Aerostat 2. (Watts, KY)

6521.9: NAEF, USCGC Manitou WPB—1302 wkg Miami Commsta in USB at 0501. (Sabo, CA)

6578: YL/SS at 0218 w/5F grps. At end said finale x3. (Warrington, OH)

6655: Romeo, Kilo in LSB 0430-0433. OM/SS passing 5F grps to another but using Spanish Ordinal nbrs instead of Cardinal nbrs. Between msgs weird coded speech using what seemed be 1st ltr of each word. Other calls hrd were Uniform, Echo, Tango. The next day callsigns had been changed to Pantera, Tigre, Buitro, Aguila and Salino. (Perez, WI)

6660: YL/EE rptng 468 in AM 2100-2105. Then 235, 97 and into 5F grps. Ended w/00000. (Mason, England)

6666: Rio, Buffalo in USB 0421—0430. OM/SS w/another OM making reference to 21st Military Zone & various Military Units. Ref'd two freqs of 5415 & 10265 kHz. (Perez, WI)

6670: Two unid stns in USB at 0438—0458. One OM/SS opr sending msg to another re Two USAF C—20's. Names of two US Officers were given & they were associated w/US Army Officers School. The two C—20's had arrived in xmting stn country from Key West & departed after refueling enroute to airbase in Honduras. (Perez, WI)

6676.6: Two OM/EE (heavy Irish accent) in USB w/comms re fishing ops (XXX lang) at 0615. (Fernandez, MA)

6708: Agar 35 (EC-135 Advanced Range Instrumentation a/c) in USB via Cape Radio to Thinker 1 (Senior Ground Range Officer). Was receiving encrypted track data of 4 targets from unknown radar source. Called it a successful test after working out some bugs. Thinker 1 released satellite time and Agar 35 was in Contact with the Vault re scheduling after test completed. 2346. (Willmer, MI)

6735: SLHFB "X" hrd at 0140. (D.P., NC)

6750: MAC 70024 wkg Croughton at 0429; MAC 40614 wkg Macdill at 0311; MAC 50247 wkg Croughton at 0312. All for p/p to meteo. (Syminton, OH)

6750: MAC 50275 clg Lajas AFB, Azores in USB for wx at 0152. Due bad wx there, MAC advises Lajes Command Post they changing route & going to Rhoda. They carrying 2200 lbs of hazardous materials with destination Niamey, Niger. (Pecora, OH)

6753: St. Johns Military, Canada at 0345 w/area wx. (Hill, MI)

6756: SAM 681 enroute Panama w/US Ambassador aboard in P/p to State Dept re bringing down hand held satcom due poor commo & lack of secure lines at destination. The p/p to Andrews Current Ops about contacting someone at destination to set up satcom. 2211. This was day US Forces went into Panama. (Willmer, MI)

6761: OM/EE in USBn at 0102 w/SAC Skyking best. (Mayfield, NM) This is SAC Primary Night Air-to-ground channel. (Ed.)

6761: Frog Pond wkg Blue Chip requesting p/p to Nightwear for signal test. Frog Pond requested initials of Nightwear rdo opr. There was pause and then Nightwear opr stated "unable to comply." USB at 0512. (McAtee, WV)

6761: Roma One Zero wkg Milkweed in USB at 0408. (Hill, MI)

6768: YL/SS in USB at 0704 w/5F grps. (Syminton, PH)

6785: Warble jammer right on top of WCC. Why is this tn being jammed?? Hrd at 2249. (Ed.)

6840: YL/EE in USB 2335-2340 sending 3/2F grps. (Mayfield, NM)

6850: OM/RR in AM rptng 305 between 2200-05. Then 573, 71 and into 5F grps. Ended w/00000. (Mason, England)

6926: Two unid stns in USB 0232-0324. Oprs OM/SS. One passing 5F grps. Passes 6 grps at a time with line number in front of each 6 grps. (Perez, WI)

7366: MARS net in USB, NNN0ZJM NCS. 2300-2310. (Gay, KY)

7410: Unid CW stn w/255 x6, Tll x2 callup then into 5F/L grps at 0405. (Warrington, OH)

7411: OM/EE in USB rptng 132 x3 000, 2311 until s/off at 2315. (Gay, KY)

7412: YL/RR in AM 0455-0458 w/5F grps. Carrier off at 0500. (Galasso, NJ)

7474.9: U/I stns on USB at 1555. One said "Let's go lower." On LSB hrd KCP63, FAA Longmont, CO; KDM50, FAA Hampton, GA; Backburner, Bandsaw Guild, Fletcher and Best Deal were other calls hrd. Ref'd freq of 14902 kHz. Sound like possible SHARES ops. (Ed.)

7525: YL/SS in AM w/5F grps. Off at 0516. (Galasso, NJ)

7535: Foll ships wrkd Norfolk SESEF for equip checks: NJEC, USS Trippe FF1075 at 1830; NZDN, USS Fiarfax County LST1193 at 1835; NNSN, USS Richard E. Byrd DDG23 wrkd NZDN at 1835 and then at 1900 the Byrd QSY'd to 4040 kHz for FSK check w/SESEF; NUCU, USS Barnstable County LST1197 at 1855; NOUD, USS Inchon LPH12 at 1530; US Navy Harbor Craft 21 clg Control at 2030. Craft 21 called this net "Radio 2" and most comms were "in the green" w/rdo checks in the clear. (Gordon, CT)

7790: WGY903, FEMA, Olney, MD in USB at 1444 requesting KIA85, FCC, Vero Beach, FL to pass a SHARES exercise msg between two FCC stns. (Willmer, MI)

8049: CW stn at 0135 sending 5L grps in blocks of 10. Stopped at 0142 w/AR YA TT. No chatter or rpts followed. Nil hrd 0147. Similar stn hrd 1238 on 4521 kHz. (D.P., NC)

8125: Two stns-KIT88, FAA Martinsburg, WV and KEM80, FAA, Washington, DC w/short count then KEM80 tells KIT88 they would see them up on the net. 1429. (Willmer, MI)

8241.4: USCGC Vigorosa at 0424 & USCGC Kiska at 0448 to Commsta New Orleans in USB. (Watts, KY)

8291.1: WRS976, the Silverado Corp, Seattle, WA at 0333 wkg WZE6966, fishing vessel Silverado; foll by WYG7180, the Ross Seal, wkg WYG7573, the China Seal. Both vessels are deck cargo ships out of Galveston, TX. At 0511, WTW9136, tug Centurion, w/position report to WPE, Tug Communications, Jacksonville, FL. All USB mode. (Sabo, CA)

8448.4: A9M, Manama, Bahrain in CW at 1838 w/call mkr. (GB, AK)

8469.3: D4A, Sao Vincente, Cape Verde in CW at 0555 w/CQ mkr. (GB, AK)

8472.3: SUP, Port Said, Egypt in CW at 11834 w/CQ mkr. (GB, AK)

8490.3: AQP2, Karachi, Pakistan in CW at 2151 w/V mkr. (GB, AK)

8587.9: XVS, Ho Chi Minh City, Vietnam in CW at 1440 w/CW mkr. (GB, AK)

8690.5: 3DP3, Suva, Fiji in CW at 0611 w/CW mkr. (GB, AK)

8699: Unid stn (poss CFH, Halifax, NS, Canada) in CW at 0040 w/news of lost deep sea divers of St. Lucia & requesting all ships to assist if possible & report to MRCC. (Warrington, OH)

8765.4: Barbados Radio clg vessel polynesia at 0437 in USB. Ship hrd on duplex 8241.4 kHz; Commsta Kodiak clg USCGC Mustang at 0515 in USB. (Watts, KY)

8861: Air France 097 wkg Dakar, Senegal w/flight status. USB at 0150. (Hamlin, NY)

8927: Two unid OM/EE oprs discussing new software for countdown developed in Brussels. USB at 0015. (Hamlin, NY)

8957.2: EIP, Shannon, Ireland in USB at 0438 w/wx in European cities. (GB, AK)

8984: USCG New Orleans Air in USB at 1505 giving VHF freq of 122.95 MHz to CG 1265. (Watts, KY)

8989: Command Post, Discard, 177A and 80321 hrd at 0230. One of a/c stated it had Class A on board and only about 1000 rounds of M16 ammo. Some discussion between one of gnd stns and a/c re wx conditions at Norton AFB and problem w/ash over Alaska. (Kaufman, CA)

8989: MAC 67952 in USB at 0500 wkg McClellan w/pp to Discard; Palm 15 in USB at 0511 clg Crabgrass but no joy. (Symington, OH)

8993: MAC 60177 wkg MacDill AFB in USB w/pp to Discard (22nd AF, Travis AFB, CA) at 0113. (Hamlin, NY)

9006: Cannon Cocker wkg Grey Hawk in USB at 0316. Sounded like could be Canadian Forces. (Sabo, CA)

10000: AR43, AR42, and AR46 w/RTTY tlc & associated comms in USB at 2023. (Some tlc reported in Column 2 yrs ago.) (Willmer, MI)

10051: New York Volmet in USB at 2240 w/wx. (Hill, MI)

10493: Rdo check between FEMA units WGY902, NYC, NY and WGY912, FEMA Special Facility, Berryville, VA on FEMA daytime primary freq. Rdo checks are approx every hour on the hour. USB at 1658. (Pecora, OH)

10646.6: Possible beacon cluster. "Z" rptd every sec., "O" sent every sec. on 10-646 kHz, the "L" on 10,646.8 kHz. All sent slowly and at different rates. Hrd 0700 in CW. (Fernandez, MA)

11176: MacDill AFB to 174. Relay to Dover AFB at 1726. Also hrd earlier on 11246 at 1624 w/wx. USB mode. (Kinsland, GA)

11176: MAC 397EV wkg Albrook w/pp to Pope CP in USB at 1223; Glare 2 wkg Croughton in USB at 1159 w/pp to meteo. (Syminton, OH)

11191: Anti-smuggling ops w/Atlas, Hershey and Screwtop in USB testing green (secure) modes at 0015. (Hamlin, NY)

11204: Architect (RAF, Upavon, England) in USB at 1930 w/wx best using colors to represent conditions at various terminals around England. (Fernandez, MA)

11233: CanForce 1 in contact w/Lhar requesting wx for Brussels. USB at 0255. Canadian Prime Minister enroute to a NATO mtng. (Willmer, MI)55

11246: MacDill wkg (?)206 w/pp from a/c to various US Officials and newspapers. Hrd at 1642. Later hrd w/tlc re emergency phone nbrs in Panama & El Salvador for wife of one of passangers.

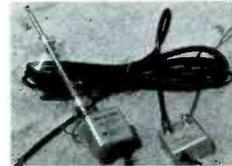
11267: Zero Papa Sierra and Seven Henry Quebec in comms coordinating RTTY and another freq. 7HQ asked if OPS was using a nonsynchronous modem but OPS didn't know that that was. These oprs having hard time getting the RTTY to work. USB at 1650. This is an ac-

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tive USN freq. (Pecora, OH)

11288: Corned Beef to Bodyguard w/fc relayed from Slingshot. USb mode at 0007. DEA Channel YD. (Sabo, CA)

11390: United 711 w/position report at same time United 46 clg NY. USB at 2131; Antillian 988 w/position report. NY advised they to change to secondary freq of 8846 kHz. Hrd 2138 in USB; American 1083 hrd 2142 in USB enroute Boston to San Juan. NY gave them secondary freq of 8864 kHz & pilot requested check on flight recorder Kehoe, GA)

11396: Unid a/c giving New York air the next check point. NY reply is we have no listing of that check point. The a/c asked if NY could contact Singapore for him. NY laughed and said they had no link to Singapore. Pilot had very accented speech and it really sounded like he was lost!! USB at 2210. (Pecora, OH)

11488: SA 60206, a C-20 enroute Andrews fm Panama w/combat film. Made arrangement w/MACCAT Director to have film shipped to Scott AFB. USB. (Willmer, MI)

12168.5: AAC46, AAD32 and AAE80 in net w/rdo checks and talks of contacts by land line. USB at 1505. (Willmer, MI)

12242: YL/EE in AM at 2309 w/call-up of 1-0 284 284 rptd until 2310. Ten tones then Count 116 x2 then into 3/2F grps. A sweeping jammer was strong in background. Text was simulcasted on 11463 kHz and had sweepomg jammer in background also. Have heard EE 3/2F on USB on this freq also. At end of msg. "Repeat" said and text rptd. (Fernandez, MA)

12886.5: WLO, Mobile, AL Marine rdo w/marine wx in CW at 0047. (Hamlin, NY)

12950: YL w/Victor Lima Bravo 2 callup in Am at 0634. No msg sent. (Fernandez, MA)

12950: YL w/Victor Lima Bravo 2 callup in AM at 0634. No msg sent. (Fernandez, MA)

13122.3: KMI, Dixon, CA w/pp for vessel Cordova in USB at 0200. (Watts, KY)

13179: WLO, Mobile, AL xmtng Gulf wx foll by tfc list w/fc for Shannon, Patterson, lady Janet & Flying Wing and Mila, USB 1800-1806. (Kinsland, GA)

13201: Zink 11 (tail -63-7889) wkg Thule w/pp to Format at 1436; MAC 59409 (C-141) wkg Thule w/pp to McGuire CP at 1430. All USB. (Syminton, OH)

13244.2: Lajes GCCS in USB at 1941 w/phonetic msgs. (Watts, KY)

13247: Andrews AFB wkg SAM 27000 (AF 1) in USB at 0121 w/pp to Crown (White House Communications Agency) and the AF-1 forecaster at Andrews Meteo, and connect w/nationwide telephone link. (Hamlin, NY)

13312: 752DT in comms w/Rockwell Flight Test w/test of three HF xmtrs. USB at 2205. (Willmer, MI)

13330: A/c 500 Lima Sierra asking Houston Radio for some NY Air freqs. Houston provided freqs but could not check Selcal for them because xmt was down. USB at 1625. (Pecora, OH)

13354: Honolulu Aero to 11543 and Hawaiian 22 at 0235 in USB. (Watts, KY)

13455: SAM 202 enroute Lima, Peru w/pp via Andrews to Wash DC area. At same time on 13542 kHz RCS a YL/EE w/4F grps. USB at 0010. (Willmer, MI)

13567.7: AAC43 and AAC46 exchanging authentication. Both oprs OM/EE. Unid stn w/YL opr clg but no joy. USB at 1350. (Ed.)

13743.9: Unid stn in CW at 1335 sending grps w/cyrillic characters noted. Very bad flutter to signal. (Ed.)

13826: NNN0ICE, McMurdo, Antarctica in USB at 0222 wkg stateside MARS stn NNOJET, Santus, FL w/pp. (Syminton, OH)

13959.7: Alpha Seis DE Alpha Siete in USB at 1546. A7 opr is YL/SS and appears be net control. She talking to unhrd stn and said something regarding papers for the University and later mentioned sending papers to Lima (Peru?). Later called Alpha Tres but no joy. Down at 1557. (Ed.)

14441.5: NCVV, USS Carl Vinson CVN70 (NNNOCWY) wkg Hawaiian islands MARS stn NNNOUTG at 0310. The Vinson was nearing Pearl harbor for a ceremony at the Arizona memorial. (Gordon, CT)

14477: Precommissioning unit USS Normandy CG60 using their International callsgn NVVV as temporary MARS callsgn while working NNNOVNO on Valentines Day at 0045. (Gordon, CT)

14686: Atlas wkg 17 (a/c?) w/pp to Control in USB at 0116. re tugboats going out to tow in a vessel. Atlas wkg Ambush w/pp to Warrior (YL opr) in USB at 0301 & told Warrior he'd meet her on "TE" in a few mins. (Sabo, CA)

15015: Omni 92 wkg Albrook in USB at 2104 w/pp to Furious and yeteo. (Symington, OH)

15044: WGY903, FEMA, Olney wkg Foxtrot 2 w/pp. USB at 0331. (Sabo, CA)

15867: Homeplate wkg Omaha 25 w/instructions to patrol SE of India 8. USB at 2235. (McAtee, WV)

15875: NRT, Yokota Loran Monitoring Station, wkg NRV9, Barrigada Loran stn at 0430. NRT wkg NRT2, Gesashi Loran stn Okinawa at 0453 and NRT wkg Ham-pyong, South Korea Loran stn at 0458. All USB mode. (Sabo, CA)

16077: Army COE tng net w/WUG, Vicksburg; WUE4, West VA; WUH, Nebraska, WUK, San Francisco; WUA, Massachusetts; and WUB and SUM both in-audible. Also KC2XJB contacted on a telephone remote. Said to always contact NCS to close a net. 1505 in USB. (Willmer, MI)

16382: AAR4USA requesting WUI to pass a USACOE SHARES exercise msg. KIA85 requesting AGA6NE to pass a FCC SHARES exercise msg. AGA6NE requesting WUE4 to pass a INS SHARES msg. Also hrd Coast Guard CAMSATLANTIC Chesapeake, CAMSPAC San Francisco, KAB960 and WUE4 w/similar tmc. USB at 1732. (Wilmer, MI)

16383.5: Stns X78, T78, Z76, and Z78 in net. Every few mins would pass msg w/header, L/F grp, location, position, then "transmitting transmitting." For example: Timothy CA603 location GO 5751 heading South East transmitting transmitting. USB at 1520. Never monitored anything like this before. Poss tracking net?? (Willmer, MI)

16549.9: U/I individuals, 2 OM/EE oprs w/sk'd at 1700 on Sun & Wed. One stn location given as La Pax, Bolivia and other in US in Vancouver, WA. No callsgns & stn in Bolivia told other stn not to use any callsgn. This is not a MARS activity. (Banner, NV)

16905.8: YIR, Barrah, Iraq in CW at 1513 w/call mkr. (Tubbs, VT)

17013: 5BA, Nicosia, Cyprus in CW at 1626 w/call mkr. (Tubbs, VT)

17254.6: Goteborg Radio w/EE voice tape at 2005 in USB. (Watts, KY)

18027: Dragnet Tango and Dragnet Whisky in NORAD exercise. ID'd freq as Charlie 8. QSY'd to Charlie 3 which is 6750 kHz. USB at 1540. (Willmer, MI)

18171: 701 to 721 re Peru rejoining ops. 107 to Atlas re moving a plane from Jaguar 200 to Sundance 100. USB at 1844. This is Sierra India channel. (Willmer, MI)

18196: Agar 27 (EC-135N) wkg Orion Control re radar malfunction. Agar 27 requested pp to Griffith AFB to make arrangements to have radar unit checked before proceeding to the Azores. USB at 1705. (McAtee, WV)

20185.8: Launch Conductor (LTDR) to AFLC w/launch controllers check list for test 4785 of a launch of Delta II carrying a Navstar Global Positioning Satellite (GPS) from Cape Canaveral. Cape Winds launched 3 balloons from winds check. Multiple wx briefings given. Fuel loading also monitored. Said CH 8 was for USAF, CH 9 and 14 for anomalies. Recd clearance from ETR Bermuda BDA had established road blocks. Launch window of 1754-1815. Launched at 18010 after a high altitude wind anomaly cleared. After orbit achieved, Falcon at Space Surveillance Center requested TEAR data and wanted to verify that Assencion had locked onto the right target. Said orbit was 88 x 103 degrees. (Willmer, MI)

20192: Silver 12 to Silver 19 counting off times and mach nbrs of Delta II after its launch. LSB at 1812. (Willmer, MI)

21964: United 807 wkg Honolulu in USB at 0108 w/flight status. (Hamlin, NY)

22476: NMO, USCG Honolulu in CW at 1911 w/call mkr. (Tubbs, VT)

22689: Paris Radio w/accordion notes & voice tape in FF & EE at 1925 in USB (Watts, KY)

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Each month's winner will receive a free one-year subscription, or subscription extension, to POP'COMM. Entries will be judged taking into consideration if they tell a story that is especially interesting, amusing, or otherwise unusual. We reserve the right to make any necessary syntax, spelling, or grammatical corrections, or minor wording changes to improve style.

Address all entries to: How I Got Started, Popular Communications, 76 North Broadway, Hicksville, NY 11801

Winner - July, 1990

For July, we'll introduce you to Ken Kohl, of Kohl Communications Inc., of Los Ange-

les, CA. Ken took a few more words than we asked for to tell his story, but it was so interesting that we're bringing it to you intact. Ken told us:

As I look back over a twentyplus year career in broadcasting I realize that it all started with the communications hobby. Although at the time I didn't know that it was a hobby.

Cousin Brucie, the WMCA Good Guys, Alan Freed, the old WMGM . . . the top 40 radio of my youth in NY. Not really unusual media input for a kid from Long Island. But as high school progressed a certain alienation factor started to slip into my listening. Late night radio. First the NY legends like Barry Farber, Long John Nebel and Barry Gray. Then Bob Fass on Pacifica's WBAI kept me up all night, mesmerized by the lighted dial and the talk of things so adult, so exciting that I soon found myself tuning around the dial searching for distant signals to eavesdrop on. The East Coast is rich territory for a young DX'er. Later KSL and The Night Caps found it's way to my SONY World Radio from my mountain top home in Colorado in the 70's. The magic of shortwave and getting mail from Radio Havana and Radio Peking upset my small town mailman, but continued to fascinate me

So the hobby was the intro to what has since become my life. My first radio jobs were on Long Island at the legendary WLIR

and as part of the founding staff of WBLI. These on air jobs later turned into management positions at some powerhouse radio stations; including 50,000 watt giants KOMO Seattle and KFI Los Angeles. Today, I have moved into ownership and head what I feel will become one of the premier medium market radio groups in America. But along the way, my life and the communications hobby have continued to impact my life.

In Colorado, I became a volunteer firefighter/EMT and was introduced to emergency band traffic, at KOMO my staff of news people and I were linked to the city with our own radio system and banks of scanners. I carried a two way, pager and car phone. After becoming a pilot I discovered yet another aspect of our hobby. Today in addition to two-way systems at my stations, the aircraft radio I use while aloft, the infrequent shortwave listening. I find the hobby has taken on a new aspect; following the day to day excitement of the Los Angeles City Fire Dept with a PRO-2005 and PRO-34, Nikon and telephoto lens. Today one of the things I am most proud of is seeing my photographs appearing in Fire service magazines and hanging in LA's Station 58.

And all this started with the teenage late night DX'ing. Once I got started I just couldn't stop!!!

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THE EXCITING WORLD OF RADIOTELETYPE MONITORING

Every so often I make an appeal for readers to send us heaps of loggings to beef up the intercepts section. The response is usually great, but after a while the number of contributions diminish for various reasons, and I find myself having to make another appeal. This constant appeal seems like a TV telethon to me. Maybe I should call my appeals a "logathon."

Anyway, several new contributors responded to my most recent appeal, and they're making their debuts here this month. We're glad to have you join us as we hope you send us loggings for years to come.

One of the new contributors is Peter T. of England, who doesn't want his identity revealed because the British Government frowns upon its citizens snooping around utility station communications and reveling in what they heard. You see, the British have what is called the Official Secrets Act, which became law in 1911. It makes it a crime to disclose classified information to unauthorized persons, and Peter says that recently "someone has actually been prosecuted in London" for breaking the law. This same law is probably used to keep *POP'COMM* off the magazine racks in London. I went to London earlier this year and could not find the magazine in any store that sold periodicals. There were plenty of magazines for the amateur radio operator, but none provided the detailed utility stations information that is found inside *POP'COMM*.

Because of this lack of information, I'm sure there are many RTTY—monitoring buffs in England and elsewhere in Europe, and on the other continents, who are seeking a place where they can share their loggings accomplishments with other people with similar interests. *POP'COMM* is that medium, and I now ask those hobbyists, in this latest logathon, to send their material to this column. Besides, we need more input from those living outside North America to show us what can be monitored overseas that we might not be able to monitor in the United States and Canada.

Last March's RTTY column addressed the issue of what information I sought from contributors for compiling the intercepts section. It was stated that basic information included frequency, callsign, station name and location, context of the transmission, RTTY speed/shift/polarity setting, and the UTC time the item was logged.

A contributor replied in a letter that he tries to provide the information I seek, "but not all of us have access to ITU records!" You don't need a set of ITU microfiche cards to give us detailed information about what you logged. A solution to the problem of omitting details from loggings was given

in that same column near the end of the text section. That was to copy the information monthly from the intercepts section into a notebook, so that an instant reference source would be at hand.

RTTY Intercept All Times Are UTC Settings = Hz/Baud/Polarity

4220: GYU, Royal Navy, Gibraltar, w/RTTY, 700/75R at 0500 ("Bunky," IL).

4416: UN-ID w continuous RYRY, 0200-0230 + 0245, 500/50N (Fred Hetherington, FL).

4468.2: Cairo Meteo, Egypt, w/coded wx, 425/50N at 0305 (Joe Palkovic, FL, via Hetherington, FL) Calling is SUC26—Ed.

4620: Un-ID, possibly Gernam, w/encryption or testing in GG, ARQ-E/72 at 2300 (Peter T., England). The National German Network in FRG has been logged on this freq—Ed.

5117.5: ASECNA, TYE, Cotonou, Benin, w/RVRY at 0457, 425/50N (Dallas Williams, CO).

5240: 4OC2, Tanjug, Belgrade, Yugoslavia, w/nx at 0220, 850/50 (Robert Charlton, ON, Canada).

5460: CNA7, Tangiers, Morocco, w nx in EE at 0115, 425/75 (Charlton, ON.) Sorry, but it's the VOA from Tangiers. The sta has no callsign—Ed.

5470: RKC29, Bakhtar, Moscow, USSR w/nx in EE at 0515, 425/50R ("Bunky," IL).

5733: HZJ, Jeddah Aero, Saudi Arabia, logged at 0124, 425/50 (Bosse, PW).

6331: CFH, Halifax Meteo, NS, Canada, w/wx at 0228, 850/75R (Charlton, ON).

6406.7: 98DDX, Madrid Navrad, Spain, clg 97TKP to QSY E213. Was 850/100N at 2057 (Peter T., England)

6676: GYA, Royal Navy, London, England, w/foxes, 850/75R at 0236 (Charlton, ON).

6943: 5TX, ASECNA, nouadhibou, Mauritania, w/coded wx data to Dakar, Senegal. Was ARQ-E3 415/48, at 2230 (Hetherington, FL). Same at 0205 (Ed.).

6960: LZN3, BTA, Sofia, Bulgaria, w/RVRY + "QRA DE LZN3 testing for Beijing." Was 509/50N at 2106 (Peter T., England)

7397.5: KAWN, USAF, Offutt AFB, Omaha, NE w/wx BC at 0457, 900/75N (Williams, CO).

7422.5: 5YD9, Nairobi Aero, Kenya, w/aero wx, 85/50N at 0441 (Williams, CO). Also at 2245 (Hetherington, FL).

7519: BZP57, Xinhua, Beijing, China, w/nx in EE, 327/75N at 1925 (Peter T. England)

7626: TZH, ASECNA, Bamako, Mali, w/RVRY^s QJH1, 425/50R at 03536 (Williams, CO).

7646: DDH7, Hamburg Meteo, FRG, w "Let us drink a glass of champagne to celebrate the New Year. Rgds Sondredrom IC and Com-Center." Was 225/50 at 0137 (Bosse, PQ). I couldn't tell if that was garbling that appeared to the left of the msg on your printout, or if the TTY op was trying to draw a champagne glass using text letters in a graphing. Or maybe it was an unsteady had attempting to draw a glass and it got to look like garbling?—Ed.

7675.9: Un-ID w text in SS re Nicaragua & Grenada, 225/50R at 0458. Off in mid of text at 0505. Each item was separated by a line of hyphens. No dateline was used (Williams, CO).

7685: RBV75, Moscow meteo, USSR, w/coded wx at 0225, 1000/50R (Ed.).

7712.7: Possibly MDK, RAF, Akrotiri, Cyprus (too garbled for pos ID), w RYI's and foxes, FDM 325/50R, at 0455 (Williams, CO). Not MKD, but MKK, RAF, London, according to my own loggings in the past—Ed.

7760: RGH77, Arkhangelsk Meteo, USSR, logged at 1312, 1000/50 (Bosse, PQ).

7850: ZAA, ATA, Tirana, Albania, w/RVRY foll by

nx in FF at 1900, 425/50R (Steve Black, NY).

8087: KMI, Dixon R., CA, w/a tlc list in FEC at 0530 ("Bunky," IL).

8140: RNN51, Bakhtar, Moscow, USSR, w/nx in EE, 425/50R at 0525 (Williams, CO).

8354.9: RMGH, Soviet Navy oceanographic research vessel Vizir ("Yug" class), w tlc in RR for UJY, Kaliningrad R., USSR, 170/50N at 0302 (Sam Ricks, PA).

8627: GYU, Royal Navy, Gibraltar, w/foxes & 10 count, 850/75R at 0027 (Ed.).

9044: GHH, Jamestown Meteo, St. Helena, w/RVRY, 250/50 at 0215 (Bosse, PQ).

9050: RCR74, Khabarovsk Meteo, USSR, w/coded wx, 500/50R at 0520 (Williams, CO).

9265: ZRH, Cape Town Navrad, RSA, w/RVRY to NMN, 650/75 at 0010 (Bosse, PQ). Same w/AMVERs to NMN at 0035, 850/75R (Ed.).

10100: RUZU, SAAM, Molodezhnaya, Antarctica, w/a svc msg to "all stations," 400/50 at 2245 (Bosse, PQ).

10202: MKK, RAF, London, England, W/RVRY. FDM 50N, at 1402 (Peter T., England).

10220: CML28, FTT, Havana, Cuba, w/a msg to ITT, New York City, 850/50R at 0103 (J.M.S., MO).

10235: 3MA99, CNA, Taipei, Taiwan, w/RTTY, 850/50N at 1342 (Ed.).

10390: FSB57, Interpol, Paris, France, w/ARQ phasing sig & CW ID at 0248 (Black, NY).

10805: NA, Buenos Aires, Argentinian, w/nx in SS, 850/75N at 2258 (Black, NY).

10900: KAA60 calling KKA59, KOA56, KNU70, KKA60, KGA91, KGA91, KGA93, KMB27, KIA84, and KCA35, to test radio net. Was 850/50R, 1948-2010 (J.M.S., MO). These are FCC stations. KAA60 is a Grand Island, NE—Ed.

10910: Possibly HGH29, MTI, Budapest, Hungary, w/nx in EE at 0605, 425/50R (Williams, CO)

10982: BAP40, Xinhua, Beijing, China, w/QRA & RVRY at 0061, 1000/75R (Williams, CO).

11006.8: AFTS, Los Angeles, CA, w/UPI nx at 0521, FDM 85/50R (Williams, CO).

11065: YAV25, Kabul Aero, Afghanistan, w/RVRY at 0507, 725/50N (Williams, CO).

11069.8: LOR, Puerto Belgrano Navrad, Argentina, w/5L grps in mil format at 0434, 170/75N (Williams, CO).

11074.7: Un-ID w/manually typed RVRY. 0424-0426, 250/50N. (Williams, CO)

11080: SANA, Damascus, Syris, w/nx in AA, 550/50R at 1830 (Williams, CO).

11097.8: MKD, RAF, Akrotiri, Cyprus, w/RVYI's & foxes, FDM 325/50R at 0514 (Williams, CO).

11125: Possibly LZU2, Sofia Meteo, Bulgaria, w/coded wx at 0512, 800/50N (Williams, CO). I'm guessing the same thing, and I've logged it at 1532-1554, 850/50N—Ed.

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
RVRY	"RVRY . . ." "test tape"
SS	Spanish
tlc	Traffic
w/	With
wx	Weather

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11439.1: 5NK, Kana Aero, Nigeria, w/RYRY, 550/50R at 0453 (Williams, CO).

11443: 9JZ9, Lusaka Aero, Zambia, w/coded wx at 0506, 500/50R (Williams, CO).

11470: RNK33, TASS, Moscow, USSR, w/nx in EE at 1827, 425/50R (Williams, CO).

11506: Un-ID w/5L grps, 0416-0418, 500/75N (Williams, CO).

11574: Y7A51, MFA, Berlin, GDR, w/RYRY at 0500, 425/50N (Williams, CO).

12209.9: PWZ33, Rio de Janeiro Navrad, Brazil, w/CQ, RYRY, SSGS, at 0356, 1100/50R (Williams, CO).

12513.9: UMay, Soviet hydromet weather research ship Akademik Shirshov, w/ships sta. wx prts for RNO, Moscow, 170/50N at 0311: Was in the Indian Ocean west of the Maldives Islands (Ricks, PA).

12522.9: UVXJ, Soviet oceanographic research ship Akademik Nikolay Strakhov, w/tfc in RR to UNM2, Klaipeda R., 170/50N at 2159. Was off northern Brazil heading for a refueling stop at Santa Cruz, Cuba (Ricks, PA).

12523.4: LYGI, Soviet stern trawling factory ship Tsefey, "Super Atlantik" class vessel w/pendant # BMRT 7582, w pos. rpt to UJY, Kaliningrad R., USSR, 170/50N at 0316. Was in the Atlantic, off Brazil, at the equator (Ricks, PA).

12736.2: UFB, Odessa R., USSR, w/msgs in GG, than in RR, ARQ at 2019 (Peter T., England).

13088: SPB62, Szczecin R., Poland, w/a FEC tfc list at 1806 (Peter T., England).

13366.3: 5YD9, Nairobi Aero, Kenya, w/coded wx at 0453, 85/50N (Williams, CO). Same staf w/NOTAMs at 2012, 350/50N (Black, NY).

13460.2: Un-ID w/foxes & 10 count, FDM 170/75N at 0406 (Williams, CO).

13655.5: XVMB, VNA, Hanoi, Vietnam, w/nx in FF, 500/50R at 0447 (Williams, CO).

13892: CLP1, MFA, Havana, Cuba, w/crypto & cables in SS to Mozambique, Ethiopia, South Yemen, et al, at 0431, 500/50N (Williams, CO).

13897.7: CLP1, MFA, Havana, Cuba, w/a cable in SS & crypto to Maputo at 0436, 500/50N (Williams, CO).

13905: CLP1, MFA, Havana, Cuba, w/a circular in SS at 0446, 500/50N (Williams, CO).

13930: Un-ID w/5L grps, 0442-0444, 500/75N (Williams, CO).

14403.5: MKD, RAF, Akrotiri, Cyprus, w/RYL's and faxes, FDM 170/60N at 0406 (Williams, CO).

14422: 9KT321, KUNA, Safat, Kuwait, w/nx in AA at 2141, 425/50N (Black, NY).

14452: HMF57, KCNA, Pyongyang, North Korea, w/nx in FF, 170/50R at 1329. Off abruptly at 1330 after sending "ZCZC QRN SK QRM SK XBJRJJJJ IJKJJJ NNNN" (Ed.).

14485.6: NNNOUNS, USMC MARS, unknown QTH, w "NAVAMARCORMARS" computer bulletin board & msgs to MARSgrams senders. Was ARQ at 1722 (Ed.).

14602: Un-ID w encryption, FEC, at 1832 (Peter T., England).

14722.5: TNL, ASECNA, Brazzaville, Congo, w/RYRY at 2147, 500/50N (Black, NY).

15753: CNM66, MAP, Rabat, Morocco, w/nx in FF at 1600, 425/50R ("Bunky," IL).

15845: SUS289, MENA, Cairo, Egypt, w/nx in AA at 1900, 425/50R ("Bunky," IL).

15925: AOK, USN, Rota, Spain, w/encryption at 2220, 850/75 (Black, NY). Whenever I log U.S. mil stations sending encryption, I note them as an un-ID, no matter what the guidebooks say. Unless there's an ID in the clear, I won't make any assumption because there's a great chance I would be wrong. In this case, AOK may have been logged with an ID in the clear on this freq one day, or for several days, a long time ago. But that does not mean AOK is the sole user of this freq. Many other USN stas also may be using it, even a base close to your home. There's no way to tell solely from watching the stuff on your monitor where it's coming from—Ed.

16008: BTA, Sofia, Bulgaria, w/nx in EE at 1228, 500/50N, foll by nx at 1229 in either RR or Bulgarian (Ed.).

16066.7: IRO30, ANSA, Rome, Italy, w/nx in EE, 550/50R at 1735 (Ed.).

16300: NNNOMQU, USMC MARS, Quantico, VA, relaying MARSgrams at 1510, 170/75R (Ed.).

16343: YZ14, Tanjug, Belgrade, Yugoslavia, w/nx in EE at 1353, 425/50R (Ed.).

16348: CLN530, TASS, Havana, Cuba, w/nx in EE at 1645, 850/50R. W/PL nx in EE at 1956 (J.M.S., MO).

16618.9: 92NTX of the Spanish Navy w/tfc to 98DDX, Madrid Navrad, 850/100N at 0225 (Palkovic, FL, via Hetherington, FL).

16703.4: UZGH, Soviet hydromet weathership NISP Passat, in North Atlantic, w/wx rpt for UPMG, tanker Fyodor Poletayev, 170/50N at 1645 (Ricks, PA).

16695.9: UFJJ, Soviet oceanographic research ship Akademik Mstislav Keldysh, w/tfc in RR for UNM2, Klaipeda R., 170/50N at 1424 (Ricks, PA).

16696: Y5CC, GDR ship "Arkona," w/nx in GG, FEC at 1332, foll by list of "fx-positionen" of GDR merchant ships worldwide and times they were reported there. S/off 1352 w "das wars GW 73 bis ltr bibi de Y5CC SU" (Ed.).

17417: FFT41, St. Lys R., France, ending telex tfc at 1500, ARQ/250. Foll by CQ & Tfc list, FEC/250 (Ed.).

17417.8: Un-ID w navareas in SS, 75N at 1708. Very weak sig, Couldn't determine shift. Off at 1711 (Ed.).

17427.5: OFA, Helsinki R., Finland, w/ARQ telex tfc at 1714, foll by nx in Finnish, FEC, at 1717 (Ed.).

17472: RPFN, Monsanto Navrad, Portugal, w/RYRY, faxes, & 10 count, 850/75R at 1500 (Hetherington, FL).

18055: DFZG, MFA, Belgrade, Yugoslavia, w/nx in SC, 425/75N at 1524 (Ed.).

18215: VOA, Greenville, NC, w/nx in EE at 1600, 425/75N ("Bunky," IL).

18293: PL, Havana, Cuba, w/nx in EE at 1600, 425/50N ("Bunky," IL).

18310: RDT57, TASS, Krasnoirsks, USSR, w/nx in FF, 425/50N at 1625 (Ed.).

18350.2: KUP, Jamba, Angola, w/nx in EE at 1908, 425/50R (Palkovic, FL, via Hetherington, FL).

18504.3: ELRB, Monrovia Aero (Roberts Aport), Liberia, w/coded wx at 0258, 550/50R (Williams, CO).

18604: VOA, Greenville, NC, W/RYRY to VOA, Tangier, Morocco, FDM 85/75R at 1512. S/off msg at 1513 sent apparently by a hunt-and-peck typist, he was so s-l-o-w (Ed.).

18655: CLP1, MFA, Havana, Cuba, w/5F grps to Embacuba Guinea-Bissau et al, 500/50R at 1834 (Black, NY).

19048.2: Un-ID w nx in EE at 1550, 425/75N (Palkovic, FL, via Hetherington, FL).

19225: FDY, French Air Force, Orleans, France, w/RYRY at 1600, 425/50R ("Bunky," IL).

19237: Y7L36, GDR Embassy, Havana, Cuba, w/tfc in GG, 425/50N at 1545 ("Bunky," IL).

19324.5: KGWC, USAF Global Wx Center, Offutt AFB, Omaha, NE, w/TAF forecasts for various USSR towns, 850/75N at 2008. Each town was listed in DoD's "Soviet Military Power: 1987" as an ICBM base or ABM/BMEWS radar site (Ricks, PA).

19454: CLP1, Havana Meteo, Cuba, logged at 2043, 850/50R (Charlton, ON). The meteo station in Havana does not use HF radio for TTY xmsns. I pre-

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CIRCLE 91 ON READER SERVICE CARD

sume you saw a msg containing 5F grps, although your logsheet doesn't state what you intercepted, and you surmised it was coded wx. CLP1 is Cuba's foreign affairs ministry at Havana—Ed.

19528.4: JMG5, Tokyo Meteo, Japan, w/coded wx at 0331, 805/50R (Hal Bilodeau, IL).

19699.8: PL, Havana, Cuba, w/nx in EE, 425/50R at 2216 (Ed.).

20127: VOA, Greenville, NC, w/RURY, 1314-1315, 85/75N (Ed.).

20209.8: PL, Havana, Cuba, w/nx in EE, 425/50R at 2229. Not a spur of 20259.8, cuz off abruptly at 2322, while xmsn continued on higher freq (Ed.).

20259.8: PL, Havana, Cuba, w/nx in EE & A whop-ping S30 sig! Was 425/50R at 2317 (Ed.).

20327: 6VK221, PANA, Dakar, Senegal, w/nx in EE at 1535, 325/50R (Williams, CO).

20402: YWM1, Maracaibo Navrad, Venezuela, w/long-winded test tape reading, "Estacion radio Bolivar YWM1 saluda a los Hermanos Iantnitos" + "cinta de prueba RURY... SB..." 10 count, "IANTN comunica por la union de America." Was 850/75N at 2334, foll by brief ttc to his "colega" at 2339, then back to test tape (Ed.).

20481.6: VOA, La Union, Philippines, w/nx in EE at 0251, 339/75N (Bilodeau, IL).

20482.5: VOA, Greenville, NC, w/a circular to "all relay station managers," 425/75N at 2042. Circular was rptd many times (Ed.).

20532: Un-ID w a long s/off in SS. Either diplo or mil. Was 850/75R at 1545 (Ed.).

20560: JANA, Tripoli, Libya, w/nx in EE at 1611, 425/50N (Ed.).

20596: HBD46, Swiss Embassy, Havana, Cuba, signing off in ARQ at 1615 (Ed.).

20784.8: CLP1, MFA, Havana, Cuba, w/plaintext ttc in SS marked "urgente" and "muy urgente." Was 850/75R and 850/50R at 1528 (Ricks, PA).

20863: FDY, French Air Force, Orleans, France, w "test de FDY," le bricks, 10 count, RURY, FDYFDYFDY... Was 425/50R at 1323 (Ed.).

20910: Cape Town Navrad, RSA, w/AMVERS, 850/75R at 1307 (Ed.).

21985: Un-ID w/a damage assessment report for mosques and villages, 425/100N at 1530 (J.M., KY).

22223.9: UZYY, Soviet spaceflight tracking ship Kosmonaut Viktor Patsayev, w/F-2 tracking schedule for Science One via UAT, Moscow R., 170/50N at 1917. Was 405 nm east of Montevideo, Uruguay, headed NE to assigned retrofire pos at 22S35W, 3 wks prior to Soyuz TM-9 rendezvous mission w/MIR. Was monitoring MIR orbits 22518 to 22594 enroute (Ricks, PA).

22449.9: ROT, Moscow Navrad, USSR, w/wx & navigation info for fishing fleets at 1430, 170/50R (Ricks, PA).

22463.9: UFB, Odessa R., USSR, w/tfc list & nx at 1532, 170/50N. Also ttc to UUVO, Soviet tracking ship NIS Kosmonaut Vladimir Komarov, enroute to the Baltic Sea via Leningrad on an inland waterway system (Ricks, PA).

22587: URB2, Klaipeda E., Lithuanian SSR, w/msgs to ships at 1546, 170/50N (J.M., KY).

22592.5: UAT, Moscow R., USSR, w/nx briefs in RR, ARQ at 1430 & 1515 (Hetherington, FL).

22949: Y7L36, GDR Embassy, Havana, Cuba, w/RURY at 1520, 425/100N, foll by 5L grps at 1527, 425/50N (J.M., KY).

22967.2: HBD68, Swiss Embassy, Guatemala City, Guatemala, w/5L grps, ARQ at 1540 (Palkovic, FL, via Hetherington, FL).

23561.7: PCW1, MFA, The Hague, Holland, w/5L grp "circulaire(s)" & press review in Dutch. Was ARQ at 1326 (Ed.).

23697.6: DFX69H6, PIAB, Bonn, FRG, w/nx in GG, FEC-A/96 at 1445 (Ed.).

24300: Y7A90, ADN, Berlin, GDR, w/nx in EE at 1340, 360/50R (Hetherington, FL).

25015: 97KQU of the Spanish Navy, w/RURY & a msg to 98DDX, Madrid Navrad, 850/100R at 2110 (Hetherington, FL).

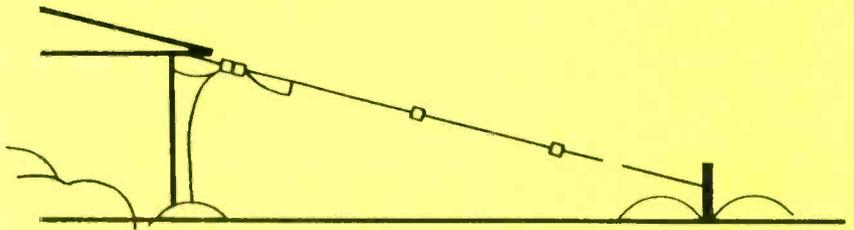
25417.5: DMK, MFA, Bonn, FRG, idling in ARQ, 1534-1605. Went to DCW to send VVV's & an ID (Ed.).

25437: OXZ, Lyngby R., Denmark, w/a telex in ARQ at 1730 (J.M., KY). W FEC nx in Danish, 1645 (Hetherington, FL).

26207: DFZG, MFA, Belgrade, Yugoslavia, w/RURY & crypto, 425/75N at 1500 ("Bunky," IL).

29897.9: MUN, an un-ID British sta, w/Z-codes in, msg to MUN1, 525/50R at 1530 (Hetherington, FL).

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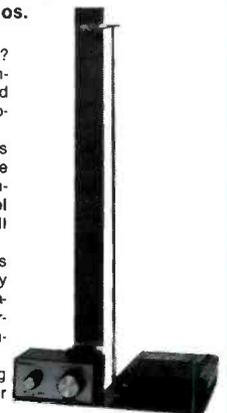
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Beaming In

(from page 4)

Ultimately, when you stop to think about it, there are very few individuals who will have any real use for *Caller ID*, although I could see its appeal to hotlines, public safety agencies, Domino's Pizza and some other companies. Most individuals who get this

will undoubtedly find that it is an interesting, but costly novelty that serves little practical purpose, and which will be generally unheeded after the first week or two.

Anybody who has it in their mind to place an obscene or harassing phone call, collect a bill, or seek to borrow money from their brother-in-law, in light of *Caller ID*, need not be especially creative to figure out that a series of calls from different pay telephones makes the entire technology meaningless.

There is no way a person with *Caller ID* can automatically and effectively pre-screen all calls. Imagine what would happen if a guy's wife gets stuck on the other side of town with a car problem. She calls home from a pay phone, but Mr. High Tech refuses to answer because he doesn't recognize the number. Rest assured that will be the last day for *Caller ID* in that household. Take my word on this.

Perhaps this would be useful if you decided that you would answer your phone only if a couple of specific numbers were going to call in, but wanted to ignore a large number of other callers. Otherwise, unless you actually answer the phone there doesn't seem to be a lot of value to *Caller ID* for most people. You'd really have to pick up the call. At that point, you could use the service to verify the number that an obscene caller gives you. Or, you could learn the number from which an obscene or harassing call was being placed. For most of us, there aren't very many times that such situations arise, and if you complain to telco about an obscene or threatening caller, they'll put an automatic monitor on your line at no cost until the problem ends. Even with *Caller ID*, once you've answered the call, you're sort of stuck with the party on the other end, unless you say the you're the butler and the people are out for the evening.

With or without *Caller ID*, you could always ask the caller for their number and, if it was really that vital to verify, call them back. You could just slam down the handset if it was a call you didn't want. Or, as I mentioned earlier, you could get an answering machine.

Fact is that while, from a technological standpoint, I can appreciate that it might be sort of fun to watch a caller's number come up on the LCD's, I'd say that it's something that's going to need a hard sell to convince the average person that it's going to enhance their life. How many obscene or harassing calls does the average person get? How many bill collectors constantly call to press for their money? Who needs this gimmick?

At this point, most of the paranoia isn't justified. *Caller ID* will have less appeal to individual users than telco thinks, but will probably serve a useful purpose to public safety agencies, hotlines, and commercial activities having a considerable and ongoing need for what it offers. For those individuals who think it might be convenient to filter out maybe two mildly bothersome calls per week, it's cheaper and easier to get an answering machine or simply hang up. Most individuals who sign up for a service when its first offered will quickly find it a useless novelty.

For now, telco is hyping *Caller ID*, and it has gotten lots of media attention. I suspect there's more smoke than fire here. But let's see how it evolves.

I'll have more to say as I get a picture of this thing in actual operation.

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Ham Column

(from page 63)

using the typewriter keyboard. The sample QSOs, similar to code tests, also help.

Along similar lines I bought (the Extra ticket is going to cost a fortune) some 20-WPM code test tapes that run QSOs similar to the tests. The only trouble with the tapes is that I find they're a "one-time" affair—I remember individual QSOs and anticipate the characters (Pamela from Fort Worth, hot weather, etc). I'll have to reserve the tape for final practice just before taking the test.

Although my experience may not be typical, it sure has been challenging! Every once in a while, however, a glimmer of hope breaks through. I was listening to W1AW one day when the practice session paused and the text and dropped down to the next lower speed which, much to my surprise, was 20 WPM. I thought I was copying 20 WPM, built was really copying 25. My typing seems to be improving but, again, slowly.

Another 20 hours should do it . . . — William Divine, KD3OW

As I write this (in March), Bill hasn't quite got his Extra Class ticket, but he's still working on it. No one can fault him on his effort, that's for sure! Good luck, Bill. By the time this appears in print, I'm sure you'll be signing your new Extra Class callsign.

If you'd like more information on recruiting older-than-average potential hams into the hobby, or would like to a complete schedule of W1AW code practice bulletins, drop me a line in care of ARRL, Department PCN, 225 Main Street, Newington, CT 06111. Photos and letters are also welcomed.

PC

Washington Pulse

(from page 64)

Radio Rules by relocating the frequency segments used by automatically controlled beacon stations operating in the 2 meter and 70 centimeter bands. The Commission believes that relocation will improve beacon station reception and make the information obtained from beacons more useful in conducting propagation experiments.

Amateur operators employ automatically controlled beacon stations that transmit a one-way signal to provide a means of determining quickly the propagation characteristics of certain amateur service frequency bands. Because these beacons transmit continuously, FCC rules limit them to low power and to segments of the band where the likelihood of disruption from and to other types of operation is minimal.

The Commission proposed changing the segment where beacons can operate in the 2 meter band from 144.05-144.06 MHz to 144.275-144.300 MHz, and in the 70 centimeter band from 432.07-432.08 MHz to 432.300-432.400 MHz. This proposal was in response to a petition from the American Radio Relay League, Inc., (ARRL) which also asked the Commission to change the segment where beacons can operate in the 1.25 meter band from 220.05-220.06 MHz to 220.275-220.300 MHz. However, the Commission declined to adopt this portion of ARRL's proposal stating that such a relocation would serve no useful purpose since all types of amateur station transmissions in the 220-222 MHz segment will be deleted when it becomes available for land mobile use.

PC

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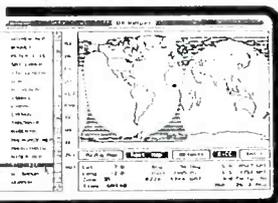


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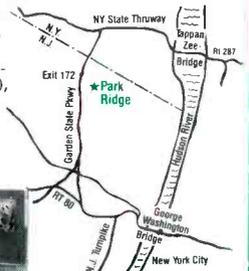


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Sensitivity:	.4uV Lo,Hi. .8uV Air. .5uV UHF. 1.0uV 800
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IF:	21.4MHz, 455KHz
Increments:	10,12.5,25,30
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High performance
receivers.

Scan the world bands with Kenwood's R-5000, R-2000 and RZ-1. Listen in on foreign music, news, and commentary. Monitor local police, fire, and other public safety services, as well as the Marine channels, and the many other services 50 MHz and above.

(The VHF converter options must be used in the R-5000 and R-2000.)

R-5000

The R-5000 is a high performance, top-of-the-line receiver, with 100 memory channels, and direct keyboard or main dial tuning—makes station selection



R-2000

The R-2000 is an all-band, all mode receiver with 10 memory channels and many deluxe features such as programmable scanning, dual 24-hour clocks with timer, all-mode squelch and noise blankers, a large, front-mounted speaker, 110 volt AC or 12 volt DC operation (with the DCK-1 cable kit), and 118-174 MHz VHF capability with VC-10 option.

Optional Accessories R-2000:

- VC-10 VHF converter
- DCK-1 DC cable kit for 12 volt DC use.

R-5000:

- VC-20 VHF converter
- VS-1 Voice module
- DCK-2 for 12 volt DC operation
- YK-88A-1 AM filter
- YK-88SN SSB filter
- YK-88C CW filter
- MB-430 Mounting bracket.

Other Accessories:

- SP-430 External speaker
- SP-41 Compact mobile speaker
- SP-50B Mobile speaker
- HS-5 Deluxe headphones
- HS-6 Lightweight headphones

super easy! Other useful features include programmable scanning, large, built-in speaker, 110 volt AC or 12 volt DC operation (with optional DCK-2 cable), VHF capability (108-174 MHz) with the VC-20 option, dual 24-hour clocks with timer, and even voice frequency readout with the VS-1 option.

RZ-1

Wide-band scanning receiver



The RZ-1 wide-band, scanning receiver covers 500 kHz-905 MHz, in AM, and narrow or wideband FM. The automatic mode selection function makes listening

easier. One hundred memory channels with message and band marker, direct keyboard or VFO frequency entry, and versatile scanning functions, such as memory channel and band scan, with four types of scan stop. The RZ-1 is a 12 volt DC operated, compact unit, with built-in speaker, front-mounted phones jack, switchable AGC, squelch for narrow FM, illuminated keys, and a "beeper" to confirm keyboard operation.

- Optional Accessory
- PG-2N Extra DC cable

KENWOOD

CIRCLE 109 ON READER SERVICE CARD

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