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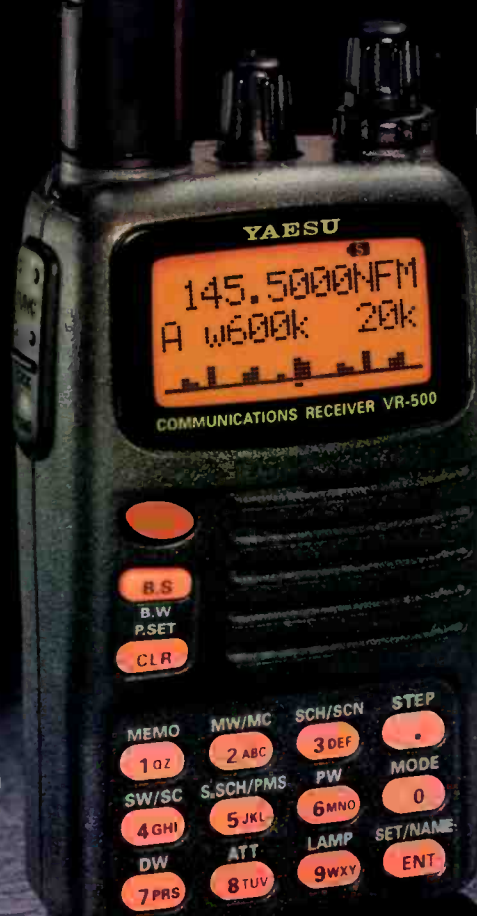
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Contents

POPULAR COMMUNICATIONS

Volume 19, Number 1

September 2000



20

10 DXing The TV Bands: An Unusual And Exciting Hobby
Super Long Distance TV Reception Is HOT! by William Eckberg

16 Radio's Original Tower Of Power
On Top Of Old Sparky, All Covered With Clouds! by Alice Brannigan

Product Spotlight

59 • Fineware's 'Smart Icom' Software by Ken Reiss

20 *Going Mobile On High Frequency, Part 4: Debugging The Noise* Radio Resources

24 *A Call For Help!* The Radio Connection

28 *Special Theme: Radio-Related Clip Art* Radio & The Internet

30 *One For The Books* CB Scene

35 *Anti-Iranian Clandestines Being Heard, And Radio Chechnya's Current Sked* Clandestine Communiqué

36 *Catching Tower Communications* Plane Sense

40 *Navigating International SW BC Bands The Easy Way* World Band Tuning Tips

44 *Skyhooks For Scanners!* ScanTech

50 *Voice Of Hope Airs From German Transmitters, And New South American SW Stations On The Air* The Listening Post

56 *The Marconi Antenna* Antennas & Things

62 *Antenna Rights: FCC Protects Consumers* Broadcast DXing

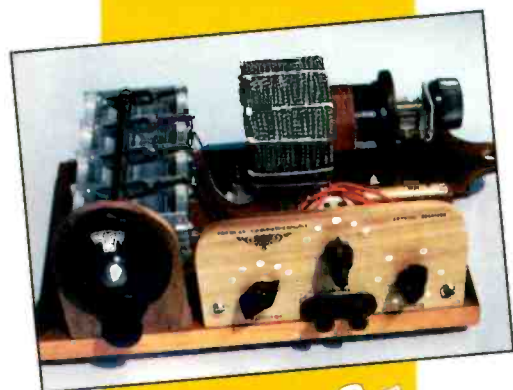
65 *Aeronautical Services Theme, And Utility Clubs, Organizations And Newsletters* Utility Radio Review

72 *Stealth Radio Operating Techniques* The Ham Column

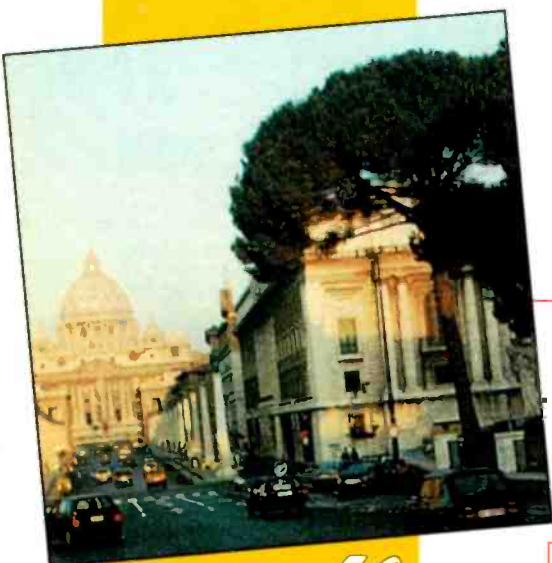
74 *Congress' Good Old Boys At It Again* Washington Beat

78 *Pirate Activity Cools Down This Summer* Pirate's Den

80 *Norm's Idea Of A Good Time* The Loose Connection



24



50

Departments

- 4 *Tuning In* — An Editorial
- 6 *Pop'Comm P.O.* — Letters
- 19 *How I Got Started*
- 42 *Product Parade*
- 79 *Readers' Market*

On The Cover

The beautiful Eiffel Tower is not only a transmitting site for Radio France, but in the past it was used for two-way radio and even transmitted CW! Read this month's Alice Brannigan's "Radio's Original Tower Of Power" on page 16 to learn more. (Photo courtesy of the French Government Tourist Office)

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TUNING IN

An Editorial

Keeping Track Of Indiana's Cops

Imagine it's your day in court, the judge has looked over the evidence and just said, "dismissed." You're out of there, right? Think again — this is the *new* America, folks. As the paperwork was handed to the bailiff, the case gets referred to the prosecutor! It apparently happened to Josh Church, N9VKS of Indiana who was ticketed for illegal possession of a police scanner. That alone *should* be enough to make any law-abiding citizen's blood boil — radio enthusiast or not. I get especially upset with cases like this because I personally don't agree with states and municipalities having asinine laws on the books exempting *hams* from laws prohibiting mobile scanner use. Why not also exempt CBers? They also provide emergency and disaster assistance. Just ask the folks in Miami who were devastated by Hurricane Andrew a few years ago. There's nothing holy about hams, including their service during disasters that should give them special status.

I've been a scanner user for a number of days — actually since the '60s, and a ham for only six years. It just doesn't make sense to me that anyone would get their ham license just so they can have the legal right to use a mobile or portable scanner, no more than it makes sense to become a cop just to carry a gun. (Sorry, a bad analogy today). Either we work in concert, raising hell about dumb ill-conceived laws and get them repealed, or the system will keep rolling over us until we flat out cry "uncle."

So in my estimation, it certainly doesn't make sense that any state, not in this country at least, would enact such an outrageous law. But they have, and continue to do so. We've said it before, and will repeat it with our last breath that criminals don't give a hoot about anti-monitoring legislation. If they're crazed enough to rob the convenience store or steal your car what makes legislators think tacking on a misdemeanor charge of possessing a mobile scanner will accomplish? Point is a person intent on breaking the law and avoiding police detection could care less about laws such as Indiana's Code 35-44-3-12.

Josh Church's case has again — for a second time — been dismissed, hopefully once and for all. That still doesn't negate Indiana Code 35-44-3-12, enacted in 1977 and amended in 1994 that talks about possession of "a police radio." Hmm, here we go again with bureaucrats not knowing a police *transceiver* or a *scanner* from a box of Dole Bananas. The Indiana code specifically addresses possession or use of a *police radio*, then goes on to define it as "a radio that is capable of sending or receiving signals transmitted on frequencies assigned by the Federal Communications Commission for police emergency purposes and that can be installed, maintained, or operated in a vehicle or can be operated while it is being carried by an individual."

Of course there are the usual exemptions for government entities, cops and for "a person who holds an amateur radio license . . ." and if it's used in a dwelling or place of business. And, appropriately, the Indiana law addresses use of such a radio to further the commission of a crime or avoid law enforcement detection. You don't have to be the brightest light bulb in the box to clearly see that this law regarding "a police radio," needs to be fixed. By definition, your scanner, if used mobile in Indiana is a police radio. Funny, I've always thought of a police radio as the two-way radio that cops use to take and receive calls. Indiana's dumb law doesn't even *require* the scanner to be in actual operation; the mere installation or placing of the scanner on a car seat is a crime in the Hoosier State! And don't even think about carrying a scanner down the street in Indiana. But it's OK to have one inside your "dwelling" as the law specifically states, "the term [police radio] does not include a radio designed for use only in a dwelling." So in Indiana you could be a criminal hard at work with a scanner — as long as you do your "business" inside a "dwelling." Very strange. Sounds like Indiana law enforcement is doing some serious doublespeak and that

(Continued on page 77)

BY HAROLD ORT, N2RLL, SSB-596

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readers

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Each month, we select representative reader letters for our "Pop'Comm P.O." column. We reserve the right to condense lengthy letters for space reasons and to edit to conform to style. All letters submitted must be signed and show a return mailing address or valid E-mail address. Upon request, we will withhold a sender's name if the letter is used in "Pop'Comm P.O." Address letters to: Harold Ort, N2RLL, SSB-596, Editor, *Popular Communications*, 25 Newbridge Road, Hicksville, NY 11801-2909, or send E-mail via the Internet to <popularcom@aol.com>.

Freebanding: Questionman's Views

Dear Editor:

I am 24 years old and really enjoy reading *Pop'Comm*, as it is a very informative magazine. Keep up the great work. By the way, my favorites are "CB Scene" and "Readers Speak Out."

OK, here are my thoughts on Freebanding. Why is it that there are operators in the ham community that look down on us Freebanders? Is it because they think they are better operators? Well, I have been Freebanding for about two years now and my current equipment includes a Galaxy Saturn modified 10-meter base. ParaDynamics 7000 meter, a D104 Silver Eagle desk mic all hooked up to an Antron 99 base antenna mounted on a five-foot mast. I consider myself a good operator as I'm always polite and courteous to other operators. I don't use foul language on the radio, and am always trying to help out other people if I can, and even though my radio can go into the 10-meter band, I will not transmit in that band as that would be rude and in very poor taste!

I usually use the AM mode to talk to my local operators and SSB for long distance contacts. I don't know if I'll ever get my ham license, but for right now I'm enjoying my hobby. I can be found monitoring 27.655 USB or if I'm not there, I'll be on Channel 19 AM talking to the locals. My SSB No. 210 Papa Alpha and on AM mode I go by the handle Questionman. I usually don't operate until after 10 p.m., so as not to disturb my neighbors or parents. I talk to anybody if they are in the area. In closing, I think they should legalize Freebanding as it is a great hobby. After all, isn't it really about making new friends and helping other people first? I hope other Freebanders will see this and feel the same way.

By the way, what Freebanding channels would be legalized by the FCC someday in your opinion?

2.Div 210 Papa Alpha
Pennsylvania

Dear Questionman:

Thank you for your letter and kind comments about *Pop'Comm*. We try very hard to give our readers a multitude of radio topics to enjoy every month. That also includes *Freebanding*, which gives some folks their jollies. In short, *Freebanding* — however anyone defines it — is all about operating a radio transmitter on frequencies not assigned to the

operator. The FCC considers freebanding a very serious radio offense. We'll continue to report on Freebanding activity. We also report on pirate radio activity. But we aren't giving folks articles on souping up Radio X or pirating instructions. My feeling is that folks will instinctively find what they need to operate on the radio to achieve a high jolly factor. For some it's Freebanding, others it's using FRS radios, still others derive great pleasure from monitoring the feds. And guess what? Any one of those activities — yes, including using FRS if it interferes with a licensed GMRS user — could be stepping on another person's radio toes, and perhaps illegal. Have fun but be careful.

Dear Editor:

Regarding Alan Dixon's submission of petition to amend FCC rule 95.413 (a)(9) CB rule 13, I love it. If in fact the FCC does amend the rule so that one can legally shoot skip, then it will be time to maybe set up an awards program similar to those offered by CQ and the ARRL. But only for those CBers using legal radios. I mean it's all fine and dandy if you've got the biggest footwarmer in the state, but to shoot skip with a legal radio can be a real art form all by itself — that is until Uncle Charlie decides to lift the CB output wattage limit.

Larry Baker
KE6KXU
Gatorbait

Dear Larry:

Of course what the FCC should do and what they will do is anyone's guess. Giving the radio public the legal green light to talk more than 150-miles on 11-meters would be the smart thing to do, especially since this is still America and the overwhelming CB radio community is all for it, but my gut feeling is that they'll soon dismiss the whole matter, once again turning their backs on this ancient 150-mile rule favoring the status quo. Many hams will tell you that it's just another case of caving in to whiners and radio renegades and that lifting the distance limit will encourage other illegal operation. Oh, baloney! Fact is, people, ideas, and sentiments change over the years. If they believe otherwise, they're lying to themselves. Let's face it, most people using otherwise legal, unmodified CB radios without linear amplifiers shoot skip. This is not rocket science. The ionosphere supports long-distance radio on 11-meters, Uncle Sam deliberately put CBers there and then made an absurd rule making shooting skip illegal. Go figure.

Great Radio!

Dear Editor:

Thank you for your review of the ICOM R-2. Mine included two NiCd batteries, a charger, and TMA-to-BNC antenna adapter. The R-2 has many pluses and few negatives. The triple conversion circuitry and the attenuator help keep strong stations at a distance. The VFO/memory feature helps me manu-

ally track air band calls. And it covers TV channels 14-69 where the UPN, Fox, WB, Fox, PAX, and PBS stations are. And the size is a plus. Nice radio!

Normal W. Hill
Virginia

Ralph Disagrees

Dear Editor:

I read Gordon West's article in the November (1999) issue of *Pop'Comm* and found at least two statements with which I disagree. First, that the Red Cross is usually the first to arrive. Granted, this may be true in areas where there is a very strong chapter and the members are pro-active in the event of severe weather, etc. From my experience, the Skywarn, ARES, and RACES amateur radio groups are already on duty before the disaster hits and then they have to help the local disaster people cope with the problems, especially if the local infrastructure has been disabled by a strong F3 tornado as was the case here in Clarksville, Tennessee in January 1999. Also, it is quite helpful if the local EMA personnel are pro-active with the EOC instead of trying to catch up after the fact.

Also he said the Red Cross has its own communications system. Again, this is particularly true for a large urban chapter that has *lots* of support and can justify the expenditure of funds — scarce for a small chapter. In the case of the Clarksville (Montgomery County) chapter, they are primarily dependent on local hams for their communications.

Another thing that can adversely affect the response of both local government and the Red Cross is the lack of adequate and effective weather information from the NWS via NWR. In January, the only warning that was received was from a NWR site about 36 miles away with a signal strength of S2! Within the past two weeks, there has been a NWR transmitter installed here in Clarksville — this unit will provide clear and timely weather data to this part of Tennessee and parts of Kentucky.

73,
Ralph A. Brigham, KG4CSQ

VOA Cutbacks

Dear Editor:

First I have to say, outstanding mag! Keep up the great work! Your "Tuning In" editorial for May was, as always, great. But there is one group that you had forgotten. Our women and men in uniform overseas. While in Germany for two years, my roommate and I listened to sports via VOA. While deployed to Bosnia and being on a remote hilltop, that was only 200m x 200m and the closest camp about two hours away, we listened to the VOA for news and information from "home" and in the region. These cutbacks are not only a grave disservice to the people that enjoy the programming, but to the people that rely on them as well. Keep up the great work!

Chris Halinar, PA

Just A Second, Hank

Dear Editor:

"Atomic clocks" tuned to WWVB are great and are available now for less than \$30. Certainly the circuitry can't cost much at all. Why haven't they appeared on table model shortwave radios, or VCR's or clock radios for that matter? What about on

car clocks or any electronic clocks? What am I not understanding? P.S. I enjoy the magazine each month. Thank you.

Hank Teich, Asheville, NC

Dear Hank,

I've been wondering about the same thing for a long time — and don't have an answer. But then again I've also been wondering why we can't, in the 21st Century, have decent socks that stay up, bulbs that don't burn out and airplanes that get me home on schedule. I guess some things aren't meant to be understood by you and me.

Congress And The Lawyers

Dear Editor:

I found the article "Washington Beat — CB Radios 155 Mile Rule Petition Update" very interesting. As a CB aficionado since 1980 and equipping my Chevy Camaro with a CB, I was very disturbed with this article. Yes, the FCC once had engineers and technical types running the show, but it is disappointing that lawyers at Congress want to get their hands in every cookie jar. Lawyers dominate all aspects of society and its time that we stand up to them and tell them to stop. This issue with the CBs is just another example. The June issue of *Popular Communications* was quite insightful!

Sincerely yours,

Paul Dale Roberts, Chief

Northern Region I / Central Region II/Southern Region III

Dept. of Community Services and Development

Elk Grove, CA

Get Out.

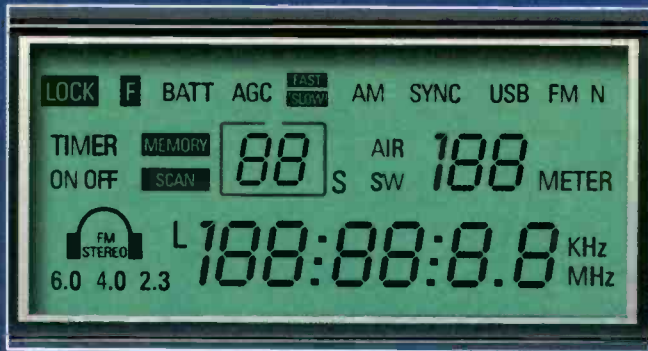
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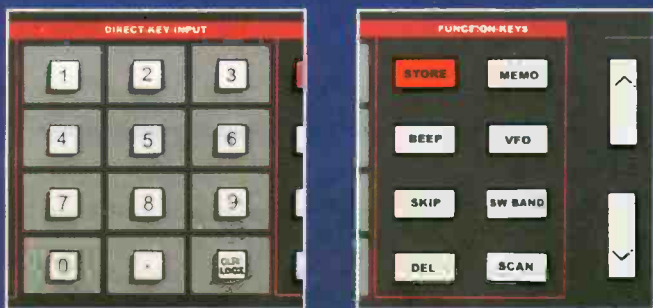
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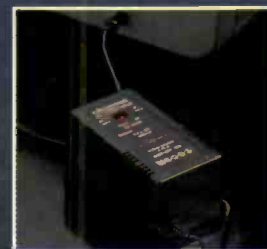
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DXing The TV Bands: An Unusual And Exciting Hobby

Super Long Distance TV Reception Is HOT!

By William Eckberg

I confess. I look at snowy TV pictures for hours on end. I even take pictures of these snowy pictures. I'm a TV DXer. Forty-five years in the hobby can't calm the excitement when someone calls me in Illinois from a distant city and says, "I'm watching tropo into your area this minute, what do you see?" A few years ago, someone phoned from New York State in midwinter and said, "I just received double-hop E's from California. What do you see?" I painfully admitted I hadn't even turned on the TV.

Why do we TV DX? Is it because no two openings are exactly alike? Or the thrill of the unknown? What kind of receiving equipment do we use? And what do all these strange terms mean — tropo, double-hop E's? In this article, I'll explain these terms and give accounts of some bizarre TV DX.

Many DXers take pictures of the sta-

tion's call letters as they briefly flash on the TV screen, and a large number of DXers are even drawn into the technical aspects of the hobby. What antenna, preamp, or receiver is best, and why? Still others like receiving a QSL letter of verification. (I've even seen a panel truck covered from headlights to rear bumper with TV and FM logo stickers. Yet another DXer was seen with a TV antenna projecting through the sunroof of his car!)

In the '50s regular columns appeared in *Radio Electronics* magazine detailing DXer's reception reports, which was first written by E.P. Tilton and later Bob Cooper. The band, in those days, was wide open beyond the large cities. VHF was king, and new stations were coming on the air monthly. Many UHF stations left the air as abruptly as they began operations. They were unable to compete with VHF.

Little interference was present — this was indeed the golden age of TV DXing.

A Little History

The American Ionospheric Propagation Association was the unlikely name of the first TV DX organization. Formed in western New York State by several folks in the early '50s, it operated for 10 years, mailing its last bulletin July 12, 1963.

The current organization began in 1967 and is called the Worldwide TV-FM DX Association. The founders were Gary Olson and Morrie Goldman. The first club bulletin, termed a sample issue, was dated September–October 1967. Their first convention was held in Steger, Illinois in May 1969. Recent locations include Lake Placid, New York; Estes Park, Colorado; Atlanta, Georgia; and Nashville, Tennessee. A club publication called the *VHF-UHF Digest* is sent out monthly. Members interested in FM and satellite reception are also accommodated. Late-breaking TV reception reports are covered in the Western and Eastern TV DX sections, and numerous columns are also included in the Digest.

Unusual Loggings Via Sporadic-E

VHF TV channels 2 through 6 cover 54 to 88 MHz. VHF channels 7 through 13 cover 174 to 216 MHz. UHF channels 14 through 69 cover 470 to 806 MHz. (A channel 1 was assigned and deleted during TV's infancy.) Channel 37 is reserved for radio astronomy and 70–83 were dropped a few years ago.

E-skip is an important mode of long distance TV reception. The station's signal is reflected off the E region of the ionosphere at a height of about 60 miles.



Interesting verification card from Cuba received in 1961.



TV DXers outside "The Weather Channel" in Atlanta in August 1997. TV personalities Jill Brown and Dan Atkinson had just taken us through the facilities. The WTFDA convention was nearby.

The picture is typically strong and ghosting. Since the '50s, TV DXers have noticed E-skip is associated with intense thunderstorms. Recent research might prove us correct. Unusual flashes occur above thunderstorms called red sprites, blue jets, etc. Most E's activity occurs from May to August. Activity also develops near the shortest day of the year in December. It's first noticed on channel 2 and can rapidly move up through channel 6 into the FM band. Normal DX range is 700 to 1,400 miles. Twice I've seen it under 500 miles.

In rare instances, activity will reach channel 7 and higher. In June 1995, Jeff Kadet and Frank Merrill of Macomb, Illinois, logged CIPA channel 9 in Prince Albert, SA, at a distance of 1,130 miles. E's reach channel 12 — probably a once-in-a-lifetime opening.

The western states abound with many channels 2 through 6 low-band translators (low-power relay of a primary station on a different channel). Unbelievably, on June 9, 1977, two DXers at nearby locations in New York logged KGIN channel 11, Grand Island, Nebraska, on channel 4. After extensive research, they determined reception to be a very low-power translator in McCook, Nebraska!

One or two DXers a year will see double hop E's. Distance is typically 1,500 to 2,500 miles. A typical 2E opening happened in June 1990. Bob Seybold received Phoenix channel 3 and Flagstaff channel 2 at a distance of 1,800 miles. He also saw a very short skip on channel 3 in Harrisburg, Illinois, (600 miles) from his western New York location. I have seen

2E three times in the past, namely San Salvador and Los Angeles on channel 2. Seattle on channel 5 was a more recent reception. Many times a short skip station is in the mix, which might be a tip-off that highly unusual conditions are present conducive to 2E, which is strong and ghosting, similar to single-hop E reception.

How 2E occurs is debatable. The signal can bounce from two or more ionized clouds then return to Earth. The signal can go to an ionized cloud, be reflected back to Earth or water, be reflected to another ionized cloud and finally bounce down to your receiver. Either way, several reflective objects must be aligned between the TV transmitter and your receiver. Two or more ionized clouds will not line up for long, explaining the short duration of 2E reception. Very short E's indicate extreme turmoil in the ionosphere and possibly many highly ionized clouds between you and the transmitter. Michael Wimer of Woodbridge, Virginia, snapped a rare photo of 2E reception — a 1,600 mile path from Virginia to Puerto Rico.

Unusual Loggings Via The Troposphere

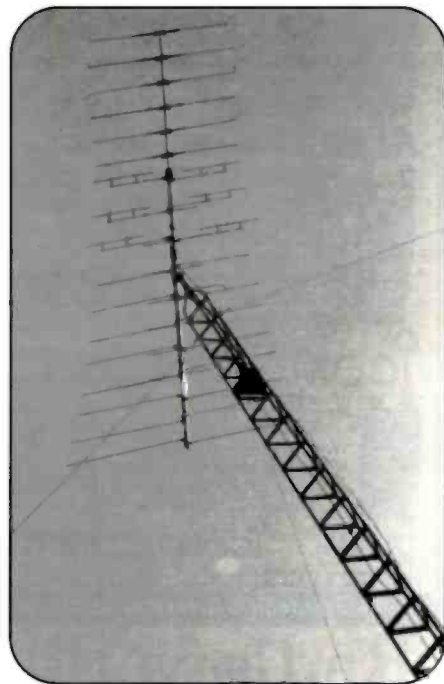
TV reception via **tropospheric bending** is another important propagation mode. UHF channels 14 to 69 reign supreme followed by VHF channels 2 through 13. Tropo is a phenomenon of the lower atmosphere.

Fernando Garcia of Guadeloupe is the long-distance tropo king of the TV bands. From a high elevation in northern

Mexico, he has an all-water path to south Florida and Gulf coast TV stations. Spring and fall seem to be the best times for him. He frequently has 1,200-mile tropo into central and south Florida and has recently seen tropo into Iowa.

Another area excellent for tropo is the outer banks area of North Carolina. An all-water path stretches to south Florida and along the eastern seaboard into the Maritime Provinces. The first high hills in western New York State presents an opportunity for 1,000-mile tropo to Texas and the Gulf coast. These are among the best locations in the U.S.

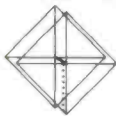
From northern Illinois, the best direction for tropo is down the Mississippi River from July to October. Many good openings can also occur in mid-winter. Tropo can materialize anytime there's a mixing of hot and cold air masses. Strange tropo ducts occur unexpectedly. A line may be drawn to a distant city, and only stations in a narrow band are received. A much closer station on the same channel, in exactly the same direction, and on the air, is often absent. And only a portion of the UHF band is sometimes affected. A single snow-free UHF station in a remote city with many UHF stations can appear, then suddenly the station will vanish. Theory says a duct has a top, sides, and sometimes a bottom. It can be the straight portion of a weather front, and distance is unimportant. The transmitter can be 600 or 1,000 miles distant, and be received like a local station. Channel 26 in



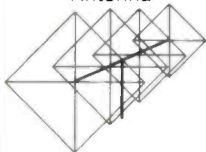
Channel Master's 1110 VHF antenna looking west for E-skip.

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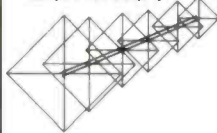
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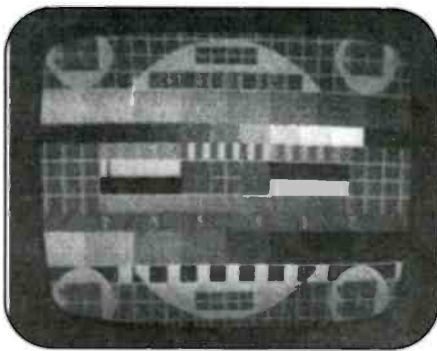
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1,350 E-skip to Mexico hits the bullseye at Monterrey.



A "Cuban Phillips Test Pattern" on channel 3, an E-skip logging over 1,400 miles. Castro ran this test pattern all day for years.

Augusta, Georgia, is a personal logging I attribute to a duct. WAGT was 725 miles distant and briefly snow-free. Ordinarily tropo is more widespread, but duct type openings are routinely missed — an amazing form of DX that's seldom seen.

Other Types Of Propagation

Meteors continually penetrate the ionosphere. A small area is ionized and TV signals are then reflected. Channels 2 through 6 are the primary channels affected.

Lightning scatter is the domain of the UHF band. In Indiana recently, Cincinnati, Ohio's UHF stations were pulsating and watchable at a distance of 325 miles.

Another form of propagation is the aurora borealis or northern lights, which primarily affects the lower TV bands. Check Internet Websites for aurora alerts.

Screened Dishes, Preamps, And Hot Receivers

Serious DXers spend thousands of dollars on receiving equipment, but you don't have to! Mike Condon of Poynette, Wisconsin has installed an elaborate antenna array atop a 160-foot tower on a

hill 850 feet above sea level. But numerous DXers see 600-mile tropo and 1,300 mile skip on rabbit ears and small outdoor balcony antennas or pole-mounted or attic antennas. TV DXers' most important attribute is knowing when and where to look!

Channel Master's 1110 is the most popular VHF antenna. DXers like the 1110's superior front-to-back ratio and pattern. Although it has been discontinued, other comparable VHF antennas work quite well for DXing.

Channel Master's seven-foot dish (model 4251) which has high gain and sharp directivity, is the most popular UHF antenna. Many TV DXers screen the antenna with chicken wire. I screened it with the elements of an identical antenna. Both methods work fine to improve the front-to-back ratio dramatically. Gain is improved in the upper reaches of the UHF spectrum.

The preamp sets the noise figure for the entire system. Many DXers use RDX Lab's custom-built UHF preamps. I have the UA-903 with 15dB gain and a 1.0dB noise figure. Incorporated is a special design with very high overload resistance for strong signal areas. The UA-902 is also available with 27dB gain and a 0.4dB noise figure for DXers in isolated areas. They contain the latest GaAs FET circuitry and are available on special order. VHF and FM preamps are also available.

The weak link for the TV DXer is the TV receiver. No one builds one to fit DXer requirements, as we comprise such a small group. In contrast, hams and FM enthusiasts can buy excellent receivers. TV DXers solve the problem by purchasing a TV set for each use. Receivers used include the 1966-era 14N22 Zenith black and white. Zenith L and N1310 13-inch color sets (circa 1979-1982) are also popular. A 1990-era nine-inch AC/DC Zenith color receiver (G0930Y) is good. The latter set's push-button electronic tuning is nice during a fast-moving tropo opening. Other suitable sets are available. The more recent receivers have better traps in the IF to prevent the audio and video components of the signal from bleeding into the adjacent channels and destroying a weak signal, but the early sets have a vertical hold control. Many stations astutely place their call in the sync bar so the picture must be manually rolled to see the call. A vintage receiver is mandatory for meteor scatter DX. Those Zenith L and N1310 TV sets are a good compromise, if they can be found.

One useful feature that's helpful to the



KXLF-4 in Butte, Montana, was signing off with the national anthem. Early morning E-skip is rare — distance was 1,200 miles!

DXer is only found on an ICOM. Several DXers own the ICOM R-7000 receiver or the newer R-7100. A video adapter and separate monitor can be added. TV transmitters on the same channel will have (+), (0) or (-) offset audio. Stations on the same channel and with different offsets can be heard individually with an ICOM. It also gives the illusion of being more sensitive because it has the option of a narrow FM filter which is used to separate the different TV audio offsets.

Weak, distant UHF reception, received under normal conditions, is called tropo scatter. I see and hear weak fading signals to 375 miles every day, achievable under normal conditions with a sensitive antenna system and TV receiver. Minneapolis,

Equipment Sources

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FAX: 919-989-2200

RDX Labs
P.O. Box 88
Derby, KS 67037

Rohn Industries
6718 W. Plank Road
Peoria, IL 61604
Phone: 309-697-4400

Worldwide TV DX Association
P.O. Box 501
Somerville, CT 06072

Kansas City, and Cincinnati UHF stations are a few that reach my home. An ICOM can extend the audio of these stations about 100 miles!

A Rohn No. 25 crankup tower supports my UHF antenna. It's only 52-feet high as the area is severely congested with UHF stations. The signal strength of a nearby station rises faster than a distant one with increasing antenna height. A 52-foot height will avoid most ground reflections. Of course ideal antenna height can

be higher in a fringe area. A VHF antenna can be lower for sporadic-E on channels 2 through 6. I use a Yaesu G-400RC rotor and 130-feet of Jerrold RG11 cable for UHF. The VHF antenna is on another tower.

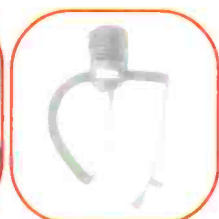
But the fact is, you don't need thousands of dollars of antennas, towers, TV receivers, and rotors — more than anything patience is a virtue and knowing where and when to tune in will get you superb TV DX results! ■

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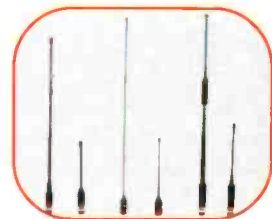
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CIRCLE 160 ON READER SERVICE CARD

Radio's Original Tower Of Power

On Top of Old Sparky, All Covered With Clouds!

By Alice Brannigan

When France was getting ready to celebrate the French Revolution with the Centennial Exposition of 1889, in 1886 the government held a competition for the design of a monument. Though many suggestions were offered, the winning one was that of Alexandre-Gustave Eiffel (1832–1923), a leading mechanical engineer who had designed many bridges, as well as the framework for the Statue of Liberty. Eiffel proposed and designed a cloud-topping 300-meter (984-foot) open-lattice tower fabricated from wrought iron. Nothing like it had ever been constructed. It would be the world's tallest manmade structure, soaring twice as high as the Great Pyramid of Giza and the dome of St. Peter's Basilica in the Vatican. There were those who complained the large tower would be inappropriate, vulgar, extreme, and ugly, as well as unsafe.

Eiffel's tower was built anyway, right in the middle of Paris, where it was scheduled to stand for 20 years. Elevators took a continuous stream of visitors to the tower's observation deck. Still, as 1909

approached, when its scheduled 20-year lifetime would end, plans were being made to take it down. The Paris city fathers eagerly awaited that day. Police arrested Victor Lustig, a con artist, who seized the occasion to fraudulently "sell" the forthcoming remains of the Eiffel Tower to two gullible scrap iron dealers. Eiffel and his supporters were horrified at the thought of the tower being destroyed. They conceived a list of reasons why it should be spared.

More Than Just A Trinket

For one thing, Eiffel had discovered that the huge tower was an ideal wireless receiving antenna that brought in stations from all over the world. He convinced the government the tower was an aesthetic beauty, engineering masterpiece, and valuable tourist attraction. But mainly, the tower's wireless potentials caused the government to decide the structure was more than purely decorative, it was truly functional and needed to remain for national defense purposes as the antenna of a new military wireless station.

In 1910, the Eiffel Tower's wireless station was installed and operated from the base of the tower by the French Army Signal Corps. The transmitter used the distinctive call letters "FL," which instantly identified its location. This was a spark station that originally sent out weather bulletins and time signals, then (eventually) press information. The station initially operated on 30 kHz, 111 kHz, and 120 kHz. The antenna consisted of a wire suspended from the top of the tower. By 1920 and at least into the 1930s, this station was operating with CW under the call letters FLE in the Fixed Public Service. FLE operated on 41.7 kHz, 113.2 kHz, and 4081.6 kHz.

Finding Its Voice

In early 1922, the Eiffel station installed an experimental radiotelephone transmitter and began conducting two-

way tests. This was to explore the feasibility of air/ground radio, ship/shore radio, and duplex point-to-point radiotelephone service between Paris and London. Several broadcasts of musical concerts were conducted in addition to the two-way work. This 800-watt transmitter had more than a 1,500-mile range, being received in North Africa at good level on a loudspeaker. The tests were in anticipation of a higher power transmitter being installed at a later date.

As the 1930s arrived, in addition to its point-to-point CW station, the Eiffel Tower had become home to a full-fledged 10 kW long and mediumwave broadcasting station. This operated at various times on 182, 208, 214, and 1456 kHz, also shortwave on 6120 and 9230 kHz. The operations on 1456 kHz (206-meter wavelength, near the 200-meter edge of the broadcasting band) meant this was a unique station with a tower structure capable of accommodating a fullwave vertical antenna. The station was widely heard. By then, the Eiffel Tower had become generally acknowledged as an engineering marvel, an aesthetic gem, and the signature landmark of the Paris skyline. It had become unthinkable to consider tearing it down.

For more than 40 years (until the Empire State Building was constructed) the Eiffel Tower remained the world's tallest manmade structure. Today the Eiffel Tower is used as a TV and *Radio France* transmitting site. Recently, *Architectural Record* magazine named the Eiffel Tower as number four of the world's 10 greatest existing architectural wonders. Saved by wireless! *Le vrai n'est pas toujours vraisemblable.*

Band Plans

We have often mentioned that (in the U.S.) the AM broadcasting band has been repeatedly expanded and realigned in order to keep up with the needs of the service and with changes in technology. We have had numerous reader requests for an



Here's an eyeful of M. Eiffel's beautiful 984-ft. tower. Makes a great antenna, too.



Station FL's personnel near the huge lead-in wire and insulators at the tower's base.

overview of the major milestones affecting broadcast frequency assignments in the U.S. These are the most significant.

From the end of 1921 until early 1923, broadcasting was mostly limited to what was then known as "the common wave," a wavelength of 360 meters (833 kHz). Some stations were granted special additional authority by the U.S. Dept. of Commerce to also use 619 kHz to broadcast market reports and weather information. A few "better" stations were authorized to operate on 750 kHz. By early 1923, there were too many stations jammed onto 833 kHz, so the American band was expanded. The new band consisted of channels spaced at 10 kHz intervals from 550-1350 kHz, except for a gap at 980-1040 kHz reserved for maritime and military usage. Stations were reas-

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signed from 833 kHz to the newly available frequencies. As of 1925, the band had been further expanded to cover the range of 550-1500 kHz without any gaps.

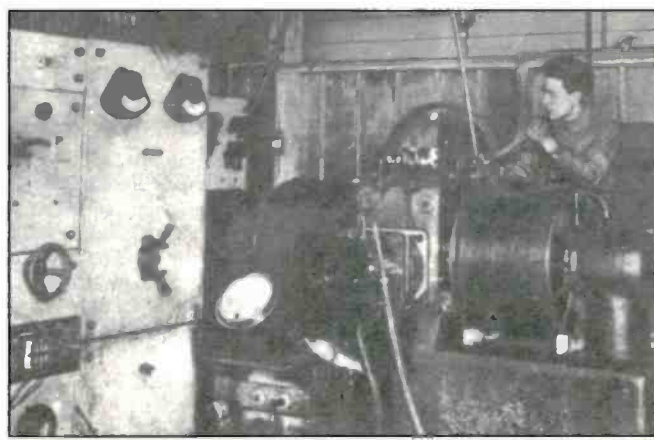
When 1926 rolled in, broadcasting had become such an overwhelming success that it defied control by the Dept. of Commerce. Stations were changing frequencies and power without authority in order to drown out their competition. Unlicensed stations were abundant, even though anyone who requested a station

license was issued one. The interference was so severe it made listening a challenge in many areas. The public was furious, so were many broadcasters. The Dept. of Commerce was stripped of its regulatory authority.

On April 26, 1927 the newly created Federal Radio Commission began taking steps to get the broadcasting service under control, as demanded by Congress. While the FRC didn't create an absolute blood bath, the agency began removing pirates,



The mercury turbines for manipulating arc at the original FL. Behind is the control switchboard of the arc transmitter.



The Poulsen Arc used at FL for undamped wave transmission in the early days.

forcing local stations to share time on a single channel, ordering some stations to shift frequencies and/or reduce power, and others to leave the air altogether. The FRC endeavored to keep a 20 kHz frequency separation between local radio stations.

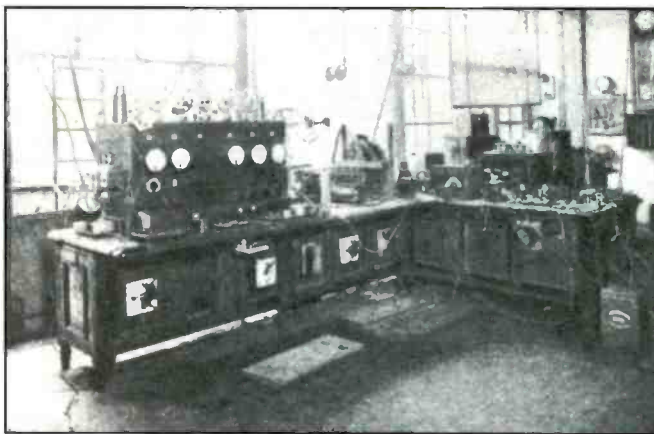
A mere two months later, on June 15, 1927, the FRC tweaked their original plans. The agency felt that a 20 kHz separation between local stations was insufficient to eliminate interference in much of the era's receiving equipment. Stations nationwide were reassigned, as necessary, to allow at least 50 kHz separation between local stations. In some metro areas, this meant as many as four local stations having to share time on a single frequency, with new station applications being rejected for a lack of available frequencies. On December 1, 1927, the arrangements were slightly modified, affecting about 10 percent of the nation's stations.

November 11, 1928 was when the Commission completely reorganized the broadcast band, designating so-called clear, regional, and local channels. The majority of stations were forced to shift frequencies. Many also had to change power, reduce their broadcasting hours, use directional antennas, and/or share time on-frequency.

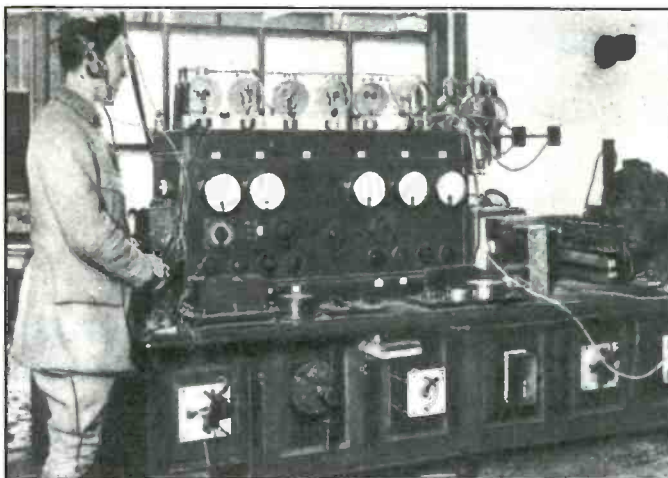
By the early 1930s, improved receiver selectivity allowed the 50-kHz minimum channel separation for local stations to be relaxed. Some local stations were separated by only 30 kHz.

On July 1, 1934, the Federal Communications Commission was formed as a more powerful replacement of the FRC. During the Great Depression of the 1930s, many time-share stations complained that only 4 to 5 broadcast hours daily didn't allow them sufficient airtime to remain financially viable. Those stations who were able to profit tended to buy out their less-fortunate time-share partners in order to consolidate and extend their own broadcasting hours. By the end of the 1930s, most time-share arrangements had either been eliminated or were greatly modified from several years earlier.

The North American Regional Broadcasting Agreement (NARBA) treaty went into effect on March 29, 1941, which extended by 100 kHz to cover 550-1600 kHz. The U.S., CANADA, Cuba, Haiti, and the Dominican Republic signed NARBA. It was in response to complaints by Canada and Mexico that the U.S. was ignoring their needs by hogging most



An overview of the Eiffel Tower's transmitting room after the 800-watt voice transmitter was installed in 1922.



A close-up view of the 800-watt voice transmitter. Atop the cabinet are the amplifier tubes. The oscillators are on the right.

of the clear channels. In response to this, NARBA caused a major overhaul of the band, with all U.S. stations on some frequencies shifted upwards by anywhere from 10 kHz to 40 kHz. For instance, American stations between 1200-1450 kHz were shifted to new channels 30 kHz higher in frequencies. Of the 862 stations in the U.S., 777 were forced to change frequency. Some 100 Canadian stations shifted frequency as the nation got better allocations. Many Mexican stations broadcasting to the U.S. from locations along the border were shut down to reduce interference.

In 1955, with the inclusion of 540 kHz, the American band was expanded to 540-1600 kHz,

In late 1995, the band was extended. The band became 540-1700 kHz. The new channels added above 1600 kHz were intended to allow a limited number of existing daytime-only stations to migrate there where they would be able to operate full time. During a transitional period, they would be permitted to simultaneously use both channels, but would eventually have to discontinue operations on their original frequency.

That's it for this time. Please be with us next time. Don't forget we welcome your thoughts, comments, and column suggestions. Our direct E-mail address here is: <Radioville@juno.com>, or you can reach us by snail mail at: Alice Brannigan, *Popular Communications*, 25 Newbridge Road, Hicksville, NY 11801. See you on the road to Radioville! ■

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HOW I GOT STARTED

Congratulations To Leonard Signoretti, Jr. Of Brooklyn, New York

Popular Communications invites you to submit, in about 150 words, how you got started in the communications hobby. Entries should be typewritten, or otherwise easily readable. If possible, your photo (no Polaroids, please) should be included.

Each month, we'll select one entry and publish it here. Submit your entry only once; we'll keep it on file. All submissions become the property of *Popular Communications*, and none will be acknowledged or returned. Entries will be selected taking into consideration the story they relate, and if it is especially interesting, unusual, or even humorous. We reserve the right to edit all submitted material for length, grammar, and style.

The person whose entry is selected will receive a one-year gift subscription (or one-year subscription extension) to *Popular Communications*. Address all entries to: "How I Got Started," *Popular Communications*, 25 Newbridge Road, Hicksville, NY 11801 or E-mail your entry to popularcom@aol.com, letting us know if you're sending photos. If you're E-mailing photos, please send them in a separate E-mail with your name in the "subject" line.

Our September Winner

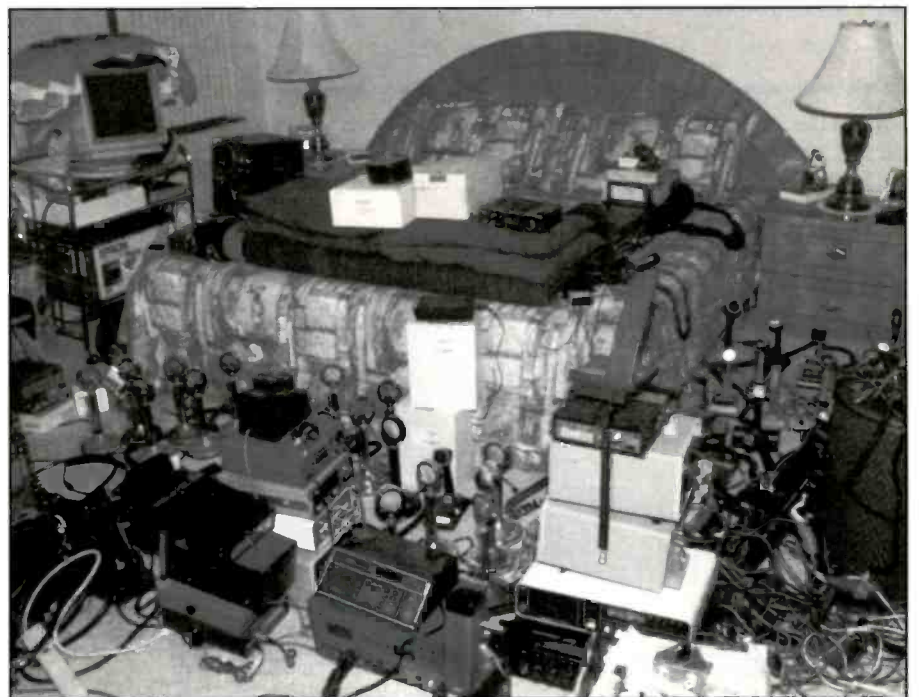
Pop'Comm reader Leonard J. Signoretti, Jr. "Shane 500" of Brooklyn, New York, says, "My Mom and Dad gave me my first 'CB-like' radio for my birthday in September 1975. I had just turned 10 and was very anxious to hook up my new battery operated CB radio with built in Morse code sender. It was a fun toy that gave me the opportunity to listen to people talking about everything in my local neighborhood. I don't think I was able to transmit for more than one block, but I kept on trying. After about three months, my parents surprised me with a beautiful used Spark-O-Matic 23-channel CB for a Christmas gift. At that time, I had no idea about standing wave ratios (SWR), 50-ohm antenna loads or even how to properly hook up a CB radio in my house.

After only three hours on Christmas morning, I blew up the radio! I guess my parents knew how sad I was. They quickly went out and purchased a late Christmas gift. I received one of the first 40-channel CB radios, the Realistic TRC 466 'mini 40' CB radio. I had become so engrossed with talking to people that the hobby expanded from using a car AM/FM antenna hooked up to the radiator pipe at my parent's apartment, to mounting several enormous antennas on top of my six-story apartment building over the years with the help of friend's whom I had met over the radio.

As I got older, the hobby grew and as you can see by my photos, a lot of money has been spent to build up my collection. There are over 350 pieces of radio equipment in my collection from both CB radio and HF gear. I even enjoy fixing CB radios for my friends and other people I have met over the air. There is no question in my mind that CB is still a fun pastime and I hope that it will become more popular in the new millennium." ■



Leonard Signoretti of Brooklyn, New York, and his vast collection of radio gear.



Another look at "some" of Leonard's radios.

RADIO RESOURCES

Interesting Thoughts And Ideas For Enjoying The Hobby

Going Mobile On HF — Part 4: Debugging The Noise

Let's double-check our high-frequency transceiver installation. Your 12 volts is coming directly from the battery. Red goes to battery positive, and black goes to battery negative. *Never* use the vehicle chassis as a battery negative return.

Is *your* high-frequency transceiver well grounded? You should have copper foil or silver tinned braid going from the rear of the transceiver to a good hunk of chassis metal.

How is your coax run to the antenna? Have you routed it away from power seats that could accidentally sever it? If it goes through a tiny sharp hole, have you provided a grommet to insure that bare metal doesn't cut through it? And where the coax joins the base of your high-frequency antenna mount, is this connection absolutely sealed up?

When I look over mobile antenna installations, the majority of them look relatively good except for one glaring omission — Coax Seal™, a trademark goo available from Universal Radio, completely sealing up the coax at the feedpoint, or the coax connector going into the feedpoint. If you can see a PL-259 or the split between the coax center conductor and the braid, this is considered wide open for water to get into your coax and spoil an otherwise perfect HF installation.

Is the base of your antenna mount well grounded? If you are running your antenna on the lip of a door that every now and then gets opened, you may wish to add a good grounding strap to that door to insure the door is well grounded to the rest of the vehicle. Hinges alone do not necessarily convey a good ground.

Noise Sources

With the vehicle turned off, turn ON your radio system, and listen around 14302.5 MHz. This is a good spot to get some radio checks from overland ham truck drivers who camp out



Reduce vehicle noise by bonding the hood to the chassis with braid or large cable.



This radio was re-grounded for noise elimination. We noticed much less noise across the bands.

on this frequency and are excellent mobile operators. When you hear a relatively weak station on frequency, start up the vehicle, and then see whether or not you can still hear that station talking.

If your S-meter shows an increase of noise greater than one S-unit (6 dB), then you need to find out what is causing the racket. If the radio has a noise blanker, give it a try. Some work well, and some hardly work at all. The new Yaesu and Kenwood noise blankers are exceptionally good, and the ICOM IC-706 MK IIG noise blanker is effective on some sparkplug noise, but doesn't seem quite as aggressive in killing noise as the Yaesu or Kenwood noise blankers. These modern transceivers may also offer noise reduction (NR) circuitry along with digital signal processing, but don't expect any of these circuits to magically kill the noise and pull out weak signals from the hash. To really get weak signals out of the hash, you've got to stop the hash.

For sparkplug noise, resistor plugs and resistor wiring may help. Sometimes taking copper screen and carefully placing it over the electronic distributor may minimize the annoying rhythmic snap, crackle, and pop. Be sure to ground the screen for best results.

If you have an oversized alternator, *this* noise sounds like a musical whistle, and continues even though you might disconnect your antenna coax. If the whistle is coming in through the 12-volt cable, first double-check that your battery has plenty of

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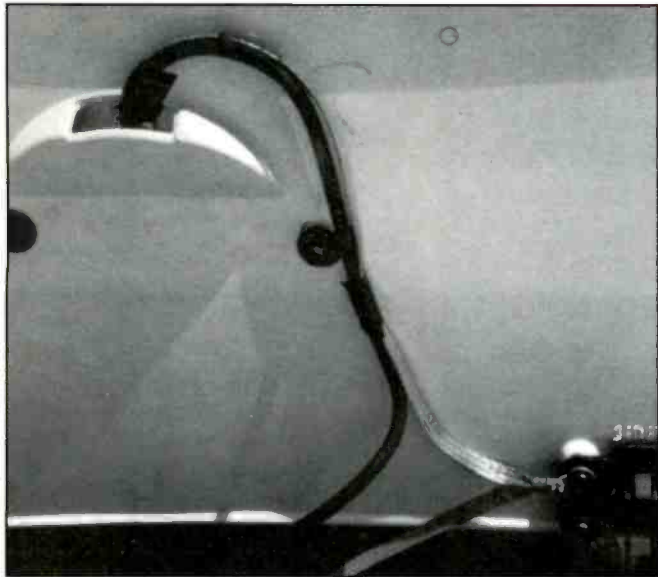
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This silver braid added to the trunk lid cut the vehicle noise by two "S" units!

water in it. If the battery is OK, then it may be time to invest in some big 20-amp series noise filters.

These filters are common in the marine electronics industry, and you might try the following phone numbers to add these filters to your noise abatement arsenal:

- West Marine 800-262-8464
- Defender Marine 800-628-8225
- Consumer Marine Electronics 800-332-2628

"To really get weak signals out of the hash, you've got to stop the hash."

Sometimes, the noise may be intermittent. Electronic fuel pumps are notorious for noise that comes and goes. Try this test with the radio receiving a rather weak signal: Turn the key to ON, but don't actually start the car. If the noise clicks in, and then in a few seconds goes away, this indeed could be the fuel pump. Fuel pump noise usually requires a fix at the car dealer shop authorized to work on your brand of vehicle. Ask them to look in the service notes about noise, and more than likely, there will be something that they can add like a bypass filter network that goes right at the electronic fuel pump noise source.

Every so often you may experience a "birdie" coming in over high frequency or the 2-meter band. "Birdies" are unmodulated steady carriers that appear when you turn on the key. They usually don't change frequency, and the birdie is actually a "spur" coming off of your vehicle's built-in computer. There is little that can be done to coax a birdie a few kilohertz up or down frequency to get it off of your favorite frequency. I once had a vehicle where the birdie was right on 146.520 MHz, the national simplex calling channel. It finally took a computer swapout, and now the birdie is around 146.900, luckily an unused frequency in our area. If you can tune the entire 2-meter band and not hear any "birdies," you either have an exceptionally old vehicle without a computer or an exceptionally lucky situation where the onboard computer is not giving you hash on VHF.

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Important Yaesu antenna fact: The FT-100 radio must be grounded for this antenna to work properly with low noise on autotune.



Mount your HF whip as far away from the engine compartment as possible for low noise pickup.

Down on HF, birdies are usually so far down in the noise that plain old background static will easily mask their presence. But if you do find one, just make a mental note where it is, and rest assured it will always be there as a micro-signal to double-check your receiver.

How Bad Is Bad?

When you are driving down the expressway, the typical noise floor on 20 meters (14 MHz) is usually about S6 without the noise blanker turned on. When you finally get to where you are going, and turn off the engine, the noise should rest around S5 or S4.

On 40 meters, typical atmospheric noise will give you a constant S6 signal. When you turn on the vehicle, an S7 constant reading is quite normal.

If you turn on the vehicle, and your signal strength meter rises more than 3 S-units, then you have an unacceptable amount of ignition noise that will need to be remedied. Noise blankers will help, but do everything you can to filter, shield, and bypass noise that could be covering up weak signals when you are at highway speeds down the expressway. No one

likes to pull to the side of the road and turn off the engine in order to make a DX contact. I would probably change cars if that were the case!

So track your noise, and then clean it up at the source. Then stand by for plenty of excitement on the worldwide bands. I look forward to hearing you on HF! ■

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THE RADIO CONNECTION

A Look Behind The Dials

A Call For Help!

This column marks the end of our fourth year in *Popular Communications*; "The Radio Connection" first premiered in the October 1996 issue! I have to be very honest with you. I never imagined that we have this long of a run; after all, there is only so much knowledge that I can share on a monthly basis before running out of ideas and material. There are those months when I am hard pressed to get a column written by my deadline, so, I am going to ask for your help — after all, this is your magazine and column — to decide what direction we should take from here. The vintage radio projects have been very well received judging by the E-mail and letters you've written to me since the *Boy's First Receiver* project was run several months ago. Letters and E-mails about our *Lyonodyne* crystal set project are also steadily increasing.

Where do I go from here? I would like to do another crystal set in a few months, on a rather intriguing 1930s "*Mystery Crystal Set*" that first appeared in an Australian newspaper article. It is a simple set that delivers surprisingly good performance: and, it should be easier to find parts and to build than the more complex *Lyonodyne*. I'd also like to do a version of the original 1930s *Doerle Twinplex* two-tube regenerative receiver that appeared during the 1930s in a radio hobbyist magazine. If any of my readers can supply us with a copy and write-up of the original Doerle design, I would gladly pay for your copying costs. Please, only vintage versions of the Doerle circuit, not the recent variation published by Lindsay. This has an AC line powered receiver to satisfy those of you who requested one. And yes, I still have to build the long-promised AC supply for the *Boy's First Receiver* as well. I need another 24 hours in each day.

One other suggestion; if you have a library of early electronic hobbyist magazines, I am looking for simple radio and electronic projects dating from the early sixties back through the late 1920s. Early one or two transistor projects are fine; I'll revamp whatever needs to be done to accommodate the use of modern or read-



Reader John Haught's *Lyonodyne* crystal receiver. The white switch position markings are done by drilling holes to a 1/16" depth and then filling in the depressions with a white putty stick from the local hardware store.

ily available components. Of course, we will continue with restoration topics as I have several Hallicrafters receivers that need restoration that I promise you will enjoy reading about. So, we are not going to abandon the restoration or vintage radio aspect of the column, but I'll be running more fun construction projects in the future.

Our First *Lyonodyne* Winner!

Reader John Haught KA3BRK, of Pennsylvania, contacted us a few months about the *Lyonodyne* set, noting that he had just finished building it and also remarked in passing that it was quite a knob-twister and a good performer. John mentioned he would write up his experiences building and using the set along with some photos. He was as good as his word. I just received his package of material a few days ago in time for this column. John did such a nice job (his work-

manship really puts mine to shame!) that I am going to use all of the photos he sent, plus his very informative write-up. I am using everything he sent since I am sure many of you will want to use some of his innovations in your set, if you haven't gotten around to building the *Lyonodyne* yet. John will be receiving a one-year complimentary subscription extension to *Popular Communications* for his submission. Here's what John has to say:

"Hi! I recently completed the crystal set from the plans you published in the April and May issues of *Popular Communications*. It was great fun and a challenge, and my wife Sara knew where she could find me for quite a few nights until the set was completed."

"As I normally do with a new project, I began by first scrounging through my collection vintage parts to find the components needed to build the *Lyonodyne*. The parts were then cleaned to "like new" condition. Next, I cut the wood base, front-panel, and the various wood parts I need-

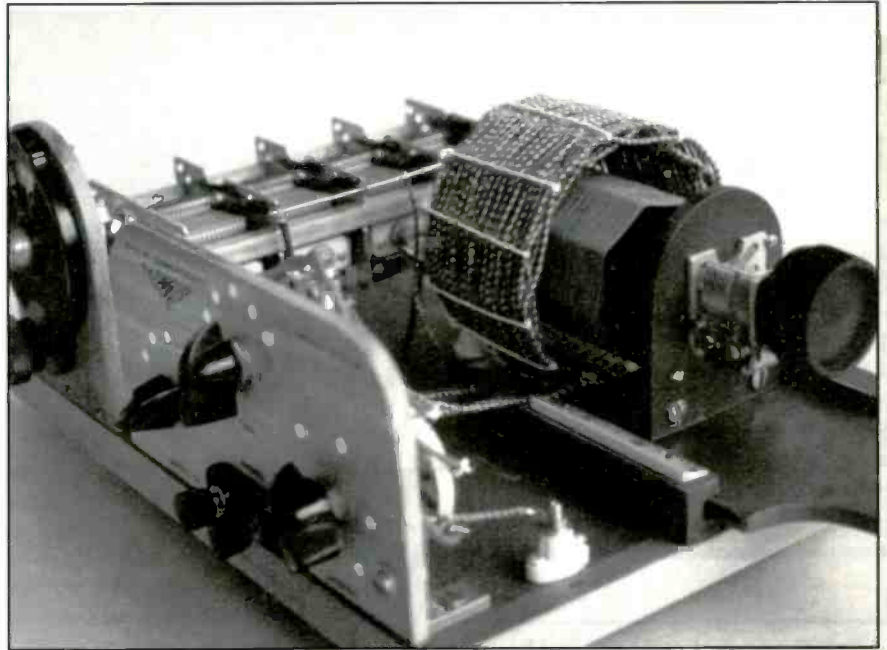
ed for the Wave Trap. The wood pieces were sanded and stained to completion. Once I was satisfied that all the components for the project were in my immediate work area, I was ready to begin assembly, just like I was building a kit."

"The four-section tuning capacitor (only three of those sections are used) was in my parts inventory for many years. It was probably intended for a military WWII unit, and it did have the desirable low-loss ceramic stator insulators and brass rotor wipers. I also added an insulated shaft coupling between the tuning capacitor and the panel-mounted National Radio *Velvet Vernier* dial drive to lessen hand-capacity effect."

"Scribing a 3-1/2" diameter circle on a 1/2" thick pine board, with nails inserted in holes drilled at 13 equally-spaced points, provided the form for winding the basket-weave coil. The coil is wound with vintage # d.c.c. (double cotton-covered) bell wire dating from the 1930s. As per the instructions, the coil windings go over two nails then under one. This yielded a compact and vintage appearing coil. My coil has four taps, plus the two end leads, and it is mounted on small ceramic National Radio standoff insulators. The set is wired using both vintage round bus wire and cotton-covered wire; and the antenna and ground connections are also made to small National ceramic standoffs."

"Once the three ceramic rotary switches were installed on the front-panel, the set was ready to be wired. Small diameter holes were drilled to a depth of 1/16" to mark the switch positions on the wood front panel. The indentations were filled using a white *putty stick* to highlight the various switch positions. When operating the set, the marks allow a quick return to the settings of previously logged stations. I arbitrarily assigned numbers to each position, starting with number 1 for the first switch position at the lower left of the front panel. This at first may appear to be complicated, but don't forget that rub-off lettering wasn't available during the crystal set era."

"In order to log a station, the switch positions along with the vernier dial readings are recorded on column-lined paper. When the Wave Trap is needed, a scale made from part of an old wood ruler provides a means to record its exact insertion depth into the basket-wound coil. Building the wave trap was a challenge as I wanted to keep the overall size of the set as compact as possible. The coil uses #24 d.c.c. wire wound over a plug-in Bud ribbed coil form with its pins removed.

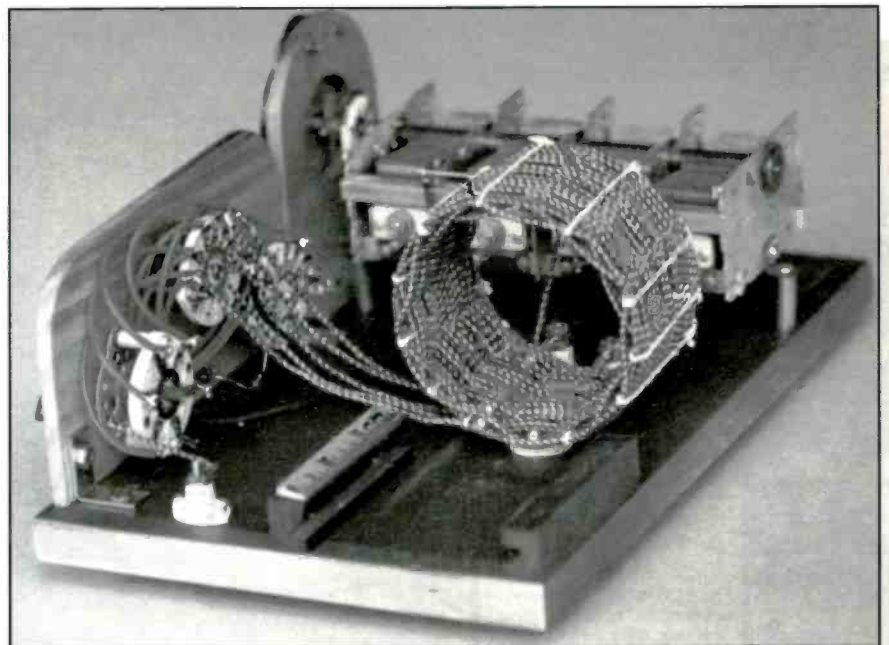


This oblique right-side view of John's set shows some of the workmanship that went into this set. Note how baseboard is trimmed out on four sides with a lighter colored wood. This photo also shows the details used in John's version of the Wave-Trap assembly. One of the white ceramic standoffs used for the antenna and ground connections can also be seen.

The coil was mounted on the front of the moveable slider, with the wave-trap tuning capacitor mounted on the other side. The Wave Trap operates by sliding the coil towards or away from the larger coil,

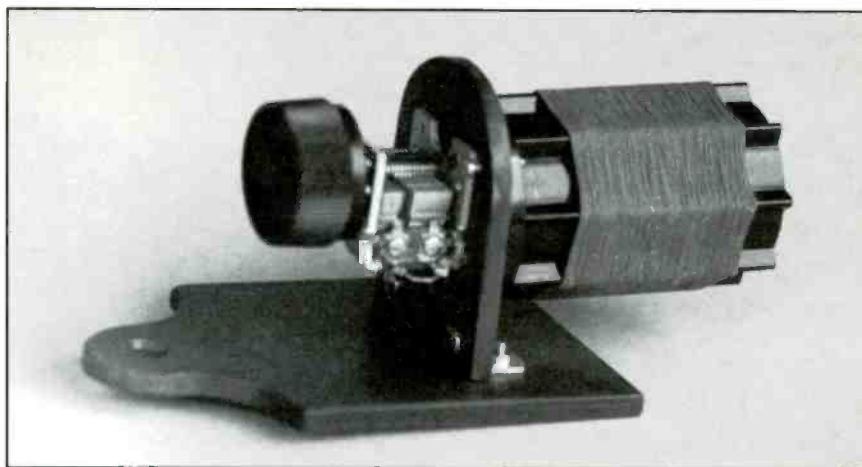
and by adjusting the variable capacitor until the offending station is nulled."

"Operating the crystal set has been a scream! All the locals come in loud and clear, and they are easily separated using



This right-side shot gives a good view of the main tuning coil, and how the set is wired — a very neat job indeed! Note that John used three high-quality ceramic switches on the front panel for selecting coil taps positions for the antenna, detector, and tuning capacitor. In this photo, the Wave Trap is removed to show the details of the rabbits that provide a slider system that the Wave-Trap board travels across. The scale showing the Wave Trap insertion depth is made from a section of an old wooden ruler.

the wave trap when needed. I've picked stations over the entire Eastern seaboard, and some foreign stations. I haven't had time to log the call letters. So far I've been using my amateur station antennas, but I will be putting up a long-wire and a good ground for this Winter to chase DX stations. The set was built using all vintage components and hand tools, and I tried to stay with the 1920s and 1930s theme as I do for my vintage projects. When the set is not in use, it will become part of my stable of vintage receivers and transmitters. Thanks to you, Peter, and *Popular Communications* for the interesting and fun-time I've had building the radio and crystal set projects."



The Wave-Trap assembly. The Wave-Trap may be removed when not in use. The Wave Trap coil is wound using double-cotton-covered wire wound over a ribbed Bud coil form with its pins removed.

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One suggestion, John. You might try adding a single-pole single-throw switch to the design to allow paralleling that unused section with the two used for controlling the ground coupling. That would give you some additional control of the amount of ground coupling and would compensate for a poor ground system in some instances.

Reader and *Lyonodyne* set builder George Hawkins from Texas comments: "I've enjoyed your column. The crystal set project caught my interest, and I've built the set following the directions in the

March and May issues. I'd thought you'd like to hear about my results. Winding the basket-weave coil was interesting; I had to wind it twice to get a coil that I was pleased with. I assume the basket weave is to reduce the coil's self-capacitance. (*Ed — I will comment later*). My tuning capacitor came from a vintage parts vendor and was salvaged from an early receiver and looks very similar in size and design to one you used."

"I complicated the design of my set in the manner of Rube Goldberg! The main tuning cap had a pulley; so using wood-

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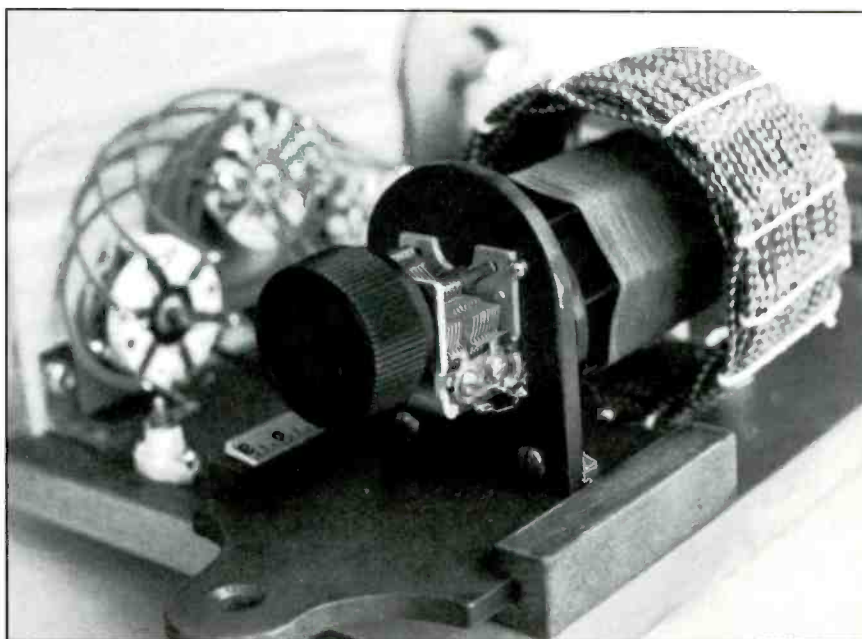
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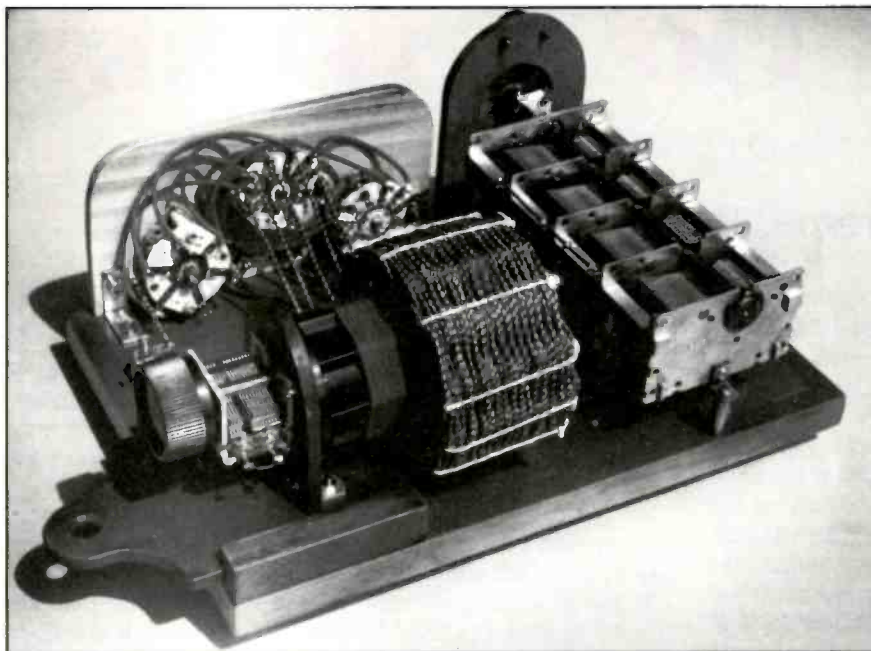
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The Wave-Trap board in place. It slides in or out of the larger coil by riding in the wood rabhet track system.



This rear view really shows what a gorgeous set this is! Note how the lacing cord is used to tie and secure the basket weave coil windings from unraveling. Only three of the four sections of the main tuning capacitor are used, however experimenters might try switching the additional section in parallel with the two sections used for ground coupling to increase volume on the lower frequency ranges. Don't be afraid to experiment.

"My antenna is a random wire strung around the bedroom. Come winter, I may try a longer wire outside, but right now the *skeeters* are too active to go outside for long times at night. My current project is to get an old tube radio working using the restoration techniques you explain in *Popular Communications*."

George, your results using an indoor antenna are amazing! Thanks for sharing your experiences with us. Please, if you get a chance, send in a few photos of the set. I would love to see them, and we still have a few *Lyonodyne* subscription prizes to award. My first guess regarding the basket-weave technique was that some separation between the adjacent windings was done to decrease the inter-winding capacitance, and thus increase the overall tuning range of the set. But, more importantly, I've since learned that basket-weave coils alleviate what is called "Proximity Effect," or the loss of circuit Q due to having metal windings in close relationship to each other. Proximity Effect was well-known during the Golden Age of Radio; but the reasons for doing so are slowly fading into oblivion as the old ways are forgotten. ■

en dowels, spools, and black knobs from the local hobby shop and *RadioShack*, I was able to make a five-to-one reduction drive for tuning. I really didn't need it, since the tuning is rather broad. I used a similar arrangement to drive the wave-trap capacitor, making the drive pulleys from 2-3/8" hardwood disks. All three dials have indications from 0-to-10 to aid in logging. I also used three six-position wafer switches from *RadioShack* along with two-barrier terminal strips from also from *RadioShack*. Assembly took about four weeks of my spare time. I work real slowly and make plenty of mistakes, but it is fun! I still have some bugs to work out in the on the wave-trap and tuning and coupling drives."

"I live in Houston, Texas, in a location that can be best described as 'AM DX hell.' My apartment is surrounded on all sides by either close or powerful radio stations. So far I've been able to log the following stations:

- KILT 610 kHz at 9.2 km
- KTRH 740 kHz at 47.4 km
- KBME 790 kHz at 9.9 km
- KPRC 950 kHz at 26.4 km
- KNER 1070 kHz at 3.9 km
- KGOL 1180 kHz at 20.7 km
- KMIC 1590 kHz at 17.4 km

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RADIO & THE INTERNET

Pop'Comm's Cyber Sleuth Checks Out Online Resources

Special Theme: Radio-Related Clip Art

Given the worldwide interest in radio and vastness of the Internet, you'd think finding quality radio related clip art for things like your Website, QSL cards, correspondence, flyers, club publications, etc. would be a simple matter. Unfortunately, and most surprising to me, it's not. After spending an entire Sunday afternoon and evening searching the web, I came away shaking my head with the conclusion that there's NOT a whole lot of quality clip art out there. Many of the resources I explored (that indicated a presence of clip art) contained no clip art at all. Rather, they merely pointed to other sites (often the same ones) that, in several cases, no longer exist. For those sites still accessible and, with the exception of the few resources noted below, most presented imagery of such poor quality that it would be a waste of time to capture, download, or use. Several resources also made identifying imagery difficult by offering just image files for download without a thumbnail image (small sample image) or any type of description. These were generally found in "ftp" download areas. In addition, those with just file names appeared in a variety of non-standard web formats such as BMP, TIFF, and PCX. This meant they needed to be individually downloaded and opened in a graphics program just to see what they were — only to find (generally) the quality so poor that they couldn't (or shouldn't) be used.

There is a positive ending to this story though since some good resources are available. "Zed Zed's Amateur Radio Clip Art" is one, and represents a really nice resource for WEB graphics, some areas of desktop publishing and is provided FREE for personal use. Two others are commercial, relatively inexpensive and offer, I believe, real value for your money. They include a superb CD from France, "Ham Radio Clipart by TK5NN" and a download subscription service from ArtToday®. The imagery from both of these resources is quite good and can be used for just about any application including Web pages, Word Processing or Desktop Publishing. While I don't have the TK5NN CD, I WAS impressed by the sample images downloaded from their site and highly recommend it on that basis alone. As for ArtToday®, I've been a subscriber for over three years and have been quite happy with the quality, quantity, variety, and reliability of their service. For general artwork, photographs, fonts, etc., I think you'd be hard pressed to find a better (and easier to use) online resource. The final pointer is not really a clip art resource per se', rather a technique for obtaining clip art from military (or other) documents placed in the public domain.

In terms of spending money for radio related imagery, opposed to trying to get it for free on the Internet, consider the time you will spend searching online — with questionable results after hours of searching. You also need to be aware of possible copyright issues. Just because you find an image on the Internet, it does not necessarily follow that you have the legal right to use it. The entire copyright arena continues to heat up, with more and more infringement suits being filed, so be careful about the



Zed's Amateur Radio Clip Art offers free amateur radio graphics for your Website.

imagery (and other media) you use. That's the overview so let's take a peek at the resources I think you'll find useful.

If you're looking for radio-related Web graphics, Paul D. "Dave" Tadlock's (KGØZZ) "Zed Zed's Amateur Radio Clip Art" site is the place to check out. In Paul's words, "My amateur radio clip art images were originally used to illustrate some of the funny and sometimes seemingly odd happenings in the daily life of a 'ham' radio operator. Many of these images were used to decorate a ham radio humor web page of mine that no longer exists on the web today. I found that my simple art work became much more popular than the humorous web page so the pictures remain and the rest is history." Complete with original Animated Images, Backgrounds, Icons & Rules, Buttons and more, you're sure to find something that will add that perfect touch to your (non-commercial) web site. Nicely done Dave! Check it out at http://www.qni.com/~kg0zz/amateur_radio/clipart.htm.

Ham Radio Clipart

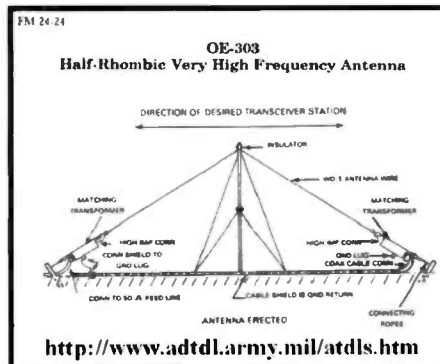
If I had to choose just ONE product to serve my radio-related clip art needs, the "Ham Radio Clipart by TK5NN" CD would be it! Covering an impressively wide variety of themes, and with 1,350 images in both TIFF and EPS formats, there's something for everyone — plus compatibility with both PC and MAC platforms. It would take the rest of this column's space



If I had to choose just ONE Ham Radio Clip Art product, this would be it!

BY ERIC FORCE <eric@dobe.com>

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Grab some Clip Art from Military Field Manuals — See Text.

just to list the different images available on this outstanding CD but you can view its contents plus download several samples from the TK5NN Website. The EPS format is especially valuable if you intend to use the imagery for (paper based) newsletters, flyers, programs, etc. since EPS (Adobe's Encapsulated PostScript) is SCALABLE without distortion — you can enlarge EPS images without having to worry about the "jaggies."

Included on the CD is a full color and indexed PDF (Adobe's® Portable Document Format) manual/catalog depicting every image in the collection. If that's not enough, each image is hyper-linked so you can open up the image just by clicking on it. This is also the ONLY clip art resource on CD I know of that provides two years of technical support plus a discount on future releases for just registering the software — which can be done easily online after purchase. Priced at just \$25 plus \$5 airmail S/H, this is probably one of the best values out there for, professionally done, radio-related clip art. Based on the samples I've downloaded, if you or your club need this type of artwork, the TK5NN CD is a MUST have. Get the full story (in French or English) at <http://tk5nn.free.fr/>.

Application Note for the TK5NN CD: To properly use EPS images, you'll need a vector-based graphics program like Corel Draw™ or Adobe Illustrator™. However, even if you don't have EPS capability, the TIFF (bitmapped) images are sufficiently large for use, as is, in most word processing applications like Microsoft Word® or WordPerfect®. If you wanted to put any of the images on the Web you could use a graphics program like "Paint" (in your Windows' accessories folder) to load (open) the TIFF image, resize (Stretch/Skew) to suit, then save it in GIF or JPEG format.

ArtToday

ArtToday® is probably the largest searchable, categorized, and downloadable set of clipart, photos, web graphics and sounds available on the Internet. It contains well over one million photos, fonts, sounds, web graphics, and clip art images. Once a subscriber you can take advantage of their huge image selection, quality, super-fast search engine, graphic tools, and message boards. With over 200 gigabytes of data (enough to fill over 312 CD-ROMs) you're bound to find the (royalty free) image(s) you want! And, once found, they are available for immediate download. Annual subscriptions to this superb service range in price from \$29.95 (Standard) to \$99.95 (Professional). Which one you select would depend on your budget and specific needs. Full specifications for each membership level is available at the site. You can also elect to become a "Basic" member for FREE and gain access to thousands of Web graphics.

While all one million plus files are not radio-related, an impressive number are. You'll find imagery at ArtToday® available no where else. Here are the results of a quick search using a few common keywords: (The number of files found are in parentheses following the keyword based on my "Standard," \$29.95 per year, subscription rate) radio (431), antenna (164), schematic (543). A higher priced subscription would probably yield more selections. Whatever your clip art needs, ArtToday® represents, what I believe to be, a good value for a subscription type (downloadable) clip art service. Check 'em out at <http://www.arttoday.com/>.

Military Art

Several months ago, we took a peek at the "General Dennis J. Reimer Training

and Doctrine Digital Library" from the perspective of obtaining a wide variety of Army Field Manuals. Those same manuals can also be used to obtain an amazing array of clip art. If the manual is available in HTML format, all you need to do is RIGHT click on the desired image and select "SAVE IMAGE AS" from the drop-down menu (Netscape) or "SAVE PICTURE AS" (Internet Explorer).

If you're dealing with a PDF (Adobe's® Portable Document Format) file, capturing the image is almost as easy. Just open the document in your Adobe® Acrobat reader, scroll until you find the desired image, use the ZOOM tool (magnifying glass) to enlarge or reduce the image size then press your "Print Screen" key to transfer the screen image to your clipboard. Then open a suitable "paint" program (like the one included with Windows®) and Paste (or Shift-Insert) the stored image to your screen. Crop the image from the text, choose a filename and save in the format (GIF, JPEG, etc.) of your choice.

To find MILITARY radio-related imagery, go to the following URL, select SEARCH then select SIGNAL for a list of available Signal Corps publications: <http://www.adtdl.army.mil/atdls.htm>.

Footnote: Even though several hours were spent actively searching for (quality) radio-related clip art, I probably missed many worthwhile sites. If you know of a *good* (radio-related) online clip art resource please let me know about it (Be sure to include the site's URL). If there's sufficient feedback, I'll plan on a future update. This is also the first time I've devoted an entire column to a specific theme, so I welcome your comments — positive or negative. Is this an approach you found worthwhile? I'm toying with a similar "Special Theme Issue" related to Internet Radio so let me know what you think — including any suggestions for a theme if you think that's the way to go on occasion — or everytime?

It looks like we're out of space so we'll head back to the barn. Keep those comments and suggestions coming and don't forget to visit the NEW and IMPROVED Pop'Comm Website at <http://www.popular-communications.com/> for the latest greatest. Thanks for joining me on this month's journey and remember, September is "Back to School" month. So, please be especially careful when driving as the kids and school buses hit the streets again.

Until next month, 73! ■

CB SCENE

27 MHz Communications Activities

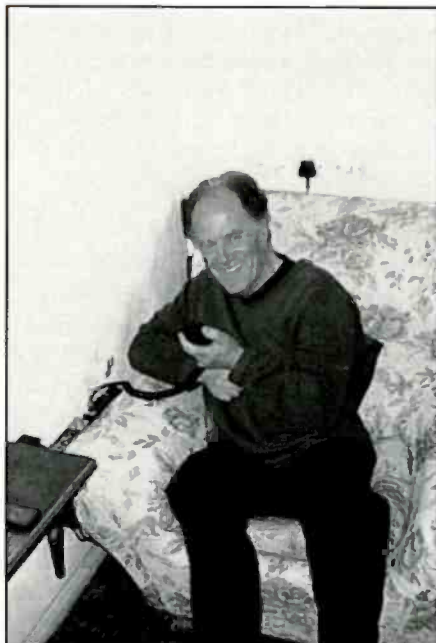
One For The Books

A couple of months ago, out of sheer frustration, I took off on a flight of fancy about an old hermit that held the secret to the "Perfect CB Antenna." As you may recall, this antenna was very low profile, (hard to see/easy to hide) and very powerful (capable of dependably communicating with distant skip stations using 5 watts or less.) As you may also recall, I offered some very substantial rewards for anyone that could procure this secret and deliver it to me for publication in this column.

Well, the results are in. We came close! It is, however, with great regret (because I really wanted to know) and relief (because I would have had a hard time coming up with the prizes) that I must announce, there was no winner. The secret to the perfect CB antenna, should it exist, is still just that, a secret.

There were, however, two entries that merit honorable mention. Each misses the "Perfect" rating for different reasons. One, only because it cannot, by itself, dependably shoot a 5-watt signal around the world. The other because it is just a little too big to classify as stealth.

Before I announce our runners up, I would like to thank all of you who wrote to reassure me that the laws of physics and nature all but eliminate the possibility that the antenna we were searching for exists. It is nice to know that when I (who really don't know what I am talking about), dash the hopes and dreams of countless readers of this column, by telling them that the antenna they desperately desire does not and cannot exist, I am probably correct. That said, I am pleased to announce our second runner up. Drum roll, please. And the winner is **Bob Lindstrom of Broomfield, Colorado**. Bob submitted three entries. Two were home brew antennas, as described in the old "S9" magazine, the legendary "Bat" and the portable "Sky Hook." Each easily fit the "stealth" category though neither is known to be able to fill the distance bill. Unfortunately, I

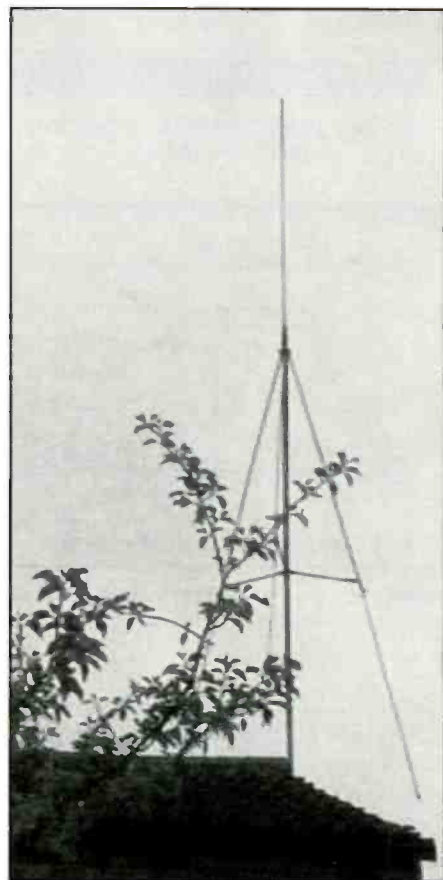


Michael Bartholemew and his worldwide four-watter.

cannot find any copies of these articles that are suitable for reproduction here.

His third entry, however, is commercially produced, readily available and comes as close to fitting the description for our "Perfect" antenna as I have seen. It is stealth, very small, measuring only 16" by 1" by 4" and weighs only 1 _ pounds. It can be easily mounted in any position. It can be used indoors, outdoors, mobile and portable. Bob has used this antenna mobile on a roof rack for a "garageable" antenna, on porch railings, in attics, on masts and even leaning against walls. Bob says that his experience with this antenna has proven its performance to be "truly amazing!" While it cannot, by itself, dependably shoot 5 watts around the world, it is rated for 300 watts AM/FM/ CW (1000 watts P.E.P.) so you never know.

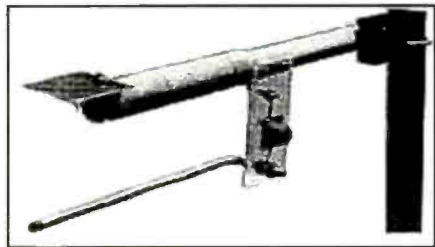
Bob's winning entry is Bilal's Isotron 11 Meter antenna. It cost about \$60 and is available from Rayfield Communications, Springfield, Missouri, 417-887-



The antenna at Bartholemew's home.

4663. You can get more information and order from their website at <http://www.rayfield.net/isotron>.

And now, the moment we have all been waiting for — Maestro, Ruffles and Flourishes if you please — our first runner up, who is not by the way from the Badlands of Montana but the suburbs of Newbury in Merry Ol' England. Ladies and Gentlemen, may I present, **Mr. Michael Bartholemew**. Bartholemew, if his claims are correct, has developed a revolutionary antenna system that is truly amazing. His antenna misses our "Perfect Antenna's" stealth qualification because it looks like a very ordinary mast-mounted omni-directional sitting atop a chimney and therefore, may not be suitable for



The Bilal Isotron 11-meter antenna.

use by most apartment dwellers. Bartholemew's antenna, does however appear to meet, if not exceed, our requirements for sending very low power signal very great distances. Using this antenna, Bartholemew and his associates report regular and often daily communications with stations well outside of England, including here in the U.S.A. Not only that, but the signal delivered to the U.S.A. is so strong, that he is able to communicate with *AM stations* (legal mode for U.S.A. operators) while operating in FM (legal mode for UK operators). This is done using only *four* watts. That's right, Bartholemew is doing all of this running strictly legal equipment. Impossible you say? My thoughts at first as well. But this was such a fantastic claim, which if any part of it was true, that it had to be investigated. So, for the past several months Michael and I have been corresponding via E-mail. After careful consideration, I am convinced that he may well be correct in his assertions. Check it out.

First of all, just who is Michael Bartholemew. He describes himself this way, "I am 60 years old, and basically where radio is concerned a layman with an extensive knowledge of how antennas and the earth's ionosphere work. I am a strong advocate of legal CB radio. The mobile FM transceiver that I use, is so small, it could be easily placed in your pocket. With it, I am able to communicate with others thousands of miles away, that are using AM transceivers, and on just four watts RF output. Of course, it cannot be done at will. My ability to do this depends entirely on normal propagation conditions. Many of the stateside CBers that I talk to do not believe that my RF output is just four watts, or that I am FM, but they are wrong. I am not some kind of irresponsible linear toting idiot. I am simply a CB radio enthusiast that over the past 17 years has developed a technique



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the enables FM and AM transceivers to communicate with each other over great distances — and on low power. I think that, if promoted, this technique could lead to a reduction in the number of power amplifiers being used, and that would benefit everybody."

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contained the majority of the radiated RF within a narrow corridor, if possible between 5-10 degrees above horizontal. That means that it would have the ability to retain as much as 80 percent of the radiated RF (signal) within that corridor. Such a transmission would only impact with the ionosphere just once between London and New York. During that one impact, little if indeed any attenuation (signal loss) would take place. An FM transmission from London on 27.325 MHz would confront an AM receiver on 27.325 MHz in New York, with a moderate to strong signal that would be audible. I have modified the shape of the radiated RF lobe by extensive RF earthing (grounding). To do this, a large area of highly conductive soil was created beneath the antenna. An RF earthing system was installed, some five hundred meters in length (resonant length). An earth resistance of virtually zero was achieved. The desired effect was

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"Looking for a little chatter on the CB? Then plan on attending the next, regularly scheduled on-air CB Mixer."

a very low angle radiated RF lobe, with the majority of the radiated RF contained within a narrow corridor."

"The 500 meters of copper wire runs from the base of the antenna pole (in one single length), down into the ground. It then runs in parallel lines approximately twelve inches apart, covering an area approximately 100 by 60 feet, at the front and rear of my home. It is buried some 12 inches beneath the surface of the ground. I'm sure you would agree, that the earthing system is large, even compared to that used by amateurs. I believe it may be effects created by the very large earthing system, that enables an FM transceiver to receive 95 percent of AM transmissions in the same way that an AM receiver does."

Well, there you have it, believe it or not. The final proof of weather what Michael says is true or not really depends on you.

Whether or not YOU can hear him. To help prove his case, Michael asks that all readers of this column listen for him. Then, when you hear him, let me know. He operates almost daily on 27.325 (channel 32 in USA) between 8 a.m. and 4 p.m. Eastern Time (1200 to 2000 UTC). His call sign is TW 26 and his E-mail address is tw26@easicom.com.

September And October CB Mixers

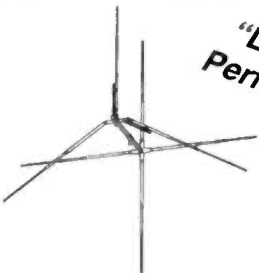
Looking for a little chatter on the CB? Then plan on attending the next, regularly scheduled on-air CB Mixer. They are held, wherever your are, on the last Saturday of the month (the next two will be on the 30th of September and the 28th of October from 9 p.m. until 10 p.m. local time. SSB operators work channel 36 LSB. AM operators work channel 23.

Well, that is it for now. Thanks for writing me here at the magazine or via the Internet where my address ed@bar-nat.com. And as always, if you can (especially September 30th and October 28th) — catch me on the radio! 73

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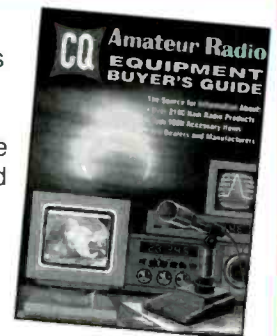
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CLANDESTINE COMMUNIQUÉ

Tuning In To Anti-Government Radio

Anti-Iranian Clandestines Being Heard, And Radio Chechnya's Current Sked

Radio Sedaye Iran (**Radio Voice of Iran**) is now being heard on **12065** (and perhaps **15550**) from 1630 to 1830 daily, supposedly broadcasting via government transmitters in Moldova and claiming to be broadcasting from Los Angeles. We expect Los Angeles refers to a studio location. This group has a website at www.krsi.com, still being developed at this writing. Word is that they are broadcasting locally in the Los Angeles area via a FM subcarrier channel, although there's no indication as to which LA FM broadcaster might be carrying this. Perhaps one of our readers in the Los Angeles area can do some detective work and pin down some info for us.

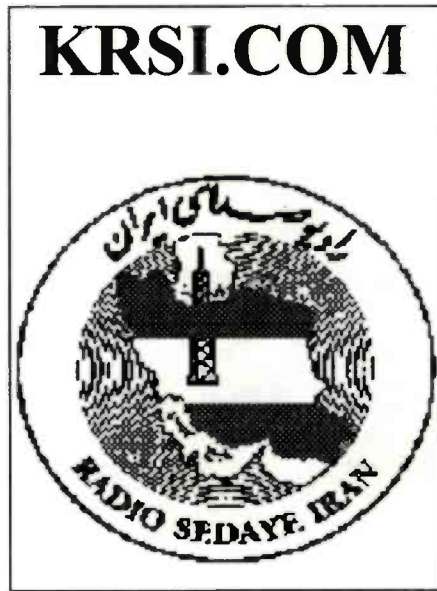
Another anti-Iranian is **Radio International**, operating from 1730 to 1800, also on **15550**, making it likely this is also aired via Moldova.

The latest schedule for Russia-sponsored **Radio Free Chechnya** (Radio Chechnya Svoboda) is from 0200 to 0500 on **7335**, 0200–0530 on **12045**, 0530 to 1400 on **12045 and 15620**, 1330–1730 on **7335, 12045** (the latter only to 1700) and 1730 to 2000 on **7335 and 9440**. All the programming is in Russian. The station's Box 1499, London address is no longer effective.

Anti-Sudanese station **The Voice of Freedom and Renewal** is on the air from 0330 to 0430 and 1300 to 1400 every day but Friday. The nominal frequency is **7000**, but this can drop as low as **6900**, when the station has to try and dodge jamming by the Sudanese authorities.

The station is supported by the Sudanese Alliance Forces and can be reached in care of S.A.F., Secretariat of Culture and Information, Asmara, State of Eritrea.

The Voice of the Democratic Path of Ethiopian Unity now operates from



Radio Sedaye Iran's emblem from their Website at www.krsi.com

1600 to 1700 Wednesdays on **15105**, 0800–0900 on Sundays on **21550**, all in Amharic, aired via Deutsche Telekom transmitters in Germany.

The Voice of Oromo Liberation, also aired via Germany, is scheduled on Thursdays, Fridays, and Saturdays from 1700 to 1800 on **11795**.

The Democratic Voice of Burma's current shortwave schedule runs from 1245 to 1330 on **5945, 11850, 15600, and 17750**. Also listen from 1430–1500 on the same frequencies. The broadcasts are aired via transmitters in Norway, Germany, and Madagascar.

The Voice of Jammu Kashmir Freedom on **5101**, variable, signs on at 1300 and carries an English newscast at 1415. If you live in the Western part of North America you might be able to snare this one, especially during the upcoming winter months.

Brian Alexander in Pennsylvania hears

the clandestine **Voice of the People of Kurdistan** on what he believes may be a new frequency — **6995** from 0215 tune in to past 0240, with local martial music, then talk in an unidentified language, Koran, and local music. Brian notes the carrier was "slightly wobbly" but the signal was fair to good. A parallel signal on **4061.5** was weaker. This one signs on around 0210 and runs to past 0500. It also airs from 1345 to past 1800, and again from around 1940 to past 2100. Broadcasts are in Kurdish and Arabic.

The Voice of Iraqi Kurdistan broadcasts in Kurdish and Arabic from 0240 to just past 0530 on **4085 and 9495** in Kurdish and Arabic. A second transmission runs from 1447 to 1735 or a bit later. Note that many clandestine stations can have sign-on and sign-off times which vary a good deal, so if you're sitting there waiting for a sign-on at, say, 0230 and don't hear anything, give it a few minutes before you move on to something else.

Something's going on with the National Radio of the Saharan Arab Democratic Republic, which earlier had turned up with a strong signal on **7470**. Now we're getting word that RTV Marocaine has taken over this frequency.

That wraps things up for this time. Remember that we're always happy to have your informational input — whether it's in the form of reception logs of clandestine stations and programs or information on QSLs received, or information on postal or E-mail addresses of clandestine stations or the organizations behind them, and information about the locations transmitters used for clandestine broadcasts. And, needless to say, we also need and welcome copies of QSLs or literature received from clandestine stations or the groups that support them. Thanks for your support!

Until next time, good hunting! ■

BY GERRY L. DEXTER

PLANE SENSE

Your Link To Aviation Communications

Catching Tower Communications

Thank you for your responses to the first three columns I've written. At least one of you wrote to me saying you were planning on getting back into the cockpit and resume flying because of my articles. I don't know if I can take *that* much credit, but thank you, anyway.

(which will be discussed in the next two columns) have a great amount of airspace in which to move airplanes, in terms of total airspace being used, the tower controllers use relatively little space, but it is some of the most demanding. The normal allotted airspace for tower controllers has

18R/36L, 18L/36R, and 17/35 which are all north/south runways. The big jets fly out of there. Because of the flying characteristics of these aircraft, the airspace above ORL must be cut to about 1,200 to 1,500 above the airport surface. Aircraft landing on 18L and 18R must cross the



Aircraft wait their turn at O'Hare.

Last month's column dealt with part of the air traffic control (ATC) system, the Flight Service Station, or FSS. This column will deal with what most people think of when they hear the phrase "air traffic control" — the airport traffic control tower (ATCT) or simply "tower" for short. Much of what you see in the movies and on TV dealing with ATC is tower related. In the film "Pushing Tin" when John Cusak's character told a female in a bar or restaurant he was an air traffic control specialist she responded by saying something to the effect of, "What tower do you work in?" It is so ingrained into our psyche that the ATC badges worn in the U.S. Air Force shows a control tower.

The Aeronautical Information Manual (AIM) defines control towers: "Towers have been established to provide for a safe, orderly, and expeditious flow of traffic on and in the vicinity of an airport. When the responsibility has been so delegated, towers also provide for the separation of IFR (instrument flight rules) aircraft in the terminal areas."

While approach and center controllers

been somewhat reduced in recent years. This "Class D" airspace is "generally that airspace from the surface to 2,500 feet above the airport elevation (charted in MSL [elevation above Mean Sea Level]) surrounding those airports that have an operational control tower. The configuration of each Class D airspace area is individually tailored . . ." Pilots must, unless otherwise authorized by ATC, have and utilize an operable two-way radio.

"Tailoring" of Class D airspace means that should traffic dictate, a controller may not have a full 2,500 feet of airspace above him to control aircraft. A good example is the Orlando Executive airport (ORL), known as Hemdon Airport during my formative years in Orlando. This airport has two intersecting runways, runway 7/25 (northeast/southwest) which is the main runway, and 13/31 (northwest/southeast) which is normally used by smaller aircraft based at ORL. The problem for the controllers is the Orlando International Airport (MCO), formerly McCoy Air Force Base, located 5.6 miles due south of ORL. The runway configuration is

ORL VORTAC at or above 2,500 before dropping rather rapidly in order to land safely. Likewise aircraft departing 36L and 36R must either cross the ORL VORTAC at or above 2,500 feet or turn east or west to avoid clipping the ORL airspace which requires the ORL controllers to scramble to keep their aircraft from mating with one talking to MCO.

Smaller airports also have a slight problem with mixing different types of aircraft in such a small environment. At your larger airports, the traffic is normally sequenced and spaced in such a way that the controller in the tower normally just gives clearances to land or take-off, as most of the aircraft are somewhat equal in terms of speed and handling characteristics. There are some exceptions to this rule, but most of these planes are doing the same speed of about 250 knots for proper spacing. Such is not normally the case for smaller towers. It is not uncommon to have three to five small Cessna's, Piper's, or Beechcraft flying touch-and-go's simultaneously. These aircraft are also roughly the same in speed and handling, but fre-

BY BILL HOEFER <flacap388@prodigy.net>

quently this traffic pattern must be altered, sometimes rather quickly, in order to accommodate larger, faster business jets, or slower home-built aircraft. If you listen to the tower controllers you may hear statements like, "extend your downwind, I'll call your turn to base," or "advise when you have the Citation in sight, he's on a three mile final." Controllers must be able to mix non-compatible aircraft with each other and think five to 10 minutes ahead to see about "opening a hole" to stick another aircraft in.

Toughest Job

Probably the toughest job at most control towers is not the local controller doing the pattern work I just described. It is more often than not the ground controller. The local controllers can climb or descend or turn aircraft as needed. But with the exception of helicopters and Harrier jumpjets, they cannot stop the aircraft's forward movement. The ground controller is trying to get aircraft taxiing from the hangars to the runways and vice-versa, all the while taking into account the characteristics, sizes, and destinations of the various aircraft. For example, if there is a Piper Tomahawk trainer aircraft taxiing out and suddenly you get a Lear Jet flying a hospital patient to another airport for treatment at a specialty hospital, it's the ground controller's responsibility to move the training aircraft out of the way to get the jet out. Jets normally are ready for departure as soon as they reach the runway; smaller prop-driven aircraft usually do an engine warm-up and may wait near the end of the runway for a few minutes for this "run-up."

Any way you look at it, moving aircraft is a choreographed ballet that sometimes looks like mass confusion in getting aircraft out and in. The greatest numbers of washouts in control towers is due to failure at the ground control level, not the local control position.

Frequency Allocations

Enough of what they do, here's some frequency allocations that are found in control towers. Emergency frequencies, which are monitored in most ATC facilities are **121.5** and **243.0 MHz**. Ground frequencies are normally between **121.65** and **121.9 MHz**. If you hear a local controller tell a pilot that just landed to, "turn left next taxiway and contact ground on point seven five when clear"

he is telling the pilot to turn off the runway onto the next taxiway and when he is clear of the runway to contact the ground controller on 121.75 MHz. It's just a little shorthand. There are ground control frequencies outside this band, and in those cases the controller would give the complete frequency.

The "civilian" tower frequency at most military airports is **126.2 MHz**. Most other VIV aviation frequencies are up to 136.0 MHz. Many of these are used by towers, approach controls, and centers. Many military tower (and approach) frequencies are found between **236.0** and

382.0 MHz. (On a side note, you may also hear the Air Force "Thunderbirds" and Navy "Blue Angels" in this sub band. Blue Angels may be on **250.8** and **251.6 MHz** with the T-Birds on **283.5 MHz**.) Civilian towers usually operate on **257.8 MHz** for military aircraft in and out of their airports. Again, not all civilian towers monitor or use this frequency. The most up-to-date frequencies are found in the A/FD and instruments charts I discussed in the May and July issues. Back issues can be acquired directly from *Pop'Comm* at 25 Newbridge Road, Hicksville, NY 11801.



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27.165	1.50	41
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27.365	2.00	58
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Your Questions And Loggings

Duane M. in Indiana has heard military traffic in the Hill Top Military Operating Area (MOA) on 350.35 MHz using call-signs ACExx, BULLDOG, and SNAKE. The Air Force Reserve out of Grissom ARB in New York have shown up there with call-signs MASE xx and INDYxx.

Thanks, Duane. Duane sent me my first letter about the column, and it wasn't even printed yet.

Ron H. in Canton, Michigan, sent me a letter on April Fool's Day about moni-

toring LF radio beacons and wants to know what they are. I'll deal with that in a larger article later, but I will say that unlike the VORS, TACANs, and VORTACs navigational aids which have unique call signs (there are 17,576 combinations of three letters for identifications) these non-directional radio beacons (NDBs) may have two or three letter ID's. The number of letters tells what kind of NDB it is. There are only 676 possible two-letter combinations so some ID's may be used in different areas, but on different frequencies. Propagation sometimes masks the Morse code ID, so it is

repeated slowly and continuously to verify the proper navaid. Thanks for the idea for a later column, Ron.

Gregg in Kentucky inflated my ego with his letter about my first column and saying, "It was nice to see a column that had more than one good piece of info. Even seasoned listeners could take something away from it." Thank you, Gregg.

MaryAlice did have a small complaint which I hope I rectified in the later articles. When I did the article on the Airport/Facility Directory in May I sent a digital copy of the legend that was reproduced on page 36. Unfortunately the scanning of the page was problematic on my end, and for that I apologize. The graphics in the June and July issues were better. I am endeavoring to keep it that way. I am glad that the "Plane Sense" was something she was looking for. Hope all is well in the later editions for you, MaryAlice, and thanks.

Kent P. in Tulsa, Oklahoma, dropped me a line about the Internet site at www.aimav.com/aiEport. I have looked at it and will try to review that and other websites as I find them. Thank you.

James S. is planning a trip to China and Japan and asked about websites with ATC frequencies for these countries. I am not aware of any website, but I am looking for them. Readers, any help for James and other travelers?

Greg B. from Maryland mentioned the A/FD and charts I have reviewed in the first three columns. Since he works for the division of NOAA that produces these charts, he has insight I don't and states that the data is checked several times for accuracy by the Aeronautical Information Branch of NOAA before being passed to production. Information is also provided to other aviation publishers such as Jeppesen and GTE. He also notes that the state of Maryland also produces a state sectional chart and a state aviation directory for all Maryland civil airports. I'm looking forward to getting those. Thank you, Greg. (By the way, Greg, like me, is a member of the Civil Air Patrol. While you're at it, Greg, send me a wing patch, I'll get you one of Florida.)

And finally, Eric Force, the "Radio and the Internet" guru for *Pop Comm* wrote me to welcome me to the company. He also said I'm getting him to the point of renewing his pilot's license and getting back into the left seat. Thank you for having me aboard.

Hopefully it won't take this much time to answer your questions. Keep the E-mail coming. Thank you all.

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DS-303 40MHz/20Me/s Analog/Digital	\$850
DS-603 60MHz/20Me/s Analog/Digital	\$950

Test Instruments

<p>Elenco 3MHz Sweep Function Generator with built-in 50MHz frequency counter Model GF-8046</p> <div style="text-align: center;">  </div> <p>\$195.95</p> <p>This sweep function generator with counter is an instrument capable of generating square, triangle, and sine waveforms, and TTL CMOS pulse over a frequency range from 0.2Hz to 2MHz.</p> <p>GF-8025 - Without Counter \$139.95</p>	<p>Elenco Handheld Universal Counter Model F-280Hz</p> <p>\$99</p> <p>Features 10 digit display, 16 segment and RF signal strength bargraph. Includes antenna, NiCd battery, and AC adapter. Resistor to 10kΩ. C-78000 Case with Belt Clip \$14.95</p>	<p>Elenco Power Supply Model XP-581</p> <p>4 Fully Regulated Power Supplies at 1 Unit</p> <div style="text-align: center;">  </div> <p>\$85</p> <p>4 DC voltages: 3.3V @ 0.5A, 5.0V @ 1.0A, 12.0V @ 1.0A, 28.0V @ 0.5A. Fully Regulated & Short Protected. Voltage & Current Meter. 14 Wire-Cord.</p>
<p>20MHz Sweep / Function Generator with Frequency Counter Model 4040</p> <p>\$445</p> <p>• 0.2Hz to 20MHz • AM & FM modulation • Burst Operation • External Frequency counter to 30MHz • Linear and Log sweep</p>	<p>Elenco RF Generator with counter Model SG-9300</p> <p>\$225</p> <p>Features internal 800 mod of 10µV 10Hz output 100W - 350W. Audio output 10W @ 10V RMS. SG-9300 (Analog into counter) \$124</p>	<p>Elenco Power Supply Model XP-603</p> <p>\$85</p> <p>• 0-30VDC @ 3A Output • 3A Fuse Current Protection • Current Limiting, Short Protection • 0.02Ω Output Impedance</p>
<p>21.5MHz Model 4070 \$1295 10MHz Model 4017 \$325 5MHz Model 4011 \$255</p>	<p>Elenco 10Hz - 1MHz Digital Audio Generator Model SG-9300</p> <p>\$225</p> <p>Features built-in 150MHz frequency counter, low distortion and sinusoidal waves. SG-9300 (with counter) \$124</p>	

Deluxe Soldering Station

Elenco SL-5 Series

Electrically controlled, ideal for professionals, students and hobbyists. Available in kit form or assembled



As Low As \$29.95

Works w/ any iron! Turn any soldering iron into a variable iron

Features:

- Cushion Grip Handle
- Soldering Iron (optional) with Rounded Tip for Soldering Sensitive Devices. Easily Reversible. Uses Long Life Tinned Conical Tip.
- Heavy Steel, Non-Slip Base
- Vise Holder: Funnel-shaped, adjustable, iron or sponge pad.
- Steel Tray for sponge pad.
- Sponge Pad

Ordering Information:

Model SL-5 - No Iron (Kit SL-5K)	\$29.95
Model SL-5-40 - Includes 40W UL iron (Kit SL-5K-40)	\$35.95
Model SL-5-60 - Includes 60W UL iron (Kit SL-5K-60)	\$36.95

Limited Time Offer: **FREE SP-14 Solder Practice Kit w/ Kit Outfit**

Elenco Educational Kits

<p>Model AR-2N6K</p> <p>\$34.95</p> <p>2 Meter / 6 Meter Amateur Radio Kit</p>	<p>Model AM-780K</p> <p>\$11.95</p> <p>2 IC Radio Kit</p>
<p>Model M-1005K</p> <p>\$19.95</p> <p>Digital Multimeter Kit</p> <p>• 18 Ranges • 1/2 Digi LCD • Transistor Test • Diode Test</p>	<p>Model RCC-7K</p> <p>\$29.95</p> <p>Radio Controlled Race Car Kit</p> <p>7 Functions</p>

Four Functions in One



Elenco Model MX-9300B \$450

Features:

- One instrument with four test and measuring systems:
- 1.3GHz Frequency Counter
- 2MHz Sweep Function Generator
- Digital Multimeter
- Digital Tripe Power Supply - 0-3V @ 2A, 5V @ 2A, 15V @ 1A

Digital/Analog Trainer

Elenco Model XK-150



\$89.95

A low cost, full-function digital/analog trainer that meets the needs of electronic training programs. Rugged construction can be used as bench lab equipment or be portable. An economical zipper case is available.

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38

CIRCLE 63 ON READER SERVICE CARD

Scan Our Web Site

Tap into secret Shortwave Signals

Turn mysterious signals into exciting text messages with the MFJ MultiReader™!

Plug this self-contained MFJ MultiReader™ into your shortwave receiver's earphone jack.

Then watch mysterious chirps, whistles and buzzing sounds of RTTY, ASCII, CW and AMTOR (FEC) turn into exciting text messages as they scroll across an easy-to-read LCD display.

You'll read interesting commercial, military, diplomatic, weather, aeronautical, maritime and amateur traffic . . .

Eavesdrop on the World

Eavesdrop on the world's press agencies transmitting *unedited* late breaking news in English -- China News in Taiwan, Tanjung Press in Serbia, Iraqi News in Iraq -- all on RTTY.

Copy RTTY weather stations from Antarctica, Mali, Congo and many others. Listen to military RTTY passing traffic from Panama, Cyprus, Peru, Capetown, London and others. Listen to hams, diplomatic, research, commercial and maritime RTTY.

Listen to maritime users, diplomats and amateurs send and receive *error-free* messages using various forms of TOR (Telex-Over-Radio).

Monitor Morse code from hams, military, commercial, aeronautical, diplomatic, maritime

Super Active Antenna

"World Radio TV Handbook" says MFJ-1024 is a "first-rate easy-to-operate active antenna...quiet... excellent dynamic range... good gain... low noise... broad frequency coverage."

Mount it outdoors away from electrical noise for maximum signal, minimum noise. Covers 50 KHz-30 MHz.

Receives strong, clear signals from all over the world. 20 dB attenuator, gain control, ON LED.

Switch two receivers and auxiliary or active antenna.

MFJ-1024 \$139⁹⁵ 6x3x5 inches. Remote has 54 inch whip. 50 feet coax. 3x2x4 inches. 12 VDC or 110 VAC with MFJ-1312, \$14.95.

Indoor Active Antenna

Rival outside long wires with this tuned indoor active antenna.

MFJ-1020B \$79⁹⁵

"World Radio TV Handbook" says MFJ-1020B is a "fine value... fair price... best offering to date... performs very well indeed."

Tuned circuitry minimizes intermod, improves selectivity, reduces noise outside tuned band. Use as a preselector with external antenna. Covers 0.3-30 MHz. Tune, Band, Gain, On/Off/Bypass Controls. Detachable telescoping whip. 5x2x6 in. Use 9 volt battery, 9-18 VDC or 110 VAC with MFJ-1312, \$14.95.

Compact Active Antenna

Plug MFJ-1022 into your compact MFJ

MFJ-1022 \$49⁹⁵

all band active antenna into your receiver and you'll hear strong, clear signals from all over the world. 300 KHz-200 MHz including low, medium, shortwave and VHF bands.

Detachable 20 inch telescoping antenna. 9 volt battery or 110 VAC MFJ-1312B, \$14.95. 3/4x1 1/4x4 in.



-- all over the world -- Australia, Russia, Japan, etc. MFJ-462B \$179⁹⁵

Printer Monitors 24 Hours a Day

MFJ's exclusive TelePrinterPort™ lets you monitor any station 24 hours a day by printing transmissions on an Epson compatible printer.

Printer cable, MFJ-5412, \$9.95. MFJ MessageSaver™

You can save several pages of text in an 8K of memory for re-reading or later review.

High Performance Modem

MFJ's high performance PhaseLockLoop™ modem consistently gives you solid copy -- even with weak signals buried in noise. New threshold control minimizes noise interference --

greatly improves copy on CW and other modes.

Easy to use, tune and read

It's easy to use -- just push a button to select modes and features from a menu.

It's easy to tune -- a precision tuning indicator makes tuning your receiver easy for best copy.

It's easy to read -- the 2 line 16 character LCD display with contrast adjustment is mounted on a brushed aluminum front panel for easy reading.

Copies most standard shifts and speeds. Has MFJ AutoTrak™ Morse code speed tracking.

Use 12 VDC or use 110 VAC with MFJ-1312B AC adapter, \$14.95. 5 1/4x2 1/2Hx5 1/4D inches.

No Matter What™ One Year Warranty

You get MFJ's famous one year No Matter What™ limited warranty. That means we will repair or replace your MFJ MultiReader™ (at our option) no matter what for one full year.

Try it for 30 Days

If you're not completely satisfied, simply return it within 30 days for a prompt and courteous refund (less shipping). Customer must retain dated proof-of-purchase direct from MFJ.

Eliminate power line noise!



MFJ-1026 \$179⁹⁵

New! Completely eliminate power line noise. lightning crashes and interference before they get into your receiver! Works on all modes -- SSB, AM, CW, FM, data -- and on all shortwave bands. Plugs between main external antenna and receiver. Built-in active antenna picks up power line noise and cancels undesirable noise from main antenna. Also makes excellent active antenna.

MFJ Antenna Matcher



MFJ-959B \$99⁹⁵

Matches your antenna to your receiver so you get maximum signal and minimum loss.

Preamp with gain control boosts weak stations 10 times. 20 dB attenuator prevents overload. Select 2 antennas and 2 receivers. 1.6-30 MHz. 9x2x6 in. Use 9-18 VDC or 110 VAC with MFJ-1312, \$14.95.

Dual Tunable Audio Filter



MFJ-752C \$99⁹⁵

Two separately tunable filters let you peak desired signals and notch out interference at the same time. You can peak, notch, low or high pass signals to eliminate heterodynes and interference. Plugs between radio and speaker or phones. 10x2x6 in.

High-Gain Preselector



MFJ-1045C \$99⁹⁵

High-gain, high-Q receiver pre-selector covers 1.8-54 MHz. Boost weak signals 10 times with low noise dual gate MOSFET. Reject out-of-band signals and images with high-Q tuned circuits. Push buttons let you select 2 antennas and 2 receivers. Dual coax and phono connectors. Use 9-18 VDC or 110 VAC with MFJ-1312, \$14.95.

CW, RTTY, ASCII Interface



MFJ-1214PC \$149⁹⁵

Use your computer and radio to receive and display brilliant full color FAX news photos and incredible WeFAX weather maps. Also RTTY, ASCII and Morse code. Frequency manager lists over 900 FAX stations. Auto picture saver.

Includes interface, easy-to-use menu driven software, cables, power supply, manual and JumpStart™ guide. Requires 286 or better computer with VGA monitor.

High-Q Passive Preselector



MFJ-956 \$49⁹⁵

High-Q passive LC preselector boosts your favorite stations while rejecting images, intermod and phantom signals. 1.5-30 MHz. Preselector bypass and receiver grounded positions. Tiny 2x3x4 inches.

Super Passive Preselector



MFJ-1046 \$99⁹⁵

New! Improves any receiver! Suppresses strong out-of-band signals that cause intermod, blocking, cross modulation and phantom signals. Unique Hi-Q series tuned circuit adds super sharp front-end selectivity with excellent stopband attenuation and very low passband loss. Air variable capacitor with vernier. 1.6-33 MHz.

Easy-Up Antennas

How to build and put up inexpensive, fully tested wire antennas using readily available parts that'll bring signals in like you've never heard before. Antennas from 100 KHz to 1000 MHz.



MFJ-38 \$16⁹⁵

MFJ Antenna Switches



MFJ-1704 \$64⁹⁵

MFJ-1702C \$24⁹⁵

MFJ-1704 heavy duty antenna switch lets you select 4 antennas or ground them for static and lightning protection. Unused antennas automatically grounded. Replaceable lightning surge protection. Good to 500 MHz. 60 dB isolation at 30 MHz. MFJ-1702C for 2 antennas.

World Band Radio Kit

Build this regenerative shortwave receiver kit and listen to signals from all over the world with just a 10 foot wire antenna. Has RF stage, vernier reduction drive, smooth regeneration, five bands.

21 Band World Receiver

MFJ's MFJ-8121 new 21 Band World Receiver lets you travel the world from your armchair! Listen to BBC news from London. Live music from Paris, soccer matches from Germany and more! Covers 21 bands including FM, Medium Wave, Long Wave and Shortwave. Sony® integrated circuit from Japan, multicolored tuning dial, built-in telescopic antenna, permanent silkscreened world time zone, frequency charts on back panel. Carrying handle. Operates on four "AA"s. Super compact size!



MFJ-8100K \$69⁹⁵ kit

MFJ-8100W \$89⁹⁵ wired



MFJ-8121 new 21 \$39⁹⁵

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Pop'Comm's World Band Tuning Tips

September 2000

This listing is designed to help you hear more shortwave broadcasting stations. The list includes a variety of stations, including international broadcasters beaming programs to North America, others to other parts of the world, as well as local and regional shortwave stations. Many of the transmissions listed here are not in English. Your ability to receive these stations will depend on time of day, time of year, your geographic location, highly variable propagation conditions, and the receiving equipment used.

AA, FF, SS, GG, etc. are abbreviations for languages (Arabic, French, Spanish, German). Times given are in UTC, which is five hours ahead of EST, i.e. 0000 UTC equals 7 p.m. EST, 6 p.m. CST, 4 p.m. PST.

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0000	6535.8	Radiodifusora Huancabamba, Peru	SS	0230	13620	All India Radio	
0000	11735	Radio Nova Visao, Brazil	PP	0230	17580	Radio Australia	
0000	13650	Radio Pyongyang, North Korea	KK	0245	15310	BBC, via Oman	
0030	11970	Voice of Islamic Republic of Iran		0300	4832	Radio Reloj, Costa Rica	SS
0030	13695	Radio Thailand		0300	4976	Radio Uganda	
0100	9560	Radio Budapest, Hungary		0300	4980	Ecos del Torbes, Venezuela	SS
0100	9737	Radio Nacional, Paraguay	SS	0300	6025	Radio Amanacer, Dominican Republic	SS
0100	11815	Radio Brazil Central, Brazil	PP	0300	6895	Galei Zahal, Israel	HH
0100	11870	Radio Yugoslavia		0300	7305	Vatican Radio	
0100	15250	Voice of America, via Sri Lanka		0300	7450	Voice of Greece, via USA	Greek
0130	4870	La Voz del Upano, Ecuador	SS	0300	7465	Radio Norway	NN
0130	6000	Radio Havana Cuba		0300	9705	Radio Mexico Int'l.	SS/EE
0130	6957.6	Radio Paraton, Peru	SS	0300	9730	Radio Free Iraq, U.S. gov't.	AA
0130	9835	Radio Budapest, Hungary	Hung.	0300	9730	Radio Free Iraq, U.S. gov't.	AA
0130	9870	Radio Austria Int'l.		0300	11615	Radio Prague, Czech Republic	
0130	9925	Croatian Radio, via Germany	Croat/EE	0300	11655	Voice of Turkey	
0130	11765	RAI, Italy, via Ascension Island	II	0300	15355	Radio Sultanate of Oman	
0130	13730	Radio Austria Int'l.		0300	17770	Radio Cairo, Egypt	AA
0130	13770	YLE/Radio Finland		0315	15075	All India Radio	unid
0145	6155	Radio Telefis Eireann, Ireland, via UK		0330	6010	Radio Mil, Mexico	SS
0200	3280	La Voz del Napo, Ecuador	SS	0330	6940	Radio Fana, Ethiopia	vern.
0200	3360	La Voz de Nahuala, Guatemala	SS	0330	7265	Sudwestrundfunk, Germany	GG
0200	5950	Radio Taipei Int'l., via Florida		0330	7280	Radio France Int'l.	FF
0200	6175	Radio Japan, via Canada	JJ	0330	9665	Voice of Russia, via Moldova	
0200	6200	Radio Prague, Czech Republic		0330	9885	Swiss Radio Int'l.	GG
0200	9585	Radio Globo, Brazil	PP	0330	12020	Radio Rossi, via Magadan, Russia	RR
0200	11735	Radio Pyongyang, North Korea	SS	0330	15170	Broadcasting Service of Kingdom of Saudi Arabia	AA
0200	11785	Radio Baghdad, Iraq	G	0345	3380	Malawi Broadcasting Corp.	unid
0200	13675	UAE Radio, Dubai		0345	15530	Far East Broadcasting Assn., Seychelles Is.	unid
0200	15315	Radio Netherland	DD	0400	9730	China Radio Int'l., via French Guiana	
0200	15375	Voz Cristiana, Chile	S	0400	9905	Swiss Radio Int'l.	
0200	17675	Radio New Zealand Int'l.		0400	11690	Voz Cristiana, Chile	SS
0215	9165	Voice of Azerbaijan	unid	0400	11920	RTV Marocaine, Morocco	AA
0230	6105	Radio Universidad, Costa Rica	S	0400	15140	HCJB, Ecuador	SS
0230	6115	Radio Tirana, Albania		0400	15505	Radio Kuwait	AA
0230	7125	Voice of Russia		0400	15615	Kol Israel	
0230	7160	Radio Tirana, Albania		0430	4930	Radio Costena, Honduras	SS
0230	9400	Radio Bulgaria		0430	9580	Radio Yugoslavia	
0230	9495	Radio Sweden		0430	12000	Voice of Russia	
0230	9695	Voice of Vietnam, via Canada					
0230	11940	Radio Romania Int'l.					

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0500	4850	RTV Cameroon	FF	1445	11402	Icelandic Nat'l. Broadcasting Service	Icelandic
0500	4895	Colombia Estereo, Colombia	SS	1445	12065	Vatican Radio	unid
0500	6055	Radio Exterior de Espana, Spain		1500	15540	BBC, England	
0500	11720	Channel Africa, South Africa		1530	11760	Radio Pilipinas, Philippines	unid
0500	15445	Radio Thailand		1600	9525	Channel Africa, South Africa	
0500	15455	Radio Rossi, Russia	RR	1600	15100	Radio Pakistan	
0600	3316	Sierra Leone Broadcasting Corp.		1600	15105	KWHR, Hawaii	
0600	4915	Ghana Broadcasting Corp.		1630	13660	Radio Portugal Int'l.	PP
0600	4991	Radio Ancash, Peru	SS	1645	17545	Reshet Bet home service, Israel	HH
0600	5047	Radio Lome, Togo	FF	1700	15475	Africa Number One, Gabon	FF
0600	5100	Radio Liberia Int'l.		1730	8000	Voice of Sudan (clandestine)	AA
0600	6185	Radio Educacion, Mexico	SS/EE	1730	15250	Radio Romania Int'l.	
0600	7165	Namibia Broadcasting Corp.		1730	17720	Radio Pilipinas, Philippines	Tagalog
0600	9620	Radio Ukraine Int'l.		1745	15265	UAE Radio, Abu Dhabi	AA
0600	11640	Trans World Radio, via South Africa		1750	15570	Vatican Radio	
0630	4760	ELWA, Liberia	GG	1800	13830	Croatian Radio, via Germany	
0630	5054	Faro del Caribe, Costa Rica	SS	1800	15410	Voice of America, via Morocco	
0645	9870	Trans World Radio, Monaco		1800	15715	Radio Exterior de Espana, Spain	SS
0700	5025	Radio Rebelde, Cuba	SS	1800	17830	BBC, via Ascension Island	
0700	5985	Radio Vlaanderen Int'l., Belgium		1800	17860	Deutsche Welle, Germany, via Rwanda	GG
0700	9440	Radio Slovakia Int'l., Slovak Rep.		1800	17870	Channel Africa, South Africa	
0730	6100	Trans World Radio, Swaziland		1800	17895	Qatar Broadcasting Service	AA
0800	7405	Radio Marti, USA	SS	1830	15335	Radio Pakistan	Urdu
0800	11755	HCJB, Ecuador		1900	9965	Radio Intercontinental, Armenia	gg
0830	7120	Italian Radio Relay Service, Italy	various	1900	12080	Voice of the Mediterranean, via Russia	
0830	9615	KNLS, Alaska		1900	21800	Radio Portugal Int'l.	PP
0830	9675	NBC, Papua New Guinea		1930	11734	Radio Tanzania Zanzibar	AA
0900	9610	Adventist World Radio, Italy	GG/EE	1930	17505	Radio Denmark, via Norway	DD
0930	4790	Radio Atlantida, Peru	SS	1930	17705	Voice of Greece, via USA	Greek
0930	15115	Radio New Zealand Int'l.		1930	17750	Radio Taipei Int'l., via Florida	CC
1030	12085	Voice of Mongolia		2000	15150	Voice of Indonesia	
1100	3245	Radio Gulf, Papua New Guinea		2000	15160	Radio Algiers, Algeria	
1100	4800	Radio Buenas Nuevas, Guatemala	SS	2000	15345	RTV Marocaine, Morocco	AA
1100	4819	La Voz Evangelica, Honduras	SS	2000	17890	Radio Budapest, Hungary	Hung.
1100	4825	Radio Tezulutlan, Guatemala	SS	2015	12085	Radio Damascus, Syria	
1100	4890	NBC, Papua New Guinea		2030	9720	RTT Tunisienne, Tunisia	AA
1100	9865	Christian Voice, Zambia		2030	15476	RN Archangel San Gabriel, Antarctica	SS
1130	4052.5	Radio Verdad, Guatemala	SS	2100	9990	Radio Cairo, Egypt	
1130	5020	Solomon Islands Broadcasting		2100	15345	Radio Jamahiriya, Libya	AA
1130	9590	Radio Singapore Int'l.		2100	15445	Radio Nacional, Brazil	PP
1130	15700	Radio Bulgaria		2130	9675	African Beacon, USA, via UK	
1200	4725	Radio Myanmar, Myanmar (Burma)	BB	2200	11675	Radio Kuwait	AA
1200	9740	BBC, England		2200	13640	Voice of Turkey	
1200	12045	Radio Free Chechnya, Russia	RR	2230	9580	Africa Number One, Gabon	FF
1200	15160	Voice of America, via Philippines		2230	15325	Radio Canada Int'l.	
1200	21840	Deutsche Welle, Germany		2230	15345	Rdf. Argentina al Exterior, Argentina	SS
1215	15095	Far East Broadcasting Corp., Philippines	unid	2230	21740	Radio Australia	
1230	15240	Voice of America, via Tinian, N. Marianas		2245	15185	Radio Africa, Equatorial Guinea	
1230	15335	RTV Tunisienne, Tunisia	AA	2300	6458.5	AFRTS, Puerto Rico	USB
1230	15415	China Radio Int'l.		2300	9695	Radio Rio Mar, Brazil	PP
1300	7295	Radio Malaysia		2300	11915	Radio Gaucha, Brazil	PP
1300	9525	Radio Polonia, Poland		2300	13640	Voice of Turkey	
1300	17775	Radio Tashkent, Uzbekistan	Uzbek	2300	17485	Radio Prague, Czech Republic	SS
1330	11705	Adventist World Radio, Guam		2300	17510	Radio Free Asia, via KWHR-Hawaii	CC
1400	9970	RTBF, Belgium, via Germany	FF	2330	6180	Radio Nacional Amazonia, Brazil	PP
1400	15445	Far East Broadcasting Assn., Seychelles Is.	unid	2330	7125	Radiodifusion Nationale, Guinea	FF
1400	15650	Kol Israel		2330	9645	Radio Bandeirantes, Brazil	PP
1430	11690	Radio Jordan		2330	11905	Sri Lanka Broadcasting Corp.	unid
1430	12055	Voice of Russia		2345	11954.8	Radio Nacional, Angola	PP
1430	15400	YLE/Radio Finland	Finnish	2345	15084	Voice of Islamic Republic of Iran	Farsi
1430	18960	Radio Sweden	Swedish				

PRODUCT PARADE

Review Of New, Interesting And Useful Products

Alinco DJ-X2 Wide Band Multi-Mode Communications Receiver

Is it the world's smallest multi-mode scanning receiver? Alinco has created a multi-mode receiver that is small, sensitive, easy-to-use and can be taken nearly anywhere. Listen to the action of police, fire, public safety, aircraft, and more. AM and FM broadcast, Amateur, marine, weather and other transmissions are yours, from a receiver that fits inside a shirt pocket!

A technical breakthrough, the DJ-X2 comes with two sources of battery power; a long-lasting internal Lithium-ion battery and a snap-on dry cell power pack.



The Alinco DJ-X2 wide band multi-mode communications receiver.

Together, they can provide approximately-24 hours continuous listening, using the "battery save" mode.

Don't let the small size of the DJ-X2 deceive you. It features loud, clear audio from its speaker or headphone and three different antenna modes capture the signals you want to hear. Start with the "Easy" operation mode, then move up to "Expert" level. You can store up to 700 frequencies in memory channels.

The DJ-X2 contains several advanced features, including a unique "sniffer" circuit (patent pending) that searches for hidden transmitters or "bugs" and an adjustable descrambler that allows you to hear certain types of transmissions. An attenuator reduces strong signals. Up to five banks can be linked during scan functions. The DJ-X2 also has many custom settings that give the operator maximum flexibility in creating a user profile that suits specific needs.

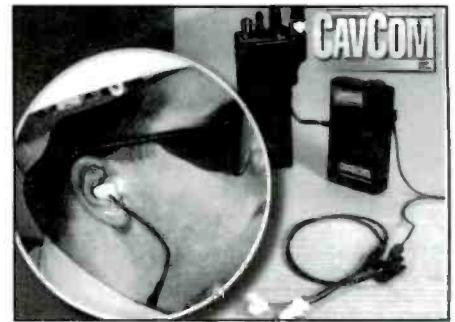
- "Credit Card" size
- 522 KHz ~ 1 GHz tuning range (less cellular)
- 700 memory channels (70 channels X 10 banks)
- AM, FM, WFM modes
- Internal Lithium-ion battery PLUS snap-on dry-cell power pack
- Effective RF "sniffer" feature detects hidden transmitters (patent pending)
- Three different antenna modes including internal ferrite loop
- Easy & Expert user operating profiles
- Attenuator
- Clone function
- Preset, memory, and VFO operating modes
- Illuminated display.

For more information, contact Alinco USA at 438 Amapola Avenue, Suite 130, Torrance, CA 90501; Phone: 310-618-8616, Fax: 310-618-8758 or visit their website at <http://www.alinco.com>.

CIRCLE 100 ON READER SERVICE CARD

Talk-Thru-Your-Ears

CavCom Incorporated, exclusive manufacturers of "talk-thru-your-ears" com-



The new CavCom Talk-Thru-Your-Ears product line works with most brands of two-way radios.

munications/hearing protection devices, has introduced an innovative line of "off-the-shelf" earsets.

The new "CUE" (Custom Universal Earset) is a lightweight earset with both the microphone and receiver built into the earpieces, which can be adapted to most brands of two-way radios. The CUE earset was designed to provide a comfortable, lightweight alternative to a headset with boom microphone. Developed by audiologists, the CUE can be used with any type of helmet, safety glasses or face shields, SCBA, or other respirator devices.

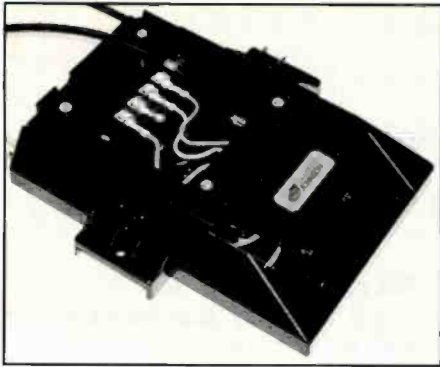
The CUE is manufactured in four generic sizes and is available for immediate delivery. For pricing and other information, please contact CavCom at 816-471-2092 or E-mail the company at cs@cavcominc.com. You can also visit their Website at www.cavcominc.com. Tell them you read about the CUE in *Popular Communications*.

CIRCLE 101 ON READER SERVICE CARD

Mobile Radio Mount Offers Quick Installation And Removal Of Radio

Safely installing communications equipment into vehicles is a challenging task that requires not only careful product selection but also finding the right mounting equipment to ensure safety and security. Cabin space is at a premium

BY HAROLD ORT AND R.L. SLATTERY



The Gamber-Johnson mobile slide mount offers you quick and easy installation and removal of your radio.

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SCAN TECH

Trunking, Tips, Techniques, And Mods

Skyhooks For Scanners!

Since it's summer, and you're probably wanting to do things outside anyway, I thought we'd take a look at a couple of antenna-related issues and maybe get you inspired to do some experimenting before the weather runs you back indoors. Of course, if you're someplace where the weather doesn't run you back indoors, you can still experiment.

Before we get started, however, you should be aware of a potential problem. Antennas are a double-edged sword. The idea of upgrading your antenna is to hear more stuff, right? And if everything were perfect, and in a perfect world, raising the height of the antenna, or increasing its effective gain would result in hearing more signals. In the perfect world, that's true, but ours is alas not quite perfect. For the ultimate proof of that, I remind you that we have to share the planet with Harold, so you just know we're gonna be in trouble!

The other problem is that the antenna can actually deliver more signal to the radio, but the radio can't process it correctly. This effect is called many things depending on where in the radio the breakdown occurs, but we'll call it overload for brevity. We've discussed this in more detail recently, so I won't go into a lengthy discussion here, but I did want to point it out so that if you do make antenna changes and then believe you're not hearing as much as you did, you could be quite right. And don't panic — you can always put things back the way they were.

Lengthy Discussion

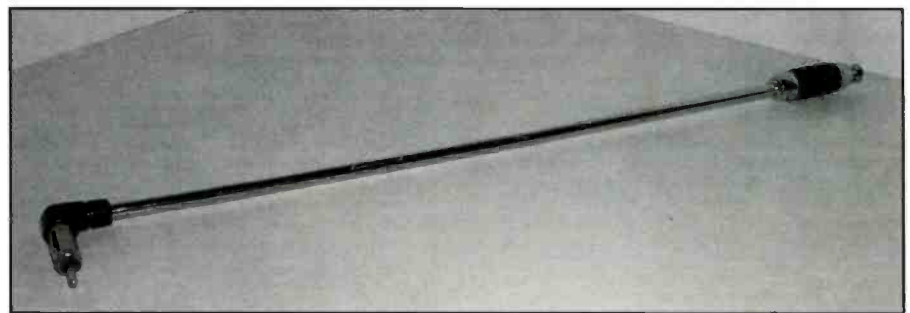
First off, let's make the point that anything that will conduct electricity (or more specifically, radio frequency signals) will work as an antenna. The old coat hanger bent in some funny shape and connected to your radio will receive. Likewise, a spool of wire from RadioShack with one end stripped and stuffed into the antenna connector will work too, but the question is always "how well?"

It's difficult to talk about antennas for any length of time without understanding



This built-in antenna is a good one to start with. Experiment with different lengths of the telescope to see what gives you the best results. Of course, it's a lot easier if everything you listen to is on one band!

wavelength. So we'll take a few minutes here and get that out of the way. If you're already comfortable with this stuff, you can skip to the next section and save some time. See how accommodating we are here at *Pop'Comm*?



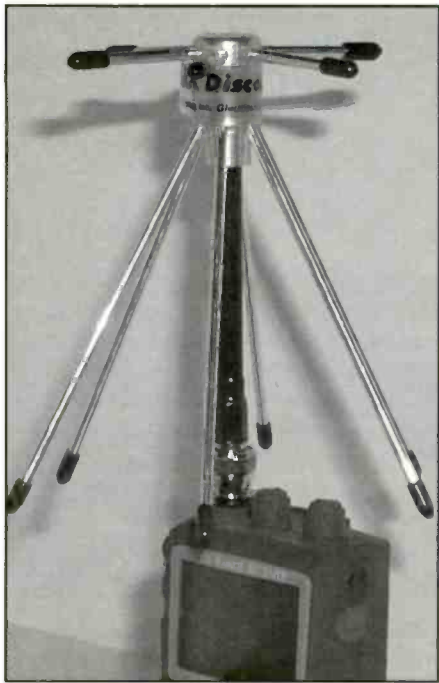
This "indoor scanner antenna" from RadioShack is actually a good performer in metropolitan areas. At \$9.99, item number 278-117 can be a bargain. Collapsed like it's shown here, it's great on VHF-Hi and UHF frequencies. Fully extended to 40 inches, it's good for VHF-Low band. It will perform on 800 MHz with stronger signals, but that's not its designed area of operation. Note that it has a Motorola type plug on it, so unless you have an older scanner, you'll also need an adapter to plug it into your radio.

We're all familiar with frequency, which is how many times per second the signal that we're interested in is oscillating per second. Radio waves travel at a constant speed of 300,000 kilometers per second (or 186,000 miles per second, if you prefer, but all of the calculations are done based on the metric system). If it has to oscillate more times per second, then there's less time, and therefore, space or distance between waves. The distance between these waves, or more specifically between the starting point of one wave and the starting point of the next, is called the wavelength.

If you're familiar with ham radio at all, you'll know that they refer to particular bands by meter. The 40M band for instance is just over 7 MHz, which makes the wave just over 40M long. There is a considerable rounding that occurs when naming the band, but when we get to antennas, we'll want to be a bit closer.

To calculate this, you can divide the frequency in MHz into 300. The result will be the length of the frequency in meters. It was common in the '30s and '40s for shortwave broadcasters to give their schedule in meters. Most of the tuners were pretty coarse in those days, so some fiddling with the dials was common. In these days of digital readout receivers and synthesized tuners, the exact frequency is much more preferred.

Notice that as we have gone from 7



Here's a discone antenna that mounts on a handheld! Note the disc at the top and the cone portion at the bottom of the antenna that is characteristic of all discones. This one by Max Systems was designed specifically for 800 MHz performance, and it works well at that range, but since it's a discone, it will also receive reasonably well in the 400 and 150 MHz ranges if the signal is strong enough. It's definitely a metropolitan antenna.



A 1/4 wave ground plane features a center vertical element, with "radials" around the bottom. Sometimes they're slanted downwards, and sometimes they are not. Three or four radials are common, but there are antenna designs with many more. Stick a magnet-mount antenna on a car's trunk lid or a filing cabinet to create your own ground plane.

MHz to 150 MHz, the wavelength has gone from 40M to 2M (slightly longer than a football field to slightly longer than a couch or bed). As we go higher and higher into the range of scanner frequencies, the waves continue to get *shorter*. At 850 MHz, we're down to 35 centimeters — just a little longer than a letter size piece of paper.

So how does all this figure into antenna design? The efficiency of the antenna is directly related to the wavelength of the frequency versus the physical length of the antenna. An antenna cut to exactly 1/2 of the wavelength (a half-wave dipole) is one of the references for antenna performance, and a relatively simple one to build. So our 146 MHz antenna should be 38 inches long, or 19 inches *per side* of the dipole.

As a shortcut, you can use a formula that will convert the length of the antenna elements directly to inches. Depending on which book you read, 2800 to 2808 divided by the frequency in MHz will give you the length per side for a dipole. 2800/146 gives us 19.17 inches, while 2808/146 gives us 19.23. Not much difference, but my philosophy was to start

longer and trim as necessary. Remember that none of this is critical for receive antennas, and in practice either one would probably be just fine.

All of this brings us to another critical point: Bandwidth. Many antennas are frequency specific. Some of them drop off considerably the further you move away from that optimum frequency, while others are fairly "broad banded." If you stop and think about it for a second, we're asking the scanner and the antenna to perform across many hundreds of MHz, while many antennas were designed for ONE frequency. Yikes!

Starting Simple

The simplest antenna is a half-wave dipole. In English, this is a wire 1/2 wavelength (the length of the radio wave from peak to peak) that is split at the center. This antenna has to be cut for a particular wavelength, although it will perform reasonably well for 20 to 30 MHz on either side of center. Remember that we're talking entirely about *receive* antennas here. If you're licensed to trans-

mit, all the rules change, and you should probably ignore this article completely!

The half-wave dipole comes in many variations; the most common for scanner users is the quarter-wave ground plane. What? You just said it was 1/2, now it's 1/4? Yep. The active or main element of the antenna is 1/2 of the 1/2 wave, or 1/4. Each leg of a dipole is 1/4 wave, too.

What makes the ground plane type antenna different is that the active element is vertical in the center of a "plane" or number of elements that form the other leg. The ultimate ground plane is a metal disk with a radius equal to 1/4 wavelength. However, you can get almost as much performance, and save a lot of wind resistance with just a few metal elements (3 or 4 are common). By having the elements spread out over 360 degrees, you'll get a very omni-directional pattern, and it will receive signals from any direction.

The antenna that comes with your radio is probably based on this principle. By winding coils or other tricks, they are sometimes shorter than the 1/4 wave normally required for the vertical element. Handheld antennas are based on this idea. And where are the other elements for the ground plane? It uses your radio itself. It's not exactly the right size, and not quite as efficient as it could be, but it's much cheaper to manufacture, and probably easier to fit in the box or carry than a 1/4 wave ground plane disk for 40 MHz.

The antenna that comes with your scanner is a good place to start. It's easy, costs nothing, and was probably tested by the manufacturer to provide good performance (sometimes just good, not great) over the range of the receiver. Once you've established the performance of the radio with this antenna, you can start to experiment and see what improves performance and what doesn't.

Remember that the length of the antenna directly affects its best frequency. If you listen primarily to frequencies in the 800 MHz range, you may get better performance with the antenna collapsed to its shortest length (assuming that it has that capability). If you listen mostly to 150 MHz traffic, you'll want it fully extended in most cases.

The next thing to try is a 1/2 wave dipole, or 1/4 wave ground plane type antenna. Both are easy to build, or relatively cheap to purchase. RadioShack makes a ground plane antenna (No. 20-176) that actually works on two bands. From the factory, it's set for about 140 MHz and 440 MHz. Cutting a bit off the

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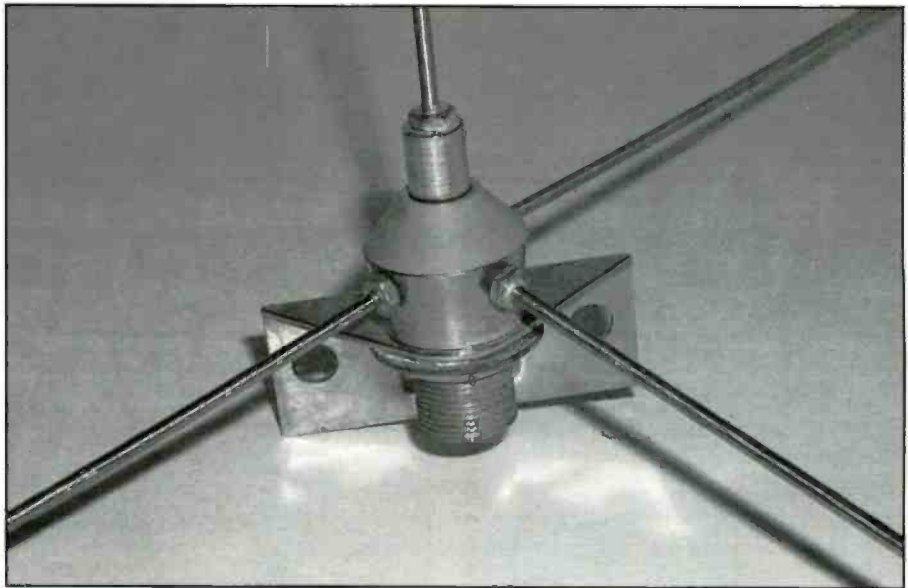
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Here's a ground plane design from RadioShack. One of the radials can be removed and the antenna mounted on a rafter or bookcase with reasonable indoor performance. The newer model of this antenna features vertical radials that form a V-shape cut for 450 MHz. RadioShack's No. 20-176 is a great antenna for scanner listeners. The low price of the antenna means you won't mind cutting the radials for a particular band if you're looking for peak performance in one area.

ends might help fine tune those frequencies, but in practice, most people find they work pretty well. The most notable exception is trying to use this antenna in the military air band (220-400 MHz) means that the elements do need to be cut for those bands. 2808/300 is about 9.3 inches for the longer elements.

A lot of scanner listeners find this simple arrangement in an attic or outside works just fine for all the radio signals they care to hear. However, this scanner antenna isn't particularly broad banded, so if you wander too far away from those frequencies that it's cut for, you'll find reduced performance, possibly to the point of unacceptable.

The Discone

Here's where the scanner-favorite discone comes into play. Most of us want to be able to listen to signals over the full range of the receiver. For scanners, that's roughly 30 MHz to something around 1,000 MHz, maybe higher, but if you go much above that all sorts of things start to change, and you really need a different antenna. The same thing applies below 30 MHz. There just isn't one antenna that will go the whole distance.

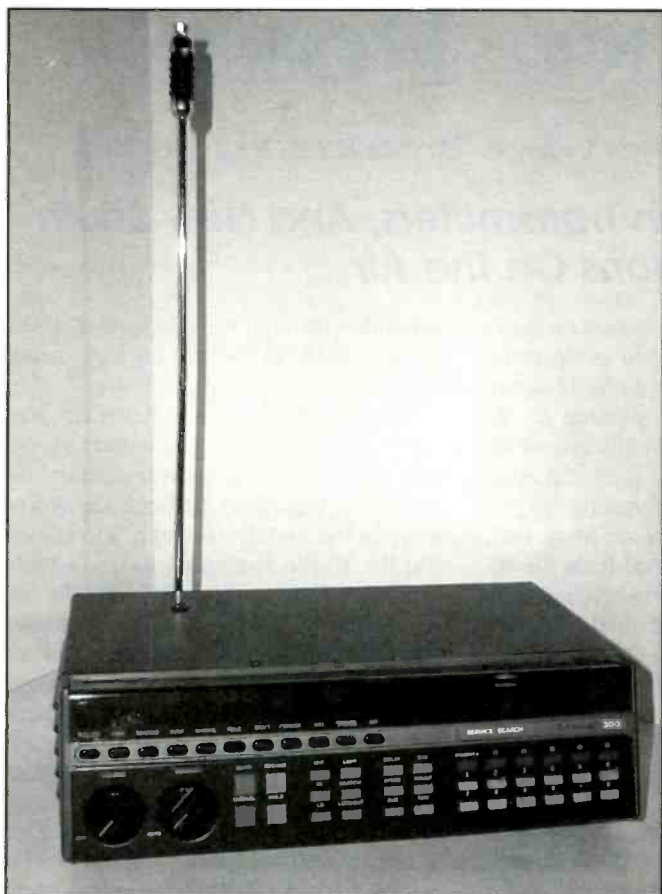
The discone, however, does a decent job throughout most of the range. Not a great job, mind you. It, like all antennas,

is a compromise. To get great performance in one spot, you give up bandwidth — performance across a wide range of frequencies. To get bandwidth, you give up performance, or gain, on any particular frequency. The discone is probably about equal to maybe slightly worse off than a dipole on any given frequency. But they will maintain that performance for a few hundred MHz on either side of center.

The discone does have a center frequency, just like the ground plane. Many military monitors cut discones to center around 300 MHz, but still get acceptable performance on most of the public safety bands. The disk radials should be 2008/Frequency and the longer "cone" radials should be 2953/Frequency.

Most discones are manufactured for the VHF Hi and UHF ranges, so you'll have to modify your own if you choose to do this. A standard discone will receive signals in the VHF-Lo range, although it is helped tremendously by the addition of a whip on top of the disc. The new RadioShack discone (No. 20-043) has this addition, as do many discones by Diamond and Comet. Remember that any antenna built for ham applications will work reasonably well for your scanner.

By the same token, the standard discone will receive some signals at 800 MHz, but not perform very well there. Max Systems makes an 800 MHz discone



Older radios like this Bearcat 300 came with antennas for the back of the radio that plugged right in to the Motorola pin plug connection. On new scanners, you'll need a BNC connector, or an adapter.

(as well as the 1/4 wave ground plane shown), or you might be better off with a dedicated antenna if 800 MHz performance is a factor for you. Experimentation, as always, is the key.

Looking For Direction?

Up until now, we've been discussing omni directional antennas — those that receive equally well (or poorly) from all directions. Under most circumstances, that's exactly what you're

looking for with a scanner antenna; we want to hear things all around us.

There are times, however, when we would like to concentrate on a particular signal, or perhaps we're looking for maximum distance. There are antennas that are **directional**.

Directional antennas, or **beams**, come in all shapes and sizes too. And they all have one major factor in common that separates them from the omni crowd. They give up bandwidth and omni directional performance for high performance (gain) in *one direction*. Many times these antennas are mounted on a rotor so that they can be turned towards whatever signal is of interest. Many transmitting operations use beam antennas for all sorts of reasons, but for receive applications, they're somewhat specialized.

One of the features of many beam antennas is that while they emphasize performance in one direction, they de-emphasize performance in another (sometimes many others). This feature can be useful in helping to eliminate an interfering signal in favor of the one you're after. If you're located in an outlying area and want to hear signals from a particular transmitter or city, a beam antenna mounted high might be your only option.

Beams come in many shapes and sizes, but they tend to be a bit larger than omni directional antennas. The higher the frequency of the beam, the smaller physically it will be, but even 800 MHz antennas with many elements can become quite large. In addition, they may need to be mounted on a mast with a rotor so that you can vary the direction.

Let Us Know What You Find!

Experimentation, as we've already mentioned, is the key. What works great in one situation may fall apart in another. One of the great things about antennas is that you can build many of them out of relatively low cost materials, and it doesn't take too much to experiment. That's what you should do. Be careful if you're working outdoors that you stay a safe distance from power lines and other structures, and always wear a safety belt if you're climbing a tower or other structure. Never work alone. Offer void where prohibited.

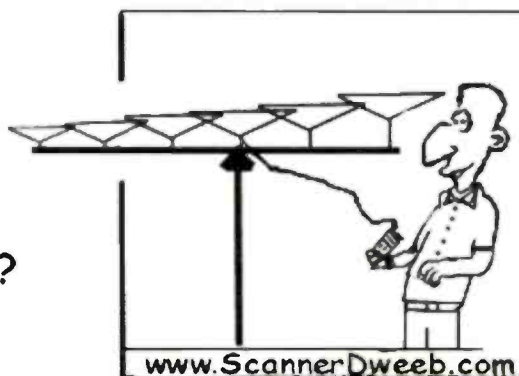
Remember this is a hobby, and you'll want to be around for next month's exciting issue of *Popular Communications*! Write in and let me know what's working in your situation. You can reach me via E-mail at armadillo1@aol.com, or regular mail at 9051 Watson Rd. #309, St. Louis, MO 63126. Until next month, Good listening! ■

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THE LISTENING POST

What's Happening: International Shortwave Broadcasting Bands

Voice Of Hope Airs From German Transmitters, And New South American SW Stations On The Air

When Israel pulled all of its forces out of the southern part of Lebanon last May, High Adventure Ministries almost immediately discontinued all broadcasts from its station there, dismantled its transmitters and antennas and moved them out. The broadcasts of High Adventure Ministries — also known as the **Voice of Hope** — (no connection with Adventist World Radio's Voice of Hope) are now aired via Deutsche Telekom's transmitters at Juelich, Germany at 0800–1200 on **21590**, 1200–1559 on **21640**, and 1700–2100 on **11985**. Note: Apparently there is still another organization using the Voice of Hope slogan, which is, at this writing, airing broadcasts via Juelich. High Adventure also operates KVOH shortwave based in Simi Valley, California.

We have to wonder where those now spare transmitters will end up! The departure of High Adventure leaves the semi-active **Voice of Lebanon** as the only shortwave outlet in Lebanon. When active it uses **6550** from 0400 to 2230, mostly in Arabic.

Wouldn't you know it! Just as a *Pop'Comm* feature article on Colombian shortwave broadcasters went to the print-

er we got word of a new station on the air there! **Colombia Estereo** is operating from Bogota on **4895**, running 24-hours-a-day. The station is operated by the Colombian army and, initially at least, are relaying 93.4 FM in Bogota as well as one or two others. (Perhaps the army can pick and choose what it wishes to relay, without having to get approval from the stations.) They also carry programming from Cadena Radial del Ejercito Colombiano (CREER) — the Colombian Army Radio Network. Reception reports are welcome to: Emisora Colombia Estereo, Escuela de Cadetes Jose Maria Cordoba, Calle 80, No. 38-00, Santa Fe de Bogota, Colombia.

There's also a new station on the air from Bolivia — **Radio Yura**, on **4716**. Details are a bit sketchy yet but it appears to sign on around 1000. The station is located at the small village of Yura, on the river of the same name. This is surely a low power operation and it will probably take some digging to pull it through.

And there's a new one in Peru, as well. **Radio Paraton**, also IDing as Radio La Voz del Campesino, is operating on **6956** and a fraction, signing on at 1055 and running well into the evening hours. This one

is coming through well enough at times to cause QRM to some of the U.S. pirate operators, who favor 6955.

Is there a QSL from Panama in your future? Shortwave from Panama has been non-existent for a quarter century or more. But there may be hope for shortwave in the months (or years!) to come. **Baptist Radio International** — which operates **Radio K'ekchi'** (**4845**) in **Guatemala** and **Radio Buenas Nuevas/HRET** (**4960**) in **Honduras** — has plans to put a **Radio Guyani** on the air from Panama. The station would operate with 500 watts and serve the Guyani population there. The organization also has plans for a **Radio Bautista**, which would operate in Guatemala. In addition to the shortwave stations it currently operates, Baptist Radio International also has medium wave and FM stations in Nicaragua, Honduras, Panama, and Jamaica. We have an inquiry out seeking more info and will keep you advised.

HCJB has located land suitable for the new transmitter site it needed to find in Ecuador. The station has to eventually give up its current site at Pifo because it would be in the way of a new Quito airport, which the government plans to



Two QSL cards from Radio Taipei International received by Rick Barton, Arizona.

BY GERRY L. DEXTER



This building houses the production facilities of Vatican Radio.

build. The new site is west of Guayaquil, near the peninsula of Santa Elena on Ecuador's Pacific Coast. No word on how long construction will take or when the move will be made.

Radio Mix Master? What kind of a name is that for a radio station? Well, cool or dumb, it's apparently real. It belongs to a new station in the Sakha Republic, a part of Russia. It's operating on **4940** from 2100 to 1700, presumably in Russian. If you get lucky, the address is Radio Mix Master, Office 1, ul. Oktyabr'skaya 20/1, Yakutsk 677027, Republika Sakha, Russia. (And don't make fun of their name.)

This month's book winner is Lee Silvi of Mentor, Ohio. Universal Radio has sent Lee a copy of *The Shortwave Listening Guidebook*, by Harry Helms. If you don't have a copy of Universal's mammoth catalog of goodies, do yourself a favor and write or call for a copy. It has over 100 pages of receivers, antennas, books, connectors, software — anything and everything a shortwave listener could want to improve reception. Phone 614-866-4267 or write to Universal Radio, 6830 Americana Parkway, Reynoldsburg, OH 43068.

Remember that your reception logs are always welcome. Please be sure to list your items by country, leave at least a double space between each (so we can navigate the scissors more easily), and add your last name and state abbreviation after each log. And also, be sure to use only one side of the paper — otherwise some of

your logs won't make it into the column. Other things we can use in the column are spare QSL cards you don't need returned (or good quality copies), station photos, and other items from stations, including schedules, and brochures.

Why are you so shy? We'd love to feature a photograph of you at your listening post, too! As always, thanks so much for your continued interest and cooperation!

Here are this month's logs. All times are in UTC, which is five hours ahead of EST, i.e. 0000 UTC equals 7 p.m. EST, 6 p.m. CST, 5 p.m. MST, and 4 p.m. PST. Double capital letters are language abbreviations (FF = French, AA = Arabic, SS = Spanish, etc.). If no language abbreviation is included the broadcast is assumed to have been in English.

ALASKA — KNLS, **9610** at 0841. Weak with religious music, ID at 0847. (Montgomery, PA)

ALBANIA — Radio Tirana, **6115** at 0236 with national and regional news. Albanian Press Review. **7270** at 0305 with Balkan pops, talks in presumed Albanian. Off at 0323. (Zimmerman, IL) **7160** at 0239 with news, and "Calendar" program. (Burrow, WA) **9540.95**, 2130-2200 with news, commentary, ID. // **7130.07**. New time for EE. (Alexander, PA)

ALGERIA — Radio Algiers, **15160** at 1936 in SS with music, man announcer. (Jeffery, NY) 2000. "Welcome to Radio Algiers." (Paszkiwicz, WI)

ANGOLA — Radio Nacional, **11954.8** at 2345 in PP with talk, ballads, ID, four time pips, news about Angola. (Paszkiwicz, WI)

ANTIGUA — BBC relay, **5975** at 0200 with "The World Today." (Jeffery, NY)

ARGENTINA — RAE, **15345** at 2150 in

Abbreviations 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/iouis
SA	South America/n
SS	Spanish
UTC	Coordinated Universal Time (ex-GMT)
v	Frequency varies
w/	With
WX	Weather
YL	Female
//	Parallel Frequencies

SS with music and what might have been a children's program. (Linonis, PA)

ASCENSION ISLAND — **15400** at 2000 with "Newshour" to West and Central Africa. (Jeffery, NY) 1800 on **17830**. (Brossell, WI)

AUSTRALIA — Radio Australia, **9580** at 1315 with news, sports report. (Linonis, PA) **17580** at 0350 with talk on today's sciences. **21740** at 2230 with "Saturday PM." (MacKenzie, CA) 0240. (Paszkiwicz, WI)

BOTSWANA — Voice of America relay, **15545** at 1759 in unidentified language with IS, ID, news. (Jeffery, NY)

BRAZIL — Radio Nova Visao, **11735** in PP at 0002, with religious program, hymns, mention of Sao Paulo, ID. (Paszkiwicz, WI) Radio Brazil Central, **11815** at 0050 with excited speech in PP. // **4985**. (Paszkiwicz, WI) Radio Nacional Amazonia, **6180** at 2350 with ID, promos, phone calls in PP. (Paszkiwicz, WI) Radio Globo, **9585** with futbol at 0156. (Paszkiwicz, WI) Radio Bandeirantes, **9645** at 2340 with PP talk. Severe het. (Paszkiwicz, WI) Radio Nacional, **15445** at 2155 with sports in PP. (Miller, WA) Radio Aparecida, **9630** in PP at 0805 with ID and nice, easy Brazilian tunes. Very weak, with rapid flutter. (Montgomery, PA)

BULGARIA — Radio Bulgaria, **9400//11700** at 0250. SWL program. Music, and off at 0300. (Burrow, WA) **11700** at 1925 with Bulgarian music; ID and mentions of Sofia at 1930. (Brossell, WI) **15700** at 1140 with ID. (Northrup, MO)

CANADA — Radio Canada Int'l. **13650//13670** at 2032 with news update, Canadian weather, sports update. "Maple Leaf Mailbag." (Jeffery, NY) **13670** at 2325 with "World at Six." **15325** at 2245 with news. (Limbach, PA) **15330** via Canada, at 0509. "Arts in Canada." (Jeffery, NY)

CHILE — Voz Cristiana, **15375** in SS at 0210 with current events program. (Zimmerman, IL)

58 INTERNATIONAL EXHIBITION
UNIVERSAL AND



BRUSSELS
APRIL - OCTOBER 1958

THIS IS TO VERIFY YOUR REPORT ON OUR BROADCAST OF 14/8/57
STATION ORU
FREQ 15.335 Kc/s
100 Kw. - 20 Kw.

ORU THE INTERNATIONAL GOODWILL STATION
LA VOIX DE LA CONCORDE
DE VRIENDSCHAPSBOEDE

BELGIAN NATIONAL BROADCASTING SERVICE
SHORTWAVE DIVISION - P. O. B. 26 - BRUSSELS 1 - BELGIUM



These fancy facilities beam the BBC from Singapore. (Thanks Mark Lussky, CA)

It's Radio Vlaanderen now, but back in 1958 the Belgian National Broadcasting Service commemorated the 1958 International Exhibition with this special card.

CHINA — China Radio Int'l, **6960** via Spain at 0310 with news, discussion on Chinese wildlife. **13685** via French Guiana at 0246 with western-style pops. (Zimmerman, IL) **15415** at 1234 with news, music, feature about China. (Jeffery, NY)

COSTA RICA — Radio Universidad, **6105** at 0233 in SS with classical music. (Paszkievicz, WI) RFPI, **15050** at 1917. (Jeffery, NY) 2346. (MacKenzie, CA) **25930 USB** at 1800. (Montgomery, CA)

CROATIA — Croatian Radio, **9925** via Germany at 0136 in Croatian. (Miller, WA) 0315 with news about Croatia, into Croatian at 0317. (Brossell, WI)

CYPRUS — BBC via Cyprus, **15180** at 1735 in AA. (Brossell, WI) **15575** at 0415 with news. (MacKenzie, CA)

CZECH REPUBLIC — Radio Prague, **7385//11615** at 0303 with news. (Brossell, WI) **17485** at 2310 in SS. (MacKenzie, CA) **21745** at 1600 with news. (Watts, KY)

DENMARK — Radio Denmark, via Norway, **15735** at 1220 with ID in FF, then into Danish. (Northrup, MO) **17505** via Norway, at 1933 in DD. (Miller, WA)

DOMINICAN REPUBLIC — Radio Amanacer, **6025** at 0325 "muy buenos noches," ID, frequency announcement. (Paszkievicz, WI)

ECUADOR — La Voz del Upano, **4870** from 0125 to 0204 close. Mostly continuous SS talk by man and woman. Brief breaks of Ecuadorian music, ID at 0201. Off with about 30 seconds of the national anthem before pulling the plug in mid-song. Irregular. (Alexander, PA) HCJB, **9745** at 0424 with "Studio Nine" program. **9745//15115** at 0226 with program "Walking in the Sunshine."

(Zimmerman, IL) **15140** at 0412 in SS. (Foss, Philippines)

EGYPT — Radio Cairo, **9990** at 2120 with international news, ID, music. (Burrow, WA) **15210** at 1945 in an African dialect. (Brossell, WI) **17770** at 0825 in AA. (MacKenzie, CA)

ENGLAND — BBC, **9590** via Canada, at 2330 with program preview. (Jeffery, NY) **9740** at 1115 and 1225. (Northrup, MO) **12095** at 0430 with "Weekend." (MacKenzie, CA) **15540** at 1539. (Miller, WA)

FINLAND — YLE/Radio Finland, **13770** at 0135 with report on a Finnish organization's visit to Afghanistan. (Limbach, PA) **15400** at 1433 in Finnish. (Miller, WA)

FRANCE — Radio France Int'l, **7280** at 0325 in unidentified Slavic language. Into FF at 0330 and off at 0357. Also **9790** at 0330 in FF. (Zimmerman, IL)

FRENCH GUIANA — China radio Int'l relay, **9730** at 0410. (Zimmerman, IL) Radio Japan/NHK relay, **9660** in JJ at 0325. (Brossell, WI) **11895** at 2250 in JJ. (MacKenzie, CA)

GABON — Africa Number One, **9580** in FF at 2238. Great African music. (Montgomery, PA)

GEORGIA REP. — Radio Sochi, **9489** at 1430 in RR. This is an unauthorized relay of a local FM station by Abkhazian Radio. (Kolesov, Ukraine)

GERMANY — Sudwestrundfunk, **7265** at 0348 with pops by "Madness." GG. (Paszkievicz, WI) Deutsche Welle, **21840** with news in GG at 1225. (Northrup, MO)

GHANA — Ghana Broadcasting Corp., **4915** at 2223 with "Tennessee Waltz." And continuous easy music. ID by woman at 2229, then into African music and change to a local language. (Montgomery, PA)

GREECE — VOA relay, **15205** at 0502. (Jeffery, NY) Voice of Greece, **7450//9420** at 0340 with local pop, talks in Greek. Off at 0350. (Zimmerman, IL) **17705** in Greek via

Delano at 1942. (Miller, WA) 1955. (MacKenzie, CA)

GUATEMALA — Radio Buenas Nuevas, **4799.8**, 0250 to 0350 close. SS religious music, talk at 0300, ID, closing announcement with IDs, call letters, and off. (Montgomery, PA) 1118 with SS religious broadcast. (Miller, WA) Radio Tezulutlan, **4825** at 1121 with Bible broadcast in Quechua. (Miller, WA) Radio Cultural, **3300** with music program at 0345. (Brossell, WI)

GUINEA — Radiodifusion Nationale, **7125** at 2340 with Afro-pops, talks in FF. Good but covered by strong open carrier from Voice of Russia at 2350 and test tones at 2351 before Voice of Russia opened at 0000, totally wiping out Guinea. (Montgomery, PA)

HAWAII — KWHR, **15105** heard at 1645 with talk about their web site and Christian music. (Linonis, PA) **17510** at 2305 carrying Radio Free Asia service in CC. (MacKenzie, CA) **17780** at 0426 with mailbag program. (Foss, Philippines)

HONDURAS — La Voz Evangelica, **4819** at 1119 with Bible broadcast in SS. (Miller, WA) 1125 in SS. (Northrup, MO)

HUNGARY — Radio Budapest, **9835** at 0133 in Hungarian. (Miller, WA)

INDIA — All India Radio, **13620** at 0246 with film music. **15075** at 0313 with IS, opening announcements in unidentified language. (Paszkievicz, WI)

INDONESIA — RRI, Jakarta, **15125** in unidentified language at 0417. (Foss, Philippines) Voice of Indonesia, **15149.83**, 2000 to 2058 with news, commentary, ID, feature, local pops. Off with schedule. (Montgomery, PA) **15150** at 2007 EE news, gamelan music, IDs. (Paszkievicz, WI)

IRAN — Voice of the Islamic Republic of Iran, **11930** in AA at 2309 with commentary and marital music. (Miller, WA) **11970** at 0035 with EE sign-on, mention of **6135** kHz, explanation of the Koran. (Paszkievicz, WI) **15084**

with anthem at 1730, into unidentified language. (Brossell, WI) 2345 with Koran. (MacKenzie, CA)

IRAQ — Radio Baghdad, 11785 in GG at 0225. "Hier ist Baghdad Radio," news. Heard over Deutsche Welle. (Paszkiwicz, WI)

IRELAND — Radio Telefis Eireann, 6155 (via Merlin transmitters in the UK) at 0145. (Watts, KY)

ISRAEL — Reshet Bet home service, 17545 at 1645 in HH with news, comment, and possible call-in show. (Linonis, PA) Galei Zahel, 6895 USB, tentative, 2322-0030 with mostly French and U.S. pops, apparent news on the hour. Man in HH. Fair but what I think is a jammer with a continuous roar that rolls through the audio. (Montgomery, PA) 0210-0315 in HH with local music, light U.S. pops. Also 15785 at 0558 in HH with local pops, radio drama. Suppressed carrier USB. (Alexander, PA) Kol Israel, 9435 at 0400 with Israeli and regional news. (Zimmerman, IL) 2000 with news, weather, ID and off. Also heard in EE at 0414. (Burrow, WA) 11535 at 0138 with news in HH. (Miller, WA) 15615 in HH at 2315 and EE at 0400. 15640 at 0353 in HH and into EE at 0400, 17535 in EE at 0405. (MacKenzie, CA) 15615 at 1800 with ID in HH and into presumed news. (Brossell, WI) 15650 at 1400 with EE news, sports, ID. //17535. (Alexander, PA) 17545 in HH at 1815. (Paszkiwicz, WI)

ITALY — RAI Int'l, 11765 at 0142 via Ascension. In II. (Miller, WA)

JAPAN — Radio Japan/NHK, 6175 via

BRITISH FORCES BROADCASTING SERVICE

SINGAPORE — HQ FARELF, c/o GPO SINGAPORE

TRANSMITTER TYPE

8D 2650

AERIAL 4 ELEMENT COLINEAR DIPOLE

EFFECTIVE RADIATED POWER

40K WATTS

Thank you for your report concerning our transmissions on 5988 Metres
Solo K/c/s M/c/s covering the period 1504 hrs to 1530 hrs

on 13/4/71 to 1530 on 6/4/77. The contents of your report have been checked with our Station Log for that day and found correct. May we take this opportunity of wishing you good luck and happy listening during 1971!

627

AS Rahatun
SENIOR ENGINEER

The BBC Singapore relay was a Johnny-come-lately. The British Forces Broadcasting Service had a station in Singapore for many years. (Thanks Dr. Adrian Peterson, IN)

Canada, at 0218 with talk in JJ. (Zimmerman, IL) 9505 at 1730 with interviews; 13650 in CC at 2245; 15590 at 0410 in JJ; 17810 in JJ and Malay at 2240 sign-on; 0235 in JJ via Canada; 17825 in JJ at 2235 and 17835 in JJ at 0245. (MacKenzie, CA) 11730 at 1600 with news in EE. (Miller, WA) 11910 at 1940 in JJ. (Brossell, WI) 15590 at 0541 in EE. (Foss, Philippines) 17760 at 0200 with IS, into possible JJ. (Paszkiwicz, WI)

JORDAN — Radio Jordan, 15435 in AA

at 0425 with pops. (MacKenzie, WA)

KUWAIT — Radio Kuwait, 15495 in AA at 1750, //15505, the latter was stronger and clearer. (Brossell, WI) 0216 with presumed Koran. Poor. (Zimmerman, IL) 15505 at 0420 in AA. (MacKenzie, CA)

LIBERIA — Radio Liberia Int'l, 5100, 2300-0000 close. EE with local news at 2300, IDs, variety of Afro, Euro, and U.S. pops. Off with national anthem. (Alexander, PA)

LIBYA — Radio Jamahiriya, 15435 with

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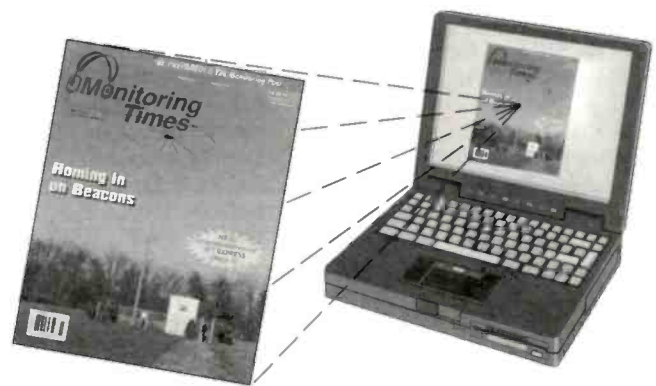
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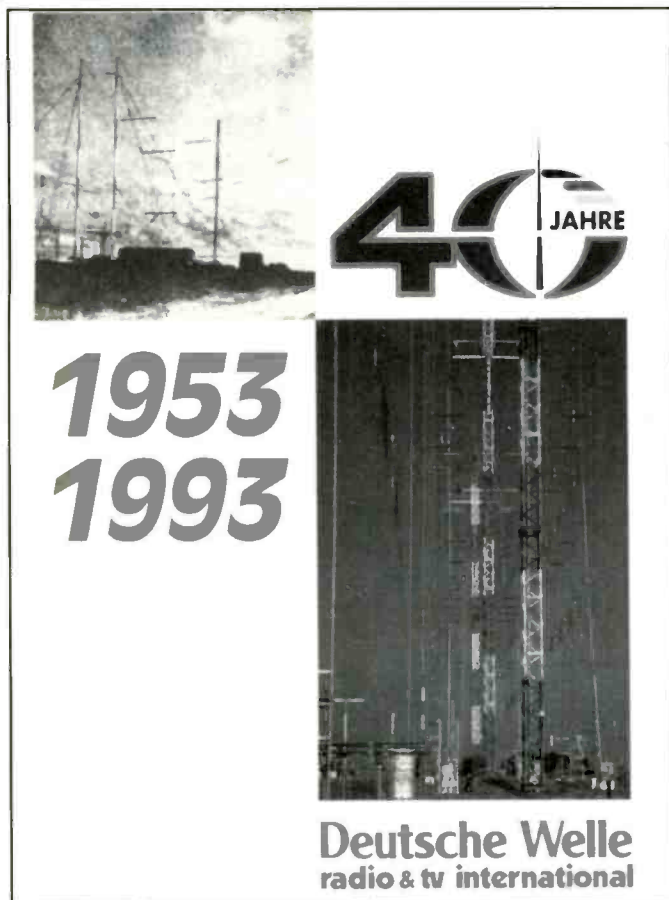
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Deutsche Welle observed 40 years of broadcasting with this card, issued in 1993. (Thanks Richard Klingman, NY)

talks in AA at 1745. (Brossell, WI) Voice of Africa service, **15435**, IDing as "Voice of Africa from the Jamahiriya" heard at 2025, 2329-2335 and 0126-0133. Strong, but very distorted audio and difficult to understand. Also co-channel QRM from Saudi Arabia. (Alexander, PA)

MALAWI — Malawi Broadcasting Corp., **3380** with religious sermon from 0347 to ID at 0400. (Brossell, WI)

MALAYSIA — Radio Malaysia, **7295** at 1600 with Islamic history, '70s R&R, DJ, news at 1700 and into "Midnight Magic" music dedication program. IDs as Radio Four and "RTM." (Burrow, WA)

MEXICO — Radio Mil, **6010** in SS with announcements at 0343. (Paszkiwicz, WI) 0700 sign-on with SS announcements, ID jingles, SS pops/ballads. Reactivated. (Alexander, PA) Radio Educacion, **6185** at 0603 in SS with IDs in EE and music. (Kolesov, Ukraine)

MOLDOVA — Voice of Russia, via Moldova, **9665** at 0330 with news headlines. (Brossell, WI)

MONGOLIA — Voice of Mongolia, **12085** (slightly variable) with EE at 1030-1100 and other languages from 1100-1230. (Silvi, OH)

MOROCCO — Voice of America relay, **15410** at 1805. (Jeffery, NY) RTV Marocaine, **11920** in AA at 0340 and **15345** in AA at 1745. (Brossell, WI)

NEW ZEALAND — Radio New Zealand, **17675** at 0210 with pop selections. (Linonis, PA) 0345 with a drama with story telling, news at 2000. (MacKenzie, CA) 0400 with news, weather, upcoming features on National radio. (Burrow, WA)

NETHERLANDS — Radio Netherlands, **6020** via Madagascar at 2330 with EE to Africa. (Linonis, PA) **15315** at 0202 with current events discussion in DD (Zimmerman, IL)

NORTH KOREA — Radio Pyongyang, **11710** at 1554 with martial music, ID, EE schedule. (Burrow, WA) **11735** at 0220 in SS. (Foss, Philippines) **13650** in KK at 0000, talks about China and South Korea. (Linonis, PA)

NORTHERN MARIANAS — VOA relay, Tinian, **15240** at 1227 with "VOA News Now." (Jeffery, NY)

NORWAY — Radio Norway Int'l, **7465** at 0300 sign-on in NN. (Brossell, WI)

OMAN — Radio Sultanate of Oman, **15355** at 0320 in EE with news, U.S. pops, ID, reference to "93.1 FM" at 0330 and more music. (Burrow, WA) BBC relay, **15310** at 0243. (Foss, Philippines) 0300 with news. (Watts, KY)

PAKISTAN — Radio Pakistan, **15335** at 1830-1850 in presumed Urdu with AA-type music. (Linonis, PA)

PAPUA NEW GUINEA — Radio Milne Bay, **3365**, in EE with Neil Young song. Very weak. IS at 0931. (Montgomery, PA) NBC, **4890** monitored at 1113 with EE news. (Miller, WA) **9675** at 0840 with ID, Sunshine band, reggae. ID again at 0859, IS, time pips, news in EE, ID again at 0906, more news, sports at 0909, ID 0910. (Montgomery, PA)

PARAGUAY — Radio Nacional, **9735**, tentative, at 0100 in SS with possible football match. (Linonis, PA)

PERU — Radiodifusora Huancabamba, **6535.8** at 2358 with continual IDs, then some local music. Heavy QRM from SSB airline transmissions. (Montgomery, PA) **6956.6** Radio Paraton, 0157 with tentative ID. Peruvian music, very weak and supposedly just 250 watts. Occasional QRM from an unknown source. (Montgomery, PA) 0348 with vocals, time check, and ID as Radio Paraton, not La Voz del Campesinos. (Paszkiwicz, WI)

PHILIPPINES — Far East Broadcasting Company, **15095** at 1215 in unidentified language with music, talk by a man. (Jeffery, NY) Voice of America relay, **15160** at 1221. (Jeffery, NY) **17790** at 2255 with talk on jazz. (MacKenzie, CA) Radio Pilipinas, **17720** at 1730 sign-on in EE/Tagalog. Off at 1930. (MacKenzie, CA)

PORTUGAL — RDP, **21800** heard at 1915 in PP, with pops. (MacKenzie, CA)

PUERTO RICO — AFRTS, **6458.5 USB** at 2316 with news, public affairs segments, sports discussion. (Jeffery, NY)

QATAR — Qatar Broadcasting Service, **17895**, all AA at 1810 and 1950. (Brossell, WI)

ROMANIA — Radio Romania Int'l, **11775//15105** at 2300-2359. Presumed // on **11830** fair at times, // **9690** barely audible. (Silvi, OH) **11940** in RR at 0151. (Miller, WA) **0250** in EE. Off at 0255. (Burrow, WA) **15105** at 2332 with ID, music, Romanian literature. (Jeffery, NY) **15180** at 2225 with concert music. (Limbach, PA) **15250** with a letterbox program at 1735. (Brossell, WI) **15365** at 1700 with IS. EE to Western Europe. (Linonis, PA)

RUSSIA — Voice of Russia World Service, **7125** at 0247 with talk in RR, music, Webpage URL, 0300 ID and news in EE. **9665** at 0321. (Zimmerman, IL) **12000** at 0440 with interview on travel in Russia. **17690** at 0335 "Moscow — Yesterday and Today." (MacKenzie, CA) **12055** at 1440. (Miller, WA) Radio Rossi, **12020** at 0350 in RR. (Brossell, WI) **15455** at 0520 in RR. (Jeffery, NY) Magadan Radio, **9530** at 1740 in RR with folk music. (MacKenzie, CA)

RWANDA — Deutsche Welle relay, **17860** in GG at 1805 and 1950. (Brossell, WI)


SEYCHELLES — Far East Broadcasting Assn., **15445** at 1414 in unidentified language, IS and "FEBA Radio." (Miller, WA) **15530** with IS and woman in unidentified language. (Paszkiwicz, WI)

SINGAPORE — Radio Singapore Int'l, **9590** heard at 1126 with EE ID, and news by woman. Bubble jammer in background. (Montgomery, PA)

SOLOMON ISLANDS — Solomon Is. Broadcasting Corp., **5109.94** at 1000 with local news, local political talk about the Malaysia government, Radio Hapi Isles ID. Co-channel QRM. (Alexander, PA) **5020** at 1126 with sports analysis. (Miller, WA)

SOUTH AFRICA — Channel Africa, **9525** at 0430 in FF with African music. (Linonis, PA) 1607 with news in EE and into another language (Afrikaans?) at 1630. (Burrow, WA) **17870** at 1805 with talk. (Brossell, WI) Trans World Radio via South Africa, **7215** in an African dialect at 0340. (Brossell, WI)


SPAIN — Radio Exterior de Espana, **6055** at 0506 with news. (Burrow, WA) **15715** in SS at 1800. (Brossell, WI)



Radio Jordan
P.O. Box: 909 Amman

Date: 3/10/96

We have the pleasure to confirm your reception report dated 9/21/96 on the frequency of 11970 KHz, at 1540 GMT. The programme details mentioned in your report have been checked and found correct. Thank you for listening to our transmission, and best regards from Radio Jordan in Amman.



Sincerely,
JAWAD ZADA
Director

Radio Jordan issued this green, black, red, and white QSL to Steven Thow in 1996.

SRI LANKA — Voice of America relay, 11705 monitored at 0228. (Foss, Philippines) 15250 at 0100. (Watts, KY) Deutsche Welle relay, 17860 in GG at 0121. (Jeffery, NY) Sri Lanka Broadcasting Corp., 11905 at 1150. Religious program in unidentified language. (Miller, WA)

SWEDEN — Radio Sweden, 9495 in probable Swedish at 0215, into EE at 0230. (Watts, KY) 0235 with economic discussion, news about Swedish military. (Burrow, WA) 18960 in Swedish. (Northrup, MO)

SWITZERLAND — Swiss Radio Int'l, 9885 in GG at 0335. (Brossell, WI) 0430 with music, ID, "News Net." (Zimmerman, IL) 9905 (via French Guiana) at 0422; news end, ID, music, sports. (Burrow, WA)

TAIWAN — Radio Taipei Int'l, 5950 at 0227; 9680 at 0300, both via Florida. (Zimmerman, IL) 11825 (probably direct — Editor) at 0206. (Foss, Philippines) 15130 in SS at 2315; 15310 in SS at 2335; 17750 in CC at 1950; 17895 in SS at 0240, all via Florida. (MacKenzie, CA)

THAILAND — Radio Thailand, 15445 at 0515 with interview in EE. (Jeffery, NY) Voice of America relay, 9550 at 1745 with ID, "Talk to America." (MacKenzie, CA)

TUNISIA — RTT Tunisienne, 15535 at 1245 with talk by man in AA. (Jeffery, NY)

TURKEY — Voice of Turkey, 11655 at 0300 sign-on with ID, news, press review, features. (Zimmerman, IL) 0302. (Burrow, WA) 11710 at 0224 in presumed Turkish. (Foss, Philippines) 13640 at 2315 in EE with foreign press reviews, listener letters. (Limbach, PA)

UNITED ARAB EMIRATES — UAE Radio, Dubai, 13675 at 0340 with comparative religion discussion, ID and EE close at 0346. (Burrow, WA) 13675/15400 at 0221 with mid-east music. (Zimmerman, IL) UAE Radio, Abu Dhabi, 15265 at 1745 in AA. (Brossell, WI)

UZBEKISTAN (presumed) — Radio Tashkent, 17775 at 1300 in presumed Uzbek

with mid-east type music. (Linonis, PA)

VATICAN — Vatican Radio, 7305 monitored at 0230 in EE, then in FF, ID at 0250. (Zimmerman, IL) 12065 at 1447 in unidentified language. (Miller, WA) 15570 at 1750 in EE. (Brossell, WI)

VIETNAM — Voice of Vietnam (via Canada) 9695 monitored at 0230. Into EE at 0230 with feature, news at 0235, local folk music. Abruptly off at 0257. EE program repeated on 9795, also via Canada. (Alexander, PA) 0240 "Vietnam's Land and People." (Paszkiewicz, WI) 9795 via Canada at 0335. (Zimmerman, IL)

YUGOSLAVIA — Radio Yugoslavia, 9580 at 0435 with news, ID, more news. (Burrow, WA) 11870 at 0107 with reports on UN, economics and culture. (Limbach, PA) 0445 with news, local music. (MacKenzie, CA)

And the deed's been done. Now, everybody up for a rousing round of applause in tribute to the folks who came through for you this time: Brian Alexander, Mechanicsburg, Pennsylvania; Robert Brossell, Pewaukee, Wisconsin; R.C. Watts, Louisville, Kentucky; Brian Limbach, Pittsburgh, Pennsylvania; Mark Northrup, Gladstone, Missouri; Jay Zimmerman, Carbondale, Illinois (welcome!); Bruce R. Burrow, Snoqualmie, Washington; Jack Linonis, West Middlesex, Pennsylvania; Lee Silvi, Mentor, Ohio; Dave Jeffery, Niagara Falls, New York; Sergey M. Kolesov, Kiev, Ukraine; Marty Foss, Talkeeta, Alaska (listening from the Philippines); Mike Miller, Issaquah, Washington; Robert Montgomery, Levittown, Pennsylvania; Sheryl Paszkiewicz, Manitowoc, Wisconsin, and Stewart MacKenzie, Huntington Beach, California. Thanks to each one of you. Until next month, good listening! ■

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ANTENNAS & THINGS

Simple Antennas And Accessories For Signal Improvement

The Marconi Antenna

Very few of us are fortunate enough to own a country estate with enough land to raise a full-size low-band antenna. I must admit having dreamed of it on occasion, and one time got a look at how the “other one-percent” live. It was with more than a hint of jealousy that I visited an eccentric life-long friend who lived in Texas. He lived in a doublewide house trailer in an antenna field. Despite his eccentricity, however, he had an antenna builder’s dream: 43 acres of prime, flat, rich Texas farmland. He bought the farm specifically to design and erect antennas. He never farmed the property, in the normal sense, unless you count the vegetable garden he kept for his kitchen and (I suspect) a cannabis plant or three.

The knee-high grass on his antenna farm concealed some real or imagined terrors for me, but my friend soothed my nervousness by pointing that Texas rattlesnakes are Western Diamondbacks, and as an Easterner I was essentially safe. Apparently his theory was that Easterners are bitten only by Eastern Diamondbacks (which is one big honkin’ snake!)

My friend’s largest antenna was a 1,400-foot long horizontal wire that could be configured as either a long wire or a Beverage antenna. My eyes fixed on that antenna wire and row of telephone poles stretch across the Texas plain, I am ashamed to admit, were tinged with a bit of green.

But what do the rest of us do? My own lot is large by some standards, but the longest dimension is only 100-feet. If you take safety issues into consideration, then about 60 or 70 feet is about right (power lines!). So how does this affect low frequency operation? Consider both quarter wavelength and half wavelength against frequency. A half wavelength antenna at 1 MHz is 492 feet long, while a quarter wavelength antenna is 246 feet long. Around 4 MHz, the half wavelength antenna is 125 feet long and the quarter wavelength is about half that length. Those lengths basically wipe out the

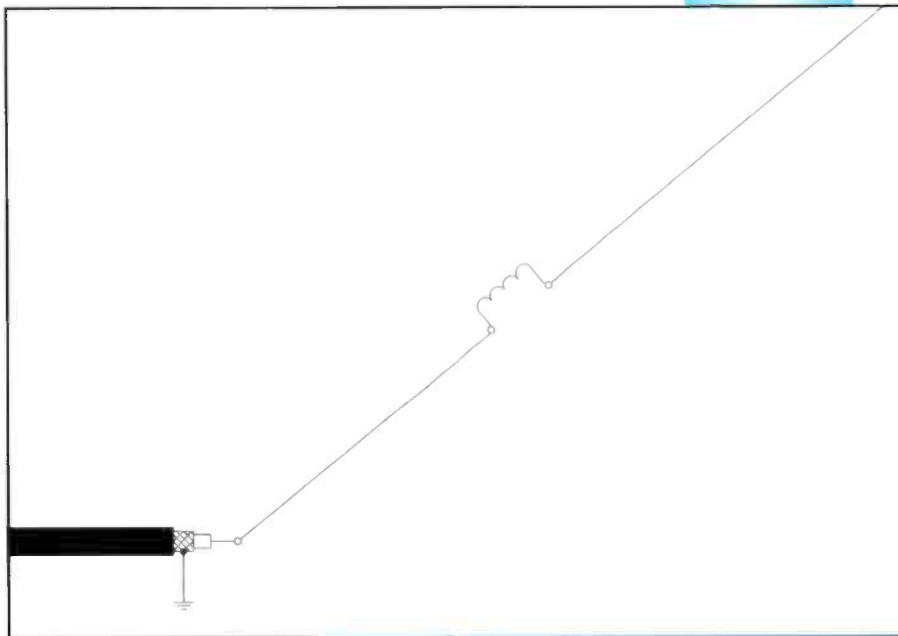


Fig. 1 Loaded Marconi antenna.

space I have for antennas — low frequency or otherwise.

Of course, one could always go vertical. The “footprint” of a vertical antenna is quite small, and it will fit nicely in your backyard regardless of the frequency of operation. Of course, can you imagine trying to convince the mechanical and electrical inspectors from the local gov-

ernment or zoning commission office that your 125-foot high pipe is safe?

Solving The Problem

Low frequency antennas on small plots of land are always a problem, but the problem can be solved to the satisfaction of most people. All of the antennas dis-

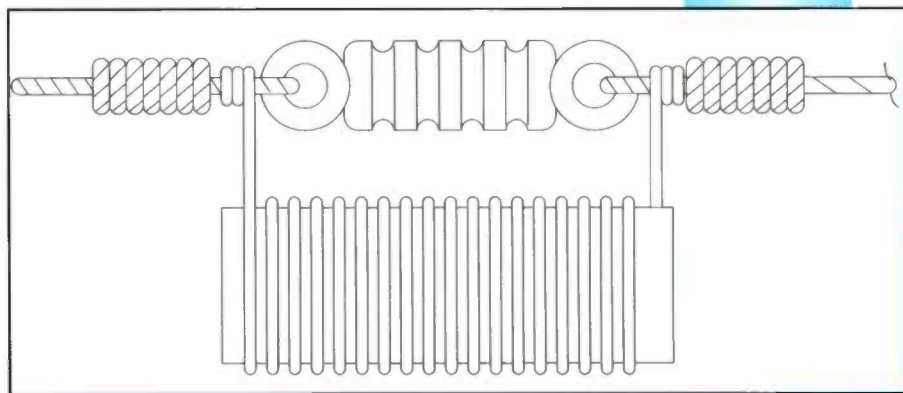


Fig. 2 Installation scheme for the inductor.

cussed here are basically compensation designs. They do not work as well as a half wavelength horizontal dipole installed at an optimal height above ground, but they work well enough to be considered over tossing 10-meters of wire out the garden window. It's a matter of a trade-off: size-Vs-effectiveness.

All of the antennas discussed in this column are variants on the Marconi theme. A Marconi antenna is one that is unbalanced with respect to ground (e.g. a quarter wavelength vertical) i.e. one side of the feedline is grounded. A Hertzian antenna, on the other hand, is balanced with respect to ground (e.g. a half wavelength horizontal dipole).

Loaded Marconi

Figure 1 shows a center-loaded Marconi antenna. The radiator element is two lengths of #16 to #12 AWG stranded antenna wire (copper clad steel wire considered the best), totaling about one-eighth wavelength at the frequency of operation. These two sections of wire are connected in the center of the run by an inductor or "loading coil." The exact value of the coil is found experimentally, but a starting point is the inductance that produces a reactance of about 800 ohms at the center frequency. The inductance is:

$$L_{\mu H} = \frac{8000}{2 \pi F_{Hz}}$$

Where:

$L_{(\mu H)}$ is the inductance in microhenrys (μH)
 F_{Hz} is the frequency in Hertz (Hz)

From this starting point the actual correct value can be found empirically by finding the value that produces the lowest VSWR. Once the correct value is found, the final coil can be constructed and installed.

The typical coil does not have sufficient strength to withstand the stress of being installed in-line with the antenna. The solution is to use an end-insulator as a strain relief (**Fig. 2**). The antenna wires are passed through the holes in the insulator, and then wrapped around itself five to seven times. The wire leads from the coil are attached to the antenna wires at points close to the wrapped portion of the antenna wire. The wrapped antenna wire and coil wire is then solder-tinned to prevent corrosion from the weather. Some people build this whole assembly inside

a weatherproof container in order to extend the life of the coil and joints.

As with all loaded antennas, the "Q" is higher than ordinary resonant antennas, so the bandwidth is narrower than, say, a half wavelength dipole.

Random Length Marconi

One the most common forms of odd-length antenna is the Random Length Marconi shown in **Fig. 3**. This antenna might be shorter than quarter wavelength, exactly quarter wavelength or longer than quarter wavelength, depending on the frequency. The overall length of the antenna should be as long as possible for low-band DXing, but is designed primarily to fit the space available.

This antenna enjoys the advantage of being multi-band. If connected directly to the antenna connectors on the receiver, then it is simply a random length antenna, and will work after a fashion. But if an antenna tuning unit (ATU) is used, then the antenna can be tuned for better efficiency on specific frequencies. Different forms of antenna tuner circuit are shown in the inset to **Fig. 3**. Which to use depends on the operating frequency and the length of the wire.

If the antenna is longer than quarter wavelength, then use a single variable capacitor in series with the antenna wire ("A"). The capacitance effectively electrically shortens the antenna wire, bringing it into resonance (longer than resonance antennas are inductive).

If the antenna is shorter than quarter wavelength, then place an inductor in series with the wire ("B" in **Fig. 3**). Electrically short antennas are capacitive, so require a series inductance to bring them to resonance.

Two forms of L-section antenna tuner are shown at "C" and "D" in **Fig. 3**. Which to use depends on the relationship between operating frequency and length. In some tuners, a single-pole-double-throw (SPDT) switch is placed so that its common connection is to the capacitor, and the two switched connections are wired to opposite ends of the inductor. That way, the tuner can be rigged as needed for the specific operating frequency. Note: This trick is not for transmitting situations unless the switch is of an appropriate high power RF type (one that can withstand high RF voltages as well as high power levels).

A "Good Ground"

All Marconi antennas, including those

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in this article, require a "good ground" to function properly. So what is a "good ground?" Figure 4 shows the elements of a good ground. The ground rod should be 6 to 8-feet long, and thick enough to withstand being driven into the ground. The steel type of electrical ground rod used at the mains service entry point of some buildings, or on the distribution pole, are nearly ideal for this purpose. The copper clad steel ground rods are best, but are not always available at a decent price.

The other element of the "good ground" is a system of radials. If the radials are installed above the ground, then they should be quarter wavelength. But if installed a few inches below the surface, make them as long as possible. As a general rule, the more radials the better. However, empirical studies show a decreasing effect above 14 to 16 radials per band. Even two radials per band will show improvement, however, so use them unless there is absolutely no way to accomplish the task.

Safety Notes

Above Ground Radials. I am not normally in favor of above ground radials. If the radials are laid on the surface, then they will impede or endanger foot

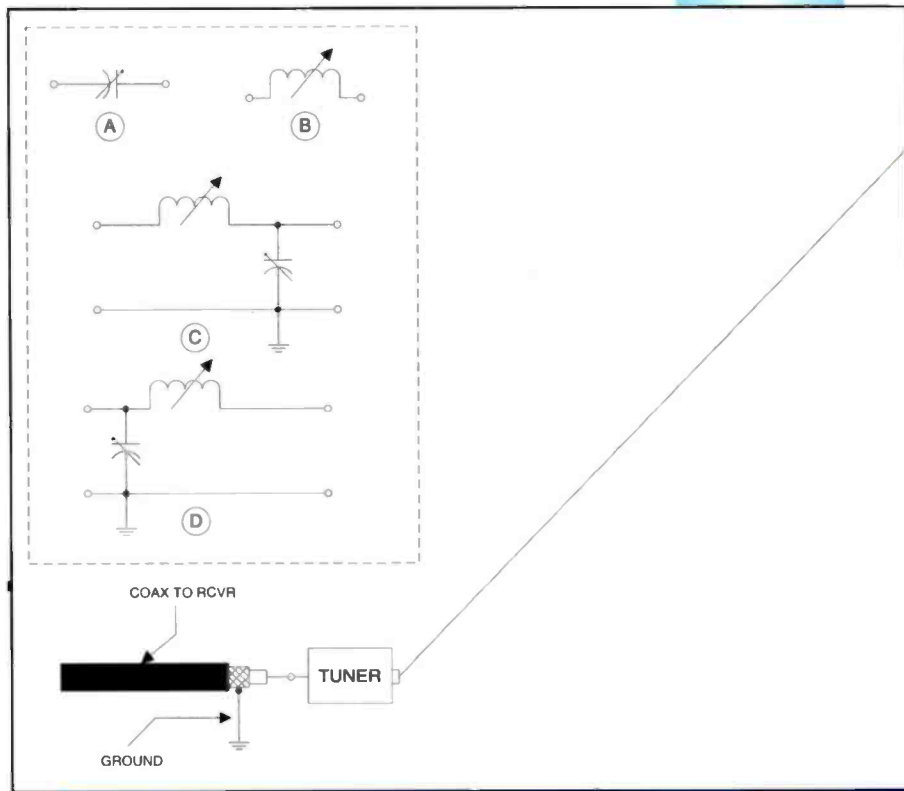


Fig. 3 Random length Marconi antenna.

traffic, and may possibly lead to injury to you or others. There may also be an issue of civil liability if your installation injures others.

Avoid AC Power Lines. Wire antennas can be very hazardous! Do not install this antenna in any location where it can contact the electrical power lines. Even if both the antenna and the power line wires are insulated, it is highly probable that the antenna wire will cut into the power line wiring and cause a short. If this happens while you are holding it, then **you will be killed**. Even if you are not killed, there is

a high probability of severe damage to the power lines, and the possibility of starting a fire. Do not toss the wire over the power lines. Do not install the antenna such that it can contact the power lines if it falls or breaks, or flails about in the wind.

Connections . . .

Got any antenna questions or photos to share with other *Pop'Comm* readers? I can be reached at P.O. Box 1099, Falls Church, VA, 22041, USA, or via E-mail at carrjj@aol.com. ■

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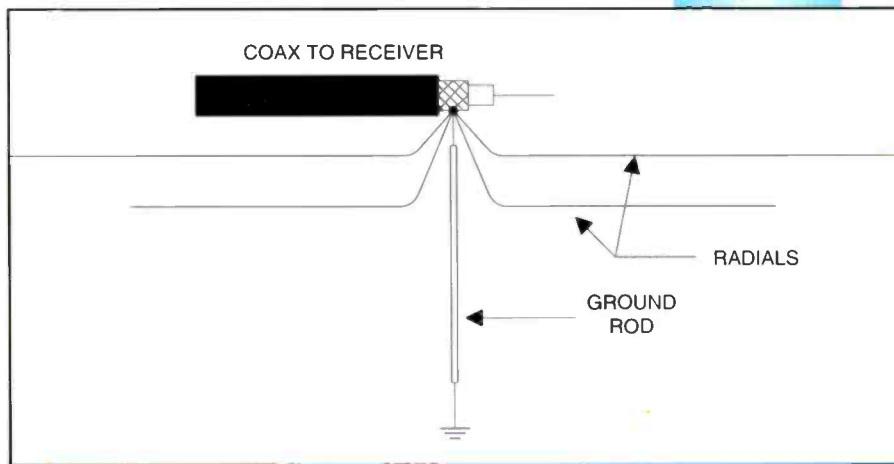


Fig. 4 A "good ground."

PRODUCT SPOTLIGHT

Pop*Comm Reviews Products Of Interest

Fineware's "Smart Icom" Software

Putting a computer control system on a radio is as much an art as a science. Computer controlling a scanner or loading frequencies into memories makes a lot of sense. Even loading the memories on your computer-capable shortwave receiver is convenient.

But after you've got the memories loaded, what do you do with that computer interface? Well, the answer may be "nothing" if you're after weak and exotic DX signals. Any computer, no matter how well shielded, will probably radiate *some* noise for your receiver to pick up. Load the memories and shut the computer off if you're interested in DX.

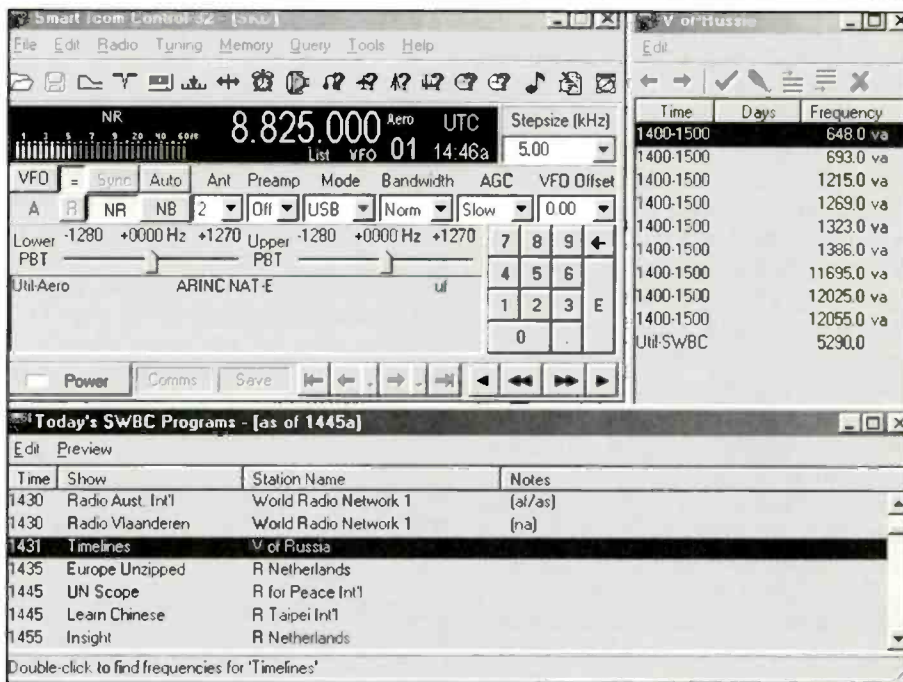
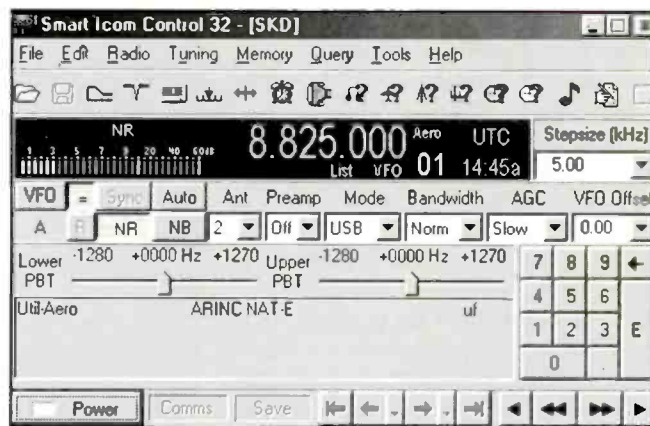
However, a lot of times we're interested in programs, or utility listening where the signals aren't all that weak. And many computer systems and newer monitors built with reduced EMI (Electro Magnetic Interference) or "low radiation" in mind are very quiet on the radio. This combination makes the right kind of computer interface a dream to use.

If you've been listening for any length of time, you'll know that managing lists of frequencies and program schedules can be challenging. Just locating the information you have when you need it can be a major headache if you're not right on top of the game. Many times I've felt that more than half of the radio hobby was really information management. A good computer program can help make that process much easier, and more importantly, free you up to listen to the radio again!

Smart Icom

When the ICOM R-75 was introduced, just the fact that it *had* a computer interface, in addition to all the other excellent features of the receiver, caused a lot of commotion on Internet discussion groups. There are not a lot of choices for computer-controlled receivers, although the options are expanding all the time. ICOM's own software for the R-75 gets the job done, but is primarily a button pusher; it will load the memories and con-

The main window of the program allows direct control of the receiver, as well as access to many settings. The area left and center shows stations that are known to use the frequency that you have tuned. →



Here's the three most common windows for use with Smart Icom — The main display window, the Programs listing at the bottom, and the frequencies for a particular station on the right. Double-clicking on a station gives you the frequencies, and double-clicking on a frequency will tune the radio to that frequency.

trol the radio from an on-screen version of the front panel. It's very useful, but doesn't really do anything that couldn't be done directly from the radio. If you've been reading my reviews and columns for any length of time, you'll already know that I like to get a bonus for going to the trouble of using an all-too-valuable serial port!

Fineware recently introduced Smart Icom to their line of computer control software. This program provides that bonus — and then some. In addition to the normal button pushing operations, Smart Icom is fully integrated with two databases — one of frequency and station information, and one of programming information. Actually, there are a couple

BY KEN REISS <Armadillo1@aol.com>

of other databases too, but more about that in a minute.

Clean And Simple

Rather than reproducing the control panel of the radio on screen, Fineware has chosen a simple but very functional layout of the basic controls. All the necessary information is presented in an easy-to-use format, while additional information unique to the software is also readily available.

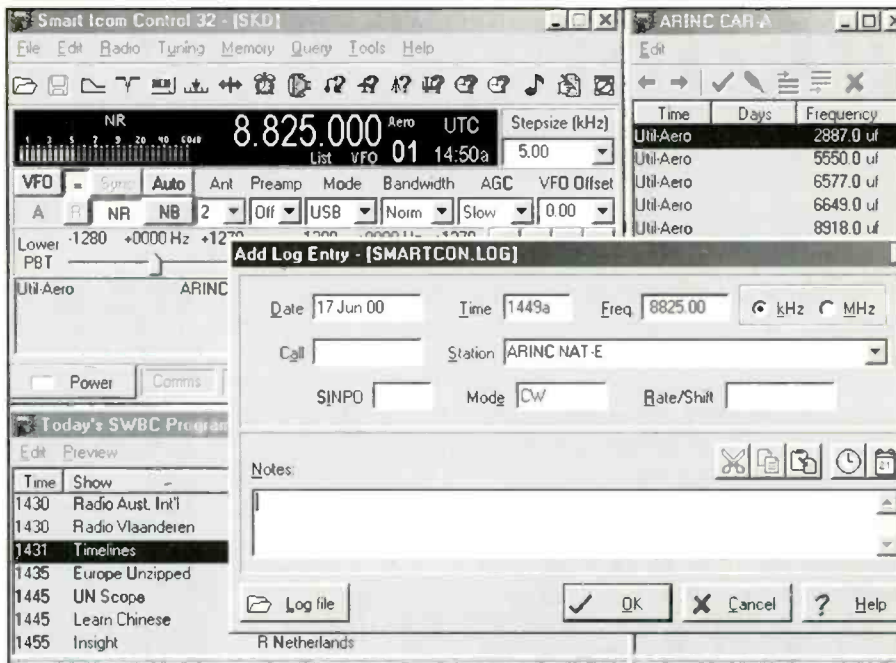
There is a row of command buttons right below the menu bar. These can be very convenient if you find that you like to work that way. I have trouble remembering what I had for breakfast, so remembering icons is not very convenient. To the credit of the program, all of the icon-based commands are also duplicated and fully accessible through menu commands. It's a good example of functional user interface design.

The program also provides support for optional filter modes, and the optional DSP. You can turn on the Noise Reduction, Auto Notch Filter, and Noise Blanker from the software. Slider controls below the main display allow for adjustment of the dual Passband tuning system. The only control I've been able to find missing is the squelch. Hopefully this oversight will be corrected in a future version. Fortunately, the squelch control on the radio still works just fine when the software is connected.

Another extremely useful feature is the "recent frequency" list. This set of controls will keep track of the frequencies you've entered in the VFO mode. Buttons take you to the previous or next, as well as the first or last frequency in the history list. A set of pull down arrows will allow you to see the previous or next five frequencies in the list and select directly. It's like a trail of breadcrumbs, or if you prefer, a VFO with an automatic memory. It's very convenient when checking a bunch of frequencies.

Extraordinary Logging!

Like most control programs, Smart Icom comes with a logging module. It allows for multiple log files, and can automatically generate entries by just double-clicking on a frequency in the main window. You're able to enter comments, SINPO, Callsign and even information about baud rate and shift if you're logging digital modes.



The log entry screen provides lots of room for data and comments. This information can later be used to generate an automatic reception report.

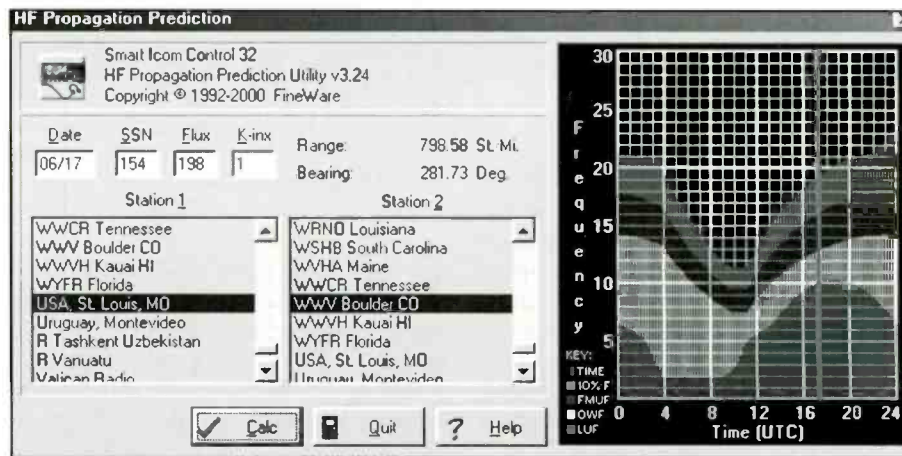
What makes this log extraordinary is its ability to not only capture most of the information, but also to export it very quickly and easily in a number of formats so that you can easily post your results to many of the common bulletin boards, Usenet groups, and mailing lists. Export modules are included for WUN, Fido, DX Window, Cumbre and Smart Control's own format. There is also an editor so that you can create your own format if you don't like any of these.

In addition to the log export, you can also have the program generate a reception report for you automatically!

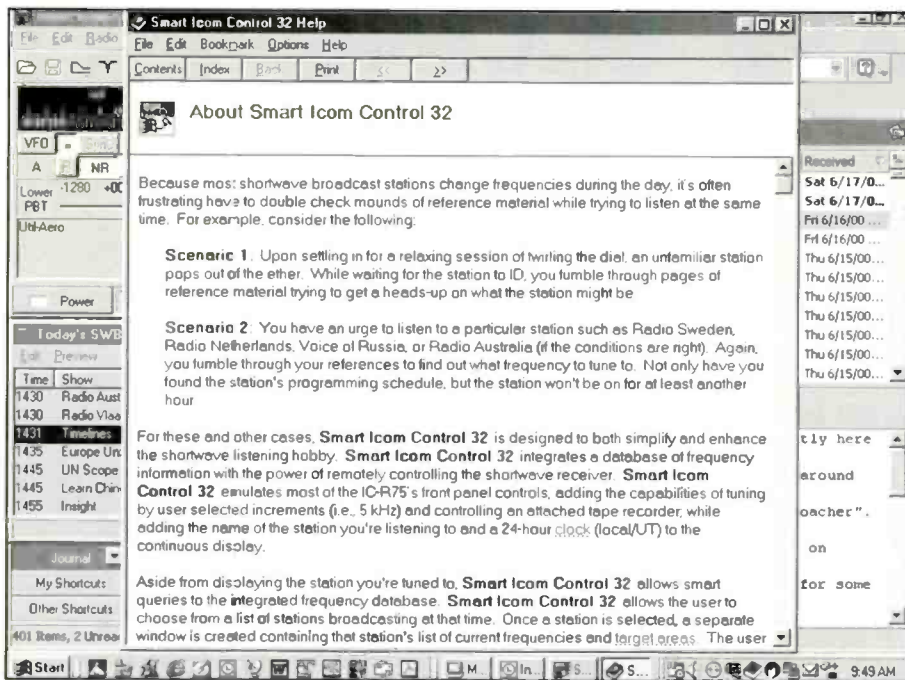
Entering the basic data in a log entry may be all you need, but you can edit both the format of the reception report, as well as the report itself if you choose to print it to a file rather than directly to the printer. If you do a lot of reception reports, this function could be extremely handy!

Propagation Conditions

The program also includes a very convenient HF propagation prediction module. You'll have to customize a data file with your home location latitude and longitude, but that's easily accomplished



The HF Prediction screen gives a forecast about propagation conditions between many worldwide transmitters and your location. Here, at 1700 UTC (dark grey bar here, red on the screen) WWV at 2.5 and 5 was inaudible, 10 was marginal and 15 was good — just like it says.



The manual is provided through an extensive on-line help system.



The program also includes a great database for utility listeners. Click on a utility, and a list of their frequencies will be displayed. One more click and you're listening to it!

with any text editor. Once the data is entered, pressing Control-F, or choosing HF Prediction from the menu will bring up the module.

The receiving location is selected in one list of stations, and the transmit station in another. Once set, the receive location will be remembered for the next use, so that's an easy one. If you press Control-F while a station is selected in the main program window, it will try to calculate propagation data for that station. Or you can select another of your choice.

There is a place to enter date, Sunspot Number, Solar Flux, and K-Index if known. The Solar Flux and K-Index can be gotten from the WWV solar information update at 18 minutes past the hour. WWVH broadcasts this information at 48 minutes. With these two pieces

of data, the Sunspot number will recalculate for you.

The result is an easy-to-read chart by UTC hour versus frequency. This will show the ideal working frequency as well as Lowest Usable Frequency (LUF) and Maximum Usable Frequency (MUF). There is also a 10% allowance variation shown for convenience. This chart can be very helpful in trying to find a particular station, or narrowing your search to the "possible" frequencies at a particular time.

Adding The Schedules Data

If you did nothing more with the program than load memories, log and control the receiver, you'd still have a dynamic program. But you'd be missing the

best part of the Fineware series of software: Schedules!

All of the Smart programs ship with a version of their shortwave "schedules" data. This is a comprehensive database of stations and programs in English. It is normally updated weekly, but during peak times when stations are adjusting their programming and transmission schedules I have seen daily updates. A one-year subscription includes unlimited downloads from their website.

By pressing the F3 key, or choosing the SWBC Programs from the menu, you'll be presented with a list of programs that are coming up in English. If you find something of interest, double clicking on the program will bring up a station list window that will give you a list of frequencies that the station is scheduled to be operating on. With the frequency of updates, it's very accurate, so the only question is can you hear that station on that frequency.

Since you're presented with a list of frequencies, it's a simple matter to just click again and see if a parallel channel is better. You can run through an extensive list in just a minute or so, and then pick the best. It's really the ultimate in "arm-chair" listening, and a great substitute for my failing memory.

Check It Out!

There's a bunch of features we didn't have time to mention. This program is one of those that just keeps going and many people will find that they don't use all of it (myself included). But the things I do use are very valuable. I've registered this program, and use it most of the time that my R-75 is on.

All of Fineware's products are available as shareware from their website at www.fineware-sw1.com. You can download a working sample of any of the control programs, which will include a relatively recent edition of the schedules data. By registering (\$60), in addition to supporting continued development of great software, you get the ability to import the updated files from schedules, as well as many other convenience features. The schedules subscription is \$35 annually for an unlimited download of updates.

While you're there, check out Fineware's new RLDB (Radio Listeners Data Base). We'll have more on this in an upcoming spotlight, but it's very convenient, even if you don't have a computer controllable receiver. ■

BROADCAST DXING

DX, News And Views Of AM And FM Broadcasting

Antenna Rights: FCC Protects Consumers

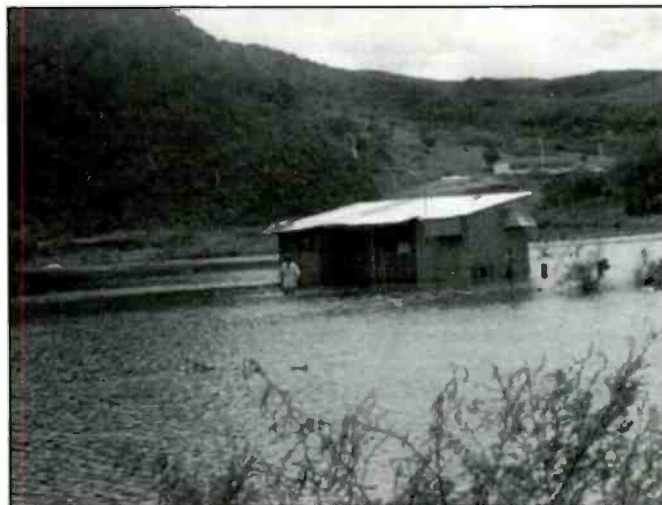
DXers involved in disputes with landlords over the installation of outdoor antennas may have legal rights under FCC rules that prohibit restrictions. According to **FCC rule 47 CFR 1.4000 in Section 207 of the Telecommunications Act of 1996**, restrictions that impair the installation, maintenance, or use of antennas used to receive video programming are prohibited provided that certain qualifications are met. According to an FCC fact sheet regarding over-the-air reception devices, "The rule applies to video antennas including direct-to-home satellite dishes that are less than one meter (39.37") in diameter (or of any size in Alaska), TV antennas, and wireless cable antennas. The rule prohibits most restrictions that: (1) unreasonably delay or prevent installation, maintenance, or use; (2) unreasonably increase cost of installation, maintenance or use; or (3) preclude reception of an acceptable quality signal. The rule applies to viewers who place video antennas on property that they own and that is well with-



The "new" Caribbean Radio Lighthouse 1160 kHz transmitter site.

in their exclusive use or control, including condominium owners and cooperative owners who have an area where they have exclusive use, such as a balcony or patio, in which to install the antenna. The rule applies to townhouses and manufactured homes, as well as to single family homes." The rule applies to video antennas including "masts to reach the height needed to establish line-of-sight contact with the transmitter," although masts higher than 12 feet above roofline must still meet local permit or safety requirements. A 1998 amendment to the rule includes rental property where the renter has exclusive use. Exceptions to the rule are allowed in cases where public safety is a concern, for historic preservation, or when the landlord or community association provides a common antenna.

What does this mean for DXers? Obviously for FM and TV DXers, the rule provides an opportunity for legal recourse if a landlord or community association tries to prohibit antenna installation. Despite the fact that the rule only applies to video



The old Caribbean Radio Lighthouse 1165 kHz after Hurricane Hugo.

antennas, it would seem reasonable that the rule could be extended to include amateur, CB, shortwave, and AM broadcast antennas. The complete fact sheet regarding the rule is available on the Internet at www.fcc.gov/csb/facts/otard.html.

The issue of outdoor antennas was recently the topic of discussion on the "Looking at the Law" program hosted by attorney Neil Chayet on WBZ Boston 1030 kHz. A phone caller inquired about whether or not his condo association had the right to restrict the temporary mounting of a satellite dish in a flower pot on his balcony. "Looking at the Law" can be heard live Sunday evenings 8-10 p.m. on WBZ. Neil Chayet can also be heard on the WOR Radio Network, home of Dr. Joy Browne and The Dolans.

Top-40 Radio Feedback

Response to the "Broadcast DXing" column about the demise of Top-40 radio continues to indicate a demand for alternative formats. Feedback from David Hunt provides some interesting observations from across the Atlantic. He says, "It's unfortunate that variety is a thing of the past in FM radio. I recently spent three weeks on the island of Gran Canaria (a part of Spain just off the NW coast of Africa), and I did encounter some interesting FM stations there. About half of the stations are high-power, government-run, national radio. The national stations have about the same formats as our current ones in the U.S. They will only play one type of music, and to make matters worse, they often broadcast the exact same programming on several frequencies at once; I heard the same soccer match coverage on 12 different frequencies as the game was going on."

"The other stations on the island were smaller, independent

BY BRUCE CONTI <BAConti@aol.com>

		<u>Pending</u>		
New Call	Location		Freq.	Old Call
KWSJ-FM	Clearwater, KS		98.7	KAYY
		<u>Changes</u>		
New Call	Location		Freq.	Old Call
WZNN	Lexington, AL		620	WKNI
KROP	England, AR		1530	KLEC
KOWS	Heber Springs, AR		1370	KAWW
KEWE	Oroville, CA		1340	KJAZ
KJAZ	Beverly Hills, CA		1260	KGIL
KJJD	Windsor, CO		1170	KVVS
WIXL	Pine Castle, FL		1190	WAJL
WHVO	Hopkinsville, KY		1480	WQKS
KHTE	England, AR		96.5	KLEC-FM
KLEC-FM	Lonoke, AR		106.3	KHTE
KZLG	Mansura, LA		95.9	New
KNMB	Cloudercroft, NM		96.7	New
KIDX	Ruidoso, NM		101.5	New
WCOV-FM	Clyde, NY		93.7	WLLW
WLLW	Seneca Falls, NY		99.3	WSFW-FM
WFXZ	Wrightsville Beach, NC		93.7	New
KMTK	Bend, OR		99.7	New
KFEG	Klamath Falls, OR		104.7	New
WSKE	Everett, PA		104.3	WSKE-FM
WPGP	Tafton, PA		88.3	New
WSEV-FM	Gatlinburg, TN		105.5	WDLY

received reports from New Zealand, Norway, Mozambique, Argentina, and Oregon to mention a few." The E-mail address for Caribbean Radio Lighthouse is cradiolight@candw.ag.

QSL Information

Patrick Griffith, NONNK has been busy promoting DXing at **KBJD 1650**; "This is one of those good news/bad news stories. First the good news. I have been working with the PD and CE of KBJD for a few weeks in order to formulate a QSL plan. Both are DXer friendly but just don't have the time to deal with QSLs. The CE is an active ham and the PD is a self confessed AM DXer and former member of the National Radio Club as was his father. After a meeting at the station today, things are almost ready. I am going to act as the station's volunteer QSL manager. I have drafted a letter size QSL that meets with their approval and I think you will like it. It should be printed and ready to mail in about two weeks."

"Now the bad news. These fellows are fairly recent arrivals at KBJD and it doesn't appear that their predecessors saved any reception reports. We searched and the only reports we could find were two hanging on the wall in the KBJD studio, one from Finland and the other from Italy. Those two lucky DXers will be receiving the first KBJD QSLs. Everyone else wanting a KBJD QSL will need to resubmit their reception reports addressed as follows: Radio Station KBJD, 3131 South Vaughn Way, Suite 601, Aurora, CO 80014-3510, Attn: Gregg Cassidy, Program Director. Gregg will forward the reports to me and, if everything goes as planned QSLs should start appearing in mailboxes in about one month. As always, return postage funds are greatly appreciated. Gregg and CE Jeff Garrett also expressed interest in running some DX tests for KBJD and KNUS 710 this coming fall." In addition to being an ambassador for AM broadcast DXers, Patrick has updated the KBJD section of his on-line photo album with a shot of the KBJD studio. To view Patrick's radio station photo album, visit <http://community.webtv.net/NONNK> on the Internet.

610 KSWA Albuquerque, New Mexico, received very informative full data QSL letter in seven days for report and \$1. The station was operating with 1 kW U-1 under an STA and using the call sign KSWA at the time I heard them, and has since switched calls to KNML. The

ones. They were much more interesting. One station that I really liked was called 'Maxi Radio' — 101.1 (Las Palmas). On that station, they played mostly English/American songs, and I heard the likes of Frank Sinatra, Aerosmith, Randy Travis, REM, ELO, KC & the Sunshine Band, Hank Williams, Sr., and Shania Twain. They would always play at least four songs in a row, and they seemed to bunch their commercials all together. From time to time, they would stop the music and air listeners phone calls about various topics (usually soccer). I heard many songs that I haven't heard in years. (I could even hear the occasional skips and scratches of the vinyl records that they were playing.) With the way things are now here in the U.S., you would think that some radio station owners would at least try to buck the trends."

Caribbean Radio Lighthouse Update

After receiving the Caribbean Radio Lighthouse in Antigua on 1160 kHz, in his reception report to the station Ron

Gitschier asked why the *World Radio TV Handbook (WRTH)* still lists them on the split frequency of 1165 kilohertz. In an E-mail verification letter, station general manager Curt Waite replied, "Sometimes I wonder how much good it does to send corrections to WRTH. We have been on 1160 for seven years and we have notified them several times but they don't seem to get the message! We switched when we installed a new transmitter (Nautel 10 kW solid-state, ND-10) to be compatible with digital-tuning radios that only scan 10 kHz channels."

Photos of the old transmitter site after Hurricane Hugo, the new 1160 site, and the staff were included with the E-mail verification. "We transmit into a 1/4 wave omnidirectional antenna, a 212-foot tall guyed tower, 24 inches on a face. Our daytime primary coverage ranges from the Virgin Islands in the north to the northern Windwards (St. Lucia) in the south, although you can fairly easily pick us up in eastern Puerto Rico (Rosie Roads area) and Barbados. We don't receive as many reception reports now as when we were on 1165 due to same-channel interference, especially from KSL, but we have

Sports Animal, and is now 5 kW day/1 kW night U-1 still operating under an STA until returning to normal 5 kW U-2. QSL signed by Mike Langner, CE. Address: 500 4th St. NW, Albuquerque, NM 87102-2102. (Griffith, CO)

990 CBKN Shalath, British Columbia, full detailed QSL card in 12 days from CBC-Vancouver, 40 watts. Signed Dave Newbury, CE. Address: P.O. Box 4600, Vancouver, BC, V6B 4A2. (Martin, OR)

1250 KKGM Kansas City, Kansas, a short hand-written note in six days signed Brian Johnston, Sales Manager. Address: 4935 Belinder Road, Westwood, KS 66205. (Martin, OR)

1280 KLDY Lacey, Washington, verie statement at bottom of my report in 5 days, signed Skip Marrow, Owner KLDY/KBRD. Address: 125 N. Turner, Olympia, WA 98506. (Martin, OR)

1540 KMPC Los Angeles, California, letter and stickers in 22 days signed Chuck Hayes, Director of Sports Marketing. New address: 2800 28th Street #133, Santa Monica, CA 90404. (Martin, OR)

1570 WFRL Freeport, Illinois, nice QSL letter in 13 days signed Vince Brandon, Operations Manager. Address: P.O. Box 747, Freeport, IL 61032. (Martin, OR)

Broadcast Loggings

This month's selected logs begin with this report from Patrick



Staff photo in front of the studios of the Caribbean Radio Lighthouse.

Martin; "I have not heard KODL The Dalles, Oregon, at 1440 during the day here on the Oregon coast at about 140 air miles to the SE. I have always heard them fair during the day. Today I kicked on the ECSS (BFO) and I can barely detect a carrier. I phoned KODL and they had some trouble with their old tower up on a hill, so they had to move to a temporary system in town. They are using a longwire antenna with maybe 1 kW. This system will be in use for quite sometime while they are building a new transmitter site with 5/1 kW U2."

Here are this month's logs. All times are UTC.

640 WMFN Zeeland, Michigan, at 0835, "Here's more Night Magic on AM 640 WMFN," easy listening music, and promos for AM 810 WMJH. (Conti, NH)

760 R. Record, ZYH888, Fortaleza, Brazil, at 2338 Portuguese religious talk, fair with presumed WCHP nulled after WVNE sign-off. (Connelly, MA)

1089 Talk Sport synchros, United Kingdom, at 0011 good with play-by-play coverage of boxing match. (Connelly, MA)

1134 HRT Zadar, Croatia, monitored at 0007 excellent, Balkan (almost Greek sounding) male group vocal with mandolin or bouzouki accompaniment. (Connelly, MA)

1140 La Voz del Caribe, Porlamar, Venezuela, at 0005, boxy telephone-type audio with Margarita and Porlamar local mentions, then a "La Voz del Caribe" ID, atop CBI. (Connelly, MA)

1520 WWKB Buffalo, New York, at 0220, "Buffalo Bison baseball on Business Talk 1520, WWKB Buffalo," has dropped "Kiss 98" FM simulcast. (Conti, NH)

1550 RASD Clandestine, Tindouf, Algeria, at 2333, fast Spanish talk with Polisario and Radio Nacional Saharaui slogans/IDs, followed by Whitney Houston's 1985 dance hit "How Will I Know," blasting over the domestics. There's much less co-channel competition on 1550 than on the former 1540 channel. (Connelly, MA)

1560 WPAD Paducah, Kentucky, at 0710 with Westwood One nostalgia format and IDs, on top of KNZR at times. (Martin, OR)

Thanks to Mark Connelly, Ron Gitschier, Patrick Griffith, David Hunt, and Patrick Martin. 73 and good DX! ■

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UTILITY RADIO REVIEW

News, Information, And Events In The Utility Radio Service Between
30 KHZ And 30 MHZ

Aeronautical Services Theme, And Utility Clubs, Organizations And Newsletters

Welcome to the aeronautical services theme column. There are lots of logs to look over this month thanks to our contributors from around the world. I must say it has been very satisfying to see the very supportive E-mails and letters coming in. Thank you all for your assistance in helping me put this column together each month.

Beginning with this column, I am going to begin reviewing some of the many clubs, organizations, and newsletters that are actively supporting the monitoring of utility radio stations. The LF and HF radio spectrum covers a lot of territory, and there is a tremendous amount of radio traffic around the world. It is fascinating to see just how much monitoring activity there is as well, and seeing what areas of specialization there are amongst different DX clubs as you move from country to country.

This month we will be looking at the logs of members of the New Zealand Radio DX League thanks to the assistance of their Ute editor Evan Murray (utilities@radiodx.com). As you will see, the advantage their location affords is being close to the Orient as well as the South Pole. It is interesting to see how stations that are considered commonplace in North America become rare DX when you are listening from the other side of the world.

We also have our regular contribution of logs this month, and again it is from monitoring stations around the world.

The spectrum survey will be put on hold this month due to the large number of logs and target frequencies that are being offered. Next month, I will be looking at those frequencies that are found just before the beginning of the broadcast band. There is an interesting mix of beacons, marine coastal stations and aeronautical services to be found here. I'll be providing a list of target frequencies to listen to at that time.

So let's begin first with an exploration of the aeronautical services, looking at what they are, and the types of radio traffic you can monitor.

Monitoring air services is a big topic and it would be impossible to cover everything you need to know in one column. What I am going to do is give you an overview so that the beginner and intermediate radio monitor can have a good idea where to start listening.

Over the coming months we will be coming back to this topic in more detail. This is where your logs and suggestions would be really welcome, particularly from those who will be monitoring this Ute service for the first time.

Listening To Aircraft Communications

Monitoring the air services means more than just listening to airplane pilots and control towers. To support the safe and effi-

cient transportation of people and goods through the air, there is a large infrastructure of communications that takes place at any given time. Radio communications can be used in a wide range of situations, ranging from the testing of prototype aircraft through to the search and rescue missions.

Because there are so many events taking place during the day, there is always something to be heard when monitoring frequencies used by aircraft and their support networks. Still, to be able to listen effectively, there are a number of things that you must be aware of first. The beginning point is to understand how air services are organized on the airwaves.

Assuming that you have never listened to radio traffic on the frequencies used by aircraft and their ground support, the first few monitoring encounters you have may require some translating. While all transmissions on international flights are in English, the terms and jargon used are very specific to the aeronautical industry.

There is an advantage to having a special working language for radio communications because it allows pilots and control personal to keep airtime to a minimum while sharing a maximum of information. While it may sound at first to be a blur of information, with practice you will be able to identify patterns of common information.

What you will normally hear during an in-air transmission will be:

- Aircraft identification and flight number
- Current position and time (UTC)
- Flight level
- Next two positions and estimated time of arrival (ETA)
- Outside air temperature (in degrees Celsius)
- Wind direction/velocity (degrees/ knots)

You may also hear other information being shared as well. Each additional piece of information can help you pin down details about the flight that will help you better understand conditions that the aircraft is flying under. Fuel levels, air speed and special conditions are sometimes part of the conversations. Emergencies or on-board problems can also be part of these conversations as well.

The part of the aircraft industry that will determine when, where, and what you will listen to (other than the pilot and the ground station) are the routes aircraft fly. If you have ever watched a commercial aircraft flying at sufficient altitude you have seen the location of one of the many invisible air routes that cross the skies around the world.

The primary communication traffic that you will hear on aeronautical frequencies will be aircraft reporting their locations to

ground stations at specific positions along an air routes. These ground stations may not be located at an airport, but can be anywhere along a major or minor air route. Ground stations involved with domestic or regional flights are designated Flight Service Stations (FSS). There are a number of International Flight Service Stations (IFSS) as well, and these are involved with transcontinental and oceanic flights.

FSS and IFSS stations each cover specific parts of an air route. When an aircraft flies into or out of a station's boundaries they must establish communications with that ground station. This is when you will hear the majority of air-to-ground aircraft communications.

Where To Listen

Commercial voice aeronautical communications, like all Ute services, are found in their own range of frequencies. The air service frequencies are well represented in the HF bands, with some data and ground services found in the LF bands as well. The bands where you can find most air service traffic are listed in Figure 1.

Figure 1 — The Aeronautical Frequencies (kHz)

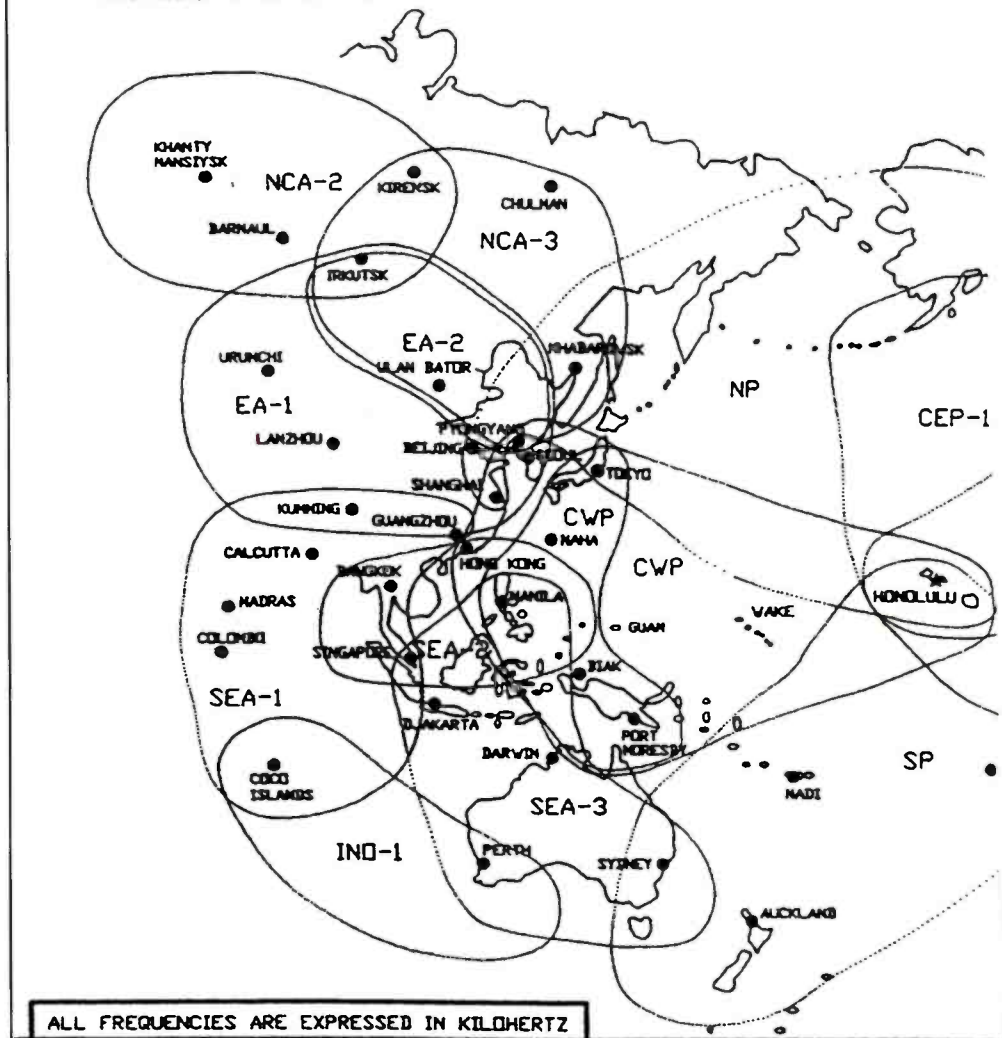
- 2850-3155
- 3400-3500
- 4650-4750
- 5450-5730
- 6525-6765
- 8815-9040
- 10005-10100
- 11175-11400
- 13200-13360
- 15010-15100
- 17900-18030
- 21850-22000
- 23200-23350

You will find that HF transmissions in the air services use the Upper Side Band (USB) mode when transmitting. Due to changing propagation conditions you will find that several frequencies may be used at any given time. If there is a rule of thumb, it is that you should monitor the higher frequencies during the daytime and lower ones at night.

The Big Picture

Through international agreements, the air routes of the world have been broken

HF RADIOTELEPHONE NETWORKS



ALL FREQUENCIES ARE EXPRESSED IN KILOHERTZ

SEA-1 & 3	SEA-1 & EA-2	EA-1	NCA-1	NCA-2	NCA-3	CWP	CEP-1 & 2	SP	NP	SAT-2	CAR-A	CAR-B	SAH-1	SAH-2
3470	3485	3016	3019	2851	3004	2998	2869	3467	5667	2854	2887	3455	2944	3475
6556	5649	6571	5646	4678	5664	4666	3413	5643	6655	5565	5550	5520	4669	5526
10066	5655	8897	13315	6592	10039	6532	5547	8867	8915	11291	6577	6586	6349	8853
11396	8942	10042	17958	10096	13302	6562	5574	13261	11330	13315	8918	8846	10024	10096
13318	11396	17958		17958	17958	8903	6673	17904	13339	17955	11396	11330	11360	13297
17907	17907					11384	8843		17946		17907	17907	17907	17907
						13300	11282		21925					
						17904	13288		2932					
						21985	17904		5628					
									8951					
									10048					
									13273					
EUR-A	AFI & SAT-1	AFI-2	AFI-3 & MID-2	AFI-4	NAT-A	NAT-B	NAT-C	NAT-D	NAT-E	NAT-F	MID-1	MID-3	IND-1	IND-2
3479	3452	3419	3467	2878	3016	2899	2872	2971	2962	3476	2992	2944	3476	3476
5661	6535	5652	5658	5493	5598	5616	5649	4675	6628	6622	4669	4669	5634	5634
6598	8861	8894	10018	8903	8906	8864	8879	8891	8825	8831	6631	6631	8879	8879
10084	13357	13273	11300	13294	13306	13291	11336	11279	11309	13291	8951	8951	13306	13306
13288	17955	17961	13288	17961	17946	17946	13306	13291	13354		11375	11375	17961	17961
17961			17961				17946							

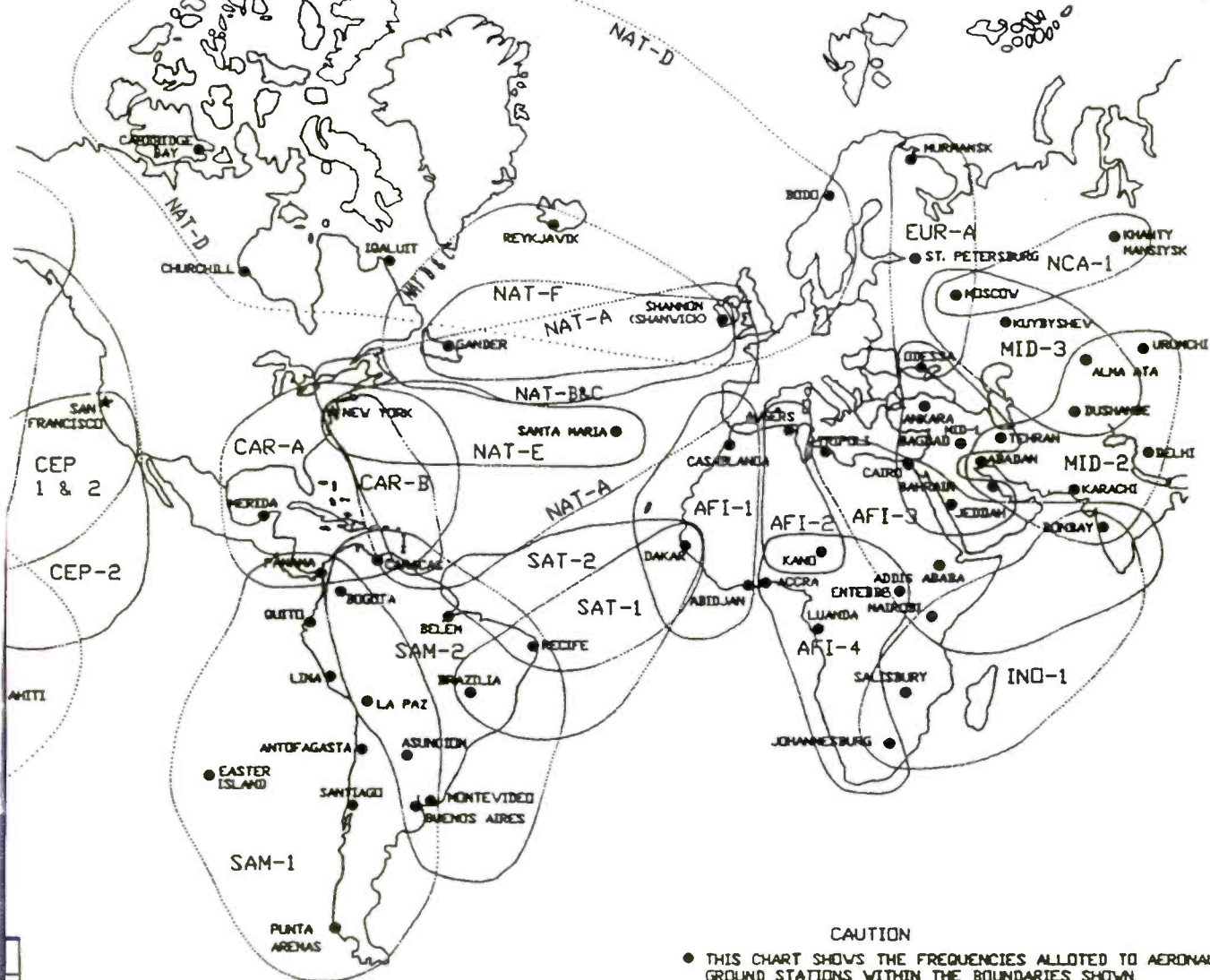
HF Radiotelephone Network Map. (Courtesy ARINC).

down into Major World Air Route Areas or MWARA. Each of these areas has an associated set of frequencies (often referred to as families of frequencies) and there may be several ground stations associated with each. Figure 2 gives the specific regions.

Most listeners in the Central regions of

the United States, and along the eastern seaboard will most likely want to start listening to Trans-Atlantic commercial flights. This will mean that one would listen to the North Atlantic (NAT) world air route area. The primary coverage area is designated NAT-A. This encompasses a large surface area that extends from

HF RADIOTELEPHONE NETWORKS



★ AERONAUTICAL EN ROUTE RADIO STATION OPERATED BY ARINC.
 ● AERONAUTICAL EN ROUTE RADIO STATION OPERATED BY OTHERS.
 THIS MAP IS NOT SUITABLE FOR NAVIGATIONAL PURPOSES.

- CAUTION**
- THIS CHART SHOWS THE FREQUENCIES ALLOTTED TO AERONAUTICAL GROUND STATIONS WITHIN THE BOUNDARIES SHOWN
 - NOT ALL STATIONS ON ALL NETWORKS ARE SHOWN ON THESE DIAGRAMS.
 - NOT ALL FREQUENCIES ARE IMPLEMENTED AT ALL STATIONS.
 - ICAO REGIONAL AIR NAVIGATION PLANS SHOULD BE REFERRED TO FOR ADDITIONAL DETAILS.
 - CURRENT OPERATIONAL DATA MUST BE OBTAINED FROM AERONAUTICAL CHARTS AND NOTAMS.

ISSUE	DATE	CHKD	APVD
1	5-27-93	RAS	PKK
2	8-28-93	<i>[Signature]</i>	<i>[Signature]</i>

ICAO HIGH FREQUENCY EN-ROUTE RADIOTELEPHONY NETWORKS SERVING THE MAJOR WORLD AIR ROUTE AREAS (MVARAS)
 EFFECTIVE 0901Z JANUARY 7, 1993



SCALE	DRAWN BY	DATE	ENGINEER	DRAWING NUMBER
N/A	RJT	5-27-93	RAS	HF-501-1

Ireland and Portugal over to Newfoundland and part of the Eastern U.S. extending to New York City. Because of its large area the North Atlantic air route area is broken down into further sub-sections. These are NAT-B through NAT-F. (NAT-F, by the way, is the main over-water corridor that extends

between Ireland and Gander, Newfoundland). Each of these areas has their own designated frequencies. As a result, if you are monitoring a particular frequency designated for an area service, you can have a general idea what part of the world that aircraft that you are listening is flying. For example, let's say that you want to

monitor flights in the Trans-Atlantic corridor. That is the area designated as NAT-F. The frequencies and ground stations associated with that area are shown in **Figure 3**. Depending upon time of day, and general propagation characteristics, you would have a good chance of hearing some traffic. (To see the complete list of

Figure 2 — Major World Air Route Areas

AFI Africa
CAR Caribbean
CEP Central East Pacific
CWP Central West Pacific
EA East Asia
EUR Europe
INO Indian Ocean
MID Middle East
NAT North Atlantic
NCA North Central Asia
NP North Pacific
SAM South America
SAT South Atlantic
SEA South East Asia
SP South Pacific

Figure 3 — (NAT - F) North Atlantic Family F

3476.0, 6622.0, 8831.0, 11336.0,
13291.0 (kHz)

Ground Stations: Gander, Shanwick

MWARA sub-sections and frequencies, see the map).

While random listening may produce some results, the best way to effectively listen is to have a plan and put it to use. There are two major tools that you can use other than your MWARA frequency list. These are background research on the commercial aircraft industry, and an important network of transcribed HF weather broadcasts called VOLMET.

This second tool is used to determine your chances of hearing a rare air to ground signal by using a VOLMET station to determine the propagation for a region and a frequency. Obviously, if you can't hear a VOLMET station, you won't hear airborne radio traffic in that area either. (A list of VOLMET stations is given in **Table 1**).

The research that you do to learn more about the commercial aircraft industry will help to ensure the success of your aircraft monitoring. To really listen properly, you have to be able to interpret what you are hearing.

By knowing the names of airlines, particularly non-domestic carriers, and the IATA (International Air Transportation Association) letter based identifiers for cities and airports, you will be able to log

more detailed information than a time and particular frequency.

Likewise having a good knowledge of different types of commercial aircraft, as well as their operating characteristics, adds significantly to your ability to be part of the action as events take place on the air.

It is beyond the scope of this column to provide you with more than a starting point for your exploration of this fascinating aspect of utility monitoring. A list of books and Internet resources that you can use to learn more will be provided in the sidebar. For those of you who are new to Ute monitoring, the logs provided this month by contributors will provide a good illustration of the type of information you should be capturing.

Along with the MWARA and VOLMET frequencies, I'm also providing some additional target frequencies that you may wish to monitor for non-standard events, such as emergencies and special flights. Please note that all of the following frequencies are in kHz.

Emergency Air Communications

If you hear of a crash that has occurred involving an international flight, there are several frequencies have been set aside for rescue communications. The two most commonly used are **3023.0** and **5680.0**.

The following are hot frequencies to check for emergency rescue traffic: 3023.0, 3488.0, 3939.0, 5420.0, 5670.0, 5680.0, 6760.0, 8364.0, 8893.0, 9025.0, and 18271.0

Oil Rigs (Helicopter)

Not everything that moves in the air has fixed wings. In many parts of the world, the helicopter is the major workhorse for getting goods and people from point a to b. The following are used in North America by the oil industry when communicating between the oil rig and a helicopter: 2875.0, 3019.0, 3434.0, 4672.0, 5463.0, and 5508.0.

Test Frequencies

A major part of the drama of the air industry is the testing of prototype aircraft or equipment. Here is where having good contact with the industry will help you know when to listen. The starting point is the standard frequencies that are used,

including 5571.0, 6550.0, 8822.0, 10045.0, 11288.0, 11306.0, 13312.0, 17964.0, and 21931.0.

Guest Logs

This month's guest logs have been made available courtesy of Evan Murray, who edits the utility column for the NZ Radio DX League. The organization's mailing address is P.O. Box 3011 Auckland, NZ, and they would be happy to hear from *Pop Comm* readers who would like to share logs and information. Given their unique location, the New Zealanders have great access to Asian and Pacific utility stations.

Interestingly enough, as you can see through their logs, many North American Ute stations come through loud and clear. One aspect of Ute monitoring that they also get a clear shot at is Antarctic operations, and given the drama of life at the south pole this certainly provides some interesting traffic to listen to.

Note: All loggings listed here were published by *NZ DX Times* and are used with permission. Format is the frequency in kHz followed by the Universal time that it was heard, followed by comments and the initials of the contributor. A list of contributors, and the equipment that used, follows at the end of the listings.

2749: 0820 Unid Marine (Canadian?) station on NE coast mention Halifax then silent. (PC)

3023: 0900 VJM McQuarie Is/Aurora Australis 64S 105E also Green Gorge field station. (PC)

3312: 0718 ZKG 2010 and ZKG 2006 locations Unid with farming talk. (PC)

4417: 0746 Reliance calls Cape Resolution Are you on air? (BJ)

4417: 0758 Antipodes Island WX to Bluff fishermen's radio Antipodes 50S. (PC)

4417: 0809 Ship Shikowski from Bounly Island with ETA Antipodes and Campbell Island with supply. (PC)

5598: 0724 Gander working Air Mexico 30.1 (BJ)

5598: 0724 Shanwick with French Lines 356 Commander 240 Lauda 9221. (BJ)

5649: 0816 Saudi 039/Gander. (BJ)

5649: 0816 Virgin 8/Gander. (BJ)

5649: 0839 EL AI 009/Gander. (BJ)

5649: 0850 Irish 251/Shanwick. (BJ)

5649: 0855 Shanwick/Navigator 974 Posn 49N 30W. (BJ)

5649: 0719 Gander/Romanian 9470 Posn 51N 40W. (BJ)

6215: 1925 "Milford Haven"/2MUU Milford Check with Taupo Marine. (JC)

6516: 0631 Auckland Cruising Radio WX and air freqs calling Daedalus 2. (EM)

6628: 0802 Santa Maria/Air Mexico 01 39N 30W Fuel 18.1 Temp-59. (EM)
6628: 0804 Santa Maria/Avianca 103 FL 390 Next posn not read. (EM)
6628: 0949 Santa Maria/Iberia 6634 Est 25N 30W at 0952 S/C BMAR. (EM)
6637: 0631 Houston/Evergreen 820 with phone patch to Co ETA Guadalajara Mexico. (JC)
6754: 0922 Edmonton Volmet WX Cold Lake and Comox. (EM)
8742: 1310 Bangkok Marine Radio ID and WX. (JC)
8825: 1838 Unid/Santa Maria. (EM)
8867: 0926 Pacific 410/Nadi Confirmed FL 390 Mach .79 Wind 250/20 At 0955. (EM)
8867: 0925 Auckland/Qantas 101 and NZ 26 Datalink has failed Auckland will maintain. (NM)
8867: 0936 Echo 41/Auckland At LEKAP contact Nadi. (NM)
8867: 2348 Auckland/HB1U W S/C ACHM Request 390 at AKMEB. (NM)
8867: 2253 Nadi/Cargolux 731 NOGOL at 2303 FL 310 330/85 Tamp —370. (NM)
8867: 0149 AKI/CPA 108 S/C FRHJ. (RP)
8867: 0200 Auckland/Unid S/C LSAM. (RP)
8867: 0211 AK/CPA 108 Psn S/C GHDL. (RP)
8867: 0309 Auckland/Orion 4206. (RP)
8867: 2021 AKI/KAL 8823 Inbound. (RP)
8879: 1917 Singapore 406/Perth Try Datalink YMMM or retrn this freq. (EM)
8879: 1137 Gander/Air F Concorde 002 Santa Maria 030W FL 520 climbing S/C AKHJ. (JC)
8879: 1142 Gander/Lauda Air 3996 51N 40W S/C EKGR. (IC)
8879: 1859 Perth/Reach J2FB at Diego Garcia GUDOS 1914 S/C GKF. (LN)
8891: 0745 American 140/Santa Maria Are you ready to copy 66N 60W 63N. (EM)
8891: 1456 Iceland/Virgin 19 with psn. (JC)
8891: 1109 Bodo coming in OK but too weak to read. (JC)
8891: 0700 Iceland/Atalia 623 Request descend due ice and fuel. (NM)
8891: 0620 Iceland/Finnair 2967 FI 370 64N 10W. (NM)
8894: 0712 Algiers/Nouakchotl reciprocated but neither audible to the other. (JC)
8903: 0446 Kinshasa working Unid. (JC)
8906: 1755 Santa Maria/Speedbird Concord 272 Request divd to Sham non due low fuel. (NM)
8906: 1820 Santa Maria/Speedbird Concord 272 Posn 46N 60W climbing 555 from Shannon Santa. (NM)
8906: 1833 Frenchline 317/Santa Maria Cleared to 370 Repod reaching. (NM)
8930: 0640 Tower 8909 working Company. We are diverting to Tel Aviv. (BJ)
8930: 0645 Tower ACEH/Stockholm Posn Boston ex JFK to TLV etal 530. (BJ)
8930: 0714 Stockholm/Air France 3531 Posn 42N 34W. (BJ)
8930: 0904 KLM 792/Stockholm. (BJ)

Table 1 — VOLMET Frequencies by MWARA Region (kHz)

AFI Africa 2860, 3404, 5499, 6538, 8852, 10057, 13261
 CAR Caribbean 2950, 5580, 11315
 EUR Europe 2998, 3413, 5505, 6580, 8957, 11378, 13264
 MID Middle East 2956, 5589, 8945, 11393
 NAT North Atlantic 2905, 3485, 5592, 6604, 8870, 10051, 13270, 13276
 NCA North Central Asia 3461, 4663, 5676, 10090, 13279
 NP North Pacific 2863, 6679, 8828, 13282
 SAM South America 2881, 5601, 10087, 13279
 SEA South East Asia 2965, 3458, 5673, 6676, 8849, 11387, 13285

8939: 0757 Rostov Volmet WX Krasnodar and Stavropol. (EM)
8951: 0759 Tokyo/N800AL. (RP)
8992: 0645 GHFS Ascension/ Hickham BE 513. Message not copied. (EM)
9032: 2311 Auckland/Skier 96 Auckland to McMurdo. (RP)
10024: 1037 Manaus/Giant 58 S/C CLAM. (NM)
10024: 1153 Lima/CWC Posn MERLO at 1153 FL 330. (NM)
10024: 1143 22GV/Punta at AREGA climb to 410 @ 100 miles. (NM)
10024: 0717 Bogota/American 918, no reply. (EM)
10024: 2229 Bogota Aero Continente 2000 No rply afr 10 mins. (EM)
10024: 2229 PeHh/Qantas 2907 Posn at 2228 50S 144.45E FL. (EM)
11256: 0435 Holloway/Ethiopian on ground Cairo 0402/08. (JC)
11256: 0615 Holloway/Ethiopian 3714 Abu Simbel 0621 FL 350 Cairo 0730. (JC)
11300: 0403 Liberty 852/Cairo. (BJ)
11300: 1924 Seychelles/Tower TOW 99 Unable work Cairo. (BJ)
11300: 1832 Sanaa/TX3C Daares Salaam to Moscow. (NM)
11300: 1721 Tripoli/Royal Air Maroc from Casablanca 1652 FL 350. (NM)
11300: 2033 Jeddah/Sanaa Sudanair 226 KhaHoum to Jeddah FL 330. (EM)
11384: 0829 San Francisco/Air Mike 932C S/C EPOR. (RP)
11384: 0658 San Francisco/Navy RG 470 Posn TAAVR. (RP)
11384: 0752 San Francisco/Nodh West 90 Posn OMLET S/C AMBD. (RP)
11384: 0752 San Francisco/Air Mike 963 Posn S/C EFAB. (RP)
11384: 0749 San Francisco/Qantas 69 Posn S/C DLBH. (RP)
11384: 0814 San Francisco/air Mike 956 Posn MAZZA. (RP)
11396: 1743 Qantas 6056/Perth Contact Brisbane 129.85 Darwin. (NM)
13261: 0245 Brisbane/Federal Express 77 Posn and S/C. (RP)
13261: 0253 Brisbane/Aussie 290 contact Tontouta 128.2. (RP)
13261: 0322 Nadi/Polar Tiger 281 Posn LANIS. (RP)
13261: 0414 Nadi/French Navy 5452 No reply. (RP)
13300: 0525 N24CL/San Francisco, unable contact Aloha 51. (NM)

13300: 0531 San Francisco/N24CL confirm Aloha 51 on ground Midway. (NM)
13300: 0535 N24CL/San Francisco from ATC cruise 290. (NM)
13300: 0814 San Francisco/Eva 21 Posn 20N 140E. (RP)
17327: 1130 This is Monaco Radio 3AC Synthesized music ID in FF/EE. (NM)
21985: 0432 Air Mike 978/San Francisco Call Guam 118.7. (EM)
21985: 0441 San Francisco/Air Mike 962 49.4 fuel 250 mil. (EM)
21985: 0607 San Francisco/Air Mike 956 Will be out of cockpit. (NM)
21985: 0304 San Francisco/Marshall Islands 559 depaded Kwajalein. (RP)
21985: 0247 San Francisco/Dynasly 760 Posn KEITH S/C BDCR. (RP)
21985: 0252 Coast Guard 1714/San Francisco Clearance to Wake. (RP)

New Zealand DX Times Contributors

JC: John Charlton Greymouth NZ Kenwood 5000 30 m wire
 NM: McKenty Napier NZ NRD 545 ICOM RT0 AOR 2002 60-foot sloper
 BJ: Basil Jamieson Oamaru NZ Drake R8 Kenwood 5000 30m wire
 PC: Peter Champers Napier NZ Drake SPR 4 Amplified 15-foot Whip
 RP: Robert Park Lower Hutt NZ Kenwood 1000 40-foot wire
 EM: Evan Murray Auckland NZ Kenwood 5000 T2FD

Reader's Logs

Our group of contributors is growing, and I thank each of them for their kind assistance. However, I still need more logs! Send them in hand-written, word-processed, or in electronic form — it does not matter. All that I ask is that it be legible, have a clear name and address, and that you follow the standard formats that you see published here.

I don't care if it is just one logging as it will get in and you will get a credit line

Aeronautical Services Information Resources

There are a number of good books available for those people who want to monitor civilian aviation utility radio in the HF radio spectrum. One of the best starting points for the beginner is:

The Worldwide Aeronautical Communications Frequency Directory by Robert E. Evans.

Evans has put together a book that systematically outlines how the service fits into the communications needs of the aviation industry. A comprehensive list of frequencies, and who uses them, is provided. Information on Military aviation frequencies is also included. Many different modes of communications are covered as well, plus VHF and UHF frequencies.

For the experienced person who wants to chase the rare DX, there are following:

The Confidential Frequency List by Geoff Halligey
Guide to Utility Stations 2000 by J. Klingenfuss.

Both of these books focus on lists of frequencies, rather than getting into the details of how to monitor the aviation services.

All three of these books are available through Universal Radio, and can be purchased at reasonable prices through their catalogue or online.

Universal Radio
6830 American Pkwy
Reynoldsburg, Ohio 43068
<http://www.universal-radio.com/>

if you want one. Likewise, if you don't want to see your name in print just tell me. I will be more than happy to leave it off. However, I have to have a name for my records, so I'm sorry to say anonymous loggings will not be accepted.

Takashi Yamaguchi MD of Nagasaki, Japan (yurinohp@topaz.ocn.ne.jp)

3150.0 Unid stn K5IU Rptng "V BCSY DE K5IU" repeatedly in CW heard at 2007.

3484.0 Unid stn Rptng "UXUO" over and over in CW at 1800.

4270.0 PCD. Mossad. E10, heard in USB at 2030 // 6498// 8835kHz.

4339.0 4XZ, Haifa, Israeli Navy, Israel, w/ V-Mkr in CW at 1951.

4461.0 FTJ2, Israeli Mossad, E10a, heard in USB at 1830.

4770.0 North Korean/YL nbrs heard in powerful and distorted AM // 5870 kHz.

5091.0 JSR, Israeli Mossad, E10, heard in USB at 1830.

5170.0 VLB2, Israeli Mossad, E10a, heard in USB at 1845 // 7605 kHz. On another day, MIW2, E10, heard at 1945.

6495.0 PCD, Israeli Mossad, E10, heard in USB at 1845.

6498.0 PCD, Israeli Mossad, E10, heard in USB at 2030 // 4270// 8805kHz.

6676.0 Bangkok Volmet, Thailand, heard w/avian wx in USB at 1601.

6745.0 KPA2, Israeli Mossad, E10a, heard in USB at 1915.

6779.5 Unid stn HMA Rptng V and CQ Mkr in CW at 1216. This stn heard a lot. What is this? North Korea?

6912.0 CIO2, Israeli Mossad, E10a, heard in USB at 2145.

7322.0 FTJ, Israeli Mossad, E10, heard in USB at 1930. Welcome back. Haven't heard this freq for a long time.

7445.0 SYN2, Israeli Mossad, E10a, heard in USB at 1845.

7605.0 Abnormal Mossad transmission, VLB2, Israeli Mossad, E10a, heard in USB. Mossad lady Rptng LB2 in phonetics for more than 30 mins at 2145. On another day MIW2, E10a, heard in USB at same time.

8025.0 KPA2, Israeli Mossad, E10a, heard in USB at 2215 // 10125kHz.

8127.0 SYN2, Israeli Mossad, E10a, heard in USB at 2045 // 10352kHz.

8465.0 CIO2, Israeli Mossad, E10a, heard in USB at 1345 // 6912kHz.

8375.0 CC/YL nbrs, V22, heard in powerful AM at 1300. YL opr Rptng "All stations, this is Beijing speaking" in Mandarin Chinese for app. five mins. This nbrs heard a lot in East Asian night.

9230.0 The Cuban 'Atencion' nbrs, V2a, in progress and faint AM at 1005.

9270.0 CIO2, Israeli Mossad, E10a, heard in USB at 2145//10970//13190 kHz.

9323.0 The Cuban Cut CW nbrs, M8a, in progress at 1024.

9331.0 The Cuban Cut CW nbrs, M8a, in progress at 1105.

10125.0 KPA2, Israeli Mossad, E10a, heard in USB at 2015.

10352.0 SYN2, Israeli Mossad, E10a, heard in USB at 2245.

10583.0 The CIA Counting nbrs, E5, in USB at 2100//11580 kHz.

10970.0 CIO2, Israeli Mossad, E10a, heard in USB at 2045//13190 kHz.

11565.0 EZI, Israeli Mossad, E10, heard in USB at 2000//9130 kHz.

12012.0 CC/YL nbrs, V9, Guangzhou, CC Intelligence, hrd in powerful AM at 1600. YL opr Rptng "All stns, this is Guangzhou. We are waiting for your messages," in Mandarin Chinese for app five mins. First time I've ever encountered CC/YL nbrs on this frequency. 12747.0 CIO2, Israeli Mossad, E10a, heard in USB at 1515 // 10970 // 14866kHz. On another day MIW2, Mossad, heard in USB at 1415.

13190.0 CIO2, Israeli Mossad, E10a, heard in AM at 2045 // 9270 // 10970 kHz.

13533.0 EZI, Israeli Mossad, E10, heard in USB at 1830.

14750.0 CIO2, Israeli Mossad, E10a, heard in USB at 1345.

14866.0 CIO2, Israeli Mossad, E10a, heard in USB at 1345 // 10970 // 13190 kHz. On another day MIW2, Israeli Mossad, E10a, heard in USB at 1215. Recently E10 heard a lot on this freq.

15652.0 The CIA Counting nbrs, E5, in AM // 16198 kHz.

16198.0 The CIA Counting nbrs, E5, in AM // 15652 kHz.

20474.0 The Cherry Ripe nbrs, E3a, heard in powerful USB at 1000//23461 kHz.

23461.0 The Cherry Ripe nbrs, E3a, heard in powerful USB at 1000//20474 kHz.

Ian Julian ZL1TBM Hamilton New Zealand julcom@ihug.co.nz

5145 VLN: School of Distant Education (SDE) Cairns, QLD Australia 0710 UTC USB 3 YLs with parent/ teacher meeting. 8/JUNE 5248.3 CCM: CN Magallanes Chile 0528 UTC RTTY 100 Bd/850 with 5LGs. 8/JUNE

5255 Dept. of Land & Water Conservation stations, NSW Australia 0720 UTC USB 2 OMs with a chit-chat. Mentioned about drilling holes. 2/JUNE

5853 VLH: SDE Charleville, QLD Australia 0554 UTC USB YL with music lessons. 8/JUNE

5885 Radio Base, ? Relay, OV4 and OV7: Variety Club of Australia stations 0940 UTC USB 3 OMs & YL with a chit-chat. 7/JUNE

6507 RBSL: IN Mumbai India 2100 UTC RTTY 50 Bd/850 with RYRY and SGSG. 2/JUNE (IJ)

6772: Fishing Boats New Zealand 0518 UTC USB. Two OMs with a chit-chat complaining they weren't catching many fish. 6/JUNE

6908 ZERO ALPHA: Australian Army Relief Ops net/Bougainville Peacekeeping Force Papua New Guinea 0840 UTC USB calling ECHO ZERO for radio check, with no joy. 7/JUNE

6945 VLH: SDE Charleville, QLD Australia 0544 UTC USB with YL reading a story. 1/JUNE

6950 VJD: RFDS Alice Springs, NT Australia 0728 UTC USB YL with WX forecasts. 8/JUNE

6965 VJI: RFDS Mt. Isa, QLD Australia 0832 UTC USB OM with recorded announcement. "For calls to the RFDS operator please use your emergency alarm call button." 7/JUNE

6986 ART: MOSSAD No station 2105 UTC USB with YL repeating ART, followed by. "Message group text." 2/JUNE

7482: Presumed Suva Meteo Fiji 0730 UTC USB with OM reading back a long list of WX synoptic numbers. 5/JUNE

7636: U.S. Tuna Fishing Boats Pacific 0735 UTC USB 2 OMs with a chit-chat. Mentioned about albacore and looking at charts. 2/JUNE

7740: Telecom Suva Fiji 2120 UTC USB with OM in EE passing phone numbers. 2/JUNE

7758: Armed Forces of the Philippines (AFP) Counter-Insurgency net, the Philippines 0852 UTC USB with OM spelling out Msgs. "The Liberation Movement, Requirements, Expedite, Report and Arrest of suspects." 7/JUNE

7770 VJQ503: Alan Brierley Limited Coast Station, QLD Australia 0820 UTC USB with OM calling. 7/JUNE

7786: Russian military 0825 UTC USB OM in RR with test counts. 7/JUNE

7792 VLH: SDE Charleville, QLD Australia 0538 UTC USB YL with music lessons. 1/JUNE

7811 MIW2: MOSSAD No. station 2116 UTC USB with YL repeating MIW2. 2/JUNE

7898.5: National Weather Service (NWS) station Papua New Guinea 0800 UTC USB OM with WX synopsis. 7/JUNE

7975: Private Outpost stations, QLD Australia 0728 UTC USB 2 OMs with a chit-chat. Mentioned about chemical analysis, Fuel, Pumps, Environmental Protection Agency and Mt. Isa Mines are the only ones doing chemical analysis. 2/JUNE

7988.3 DINY: UNID CN station Chile 0538 UTC RTTY 100 Bd/850 calling CCS. 8/JUNE

8005 VLN: SDE Cairns, QLD Australia 2130 UTC USB YL with math lessons. 9/JUNE (IJ)

8127 CIO2: Mossad No Station 2052 UTC USB with YL repeating CIO2. 5/JUNE (IJ)

9007 HUDSON 33: and RAAF Sydney, NSW Australia 0701 UTC USB with terminating PP and OPs normal. 9/JUNE

10164 VKQ943: Coastlands Ministry Bowen, QLD Australia 0718 UTC USB 2 OMs and 2 YLs with a chit-chat. Mentioned about Video cameras, Logging onto the Coastlands Website (www.coastlands.net/toc.htm), Marina, Computers & Motherboards. Ended with "Bless you guys and Coastlands base out." Other freqs listed for them are: 3216, 5910, 8002 and 15716. 30/MAY

11202 CG RESCUE 1711: and CAMSPAC Point Reyes, CA USA 0554 UTC USB with PP to District 14 JRCC. Mentioned about co-ordinating the rescue of the Vsl *Swordsman*

and co-ordinating comms with the Vsl *Sea Goddess* on 5555. 6/JUNE

27860 VMR360: Volunteer CG Melbourne, VIC Australia 2236 UTC AM OM with WX forecasts. 5/JUNE

27940 VMR466: Volunteer Marine Rescue Hervey Bay, QLD Australia 0135 UTC AM OM with WX forecasts. 9/JUNE

AL STERN Satellite Beach FL
(AllanStern@aol.com)

10780.0 RAZOR 66 (E-8C JSTARS from Robins AFB 93ACW): Cape Radio 1803z USB pp to DSN 497-2612 (Raymond 19 CP at Robins), passes formatted report. 02/Jun/00

10780.0 KING 63 (HC-130 from Moody AFB 71RQS): Cape Radio 1807z USB with Radio checks. 02/Jun/00

10780.0 RAZOR 03 (E-8C JSTARS from Robins AFB 93ACW with OG Cmdr on board): Cape Radio 0010z USB pp DSN 468-1110 Robins AFB. 03/Jun/00

Wrap Up And Requests

That's the column for this month. However, I still have a couple of notes that I want to share with you before I sign off.

First, I would like to introduce everyone to an organization that is dedicated to the preservation of utility radio history that took place on Long Island, New York. Their name is the Friends of Long Island Wireless History, or FoLIWH for short.

Much of their good work has focused on documenting well-known historic sites, such as RCA's radio central. They have also played an important role in identifying and documenting lesser-known sites. One of these is the former Telefunken long wave station that may have notified German military intelligence about the sailing time and date of the *Lusitania*. The sinking of that passenger liner by a German submarine helped to bring the United States into World War II.

Recently the FoLIWH received a grant

from the Suffolk County Park Department to make a video of Long Island wireless history. Anyone who wants to contribute to the success of this video with photos or information about the radio history of Long Island should contact Connie Currie, President of the group, at this E-mail address: CONSTANCEC@aol.com. You can also mail them at FLIWH, 43 Sayville Blvd. Sayville, NY, 11782. The group maintains a very informative webpage at: <http://www.asb.com/usr/w2g3zfj/> Please give your support to this worthy project and historic group.

Again, I ask that each and every one of you who monitors the utility radio services to please send in your logs. Even if its just one I will make certain it goes into the listing with a credit line. I'm also interested in how you made that catch as well, so I would also like information on your equipment and antenna setup. Likewise I would be very interested in hearing your strategies so that I can share them with the readers.

Next month's theme is **digital modes**. In the last two years, a real revolution has taken place in the world of digital monitoring thanks to the availability of inexpensive computer based demodulators. I will be doing a survey of the many free-ware, shareware, and commercial software decoding packages now available that work through computer sound cards and serial port modems. I would be interested in hearing about your experiences monitoring the various digital modes that are in use, and getting your opinions on whether the better investment is in hardware or software demodulators.

Until next month, may all of you take advantage of our current sunspot cycle and have some of the best monitoring sessions you've ever had. I look forward to your logs. ■

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THE HAM COLUMN

Getting Started As A Radio Amateur

Stealth Radio Operating Techniques

There's a war being waged all across America — and if you're a ham radio operator, you're also probably a combatant, fighting against an entrenched and insidious enemy. Whether you're on the front lines typically depends on whether you live in a "controlled" area or out in the "free" countryside.

On the government/establishment side, the war is fought with restrictive covenants and ordinances. Rebel hams survive by persistence, the occasional legislative or legal tidbit or by stealthily hiding (operating) right under the noses of the enemy.

Operating your ham station in an apartment, condo, or deed-restricted neighborhood isn't an ideal situation, but it's far from impossible. In fact, by combining modern technology with a little underhanded "sneakiness," we can enjoy stealth radio and successfully enjoy our favorite hobby. While we wait for legislative relief, we might as well work the bands!

Stealth hamming is more important than ever. Thankfully, techniques and technology can help you enjoy our hobby from the confines of your apartment, condo, or any dwelling with antenna/land use restrictions. High-profile outdoor antenna farms aren't necessary. With a little ham radio ingenuity and a willingness to experiment, you can have fun on the VHF/UHF ham bands and put out a decent signal on the HF bands as well. This month's column will give you a few ideas.

An Inside View

When operating indoors, low-power operating is strongly encouraged. Potential interference is minimized, as is your exposure to nearby RF energy fields. I (and many other stealth-mode ops) have had success running only five watts to various indoor antennas. Besides, if you run more than about 50 watts output, you're asking for trouble. Thanks to the physics of RF propagation, cutting your output power from 100 watts to 25 watts is hardly noticeable at the other end.

Because apartments or condos are often several stories up in the air, away



If you think stealth ops or those who must operate with indoor (or compromise) antennas while running low power have been shut out from keyboard-to-keyboard HF modes, think again. PSK31, the revolutionary new narrowband digital mode that works great with very low power, is perfect for stealth ops. The screen shot shown here is from a PSK31 software package called DigiPan. It makes operating PSK31 a breeze. In fact, it's the most exciting piece of ham radio software I've seen in the last 10 years — and it's a free download! Check out <<http://users.nais.com/~jaffejim/mixwpage.htm>> for now. I'll be highlighting DigiPan and other PSK stuff soon in an upcoming column. I found this screenshot on the CKP ham radio software site in Russia <<http://krasnodar.online.ru/hamradio/hamfip.htm>>.

from dependable RF grounds, an alternative grounding technique is needed for HF operation. An effective substitute "RF ground" can be obtained by using a counterpoise. Simply connect a quarter-wavelength piece of insulated wire to the ground terminal of your transceiver — one for each band of operation — and run the counterpoise wire(s) along the floor moldings, out of the way. Make sure the far end of each counterpoise wire is insulated (wrapped with electrical tape).

Don't ground your gear to water pipes, telephone lines, or telephone company grounds. They may be at DC ground potential, but will probably not provide a good RF ground and may cause interference. Nowadays, most residential plumbing contains at least one run of nonconductive PVC tubing, effectively

insulating the upper-level plumbing from a direct connection with the earth below.

Band By Band

Even in a small apartment, it's usually possible to find the space to put up a dipole for 10 and/or 15 meters (a dipole for 10 meters is only a little more than 16 feet long). You've probably tried this arrangement for SWL antennas once or twice. If space (and family cooperation) permits, a dipole may be the easiest way to get on the air. After all, it's pretty much a given that you won't be installing a full-size beam inside your apartment. (If you have access to a large, airy attic, however, a wire beam or other conventional antenna may work fine.) To keep household harmony, perhaps the best way to

BY KIRK KLEINSCHMIDT, NT0Z

install an indoor dipole is to run the wire elements along the wall/ceiling juncture and run the coax up the wall in a corner.

Horizontal loops are also possible. As with the dipole, run the coax up the wall in a corner. Instead of feeding the dipole, however, run a full-wavelength loop around the perimeter of the ceiling. An antenna tuner will probably be required for both antennas. With indoor installations, having a naturally resonant antenna isn't necessary (sometimes it's not even possible). Use an antenna tuner to "work" the antenna against a counterpoise or other ground connection. Whatever the configuration, give it a try. With the sunspot cycle showing signs of perking up, you'll be pleasantly surprised.

Ready-made indoor amateur antennas are available from several sources. MFJ makes several mini loops and vertical antennas designed for space-restricted and indoor operation. The units generally cover 40 through 10 (or 6) meters and have been used effectively by many stealth-mode hams. MFJ also makes an "artificial ground" that can make indoor hamming a lot easier, depending on your specific situation.

Other stealthy antenna solutions are limited only by your ingenuity and your situation. Over the years, I've loaded up my apartment building's downspout with a one-watt QRP signal, worked the steel fire escape on my dormitory building against a counterpoise, tuned up an aluminum window screen with a low-power signal, put up an outdoor "invisible" ended wire made from 30-gauge steel wire, shirt-button insulators and monofilament line; and I've even laced full-size wire Yagis and a full-size 40-meter horizontal loop in a fourth-floor walk-up attic. Where there's a will, there's a way.

My experience with indoor antennas is certainly not unique. Other success stories come to mind. I know of a Midwest ham that ran a successful 40-meter DX net with a kW to an attic dipole; and a Georgia ham who has worked DXCC with 5 watts using only attic-mounted wire antennas. These "hidden HFers" are out there, but they're hard to spot because they don't have any outdoor aluminum.

Above HF Is Easy

VHF/UHF bands are prime turf for space-restricted amateurs. At these high frequencies, antennas are physically small. Putting up a small Yagi antenna isn't out of the question. When I was get-

ting acquainted with 440-MHz FM, I simply aimed a small beam out my third-floor window. I hit several area repeaters with no trouble and had many simplex QSOs, too. In many metro areas, the rubber-duffy antenna that comes with VHF/UHF handhelds will be more than enough to access several local machines. Here, indoor antennas may be no sacrifice at all!

Don't give up on ham radio just because you lack the real estate for conventional antennas. There's a lot of fun to be had

with indoor alternatives. Remember, practice and experimentation make perfect.

For a more in-depth discussion of stealth radio techniques and antennas, check out a copy of my new book, *Stealth Amateur Radio*, available from the ARRL (www.arrl.org) or from your favorite ham radio bookseller.

Send your QSL cards, questions, letters, and stealth radio success stories to "The Ham Column," 25 Newbridge Rd., Hicksville, NY 11801. ■

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FCC Actions Affecting Communications

Congress' Good Old Boys At It Again

Summer's heat is still with us so there is still much outdoor communications activity to keep us all busy. Yet while so many of us have been enjoying outdoor life, Congress and the FCC spent many a day in late spring and early summer making major changes that will affect the ways in which we communicate over the airwaves. Some changes are for the better. Others are not. I'll try to resist the urge to editorialize about what actions fit into which of these two categories. The answer to that sort of question will always be plainly obvious to *Pop'Comm's* technically savvy readers. Given this, it could be argued that the Good Old Boys in Congress should have lightened up and taken earlier vacations this year. The FCC, for its part, has been doing some *interesting* things lately. As for my own political leanings, I simply say, "If it ain't broke, don't fix it!"

First, a quick update on **H.R. 3439**, Congress' attempt to seize control of **Low Power FM broadcasting**. This bill was discussed in the June 2000 *Pop'Comm*. At that time, the intent of this bill was straight to the point. Its objective was to overturn the establishment of the new LPFM service being established by the FCC in MM Docket 99-25. A heavily amended version was passed by full House vote on April 13, and subsequently referred to the Senate. However, this is a case of the half-finished product looking little like the original. Rather than outlaw the new LPFM service entirely, the bill that the House actually passed is substantially watered down. This kinder, gentler version no longer calls for putting a stop to LPFM. Rather, the amended bill calls for additional interference studies to be done by an unspecified independent entity to establish minimum distance separations between stations. Further, a pilot program to test LPFM, additional public comment, and a report back to Congress by next February 1 would be required. Existing new LPFM service licensees who do not meet whatever final minimum distance separations are decided upon may have their authority to operate voided. Apparently, Congress is worried sick about third-adjacent-channel interference from flea power stations running a searing 100 watts!

There's another twist, too. Rather than offer amnesty to former pirate broadcasters, H.R. 3439 would prohibit any applicant who has "engaged in any manner in the unlicensed operation of any station in violation of Section 301 of the Communications Act of 1934 (47 USC 301)" from ever becoming a legitimate LPFM broadcaster. Other journalists have summarily reported that this bars former pirates from LPFM, as presently written, H.R. 3439 could prohibit you from operating an LPFM station if you have ever operated a CB radio without a license, back when individual licensing was required.

In its short life thus far, this bill already has a legislative history literally as long as my forearm. This means that it has been marked-up, passed around committees, and voted on a number of times. Rather than ponder its implications too much further,

bear in mind that H.R. 3439 has now gone to the Senate. There it will have to survive committee action, be reconciled with the Senate version of this bill, S. 2068, and be voted on by the full Senate. It must then be sent to the President for his signature for anything less than a two-thirds majority-passing vote. As it stands at press time, H.R. 3439 will not be the death of LPFM. Still, the final product could come out saying just about anything. All of this must be accomplished before the present session of the 106th Congress ends this fall prior to the November elections. Bottom line: If the Senate is as ambivalent as the House has been about the bill, it may never pass anyway.

Wireless Telecommunications Sourcing And Privacy Act

A different bill with a slightly different number is still slithering through the halls of Congress. **H.R. 3489**, the Wireless Telecommunications Sourcing and Privacy Act, has passed through the House committee process and has been ordered to be reported to the House floor for action. What this means is that this bill is very near facing, and likely passing, a full House vote. *Pop'Comm* has reported extensively on the bill's progress and implications, as well as on reasons for its immense popularity. This saga appeared most recently in the July 2000 "Washington Beat." Yes, this is virtually **the same anti-scanner legislation seen in recent times as H.R. 2369, H.R. 514, and S. 2326**. This most recent action on this latest House version of the bill remains almost a non-issue so far. I wouldn't even bring it up again this month, but there has been some misinformation on the Internet and apparently in the printed media, surrounding this issue.

One widely read and, I had thought, well-respected on-line computer industry journal blatantly touted that since an unspecified (presumably H.R. 3489) wireless privacy bill had just passed a House Commerce Committee vote, it was now law. The sale of radio receivers capable of intercepting cellular transmissions had "now" become a crime, the writer asserted. It was further claimed that the FCC already had such laws enacted though not well enforced. Really? There are a couple of things wrong with this. First, Congressional committees do not make laws or regulations. H.R. 3489 must go through the same lengthy, convoluted process as must H.R. 3439, described above.

And, there's something else to consider. Let's not confuse scanners with radio receivers in general. Granted, the Electronic Communications Privacy Act does declare it illegal to intercept cellular phone calls with a few rare exceptions, such as possibly identifying a cellular transmitter as a source of harmful interference. I'm no lawyer, nor do I play one on TV. But look carefully through all of the FCC regulations and all of Title 47 and see if you can find where the FCC has outlawed *non-scanning* receivers that cover the cellular bands. I don't see it. Nor do any

BY ALAN DIXON, N3HOE/KST8678 <n3hoe@juno.com>

of the myriad of other telecommunications professionals, including hobbyists, that I know and correspond with. What is there then, to prevent the legal manufacture, certification, and sale of simple dial-tuned receivers capable of receiving say, 30 to 1000 MHz? Nothing of which I am aware. Now look at H.R. 3489. The bill and its various permutations make repeated reference to outlawing certain "scanning receivers," as if no other type of receiver exists. Most interesting! Legal implications of non-scanning receivers covering the entire 800 MHz band were discussed at length in this column in the August, 1999 issue.

World Radiocommunications Conference 2000 News

The biggest news in recent weeks is the conclusion of the World Radiocommunication Conference 2000 in Istanbul, Turkey on June 2. This conference occurs every two or three years and is hosted by the International Telecommunications Union (ITU), a specialized agency of the United Nations. Ambassadors of member nations, telecommunications administrators, and other representatives of both government, industry, and even the hobby sector convene at these sessions for one purpose: to revise a time-honored treaty, the international Radio Regulations. These regulations contain frequency allocations of more than 40 radio services as well as giving technical, operational, and regulatory conditions for use of the radio frequency spectrum.

The most significant accomplishment at WRC 2000 is the **new spectrum allocations** for the coming third-generation International Mobile Telecommunications-2000 standards. IMT-2000, commonly thought of as an expanded mobile phone concept is intended to deliver "high-quality" mobile multimedia telecommunications. The *standards* for IMT-2000 have been developed over the past couple of years, and previously agreed upon by the ITU. (See "Washington Beat," March, 2000.) The new terrestrial *frequency bands* identified are 806-960 MHz, 1710-1885 MHz, and 2500-2690 MHz. There is no need to panic over the fate of existing services and licensees in these bands. These are to be globally common bands, conceived to give operators a "high degree of flexibility . . . according to market and other national considerations." The bands make use of some existing mobile frequencies. The decision on the new bands "does not preclude the use of these bands for other types of applications or by other services to which these bands are allocated," according to an ITU press release. This means that your 900 MHz cordless stereo speaker system and that 902-928 MHz amateur TV links will not necessarily have to vacate the band. Governments and administrations are generally expected to assign unused or under-utilized portions of these bands to accommodate the new IMT-2000 services. Although the results of WRC 2000 are official agreements, coordinated on the part of the United States by the State Department, they do have a tentative aspect. Specific new regulations under the terms of the revised treaty must generally go through the formal FCC rule-making process as well. (Minor administrative changes normally do not go through the rulemaking process anyway.)

The amateur radio service came through WRC 2000 virtually unscathed. Early reports indicate that the U.S. ham bands appear to remain intact. Only time will tell if the FCC would actually displace the 902-928 MHz amateur allocation. But the more likely scenario, as clearly recommended by WRC 2000, is that hams will simply have to continue sharing their already secondary allo-

cation in that band. For more information on the conference outcome, and for the text of the IMT-2000 resolutions and the table of frequency allocations, set your Internet browser to www.itu.int/newsroom/wrc2000/releases/imt2000_res-bands.html. You will find the ITU press releases to be straightforward, factual, and refreshingly devoid of trendy, politically correct terminology such as "digital" and "broadband." Such terminology is over-worked and too often misused.

Ultra WideBand Technology

What else does the future hold? Everyone in the field of radio communications needs to be aware of the rapidly evolving concept of Ultra WideBand (UWB) radio technology. Back in May, the FCC adopted ET Docket 98-153 (FCC 00-163), a Notice of Proposed Rule Making to consider permitting UWB operation on an unlicensed basis. So far, this is a nebulous concept with any number of varying methods of implementation, whether proven or theoretical. In the simplest possible terms, one method of UWB operation might be an extremely low power transmitter, perhaps reading microwatts at any given frequency, with a signal that is direct-sequence (continuously) spread over several gigahertz of spectrum. Special "pseudo-random" codes embedded within the signal would identify and differentiate the many overlapping signals from each other, for receiver recovery and detection. A key point is the concept that a low power signal, buried within the noise floor, would not interfere with existing conventional radio service signals. I will not attempt to speculate on any possible advantages of UWB technology here. However, I will point out the

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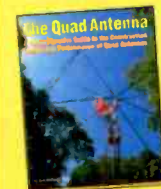
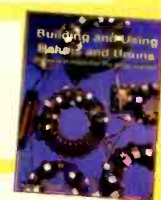


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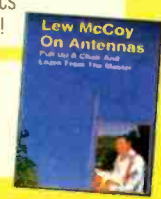


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Will We Have LPFM Or Not?

Doth the FCC giveth only to have Congress taketh away? Now that the FCC has authorized noncommercial Low Power FM broadcasting, the House of Representatives is pushing hard to entirely overturn and bury the new service. The Radio Broadcasting Preservation Act, H.R. 3439, and its companion Senate bill, S. 2068, would do just that. On March 29, the House version had just progressed from the Telecommunications Subcommittee into the full Commerce Committee. Why would Congress want to undo what the Commission has worked in good faith to establish? How would H.R. 3439 "preserve" FM broadcasting, anyway? The answers may be found in a public statement made jointly by Dale Hatfield, Chief of the FCC's Office of Engineering and Roy Stewart, Chief of the Mass Media Bureau, on March 25, and in a separate statement by FCC Chairman William E. Kennard on March 27.

In a rare demonstration of authority, Kennard blasts the (National Association of Broadcasters) "NAB naysayers" and LPFM critics' "predictable self-serving protectionist arguments" in trying to overturn the establishment of LPFM. The Chairman goes on to allege that the dispute is about "the haves — the broadcast industry" and "the have-nots," asserting that *the airwaves belong to all people*. Kennard continues by pointing out that "when hundreds of stations are owned by just one person or company, service to local communities, and coverage of local issues loses out." According to the Chairman, critics of LPFM have a "sky is falling" argument, claiming that the new low power stations would cause interference to existing broadcast stations. In response, Kennard extolled the expertise of his Commission engineers in having extensively studied the issue from a technical standpoint, ordering power kept to 100 watts, and not allowing LPFM service even on second adjacent channels. Further, he decried opponents' alleged actions in submitting their claims to Congress and the courts in hopes that these entities "without engineering expertise," would undo the FCC's LPFM service.

An equally assertive Hatfield and Stewart have flatly stated that members of Congress have been the targets of a "particularly misleading disinformation effort" involving information allegedly "being distributed by NAB." The information is "simply wrong," they claim. This information, said to be circulated on CD, does not portray actual interference, the two Chiefs say, and "was produced by artificially mixing two previously recorded radio signals and is not a demonstration of actual interference..." The crosstalk type of interference being

referred to does not occur from LPFM transmitters operating on third adjacent channels, they assert. Hatfield and Stewart also contend that the NAB incorrectly states that a three percent level of total harmonic distortion plus noise from interference to be acceptable to the FCC. This, the Chiefs say, "can only be viewed as a deliberate misrepresentation of the FCC's findings and analysis," and that the Commission had based its evaluations on a one percent level.

One possible political aspect not mentioned by the FCC is the near-future scenario in which mainstream FM band broadcasters will likely change over to digital transmission modes. Millions and millions of existing FM receivers would of course only be able to receive FM. LPFM stations may be the only remaining stations transmitting FM in the VHF-100 band. Where will *that* leave mainstream radio broadcasting?

Nonetheless, the FCC has proceeded with its lottery to determine in which states, possessions, and territories LPFM applicants will be able to file for licenses, and in what order. The first group of states and other areas chosen are: Alaska, California, District of Columbia, Georgia, Indiana, Louisiana, Maine, Mariana Islands, Maryland, Oklahoma, Rhode Island, and Utah. A five-day filing window was to be opened at the end of May 2000. Four subsequent groups of states have also been chosen in the lottery. These groups will have sequential filing windows spanning May 2000 to May 2001; to be announced in future Public Notices.

The remaining state groups are:

No. 2. Connecticut, Illinois, Kansas, Michigan, Minnesota, Mississippi, Nevada, New Hampshire, Puerto Rico, Virginia, and Wyoming. (Public Notice, July 2000; filing window, August 2000).

No. 3. American Samoa, Colorado, Delaware, Hawaii, Idaho, Missouri, New York, Ohio, South Carolina, South Dakota, and Wisconsin. (Public Notice, October 2000; filing window, November 2000).

No. 4. Arizona, Florida, Iowa, New Jersey, North Dakota, Oregon, Tennessee, Texas, U.S. Virgin Islands, Vermont, and West Virginia. (Public Notice, January 2001; filing window, February 2001).

No. 5. Alabama, Arkansas, Guam, Kentucky, Massachusetts, Montana, Nebraska, New Mexico, North Carolina, Pennsylvania, and Washington. (Public Notice, April 2001; filing window, May 2001).

real possibility that substantial numbers of these devices operating simultaneously in a given area may utterly saturate the noise floor. This "noise" could be raised to levels that would render portions of the spectrum unusable to nearly any mode of operation, UWB or conventional. This condition is sometimes referred to as having reached *pole capacity*.

I know that I will get blasted with mail from at least one or two engineers out there with a bit more experience than my own in spread spectrum operation, relating to my oversimplification of UWB. But if anyone can come up with a more *concise* description, let us have it, and maybe we will publish it right here in *Pop'Comm*. One really needs to understand the principles of spread spectrum transmission to grasp this. UWB will likely play well into the functionality of the newly evolving Software Defined Radio (SDR) technology, described in this column in the July 2000 issue. SDR is also under special consideration by the FCC. Your *Pop'Comm* editorial staff will continue watching future UWB developments.

There are a few more important developments that every RF techie and savvy consumer needs to know:

1. On June 8, the FCC established the new **Wireless Medical Telemetry Service (WMTS)** in ET Docket 99-255 and PR Docket 92-235 (FCC 00-211). The new bands for these devices are 608-614 MHz (formerly TV channel 37), 1395-1400 MHz, and 1429-1432 MHz. The upper two bands are intended for two-way duplex operation. New rules will appear under Part 95. Yes, WMTS is being designated as one of the Citizen's Band services. Like 27 MHz CB and 460 MHz Family Radio Service, WMTS will be *licensed by rule*, rather than by individual station license. Look for important background information in your November 1999 "Washington Beat."

2. The FCC's Office of Engineering and Technology has announced the appointment of independent **Telecommunications Certification Bodies (TCB's)** to streamline equipment authorization under Parts 2 and 68 of the FCC rules. Thirteen TCB's have been named nationwide in DA Docket 00-1223. All

are American National Standards Institute accredited. Manufacturers are given the choice of having one of the official TCB's or having the FCC approve their equipment for production.

3. Our friends at the FCC have finally decided to allow full **Universal Licensing System filing functionality over the Internet**. Previously, while some ULS functions could be done on the Web, actual filings had required a direct dial-up modem connection. Go to www.fcc.gov/wtb/uls.

4. How about a **"Plain English" guide to antenna RF emission health and safety?** The FCC and its Local and State Government Advisory Committee have produced just such a document. It is intended primarily to help resolve RF safety questions arising in the antenna siting permit and zoning process. As such, it may prove helpful to radio amateurs in situations where this issue may come up in a PRB-1 proceeding. You can find it on the Web at www.fcc.gov/statelocal.

Have you noticed? I have made several references to past columns. Our perspicacious editor should have warned regular readers of "Washington Beat" that sooner or later, there would be a quiz! I had promised to follow up on a number of hot items, so here we are. It pays to hold on to your past issues of *Pop'Comm*.

In writing this column, I try to give a bit of technical background as well as a bit of a civics lesson, where appropriate. I understand that our readers range in technical expertise everywhere from newbie to professional society fellow. Some regulatory matters really do require a bit of technical explanation. I also understand that very few people understand the political process in Washington or elsewhere. Again, some background explanation is often in order. If I seem to overstate an obvious fact, please bear in mind that it is for the benefit of those readers who may not be knowledgeable in a particular area. Personally, I have learned a few things from readers who have written to fill me in on technical or legal points I may have neglected. To those who have written, thanks!

The Powers That Be

Who guides telecommunications actions in Congress? According to a Cellular Telecommunications Industry Association press release, two congressmen and two U.S. senators have formed

the **Congressional Wireless Telecommunications Caucus**, "to focus on issues important to wireless companies and consumers." The newly formed group includes Representative Chip Pickering (R-MS), the author of anti-scanner legislation H.R. 3489 (see "Washington Beat," June 2000), Representative Albert Wynn (D-MD), Senator Sam Brownback (R-KS), and Senator Byron Dorgan (D-ND). Since official congressional committees already exist to handle telecommunications matters, it is unclear exactly what the role of this new caucus will be. The formation of the caucus was announced at a luncheon held as part of the CTIA-sponsored "Wireless Day 2000," this past April. The CTIA says it hosted more than 100 unidentified senior wireless

industry executives for the day, briefing congressmen and their staff on industry issues. Although the CTIA press release makes general reference to consumer-related issues, the document gives no clear indication as to what either the trade group or the new Congressional Wireless Telecommunications Caucus intends to do to advance the interests of those consumers, beyond providing a "clear and strong voice." See you next month, when things start to cool down.

Now be sure to enjoy the summer heat. Take some time off work, and enjoy some good radio listening, be it music, shortwave, ham, or any number of things. Enjoy a cheeseburger in paradise while you listen. Here at the *Pop'Comm* editorial offices I'll continue to keep an eye on things in Washington for you. ■


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Tuning In (from page 4)

moreover, the mobile or outside the home/dwelling use of a scanner is certainly more suspect than indoor use. I'm putting my Bureaucratic Shaded glasses on for this one, folks! OK, they're on, now. I can see clearly now that the majority of criminal activity in Indiana is done while *outside* a dwelling. Wait a moment, it's becoming even clearer. I see a ham radio operator walking right past Elkhart City Court with his wide-coverage dual-bander strapped to his hip. And because he's a ham, it's OK, but a non-ham walking with him is in violation of Indiana law merely by possessing the scanner — he's technically "mobile."

I spoke with his honor, Judge Charles Grodnik and asked about the Josh Church case and its *initial* dismissal. He said, "I may have said this case should be dismissed — I don't remember . . . but the case is not over with." He went on to say, "Under the law, I couldn't dismiss it."

Pardon me, your honor? The Indiana statute is clear as glass. Seems to me it was a closed case at the onset. According to the Elkhart Court officials, Church was originally ticketed by the Indiana State Police for "illegal possession of a scanner."

Think about it for a moment: Church *could be you*. With the hundreds of other things going on from road rage on the Indiana interstates, drugged and drunk drivers, and all manner of crime from A to Z, Church gets ticketed for having a scanner in his vehicle. Sad. Very sad, indeed that he's in this situation simply because in (1) of the Indiana statute it says, "possesses a police radio." Personally, I find it pretty Gestapo-like that he'd be ticketed in the first place because, **under Indiana law as a licensed amateur he's supposed to be exempt.**

Interestingly the judge's take on the statute was what I typically find across-the-board from ill-informed people: If you're using a scanner *outside the home* — walking, biking, or in your car, as Judge Grodnik told me, you're "Keeping track of the police." Perhaps he's right, you know — at least in Indiana and wherever else anti-monitoring laws exist AND are taken seriously by law enforcement *adults* that are an integral part of the community.

If a tornado cut a path through downtown Elkhart, would their law enforcement be more concerned with helping people getting their lives together or targeting ordinary law-abiding citizens with scanners on their belts whether they're hams or not? Welcome to America. ■

THE PIRATE'S DEN

Focus On Free Radio Broadcasting

Pirate Activity Cools Down This Summer

What is it the "cool" crowd likes to say these days? Waaazzzuupp? Well, I guess that will do as well as anything. But to spell it out more clearly — what the heck is going on with the pirate scene these days? I guess we all know the short answer to that question is not much! The real question is: What's behind the sudden huge drop in pirate activity?

Apparently, the FCC went through one of their occasional "crack-down-on-the-illegal-broadcasters" periods a while back, but, in the past, the effects of such get-tough episodes haven't lasted as long as this one seems to have.

I also understand that there has been some new, legitimate broadcaster activity close to 6955, in the form of a Peruvian station — Radio La Voz del Campesino, so maybe the pirate operators are looking for a new, interference-free "common" shortwave frequency.

At any rate, I'll assume the drop off is a combination of fear-of-Feds syndrome, broadcast interference, and the slight drop off always associated with the summer season. Whatever. Here's what's in the files:

Cell Phone Radio, 6955 from 0030 to 0102 with cell calls, music, and many IDs. They closed with "a service of Radio Free Speech Foundation," and noted that they will not QSL. Also heard on another occasion from 1417 to 1435 but weaker on this occasion. (Lee Silvi, OH)

Indira Calling or Partial India Radio? 6955 from 0148, heard under the Peruvian on 6956. Gave Box 28413, Calcutta, Rhode Island address. (Silvi, OH) (*Not a real address, I expect — Ed.*)

KMUD, 6852 from 0230 to past 0332 with Moody Blues, U2. "Midnight at the Oasis." Another time from 0217 to past 0308 with ethnic music and slow. Morse code IDs. "The muddy sounds of KMUD." (Randall Ruger, California)

WYHP, 6950 USB, at 0131 to 0149 with square dance, yodeling, a song about poker and male announcer with an accent. **6954.42** from 0415 to 0445. DJ mumbled or tried to imitate someone from India, rock. Possible relay via Radio Metallica. E-mail — WHYP1530@yahoo.com. (William T. Hassig, IL)

RBCN, 6955 USB at 0105–0202. Program 22, dedicated to Stevie Nicks. Dog barking in the background, country-western and rock. Live music by Stevie Nicks. Address given as P.O. Box 24, Lulu, Georgia 30554. (Hassig, IL) 0116–0144, saying he is not QSLing since it is (was) a repeat program. (Silvi, OH)

WPN, 6956.56 at 0230–0244. World Parody Network. Rock, with muffled audio. (Hassig, IL)

WFMQ, 6954.63 USB at 0300 with rock and Indian music. (Hassig, IL)

WMOE, 6955 USB at 0224 to 0301. Could just tell music and talk at grayline here. (Ruger, CA)

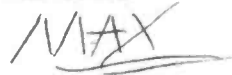
KIPM, 6953 USB at 0252 to 0328 sign-off. Alan Maxwell with long story about a strange woman the narrator kept meeting. Included extremely strange sound effects. (Ruger, CA)

KIPM Official QSL # 62

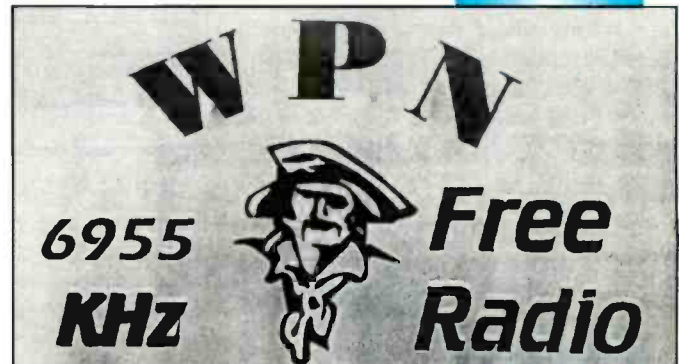
This is to confirm and verify your report of Reception of KIPM that you received on 10/30/1999 Starting at 03:24 UTC on 6955 Khz.

Your continued reports are of great interest, and your further Comments are much appreciated!

Alan Maxwell



A 1999 QSL from KIPM, heard on 6955.



World Parody Network (WPN) is still occasionally active on 6955.

Radio Azteca — Lee Silvi reports a QSL, along with a Radio Azteca "Oops Form" which indicates that the accounting firm of "Read'em & Weep" found Radio Azteca "failed to issue me their Type 1 QSL in proper sequence and that said QSL was enclosed." (Silvi, OH)

Voice of Prozac, 6955, 2315. Just caught the end of the broadcast to 2320 closing and sign-off. (Silvi, OH)

WDRR, 6950 from 2256 sign-on to 2328 close. Announced as a live broadcast, with numerous songs and station IDs. (Silvi, OH)

WBNY, 6955 from 2021 to 3022 sign off, presumably replaying an old tape, with mentions of Radio Bob.

And that, friends, is that! Except, of course, to say thanks to those who caught a signal or two and were kind enough to forward the info. I look forward to receiving your pirate logs each month, as well as station address information. And, of course, things that can be used for illustrations — QSLs and even station photos (if you're bold enough!) Thanks again for your support! ■

BY EDWARD TEACH

advertisers index

ADI/Premier Communications.....	13
AOR USA, Inc.	21
Antique Radio Classified.....	26
Atomic Time, Inc.....	27
Bill's CB & 2-Way Radio Ser.....	32
C. Crane Company.....Cov III,55	
C & S Sales, Inc.	38
CRB Research	26,58,77
Computer Aided Technologies.....	43
Cutting Edge Enterprises.....	17
Davis Instruments.....	55
Firestik Antenna Company.....	7
GRUNDIG.....	8,9,14,15
ICOM America, Inc.....	5
Jo Gunn Enterprises.....	32
Lee Electronics Company.....	32
Lentini Communications, Inc.....	1
Lextronix, Inc.....	8,9,14,15
MACO Mfg. /Majestic Comm.....	31
MFJ Enterprises, Inc.....	39
Monitoring Times.....	53
Optoelectronics, Inc.....Cov IV	
Phillips-Tech Electronics.....	55
REACT International, Inc.....	73
RadioWorld, Inc.....	12
Ranger Communications, Inc.....	23
Scanning USA.....	55
shoc.....	46
Shortwave Listening Guide.....	57
Shortwave Store, The.....	77
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THE LOOSE CONNECTION

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Norm's Idea Of A Good Time

Friends are friends, and that's why I have so many stories to tell about Norm. Norm wanted to travel the country, but in the manner known to all hams as *frugality*, he didn't want to spend money on hotel rooms, and he liked to operate his HF ham gear when he traveled.

"Old man — did I wake you?" Norm's voice was hesitant, but urgent.

"No, Norm — I had to get up to answer the phone anyway. What's wrong?"

"I found a bus!" he said, then waited for me to share his glee.

"Is this something that could have waited 'til morning?"

"I thought you'd want to come take a look at it."

"We both have to be at work in six hours. How about after work?" I asked.

"OK, after work it is. We'll take my car."

Oh joy. I don't get back to sleep very well when I've been awakened, and knowing that my day would be extended well beyond supertime gave me lots to mill about in my head. That night, I dreamed of finding a bus outside where my car had been parked, and having to drive it to work, stopping for all my co-workers along the way. I was sure I smelled diesel fuel when I woke up.

"I'm gonna be late, honey," I told my wife as I tied my tie. "Norm wants me to see his bus."

"His what?"

"Bus. Big thing — lots of seats. . ."

"I know what a bus is; why does Norm have one?" she asked.

"To travel around the country," I said.

"Greyhound has a deal where you can travel anywhere you want for \$149. You don't even have to drive — they have drivers . . ."

The phone, which didn't usually ring, interrupted me before I left for work. "Old man," Norm said, "At lunchtime, we're going to K-Mart and find some big wrenches — I'll buy you lunch."

"Would that be at the snack-bar?"

"Well, yeah — we won't have time to go anywhere else — we only get an hour."

The bus was hideous. It had been a city bus — some 40-foot long. It was a "kneeler," which meant that when it stopped to pick up passengers, the air was let out of the bags and the bus dropped to the curb for people to get on and off easily. The inside was made into a motorhome, sort of. The ideas behind the work were sound, but somehow that soundness never made it to the actual execution of the remodeling.

No, it didn't run. Just needed a battery. Actually, two batteries. They turned out to be well over \$100 each. When it didn't start, we asked its former owner, a kindly man with a carnival background, why he thought it wouldn't start, given that he had said it would. "Geeze — it *oughtta* start. We put it away right after we finished rebuilding it. Never did actually start it, though — damned batteries are too expensive."

Over the next 12 (count-'em) months, Norm and I obtained maintenance manuals for the bus and engine. We traded an old Enfield .303 and a whole lot of donuts for the manuals, and for some time had limited access to a municipal bus garage and its parts supply.

I hand pumped (and *foot* pumped two fuel tanks dry, and we hauled in 50 gallons of nice fresh diesel fuel. I learned about primary and secondary filters while Norm was deciding where the antenna masts would go, and which cabinets would be his ham shack.

I told Norm to stand back and took the key to the driver's seat. It started on one crank. I thought I would keep it idling very slowly as it hadn't run for years, and as I touched the pedal, it took off revving, screaming at full tilt. We both remembered the emergency shutoff flap and ran for it at the same time. Norm smacked it with his hand, and it wouldn't budge; we were truly afraid the engine would come apart and kill us, but we were concerned for what was left of Norm's "investment" too. I grabbed a piece of 2 X 4 and whacked the shutoff as hard as I could, and the engine obediently died. We made

sure we had everything right, and started it again, this time with Norm, 2 X 4 in hand, by the shutoff. Same deal. VROOOOOOOOOOOOOOM! SMACK! All day we did what we thought was the right thing to slow the fuel intake, but ended up carrying yet another box of donuts to the best bus mechanic we knew.

Turning a bus around is difficult in the woods. There were no blocks to go around. No driveway along the road would accommodate two crazies with a bus. Eventually, a clear patch of sandy soil showed itself, and we backed in, sat for a moment, and shifted to "forward." The engine revved, I turned the wheel, and nothing happened. I was sure it was in gear, and I shifted back and forth several times. In a way, it's good that the 29 quarts of transmission fluid were absorbed quickly by the sandy soil. Norm and I will be the first to admit that we hated to see it happen. Norm, particularly, being a member of several outdoor groups and is sensitive to polluting, but the damage was done, and we were stuck.

Sure, we got back home, but that bus is gone now. Norm is wiser. He always learns from his experiences. Yet another bus rests in a secret place by Norm's house now — a real one — one that works, and was professionally converted. The ham gear isn't installed, as life has kept Norm just a bit too busy to outfit the new bus and head off to vacationland.

I miss Norm, now that we have both moved in opposite directions. We keep in touch, and he does share some of his better stories with me, but it's just not the same as being there with him, but that may change soon: he's just bought a boat. Not exactly a *new* boat as he tells me, but a real bargain that just needs a *little* work. He says he's ordering scuba gear for me, and some how-to books. He wants to operate 40 meters from the boat, and do I think he could use a weather balloon to hold up a longwire. My guess is we'll need the balloon to hold up the boat. ■

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