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POPULAR COMMUNICATIONS

JANUARY 2001

Wheels Up: You're In The Cockpit!

- Over A Barrel? Shortwave News And Views From The Oil Rich Countries
- Special Holiday Spotlight Trio:
  Alinco's DJ-X2 Receiver
  EZ-Raze Mast System
  Ranger's RCI-2970 DX

Radio Buying Tips Page 30

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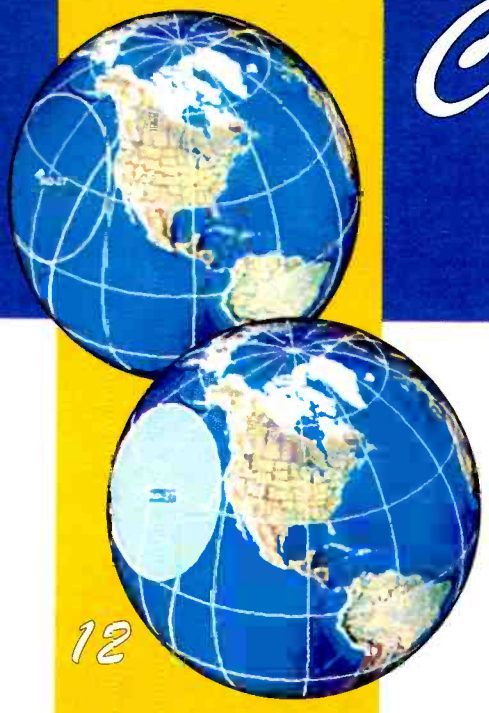

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Departments

On The Cover

Catrina Cletta, air traffic control specialist at the Key West International Airport, Florida talks with aircraft. Every month, Bill Hoefer's "Plane Sense" column covers a multiple of aircraft communications topics. This month Bill's topic is the Civil Air Patrol. Check out "Plane Sense" on page 23. (Photo by Larry Mulvehill).

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TUNING IN

An Editorial

Instead Of Enforcement We Get MURS

Talk about sweeping some dirt under the carpet. With less fanfare than radio enthusiasts celebrating Tom Wheeler's or Billy Tauzin's birthday, the FCC, in perhaps one of their strangest moments, has given the green light to the Multi-Use Radio Service, better known as MURS. In subsequent publication in the Federal Register dated October 13, 2000, Volume 65, Number 199, pages 60869 to 60879 — it's buried deep within the 1998 Biennial Regulatory Review, Private Land Mobile Radio. In the section titled Part 95 (sound familiar?) — Personal Radio Services, the FCC amended the rules at 95.401 (CB Rule 1) to add (f) "The Multi-Use Radio Service (MURS) — a private, two-way, short-distance voice, data, or image communications service for personal or business activities of the general public."

Power in this new unlicensed service is not to exceed 2-watts effective radiated power and can transmit voice, data, or image signals and can even be used for remote control (except on 154.600 MHz). Channels, the FCC says are "available on a shared basis. . . those using MURS transmitters must cooperate in the selection and use of channels in order to reduce interference and make the most effective use of authorized facilities." Frequencies include **151.820, 151.880, 151.940, 154.570, 154.600** with an authorized bandwidth of 11.25 kHz on 151.820, 151.880, and 151.940 MHz. Authorized bandwidth is 12.5 kHz on 154.570 and 154.600.

Some days I wonder if *anyone* is awake in D.C. Is there something in the water or a giant extraterrestrial force controlling those inside the Beltway? Let's do with Washington's elite what they'd do with you if it were *your* resume — look at *their* track record. I think it's only fair, don't you? We've had a president who couldn't chew gum and walk without counting off "left, right, left, right," a House Speaker doing dumb things on his cell phone, another president trying to redefine sex, Tom Wheeler — one of Billy Tauzin's bosses — double-speaking about cellular phone privacy, Billy Tauzin himself sponsoring anti-monitoring legislation that most grade-school kids would toss out, and the FCC creating 27 MHz CB from a chunk of long distance HF amateur radio territory in the late '50s then telling users they can't shoot skip. There is more odd wheeling and dealing than at an average hamfest: a First Lady speaking with the late Eleanor Roosevelt, others "seeing" Abe Lincoln's ghost in the White House, Ted Kennedy (enough said there!), hearings held and committees established (at your expense, of course) to do what you and I could do in 10 minutes at a backyard barbecue, break-ins, denials about break-ins, and the list is practically endless. Do you want any of these clowns on your team? Well, sorry folks, we've still got them!

"Some days I wonder if* anyone *is awake in D.C. Is there something in the water or a giant extraterrestrial force controlling those inside the Beltway?"

Now it's the FCC's turn again. (Don't worry, Tauzin will be back!) This time it's MURS: Maybe Uncle Is Really Sleeping. They must be. Do you know anyone that owns a scanner that would put hundreds of thousands of potential radio users on *five frequencies* — frequencies currently being used by businesses around the country? I've spoken with several school officials from Washington State to Florida expressing their concern about MURS. The possible scenario goes like this. A school is licensed to use one of these Color Dot frequencies and suddenly one Monday morning several ranting voices are heard cursing and raising all kinds of Radio Hell. I suppose the school *could* dump the VHF radios for a new,

(Continued on page 28)

BY HAROLD ORT, N2RLL, SSB-596

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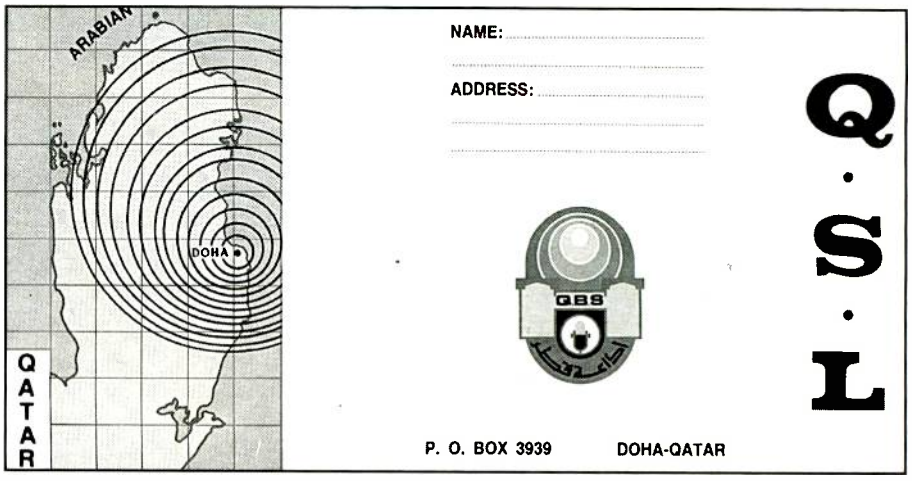
Monitoring The Black Gold Countries

Get The "Official" Story On Shortwave

By Gerry L. Dexter

Oil, not computers, is what runs the world. "Black gold," they used to call it. The experts, who are supposed to know about such things, say there is a big time oil/energy crisis in our future. They believe prices will continue to rise, putting larger and larger dents in our credit cards and checkbooks as the years go by.

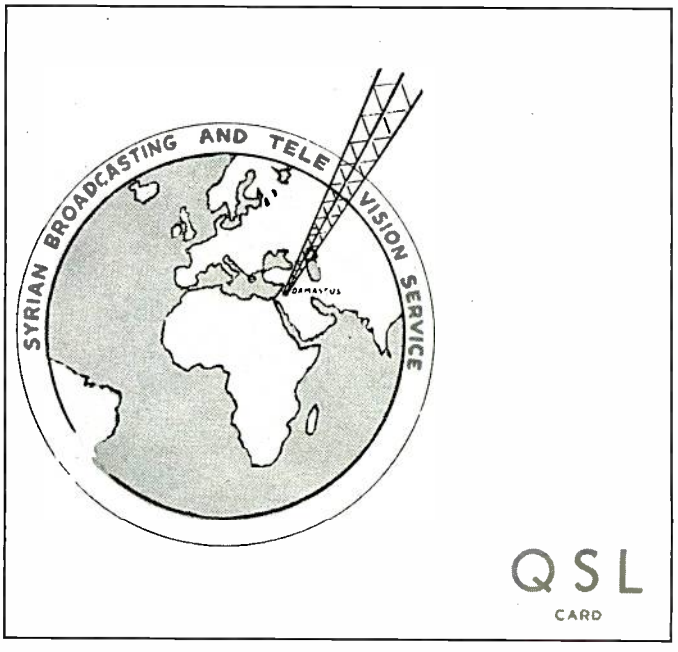
Some experts believe that 90% of the oil the planet has to give us has already been found. And, worse, that we've already used half of it! An estimate from the Institute on Energy and Man predicts that a mere four years from now, world oil production will peak and then begin to drop, drop, drop — falling by some 50% by the year 2040. Saudi Arabia is expected to be the last nation still producing oil and the reserves there may be exhausted by around 2110. These estimates may actually be too conservative. The world is using energy at an ever-faster rate (20 million barrels a day in the U.S. alone) thanks to the increasing demands of our high-tech world and governments that aren't energized into action by mere doom and gloom predictions.



Look for the Qatar Broadcasting Service on 9570.

Of course few of us will be worrying about oil supplies a hundred or so years from now. But, by then it may be a very different story for our grandchildren if new oil fields aren't found, alternatives aren't discovered, and we aren't able to make light-year leaps in the efficient use of energy. In the meantime, our only immediate worry will be prices (and what

A classic card from Radio Congo's ancestor, Radio Brazzaville, in then French Equatorial Africa (1955).



You can hear Radio Damascus, Syria in the afternoons on 12085.

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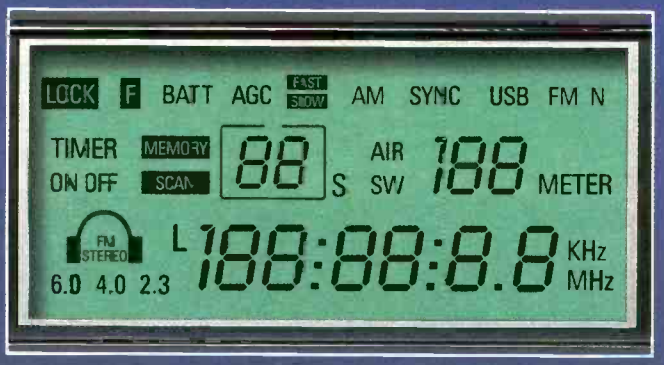


The LCD
Big! Bold! Brightly Illuminated 6" by 3½". Liquid Crystal Display shows all important data: Frequency, Meter band, Memory position, Time, LSB/USB. Synchronous Detector and more.

The Signal Strength Meter
Elegant in its traditional Analog design, like the gauges in the world's finest sports cars. Large. Well Lit. Easy to read.

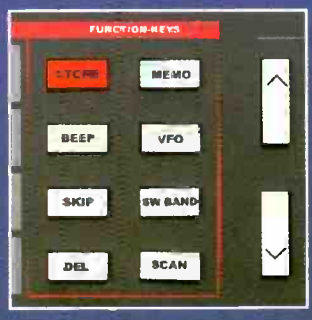
The Frequency Coverage
Longwave, AM and shortwave: continuous 100-30,000 KHz. FM: 87-108 MHz VHF Aircraft Band: 118-137 MHz.

The Tuning Controls
• For the traditionalist: a smooth, precise tuning knob, produces no audio muting during use.

Ultra fine-tuning of 50Hz on LSB/USB, 100Hz in SW, AM and Aircraft Band and 20 KHz in FM.
• For Fixed-step Tuning: Big, responsive Up/Down tuning buttons.
• For direct frequency entry: a responsive, intuitive numeric keypad.

THESE ARE THE SATELLIT 800 MILLENNIUM'S MAJOR FEATURES. FOR A DETAILED SPECIFICATION SHEET, CONTACT GRUNDIG.

Digital Technology

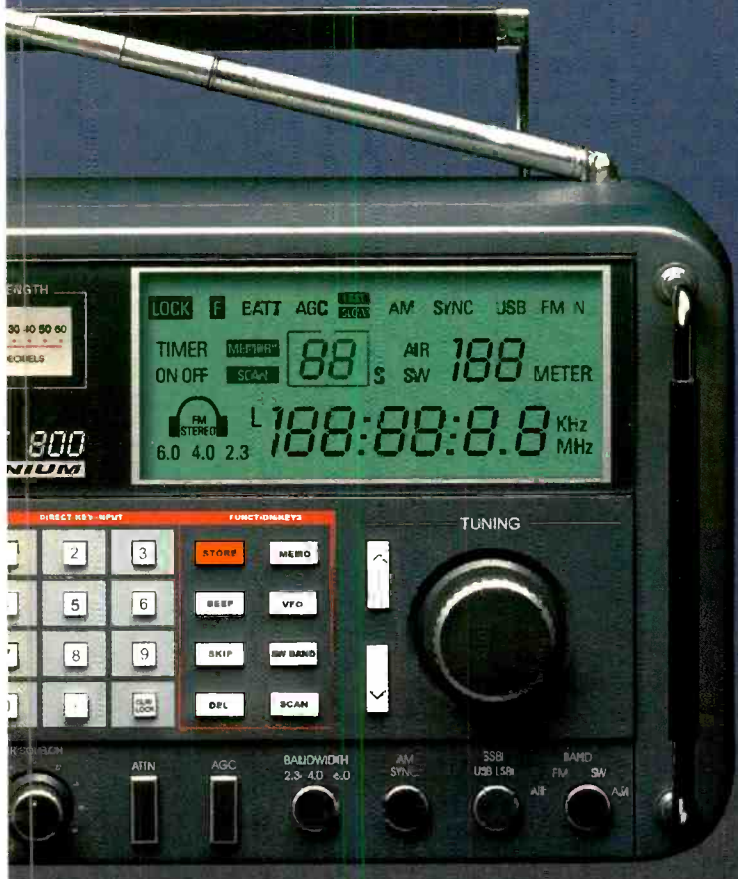


The Operational Controls
Knobs where you want them; Buttons where they make sense. The best combination of traditional and high-tech controls.

The Sound
Legendary Grundig Audio Fidelity with separate bass and treble controls, big sound from its powerful speaker and FM-stereo with the included high quality headphones.

The Technology
Today's latest engineering:
- Dual conversion superheterodyne circuitry.
- PLL synthesized tuner.

The Many Features
- 70 user-programmable memories.
- Two, 24 hour format clocks.
- Two ON/OFF sleep timers.
- Massive, built-in telescopic antenna
- Connectors for external antennas – SW, AM, FM and VHF Aircraft Band.
- Line-out, headphone and external speaker jacks.



The Power Supply
A 110V AC adapter is included for North America (a 220V AC adapter is available upon request). Also operates on 6 size D batteries. (not included)

Dimensions: 20.5" L × 9" H × 8" W

Weight: 14.50 lbs.

by GRUNDIG

Lextronix / Grundig, P.O. Box 2307, Menlo Park, CA 94026 • Tel: 650-361-1611 • Fax: 650-361-1724
Hotlines: (US) 1-800-872-2228 (CN) 1-800-637-1648 • Web: *www.grundigradio.com* • Email: *grundig@ix.netcom.com*

COUNTRY	STATION	UTC	FREQ.	LANG	NOTES
ALGERIA	Radio Algiers Int'l.	1900	15160	SS/EE	//11715
ALGIERA	Radio Algiers Int'l.	1500	15205	AA	
ANGOLA	Radio Nacional	24hr.	11955v	PP	best 04- 05.//4955v
ARGENTINA	General Pacheco Radio	any	15820usb	SS	irr., various local relays
ARGENTINA	Rdf. Argentina al Exterior	0200	11710	EE	
AZERBAIJAN	Radio Baku	0215	6110	Az.	X
BANGLADESH	Radio Bangladesh	1200	15520	EE	X
BENIN	La Voix de la Revolution	0500	5025	FF	//7210
BRAZIL	Radio Bandeirantes	24h	11915	PP	
BRAZIL	Radio Brazil Central	0100	4985	PP	
CAMEROON	Radio Garoua, Garoua	0430	5010	FF	
CAMEROON	RTV Cameroon, Yaounde	0430	4850	EE,	oth. irr., various local relays
CANADA	CBC No. Quebec Service	1200	9625	EE	
CANADA	CFRX, Toronto, relay CFRB	24hr	6070	EE	
CHINA	China Radio Int'l	1400	9700	EE	
CHINA	Yunan Peoples Bc Svc	1200	6927	CC	Kunming
COLOMBIA	Ecos del Atrato	0300	5020v	SS	Quibdo
COLOMBIA	Radio Nacional	0100	9635	SS	
CONGO	Radio Congo	2200	5985	FF	Brazzaville
CONGO	R. Nac. Congolaise	24h	15244v	FF	irr.
DENMARK	Radio Denmark	2230	15735	DD	follows R. Norway
ECUADOR	HCJB	0000	9745	EE	
ECUADOR	Radio Quito	0000	4919	SS	
EGYPT	Radio Cairo	0200	9475	EE	
EGYPT	V of the Arabs service	0300	9850	AA	
EQUATORIAL GUINEA	Radio Africa/E. Africa	1630	15185v	EE	commercial religion
EQUATORIAL GUINEA	Radio Nacional	0500	6250v	SS	
GABON	Africa No. One	1600	15475	FF	
GABON	RTV Gabonaise	0500	4777	FF	or 7270
GREAT BRITAIN	BBC	2100	12095	EE	22 hrs/day
INDIA	All India Radio	0030	10330	Hindi	
INDIA	All India Radio	1330	11620	EE	
INDONESIA	Voice of Indonesia	1200	9525	II	s/on 0900
INDONESIA	Voice of Indonesia	1730	11150	various	to 2100
IRAN	V. of Islamic Rep. of Iran	0030	9022	EE	//9835, 11970
IRAN	V. of Islamic Rep. of Iran	24hr.	15084		various near 24hrs
IRAQ	Radio Baghdad	0200	11787	AA/EE	irregular
ITALY	RAI International	0050	11800	EE	
KAZAKHSTAN	Kazakh Radio	0000	4545	Ka, RR	X
KAZAKHSTAN	Kazakh Radio	1400	12115	Ka, RR	X
KUWAIT	Radio Kuwait	afts	15505	AA	//15495
KUWAIT	Radio Kuwait	eves	11675	AA	
LIBYA	Radio Jamahiriya	2000	17725	AA	
MALAYSIA	Radio Malaysia	1200	7295	EE	24h
MALAYSIA	Radio Malaysia	1200	15295	CC	
MEXICO	Radio Educacion	0000	6185	SS/EE	to 1200
MEXICO	Radio Mexico Int'l	0000	9705	SS	
NEW ZEALAND	Radio New Zealand Int'l	1100	6100	EE	irregular
NEW ZEALAND	Radio New Zealand Int'l	1845	17675	EE	to 1015
NIGERIA	Voice of Nigeria	0500	7255	EE	s/on 0900
NORWAY	Radio Norway In'l	2200	15735	NN	1/2 hr; 23, 00, others
OMAN	Radio Sutanate of Oman	0300	15355	EE	to 0400
OMAN	Radio Sutanate of Oman	0400	9515	AA	//17590
PAKISTAN	Radio Pakistan	1600	11570	EE	
PAKISTAN	Radio Pakistan	1600	17510	EE	
PAPU, NEW GUINEA	Port Moresby	1100	4890	EE	
PERU	Radio Andina, Huancayo	0400	4996	SS	
PERU	Radio Union, Lima	0500	6115	SS	
QATAR	Qatar Bdcastg. Service	0245	9570	AA	//7205

QATAR	Qatar Bdcastg. Service	1300	11655	AA	alt 11820
ROMANIA	Radio Romania Int'l	0100	11940	EE	//5990, 9510, 9570
RUSSIA	Voice of Russia	0100	11815	EE	
RUSSIA	Voice of Russia	0200	9865	EE	
SAUDI ARABIA	BSKSA	0300	15270	AA	Holy Koran pgm
SAUDI ARABIA	BSKSA	1800	9870	AA	//9555
SUDAN	Re. of Sudan Radio	0300	9200	AA	//7200
SUDAN	V. of Sudan	0400	8000	AA	clandestine
SYRIA	Radio Damascus	1800	12085	various EE at 2000	
TURKMENISTAN	Turkmen Radio	1200	5015	RR	X; 23h
U. ARAB EMIRATES	UAE Radio, Abu Dhabi	2200	9695	AA	to 0200
U. ARAB EMIRATES	UAE Radio, Dubai	0330	13675	EE	//12005,15400
UNITED STATES	Voice of America	0000	11695	EE	
UZBEKISTAN	Radio Tashkent	1200	15295	EE	
UZBEKISTAN	Radio Tashkent	1200	9715	EE	
VENEZUELA	Ecos del Torbes	eve	4980	SS/EE	//9660
VENEZUELA	Radio Nacional	0000	9540	SS/EE	irr., also 03,11,18,21
VIETNAM	Voice of Vietnam	1230	9840	EE	//12020
VIETNAM	Voice of Vietnam	2330	12020	EE	
YEMEN	Rep. of Yemen Radio	0300	9780v	AA	

any price increases might do to your 401K). And maybe an occasional back-of-brain niggling that we ought to do something about conservation.

The 11 nations making up OPEC (Organization of Petroleum Exporting Countries) are actually a minority among the countries which produce oil. OPEC nations, however, are the big guns, producing about 60% of the world's output. They're the group that gets the media's attention when prices take a jump. And, after last year's bumpy experiences, there's still a media-generated feeling of unease in the air, as though we haven't seen the last of these oily troubles.

While individually we can do little about such matters, we can have some DX entertainment in trying to hear the countries that have the oil. And that's our listening game today.

There are almost 50 nations on the target list. You'll note that, in most cases, we've provided two targets or an alternative. And, yes, you can probably hear some of these countries more easily at times or on frequencies other than those listed here. But those are likely to be relays and we've tried to avoid pointing you at those since they aren't direct from the country in question.

Times are in UTC. Sometimes listings don't show a specific hour if the broadcast runs over several hours and can be heard during much or all of the period. In the case of Argentina's single sideband relays "any" indicates that these broadcasts may be on at any time, or not! (Not only are they irregular, they are inconsistently irregular!)

In the "Notes" column, "//" indicates a parallel frequency which should also be in use. "X" indicates that the station is extremely difficult to hear. Of course, times and frequencies are subject to change (it wouldn't be shortwave, otherwise!). Some frequencies and sign-on/sign-off times may vary a bit, particularly with the smaller broadcasters.

So have a go at it! And if you want to do it in an environmentally correct, energy-saving way, turn off all the lights and use a flashlight and a battery-operated portable receiver! ■

RADIO RESOURCES

Interesting Thoughts And Ideas For Enjoying The Hobby

Alaska Is Radio Active!

You MUST take your radio equipment next time you visit Alaska! Whether you arrive by cruise ship, or fly the convenient Seattle-to-Anchorage route, or do your own driving up the Alcan Highway, you will be greeted with more radio action than you ever imagined possible.

The amateur and scanner radio industry is always invited to show and sell their radio equipment at the Anchorage two-day hamfest, followed by the next weekend's Fairbanks Ham Convention. Neither Anchorage nor Fairbanks have amateur radio dealers in town, so there is plenty of radio excitement when companies like Seattle's Radio Depot and Ham Radio Outlet bring in equipment to sell without the sting of steep shipping charges. Mike Romanello, KL0KB, in Wasilla, Alaska, loads up his 18-wheeler in Washington with refrigerated groceries for Anchorage, and graciously makes room for ham radio dealer equipment to tag along in the back of his refrigerated trailer.

"Scanner listeners and CBers might be surprised to find that most 18-wheelers heading from Washington to Alaska operate on 155 MHz VHF high-band channels, rather than CB Channel 19," comments Romanello, showing off the cab of his truck with twice as many radios and scanners than what you might expect to see down in the lower 48! "I run the Outbacker Perth off my left mirror mount, and I can hear stations all over North America coming in via ham skywaves, and the Outbacker Perth antenna continues to work great even with a solid ice build-up around the shaft in the winter," adds KL0KB. He always makes his ham equipment delivery right on time, hours before the Anchorage show opens.

Rick and Lil Marvin, KL7YF and NL6DL run the Anchorage Hamfest, along with their two Scottish terriers, Farley and Maxwell.

"Anchorage and surrounding communities out 50 miles are covered with 2-meter and 440 MHz open repeaters, along with the KL7AA-7 packet BBS, on 145.010 MHz and 147.960 MHz," comments Rick. Most of the Alaska 2-meter and 440 MHz repeaters take a 100 or 103.5 subaudible tone, along with the customary minus or plus offset on 2 meters. Most Anchorage 440 MHz repeaters output below 445 MHz, taking a +5 MHz transmit split, and usually the 100 or 103.5 Hz PL.

"Fairbanks and Anchorage have some evening nets on high frequency that everyone MUST check in to get the latest info, and to double-check that everyone is OK during severe snows," adds Lil, a popular code and theory instructor.

Alaska Pacific traffic net — 0900 local time, 14.292 MHz

Alaska Sniper's net — 1800 local time, 3920 kHz

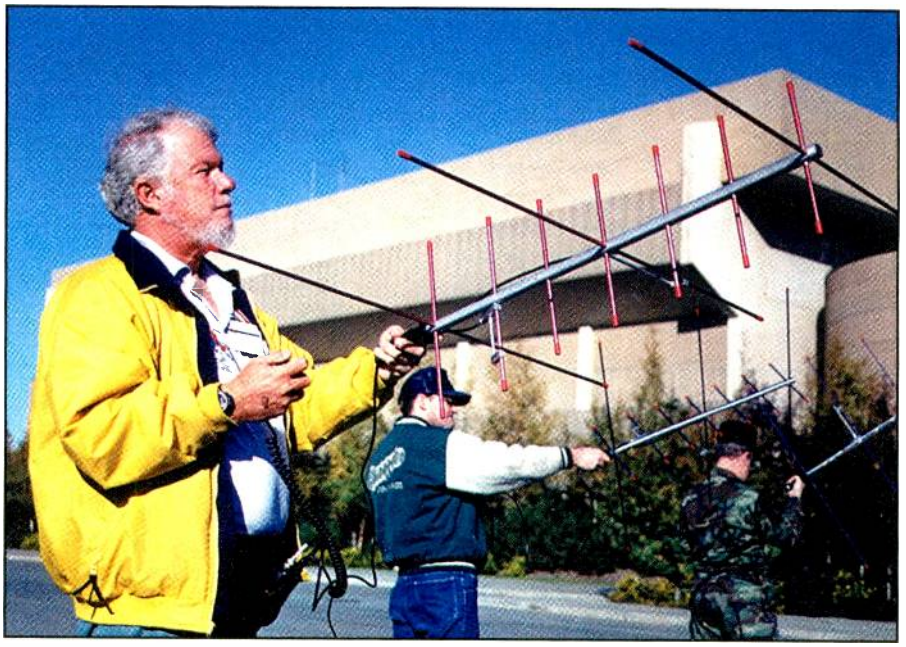
Alaska Bush net — 2000 local time, 7087 kHz

Alaska Motley net — 2100 local time, 3933 kHz

The Anchorage Amateur Radio Club convention committee also brings in the ARRL Northwest Division Director, Greg Milnes, W7OZ, to ensure everyone is up-to-date on the latest restructuring rules and regulations, plus an up-to-the-minute review on what the American Radio Relay League is continuing to do for amateur radio, and accepting suggestions from their further north constituents.

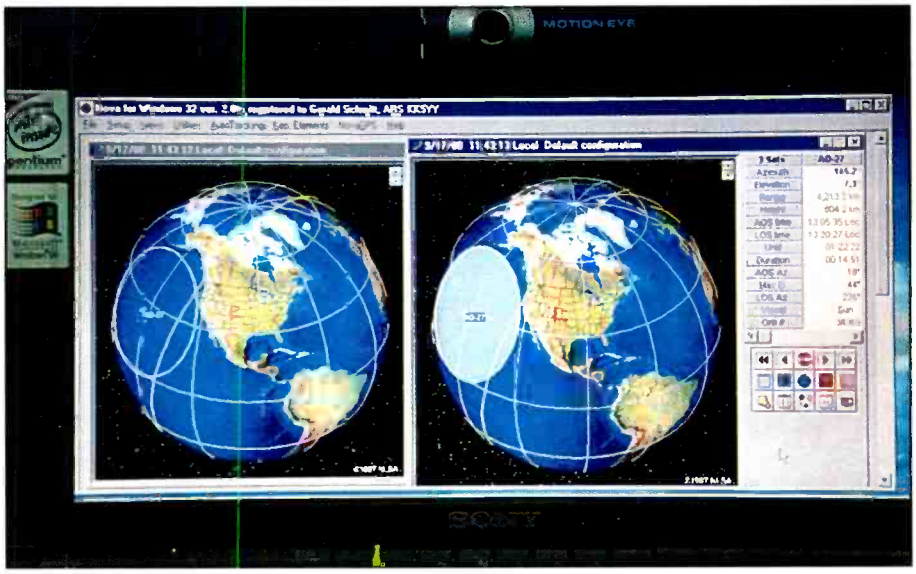
"Some of the ham operators I met in both Anchorage and Fairbanks tell me the amateur radio service is their virtual lifeline for survival when heavy weather hits . . . some amateur operators live in remote areas with no commercial power, no telephone lines, no cellular, and rely exclusively on VHF and high-frequency amateur radio frequencies to stay in contact," adds Milnes.

Both ham conventions were also treated to the country's Number One, walking-talking, portable satellite guy, Jerry Schmitt, KK5YY. It was Jerry who first introduced Alaskans to polar-orbiting FM satellites AO-27 and UO-14, and the capabilities of these satellites to work as FM cross-band repeaters through a simple dual-band handheld and the Arrow 2-meter/440 handheld Yagi antenna. He would uplink to the satellites on 145.975



Jerry, KK5YY, demos portable satellite FM calls on VO-14 and A0-27.

BY GORDON WEST, WB6NOA



Satellite tracking software is a must for the FM "birds."

for UO-14, and 145.850 for AO-27. He would show everyone gathered around him how they could use their own little handheld to easily tune into the satellite downlink on 435.070 for UO-14, and 436.800 for AO-27, shifting 5 kHz down to optimize reception to compensate for Doppler shift.

"It's easy to uplink to the satellite with a simple handheld 2-meter radio, even with a simple rubber duckie, but *receiving* the 70 cm downlink of your voice requires the Yagi antenna along with constant aiming and shifting of polarization," adds Schmitt. He recommends the Arrow brand of handheld dual-band Yagi antenna for UO-14 and AO-27 satellite excitement, and says to get the 137 model antenna because it uses his exclusively designed duplexer that keeps your 2-meter transmit from desensitizing your simultaneous 70 cm receive. Jerry insists that working either of these satellites should only be accomplished through a directional 70 cm Yagi antenna that may be manually rotated to compensate for polarization shifts, and hearing the satellite downlink of your voice is far more important than the easy job of getting a couple of handheld watts up to the satellite on the 2-meter uplink channel.

Reaching Jerry

"I love training new and old-time hams on using these two FM satellites, and anyone interested in learning more about how to procure and work the Arrow antenna on your present dual-band handheld can call me at 505-672-3717, or E-mail me at kk5yy@arrl.net," adds Schmitt. I traveled with him on the Alaska interior for a week, and we gave out some mighty rare grid squares to stations all over the lower 48 states on the two polar-orbiting, FM repeaters in the sky. Passes would last only about seven minutes, but this gave Jerry plenty of time to hand out as many as 25 different contacts! Incidentally, the AO-27 satellite had a hiccup just before the Alaska Hamfest, but ground controller Chuck Wyrick, KM4NZ, indicated after several attempts they have successful reloaded the software and had the satellite up and running again.

Gordo talks to the lower 48 on 20 meters.

A Look At HAARP

The trip to Fairbanks from Anchorage in a rented van with many antennas on it took a big detour to visit the famed, high frequency, active auroral, research program site in Gakona, Alaska. Advanced Power Technologies, Inc., out of Alexandria, Virginia operate the facility. We took an almost-unmarked dirt road to get to HAARP, (HF Active Auroral Research Program) and were warmly received by Michelle Engebretson, the HAARP site coordinator.

"Welcome to HAARP — want to see some antennas?" asks Engebretson. I thought we would need some sort of top-secret clearance just to be able to look at them from a mile away, but APTI technical types Ed Bishop and John Chiochetti undid the padlock and let us stand beneath the ground curtain high above our heads to reflect the high-frequency imaging signals skyward from 6 x 8 cross-dipoles above the ground curtain, driven by 48 10,000 watt transmitters. They explained that HAARP operates a wide array of operating frequencies in the high-frequency band, from 2.8 MHz to a high of 10 MHz. They scan a +30 degree cone in just 10 milliseconds, and polarization and beam shaping of the radiated pattern are controlled at a blockhouse about a half-mile away. Fiber optics allows for high-speed FO phase control at 144 MB/s, and high-speed FO data communication. All sorts of computers inside the blockhouse could show ground and underground imaging results, ionospheric research, auroral oval interaction of the solar wind and the earth's magnetic field, and observations of the radiated energy that is re-radiated as opti-

GRUNDIG Best in Technology

Yacht Boy 400 Professional Edition (Y3 400PE)

The most powerful compact Radio AM/FM Shortwave Receiver.

"The Best compact shortwave portable we have tested" Lawrence Magne.-Editor in Chief, Passport to World Band Radio

The Big Breakthrough! Power, performance, and design have reached new heights! The Grundig 400 Professional Edition with its sleek titanium look is packed with features like no other compact radio in the world.

Finpoint Accuracy The Grundig 400PE does it all: pulls in AM, FM, FM-Stereo, every shortwave band (even aviation and ship-to-shore)-all with lock-on digital precision.

Ultimate Features! Auto tuning! The Grundig 400PE has auto tuning on shortwave and stops at every signal and lets you listen. With the exceptional sensitivity of the 400PE, you can use the auto tune to catch even the weakest of signals.
Incredible timing features! The Grundig 400PE can send you to sleep listening to your favorite music.
You can set the alarm to wake up to music or the morning traffic report, then switch to BBC shortwave for the world news.
The choice is yours!

Powerful Memory! Described as a smart radio with 40 memory positions, the Grundig 400PE remembers your favorites-even if you don't!

Never Before Value! Includes deluxe travel pouch, stereo earphones, owner's manual, external antenna and a 9 volt Grundig AC adapter. Uses 6 AA batteries (not included)

Style • Titanium look

Shortwave, AM and FM • Continuous shortwave from 1.5 - 30 MHz, covering all existing shortwave bands plus FM-stereo, AM and Longwave. • Single sideband (SSB) circuitry allows for reception of two-way communication such as amateur radio, military, commercial, air-to-ground, and ship-to-shore.

Memory Positions • 40 randomly programmable memory positions allow for quick access to favorite stations.

Multi-function Liquid Crystal Display • The LCD simultaneously displays the time, frequency, band, alarm and sleep timer.

Clock, Alarm and Timer • Two alarm modes: Beeper and radio
• Dual clocks show time in 24 hour format.
• Sleep timer programmable in 15 minute increments.

Dimensions: 7.75" L x 4.5" H x 1.5" W

Weight: 1 lb. 5 oz.

- Best in Value

Yacht Boy 300 Professional Edition (YB 300PE)

Power and Performance with the Affordable Yacht Boy 300 Professional.

Designed for the traveller, the titanium look digital radio provides incredible power and performance for an incredibly low price! Packed with features, this radio is an excellent value, accompanied with 3 AA batteries, AC adapter, earphones, supplementary Antenna and carrying case

State of-the-art features include:

- Digital tuning with 24 user-programmable memory presets
- 13 SW Bands (2.30-7.80 MHz; 9.10-26.10 MHz)
- Illuminated multifunction LCD display screen
- AM/FM stereo via earphones
- Clock, alarm and 10 to 90 minute sleep timer
- Digital tuning display
- Direct frequency entry
- DX/Local selector
- Titanium look finish
- External antenna jack
- Dynamic micro speaker
- Earphone jack
- Telescopic antenna

Dimensions: 5.75" L x 3.5" H x 1.25" W

Weight: 9.92 oz

by GRUNDIG

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Hotlines: (JS) 1-800-872-2228 (CN) 1-800-637-1648 • Web: *www.grundigradio.com* • Email: *grundig@ix.netcom.com*

cal energy. The resulting airglow spectrum is dependent on the heater beam intensity, and the composition and density of the atmosphere in the energy deposition layer. The monochromatic heater signal can also be converted into a broad radio spectrum impacting communications and providing diagnostic utility.

The HAARP system can also be used as a low-frequency radar transmitter or radio system that is tunable continuously over the range of .001 Hertz to 40 kHz. This function is achieved by amplitude modulation of the transmitter signal at the desired low frequencies. The lower frequencies can propagate with low attenuation over thousands of kilometers using the waveguide formed between the ground and the ionosphere. The signals are useful for communications with land forces over submarines and, because they have great penetration range, for the investigation of subterranean formations, caves, tunnels, or structures.

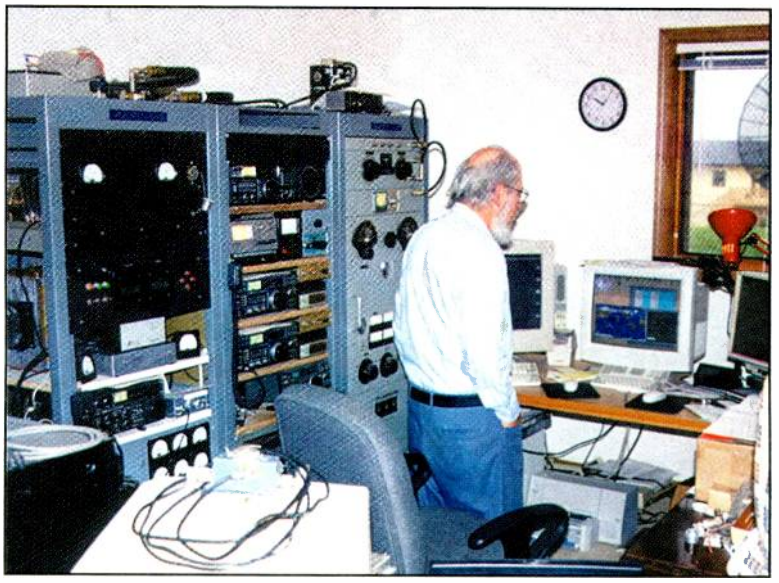
Problems With HAARP?

Although there have been books written about HAARP claiming the radio signals are invading our bedroom or our brains, or are capable of snooping around to see what might be buried in our backyard, I doubt that this facility is beaming out an almost 1 million watts of effective radiated power for this purpose. But I was fascinated to ask the question on whether or not they could actually make the ionosphere glow like an aurora, and the answer was no, or at least not yet. And could you watch an aurora and see when the transmitter was kicked on and see a change — again, they say their transmissions to an aurora would be much like poking a straw to the side of an elephant. And when I asked whether or not the local hams around Alaska were ever interfered with by HAARP on the 40-meter and 75-meter ham bands, the answer was HAARP is a great next door neighbor, and either avoids the ham bands or uses some sort of sequencing transmit technology that can't be heard by the common shortwave receiver or ham set.

We were told that they were soon to start an experiment, and we should not stand underneath the several acre HAARP antenna system, along with its elevated ground plane. Alaska soil, we are told, is a lousy ground current conductor.

The Denali Highway

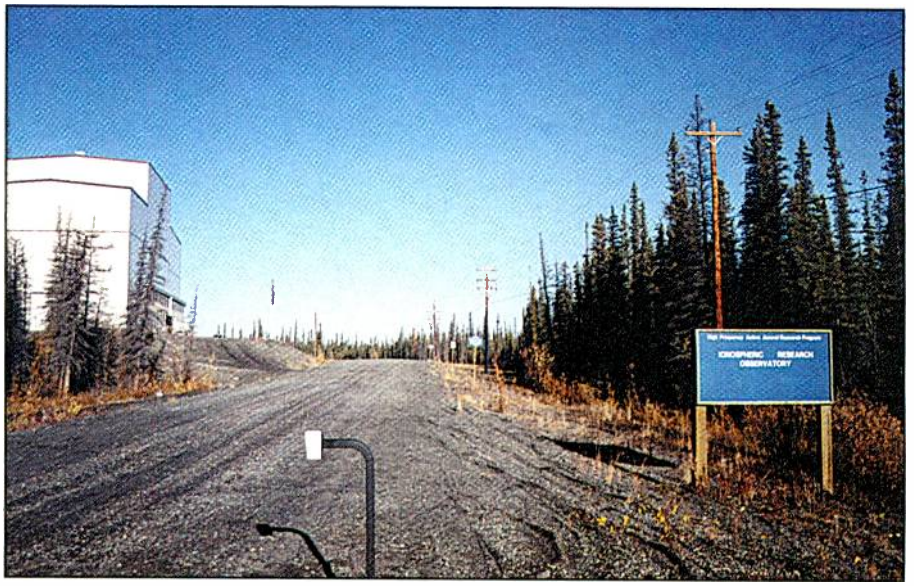
We next traveled a very rugged, couple-hundred-mile dirt road called the Denali Highway between Paxson and Cantwell. All Alaskans told us this was the road with no VHF/UHF radio contact. They are correct — except for a couple of warm spots (maybe created by HAARP?) — good repeater coverage was absent. But every hour or so, Jerry's little portable laptop would beep, he would slam on the brakes into a 4-wheel skid, and we would jump outside and give out a few more rare grid square satellite contacts on AO-27 and UO-14. With the Arrow handheld antenna to his little dual-band Yaesu and Kenwood HT's, the FM connection was "full quieting" as he swung the beam back and forth and regularly rotated it to compensate for ionospheric polarization shift.



Big moonbounce station in Alaska.

High-frequency contacts were plentiful on 15 and 20 meters during the day, and 40 and 75 meters at night. We ran an Outbacker Perth for 75 meters, and the Yaesu ATAS-100 automatic, mini-screwdriver, motorized antenna on 15 and 20, or for that matter, 40 meters up through 440 MHz. We are told the ATAS-100 antenna from Yaesu, working with the Yaesu FT-100, works well, even when operated in the dead of an Alaska winter where temperatures can sometimes get down to minus 40 degrees. They say you sometimes have to chip the ice off of the Yaesu antenna bellows, but after you do, it goes up and down remotely a little slow, but will eventually lock into tune.

We also tested the GlobalStar satellite, portable, full-duplex telephone. We needed to get to an area where there was no local cellular coverage to see how well the unit would first search for cellular, and then flip over to the satellite phone mode.



The entrance to HAARP.

New! Edition 2001

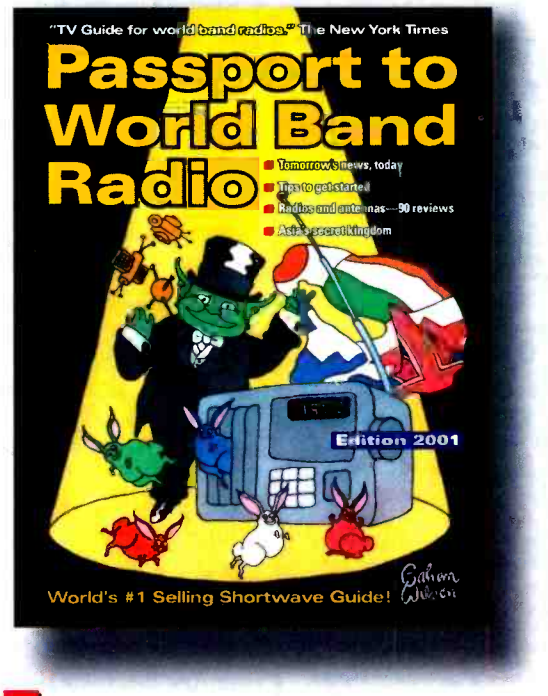
Passport to World Band Radio

World's #1 selling shortwave publication

Unparalleled news and perspectives, plus every sort of music and diversion. That's world band radio, from as many as 165 countries.The New York Times calls Passport to World Band Radio the "TV Guide for world band radios," and no wonder. Passport is jammed with just what you need to eavesdrop on our world: Best and worst radios. What shows are on. Tips from the world's leading experts. With Passport, you'll have the world at your fingertips.

"A whole new world of listening enjoyment. PASSPORT TO WORLD BAND RADIO is the perfect primer."

—Harrowsmith



$19.95 each at bookstores everywhere, or contact:
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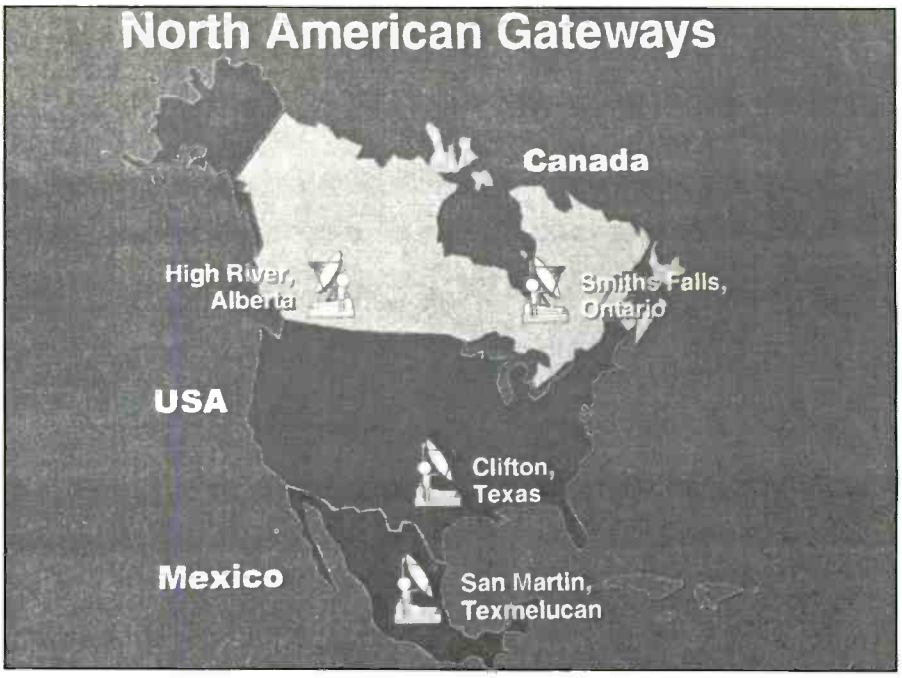


GlobalStar now does Alaska!

On the first try, it took only about 10 seconds for the GlobalStar equipment to realize it was truly out in the bush, and quickly locked onto a series of GlobalStar satellites that had a mutual view of the Canadian downlink earth station in High River, Alberta. We would be one of the very first radio operators to try out the system after the Canadian ground station "touched up" its antenna system to extend a mutual view of the low-earth-orbit satellites in northern Alaska.

I can tell you first hand the GlobalStar Qualcomm phone worked EVERY TIME, as far north as near the Arctic Circle. Unlike the off-the-air Motorola Iridium phone service, GlobalStar was just like talking digital cellular with absolutely no hint of echoes, no hint of the rolling or tunnel effect, and a positive feedback of hearing your own voice without any delay from the combination of two or three low-earth-orbit GlobalStar satellites processing the call. I was even surprised to find that we could make phone calls from the GlobalStar satellites with snow capped mountains looming several thousand feet above us in the direction of the satellites. When we were surrounded by mountains, we found that the antenna position for best reception might not be necessarily straight up, and we would move around just a little bit in order to find a hot spot that would remain hot for at least 2 or 3 minutes before new satellites would take over the relay. Only once did a call get dropped, and that was my own fault when I was yakking on the phone and stepped behind a big tree.

We met Doug, KL7IKZ, with the Bureau of Land Management, and he says that he is also testing the GlobalStar system with much more success than what they had achieved with Iridium that went off the air for them on September 1.

So if you're going to Alaska and going to the wilderness outside of cellular coverage, but you still need to contact your home or office phone, I can tell you first hand after almost two weeks in the rugged areas of Alaska, globalstar really works!

Finally, Fairbanks!

Bring your note pad. Fairbanks hams have lots to tell you, and show you. And be prepared to be surprised!

"Want to see our RadioShack store?" asks Rex, KL7BJ. When he took us into the probably most north RadioShack store in the world, I couldn't believe how *big* the store was, and the amount of stock they carried with multiple back-ups. Fairbanks RadioShack carried the latest in scanners, shortwave receivers, computers and phones, and thousands of those little replacement parts that only RadioShack stores seem to carry. It was also the only RadioShack store I have ever gone into where a clerk came out from behind the counter and walked up to Jerry and me and said, "Welcome to our store, may I help you find something you are

looking for?" We went inside to double check that they had plenty of the Technician, General, and Extra class theory books to go along with the classes I was teaching in Fairbanks, and they indeed had a good stock on hand. Jerry picked up a sub-miniature plug to go along with his Kenwood D-7 and APRS demo.

Fairbanks, Alaska, has a linked repeater system that goes just about anywhere you might drive or snowmobile, too. "Benny," NL7XH, adds to the system solar-powered cross-band links, utilizing Kenwood TH-79 portable transceivers. He is always on the lookout for more 79's because this is the radio of choice due to its extremely low power consumption and capability to work when literally frozen. If you have an old Kenwood in need of repair and want to send it to a worthy cause, get it up to Benny in Alaska minus the battery pack and his public service communicators will be forever grateful.

Jim Movius, KL7JM, is the Fairbanks Hamfest Coordinator, and he arranged several days of tours for locals and us visitors. We couldn't believe what we saw: Bill Beam's, NL7F, microwave moonbounce station; the Alaska synthetic aperture radar facility at the Geophysical Institute; Jack Mercer's, AL7KF, tour of the Fairbanks National Weather Service and all of their satellite imagery equipment; a tour of the International Arctic Research Center at the University of Alaska Fairbanks; the Gilmore Creek Geophysical Observatory with its 26-meter dish; and Rich Strand's, KL7RA, computerized remote amateur contest station with eight operating positions all computer-interfaced, 26 antennas on 7 towers varying in height from 100 to 190 feet, situated in a remote area where man-made electrical noise is totally absent. He knows when you are driving up the rutted dirt road over a mile away, because he can hear the sound of your spark plugs and alternator coming over any one of his contest station sets!

The Fairbanks Hamfest, along with a web schedule of events authored by Fred Brown, KL7CUS, really points out how eager Alaskan amateur operators and shortwave listeners are to fill you in with the local sites. More than once I overheard Anchorage and Fairbanks, Alaska, operators saying that any ham coming into the area must absolutely announce themselves on the local repeater for things to swing into action — anytime — even during the 24-hour dark winter months, too. This is when they say the auroras are the best, and they will pile you in their snowmobiles or 4-wheel-drive vehicles, and take you to the top of the hill to see the sights.

Alaska hams put radio as one of their most important assets throughout the year, regularly checking into the evening high-frequency nets and 2-meter repeaters to let everyone know their status.

Scanners and shortwave radios are found all over the place; car dealerships, country stores, and all over the university. "Wireless" is one of the things that Alaska is all about, so next time you want to take some radio equipment somewhere you've never been before, indeed consider the Land of the Midnight Sun and all of the Alaskans who just can't wait to show you what it's like up in their part of the wireless wilderness. ■

THE RADIO CONNECTION

A Look Behind The Dials

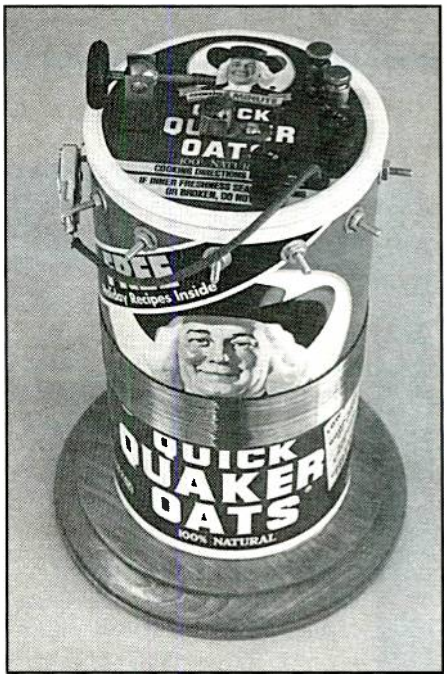
John's Oatmeal Box Crystal Set

Hello and welcome to the column that almost wasn't. Folks, It's been a bad few weeks, and I must apologize for not finishing up our Mystery Crystal Set project this month as I had wanted to. During the four weeks between column deadlines all three family cars ended up in the repair shop, the pump that supplies our household water also gave up the ghost, the washer died — but not until after it had flooded the kitchen; and the final insult was my computer fatally upchucking on an attempted Internet Explorer 5.5 upgrade attempt made last Friday, which was coincidentally October the 13th!

Let's bring our new readers up to speed. We started discussing our latest project, the 1932 Mystery Crystal Set, in the November 2000 issue. At that time we reran most of the original material regarding the Mystery Crystal Set, which had first appeared in the *Our Wireless Circle* column in the July 3, 1932 issue of Brisbane's *Sunday Mail* newspaper. In our December 2000 column, I showed how to make a very nice replica of a vintage fixed-detector using the body of renewable link 20-amp fuse cartridge for the Mystery Set's detector. Hopefully, if my little world holds together long enough, we'll be wrapping up the Mystery Set in our next issue and moving on with more restoration topics and construction projects!

Our column regulars will remember John Haught, KA3BRK, the gentleman who holds the current record by winning two one-year subscriptions for his prize-winning photos and descriptions of his versions of the Boy's First Receiver and the Lyonodyne Crystal set projects. Well, John has sent in some more photos of his latest homebrew efforts, and as usual, he has outdone himself!

Back in the 1920s, many an enterprising lad used a Quaker Oats box as a handy coil form for a crystal set. Occasionally you'll see examples being offered at radio meets. In 1921, Quaker Oats began offering promotional Quaker Oat sets, made by the Marquette Radio Corporation, for a dollar plus two labels from Quaker Oats containers. Few of the original factory sets have survived, and as you can imagine the remaining examples are highly coveted by collectors. One way to tell a factory set from a home brew copy is whether the tuning coil is wound beneath or atop the Quaker Oats label. The label is over the coil windings in the factory versions. The sets are tuned using a slider across the windings where they are exposed by a strip in the label running parallel to the windings.



John Haught's homebrew Quaker Oats-style crystal set is reminiscent of the sets offered by the Quaker Oats Company of Louisiana in 1921.

John's version differs from the factory set in several ways; he used a fancy wooden base, and he also used fixed coil taps selected with an alligator clip for tuning. John's coil is also wound on top of the label. His set closely resembles the RadioGem Corp. of New York crystal set that was also sold for a dollar back in 1922. Nonetheless, I hope some other readers are inspired to try their hand at making their own version of the venerable Quaker Oats set. I've heard that the familiar round boxes may be becoming a rarity in the near future, so aspiring builders shouldn't delay finding the requisite box ASAP! John's Quaker Oats set is a fine example of a crystal set design that goes back almost 80 years!

A Future Radio Project: The Night Hawk

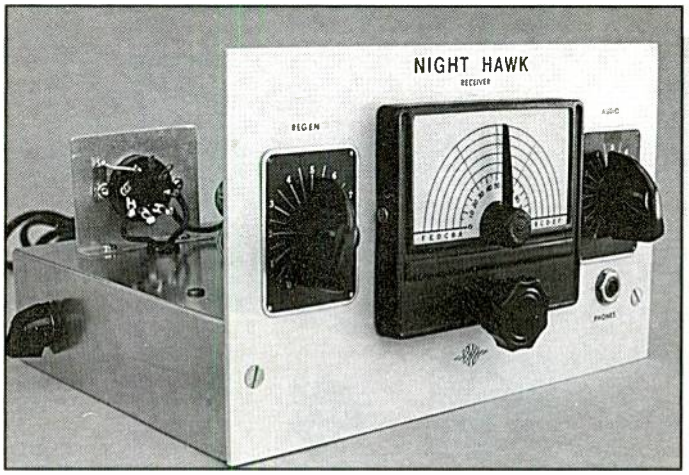
John also sent along several photos of his latest accomplishment: a very nicely constructed one-tube receiver! Here, in John's own words, are his comments regarding the project:

"Hi Peter,

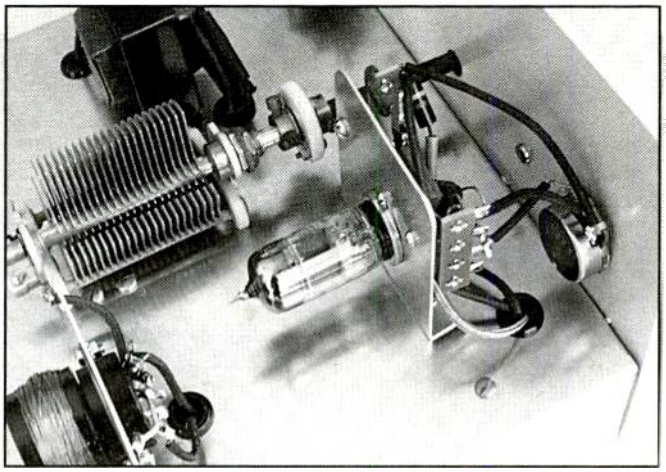
I recently completed the one-tube (using a 12AT7 dual triode) radio that was featured in the *Electronics Illustrated* PRACTICAL ELECTRONICS, book #641, copyrighted in 1966 and 1967, by Facett Publications, Inc. I approached the chassis layout quite differently than what was shown in the publication; I mounted the 12AT7 horizontally on a vertical panel close to the front panel. The front panel layout is my own design. I also used a variable capacitor instead of a trimmer for the antenna coupling — this gives smoother control and a means to indicate the position so repeatable performance can be expected.

"The radio was easy to build. The coils were simply scramble-wound on octal tube bases, and the radio and power supply is self-contained. The only component that might be difficult to find is the power transformer. A hint: look for old tube instruments like vacuum tube voltmeters, etc., as most have small transformers similar to the one I used for this radio. I've only wound two coils; one for the broadcast band and one for the 40-meter amateur band. Both give good results when used with an outside antenna. As the pictures indicate, I use an insulated shaft-coupler between the tuning capacitor and

BY PETER J. BERTINI <RadioConnection@juno.com>



John's Night Hawk one-tube regenerative set looks like it was commercially produced! This set is very similar to inexpensive kits sold to young builders and beginning radio hams during the '30s, '40s and '50s.



Most of the circuitry is mounted above chassis. John uses shaft extenders and couplers to keep the tuning capacitor near the tuning coil and tube, which reduces stray lead lengths.

the front panel — this also permits mounting the capacitor closer to the coil. *(This minimizes lead lengths — Ed.)*

"This has been another fun project from the tube era of our hobby; I hope others find it interesting as well! Look for the components at electronic or amateur flea markets; they are still available!"

73, John

Well, thank you again, John! I needed some column material for this issue, and you are a lifesaver! Seriously, I have been looking for another simple two-stage receiver project, and I think I will use this one for an upcoming "Radio Connection" in the immediate future. I am also tempted to add one more optional audio stage for loudspeaker operation; perhaps a 6AQ5 pentode. I like the idea of recycling old octal tube bases for coil forms; that sure beats spending several dollars for new ones. I think the thing I liked best was the "Night Hawk" moniker you've given the receiver! When you view the photos of John's Night Hawk I'm sure you'll agree that his workmanship is suburb! Note how the flat-head screws on the front panel are properly counter-sunk, and the neat dial plates for the volume and regen controls. John must be a very active radio flea market attendee, or has a bottomless junk box at his disposal!

More Comments On Ronnie Miller's Story

Adam Smith was kind enough to pass this short message via E-mail:

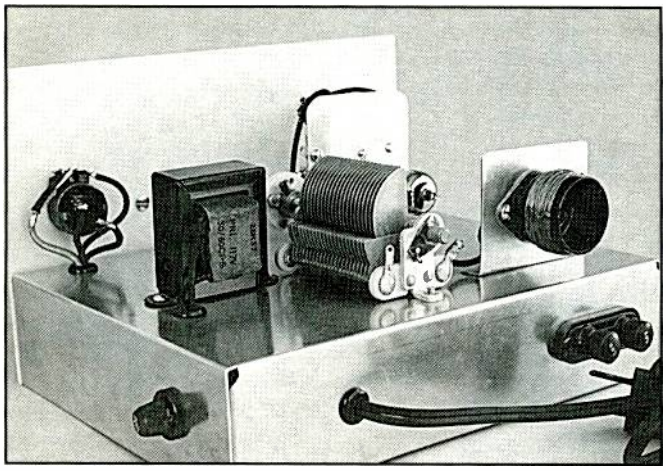
"I just wanted to drop a line and thank you for running Mr. Miller's story about his old radio. I though it was wonderful and hope he can get the parts he needs! Thanks again, Adam"

Well Adam, as you've probably learned, Ronnie's problem was solved before his letter was even published in the column. I do want to thank you for writing us, since I rely on comments like yours to determine what sort of material people enjoy reading in our column.

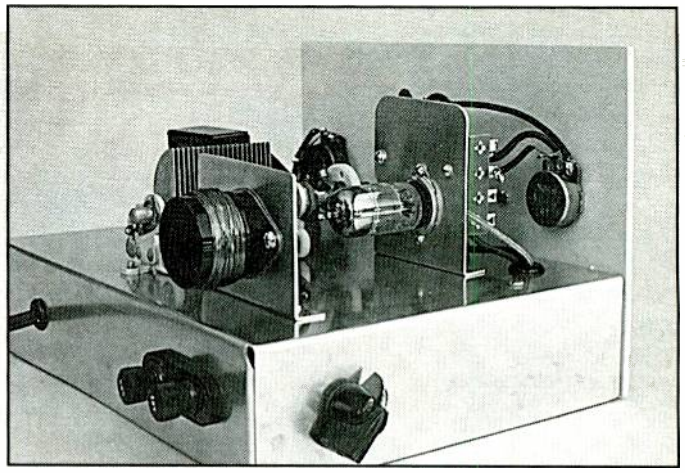
Reader Tony Kriwokulski has raised several questions about protecting tube filaments in the Zenith Transoceanic battery set portables in a recent E-mail he sent to our attention:

"Peter, I really enjoy your column. I have been repairing old radios for 21 years since I was in the 7th grade and the old *Elementary Electronics Magazine* was still being published. I read one of your previous articles which stated how to protect the old 1.5-volt tubes (1L6, 1U4, etc., from inrush current when operating the radio on AC. This would be of great help when I finish revamping my Zenith Transoceanic radios this winter.

"I have a story to share that I think is very funny today, but it sure scared me when I was 10 years old and very inexperienced. I decided to build a one tube AC powered regenerative radio for my school's science fair. A magazine article showed the schematic and parts list. I went to the local electronics parts store with my list and obtained everything except a diode for the power supply, which had no part number. I decided that if there was no part number it couldn't



The rear of the Night Hawk. The tuning coils are wound on recycled octal tube bases. The power supply components are mounted below the chassis.



Rather than use a ceramic trimmer, John uses a small variable capacitor for adjusting the antenna coupling. Note this capacitor is set by the small knob visible on the side apron of the chassis.

be a very important part — boy, was I wrong!

"Once the radio was built I double-checked the wiring and went for a test run. After waiting a few minutes nothing happened, so I unplugged the set and told my dad I had failed. He said keep trying; at this point I thought that perhaps I needed to wait longer for it to warm up, so I plugged it again. The rest is history. The two electrolytics exploded all over my mom's kitchen! There is a lot to be said about experience and asking for qualified help! The next weekend I went back to the supplier, and with help found the right diode to use and some replacement caps. The radio then worked OK.

"Thank you for a great column which I am sure has helped many people, and hopefully it will spark interest in the younger generation."

Tony, thanks for the kind words. I am afraid I don't recall discussing the Zenith or Hallicrafters suitcase-styled battery/AC sets; although I believe we did review the book *The Zenith Trans-Oceanic* by John H. Bryant and Harold Cones, Ph.D. The book was published by Schiffer Publishing, and the ISBN is 0-88740-708-0. Chapter 10 covers physical and electronic restoration of tube models; and I would suggest obtaining a copy for your library. Here are a few general notes off the top of my head. Many of these sets eventually used selenium rectifier stacks to rectify the AC for both the filament string and DC operating voltages. The tube filaments were operated in series, and the sets either used a fixed-value dropping resistor or ballast-type tube such as the 50A1 to regulate the filament current. It is not inconceivable that the fragile filament in the 50A1 could fail, and in doing so fall across the internal connections of the device causing a large voltage spike on the tube filament voltage supply line!

The selenium rectifier should be replaced, regardless of the set's present operating condition. They will develop high leakage currents with age, and also a high internal resistance that allow the output voltage to drop lower that might be desirable. This often results in lowered filament voltage and may cause a set to appear to be dead or to operate intermittently; all too often inexperienced restorers needlessly replace tubes to temporarily mask this condition — unknowingly relying on the higher emission of a factory fresh tube to effect a Band-Aid cure. Replace the selenium with a modern silicon rectifier diode — something with a one or two amp rating and several hundred volts PIV will do fine. Do not use a new old stock replacement selenium. They deteriorate with age, not usage! The eventual failure mechanism for these rectifiers is total breakdown, and they will release a very noxious rotten egg odor when do they eventually fail. You might also want to experiment with a small value power resistor in series with the silicon diode to adjust its output to match the old selenium — something in the order of 15-ohms or so would be my best guess as a starting point. A five-watt resistor should be more than ample. Selenium rectifiers have been covered in great detail in past issues of the *Antique Radio Classified* magazine. You might contact them to see what issues the articles, written by Dan Schoo, appeared in. One other caveat: always leave the old selenium in place, but disconnected from the circuit. This will preserve the original under chassis appearance, and you might also be able to hide the newer silicon rectifier diode beneath it, out of sight! Some Zenith Trans-Oceanic owners are fanatical about the originality of their radios. Many insist on all original parts, and also that only factory stock material be used to repair an ailing radio. Just remember what may be a proper restoration to many of us may be totally unacceptable to others.

As for protecting the tubes from over voltages, this could be accomplished by placing a high-wattage zener diode across the filament supply. For example, if the filament supply is 9 volts, installing a 10-volt, 50-watt power zener across the filaments would clamp the voltage to a safe level; excess current would be dissipated as heat by the ballast tube or dropping resistor. 1L6s seem to get scarce as the supply and market wan and ebb, and they often command prices in the $30 region, so it pays to provide some protection for these tubes.

That's it for this month. Next month will be the final construction notes for the Mystery Crystal Set, and I will have a few photos from reader George Hawkins to share with you. ■

PLANE SENSE

Your Link To Aviation Communications

Inside The Civil Air Patrol

Welcome to the first issue of *Pop'Comm* for the 21st century. Sorry you had to use all your fireworks a year ago, but the 21st century and the 3rd millennium started the first of January of 2001; you wasted your money a year early. (Hint: the first millennium was from 1AD to 1000AD and the second started 1001AD.)

I hope you had a great Christmas, Hanukkah, Kwanza, etc. I trust you received all the new radios you wanted. Since I'm writing this before Halloween I hope I'll be seeing a new IC-R3 under my Christmas tree.

Eleven months from now (December 1, 2001) will mark the 60th anniversary of a rather quiet organization that saves over 100 people a year — the Civil Air Patrol. The Civil Air Patrol, or CAP began its career less than one week before the bombing of Pearl Harbor. Though the U.S. desired to remain clear of WW2, many people saw the need for an organization to harness the civilian aviation resources to aid the U.S. in case America entered the conflict. Writer-aviator Gill Robb Wilson, who was supported by General Henry "Hap" Arnold, led the effort to start the CAP.

Originally organized under the Office of Civilian Defense, headed by former New York Mayor Fiorello LaGuardia, CAP members became the "minutemen" of WW2, volunteering their time, resources, and talents to assist in defending the nation's borders and fill the gaps as men and resources were being mobilized to fight abroad.

The War Department, especially the Army Air Forces, recognized the important roles performed by CAP. In April 1943, CAP was reassigned from the Office of Civilian Defense to the War Department and placed under the jurisdiction of the Army Air Forces.

These volunteer flying minutemen performed bravely during the war. They performed many missions, including coastal patrol to search for enemy submarines, search and rescue missions throughout the United States (which is still being performed today), cargo and courier flights to transfer critical materials and personnel, and even towing targets so Army Air Corps personnel could practice air-to-air gunnery techniques – a very risky mission with new gunners. It was not uncommon to have some target towing aircraft to land with holes shot in them.

The Communications patch is worn on our BDUs and blue jump suits (also know as "Smurf Suits" by those who have gone through the communications course).

These volunteers amassed a stunning record, flying more than half-a-million hours, sinking two enemy submarines, and saving hundreds of crash victims.

"After the German surrender, one of Hitler's high-ranking naval officers was asked why the Nazi U-boats had been withdrawn from U.S. coastal waters early in 1943. The answer was exploded in a curt guttural: 'It was because of those damned little red and yellow planes!'"

— From Robert E. Neprud's Flying Minutemen

A grateful nation recognized the vital role CAP played during the war and understood the organization could continue to provide invaluable help to both local and national agencies.

On July 1, 1946, President Harry S. Truman signed Public Law 476 that incorporated CAP as a benevolent, nonprofit organization. And on May 26, 1948, Congress passed Public Law 557 which permanently established CAP as the non-combatant Auxiliary of the new U.S. Air Force. This law also gave the Secretary of the Air Force the authority to provide financial and material assistance to the organization.

Today the Civil Air Patrol has more than 60,000 members in all 50 states, Puerto Rico, and the District of Columbia. They come from a variety of backgrounds from police chiefs to air traffic controllers to schoolteachers to housewives to retirees, and from big cities and small towns. These differences matter little. What does matter is that all of these people want to be involved in their community — they want to help others and they share a love of aviation.

The Civil Air Patrol owns more than 500 light aircraft, primarily Cessna 172s and 182s and now Maule's. Also, individual CAP members own another 4,700+ aircraft that can be used to support assigned missions. One third of all CAP members are FAA-qualified pilots. As a result of the combined assets, the CAP operates the world's largest fleet of civil aircraft and flies nearly 130,000 hours each year.

In addition to the 500+ aircraft, the Civil Air Patrol owns almost 1,000 ground vehicles to support their missions. Many of these vehicles are equipped with sophisticated communications equipment that becomes invaluable during disasters or extended search-and-rescue missions.

In addition to the search-and-rescue missions, the CAP is also involved with customs and the DEA in counter drug operations and is supported by airborne video and thermal imaging equipment.

Huge Comm System

The CAP operates one of the largest communications systems in the country with over 6,000 fixed land stations and

BY BILL HOEFER <flacap388@prodigy.net>

The Emergency Services patch we call the "Pluto Patch" due to its resemblance to Disney's Pluto.

The Florida Wing Cessna 172s that's porting the new CAP paint scheme.

greater than 10,000 land and airmobile radios operated by 20,000+ trained communicators. This system consists of voice and automatic digital communications capabilities on both long and short circuit paths. Numerous individual networks are linked together to form a highly flexible and survivable nationwide traffic handling system. The CAP National Digital Radio Network (NDRN) has drawn particular interest from other organizations such as the Federal Emergency Management Agency (FEMA) which has joined the network and now includes it in their emergency communications planning.

The NDRN consists of over 2,000 computer-based radio stations which take advantage of leading-edge technology to automatically establish links as necessary and pass error-free message traffic throughout the system.

The NDRN system doesn't rely on telephone lines, so it is highly survivable in the event of natural or man-made disasters and — also because of its radio-based architecture — it is extremely flexible allowing CAP communicators to "plug" into the system from anywhere within radio range of one of the 500+ system modes across the U.S.

Though the Civil Air Patrol is a civilian organization, as the civilian Auxiliary of the U.S. Air Force, it is no surprise that it is organized along military lines.

CAP is organized into eight geographic "regions." These regions are subdivided by the states falling within their boundaries and each state has it own CAP wing. Additionally, the District of Columbia and Commonwealth of Puerto Rico have CAP wings. These 52 wings are then subdivided into groups, squadrons, and flights depending on their size. There are more than 1,700 CAP units, half of which are composite squadrons or squadrons that have both senior and cadet members.

Five Major Duties

Civil Air Patrol duties include: Search and Rescue, Disaster Relief, Humanitarian Services, Air Force Support, and Counterdrug activities.

* Search and Rescue (SAR): Perhaps best known for its search-and-rescue efforts, the CAP now flies greater than 85 percent of all federal inland SAR missions directed by the Air Force Rescue Coordination Center (AFRCC) located at Langley AFB, Virginia. Outside of the 48 conterminous states, CAP supports the Joint Rescue Coordination Centers in Alaska, Hawaii, and Puerto Rico. How effective are these CAP SAR missions? CAP members save over 100 people each year.

• Disaster Relief: Often overlooked but equally important is the role CAP plays in disaster relief operations. CAP provides air and ground transportation with their extensive communications network. They fly disaster relief officials to remote and inaccessible locations, and support local, state, and national disaster relief organizations with manpower and leadership.

The CAP has formal agreements with many city, state, and federal government and humanitarian relief agencies such as the American Red Cross, Federal Emergency Management Agency, Federal Aviation Administration, National Transportation Safety Board, and the United States Coast Guard.

• Humanitarian Services: Very closely related to disaster relief is CAP's support of humanitarian missions. Normally in support of the Red Cross, CAP air crews transport time-sensitive medical materials including human tissue and blood in situations where no other means of transportation are available.

• Air Force Support: Because of its relationship, it should be of no surprise that CAP performs numerous missions in direct support of the Air Force. Specifically, CAP conducts damage assessment, radiological monitoring, light transport, communications support, and low-altitude route surveys. Joint USAF and CAP SAR exercises help sharpen the skills of all participants and offer realistic training for a deadly serious mission.

• Counterdrugs: In 1986, the CAP joined the "war on drugs" when an agreement was signed with the U.S. Air Force and U.S. Customs Service offering CAP resources to be used to stop the flow of illegal drugs into and within the United States. Today, CAP has similar agreements with the Drug Enforcement Administration and the U.S. Forest Service. The Civil Air Patrol has made major contributions to the counterdrug fight by providing aerial reconnaissance, airborne communication support, and airlift of law enforcement personnel. In 1997, Civil Air Patrol units flew close to 40,000 hours in support of counterdrug efforts.

Now that you see what the Civil Air Patrol is and what we do in the CAP, here's the frequencies to listen to us. I have mentioned the frequencies of 121.5 and 243.0 MHz used for emergency locator transmitters (ELTs). Obviously they cannot be used for practice, but seven nearby frequencies are authorized for use by the FAA and FCC for ELT training,

provided harmonic radiation is suppressed and no harmful interference to voice transmissions occurs. They are **121.6, 121.65, 121.7, 121.75, 121.775, 121.8, 121.85,** and **121.9 MHz.**

VHF voice is normally carried on and near 2-meter ham and aviation frequencies: **122.9, 123.1 MHz** (AM). Voice operation on **143.75, 143.9, 148.15, 148.125, 148.1375,** and **149.5375 MHz** (FM) with **143.9 MHz** being a repeater input with **148.15 MHz** being both a repeater output and simplex. Also 143.75 MHz is a repeater input with 148.125 MHz being both a repeater output and simplex. Ground tactical simplex is **148.1375 MHz**, and air to ground and air to air simplex is found on **149.5375 MHz**. Packet frequencies are **149.895** and **149.925 MHz.**

HF frequencies utilized are **2371, 2374, 4466, 4469, 4506, 4509, 4582, 4585, 4601, 4604, 4627, 4630, 7635, 7920, 14902, 18205, 20873,** and **26617 kHz.** Both voice (USB) and packet can be found here, but not all frequencies are available U.S. wide. Packet and AM voice are heard on **26620 kHz** with packet only on **7341 kHz**.

Call Signs

A short time ago, tactical call signs were the rule throughout CAP. It was not uncommon to hear call signs like Mockingbird, Redbird, and Magnolia. Each wing had its own distinct call sign. Call signs are still utilized but are more in line with duties. During SAR missions and special events, temporary functional call signs may be used without a location prefix, i.e. Air Ops, Command 1, Flight 2, etc. Those who operate HF must use a geographical name, such as MacDill CAP Mission Base. All CAP-owned aircraft use the call sign "CAPFlight" followed by the number. (The three-letter identifier used by air traffic control is CPF). Each state, or wing, region has specific call sign numbers. For example, CAP flights out of Mississippi will start with 22, Nebraska with 26. The chart gives each of the numbers.

In case of an actual search-and-rescue mission, one word is added to the call sign: Rescue. For example Air Force Rescue 6899 or CAPFlight Rescue 1234. If you hear the word Rescue in the call sign, be assured the mission is real with lives on the line.

One other call sign is used. When a CAP member completes his communications course and owns a radio that has been certified to operate on CAP frequencies, he is given a specific call sign for the wing he is in. In my case, it is FloridaCap388.

Hope you hear us. I'm always looking for reports from you. And should you decide to join the CAP (you don't have to fly) please tell them that I recruited you so I can get my recruiter ribbon.

Next month we'll have Canadian frequencies. See you then! ■

Wing	CAPFlight #
Alabama	1
Alaska	50, 61
Arizona	2
Arkansas	3
California	4, 60
Colorado	5
Connecticut	6
Delaware	7
Florida	8
Georgia	9
Hawaii*	51
Idaho	10
Illinois	11
Indiana	12
Iowa	13
Kansas	14
Kentucky	15
Louisiana	16
Maine	17
Maryland	18
Massachusetts	19
Michigan	20
Minnesota	21
Mississippi	22
Missouri	23
Montana	24
National Capital	25
Nebraska	26
Nevada	27
New Hampshire	28
New Jersey	29
New Mexico	30
New York	31
North Carolina	32
North Dakota	33
Ohio	34
Oklahoma	35
Oregon	36
Pennsylvania	37
Puerto Rico	52
Rhode Island	38
South Carolina	39
South Dakota	40
Tennessee	41
Texas	42
Utah	43
Vermont	44
Virginia	45
Washington	46
West Virginia	47
Wisconsin	48
Wyoming	49

Region	CAPFlight #
Northeast	91
Middle East	92
Great Lakes	93
Southeast	94
North Central	95
Southwest	96
Rocky Mountain	97
Pacific	98

Other	CAPFlight #
National Commander's SQ	99
Congressional Squadron	99

* Hawaii Wing is assigned a different block of call signs per FAA request.

CB SCENE

27 MHz Communications Activities

2001: A Radio Odyssey

Happy New Year! Welcome to 2001 — a year that's very name conjures images of high-tech adventure and surprises. Anxious to promote that vision, 2001 has already delivered its first surprise, and it is a doozy. It is a surprise that hints at a promise of being the beginning of a very high-tech adventure for the members of a growing CB community.

What is the surprise? The surprise is that we have a new radio service called MURS and with it a lot of new operators who can now call themselves CBers. Officially launched on November 12, 2000, MURS — the Multi-Use Radio Service — reassigns five frequencies from the Private Land Mobile Radio Service (Part 90 of FCC rules) to the Citizen Band Radio Service (Part 95 of FCC rules) and eliminates the licensing requirement for these frequencies. It gives unlicensed access to five channels in the VHF radio band at **151.820 MHz, 151.880 MHz, 151.940 MHz, 154.570 MHz, and 154.600 MHz** with up to 2 watts of ERP (effective radiated power). The promise of high-tech adventure begins with the fact that, not only are we allowed to talk on these frequencies, but to transmit data and images as well. Yes, that is right, we can now do, among other things, CB TV.

A Frightening Thought

It's especially frightening when you consider how many CB operators make their mark on the radio world by sticking their mic down their shorts. Frightening, but not surprising, though, when you consider how many internetizens already shove cameras there. So let us keep in mind, as we enter this brave new world, that voyeurs and exhibitionists exist in all walks of life and consider the possibilities that lie beyond. Think 2-meter amateur band. Can you say "Rival?"

How Did We Get Here From There?

Now before you go thinking that we have some mysterious benefactor at the FCC who went out of their way to do us a favor, forget it. Let me tell you how it really happened. It was an accident —well at least it was unintentional. That is to say that the UHF CB service just happened to be a convenient place to stick a problem that the Commission did not know how to solve. That problem was a growing number of illegal operators on what, in the past, had been referred to as the Color Dot Frequencies. In short, they had a growing number of illegal operators, realized they could not control them and so they "LEGALIZED" their activity. Wow, what a novel idea!

I talked to Guy Benson, the FCC's legal mind behind the reforms. When I asked him why they assigned these new frequencies to the CB service he said, "Our intention was not to change the rules, it was to put these frequencies . . . (pause) . . . You see these are the 'Color Dot' frequencies and basically what you had happening was companies like RadioShack selling these radios with a little thing inside saying that you have to register these with the FCC. Of course most people just don't do that so we said basically we are just going to take these out of Part 90, where you have to have a license, and put them in CB where, ahhh, there are, ahhh, no licensing requirements. So, then as long as the radios meet the requirements, anyone can go in and buy one, just like a CB. You can go out and get one of those and just start using it. We did not mean to increase or decrease their use when we moved them into part 95. The whole reason we are doing this is that people were just going in and buying them and never bothering to register."

"The surprise is that we have a new radio service called MURS and with it a lot of new operators who can now call themselves CBers."

I asked him if, in other words, their intention was simply to put these radio scofflaws down with the rest of us renegades on the CB Band, he just chuckled knowingly. Nice to see at least some folks at the Commission occasionally see the light.

I also spoke to Ghassan Khalek, the FCC technical expert on the project. He did not think that the use of repeaters, Internet gateways, or packet was out of the question. He was not sure that they were allowed, but could not think of anything that would automatically preclude their use. Admittedly, these questions had never been considered, so he honestly did not know but promised to look into it. If allowed, the use of repeaters and the like could very well mean that we have at our disposal a very Amateur-like service. It could be unlike the Amateur 2-meter band only because of power restrictions and limited channel space, of which there could be at least four more available in the future.

MURS Surprised Many

It appears that MURS has come as such a surprise to so many people that, so far, nobody really knows what to make of it. The FCC still doesn't fully understand what it has done. The rules have not been fully formed and so solid guidelines do not yet exist. The few radio manufactures I have been able to talk to (Cobra, RadioShack, and Motorola) seem honestly confused. None will admit to having any new products in the works to service the band, but admit the potential is there. Even the amateurs seem to have been blindsided on this one. They apparently did not see it coming and so were not able to comment on it or derail it the way they did our recent effort to get the 155-mile limit on 27 MHz CB communications repealed. So, for the moment, they seem to have resigned themselves to live with it and hope that it will not "rival" their service and draw potential members, but serve as a "sample" to entice more operators to become amateurs. Gee, more original thinking.

BY ED BARNAT <Ed@barnat.com>

For the time being, the best we can do is thank the FCC, enthusiastically welcome to Color Dot "outlaws" to our Citizens Band, enjoy the limited equipment that is available, and then wait for the government and industry to catch up with the changes. I hope we don't have to wait too long. Let the odyssey begin.

Recent FCC CB Enforcement Actions

If you are a licensed Amateur, you had better be careful wreaking havoc on and around the CB bands. Why? When you apply for or are granted an Amateur license, you automatically grant the FCC permission to information about the operation of your radio station.

Ruffin E. Smith, KE4SVC of Danielsville, GA and Milton O. Rothery, Jr., KU4JH both received warning letters in October for operating amateur radio equipment on Citizens Band frequencies and on 27.366 MHz, which is between Citizens Band channels. Both have been requested to respond stating the full circumstances of any operation conducted on Citizens Band frequencies, and the equipment used, since January 1, 2000.

Brett C. Rogers, KF6ZDS, of Long Beach, CA also received a warning letter in October stating that the Commission had information that he had been operating radio equipment on Citizens Band frequencies, and frequencies between Citizens Band channels. Further, he had been deliberately interfering with the communications of other operators, transmitting sound effects, utilizing non-type accepted equipment and illegal amplifiers on CB channels and between those channels. And the District Director of the Los Angeles Office of the FCC had warned him about these activities in December 1999. He also has been requested to respond stating the full circumstances of any operation he has conducted in Citizens Band frequencies and equipment used since January 1, 2000.

Readers Write

Stanley Bock of Mesa, Arizona, writes to ask if there might be a way to find out what his forgotten 1980s vintage SSB call sign was. Well, Stanley, from what you tell me it sounds like you might have been a member of the SSB Network. If so you might want to check with the SSB Network, P.O. Box 908, Smithtown, NY 11787 or CRB Research at Box 56, Commack, NY 11725. Stanley would

also like to see more about SSB in this column. Me too. Tell me more!

Glenn Daniels, of Marlboro, New York, is a true Citizen of Radio. Known as KB2GQZ, Killercat, and Unit 521 Glenn is an Amateur (for over 10 years) and still a diehard CBer who enjoys collecting and restoring vintage CB radios. Located in the Hudson Valley Region, dead smack in the middle of apple country about 75 miles northwest of NYC he writes to say that, "I have noticed here in New York that there seems to be a huge comeback for CB radio. I have seen more and more cars here with CB antennas on them. It is good to see that there are so many people still interested in the hobby. We all know that CB has its fair share of knuckleheads on the other end, however it is a fun hobby for all to enjoy. We have a great bunch of locals who get together to talk in the evening hours on AM channel 20. I always park the base on the local channel at night to talk to the other fine people that CB has to offer. I encourage all to try this hobby on for size as it has proven to be a lot of enjoyment. See you all at the CB mixers!"

Thanks for the encouraging words Glenn. If I ever find myself in the Marlboro area, I will be sure to check in on channel 20. I hope other readers of this column will do the same. And speaking of the mixers, our January and February mixers are just around the corner. If you are looking for a little chatter on the CB be sure to make plans to attend 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 January 27 and February 24 from 9 p.m. until 10 p.m. local time. SSB operators work channel 36 LSB. AM operators work channel 23.

Well, that's it for now. Thanks for writing me here at the magazine or via the Internet where my address ed@barnat.com. And as always, if you can (especially on January 27 and February 24), catch me on the radio! 73 ■

Tuning In *(from page 4)*

more expensive, radio system. They really don't need to but *must* if they want to communicate. One wonders if that was part of Uncle's intent, bossed around by RadioShack and Motorola bigs intent on selling radios.

The FCC has been *thinking* for years about these Color Dot frequencies. They also *thought* for years about CB radio. Users simply go into the store, plunk down the cash or order them by mail and fill out the required licensing form and send it to the FCC, right? Believe that and you'll also believe 11-meters will be given back to amateur radio next month. Hardly. Same thing was true during the CB craze, and we all know how out of control that became. Now, I'm not saying there'll be chaos everywhere (remember how the PRSG went bananas when FRS was approved, and the perceived wide-scale interference never happened?) I do believe there's a lot to be ironed out. Things that should have been fixed *before* the FCC gave MURS the final rubber stamp. Stay tuned — MURS promises to be one hot potato.

I wonder if someone at the FCC envisioned this as a higher powered FRS, new CB or just an admission of their inability to control another out-of-control situation like CB? Perhaps all of the above MURS was slipped through with no official news release (after all, who would *you* tell?), mention on their Website, or anywhere else for that matter. Whatever the reason, it's a done deal, and once the general public gets hooked on MURS, just like CB, the demand for more channels will likely increase. There's already talk about snagging some business band UHF frequencies.

And what about the impact on ham radio? Perhaps we'll lose a few folks from the "2-meter only" crowd, but here comes another golden opportunity for the amateur radio community; put on that big ham smile and welcome these new folks to the radio hobby. Talk with them — yes, on the air on your own MURS radio! You can use this as another chance to bash unlicensed radio users or show them what can be done on ham frequencies. It costs nothing, just your time and maturity.

For the record,I think it's the water.

Happy Holidays!

The entire *Pop'Comm* staff thanks you for being part of our family as we move into the new Millennium, and wishes you all the best in the coming year! Please remember that your ideas and suggestions for improving your magazine are always welcome. Happy Holidays! ■

How I Got Started

Congratulations to Eric R. Lindquist of Connecticut!

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 January Winner

Pop'Comm reader, Eric Lindquist of Higganum, Connecticut, says, "My earliest encounters with the world of communications was the business radio in my father's car when I was ten or 11. I was always curious how these radios worked and never forgot this. At 13 or 14 years old, I came across the 1978 edition of the *Radio Amateur's Handbook* published by the ARRL. This caused me to remember my father's radio, so I investigated further and began tinkering with yard sale radios. I recently got a Uniden BC235XLT scanner and listen to the many interesting conversations on the ham bands. I hope to get into shortwave soon, but being 16, I can't afford a good radio. I also hope to get my amateur license so I can be the one being monitored. Thank you very much. You have a wonderful and informative magazine that I'm sure has helped out many radio listeners." ■

January's "How I Got Started" winner, Eric Lindquist of Connecticut. Eric asked us to include his address so he might hear from radio enthusiasts. He's at 8 Skunk Misery Road, Higganum, CT 06441.

SCAN TECH

Trunking, Tips, Techniques, And Mods

Tips Before You Buy That Handheld

Some time back, we addressed the issue of buying a new radio with a particular focus on base radios. I promised then that we'd get around to doing handhelds, and this month, I'm going to keep that promise. I didn't say when, just that I would. And yes, it's slow, but I'm still one step ahead of Harold! (*But Ken's batteries aren't fully charged! — Ed*)

One of the most frequent topics of discussion amongst scanner enthusiasts is "which radio should I buy?" This question comes up very frequently on our weekly conference on AOL, and at other times too. Sometimes it almost comes down to "tell me which radio to buy." I can certainly understand the anxiety of committing to a particular radio, especially for first time buyers, and even for those wanting to upgrade. There are so many options these days, and it seems to be getting worse. My answer to this favorite question is always — more questions.

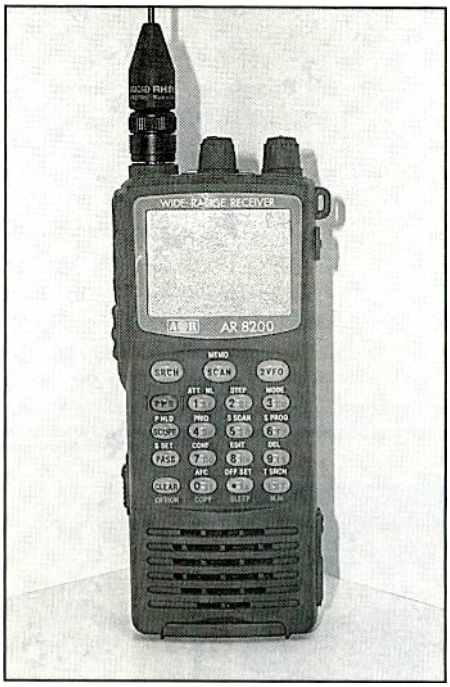
First Radio?

If this is your first scanner and you are just beginning, there are a number of special considerations. The first couple of questions are pretty critical, and after that it really comes down to how serious you are.

First-time scanner listeners are often advised to buy handheld radios because they're portable and you can listen anywhere. This is probably good advice for most people, but not for everyone. If you know that you're going to put the radio in one spot and not move it again, or if you want the convenience of larger keys that many (but not all) base stations offer, don't let me persuade you otherwise. If you're not sure how you'll be listening, I'd probably recommend a handheld — you can always buy a base or upgrade your radio later.

First Question: Trunking?

The absolute first thing we have to get out of the way is if you need trunking capabilities, and if so what kind? Trunking refers to a particular type of radio system that is very popular around the country with two-way radio users because it offers a lot of convenience without much fuss for users. Until recently, there was no really good way to follow a trunking system with a scanner, but all that's changed.



If you're looking for top-of-the-line, many feel that the AR-8200 from AOR can't be beat. Unfortunately the radio does not feature trunking, but does offer almost every other imaginable feature.

It hasn't been all that long that we can ask about trunking, but it sure can eliminate some of your choices in a hurry. If you live in an area that uses a trunked system (Motorola type I, II, or IIi), the trunk-trackers should be at the top of your list. These radios make excellent regular scanners too, as their ability to reject interference and unwanted signals is rather high. But if you have a trunking system to listen to, there's no substitute. Right now, your only choices are the BC-235XLT handheld, or the BC-895XLT base unit. Both come highly recommended if you're in a trunked environment, and well recommended if you're not.

The best way to find out if trunking is used in your area is to ask a friend who's into scanning. Anyone who's been scanning in a particular area for any length of time will know whether or not the system they're listening to is trunked.

If you don't have a friend that can tell you, then you may have to do a little more legwork. The next thing I'd try is to visit a local scanner store. Often they have a list of frequencies that are available to scanner buyers. Sometimes, you'll get lucky and find a knowledgeable salesman that can really fill you in. Count your blessings if you do, but don't despair if you don't get that lucky.

Look over a list of frequencies in the 800-MHz range in particular. If you find that the agency you're interested in has a bunch (usually in groups of five to 30), there's a good chance that their system is trunked, and you'll need a trunking-capable scanner. These days, that's a pretty reliable indicator, but there are a couple of issues you should also be aware of.

First, the FCC has approved trunking systems in other frequency ranges. Some are beginning to show up in the 400- and 900-MHz ranges, but they are not very common for public safety operation. This will change over time.

Second, even with a trunking scanner, there are a few trunking systems that cannot be scanned. Most of them involve digital techniques or scrambling of speech deliberately for security purposes, but in any event those types of systems will not be scanable with currently available receivers. Time may change this too, as it wasn't too long ago that trunking scanners didn't exist.

Second Question: Frequency Coverage?

The second most important question to ask before buying a new radio is what frequencies it covers. In the United States, all receivers will have the cellular frequencies in the 800-MHz range blocked,

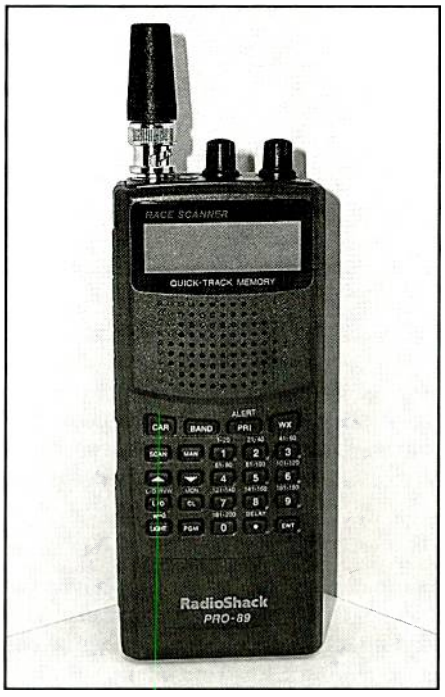
BY KEN REISS <armadillo1@aol.com>

so that's not an option. Don't panic when you see restricted coverage in the 800-MHz region because it's just cellular telephones that are restricted out of the receiver. The public safety portion of the 800-MHz band is intact if the radio lists 800-MHz ranges as part of its coverage. It used to be that most scanners would cover the frequency ranges that most of us were interested in. However, in recent years that's changed a bit. One of the biggest areas to have trouble is the military air region from 220 to 400 MHz or so. There are simply not a lot of scanners on the market right now that cover this area. If you're interested in this frequency range, you can eliminate a lot of choices from your shopping list quickly.

If you need trunking, your choice will be narrowed to only a handful of radios, but your options are changing quickly. This is the Uniden BC245XLT, and excellent choice for both Motorola type I and II as well as EDACS trunking systems.

Now the good news is that in many places in the country, VHF/UHF is about all that's in use and you can live without the 800 bands. You can certainly save a lot of money on the radio that way, and that might be an option for a second radio or other application where you don't have a lot of 800 MHz activity anyway.

More important are the high and low bands, as well as other gaps that are common in scanner models. Many of the more economical receivers, in order to cut costs, will leave out the VHF-Lo band (30 to 50 MHz) used by many state police agencies and fire departments. Or they will have the Lo band, but not include 800 MHz coverage at all. Both are perfectly acceptable if you don't need those ranges.



This new scanner from RadioShack, the PRO-89 is called the Racing Scanner because of its features designed specifically for listening at auto racing events. However, it may make a versatile all-around scanner too. We'll have an in-depth review coming soon.

Common bands for "middle of the line" type scanners include the VHF-Lo band, VHF-High band (roughly 144–174 MHz), UHF (roughly 430–512 MHz) and "800." I say "roughly" because some manufacturers start and stop at slightly different places, or some of them consider each little portion of that frequency range a "band" so that they can claim a 12 or 14 band scanner.

A very good example of this is the ham or amateur radio band between 144 and 148 MHz. Then there's some military and government frequencies between 148 and 152 MHz before the "real" VHF-High band starts and runs from 152 to 162. 162 to 174 is another group that's broken up with many users, but primarily federal government users. There are four bands if you choose to count that way!

The civil aviation band of frequencies is another one that's fairly common on most "mid line" scanners and up. This is AM modulation (as opposed to FM used for most public safety operations) and runs from 108 to 137 MHz. Of course, if you have an interest in airplanes, this is an essential band. Check to make sure the scanners you're considering do include it!

And while you're at it, make sure that you can select between AM and FM modes in this range if you want to hear the federal agencies in the upper portion of this range. Many scanners will switch for you but allow you to override that automatic selection. That's probably the best for maximum versatility.

Price Level?

Probably the next most important question after the type of radio is the price level that you're looking at. It's easy to spend literally thousands of dollars on high-end receivers, but if that's not what you had in mind, there's not much sense in throwing those receivers into your selection mix. It's simply not fair to compare receivers in the thousand-dollar class with high-end scanners in the four or five hundred range. It's a different class of radio, and the features are completely different. And if it doesn't make sense to you as to why someone would spend that much on a receiver like that, don't. We'll talk more about why crazy people buy those things in another article.

Number Of Channels?

The next function most people are after is large numbers of channels. Somewhere around 1000 seems to be about the right number for folks to ask for, but 500 or so is also a very comfortable level. In reality, even folks with thousand channel radios don't fill them all up. In fact, I'd guess there are a lot of 400-channel units that aren't full either. Don't get too wrapped up in the number of channels, as long as it's a big enough increase over what you have to make a difference.

Number Of Banks?

This is probably a much more important consideration. The whole idea of banks is to be able to organize and switch in and out of channels that are of interest at the time. By having large numbers of small banks, you can divide things up pretty well so that you only have to scan what's of interest at the time. The best radios in this regard have at least 10, but 20 banks is nicer. Only a few of the high-end Uniden radios have this many banks

If you're looking for small, these two can't be beat! Either one makes a great addition to your scanner arsenal. The Alinco DJ-X2 (left) is reviewed in this month's "Product Spotlight," and the ICOM R-2 (right) is also a popular pocket scanner. As long as you're aware of the limitation of the small size (including no keyboard for direct entry of frequencies), you won't go wrong with either one of these!

that I'm aware of. Computer control can eliminate both the banks and number of channels barrier, so that's also something to think about.

Computer Control?

Over the past few years, computer control has really become a viable option for scanner enthusiasts. Both software and hardware interfaces have improved considerably and can now make the marriage of the computer and scanner seem almost a necessity. If you have any leaning toward computer control, think carefully about this as a major factor in your decision. It's easy to spend lots of money on both the receiver and the computer control portion of the system, so watch your budget carefully. You can have lots of fun with some of the medium range communications receivers by spending a few extra dollars on better software.

It is virtually impossible to gain full functionality from many receivers that simply don't have a computer interface built-in, or an add-on system available for them. Make sure, if you're interested in computer control, that the receiver you buy has that as an option. You can always add it later if they make one, but inventing one from scratch is a bit inconvenient, to say the least. The bottom line is a system you're happy with, and a budget you can live within.

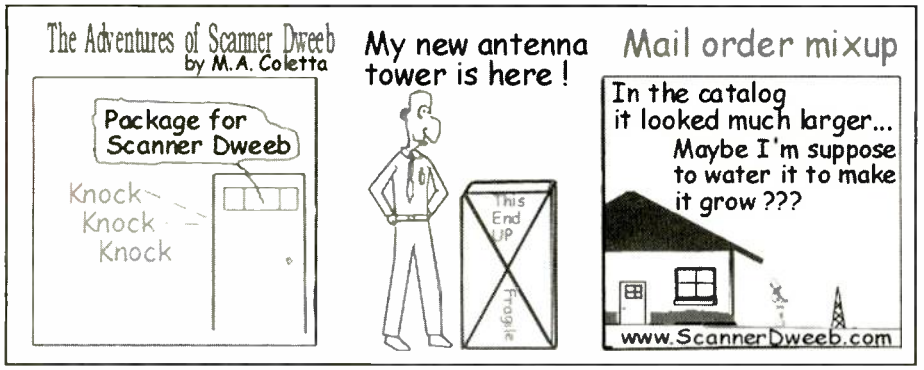
Many of the high-end receivers, including those from AOR and ICOM, have computer interfaces built right in. Several software packages have been developed to support these radios and can really overcome some of the built-in limitations of the radio. A perfect example of this is the high-end ICOM receivers which tend to have either no banking capability, or a very inflexible bank structure (the top-of-the-line 8500 and 9000 are the exceptions to this pattern). By using a computer control system, you can completely overcome this and have as many banks and channels as your hard disk will hold. In addition, the computer allows you to store information and groups of frequencies that are not in use until they are needed. Rather than re-program the entire receiver when something happens, you can simply reload the file and scan away.

If your budget doesn't allow for a high-end receiver such as this, you may still be in business. There are certain models of radio that are still in production (PRO-2042 for instance) that can have computer interfaces added later. This will allow you to ease in slowly if you think computer control is something you may be interested in later. Also, the recently introduced BC-895XLT has an interface, but very little information is available as of this writing regarding the functions that this interface will provide, or the software that may be available soon.

Currently, the number of handhelds that support computer control is very limited. The PRO-64 from RadioShack has a download capability (i.e. you can use the computer to re-program the radio's memories, but the radio does not talk back to the computer). The AOR-8000 has a full computer interface, as does the recently introduced ICOM R-10. If you think about it, download is really what you would want in a handheld most of the time, as you're not going to be carrying a computer around with the radio.

Alpha Tags?

If you don't want computer control, the next best thing to have is the ability to assign each channel an alphanumeric label. Only a handful of high-end radios currently have this feature, but it is very valuable in larger capacity radios. The BC-9000XLT is the main base station receiver that has this feature (leaving out the high-end ICOMs once again). The AOR AR-8000 handheld seems to have a lock on the handheld market, but there may be additional radios on the horizon with this feature. The AR-8000 is currently the only handheld that will allow you to have your



cake and eat it too. It's a handheld, with computer control and alpha tags.

CTCSS?

Continuous Tone Code Squelch System, also known by the Motorola trade name Private Line™ is becoming available on more and more units. If you are in a metropolitan area, this is a worthwhile option. It's discussed at some length in the Dec. '97 "ScanTech" column.

S-Meter?

A signal strength meter is something that most shortwave listeners find absolutely necessary. It allows you to see at a glance the incoming signal strength and to make comparisons between antennas, time of day, frequencies that are on at the same time, etc. For some reason, this feature has been lost from all but the high-end communications receivers and scanners for years. The first consumer grade radio to offer this feature in quite literally years is the BC-895XLT (also a TrunkTracker) base radio, the Regency HS-200 and AOR AR-8000 handhelds. It's really a convenient feature in a handheld so you can check your antenna stations and more.

Other Considerations

There are lots of other features available from model to model. Some folks would not own a scanner without search lockouts, while others never search. Auto search and store is a handy feature too, if you do any searching.

Selectable attenuation, delay function, priority operations, service search, weather scanning or alert functions, selectable modes, and tuning dials are also features that have various amounts of importance depending on who you talk to. Look around, collect some catalogs and dive in. Once you've narrowed the field a bit, start asking around and see if you can find folks who have used the receivers you're interested in. Check the Internet and back issues of *Pop' Comm.* Join us on the AOL Radio Listener's Conference and ask the "panel of experts" that frequent the conference. But ultimately, only you will have to live with your final decision. Good luck!

Frequency Of The Month

Our frequency this month is **462.250**. Plug it in and see what you hear. And see if you can identify what you hear! Let me know what you found and we'll enter you in the drawing for a one-year subscription or extension. Make sure you put the frequency on the envelope or E-mail subject so it can be correctly entered. You can send your entry or any other questions via E-mail to armadillo1@aol.com, or the old fashion way to Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126. Until next month, Good Listening! ■

Pop'Comm January 2001 Survey

Circle Reader Service #

42. I plan on purchasing a communications receiver from a Pop'Comm advertiser within the next six months.

Yes	42
No	43

43. The new MURS, Multi-Use Radio Service interests me because: (Mark all that are appropriate)

It's license-free	44
It's higher power than FRS	45
I already own a Color Dot transceiver for my business	46
It doesn't interest me	47

44. I'd like more articles in Pop'Comm about the following:

Basic construction projects - antennas, tuners, receivers, preamps, etc.	48
Satellite monitoring, including image reception.	49
Oldtime radio historical	50
Entry-level ham radio, including propagation and equipment.	51
Freebanding	52
FRS	53
CB	54
Scanning, specifically military and federal	55
Antique radio information including restoration	56
Shortwave utility monitoring	57
DXing on shortwave bands	58
DXing on VHF bands	59
Broadcast Band DXing	60
Searching the VHF/UHF spectrum with more published frequencies	61
Reader-submitted monitoring and DXing experiences, photos	62
Disaster preparedness	63
Receiver or transceiver reviews (Spotlights)	64
Other product reviews	65

45. I typically use my scanner this amount of time in a week:

40+ hours	66
30-40 hours	67
25-30 hours	68
20-25 hours	69
15-20 hours	70
10-15 hours	71
5-10 hours	72
2-5 hours	73
Under two hours	74

PRODUCT SPOTLIGHT

Pop'Comm Reviews Products Of Interest

The Alinco DJ-X2

Is this the world's smallest scanner. We think the Alinco DJ-X2 just might be — it's tiny!

The first item that struck me about the DJ-X2 was its unusual battery arrangement. There are actually two battery systems included in the package. The first is an internal lithium-ion battery, which does a surprising job of powering the receiver. The battery charger is an unusual "pack" which snaps on the back of the unit. The charger also includes a spot for three AA batteries, which will power the radio for quite some time. Even with the charger/AA batteries attached, the DJ-X2 is by no means a large receiver.

The receiver offers impressive frequency coverage from the bottom of the AM broadcast band at 530 kHz to 999.995 MHz with only the required gap for cellular systems. To accommodate such a wide range of frequencies, and to offer maximum versatility, the DJ-X2 features an unusual combination of antennas.

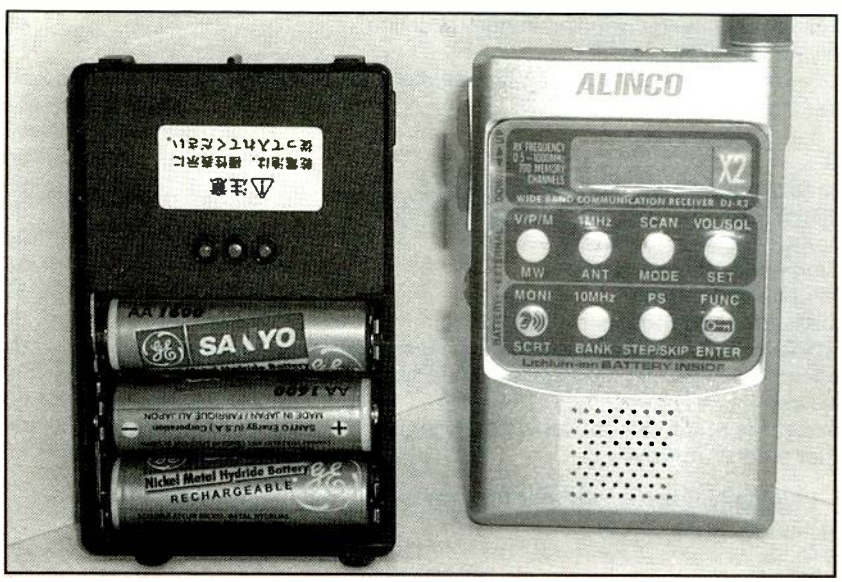
The main antenna attaches through an SMA jack like most small portables these days. Many antennas are now made for the ham market that fit this connector directly and might be of interest to you if you are primarily using the receiver in one frequency range (say the VHF-High or UHF ranges for public safety). You probably would want different antennas if you were using the HF reception or for AM broadcast reception. There is in fact, a ferrite bar antenna inside the receiver for just such purposes. This antenna can be switched on and off through menu controls.

" . . . for such a small unit, it's relatively interference-free."

The most unusual antenna arrangement is to use the earphone cable as an antenna. There is a switch to turn this on and off through the menu commands, but it is a surprisingly effective tool, and helps to minimize the size of the radio when you don't want anyone to know you're carrying a radio.

The DJ-X2 is a triple conversion receiver and for such a small unit, it's relatively interference-free. It will overload in *very* strong signal areas. It was a bit disappointing to notice that no facility for tone squelch was included.

While there's no keypad for direct entry, the buttons on the DJ-X2 are remarkably easy to master. The tiny speaker at the bottom is very impressive for its size.



This charging unit serves double duty. You must attach the radio to the front of the charger to recharge its internal batteries, but you can also use the charger as a AA battery supply. I got about 5-6 hours of typical scanning on the internal battery, and about 20-25 on the AA batteries. Very impressive!

Lots Of Memories

The DJ-X2 features a somewhat unusual arrangement of 10 banks of 70 channels for a total of 700 memory channels usable for conventional scanning memories. In addition, there are 20 pairs of frequency ranges used for searching, and 100 search pass memory channels.

The 10 banks can be scanned individually, or by using a procedure called bank linking, up to five of the 10 banks can be scanned at once. A memory skip feature allows undesired memory channels to be left out of the memory scan cycle.

There is also a VFO mode, used for entering frequencies to be stored, or for monitoring frequencies you may not want to put into memory. This feature is extremely handy for parking on one channel in a hurry if you come upon an event that you may not have programmed into

BY KEN REISS <Armadillo1@aol.com>

memory, or for testing a channel for activity before committing it to memory.

Finally, there is a preset mode. In this mode, AM broadcast, FM broadcast, and TV audio channels have been preprogrammed into the receiver. By operating just a few buttons, these media channels can be recalled fairly quickly. This actually proved a bit more useful than I first thought. The receiver's audio, particularly through earphones, is fairly impressive.

The DJ-X2 has two modes of operation, easy and expert. Unfortunately, I think almost everyone is going to have to get to the expert mode almost immediately as it includes the most useful features, including memory access! Some of the other settings that are available in this mode are not as important, and probably should be in some form of expert or controlled access mode to prevent accidental resetting by an inexperienced user. However, memory operation is pretty basic to most scanner/receiver operation, and I'm not sure why this mode was included there. It is a very easy switch to make, although it requires a brief trip through the manual to find out why the memories are not accessible if your receiver ships in the easy mode.

"For its size, it is quite an impressive performer."

Other features included in the expert mode are the antenna selection, modulation mode, tuning step, memory skip, and many operational settings. Once the expert mode is selected, all of these parameters become available, and with just a few minutes with the manual, it is fairly obvious how the settings and menus work. Anyone familiar with the operation of the receiver will find it easy to access the controls necessary, while those unfamiliar with its operation would probably have some difficulty changing by accident those settings, which might cause problems. Having said that, it is important to remember that it is difficult to make anything foolproof, since fools are so ingenious.

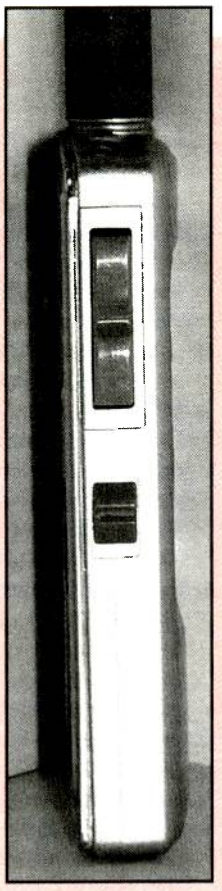
"In actual operation, the DJ-X2 proved to be quite surprising. It is probably one of the most sensitive receivers I have tested in some time."

Field Test

In actual operation, the DJ-X2 proved to be quite surprising. It is probably one of the most sensitive receivers I have tested in some time. With the supplied antenna (which is usually the first problem with many receivers) the DJ-X2 surprised me in receiving from some distance VHF-High public safety channels while mobile. On many handhelds, the reception falls off quickly as you go from district to district without the help of an outside antenna. Quite impressive.

Sensitivity is only half the battle, however. A sensitive receiver is much more prone to interference and overload problems. In this respect, particularly considering that the DJ-X2 does not include tone (CTCSS or DCS) squelch, I was again impressed. For its size, it is quite an impressive performer.

As a final note, I did not get a chance to test the receiver in the military air band, although it includes this range in its coverage. I simply did not have the opportunity. I did, however, use it briefly on the civilian air band and the performance was satisfactory. I'd assume that it would do OK on the military air range as well, which is an important note, since so few receivers available today cover this range.



No matter which way you look at it, this is a small receiver. But don't let its size fool you!

Once snapped on the back, the unit is still small. As a handheld or carrying it around, I found that I almost preferred the charger to be in place as it helps keep the radio from tipping over. However, in the pocket, the small thin radio by itself is barely noticeable and quite effective.

The Bottom Line

So how does the DJ-X2 stack up? Quite well, actually. Its impressive sensitivity and strong signal handling make for a great combination in any receiver. The real challenge comes in getting it programmed and operating. While it certainly would be possible to program the receiver's 700 memory channels, I wouldn't want to do it by hand, and I certainly wouldn't want to re-program it once I had it done! There is supposed to be software made available at a later time, but we were not able to test this. That might make the Alinco D5-X2 acceptable as a primary receiver.

More likely, however, you'll want this as a second receiver; one to carry when you don't want to be bothered much with a receiver in your pocket, but want something along. Or perhaps, you don't want to be seen with a receiver. Keep in mind that it does not do trunking, so if your primary listening interest is in a trunked system, this won't work. However, for a conventional scanner, it's definitely worth a look!

For more information on Alinco's new DJ-X2 receiver, contact Alinco USA at 438 Amapola Avenue Suite 130, Torrance, CA 90501 or phone 310-618-8616. Visit Alinco on the web at www.alinco.com. Tell them you read about the new Alinco DJ-X2 in *Popular Communications*! ■

OUR readers SPEAK OUT...

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>.

Indiana Wants Me

Dear Editor:

Just finished reading your September editorial on Indiana's vague and archaic scanner law. It reminds me of the vague and archaic scanner law that *used to* be on the books in New Jersey. Back when I was ARRL Section Manager for Northern New Jersey, and folks started getting arrested for "possessing radios capable of operating on police frequencies," I helped organize an effort to get the law changed, and not just to exempt hams. With help from many people, but especially Frank Terranella, N2IGO, we were able to get the New Jersey Legislature to pass and the Governor to sign a new law which did away with penalties for possessing a radio and focused instead on making it illegal to *use* a radio in the commission of a crime or to evade the police. The state Attorney General liked the new law because it made the improper use of a scanner illegal no matter where it was (like in the crack-house), as opposed to the old law, which applied only to possession in a vehicle.

I would recommend that all radio enthusiasts in Indiana — hams, scanner enthusiasts, CBers, SWLs — work together to bring the law into the 21st century. New Jersey's new law should be an excellent model.

Rich Moseson, W2VU
Editor, *CQ*

Freebanding And Skip Shooting

Dear Editor:

Your editorial in the August 2000 issue of *Popular Communications* was dead on about skip shooting and freebanding. Freebanding is just as illegal as pirate radio broadcasting and everyone that does it knows that. It is not a question of "if," but "when" they will be visited by the FCC.

Skip shooting on the other hand, with legal limits on power (4 watts AM, 12 watts SSB) is just plain silly to try and enforce. I too love to cruise the 40-channels at night and yes, even contact someone in Georgia (heavens, no!) from here in southeast Texas on four watts. The ol' Midland 77-838 into a Wilson 1000 mag-mount on my two-door hatchback will really surprise you sometimes! The only thing I have to say is "Propagation Happens."

Illegal power should be controlled. If the people want to run 1500 watts PEP, they should go get a ham license and have at it. Heck, I just passed my tech no-code and received my callsign. I have been a CBer since 1987. Now that I am a "ham," do you think I will take the CB out of my car? Hell no! I'm sorry, but the other ham on the 2-meter band that I may talk to while driving down the highway can't tell me where the "Bears" are hanging out and "Taking Pictures" from the comfort of his living room!

I just wanted to let you know that I couldn't agree with you more! If you want to talk to the world and run monster power, get a ham license. If you want to be a freebander, you better know what to do when the FCC comes knocking on your door.

73,
Scott Bowen, KD5KNZ
"Voodoo Child"

Dear Editor:

In 1998 I had the honor of being elected to the position of director on the REACT board of directors along with two other gentlemen that were also elected to fill the positions open at that time. Then I was appointed as treasurer and worked with the office staff.

This new React board of directors is going through a transitional period to better serve the teams and members. This board has pledged cooperation to promote growth.

Working together with the other directors and officers, through an exchange of cost savings ideas, donations, bartering, an exchange of services, in-kind donations and using a common sense business approach, we are working to bring the high costs down to a more manageable level.

The board members respects the membership's various types of experience and expertise as well s the amount of service given to the REACT organization and their communities. This length of service time is from the time joined to 38 years, for any member.

Instead of a few directors, there are now regional directors and four officers to assist the teams, councils, the membership and the general public. Many of the new directors and officers are actively involved in their local teams and state REACT councils as well.

REACT International, Inc. is striving to enhance its relationships with all agencies at all levels and promote within the REACT organization. REACT still promotes monitoring of CB Channel 9, amateur, GMRS, marine band and FRS for emergencies, assistance and informational radio calls, along with safety and administrative radio communication, traffic safety awareness and manpower for community/civic events, Crime Watch, SkyWarn and for disaster services.

If you're interested in an exciting challenge in community service, having fun, fellowship, and giving something back to your community, then you are invited to join us. To learn more about REACT International, Inc. see our ad in this issue or look us op on the Internet at www.reactintl.org or write 5210 Auth Road, Suite 403, Suitland, MD 20746, phone 301-316-2900.

Fred J. Lanshe, N3QLU

Thanks, Gordo!

Dear Editor:

Yet another ham operator joins the world of amateur radio. Thanks to your materials I was able to join in the fun. Upgrading soon. Thanks again, Gordon.

Jack R. Cleavenger Jr.
USN (Ret.)
KD5ILA

Dear Jack,

Thank you for your letter and congratulations! A special thanks to Gordon West for his superb books and tapes, and for being one of America's all-time hobby radio advocates!

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, Tanjug Press in Serbia, Iraqui 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

-- all over the world -- Australia, Russia, Japan, etc.

MFJ-462B **$179.95**

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. 5¼Wx2½Hx5¼D 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.

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.

MFJ-1024 **$139.95**

Receives strong, clear signals from all over the world. 20 dB attenuator, gain control, ON LED. Switch two receivers and auxilary or active antenna. 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

MFJ-1020B **$79.95**

Rival outside long wires with this *tuned* indoor active antenna. *"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

MFJ-1022 **$49.95**

Plug this *compact* MFJ 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. 3⅛x1¼x4 in.

Eliminate power line noise!

MFJ-1026 **$179.95**

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 **$99.95**

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 **$99.95**

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 **$99.95**

High-gain, high-Q receiver preseletor 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 **$149.95**

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 **$49.95**

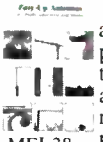
High-Q passive LC preselector boosts your favorite stations while rejecting images, intermod and phantom signals. 1.5-30 MHz. Preselector bypass and receiver grounded positions. Tiny 2x3x4 inches.

Super Passive Preselector

MFJ-1046 **$99.95**

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 attenuation and very low passband loss. Air variable capacitor with vernier. 1.6-33 MHz.

Easy-Up Antennas



MFJ-38 **$16.95**

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 Antenna Switches

MFJ-1704 **$64.95**

MFJ-1702C **$24.95**

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

MFJ-8100K **$69.95**_kit_
MFJ-8100W **$89.95**_wired_

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-8121 **$39.95**

MFJ's 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!

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Pop'Comm's World Band Tuning Tips

January 2001

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
0000	6145	NHK Radio Japan, via Canada	
0000	7415	WBCQ, Maine	
0000	9580	Africa Number One, Gabon	FF
0000	15345	Radio Argentina al Exterior	
0000	17485	Radio Prague, Czech Republic	SS
0030	4985	Radio Brazil Central, Brazil	PP
0030	5905	Radio Ukraine Int'l.	
0030	9855	Radio Vilnius, Lithuania, via Germany	
0030	11800	RAI, Italy	II
0030	4052v	Radio Verdad, Guatemala	vern
0050	9022	Voice of the Islamic Republic of Iran	
0050	9835	Voice of Islamic Rep. of Iran	
0100	6085	Bayerischer Rundfunk, Germany	GG
0100	9440	Radio Slovakia Int'l., Slovakia	
0100	11615	Radio Prague, Czech Republic	
0100	11620	All India Radio	Hindi
0100	11985	YLE Radio Finland	Finn.
0100	13770	YLE Radio Finland	
0100	15395	Radio Thailand	Thai
0100	4911v	Radio Barahona, Dominican Republic	SS
0100	4915v	Radio Cora, Peru	SS
0100	6536v	Radiodifusora Huancabamba, Peru	SS
0100	6895v	Galei Zahal-Israeli Defense Forces	HH
0130	3280	La Voz del Napo, Ecuador	SS
0130	3300	Radio Cultural, Guatemala	SS
0130	9735	Radio Nacional, Paraguay	SS
0130	11825	Voice of Russia	
0150	12055	Vatican Radio	
0200	5025	Radio Rebelde, Cuba	SS
0200	7220	Radio Rossi, Russia	RR
0200	7385	WRMI, Florida	SS
0200	9475	Radio Cairo, Egypt	AA/EE
0200	9635	Radio Nacional, Colombia	SS
0200	11710	Radio Argentina al Exterior	
0200	11787	Radio Baghdad, Iraq	AA
0200	12110	Voice of Greece	Grk
0200	12160	WINB, Pennsylvania	
0200	13662	Armed Forces Network, Guam	USB
0200	13760	Radio Pyongyang, North Korea	SS
0200	15375	Voz Cristiana, Chile	SS
0200	15380	Radio Romania Int'l.	
0200	15425	Sri Lanka Broadcasting Corp.	
0200	17675	Radio New Zealand Int'l.	
0200	4800v	Radio Buenas Nuevas, Guatemala	SS
0200	4940v	Radio Amazonas, Venezuela	SS
0230	6673	Radio Super Sensacion, Peru	SS
0230	9835	Radio Budapest, Hungary	
0230	10320	Armed Forces Network, Iceland	USB
0230	10330	All India Radio	vern
0230	10940.5	Armed Forces Network, Sicily (Italy)	USB
0230	12050	Radio Cairo, Egypt	AA
0230	17770	Qatar Broadcasting Service	AA
0230	3290v	Voice of Guyana	
0230	5019v	Ecos del Atrato, Colombia	SS
0300	1350	Radio Ukraine Int'l.	
0300	6040	Radio Monte Carlo, Monaco, via Canada	AA
0300	9690	Radio Exterior de Espana	SS
0300	9905	Swiss Radio Int'l., via French Guiana	Ital.
0300	9925	Croatian Radio, via Germany	Croat/EE
0300	11885	Voice of Turkey	TT
0300	15165	HCJB, Ecuador	
0300	15245	Radio Sweden	
0315	6015	Adventist World Radio via South Africa	
0330	5975	BBC, England, via Antigua	
0330	7285	Sudwestrundfunk, Germany	GG
0330	9795	Voice of Vietnam, via Canada	
0330	9870	Radio Austria Int'l.	SS
0330	13675	UAE Radio, Dubai, UAE	AA
0400	4775	Trans World Radio, Swaziland	
0400	9680	Radio Taipei Int'l., via Florida	CC
0400	9705	Radio Mexico Int'l.	SS
0400	9730	China Radio Int'l., via French Guiana	
0400	15435	Radio Jordan	AA
0400	15565	Radio Vlaanderen Int'l., Belgium, via Bonaire	
0500	4975	Radio del Pacifico, Peru	SS
0500	7255	Voice of Nigeria	
0500	11720	Channel Africa, South Africa	
0500	11930	Voice of the Islamic Republic of Iran	AA
0530	7195	Voice of America relay, Morocco	

UTC	Freq.	Station/Country	Notes
0530	7405	WEWN, Alabama	SS
0600	4960	Radio Villa, Dominican Republic	SS
0600	7210	ORTB, Benin	FF
0600	11770	Qatar Broadcasting Service	AA
0630	4845	Radio Mauritanie, Mauritania	AA
0700	9870	Trans World Radio, Monaco	
0730	6160	CKZN, Canada	
0800	5020	Solomon Island Broadcasting Corp.	
0900	4755	Radio Rural, Brazil	PP
0900	4885	Radio Clube do Para, Brazil	PP
0900	4960	Radio Vanuatu, Vanuatu	FF
0900	4980	Ecos del Torbes, Venezuela	SS
0900	9615	KNLS, Alaska	RR
0930	6020	Radio Australia	
0930	5055v	Faro del Caribe, Costa Rica	SS
0930	6140v	Radio Aparaecida, Brazil	PP
1000	6185	Radio Educacion, Mexico	SS
1000	12020	Voice of Vietnam	
1030	12085	Voice of Mongolia	
1030	5040v	La Voz del Upano, Ecuador	SS
1045	11715	Radio Korea Int'l.', S. Korea	
1100	3205	Radio Sanduan, Papua New Guinea	
1100	3325	Radio Bougainville, Papua New Guinea	
1100	4881v	Radio Comas, Peru	SS
1130	9525	Voice of Indonesia	JJ
1130	13640	Radio France Int'l., via Fr. Guiana	FF
1200	4725	Radio Myanmar, Myanmar (Burma)	BB
1200	4753	Radio Republik Indonesia, Ujung Pandang	II
1200	9805	Radio Marti, USA	SS
1200	9865	Radio Vlaanderen Int'l., via Russia	
1200	15075	All India Radio	
1200	15285	Radio Tashkent, Uzbekistan	
1230	4890	National Broadcasting Corp., Papua New Guinea	
1230	13765	Vatican Radio	
1230	15330	Adventist World Radio, Guam	
1300	9335	Radio Pyongyang, North Korea	KK
1300	9570	Radio Korea Int'l.', S. Korea	
1300	15390	Radio Romania Int'l.	
1300	17775	Radio Tashkent, Uzbekistan	Urdu
1330	9590	Radio Singapore Int'l.	
1330	18960	Radio Sweden	
1330	21495	Broad. Service of Kingdom of Saudi Arabia	AA
1400	9830	Radio Thailand	
1400	11690	Radio Jordan	
1400	11730	NHK Radio Japan	
1400	11905	Sri Lanka Broadcasting Corp.	unid
1430	12075	Radio Netherlands, via Uzbekistan	
1430	14140	Sultanate of Oman Radio	AA/EE
1430	15400	YLE Radio Finland	Finn.
1430	17725	Radio Jamahiraya, Libya	AA
1500	9380	China Peoples Broadcasting Station	CC
1500	9405	Far East Broadcasting Company, Philippines	CC
1500	9580	Radio Australia	
1500	9740	BBC relay, Singapore	
1500	11765	Radio Free Asia, USA, via No. Marianas	CC
1500	15235	Voice of America relay, Thailand	
1500	17770	Channel Africa, South Africa	
1530	9575	Swiss Radio Int'l.	GG/FF
1530	17865	Radio Austria Int'l.	
1600	11570	Radio Pakistan	
1600	17850	Radio France Int'l.	
1630	11730	RTT Tunisienne, Tunisia	AA
1630	11815	Radio Exterior de Espana, Spain, via Costa Rica	SS
1630	21470	BBC relay, Cyprus	
1630	21660	BBC via Ascension Is.	
1700	9000	V. of Democratic Alliance of Sudan (clandestine)	AA
1700	9465	WMLK, Pennsylvania	
1700	11510	Voice of Russia	
1700	21630	NHK Radio Japan via England	JJ
1730	14670	CHU time station, Canada	
1730	15265	United Nations Radio via England	
1730	15335	RTV Marocaine, Morocco	AA
1730	17720	Radio Pilipinas, Philippines	
1800	9780	Republic of Yemen Radio	AA
1800	12010	Radio Maryja, Poland, via Russia	Polish
1800	15475	Africa Number One, Gabon	FF
1830	13725	Radio Telefis Eireann, via Canada	
1830	17870	Channel Africa, South Africa	FF
1900	11675	Voice of Russia	
1900	15190	Radio Pilipinas, Philippines	
1900	17535	Kol Israel	
1900	17660	HCJB, Ecuador	
1930	11975	Voice of America relay, Sao Tome	
1930	11990	Radio Kuwait	
2000	11640	World Beacon, via South Africa	
2000	12005	RTT Tunisienne, Tunisia	AA
2000	15160	Radio Algiers Int'l.	
2000	15210	Radio Cairo, Egypt	AA
2000	15275	Deutsche Welle, Germany, via Sri Lanka	GG
2000	15150v	Voice of Indonesia	
2030	7280	Voice of the Strait, China	CC
2030	11734	Radio Tanzania, Zanzibar	vern
2030	12140	Kol Israel	AA
2100	13660	Radio Havana Cuba	USB
2100	13820	Radio Marti, USA	SS
2100	17565	Voice of Greece	Grk
2115	12085	Radio Damascus, Syria	
2130	17705	Voice of Greece, via USA	Grk
2130	17825	NHK Radio Japan	
2130	21800	RDP Int'l., Portugal	PP
2200	9615	Radio Cultura, Brazil	PP
2200	17695	Radio Canada Int'l.	
2200	17850	Deutsche Welle, Germany, via Rwanda	GG
2200	21540	Radio Exterior de Espana, Spain	SS
2200	6250v	Radio Nacional, Equatorial Guinea	SS
2230	17740	Voice of America relay, Philippines	
2230	5985	Radio Congo, Congo Rep.	
2230	13640	Voice of Turkey	TT
2300	15495	Radio Kuwait	AA
2300	15735	Radio Norway Int'l.	NN
2300	15760	Reshet Bet, Israel	HH
2315	11401	Rikisutvarpid, Iceland	Ice.
2330	5770	Radio Miskut, Nicaragua	SS
2330	7125	Radiodif. National de Guineenee	FF
2330	11585	Kol Israel	HH
2330	11710	Broad. Service of Kingdom of Saudi Arabia	AA
2330	11815	Radio Brazil Central, Brazil	PP
2330	11915	Radio Gaucha, Brazil	PP
2330	15455	Voice of Russia	RR
2330	17510	KWHR, Hawaii	

BY HAROLD ORT AND R.L. SLATTERY

PRODUCT PARADE

Review Of New, Interesting And Useful Products

CEA Publishes Digital America

The Consumer Electronics Association (CEA) has published its annual review of the consumer electronics industry today. *Digital America — U.S. Consumer Electronics Industry Today* chronicles product category performances and offers the industry perspective on market trends. While it's not about ham radio, shortwave, or scanning, it's a 100-page comprehensive analysis of video, audio, mobile electronics, multimedia, communication and information, integrated home systems, and accessory products.

Previously entitled *U.S. Consumer Electronics Industry Today*, CEA renamed the publication to more accurately convey the emergence of digital technologies. "As the lines between traditional consumer electronics products and information technology continue to blur as digital technologies develop, our industry is primed for phenomenal growth. *Digital America — U.S. Consumer Electronics Industry Today* details this growth and the economic impact these products have had on U.S. business and projections for the future," stated Gary Shapiro, CEA president and CEO.

The book also provides a historical overview of the industry and includes a timeline incorporating significant technology achievements along with a directory of related industry sources. To order copies of the publication, contact CEA's Customer Service Department at 703-907-7600 or E-mail cea@ce.org.

The CEA, a sector of the Electronic Industries Alliance (EIA), represents more than 600 U.S. companies involved in the development, manufacturing, and distribution of audio, video, mobile electronics, communications, information technology, multimedia, and accessory products, as well as related services that are sold through consumer channels. Combined, these companies account for more than $60 billion in annual sales.

A Breakthrough Antenna — The 'Super Mobile' from Nil-Jon

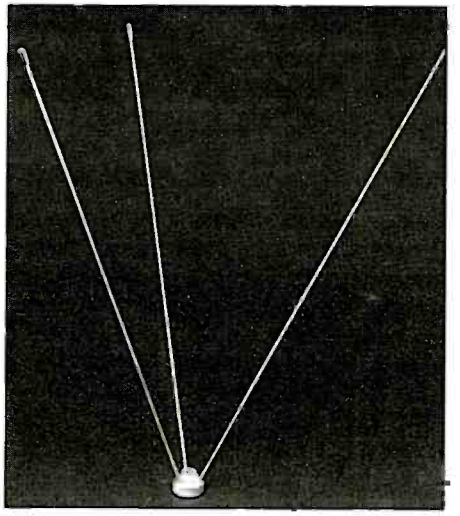
Tired of banging that 5/8th wave? Impossible to use parking garages? Forget to use that flip down? That 1/4 wave just not enough? Nil-Jon Antennas has just introduced the Super Mobile.

The newest design features an 18-inch compact high-performance mobile

antenna. It's radical and certainly unique. This antenna is dual polarized with no loss from coils, winding, or traps because they don't use them! Nil-Jon says it will work on any frequency in three radio bands. Use it mono band, dual band, or multi band. It will transmit and receive on any frequency from 140 through 170 MHz and/or 200 through 225 MHz and/or 400 through 480 MHz. That is correct! They report SWR matches at 2 to 1 or better and no tuning.

Do you like to work simplex or operate QRP (low power)? This 'Super Mobile' is a must have! Any VHF/UHF transceiver including amateur, satellite, APRS, business, police, fire, emergency services, Land Mobile, the New "MURS" CB allocation — operators of these and all other VHF/UHF mobile transceiver applications — will see improvements from the use of this patent-pending design.

Scanning Enthusiasts — this could be the ultimate mobile antenna for your hobby. The antenna consists of three tipped elements (lengths from 16 to 18 1/4") angled up from a gold irridized base cone that fits 'LM' style mounts. Adapters available for 'NMO' mounts. It's priced at $69.95. For information and orders, visit their Website at www.Nil-JonAntennas.com. Be sure to tell them you read about it in *Pop'Comm*!



Nil-Jon's Super Mobile antenna. We'll be reviewing it in an upcoming issue.

SMD Electronic Projects

Renowned author Homer Davidson has outdone himself again by bringing you a book of 30 electronics projects, all utilizing surface-mounted devices. These projects are built with readily-available components, and not only are they great fun to build, they can be of great use in your home.

SMD components have opened up a brand new area of electronic project construction. These tiny components are now available and listed in many electronics mail-order catalogs for the hobbyist. The book includes everything you need to know to build 30 surface-mounted projects including an earphone radio, Xtal receiver, shortwave receiver, IC radio, shortwave converter, FM radio, active antenna, RF amplifier, sideband adapter, audio amp, Xtal earphones, FM baby monitor, code oscillator, LED flasher, melody doorbell, electronic timer, flashing pin, touch alarm, continuity tester, signal injector, audio generator, pink noise injector, cable checker, Xtal checker, laser disk tester, and various recorders.

For more information or to order your copy of this great 336-page book at $29.95, call 800-428-SAMS or FAX 800-552-3910. Order book No. 61211 from Howard W. Sams & Co., Indianapolis, Indiana. Be sure to tell them you read about it in *Popular Communications*.

WASHINGTON BEAT

FCC Actions Affecting Communications

New Phone Tap Legislation, And Keeping Tabs On Your Boss

More news from the "What Are They Thinking?" file: this time legislators claim it's too easy for law enforcement officers to obtain court orders to disclose the telephone numbers that criminals dial. In the form the law is currently written, obtaining permission for a pen register telephone tap — which records source, frequency, and destination of telephone calls — only requires that a prosecutor certify to a judge that the information the tap would obtain is relevant to an ongoing criminal investigation. Legislators say they want the standard of evidence for a pen register tap raised to match that needed to actually record phone calls: a showing of probable cause that a crime has or is about to occur. Several bills were introduced relating to this, including **H.R. 5018**, the Electronic Communications Privacy Act of 2000, which was been forwarded by subcommittee to the full committee by a voice vote and now is under Committee consideration, and H.R. 4987, the Digital Privacy Act of 2000. And, of course, because they can't leave the Internet out of anything these days, these laws also propose to extend current legislation related to law enforcement interception of online conversations and other electronic means. These bills fly in the face of rulings by the Supreme Court, which has held that dialed telephone numbers are not covered by an expectation of privacy, only the actual conversations. Who's going to win this one? Stay tuned.

Workplace Monitoring

Ever felt like someone is looking over your shoulder? Watching you type that E-mail message at work? Listening to your phone calls at the office? You're not paranoid, you're probably right. Workplace monitoring is becoming more common as employers keep a weather eye on what employees are up to. When you're on company time, what you do on the phone, on your computer, and at your desk becomes company business. Sen. Charles Schumer, (D-N.Y.) says that workers have a right to know how their employers are watching them, and he has introduced a bill very similar to one already in the House, which forces employers to disclose if and how they are monitoring their employees. Legislators say **H.R. 4908, the Notice of Electronic Monitoring Act**, is a good bill which has found little opposition so far. The bill would require employers to release details every year of how employee actions or communications are being monitored in the workplace.

FCC Denies Three Amateur Petitions

In the space of one week, the FCC denied petitions for reconsideration from three Amateur Radio operators, citing improper filing as the reason for the denials. **Lawrence Gutter**, formerly **WA2YTO**, and **Richard E. Jamison, KG6ARN** and formerly K1OTO, were turned down for license renewal by the Wireless Telecommunications Bureau after filing late in their two-year grace period and failing to include their Taxpayer Identification Numbers. Both re-filed with the proper information after their grace periods had passed, stating that they were not aware of the TIN requirement. The FCC said, in effect, that ignorance is no excuse and refused to accept the refiled petitions.

Charles W. Heard, W4CO (formerly W2FLA) also was turned down after seeking reconsideration of the denial of his request for a vanity call sign. Heard lost call sign W4FX to amateur Robert C. Williams because of what he calls "a handling error" and misuse of the ULS system. The FCC fired back that Heard's allegations lacked merit and that the system "processes mutually exclusive vanity call sign applications received on the same day in random order." Luck of the draw, pal, luck of the draw.

CTIA Gets Postponement Of 700-MHz Auction

The FCC delayed the auction of commercial licenses in the 700-MHz band for six months after a request from the Cellular Telecommunications Industry Association and other lobbyists. Interested parties cited the need for more time to prepare as the reason for requesting the delay, saying that the compressed timing of the auctions does not provide enough time to develop business plans, formulate strategies, and assess market conditions. The 746–764 and 776–794 MHz bands, traditionally used by UHF TV stations 60–62 and 65–67, were reallocated for broadcast use in 1997. TV stations currently using these channels were directed to vacate the spectrum by the end of 2006. In November of 1999, Congress pushed up the throttle on the auction schedule for licenses, requiring that the proceeds for any auctions be deposited no later than September 30, 2000. After review, the Commission decided that Congress' mandate was superceded by the Communications Act statute that requires sufficient time for bidding preparation.

LPFM Update

On April 13th, 2000, the House of Representatives overwhelming approved **H.R. 3439** by a vote of 274–110. H.R. 3439, you may recall from the September 2000 issue of *Pop'Comm*, deals with the issue of Low Power FM broadcasting. This retooled bill was designed with provisions to make the National Association of Broadcasters and others breathe easier about what they perceive will be hideous interference as a result of LPFM stations. The bill mandates and makes permanent current third-adjacent channel protections, while still allowing the FCC to continue licensing LPFM stations. It also requires an independent third party to find out how LPFM, without third-adjacent channel protections, would affect listening audiences in nine test markets, with the findings to be reported to Congress by February 2001. Should the Commission decide to make changes to third-adjacent channel protections, it must then get congressional approval. The bill also goes on to require several additional studies by the FCC, including an LPFM economic impact study on what it calls "incumbent FM broadcasters in general, and minority and small-market

BY LAURA QUARANTIELLO <LauraQ@cti.com>

broadcasters in particular," as well as a study of the impact on the transition to digital in-band on-channel (IBOC) radio, reading services for the blind, and FM translators. As if that isn't enough, this legislation also establishes that all LPFM licenses will be non-commercial and remain non-commercial, and prohibits issuing an LPFM license to anyone who has engaged in unlicensed (pirate) radio broadcasting. Hopefully H.R. 3439 will make everyone happy for the time being, at least until those LPFM stations start going on the air.

Meanwhile, back at the ranch, the FCC has adopted new complaint procedures designed to ensure swift action if any significant third-adjacent channel interference occurs due to operation of an LPFM station. The process would begin with efforts between the LPFM and the full power FM station to identify and resolve any true interference complaints, assisted by FCC field agents if needed. If this doesn't work, an expedited modification procedure will kick in to resolve the complaint within 90 days. These actions won't begin unless at least one percent of the FM station's listening audience registers complaints.

The Commission also modified its single station ownership rules to allow government public safety and transportation organizations the chance to apply for several LPFM stations to distribute traffic, safety, and similar information. University student-run LPFM stations would also be allowed from universities holding full power FM licenses that are not student-run.

To prove just how popular LPFM is, the FCC received 473 low power FM radio applications during its second filing window, held August 28 to September 1, 2000. Applications arrived from nonprofit community-based organizations and state and local governments in Connecticut, Illinois, Kansas, Michigan, Minnesota, Mississippi, Nevada, New Hampshire, Puerto Rico, Virginia, and Wyoming. A list of the applicants is available from the FCC website at www.fcc.gov (Broadcast Applications Public Notice, Report No. 24820, pages 8-103.) Three more filing windows remain in November 2000, February 2001, and May 2001.

GPS On FRS

The FCC has granted a waiver of Family Radio Service rules to allow the transmission of Global Positioning Service location information on FRS channels. Currently, Family Radio Service Rule Sections **95.193(a)** and **95.631(d)** allow units to transmit only emission type F3E and tones to establish or continue FRS voice conversations. Manufacturer Garmin International petitioned the FCC to change their rules to allow licensing of handheld FRS units which contain a feature which poll other units for their GPS-derived location information and display it on a map of the receiving unit. The request for waiver was originally denied due to concerns that the GPS feature could be used to track other FRS units, but Garmin clarified to the FCC that the user of the unit being polled would have to press a button to transmit GPS information and that it could only be transmitted once every 10 seconds. ■

BROADCAST DXING

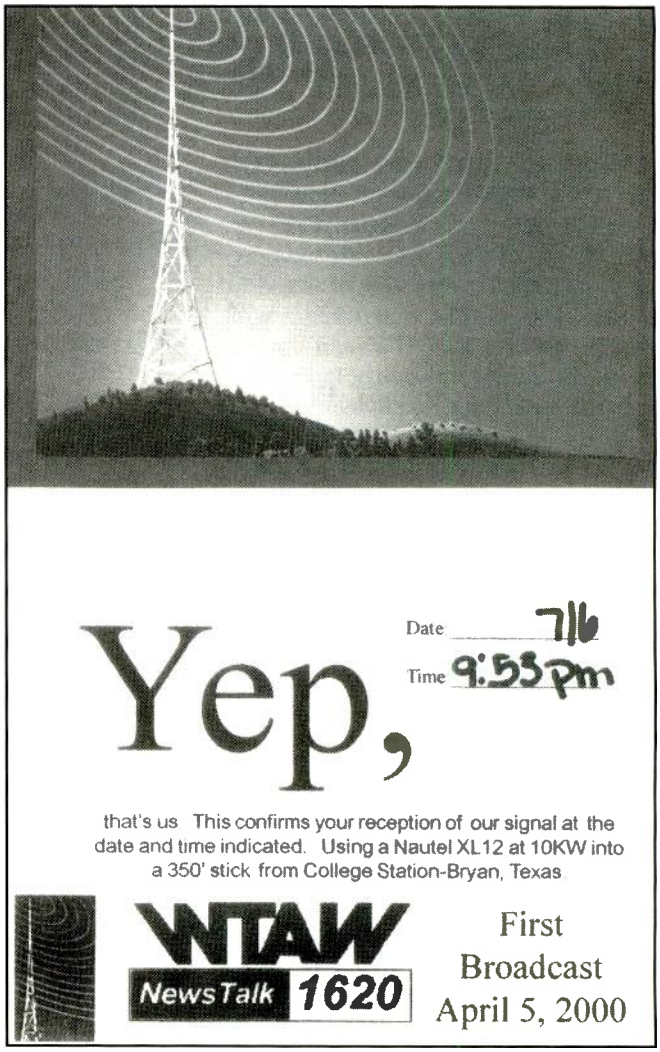
DX, News And Views Of AM And FM Broadcasting

WPAQ Archives Bluegrass Music

Community radio is alive and well along the Blue Ridge Parkway in the southern Appalachian mountains, where bluegrass music emanates from a hilltop in Mount Airy, North Carolina. With a solid 10,000 watts non-directional on 740 kilohertz, WPAQ broadcasts the music that is part of the heritage of the region. Locally owned and operated by the same owner since its inception in 1948, WPAQ has become synonymous with bluegrass, earning the respect of the community and the world. The continued success of WPAQ can be attributed to the commitment of owner Ralph Epperson. Since the beginning, Epperson has dedicated his efforts toward supporting the community and its traditional music. Epperson grew up listening to country music on clear channel WSM Nashville and WLS Chicago, along with WBT Charlotte, North Carolina and WCYB Bristol, Tennessee, all of which served as models for WPAQ programming. The keystone to WPAQ programming has been the Merry-Go-Round, first broadcast in 1948, featuring live performances and conversation with local musicians. The Merry-Go-Round was based on similar programs heard on WNOX Knoxville, WSB Atlanta, and WLS. After a brief respite as the airwaves succumbed to the popularity of rock n' roll in the 1950s, WPAQ returned to its roots in the mid '70s, bringing back the old bluegrass recordings and inviting new artists to perform. Since then WPAQ's popularity has continued to grow. Today you can hear the best in bluegrass featuring original 78 rpm cuts and masters recorded live at the WPAQ studios, live remote broadcasts from area concerts, and the Merry-Go-Round on WPAQ.

You can sample the music of WPAQ on a new compact disk recently released by Rounder Records. "WPAQ: The Voice of the Blue Ridge Mountains — Radio Recordings from Mt. Airy, NC 1947–1950" is a compilation of music from the extensive WPAQ archives featuring local and national bluegrass artists of the time.

Broadcasting has become an Epperson family endeavor. Epperson's daughter owns WBOB Galax, Virginia, and his son can be heard on WBRF FM Galax and WPAQ. Epperson also owns WPNC AM and FM, Plymouth, North Carolina.



QSL card from WTAW College Station, Texas on 1620

More News!

Perhaps sensing the growing trend toward local radio, "Q-93" CJYQ St. John's, Newfoundland, at 930 AM has changed from classic rock to a local bluegrass music format. Under the new nickname "Radio Newfoundland" CJYQ will be playing a variety of local music including the jigs and reels representative of the region's Irish heritage.

"Cool 96.5" WQLL Manchester, New Hampshire, sought out local talent for their morning drive time show. After morning DJ Darien Jaye's co-host Joan Kelley retired from the airwaves, WQLL launched the "Who wants to be Joan Kelley?" on-air campaign. Program director J.C. Haze writes, "We received tapes from radio industry pros as well as beginners who thought they'd give it a try. After this long and exhaustive search, we've finally filled our opening for co-host/newsperson on our More Music Morning Show. Bonnie McCann, from Francestown, NH, has been hired for the position. And no, Bonnie has no prior radio experience! But she's got the perfect personality for Cool 96.5." Bonnie will have quite a challenge ahead, as Darien Jaye and Joan Kelley were the New Hampshire Association of Broadcasters' 1999 Personalities of the Year.

A unique simulcast is history. "Oldies 98" WTRY AM and FM Troy, New York, was unique because of it's simulcast on 980 AM and 98.3 FM, such that the Oldies 98 nickname applied to both the AM and FM frequencies. 980 is now WOFX Fox Sports Radio, also carrying Imus in the Morning. The oldies

BY BRUCE CONTI <BAConti@aol.com>

will continue to play on WTRY 98.3 FM.

Spanish news radio is on the air in New York City. WNNY is broadcasting all-news in Spanish on 1380 in an effort to compete with the Big Apple's English-language all-news stations WBBR, WCBS, and WINS. WSKQ FM has been a big success in the city with its Spanish-language tropical music format. WNNY hopes to attract some of the FM audience as well, satisfying the need among Hispanic listeners for the latest news and information during the lucrative morning and evening commuting hours.

QSL Information

610 WDAF Kansas City, Missouri, a nice letter signed Ted Cramer, Program Director, mentioning 5 kW night power, signed on in 1922. Address: 4935 Belinder Road, Westwood, KS 66205. (Gillespie, MI)

620 KWAL Wallace, Idaho, info sheet and stickers in 30 days, unsigned. Address: P.O. Box U, Osburn, ID 83849. (Martin, OR)

740 WPAQ Mount Airy, North Carolina, letter and station information in six days, signed Ralph D. Epperson, Licensee. Address: P.O. Box 907, Mount Airy, NC 27030. (Conti, NH)

783 Samoan Capital Radio, Wellington, New Zealand, verification letter and station profile in 35 days, signed M. Lui, Station Administrator. Address: Level 2, Rostrevor House, Corner Vivian/Marion Streets, P.O. Box 6647, Te Aro, Wellington. New Zealand QSL #102. (Martin, OR)

830 KSDP Sand Point, Alaska, full detail QSL card and letter, fridge magnet and sticker in 798 days, signed Ronald Schoedel III, GM. Address: Aleutian Peninsula Broadcasting Inc., P.O. Box 328, Sand Point, AK 99661. Now I have them QSL'd on 840 with 250 watts and 830 with 1 kW. Alaska QSL #51. (Martin, OR)

1060 KKVV Las Vegas, Nevada, a nice letter in seven days for a taped report signed Sharon Martin, Adm. Assistant. Received with 43 watts night power. Address: 3185 S. Highland Dr. #13, Las Vegas, NV 889109. (Martin, OR)

1180 WJNT Pearl, Mississippi, form letter with IRCA logo on the top in seven days for taped report, signed Stan Carter-CE. Address: P.O. Box 1248, Jackson, MS 39215-1248. I am really pleased with this, as it is only my second QSL from Mississippi, the other being WOKJ Jackson from the '60s. (Martin, OR)

1190 WOWO Fort Wayne, Indiana, form letter in 23 days signed Jack Didier, Dir. of Engineering. Address: P.O. Box 6000, Fort Wayne, IN 46896. (Martin, OR)

1460 KTXX Salinas, California, full-data letter with coverage maps in 40 days signed Jim Hilliker, PSA Director. Address: 903 N. Main St., Salinas, CA 93906. (Martin, OR)

1520 KOMA Oklahoma City, Oklahoma, new QSL card and bumper stickers in ten days, unsigned. Address: P.O. Box 14818, Oklahoma City, OK 73113-0818. I already had this QSL'd from years ago, but wanted their new card. (Martin, OR)

1620 WTAW College Station, Texas, QSL card in 89 days, unsigned. Address: P.O. Box 3248, Bryan, TX 77805-3248. (Conti, NH)

1660 KQWB West Fargo, North Dakota, QSL letter from new x-band station in 13 days signed Mark Borchert, CE. Mentioned in letter they moved the 1550 up to 1660, so apparently 1550 is silent. Also said they are 10 kW day/ kW nights non-directional. Address: P.O. Box 9919, Fargo, ND 58106-9919. (Martin, OR)

1670 WNEG268 Sacramento, California, HAR station, E-mail QSL in one day after follow-up report, signed Michele McCormick. Address: michele @mmcpr.com. (Martin, OR)

Broadcast Loggings

Welcome to new reporter **Roger Winsor**, the "Valparaiso nightowl." Roger has been DXing since 1958, and has logged over 2300 stations. Some decent auroral conditions finally arrived during the current peak of solar cycle 23, producing welcome logs from the south. However, this month's selected logs begin with a transatlantic mystery solved by Mauno Ritola of Finland. All times are UTC.

783 R. Mauritanie, Nouakchott, Mauritania, at 0050 Koran recitations followed by 0100 sign-off with a brief announcement and national anthem. (Conti, NH) Parallel 4845.4 kHz shortwave, this is the former 1349 kHz station. Syria signed off tonight at 2330, and there was an Arab signal heard earlier at 2130 which turned out to be Saudi Arabia's 2nd programme parallel 1089, sign-off at 2200. (Ritola, Finland)

783 2YB Samoan Capital Radio, Wellington, New Zealand, at 1255 very good off and on with woman talking about Samoan language and where certain words came from in English and Samoan. (Martin, OR)

Pending

New Call	Location	Freq.	Old Call
KMLL-FM	Florissant, MO	97.1	KXOK-FM

Changes

New Call	Location	Freq.	Old Call
WARB	Oxford, AL	1580	WOXR
KFYI	Phoenix, AZ	550	KGME
KGME	Phoenix, AZ	910	KFYI
KROP	England, AR	1530	KLEC
KOWS	Heber Springs, AR	1370	KAWW
KXMX	Anaheim, CA	1190	KEZY
KEZY	San Bernardino, CA	1240	KLTH
KACD	Thousand Oaks, CA	850	KBET
WVLG	Wildwood, FL	640	WHOF
KBNZ	Honolulu, HI	1170	KBUG
KTTP	Pineville, LA	1110	KTLD
WHLX	Marine City, MI	1590	WHYT
KBUG	Belen, NM	860	KARS
KSNM	Las Cruces, NM	570	KGRT
WENU	South Glens Falls, NY	1410	WBZA
WOFX	Troy, NY	980	WTRY
WJPI	Plymouth, NC	1470	WPNC
KQJD	West Fargo, ND	1550	KQWB
KTLR	Oklahoma City, OK	890	KKNG
WHJB	Bedford, PA	1600	WBFD
WJYR	Myrtle Beach, SC	1450	WKZQ
WNMB	North Myrtle Beach, SC	900	WGSN
WTXM	Knoxville, TN	1240	WIMZ
KJOI	Dallas, TX	1190	KLUV
KQQT	Gonzales, TX	1450	KCTI
KKHT	Houston, TX	1070	KENR
KJTV	Lubbock, TX	950	KXTQ
KJKI	Oraibi, AZ	98.9	KBDT
KMLK	El Dorado, AR	101.5	KHBX
KABZ	Little Rock, AR	103.7	KSYG
KKLV	Turrell, AR	103.7	KSUD-FM
KXMX-FM	Anaheim, CA	95.9	KXMX
KWPT	Fortuna, CA	100.3	KQEX
KMXN	Garden Grove, CA	94.3	KIKF
KFXM	Temecula, CA	103.3	New
KVFG	Victorville, CA	103.1	KHDR-FM
KJCD	Longmont, CO	104.3	KCKK-FM
WJPT	Fort Myers Villas, FL	106.3	WJST
WJLQ	Pensacola, FL	100.7	WWRO
WKFF	Port Charlotte, FL	100.7	WOST
WYPT	Punta Rassa, FL	97.7	WCCL
WFSH-FM	Athens, GA	104.7	WALR-FM
WALR-FM	La Grange, GA	104.1	WJZF
WQLI	Pelham, GA	92.3	New
KIBX	Bonners Ferry, ID	92.1	New
WKAY	Knoxville, IL	105.3	WBDW
WNLF	Macomb, IL	95.9	New
KACY	Arkansas City, KS	102.5	KLPQ
WPTJ	Paris, KY	90.7	New
KAOK-FM	De Ridder, LA	101.7	KEAZ
KDKS-FM	Blanchard, LA	102.1	KRVQ
KBTT	Haughton, LA	103.7	KDKS-FM
WUXN	Jackson, LA	104.5	WBJJ
WKZN	Kenner, LA	105.3	WLTS-FM
WAYZ-FM	Hagerstown, MD	104.7	WWMD
WLZX	Northampton, MA	99.3	WHMP-FM
WWWW	Ann Arbor, MI	102.9	WIQB-FM
WLLC	Detroit, MI	106.7	WWWW-FM
WBFX	Grand Rapids, MI	101.3	WCUZ-FM
WMTE-FM	Manistee, MI	101.5	WXYQ
WKVF	Byhalia, MS	94.9	WYLT
KKAC	Vandalia, MO	104.3	New
KWKJ	Warsaw, MO	98.5	New
KBBK	Lincoln, NE	107.3	KEZG
KRKU	McCook, NE	98.5	KJKI
KWPR	Lund, NV	88.7	KWPS
KSNM-FM	Truth Or Consequences, NM	98.7	KSNM
WENU-FM	Hudson Falls, NY	101.7	WENU
WYZY	Saranac Lake, NY	106.3	WSLK
WNSA	Wethersfield, NY	107.7	WNUC
WOFX-FM	Cincinnati, OH	92.5	WOFX
KAZY	Woodward, OK	95.9	KMPQ
KNCU	Newport, OR	92.7	KBGX
WBVE	Bedford, PA	107.5	WWCW
WBYL	Salladasburg, PA	95.5	WMYL
WWMD	Waynesboro, PA	101.5	WAYZ-FM
WEZV	North Myrtle Beach, SC	105.9	WNMB
WJYR	Socastee, SC	99.5	WMYB
WMYB	Myrtle Beach, SC	92.1	WJYR
KZLK	Rapid City, SD	106.3	New
WNAX-FM	Yankton, SD	104.1	KCLH
WBON	Knoxville, TN	104.5	WQIX
WKZX-FM	Lenoir City, TN	93.5	WLIL-FM
KMHF	Bastrop, TX	88.5	KYCM
KITE	Comfort, TX	95.1	KRNH
KZJZ	Conroe, TX	106.9	KKHT-FM
KBUC	Jourdanton, TX	95.7	KBOP-FM
KHHL	Lampasas, TX	98.9	KJFK
KBAE	Llano, TX	96.3	New
KITE	Pearsall, TX	95.3	KVWG-FM
KBBT	Schertz, TX	98.5	KBUC
WVAY	Wilmington, VT	100.7	WMTT
KRKI	Newcastle, WY	99.3	KVAM

810 ZNS3 Freeport, Bahamas, at 0806 Caribbean-accented DJ played "The First Cut is the Deepest" by Rod Stewart and some other '70s/'80s era tunes, good over likely HJCY with WGY nulled, later at 1015 Caribbean English religious talk, alone on the channel during a pre-dawn "Bahamas pipeline." (Connelly, MA)

900 CBC Bridgetown, Barbados, at 0050 announcers in Caribbean-accented English with Guatemala vs. Barbados football play-by-play, good signal. (Conti, ME)

900 YVMD Mara Ritmo 900, Maracaibo, Venezuela, at 0108 "Muy pronto, Mara Ritmo 900" and Zulia mentions, "hora de Venezuela" time checks, accordion/cumbia music, mixing with CBC Barbados. (Conti, ME)

920.17 HJAA Emisora Fuentes, Cartagena, Colombia, at 2308 most likely this with Spanish talk and het against CJCH/WHJJ groundwave and an unidentified Latin American station on 920. (Connelly, MA) At 0218, poor in sub-audible het, sign-off ". . . desde Cartegena, Colombia" with anthem, then the off-frequency het was gone leaving YVQX Venezuela in clear. (Conti, ME)

930 CX20 R. Monte Carlo,

Montevideo, Uruguay, at 0250 fair, "CX20 Radio Monte Carlo" IDs, full ID "... transmite CX20 Radio Monte Carlo, Montevideo, republica ... Uruguay" with domestic interference. (Conti, ME)

1060 HJLY R. Delfin, Riohacha, Colombia, at 2200 fair, jingle, and ID, "Transmite Radio Delfin, HJLY, en la bande AM" with fanfare into program of exitos. (Conti, ME)

1110 YVQT R. Carupano, Carupano, Venezuela, at 2325 a huge signal with slogan "Radio Carupano, la emisora de la buena suerte." (Connelly, MA)

1130 YVRL R. Ideal, Maiquetia, Venezuela, at 2259 good, ad for supermercado in Maiquetia, "1130 AM.. Ideal romantica" into light adult contemporary music. (Conti, ME)

1280 VSB2 Hamilton, Bermuda, at 2332 an interview with a young girl about reasons to join the church, way over usual WADO and possible Brazil. This 1 kW station was almost pegging the S-meter! (Connelly, MA)

1320 WUNO NotiUno, San Juan, Puerto Rico, at 2334 an emotional Spanish political speech about Puerto Rico, good with WJYT (Spanish domestic) nulled and not much CKEC because of auroral conditions. (Connelly, MA)

1470 YVSY R. Vibracion, Carupano, Venezuela, at 2357 a plaintive male Spanish folk ballad, then Radio Vibracion ID, loud! (Connelly, MA)

1480 KDXX Dallas, Texas, at 0300 Spanish programming with Spanish versions of U.S. soft-rock hits from the '90s, over a second Spanish station and English sports station. (Griffith, CO)

1550 WLOR Huntsville, Alabama, "Jammin' 1550" has been very strong at nights lately. They must be newly returned to the air. I never heard them at night when they were WAAY. (Winsor, IN)

1630 KCJJ Iowa City, Iowa, at 1046 commercials and music by Styx, strong signal at first, fading with sunrise, out by 1056. (Gillespie, MI)

1630 WRDW Augusta, Georgia, at 0358 with full ID mentioning 1630 as well as on 1480 for a short time, interference from KCJJ. (Winsor, IN)

1630 KKWY Cheyenne, Wyoming, at 0536 in here this morning with the best signal I've heard since they went on the air. Frequent "1630 KWY" IDs and country music. (Griffith,CO)

1660 KQWB West Fargo, North Dakota, full ID at the top of the hour, heard several times with ID as "Star 1660." (Winsor,IN)

1670 BBC Buenos Aires, Argentina, a great signal popped up from nowhere at 0900, with man in Spanish followed by a woman with ID mentioning Buenos Aires, Argentina and BBC. My third x-band station from Argentina. (Martin, OR)

1700 KBGG Des Moines, Iowa, at 0803 good signal, local talk show interview of a female talent from TV channel 8. (Griffith, CO)

Bob Montgomery in California reports hearing Radio Progreso, Cuba on 890 kHz, and inquired about the transmitter location. This is one of the strongest Progreso signals, often heard along the eastern seaboard, but a nice catch in the west. The transmitter site is in Santiago de Cuba. The Progreso station on 640 from Guanabacoa is another one that's regularly heard.

Thanks to Mark Connelly, Ralph Epperson, Dan Gillespie, Patrick Griffith, Patrick Martin, Bob Montgomery, Mauno Ritola, and Roger Winsor. 73, and good DX! ■

PRODUCT SPOTLIGHT

Pop'Comm Reviews Products Of Interest

EZ Raze Mast System

Ask any radio enthusiast if he or she could use another antenna, antenna mast, or 50-feet of coax and you'll likely get "are you kidding, sure I can" for an answer. I first saw one of the EZ Raze mast systems at the Dayton Hamvention where the quick setup and tear down was attracting a crowd, and have since had the opportunity to use one on an extended basis first-hand, reporting my findings for you this month.

The basic EZ Raze mast system consists of the tripod mount and the four 4-foot poles. Additional poles, special large tripod feet, sturdy nylon rope, and guying ring are available in the model EZ-28 Mast 28-foot system ($1,200) and model RR-36 Military Mast which is loaded with special features. I highly recommend the RR-36 *IF* you'll be using the mast system in very windy areas where you require an installation higher than 20+ feet, and want to install multiple antennas. This superior model includes V-bars for multiple antenna installation, special guy ropes, winch & cable assembly, top pulley, and much more!

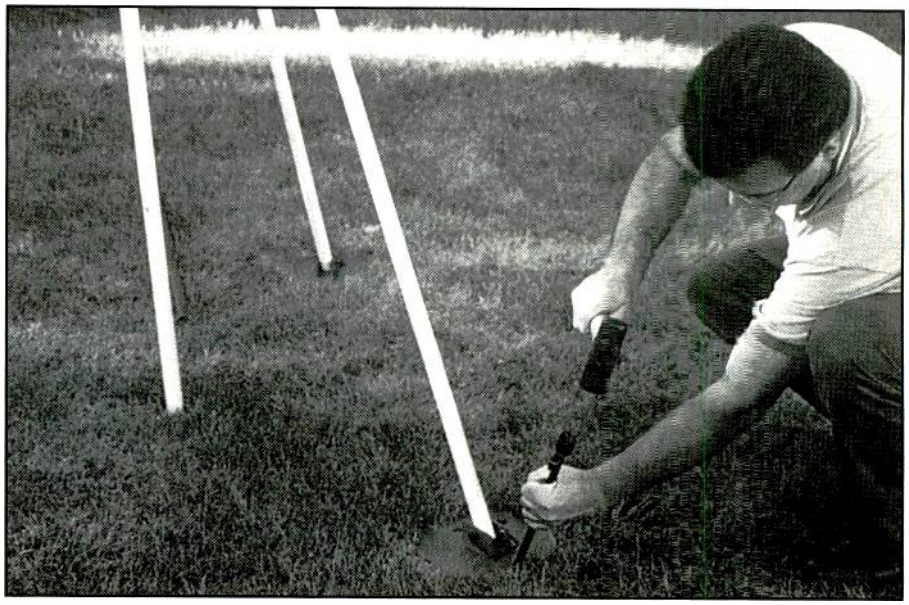
The tripod and poles on the *standard* EZ Raze Mast System are no lightweight affair; this is one heck of a mast system that can support a variety of antennas, including yagis, verticals, or discones. The company literature and Website says the EZ Raze system goes up in about five minutes. I'd say that's about right. It took me a while longer the first time, because I laid out all the poles and tripod on the ground, examined the various parts, joints and "extras," I was provided, including the heavy-duty red metal footpads and guy rope. But when it was time to open the four-foot tripod and connect the poles, it was a snap — no more than five or 10 minutes from start to finish.

Putting It All Together

My "antenna" of choice for the top of the mast was a small 18 1/2" x 25 1/2" Kyocera solar panel. While the DC power cord wasn't yet connected to the panel or run down the mast, my goal was simple: see how easy it was to connect the mast with panel already attached, to the tripod and hoist it up, pole by pole to the desired height. As you'll see in the photo, I held the tripod at an angle while maneuvering the pole-mounted panel assembly into the top hole of the tripod, and down to the center plastic hole mount, carefully tilting the entire assembly upright and connecting additional poles underneath the tripod. While it may at first look awkward, it was far better than raising a standard RadioShack 10-foot pole with the panel on top, onto another 10-foot pole, then figuring out how you would steady the entire assembly — that's easily a two-person job. Working with the EZ Raze mast system was far easier, *and* a one-person job!

Not surprisingly, the military uses these EZ Raze mast systems; they're easily transportable by one person, up in a jiffy (and down quickly if necessary!) and heavy-weight enough to withstand the elements and rigors of field day or emergency use, yet light enough for one

Unpacking the EZ Raze Mast System



Insert the provided (with the EZ-28 Mast) metal stake through the pre-drilled hole in each footpad for a super-strong installation. Or you can use the stakes and guy rope (conveniently wrapped onto provided plastic storage handles) to make an already good installation even better — something you should do for heights over 20-feet anyway.

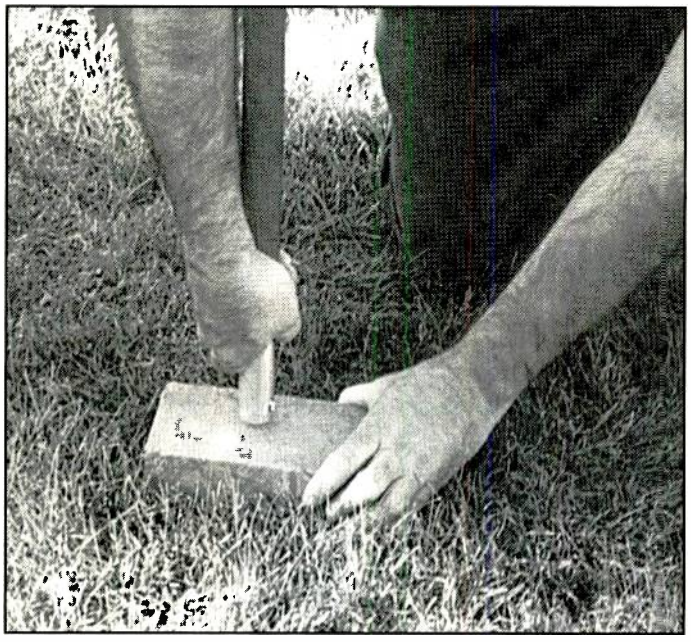
BY HAROLD ORT, N2RLL, EDITOR

Putting two four-foot pole sections together is a cinch.

Mast Systems

EZ Raze (18-Foot Mast System, $750)
1 — 4 1/2-foot center-base tripod
3 — Nested tripod base legs
4 — Center mast poles

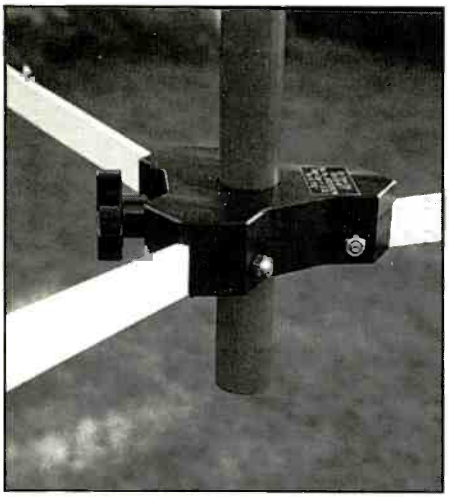
EZ Raze (28-Foot Mast System, $1,200)
1 — 4 1/2-foot center-base tripod
3 — Nested tripod base legs
1 — Guy collar
6 — Center mast poles
3 — Base plates
3 — Ground stakes
3 — Guy rope kits
3 — Quick release rope stays
1 — Five-foot canvas carrying bag
Note: Extra poles, base plates, ground stakes, and guy rope kits can be purchased separately.



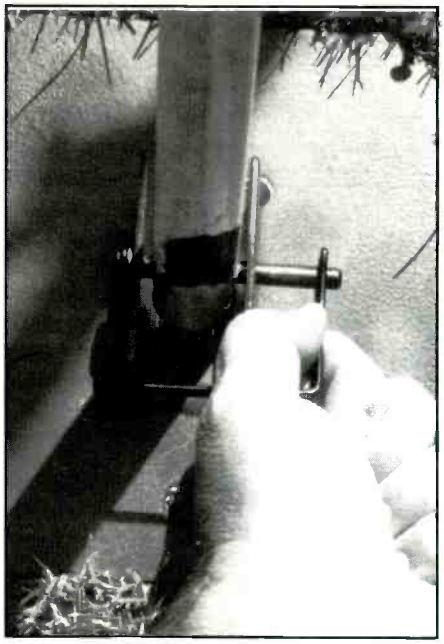
I decided to use a brick as a "base" for the center poles to keep the heavy poles from digging into the soft ground.

person to carry. The four-foot poles are constructed of .049 gauge CREWST steel tubing and are specially coated to prevent corrosion. Careful handling to avoid scratches will ensure years of continuous use. (If you do scratch the paint, simply repaint it with a good, quality outdoor enamel). The poles fit together perfectly — there's no wobbling or bowing, as each pole has a four-inch solid aluminum insert on one end that, unlike standard garden variety poles, gives each connection pole a snug fit and absolutely no chance of working loose or developing hairline cracks. Also at the "plug" end of each pole is a ball plunger similar to the locking device found on your vacuum cleaner hose — with one main difference. These snaps are extra heavy-duty and user-adjustable! A little patience is in order here if you don't want the poles to turn your beam in a heavy wind. Near the end of each pole is a simple screw adjustment that moves the small ball plunger in or out from the pole's outer surface. Be careful: too much ball plunger extending outward from the surface and you'll mistakenly believe you've got to use brute force to put the poles together. This is NOT true! I adjusted each ball plunger with small one-quarter screwdriver turns until getting just the right plunger protrusion, then pushed the poles together, resulting in four, four-foot sections that didn't turn, yet were easily separated. (I'd also recommend rubbing just a dab of grease on each connection before putting the poles together, even though they come pre-coated from the factory, simply because repeated assembly and disassembly, and placing the poles on the ground eventually removes the grease). The other, more expensive Military Mast version mentioned earlier uses *square* poles, thereby eliminating *any* possible concern about your yagi moving in the wind. Frankly, I probably would have designed the basic system with a simple hole and non-adjustable, *fixed* ball plungers, but the way it is merely requires a couple of extra minutes to properly adjust for a snug fit.

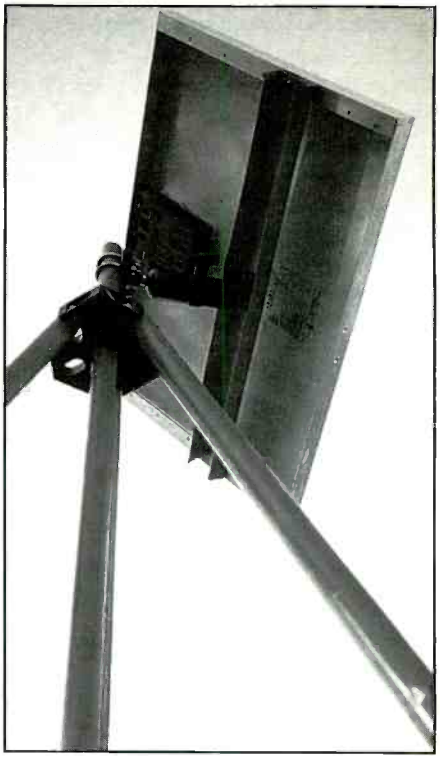
I'm an instruction manual junkie. We've got instruction manuals in a large filing cabinet on everything from blenders to tape recorders. This one is easy enough to follow, but you really don't need a manual for the basic system. The EZ Raze mast system is designed to be a temporary setup (although many folks, I'm told, get around various antenna restrictions using this "temporary"



Tightening the knob in the centerpiece holds the bottom pole firmly in place.



The black pin assembly pin locks the bottom of each leg firmly into place on the footpad.



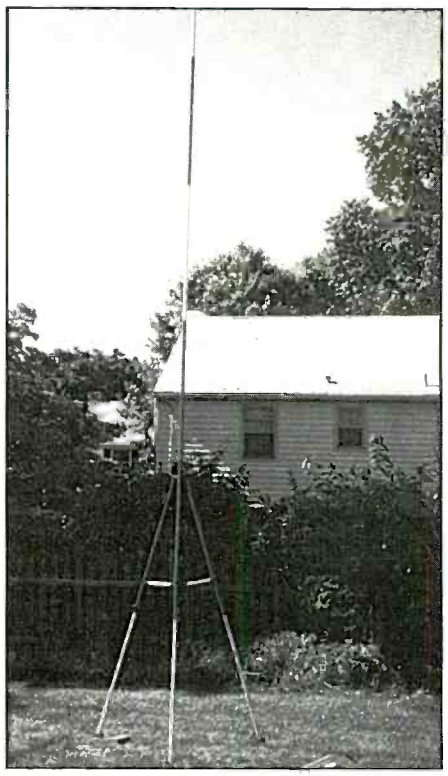
The back of our 18 1/2" x 25 1/2" Kyocera solar panel attached to the top pole with a Ram-It mount (which we'll be reviewing in a future issue).

Standing the small Kyocera solar panel and single four-foot pole/ tripod assembly.

installation) that only requires a few minutes of your time and a little common sense. Overall, I found it to be an excellent, easily assembled, sturdy mast system that's light years beyond using a few flimsy poles and shaky assemblies, despite the higher cost ($750 for the 18-foot version). It not only performs as advertised, but looks darned good as well. If you need the additional height, you can always extend the tripod's legs that tighten firmly into place with the large weather-resistant knobs. They're also extremely helpful on uneven terrain. I used the tripod feet which attach to the bottom of each leg in seconds using the provided black snap-pin gizmo. As you'll see in the photo, each footpad has two holes, through which you insert the optional 18 1/2" solid metal stakes (with the included large mallet in the 28-foot Mast System).

Be careful when opening and closing the tripod assembly. It's fairly easy to crunch your fingers on the folding center support braces. I found no sharp edges or metal burrs on any piece of the EZ Raze mast system, however you should *always* wear good quality work gloves when putting up wires and antennas.

I'd certainly recommend the EZ Raze mast system to you, regardless of your radio pursuit, especially if you're involved in disaster preparedness, or are one of those folks who likes to be prepared for virtually any emergency. After all, you've got the radios, why not go all the way and get an antenna support structure that's capable of rolling with the punches? For more information, contact Old Stone Corporation, 6101 Cascade Mill Road, Cascade, VA 24069 phone 800-538-4977 or visit them on the Internet at http:// www.AntennaMast.com. Be sure to tell them you read about it in *Popular Communications.* ■



The EZ Raze Mast System shown here (but with a total of six poles), tripod legs fully extended for a total height of 31 feet. The base of the tripod measures about 31 inches between each leg for a good, solid ground without the need for guying up to about 20 feet.

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ANTENNAS & THINGS

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Angle Of Radiation And Relative Antenna Height

This month we are going to take a look at two topics, Relative antenna heights and angle of radiation. These two topics are little discussed in radio circles, especially among shortwave listeners and monitor/scanner operators, but they are very important to the proper functioning of your antenna system. And they are somewhat interrelated.

Relative Antenna Heights

There's no doubt about it: height helps in radio communications and broadcasting. I can recall operating all over the 50 states on 40-meters with only 15 watts CW from a homebrew transmitter on a ham radio ARRL Field Day, using only a half-wavelength dipole for an antenna. The reason why we were getting very good results was the fact that we were on a Virginia mountaintop (Rocky Mountain residents need not snicker).

Height always helps, but it's even more critical on the VHF/UHF scanner bands. **Figure 1** shows why. The Earth's surface has been curved ever since Columbus sailed the ocean blue, so a radio wave that is parallel to the surface at the transmitting antenna (TA in Fig. 1) will kiss the surface tangentially at a place called the "radio horizon" (point A in Fig. 1). The radio horizon is a bit beyond the optical horizon because of atmospheric refraction.

Note the two receive antennas in Fig. 1 (i.e. RA1 and RA2). Antenna RA1 has a height that is too low for the signal path so will remain shadowed, therefore silent. But antenna RA2 is high enough to be visible to the transmitting antenna, even though the signal kisses the Earth's surface at the radio horizon.

How far away is the radio horizon? The standard equation for a single antenna is:

$$R.H. = k\sqrt{H}$$

Where:

R.H. is the distance to the radio horizon in miles

H is the antenna height in feet

k will be 1.26 if R.H. is in nautical miles (n.mi), and

1.43 if R.H. is in statute miles (mi.).

[Note: the n.mi is 6,000 feet, and the mi. is 5,280 feet; the n.mi is commonly used in navigation and in radio communications, but we'll use statute miles (mi.) because it's more familiar to most readers.]

For a two-antenna system, we need to add the radio horizons to each, when aimed at the same point (e.g. point A in Fig. 1). For this situation, the distance between the antennas can be:

$$R.H. = 1.43\sqrt{H_{TA}} + 1.43\sqrt{H_{RA}}$$

These equations are useful for direct line-of-sight communications with only a small amount of refraction, no multipath reflections, or special circumstances such as aurora or meteor scatter propagation. They add another dimension to your radio communications activities.

As you can see, height counts. The higher your receiver antenna, the more distance it will "hear."

Angle Of Radiation

The angle of radiation (() of an antenna is the angle from the Earth's surface of the main lobe (**Fig. 2**). It tells you the placement of the main lobe of the antenna, and therefore the direction of the maximum reception sensitivity.

Figure 3 shows how the angle of radiation can affect where a signal goes because of angle of radiation differences. Note that, because antennas obey a Law of Reciprocity (i.e. they work on receive the same as on transmit), you can reverse the directional arrows to see where a receiver antenna looks as a function of its angle of radiation.

Signal A in Fig. 3 has too high an angle of radiation. It is refracted in the ionosphere, like any other signal, but not sufficiently to return to the Earth's surface; it is "lost in space." Signal B, has a lower angle of radiation, but is at a critical angle. This signal does not escape into space, but is ducted along in the ionosphere. This signal is at a so-called "critical angle." Signals C and D are at angles that are low enough to be refracted in the ionosphere such that they are returned to Earth. But notice how the distance to the point of impact, or target area, varies with the angle of radiation. This phenomenon occurs in the medium wave, shortwave, and low VHF bands (but sporadically in the latter). As you can see, a horizon-hugging angle of radiation is the key to longer distance shortwave communications.

So what angle of radiation should you use? Are low angles always best? The answer would be "yes" only if you want-

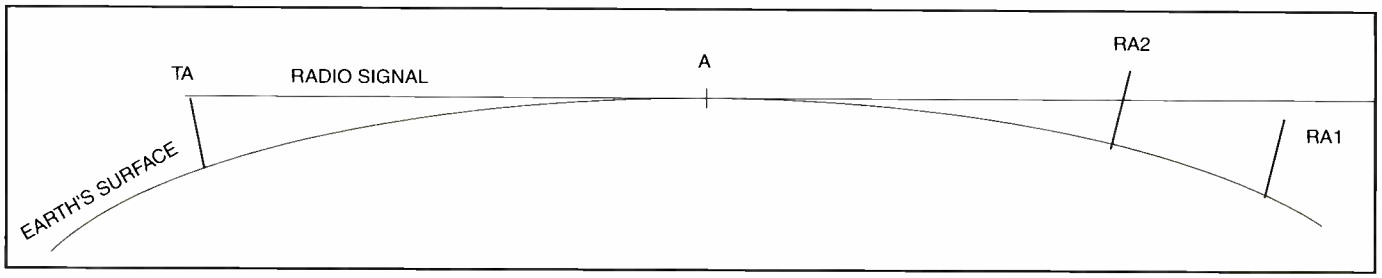


Fig. 1. Distance to the radio horizon.

BY JOE CARR, K4IPV <carrjj@aol.com>

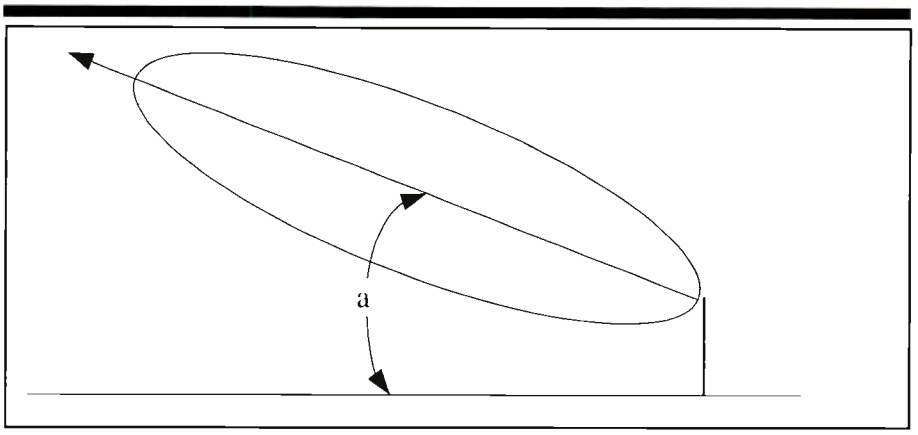


Fig. 2. Angle of radiation.

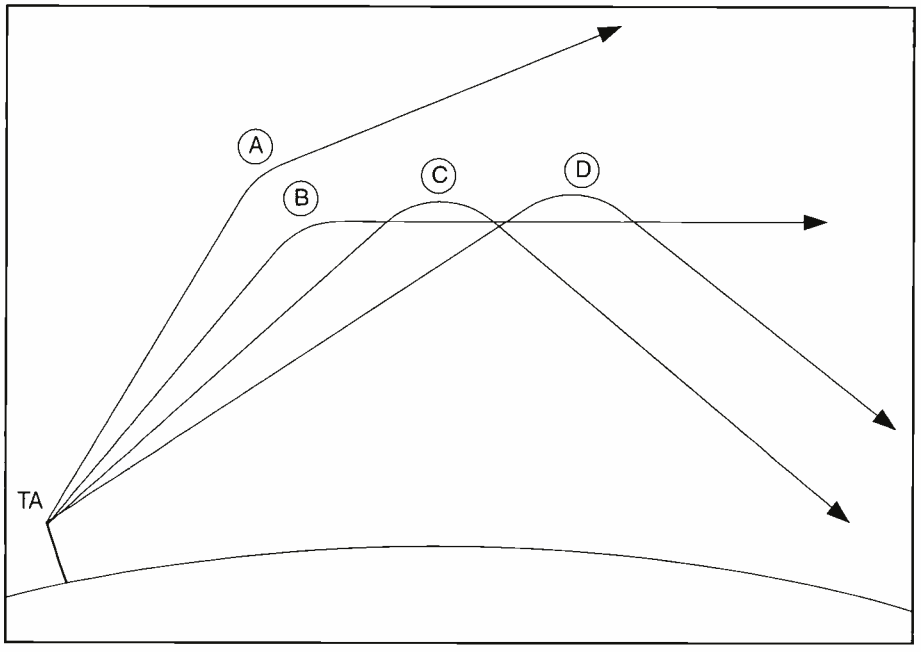


Fig. 3. What happens to a signal as a function of angle of radiation.

ed nothing but long distance DX. But if you wanted to hear stations closer in, then a higher angle of radiation (to encourage "short skip") might be in order. The key, if you have the dollars and space, is to build your antennas with various angles of radiation.

By the way, don't bother trying to tilt the antenna to affect the angle of radiation. You might affect the polarity of the signal, but not the angle of radiation. The angle of radiation is independent of the angle of the antenna.

The angle of radiation of horizontal half-wavelength dipoles, at least those less than two wavelengths above the Earth's surface, is dependent on the height of the antenna above ground. The angle of radiation of verticals is dependent on the radiator length. The standard quarter-wavelength antenna generally has a higher angle of radiation, while the 5/8-wavelength radiator element has a lower angle of radiation. Antennas such as the Bobtail Curtain and Thorne Array (for more information on the last two antennas, see my book *Joe Carr's Receiving Antenna Handbook*).

Conclusion

Clearly, angle of radiation and height above the surface of the Earth are important concepts in radio communication. Whether you listen at the AM broadcast band, shortwave bands, or the VHF/UHF scanner bands, these concepts are critical to the success of your operation.

You can contact me with questions, complaints, kudos, suggestions, brickbats, or just about anything you want, at the following NEW address: P.O. Box 1587, Annandale, VA 22003.

UTILITY RADIO REVIEW

News, Information, And Events In The Utility Radio Service Between 30 kHz And 30 MHz

Welcome To The Longwave Monitoring Theme Column

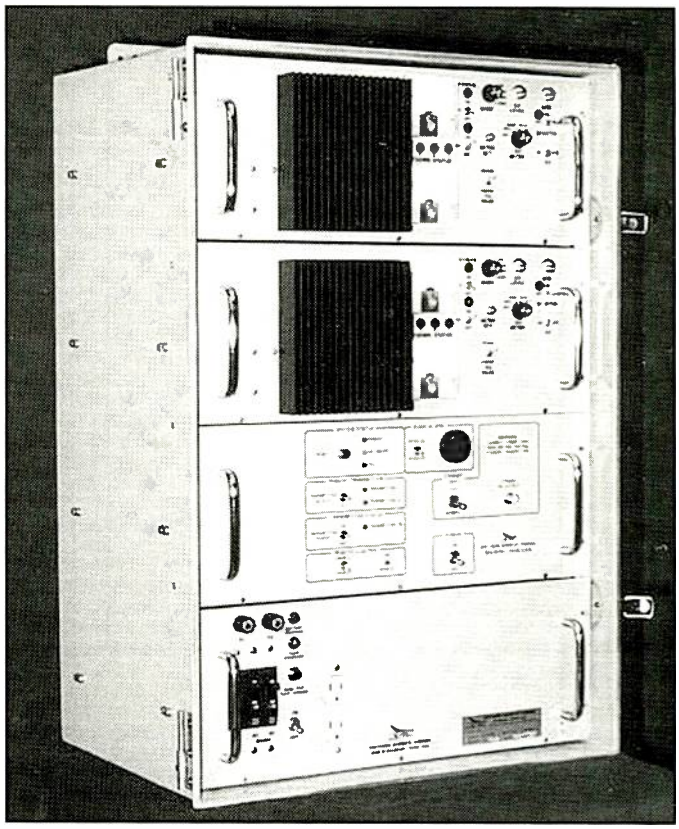
While the majority of people who monitor utility stations stick to the HF bands, there are a number who specialize logging low frequency ute stations. This month my guest contributor, Perry F. Crabill, Jr. (W3HQX) of Winchester, VA is one of those people. Perry will be providing us with an overview of the techniques that he has developed from 10 years of experience monitoring NDB's (non-directional beacons).

If there is one thing that Perry's monitoring experience shows, it is that "silence is golden." Despite monitoring in a noisy location, his LF NDB loggings include stations in South America, the North West Territories in Canada, and the Easter Islands (a distance of approximately 5000 miles). So, how has he overcome the problem of noise reduction for low frequency monitoring? Read on and find out.

People have been writing and I'll be including some of their letters in this month's column.

And I have logs — both those of Perry and several regular contributors. In that regard, I am happy to report that some new people have sent in their logs this month. Please, feel free to join in and send in your logging contributions. As always, they are more than welcome — even if it is only one log.

Enough of the housekeeping, let's get on to Perry's contribution.



Southern Avionics' SA-100 Dual NDB transmitter. Running from 25 to 100 watts, a safety feature switches to the second transmitter if the first fails. (Photo courtesy Southern Avionics Company).

Monitoring NDB — By Perry F. Crabill, Jr.

Starting January 1, 1990, I began a serious effort to log non-directional beacons in the band 190–530 kHz. These are radio stations equipped to send out signals to provide bearings for aeronautical and marine navigation. Most of these transmit with a one kilohertz channel spacing with a continuous carrier periodically tone-modulated by a Morse code identifier. Common modulating frequencies are 1,020 Hz and 400 Hz, with the later being primarily used by Canadian stations. Both USB and DSB modulation may be used, and very few beacons key their carrier without modulation.

In recent years, many radio beacons operated by the U.S. Coast Guard in the 285–325 kHz range have been decommissioned. Those remaining are now modulated with digital signals to provide local-area correction data for GPS receivers, and no longer have Morse code identifications. The digital signals are relatively broadband, and unless they can be nulled by a loop antenna, it is very difficult to copy conventional co-channel signals.

The location where I do my monitoring is a residential suburb two miles east of Winchester, Virginia, which is in turn about 70 miles NW of Washington, D.C. GPS gives the latitude as 78.12882 West and 39.17234 West. Initially, a Kenwood R-5000 Receiver equipped with a 500-Hz CW filter was used, along with an outdoor wire antenna about 100 feet long. A fairly respectable log was built up during the last year or so.

Although signals could be demodulated using the AM capability of the R-5000, better results were obtained using the CW mode with the 500-Hz filter to tune for the keyed sideband. With 1020 Hz modulation, the upper sideband was often covered up by the carrier of a strong adjacent channel station 1.0 kHz higher in frequency, but if the NDB was using DSB modulation. The signal could be frequently identified by looking for the lower sideband.

I soon learned that it was possible to identify different stations on the same channel, even if they were using the same normal modulating frequency. Apparently the manufacturing or operating tolerance allowed a slight difference in frequency to occur, and in many cases time difference could be recognized by ear. The use of a selective audio filter was especially helpful here. Initially, I pressed into service an Autek QF-1 filter already on hand, although it was not as selective as I would have liked.

BY JOE COOPER <ur-review@provcomm.net>

In time all of the easily logged signals on each channel had been identified, and new loggings were hard to come by unless a new station came on rite air. At this point, I added turns to a two-foot square loop antenna I had built for BCB reception to lower its frequency coverage to tile beacon band. This added another dimension to logging co-channel stations because the loop could be rotated to null a dominant signal on a given bearing to allow identification of signals coming from other directions.

Using a loop in the same room with the R-5000 required some physical separation between the two because the receiver's digital display radiated interference in the long-wave range. The purchase of a Drake R-8 receiver in 1992 eliminated this problem altogether and the Kenwood was relegated to standby status. Like the Kenwood, the Drake had a 500-hz CW filter capability that was equally effective. The noise blanker in both receivers was somewhat helpful in reducing man-made electrical noise. I would say that both performed equally well, although never completely eliminating power-related interference.

While the two-foot loop added another dimension to the receiving arrangement, when it was random-wound with small- gauge wire the combination resulted in high-distributed capacity and low Q. Due to its small size, the output was low and required a flat gain amplifier to provide a reasonable signal level. Rather than take the time to design and build a higher quality loop, I ordered a Model 105-C Longwave Loop from RSM Communications. This was a three-Coot square fiat loop with spaced lungs and a matching transformer for a 50-ohm coax output. The signal levels were sufficiently high that no amplification was required and its performance was quite superior.

In September 1994, I substituted the Timewave DSP-59+ Digital Filter for the analog QF-1. This was a ten-fold improvement in performance in at least two ways. The digital filter allowed adjusting both audio bandwidth and center frequency in its bandpass mode, with a narrowest bandwidth of 25 Hz available. This extremely narrow width allowed using a "fine tuning" technique for separating keyed sidebands for NDBs that were nominally co-channel but had sloppy frequency tolerance. The DSP technique also significantly reduced the effect of uncorrelated noise, and was effective on both power system interference and atmospherics.

Perry F. Crabill, Jr. NDB Logs

Note: Perry's logs number well over 1,000, so only a sampling of the DX that he has done will be listed here.

kHz	Call	QTH and comments
200	YAQ	Kasobonikar ONT; 400 Hz
201	RI	Riviere du Loup; PQ; 400 Hz
204	YFY	Iqualuit, NWT; new freq; ex-206; 1741 miles
206	GLS	Galveston, TX; DSB
207	CL	Charlo, NB; 400 Hz; 844 miles
208	YSK	Saniklauq, NWT 400 Hz; 1201 miles
210	CLO	Cali, COLOMBIA; 1000 Hz; 2472 miles
211	K7	St. Ann des Montes, PQ; 400 Hz
212	SJ	St. Johns, NB; 400 Hz
212	UCF	Cienfuegos, CUBA; 400 Hz; 1000 Hz in Guide; 1185 miles
214	YFL	Ft. Reliance, NWT; 2073 miles
218	DRM	Drummond Island, MI
218	RL	Red Lake, ONT; 400 Hz
218	YUY	Rouyn, PQ; 400 Hz
221	BO	Bristol, TN; DSB
221	HM	Hamilton, ONT; 400 Hz
230	UCL	Cayo Largo del Sur, CUBA; 1229 miles
232	GT	Grand Turk, TURK ISLANDS; DSB; 1302 miles
232	UMZ	Manzanillo, CUBA; 1000 Hz; new; 1311 miles
234	RYD	Green Cove Springs, FL
235	URT	Uruburetama, BRAZIL; 1000 Hz; 3849 miles
236	4L	Chatham, ONT; 1000 Hz; 400 Hz in Guide
236	J	Toronto, ONT; 400 Hz
242	PJN	Ft. Lauderdale/Hollywood, FL; DSB
244	BA	Baranquilla, COLOMBIA; 1000 Hz DSB; dit after ID; 1969 mile
248	WG	Winnipeg, MANITOBA; 400 Hz; voice Wx; 1196 miles
251	ZQA	Nassau, BAHAMAS; 977 miles
254	5B	Summerside, PEI; 400 Hz; new ID; ex-YSU; 875 miles
256	UNV	Nuevas, CUBA; 1000 Hz DSB; dit before ID; 1228 miles
269	UDE	Delta Station, MANITOBA; 400 Hz; 1242 miles
277	YLC	Lake Harbour, NWT; 400 Hz; 1671 miles
278	UBA	Baracoa, CUBA; 1000 Hz DSB; 1316 miles
280	4B	Little Grand Rapids, MANITOBA; 400 Hz; 1216 miles
280	IPA	Isla de Pascua, EASTER ISLAND; DSB; dit after ID; 5004 miles
280	MID	Metida, MEXICO; DSB; 1433 miles
280	QX	Gander, NFLD; 400 Bz; 1338 miles
284	QD	The Pas; MANITOBA; 400 Mz? 1482 miles
287	G	Winnipeg, MANITOBA; 400 Bz; 1194 miles
287	SMR	Santa Maria, COLOMBIA; 1000 Bz DSB; 1958 miles
290	YNP	Managua, NICARAGUA; 1931 miles
290	YZS	Coral Harbour, NWT; 400 Hz; 1726 miles
292	MIQ	Maiquetia, VENEZUELA; 2087 miles
300	ABL	Ambalema, COLOMBIA; DSB? dit after ID; 2384 miles
300	PPR	Pointe A Pitre, GUADELOUPE; 1878 miles
305	YQ	Churchill, MANITOBA; 1523 miles
311	TBG	Panama City, PANAMA; 1000 Hz; 2100 miles
318	SSB	San Sebastiean, VENEZUELA; 2127 miles
323	UWP	Argentia, NFLD; 1330 miles

I am not one of those longwave DXers who isn't bothered by power system noise and TV set sweep circuit harmonics. The problem has been becoming more serious at this location over time, and in July 1996 I purchased the ANC-4 Antenna Noise Canceller made by JPS Communications, Inc. This is intended to cancel locally generated noise before it gets into the receiver and affects its AGC circuits. It operates

by adjusting the phase and amplitude of the interference picked up by a noise antenna so that it cancels the interfering signals on the main antenna.

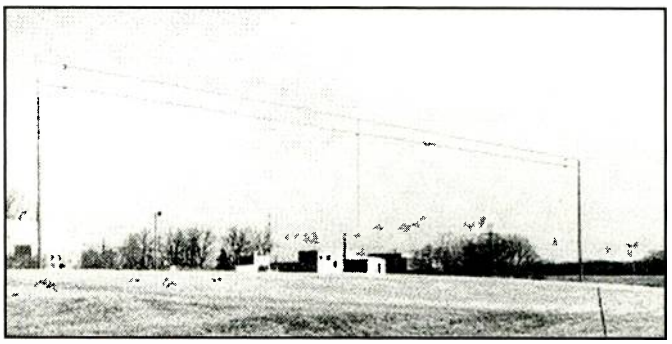
The ANC-4 has a rated operating frequency range of 500 kHz to 80 MHz, with the notation that it is usable down to 100 kHz. I tried it out only one time in the beacon band with indifferent results; its main effect seemed to be attenuation of the desired signal. Very likely I need to spend additional time with the unit, and probably need a more effective noise antenna for Longwave than the whip supplied by the manufacturer.

Serious logging of NDB signals requires certain reference material regarding frequency, modulation, identification signals, power, location, and any other pertinent information. A source that I used in the beginning was the 1990 edition of *The Aero/Marine Beacon Guide*, published by Ken Stryker through the Long Wave Club of America. It has been updated several times. A more recent reference is *Monty's 1998 Beacon Guide*, by Robert Montgomery, also published by the LWCA. Updated NDB information appears in *The Lowdown*, the LWCA's monthly newsletter.

Additional NDB information appears in two monthly listener magazines. *Monitoring Times* features a column called "Below 500 kHz," by Kevin Carey, while *Popular Communications* includes NDB data in one called "Utility Radio Review," by Joe Cooper. Other sources of NDB information are the Airport/Facility Directories and aeronautical charts published by NOAA. These are usually available at even small airports. A number of Internet websites also have such information. But including their URLs is beyond the scope of this article.

My NDB loggings are first recorded in pencil on special 8-1/2"x11" forms I have designed for fitting in a 3-ring binder. When a page is full, I enter the data into a GWBASIC program I have written specifically for this purpose and add it to the disk file, with a backup. As circumstances require, I make a printout so I can have a fairly current record before me as I tune around.

The entries are sorted by frequency, with a separate disk file for each channel from 190–530 kHz. In reviewing the printout, it is helpful to know that certain conventions have been followed in preparing the data. The modulating frequency is not shown for those U.S. stations using 1020 Hz, nor is SSB indicated if that is the known mode. All stations using DSB are also indicated. A question mark following data indicates that it may be correct, but the item does not show in an available reference. Entries labeled as "new" designate ones that were not found in the 1990 Aero/Marine Beacon Guide. Distance information for certain foreign stations were calculated with a computer program from the station's latitude and longitude. The country or province for DX stations is printed in capital letters.



An NDB "T" antenna supported by wood poles or metal towers with an above ground level height of 50 to 60 feet. The transmitter and coupler can be mounted on a wooden post beneath the antenna downlead. (Photo courtesy Southern Avionics Company).

In order to find out more about the products, clubs and organizations mentioned in the above section of the column, please see the special boxed information provided at the end of the column.

Reader's Letters

It's always a pleasure to get correspondence from the readers — even those that contain opinions that are a little critical of what's happening in the column.

Fortunately the majority of letter's and E-mails have been positive and supportive. Here are some examples that have crossed my desk or computer screen over the past two months.

Dear Joe,

First, let me say that I am very much enjoying your new series of "Utility Radio Review" columns in *Popular Communications*.

Following the August edition, I had occasion to visit my hometown, Sutton, West Virginia. Armed with my *Pop'Comm* and my DX-398, I set out to hear non-directional beacon JTM on 234 kHz, as advertised in the table on page 72 of that issue. Hearing nothing from my lodging location, I drove to the Sutton airport for another try. Still nothing. Observing a small group of fellows working on an aircraft inside a hangar, I inquired about the beacon. Pointing to the nearby knoll on which the transmitter and antenna had been located, one of the guys advised that the beacon had been removed from service about four years ago.

Just wanted to update you on that one. Thanks for doing the column, and please keep up the good work!

Jim Byrne,
South Charleston West
Virginia

Well Jim, thanks for the great story and updated information. I hope other readers get some inspiration here and send in similar information. This column is about more than monitoring; it's about the utility radio service as an important part of our community and our lives. Again, I'd like to hear from those who work at utility radio stations. What's it like to run one? What kind of problems do you have? What's the latest trends in the business? Drop me a line soon!

Mr. Joe Cooper,

Most of my monitoring time this past month was spent trying to find the USAF or NOAA aircraft that fly into hurricanes. I have all kinds of HF frequencies for this activity that I obtained from various and sundry sources, but after a lot of time monitoring them I have not heard a thing related to hurricanes. This afternoon Hurricane Gordon is making its landfall on the Gulf coast of Florida, and even with the aircraft investigating the weather close to my location, still not a peep.

I only have a few logs of interest to send you. I have heard 8BY, the U/I CW station, on many other freqs for several years. The callsign allocation falls within those used by Indonesia, but this station can not be located there.

Best Regards,
Larry J. McMahan

Larry poses a good question in his letter. Why was there no discussion about the hurricanes over the radio? Can anyone solve this mystery? Our next reader also has a good question.

Hello, Mr. Cooper.

I had to voice my opinion of your article since everyone else seems to have. I like it. I am not a big Ute guy, but I am starting to get into it. I like the amount of logs you include as they are the most interesting ones. I don't think we need to log every beacon that everyone hears (unless of course it is logged from some ungodly distance).

Thanks for your time, and keep up the good work.

Adam Smith,
Federal Way Washington

Mr. Smith has a good point. Due to the fact that so many of you have been asking for logs, and not wanting to offend anyone who takes the time to make them and send them, I have not been editing them down. How do you, the reader, feel about this? Quantity or Quality — that is the issue here, and it is your opinion that will direct me.

Speaking of opinion, not everyone is completely pleased with me, as the next letter shows.

Joe,

I have been learning a lot of interesting information from your column, and I appreciate your efforts.

However, I've got to admit that I can sympathize with Ted Powers' comment that you publised in the October column.

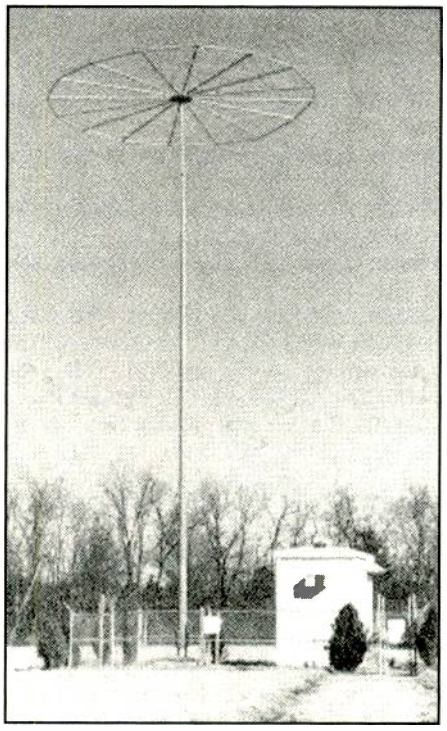
Perhaps what he was talking about was how much you have talked about what you are doing in the column, who you have talked to about it, what your rationale is.

This even shows up when you get to your topic of the month. A discussion of why you selected what you did, why you think it might be of interest, why you are going to discuss it in the manner you are.

All the topics you have picked have been worthwhile; some of more interest that others, but that will always be true. May I suggest that perhaps — and I don't know exactly how to say this — the column would be even better by telling us about the topic more than why you decided to do the column as you did and why you selected the topic and how you decided to organize it.

Wes Leatherock,
Oklahoma City, OK

Point taken, and I am working at "tuning" my writing style to keep things relevant and to the point. The Editor of this worthwhile magazine has restricted me to nine pages maximum for the column, and this may help "motivate" me to keep things to the point. So in the future look for more steak, less sizzle and lots of logs.



An NDB MDE located in Madiera, Ohio. This photo shows a self-supporting vertical antenna with capacitive top hat and transmitter shack.(Photo courtesy Xetron Corporation).

And speaking of logs, here are this month's contributions.

Reader's Logs

Note: All frequencies in kHz.

2808.5: FBI Quantico MIL-STD 188-141A clg AL1: FBI Albany, NY. (MADX)

4146.0 2: EE OMs in USB at 0400Z reference exhaust header problems forcing them to return to port. Same vessel had a hydraulic line bust and had no repair parts. At 0415Z, two shrimpers came on freq. covering the other stations. (RRM)

4426.0: Volmet Wx for East Coast (EN)

4536.0: Unid poss National Guard 0245 MIL-STD 188-141A w/sounding call. (MADX)

4604.0: Red Robin, Civil Air Patrol, Michigan, U.S., in USB w/personnel matters. (LJM)

4886.5: DUST: Unid 0248 MIL-STD 188-141A w/sounding call. (MADX)

5194.0: UNID: 1000 USB w/ANDVT pulses. (MADX)

5333.4: USB TIME 0506 possible navy radar net involved in fleet exercisces As one operator said no data on my screen. C/S FOXTROT, ROMEO NOVEMBER, also mentioned E-mail. (JD)

5333.5: USN Fleet Area Surveillance network, many mobile units in USB w/Gator and Timber info. (LJM)

5333.5: ECHO FOXTROT wkg various single letter phonetic callsigns; USN stations coordinating apparently both Link-11 and Link-16 links. (RRM)

5450.0: RAF London, England in USB w/YL/EE and wx. (LJM)

5500.0: Unid Colombian Navy 0142 CLOVER-2000 in tfc. (MADX)

5696.0: 6001: USCG HH-60J 0830 USB wkg CAMSLANT. "On short final for crew swap at Williamston, NC."(MADX)

5696.0: 1500: USCG HC-130H 0031 USB wkg CAMSLANT w/"flight ops normal." (MADX)

5717.0: HALIFAX SEARCH/ RESCUE 230 Rescue-230 was told to "liaise" with Clarks Harbor, and when situation was under control to return to base. (JH)

6458.5: American Forces Network, in USB w/rebroadcast of NFL football game. (LJM)

6501.0: Coast Guard Camslant calling cutter *Gentian* with no response. Freq note: cutter is a training ship for Carribean Coast Guards such as Trinidad and Tobago. Also used for logistics and disaster relief.(JD)

6628.0: UNID speaker with Spanish accent. EE (EN)

6809.0: FC8FEM: FEMA Region 8 0150 MIL-STD 188-141A ALE w/sounding call. (MADX)

6912.0: Mossad Numbers Station 0318 USB w/"KPA2." (MADX)

6966.0: 0000001220: poss Iranian Military 0645 MIL-STD 188-141A w/sounding call. (MADX)

7385.8: NAVY MARS NET OPS talking about a new freq. for net 4.802.0 C/S NNN0GAQ3 NNN0 AKT TIME 1338 UTC USB 4BRAVO2 ALPHA NET. (JD)

7620.0: E5: The Counting Station 0332 AM w/5FGs (3/2) in EE. (MADX)

7632.0: WRL: Warner Robbins AFB 0152 MIL-STD 188-141A ALE w/sounding call.(MADX)

7720.0: UNID: 0307 MIL-STD 188-141A w/end of call followed by ANDVT. (MADX)

7792.0: Royal Navy: 0032 BAUDOT 75/880 w/RYs in the clear then encrypted. Typical vmgtcnjbh intro following RYs. (MADX)

8050.0: CRM poss Mexican Navy 0134 MIL-STD 188-141A ALE clg CLC41: poss Mexican Navy.(MADX)

8056.0: E80267: U.S. Army MH-47E 0134 MIL-STD 188-141A ALE w/sounding call. (MADX)

8098.6: UNID: 0018 SITOR-A 100/170 w/EE chatter. Apparently shipping related.(MADX)

8125.0: KLO87: FAA Net Control Station 1443 USB w/Eastern Region Net Roll. (MADX)

8400.0: ENSB: Colombian Naval Academy Barranquilla 0101 MIL-STD 188-141A clg COVENASYB: poss Covenas Airbase. (MADX)

8422.0: KPH (RTTY) personal letter from YL. Another from someone on board the "Mahimahi." (EN)

8450.0: 5AB, Bengazi R., Libya w/CW marker. (LJM)

8450.0: 5AB: Benghazi Radio 0118 CW w/call tape. (MADX)

8478.5: FUF: French Navy Fort de France 0121 BAUDOT 75/810 w/call tape. (MADX)
8496.0: CLA: Havana Radio 0124 CW w/call tape. (MADX)
8503.9: NMG: USCG New Orleans 0127 FAX 120/576 w/chart. (MADX)
8551.6: CTP, NATO Lisbon, Portugal, in Baudot 75/850 w/NAWS marker. (LJM)
8573.0: CLA: Havana Radio 0130 CW w/call tape. (MADX)
8617.0: XSV, Tianjin R., China w/CW marker and sitor phasing signals. (LJM)
8624.0: XSQ, Quangzhou R., China in CW w/marker "cq de xsq up 356 k" (LJM)
8698.0: 7TF, Boufarik R., Algeria with malfunctioning CW auto-keyer that sends strings of 3's instead of usual marker. (LJM)
8698.0: 7TF6: Boufarik Radio 0134 CW w/call tape. (MADX)
8737.0: 5BA42: Cyprus Radio 0135 USB w/voice mirror. (MADX)
8800.0: PPR, Rio de Janeiro R., Brazil OM wkg vessels in Portugese. (LJM)
8825.0: UNID request aircraft go to 6628. (EN)
8843.0: San Francisco wrkng United 59. United 59 acknowledge SF message (EN)
8971.0: CARDFILE 711 (P-3C) wkg FIDDLE (TSC Jacksonville) in USB to pass reports and a request to drop sonobouys outside of the assigned drop area. (RRM)
8983.0: USB CAMSLANT; USCG IN COMMS W/34 CHARLIE A/C RE/ITS POSITION reports "go fast" motorboat moving 240 degrees at 25 KTS. Suspect vessel is dead in water; now underway again. CG operator reports to 34 C that stingray 35 A/C AND 41 Alpha will relieve them on scene. OPBAT advises army helo will be airborne ETA 15 mins. Army helo will contact 34C on BLUE ONE CH. (JD)
8983.0: RESCUE 6033 (HH-60), RESCUE 1720 (C-130) and CAMSLANT in comms (USB) reference MV Chios Dream and Cruise Ship Tropical (Tropicale?) and patients on board Chios Dream. (*Note: this was part of the SAR operation for the Cuban "hijacking" on 19 Sept.*) (RRM)
8983.0: RESCUE 1503: USCG HC-130H 2302 USB wkg CAMSLANT. (MADX)
8992.0: MAINSAIL/ANDREWS "FOR REGION ALPHA, FOR REGION CHARLIE" two-part EAM broadcast simultaneously on 8992, 11175, and 11244 kHz. This was echoed by HICKAM at 0500Z on 8992 and 11175 kHz. (JH)
8992.0: SKYKING/HICKAM SKYKING message. Echoed by CROUGHTON (England) at 0534Z and THULE (Greenland) at 0535Z on 8992 kHz. (JH)
8992.0: ANDREWS/REACH 7042(C-17) several phone patches: to HILDA METRO for wx forecast at GRK, ETA 0200Z; to HILDA WEST, passed offloading info for GRK. Other p/p's to Robins Gray Army Aifield Ops giving ETA, repeated offloading info, added passengers to the offload, inquired about the DV who was to meet the aircraft, requested customs, agriculture people to meet the acft, and advised he needed fuel upon arrival. (JH)
8992.0: MAINSAIL/ANDREWS EAM broadcast (32 characters) simo on 6712, 6739, 8992, 11175, 11244, 15016,and 13200 kHz. Echoed by THULE (Greenland) on 11244 at 2346Z. (JH)
8992.0: Andrews EAM message phonetic alphabet. (EN)
8992.0: Andrews working Mainsail EAM message pheonetic alphabet (EN)
8992.0: Hickam working VZM Phone patch re. ETA. (EN)
9025.0: ANDREWS: Andrews AFB 0322 USB wkg WEST COAST: McClellan AFB in voice w/radio checks and MIL-STD 188-141A (IDs: ADW and MCC). (MADX)
9085.0: RAD: unid Colombian Navy (Radgena) 0029 MIL-STD 188-141A clg VAD: unid Colombian Navy. (MADX)
10204.0: IMPLICATE/ MACINTOSH Radio check. Loud and Clear. (JH)
10540.0: CESYP: Colombian Navy Special Command San Andres and Providencia Islands 0254 MIL-STD 188-141A wkg ANTIOQUIA3: CM-53 Antioquia FS-1500-Class Corvette w/msg servicing/op chatter. (MADX)
10608.0: BARRANCA: prob Squadron Base Barrancabermeja 0059 MIL-STD 188-141A ALE clg RADGENA: unid Colombian Navy. (MADX)
10608.0: D3S: Prob USCG Cutter 2200 USB wkg USCG GROUP MIAMI on "high fox." ANDVT at 2202.(MADX)
11034.7: Prob Egyptian MFA 0036 SITOR-A w/selcal OOVF: Egyptian Embassy Pyongyang DPRK. Also in SITOR-B instructing Pyongyang to transmit on 11541.7 kHz. (MADX)
11175.0: (various acft)/ Puerto Rico New callsign. Acted as USAF GHFS station, conducting radio checks and phone patches for a number of aircraft. Initial callup was preceded by 15 minutes or so of a four or five-minute loud musical score by bells and chimes that blocked other transmissions on this frequency. (JH)
11175.0: ANDREWS/AUSSIE 805 Requested SELCALL LPDC . . . then advised Andrews to disregard.
11175.0: ANDREWS/ZW314 P/P for Brunswick NAS weather forecast for 2400Z. Weather was unfavourable for arrival time; discussed weather at other bases in Maine, decided Portland was the best, with ceilings of 600 feet. (JH)
11175.0: MAINSAIL/ANDREWS EAM broadcast (about 26-character msg) on 11175, 8992, 11244 kHz simultaneously. (JH)
11175.0: MAINSAIL/COBRA 72 Ground radio check. (JH)
11175.0: Mainsail wrkng NavyQEØ84 No response from Mainsail 2223 21Se00 Newbury, NE.
11175.0: 064 trying to work Mainsail. No reply (EN)
11175.0: Mainsail de Andrews Coded EAM message (EN)
11175.0: Andrews de Offuit Radio check (EN)
11282.0: San Francisco working 35225 at 2250 on 05 Oct 00. "Confirm time over ____." Believe an error has been made." (EN)
11342.O: A/C BRITTANIA 259 CLG NY ATC for WX report of winds calm, visibility more than six miles. VARIABLE WINDS 2000 FT. TIME 1257 UTC. sec. freq was also used. (JD)
11342.0: CONTINENTAL 725 in contact/w ARINC NY RE/PASSENGER ILLNESS. 725 will divert to SAN JUAN P.R. TIME 0115 UTC. (JD)
11342.0: NY wrking MMUN and MUCL Advice on T-Storm (EN)
11440.0: ESPARTANA: Colombian Coast Guard Patrol Craft Espartana (PM-41) 0112 MIL-STD 188-141A ALE clg RADGENA: Unid Colombian Navy. (MADX)
11476.0: Dominion in USB wkg numerous mobile units w/test of USN Fleet Area Surveillance network. Much talk of Gator and Timber digital protocols. (LJM)
11476.0: DOMINION wkg various single letter phonetic callsigns; USN link coordination net. (RRM)
11495.0: Unid Iranian station 0241 ALE w/sounding call. At 0412, 0000001220: unid Iranian station w/sounding call. Again at 0512, 0613, and 0643. These 10-digit calls reportedly are part of an unid-Iranian network.(MADX)
12101.0: S12: Swedish Embassy Bogota 0138 ALE/QPSK wkg S84: Swedish Embassy Washington, D.C.(MADX)
12132.0: BA1: unid 0947 MIL-STD 188-141A clg BR3: unid. Also at 0949, 0953, and 0955. At 0959, clg BR3, AR3: unid and BO3: unid. All probable FBI, although signal strength (for what it is worth) suggests a non-local signal. (MADX)
12592.0: KUSV test pattern ARQ625 (EN)
12673.5: CLA: Havana Radio 0041 CW w/call tape.(MADX)
12685.5: Amercan Forces Network, Key West, FL, in USB w/rebroadcast of NFL football game. (LJM)
12691.0: RFVIE, French Navy, Le Port, Reunion Island in Baudot 75/850 w/ry's (LJM)
12750.0: CWA, Cerrito R., Uruguay in CW at 0040 w/wx broadcast for South Atlantic in spanish. (LJM)
12801.0: TAH: Istanbul Radio 0045 CW w/call tape. (MADX)
12984.0: 4XZ: Haifa Naval Radio 0048 CW w/call tape.(MADX)
13031.2: FUF: French Navy Fort de France 0049 BAUDOT 75/810 w/call tape. (MADX)
13062.0: CLA: Havana Radio 0051 CW w/call tape. (MADX)
13089.0: Volmet (Unid) Forecast for Gulf of Mexico re. tropical storm (EN)
13257.0: UNID Station working aircraft re WX. (EN)
13306.0: NY wrkng Continental Ø67 position report. (EN)
13530.0: CESYP: Colombian Navy Special Command San Andres and Providencia Islands 0051 MIL-STD 188-141A wkg BARRANCA: prob Squadron Base Barrancabermeja via ZARRAN: unid

Resources For Low Frequency Monitoring

Note: The following information is provided as a guide only. Please contact people and companies listed below for more information on their products and services.

Clubs:
Longwave Club of America
http://www.lwca.org/
or write to:
45 Wildflower Road Levittown, PA 19057 USA

They publish a monthly newsletter called *The Lowdown*, which is included in the membership dues.It is $18 a year in the United States, $20 a year in Canada and Mexico, and $26 a year for overseas members.

National Radio Club
http://www.nrcdxas.org/catalog/

Internet Resources:
List of NDB
http://www.unetsul.com.br/py2pll/ndb_list.htm
Essay on NDB
http://www.southernavionics.com/sac1g.htm
Dxing.Com
http://www.dxing.com/lw.htm

Equipment:
Loop Antennas
http://www.inforamp.net/~funk/page6.html
http://www.frontiernet.net/~jadale/Loop.htm

Timewave DSP
http://www.universal-radio.com

VLF Converters:
http://www.monitor.co.uk/vlf.htm
http://www.antennex.com/palomar/page_3.htm
http://www.radiosky.com/upconv.html

Other Logs and information:
Raymond Richard Rocker
http://www.datasync.com/~rocker/longwave.html

Intro to VLF Monitoring
http://www.provcomm.net/pages/joe/introvlf.htm
http://www.amrad.org/projects/lf/

Manufacturers of NDB:
Southern Avionics
http://www.southernavionics.com/

Colombian Navy. Also in CLOVER-2000. At 0056: BARRANCA clg RADGENA: unid Colombian Navy. (MADX)
13874.0: The Counting Station 2007 USB w/"980" and I–10. (MADX)
13900.0: DEPA: Unid Moroccan MOI 0138 MIL-STD 188-141A ALE w/sounding call. (MADX)
13927.0: MARS RADIO/KING 33 (HC-130?) P/P DSN 497-0680 with command post GUNRUNNER. Notified gunrunner he departed Halifax, Nova Scotia, ETA Patrick AFB (Florida). (JH)
13972.1: WA9XHN: RTTY experimental broadcast station 0055 BAUDOT 45/170 w/EE nx. MADX)
14421.0: The Counting Station 0308 AM w/"825" and I–10 in SS.(MADX)
14776.0: FM6FEM6: FEMA Region Six 2257 ALE w/sounding call. (MADX)
14812.5: S72: Swedish Embassy Kinsasha 0149 MIL-STD 188-141A ALE wkg unid station (prob S25: Swedish Embassy Lisbon). (MADX)
14814.0: CYP: Prob British Military Contingent Cyprus 0150 MIL-STD 188-141A ALE w/sounding call. (MADX)
16788.0: U/I vessel on ship station ch. 7 w/news in Tagalog about the Phillippines. Op signs off "this is spites 94/95." (LJM)
17050.0: 4XZ: Haifa Radio 0006 CW w/call tape. (MADX)
17166.0: CLA: Havana Radio 0003 CW w/call tape.(MADX)
19530.0: U/I station w/Baudot 75/850 repeats the quick brown fox etc. endlessly w/no ID given, but every fifth line has an error. Probably U.S. Navy. Station is also noted on 5320. (LJM)
20267.0: UNID: Russian Diplo 1615 CROWD36 idle then into tfc. QRT at 1620. (MADX)

Log Contributors

RMD — Jim Deardorff
EN — Ed Newbury
JH — J. Hall
LJM — Larry J. McMahan
MADX — MidAtlanticDXer
RRM — Roland R. McCormick

Thanks again to everyone for your excellent contributions. Your efforts are appreciated!

Last Word

Now that we are finally entering into the new millennium (I'm of the school of thought that believes it really begins in 2001) there are lot of new challenges awaiting us. To celebrate this year, I'm going to be offering readers who submit logs and reports some "suitable for framing" certificates and some prizes too. In next month's column, I'm going to outline the rules, and tell you more of what I have in mind.

I'd also like having some suggestions for themes for this year's columns. There are always the standby military and naval topics, but how about something different? Send in your ideas, because I enjoy researching them and turning them into column material. Likewise, as I said at the beginning of this month's column, rough out ideas and let me write it up for you.

I know there is a lot of talent out there — it is just a matter of getting the information out of you so that it can be shared with others who read this column.

Likewise, are there any events that are coming up soon that would make a good background piece for the frequencies of target services? This could also include major breaking news, or scheduled events such as space shots, or major military exercises. Please pass on the information and I will put it to good use.

So there you have it, the basic agenda for the year 2001. And don't forget to send in your logs! Be it one or 100, each log is an important contribution to the success of this column. They are all appreciated.

Until next month, take care and may this year be the best year in your utility monitoring career! ■

THE HAM COLUMN

Getting Started As A Radio Amateur

Chasing Paper: Awards!

If you're the kind of ham who likes a good challenge, and you want the documentation to prove it when you've made good on the requirements — researching, chasing, and displaying ham radio operating awards will definitely enhance your enjoyment of the amateur radio hobby.

The quest for ham radio operating awards and certificates captures the attention and efforts of almost every ham at one time or another. Some make it a lifelong journey. So, whether you're after one specific award, or you're aiming to cover every inch of available wall space in your shack, the sheer number of available awards will keep you tuning the bands for quite some time. With the solar cycle providing its present slight boost to propagation, award-hunting opportunities will exist day and night.

In addition to providing a creative outlet for that pile of QSL cards you've been amassing, chasing awards can motivate you to improve your station and operating skills. A lot of ham activity is sparked by the desire for one award or another.

Your Competitor: Yourself

You can spend as much time as you like in the chase because you're really competing with yourself. There are hundreds of awards and certificates to work toward, some easy, some almost impossible. Set your sights on one or two that make sense and go for the gusto. In this month's column, we'll examine several of the most popular awards, show you how to apply for them, and how get more information about them.

Getting Started — WAC

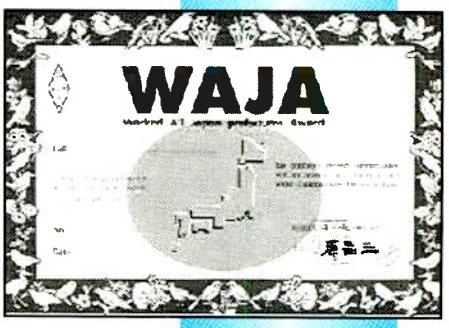
The **Worked All Continents** award is a beginning DXer's first achievement benchmark. It's given by the International Amateur Radio Union for confirming contact with hams in the six continental regions of the world: Africa, North America, South America, Asia, Europe, and Oceania (the South Pacific, including Australia, New Zealand, and Hawaii). Endorsements are available for different bands and modes. Once the basic award is under your belt you can start on the Five Band WAC award and the Six Band WAC endorsement. For complete rules and an application form, send an SASE to Awards Manager, ARRL, 225 Main St., Newington, CT 06111, or point your Internet web browser to <www.arrl.org/awards/>. ARRL membership is required for U.S. hams.

"The quest for ham radio operating awards and certificates captures the attention and efforts of almost every ham at one time or another. Some make it a lifelong journey."

A Worthy Challenge — WAS

The **Worked All States** award is just what it says: Work and confirm contacts with hams in all 50 states. Aside from the basic certificate for any combination of bands/modes, specialty certificates are issued for a variety of different bands and modes such as Satellite, 160 meters, SSTV, RTTY, and each VHF band. Available endorsements include SSB, CW, Novice, QRP, Packet, EME, and any single band except 30 meters. Your QSL cards are checked locally by a volunteer ARRL HF Awards Manager affiliated with an ARRL Special Service Club (although QSL cards can be checked at HQ, absent an awards manager). For a complete list of WAS rules, send an SASE to the ARRL Awards Manager or point your web browser to <http://www.arrl.org/awards>.

To encourage increased activity and station improvement throughout the bands, the Five-Band WAS certificate (and plaque) is available for working all states on five amateur bands (except 10/18/24 MHz). Once you've gotten your WAS or 5BWAS award, you can



The ham radio awards pictured here are only three of the thousands available worldwide. The Worked All Japan and Heard All Japan awards are granted for working (or hearing) hams in all 47 Japanese prefectures. The 10-10 Mobile Award is given to 10-10 Club members who work at least 25 other 10-10 Club members while operating mobile (from cars, boats, planes, etc.). Ham radio awards are offered by national ham radio organizations, to club stations, to individual ops. Qualifying for them and collecting them can be quite an addiction. You'd better get started right away!

BY KIRK KLEINSCHMIDT, NTØZ

announce it to the world with a WAS or 5BWAS pin!

The Big One — The DX Century Club

This sought-after award is the DXer's benchmark. **DXCC** is awarded to hams who confirm contacts with fellow hams in 100 or more "DXCC entities." Although countries such as France and Sweden are definitely DXCC entities, other areas such as Hawaii and Alaska are *also* considered DXCC entities, which makes your job a little easier, if a bit more confusing!

There are presently more than 300 entities on the official "ARRL DXCC List," which is available from the ARRL in printed form, or from its Website at <www.arrl.org/awards/dxcc/>. There you'll also find a complete list of rules and DXCC award endorsements. ARRL membership is required for U.S. hams.

Many DX contest competitors work DXCC in one day, so you should be able to finish working your DXCC contacts in a few months of mostly casual operating.

Other Awards

As I mentioned earlier, there are literally hundreds of other ham radio awards to work toward. They're sponsored by ham radio magazines such as *QST* and *CQ*, national societies and local/regional clubs and associations. The biggies include the ARRL and the Radio Society of Great Britain (RSGB). You can earn awards for working all 10 callsign areas in Japan, for working 100 or more Russian oblasts (similar to U.S. states), or for working 100 or more "islands of the world" (IOTA, short for Islands On The Air).

One popular awards program is managed by *CQ* magazine (a *Pop'Comm* sister publication). For more information, point your web browser to <www.cq-amateur-radio.com/>. For a huge list of DX-oriented awards worldwide, check out a great site created by Ted Melinosky, K1BV. Ted has published *The K1BV Awards Directory* since 1987. Look up the electronic version at <www.dxawards.com/>. If you're a real wallpaper hound, be prepared to spend several hours scouring this excellent site and its many links.

Your suggestions, letters and QSL cards are always welcome. Write to me at "The Ham Column," 25 Newbridge Rd., Hicksville, NY 11801. ■

PRODUCT SPOTLIGHT

Pop'Comm Reviews Products Of Interest

Ranger's RCI-2970DX Transceiver

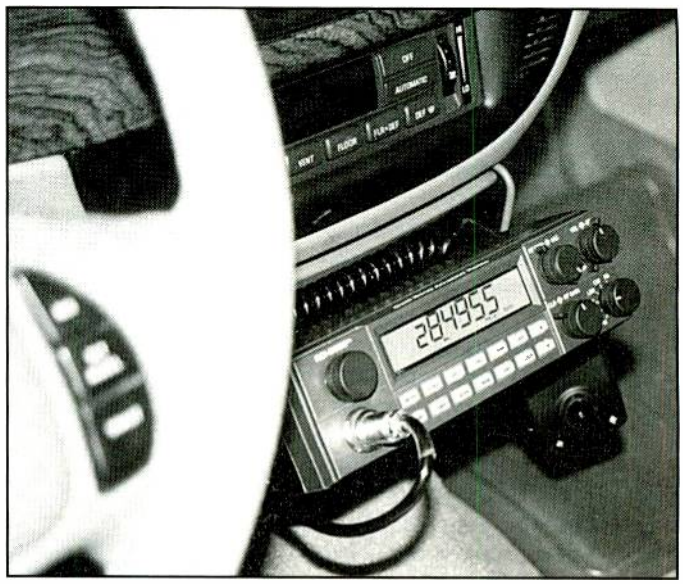
Ten meters is a fabulous band when it regularly "opens" during summer months for short skip, and in the fall for long-range F2 skywave excitement. Now that we are riding the peak of solar cycle 23, we can expect another five or six years of regular skywave activity during daylight and evening hours on 10.

Ranger Communications, Inc., based out of San Diego, California, manufactures a huge selection of 11-meter CB radio equipment as well as 10-meter and 12-meter amateur radio gear. We were fortunate enough to be able to test the Ranger amateur radio Model RCI-2970DX, a transceiver with a built-in huge-heat-sink RF amplifier coming out the top. Just by feeling the weight of this equipment, we knew it was really going to belt out a big signal on ham frequencies.

We ran the equipment in our communications van, tying directly into a 100-amp, 12-volt circuit with enough power to drive the equipment to 100 watts output at about 23 amps peak current load. Keep in mind that it only draws 23 amps on SSB during voice peaks for each syllable — not 23 amps continuously!

Our antenna was the Outbacker from Alpha Delta, and we tapped into either the 10-meter point or the 12-meter point on the side of the shaft. Frequencies read out on the Ranger 10/12-meter ham set from a very clean, crisp, and clear LCD display. We found that we could backlight the LCD display for nighttime operation at four different levels, which was great!

We tuned around the 10-meter band with the medium-sized tuning knob just above the mic cord, or could have used the microphone up and down buttons to tune. We liked the tuning knob better. The Ranger 2970 tunes at 1/10 kHz, 1 kHz, 10 kHz, and if you're really looking for activity fast, 100 kHz. There is also a 1-MHz tuning step to take you from 28 MHz to 29 MHz.



Ranger's RCI-2970DX transceiver.

Effective Noise Blanker

We found most of our operation was upper sideband around 28.400 MHz. The noise blanker was quite effective in keeping down the racket from the Chevy's 454, and the unit ran relatively cool from the large heat sinks even though we were pumping out 100 watts of power. There is even a capability of dual VFO operation if we should encounter any foreign DX working split.

There is plenty of excitement for General class operators up at 29.6 MHz, frequency modulation (FM). You can operate FM simplex at 29.5 and 29.6 MHz, as well as FM repeater at 29.62, 29.64, 29.66, and 29.68 MHz. There is a repeater offset switch with a standard 100 kHz offset. Many repeaters throughout the country operate open squelch, so no subaudible tone is required. Ranger produces an optional CTCSS encode/decode module that easily plugs into the equipment if you have a local 10 meter repeater in your area or a distant repeater via skywave.

We stored 10 frequencies in memory to give us easy recall. This was especially handy for some of the repeater frequencies. Having them in memory saves having to look down at the equipment while we were spinning down the road. In the memory mode, the microphone's up and down buttons allowed us to jump from one memorized channel to another. Although 10 memories doesn't sound like a lot, it was fine for us — most of the activity on 10 meters is usually around a few certain spots.

Great 12-Meter Performance

The 2970's performance on the 12-meter band, 24.930 to 24.990 for voice, was also as advertised – great! There's full power output, and plenty of elbowroom where QRM is a lot less. You would be surprised how strong signals are at 24 MHz when the band is open. We also tried some CW between 24.890 to 24.930 with the Ranger, and the CW action was smooth. A 3-kHz RIT allowed us to get our CW signals perfectly in tune with other CW operators.

The 100-watt version of the Ranger 10-meter/12-meter amateur transceiver is around $400. The 25-watt version of this same equipment with the same features is only $299 as seen selling at local dealers. Part of the new Ranger Communications all-dealer sales program gives ham operators an opportunity to see the equipment in action, right on the dealer's showroom shelf.

Ranger also has the RCI-2990 base station equipped for rack mounting. The unit runs right off of 110 VAC with its built-in 12-volt DC power converter. We didn't have a chance to test that particular model, but we are told it's the same radio but with power supply added in.

We liked the Ranger equipment. For those that want to go exclusively 10 meters and 12 meters, and not any other bands, Ranger equipment works well. Their Website is www.rangerusa.com, or you can call them for sales and product information at 877-536-0772. ■

BY GORDON WEST, WB6NOA

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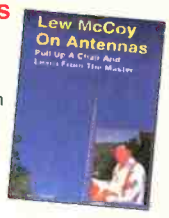

Unlike many technical publications, Lew prsents his invaluable antenna information in a casual, non-intimidating way for anyone!

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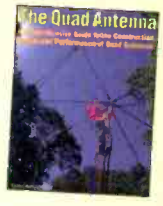

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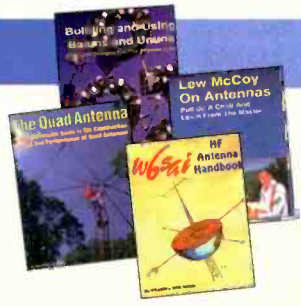

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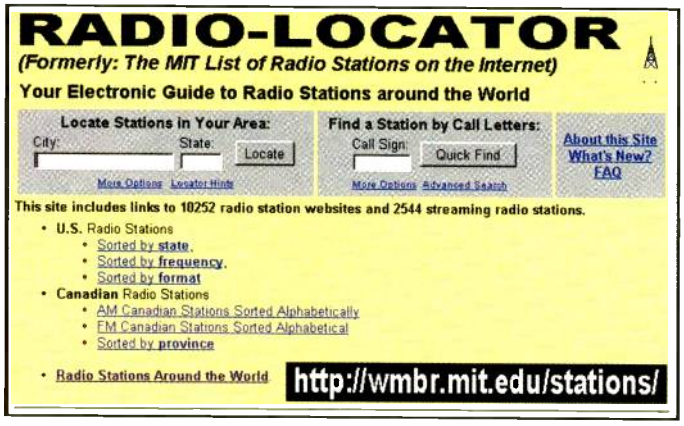
Stations On The Internet

Note: Remember, all online resources and contacts appearing monthly in *Pop'Comm* are available at the Quick Links site at http://www.dobe.com/ql/.

One of the interesting aspects of surfing the web in search of column material is observing how different people and businesses maintain their web presence over time. Based on my observations, there seems to be a growing tendency to launch a website only to abandon it a few months later when the site visitor count doesn't "take off" as expected, interests or priorities change, or reality sets in with respect to the work involved. Please don't misunderstand me. I'm not criticizing those folks since maintaining a website can be (and usually is) a VERY time consuming activity. If a site has a number of links to other sites, (most do) it can take an incredible amount of time just keeping the links current. Depending on the site's design and implementation, it can also be a VERY expensive endeavor. My reason for mentioning it here is definitely NOT to "put down" anyone — rather, just an observation and "lead-in" to one of this and future month's features. From time to time, I'll be revisiting sites that were previously noted here. If I see substantial enhancements or updates, I'll let you know about them. It's also my way of giving recognition and saying thanks to those folks who have relentlessly strived not only to keep their sites current but to add substantial and meaningful content as well.



Your electronic guide to radio stations around the world.

Radio Stations On The Internet

The name's changed but it's only gotten better. Maintained by Theodric Young at MIT's radio station WMBR-FM, "Radio-Locator" (formerly "The MIT List of Radio Stations on the Internet") is hands down, the most comprehensive resource of its kind on the web. Substantially enhanced since we last visited in November 1999, Radio-Locator now provides links (and information) to over 10,000 radio station websites (up from 8000+) and over 2500 streaming radio stations. There's a VERY good chance you'll find your favorite stations at Radio-Locator. In fact, after you've spent a little time there, you'll probably find some new favorites as well! When visiting, be sure to check out the "About this Site," "What's New," and FAQ pages. Many thanks and a tip of the ol' Sleuth's hat to Theodric for one incredible, enduring and constantly updated resource! Don't miss it at http:// wmbr.mit.edu/ stations/.

Experience a Flight on a Boeing 777 ... and more!

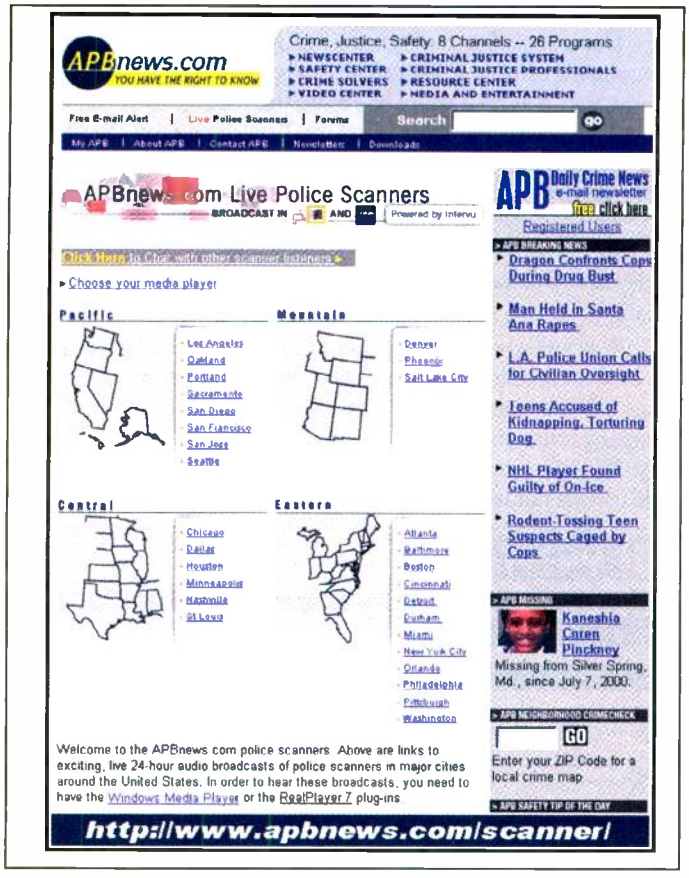
Aviation Scanning And So Much More!

Our November '99 column also noted cyberair.com as a resource for listening to the Chicago Approach frequency, transmitted from O'Hare Airport, Chicago, Illinois, and a recording of a disoriented pilot flying into an unfamiliar airport. Well, those resources are still there but that's only the tip of the iceberg today! Cyberair.com has grown dramatically! In addition to the scanner material of a year ago, they now host "Cyberair Airpark." When you "land" at Cyberair Airpark, you'll have access to valuable information by entering Cyberair Airpark's Control Tower & FAA Info, the Museum, the RealAudio area, the RealVideo area, the Fixed Base Operations building, the Links Area, the Gift Of Wings Aviation Store and more. One of the more interesting "tours" for me was one of their "5 By 5 Internet Seminar shows" where you ride along in a United Boeing 777. You'll be right there from the time the crew gets to the airport, through pre-flight, and into the air. Joining in the 59-minute audio and video slide show are two captains from United Airlines who share all of the interesting facts and figures about the aircraft. Another don't miss resource from cyberair.com at http:// www.cyberair.com/.

Scanning — Law Enforcement

"To Inform and Serve" is the stated mission of APBnews.com. It's an excellent resource for news, information, and data on crime, justice, and safety. Quoting information found at the site, "To Inform and Serve, is based on the belief that the criminal justice system belongs to the citizens, and that by informing them about the system, we are also empowering them to improve it. APBnews.com is committed to providing the news, information, and data necessary to make you, your family, and your community safer. You have the right to know." In addition, APBnews.com provides links to live 24-hour audio broadcasts

BY ERIC FORCE <eric@dobe.com>



Listen to police scanners from cities across the U.S.

of police scanners in major cities across the nation — 29 cities when I visited the site. In order to hear the broadcasts, you'll need to have the Windows Media Player or the RealPlayer 7 player or plug-ins installed. In case you don't have that capability, links to the audio players are provided. Updated daily, APBnews.com is a really nice resource — check 'em out at http:// www.apbnews.com/.

ACARS — Aviation's Digital Data Link System

From the Northern Virginia ACARS Page: "ACARS is the acronym for the Aircraft Communications Addressing and Reporting System, a digital data link system for civil and business aviation and their companies. ACARS transmissions are presently on VHF radio, and on HF in a developmental stage only. With the new wave of decoders arriving on the market from such companies as Lowe Electronics and Universal Radio, ACARS decoding is now within the reach of aviation enthusiasts who own an IBM-compatible PC and a high-speed serial port to connect the decoder to."

I haven't tried to receive ACARS data yet but it certainly looks interesting and The Northern Virginia ACARS page appears to be an excellent starting point. Take a peek at http://patriot.net/~jetset/ acars.html.

MURS: Multi-Use Radio Service

You'll find the latest scoop on MURS, GMRS, FRS, and much more at the PRSG (Personal Radio Steering Group) site. What *is* the PRSG? Here's how they describe their origin: "After the expiration of the federal PURAC charter in late 1978, several

Here's a great starting point for learning about aviation's new digital data link system.

Updated MURS info and more will be found here.

"study groups" and voluntary "notification networks" were created to encourage public participation in FCC rule-making inquiries, to study proposals for new personal radio services, and in general to carry on some of the programs of the PURAC. These groups were subsequently brought together under a common structure, the Personal Radio Steering Group. By consolidating individual volunteer efforts, a greater degree of administrative support and coordination was possible, and a broader exposure of their individual activities could be achieved."

You'll find tons of valuable information at this content-rich site. Don't miss it! Check out http://www.provide.net/ ~prog/.

Electromagnetic Radiation Explained

Jim Hawkins (WA2WHV) of "Jim Hawkins' Radio and Broadcast Technolgy Page" has done it again! This time by adding his "Electromagnetic Radiation Explained — How Radio Waves are Born" page. I won't even try to describe this awesome resource. I'll let Jim do it via his introductory paragraphs. "One of the least understood phenomena in electrical engineering is the idea that electric and magnetic fields appear to leave a radio transmitting antenna to form what we know as radio waves. Most books fall just short of explaining this process

Learn the inside scoop on how radio waves are born.

by making statements that fields snap or jump off the antenna as they expand. At the same time, books on electromagnetics present the needed laws of field behavior to explain wave propagation, but are so advanced that it can be difficult for us to relate what we are learning to radiation. This explanation attempts to go beyond the elementary treatments, while at the same time keeping the mathematics a notch simpler than the more advanced treatments of fields. This article will attempt to give the reader a better feel for how electromagnetic fields behave to provide propagated radio signals."

Folks, don't miss this! Even the ol' Sleuth could understand the concepts as presented by Jim. For those of you who missed seeing Jim's Radio and Broadcast Technology page noted several months ago, it's better than ever so be sure to spend some time exploring at http:// hawkins.pair.com/radio.shtml.

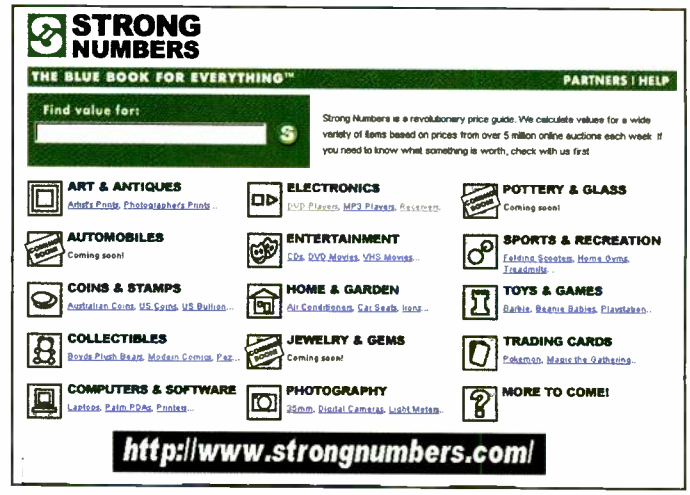
Prime Time Shortwave

Daniel Sampson's "Prime Time Shortwave" site had me going for a while. I initially thought I had snagged a completely new resource for *Pop'Comm* readers. But once I began to explore I KNEW this was an old friend. Yes, Prime Time Shortwave is a new and improved version of Daniel's "English Shortwave Broadcasts to North America" site we visited in July. Today, as then, Daniel continues to borrow a slogan from his employer to describe his effort: "I want to be the best source for schedules." I know you'll agree Daniel has more than succeeded! Super job Daniel — THANKS! Repeating my July statement: Don't miss this outstanding SWL resource. Be sure to visit http://daniel-sampson.tripod.com/shortwave/.

It's updated frequently, and a super SWL resource.

Strong Numbers

Don't you just hate it when you find one of your "million dollar" ideas already being implemented by someone else? Such is the case with one of my brainstorms put into action by another firm. "Strong Numbers" is a fast-growing and innovative Internet company founded in 1998 and based in the heart of Boston's Back Bay. It is an online price reference guide that is designed to provide users a fair market value for everything from computers and electronics to Beanie Babies. Billed as "The Blue Book for Everything," Strong Numbers is a revolutionary new type of price guide. If you need to know what something is worth (or at least what others are paying for it), perhaps that "perfect" receiver on the auction block at ebay™? Check out Strong Numbers at http://www.strongnumbers.com/.



Buying a used radio? Check out this online resource.

Dirty Mouse!

$%#*&^&!! — this mouse is driving me nuts! Getting the cursor to go where I want it is becoming next to impossible. Sound familiar? Time to toss out the old mouse and buy a new one? If you have a mechanical mouse, (95% of us do) the answer is probably not. The most likely problem is that dirt, pet hair, etc. has built up on the rollers inside the mouse. I was going to take some photos showing how to clean your mouse (using my cat hair infested mouse) but why reinvent the wheel? Here's a resource that will walk you through the easy procedure http:// www.ils.nwu.edu/~vandrvr/mouse/mouse.html.

Well, that's about it for this month. Remember to keep those comments and suggestions coming and don't forget to visit the Quick Links site at http://www. dobe.com/ql/ for easy access to all the resources noted here and the *Pop'Comm* Website at http://www.popular-communications.com/ for the latest and greatest. See you next month. ■

THE 2001 WRTH

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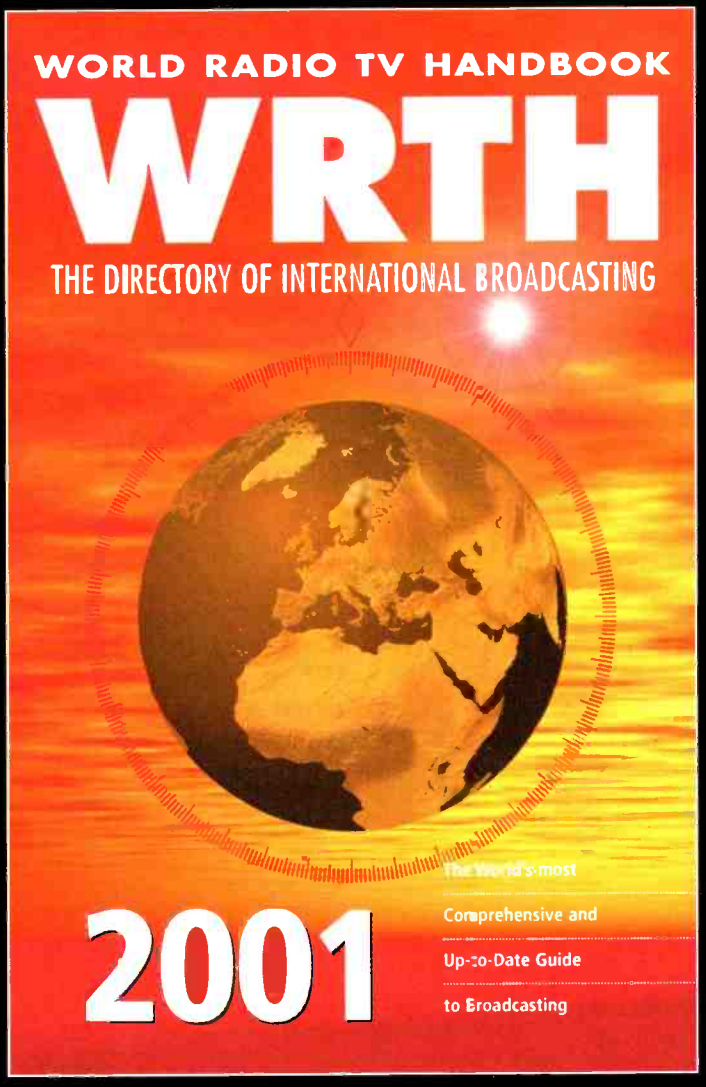

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THE LISTENING POST

What's Happening: International Shortwave Broadcasting Bands

UN Radio Returns To Shortwave

Another broadcast service, which used to be a regular on shortwave, has rediscovered shortwave. United Nations Radio has begun a regular, albeit sketchy, service to Africa. The broadcasts run 15 minutes each, as follows: in French from 1700–1715 on **6120** (via South Africa), **17580** (via Great Britain) and **21490** via South Africa. English from 1730–1745 on **6125** (South Africa), **15265** (Great Britain) and **17710** (Ascension). Arabic at 1830–1845 on **15265 and 17565**, both via Great Britain. These are all Merlin Communications facilities. The UN's unexpected appearance on shortwave is part of an effort to expand UN Radio's reach around the world, via satellite and direct cooperation with national and regional radio stations and networks around the world. It's been 15 years since UN Radio has been on shortwave (except for local stations carrying occasional UN programming). Reception reports are wanted and can be sent to: David Smith, UN Radio, Secretariat Building, Room S-850-M, New York, NY 10017.

It seems everybody's relaying everybody else these days, but this just may be the ultimate case of strange bedfellows. If you tune to **11625** between 2100–2130 or **9765** between 0200– 0300 you just may hear the Voice of Russia, coming at you via Vatican Radio! That's not set in stone, but certainly worth checking out!

Christian Vision has surely come on the air from Darwin, Australia by now (see last month's column). These broadcasts will be beamed to Asia and will likely air around the clock or close to it on various time/frequency combinations and probably in various Asian language. Initial tests were to be carried out on **6010, 13585, 17775, and 21680** so those spots are the logical places to start looking.

As of this writing Radio Yugoslavia is not broadcasting on shortwave. The main transmitter facility at Bjeljina is in Bosnian territory and the Bosnians have forced the staff there to discontinue use of the facility and get the heck out. The transmitter site at Stubline, in Yugoslavian territory was wrecked during the NATO bombing raids in the spring of 1999. Check **6100, 7115, 7120, 9580, 11835**, etc. during our evenings in the event this is somehow resolved, though it's probably unlikely anytime soon.

This computer-designed QSL for Adventist World Radio was issued to mark the 57th World Congress of the Seventh Day Adventist Church, held in Toronto last summer.

It's a lot tougher to hear than Christian Voice from Chile, but have a go anyway at **Radio Santa Maria, 6030**, which is back on the air. It signs on at 1045 daily except Sunday and that's probably your best shot. Sign-off is at 0230. The station is located in Coyhaique. Another Chilean, **Radio Patagonia Chilena, 6080**, is off the air at the moment but will be back when they get their new transmitter active.

Also reactivated is the **Voice of Guyana**, on **3290** or a shade under. They feature lots of local programming in English, and also carry four hours of BBC programming from around 0400. They're also known as the Guyana Broadcasting Corporation.

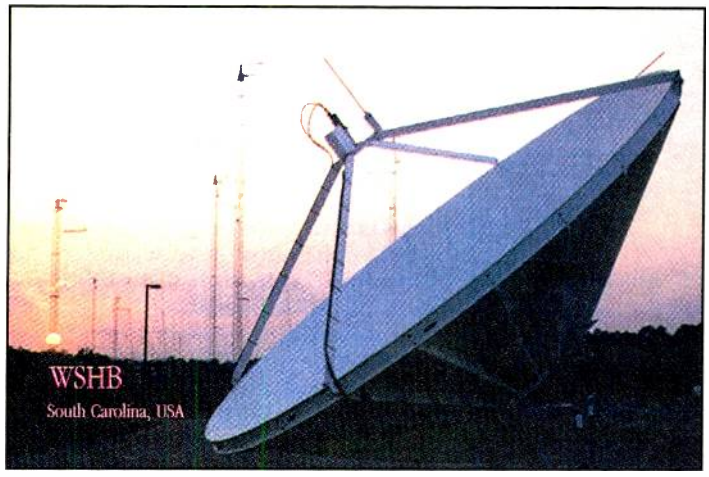
The new BBC Oman relay at Al Ashkharah will have three 250 kW transmitters when it becomes active in a year or two. The current site in Oman will be closed once the new one becomes active.

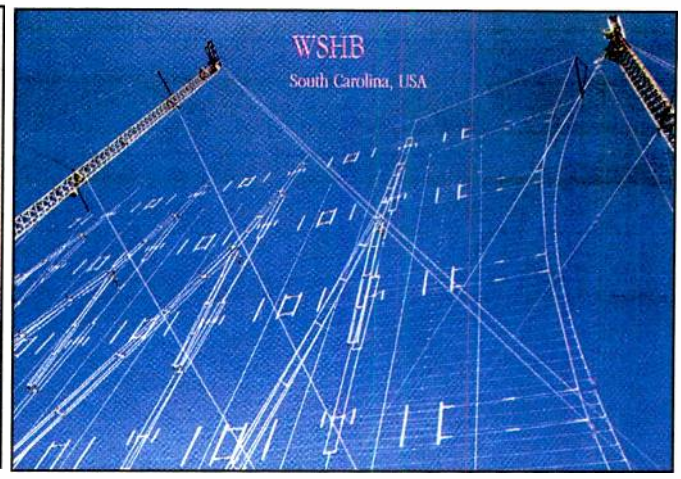
If you are into reception reports and QSL collecting you probably have your share of "war stories" — the trials and tribulations you went through to get Radio Whichever to reply to your report. We thought we'd heard everything until we heard about an old friend, Ron Hopkins in Canada. He recently got a verification from Radio Pyongyang. His first letter to them was mailed 40 years ago! And he's been working steadily on them for the last 15! Congrats, Ron. That redefines determination!

This month's book winner is Robert Brossell of Pewaukee, Wisconsin, who has been helping us out regularly with quality reports for many years. Bob will get a 2001 edition of *Passport to World Band Radio*, courtesy of Universal Radio — the people who have everything a shortwave fan needs for full enjoyment of the hobby. Their huge catalog has over 100 pages of gear, gadgets, and goodies. To get a copy call 614-866-4267 or write them at 6830 Americana Parkway, Reynoldsburg, OH 43068. And let 'em know who suggested you do so.

And by the way, *Passport to World Band Radio* is the first source we turn to when there's a question about a relay or a sign-

BY GERRY L. DEXTER





Here are the new and very attractive full color QSLs being issued by Herald Broadcasting/WSHB.

on time or the spelling of a station name. The 2001 issue is out now and we strongly recommend you get a copy. If you do without, you're listening with half an ear!

Remember that your reception logs are always welcome. Please be sure to list your logs by country, provide at least a double space between each one (so we can navigate scissors more easily) and add your last name and state abbreviation after each logging. Logs are cut and sorted so be sure to use only one side of the paper — otherwise some of your logs won't survive. Other things we can put to good use are spare QSL cards you don't need returned (or good quality copies), station photos and other items from stations, including schedules, brochures, etc. 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, **9615** in RR with pops at 0920. (Barton, AZ) **12105** at 1702 with IS, music. (Miller, WA)

ALGERIA — Radio Algiers Int'l., **15160** monitored at 2000 in EE with news. (Linonis, PA)

ANGUILLA — Caribbean Beacon, **6090** at 0845 with Gene Scott. Same old same old. (Newbury, NE)

ANTIGUA — Deutsche Welle relay, **6160** at 0904 with news, "Newslink." (Jeffery, NY)

ARGENTINA — Radio La Plata, **13365.5 LSB**, 2258 with live coverage of a soccer match. Frequent mentions of "La Plata" so presumed this one. 4 + 1 time pips at 2330 and again at top of hour. (D'Angelo, PA) *(Local Buenos Aires station relayed over a ute transmitter — Ed.)*

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

ARMENIA — Voice of Russia relay, **9965** in SS at 0140. (Brossell, WI)

ASCENSION ISLAND — BBC relay, **7160** at 0547. (Foss, AK) **11765** at 0640 with news analysis. There was a jammer here until 1700. (Barton, AZ) **12095** monitored at 0240. (MacKenzie, CA) **17830** at 2000. (Brossell, WI) **17885** at 1912 and **21660** at 1656. (Jeffery, NY) Merlin Communications, **21630** with Radio Japan relay in JJ at 1700. Into FF at 1800 and RTE Ireland relay at 1830. (Watts, KY)

AUSTRALIA — Radio Australia, **6020** at 1205 with news. **12080** at 1120 and **13605** at 1155. (Northrup, MO) **6020** at 0952 in Pidgin. **9580** at 1339, **11650** at 1352 and 0538 and **11880** at 1705. (Miller, WA) **9580** at 1215. (Newbury, NE) **9710** at 0935 in Pidgin. (Barton, AZ) **9580** at 1512, **17795** at 2245 and **21740** at 2140. (MacKenzie, CA) 13605 at 0915. (Jeffery, NY) **21740** to 0000 sign-off when switched to **17580 and 21725** (the latter inaudible) (Silvi, OH) VNG time station, **8638** at 0636. (Becker, WA) **16000** at 0449 with EE time signals. (Miller, WA)

AUSTRIA — Radio Austria Int'l., **9870** at 0313 in GG. (Paszkiewicz, WI) 0340 in SS. (MacKenzie, CA) 0445. (Weronka, NC) 1120. (Provencher, ME) 1150 in GG. (Northrup, MO) 2105 in GG. (Foss, AK) **17865**. (Newbury, NE)

BELGIUM — Radio Vlaanderen Int'l., **9865** heard with sign-on at 1200. (Barton, AZ) **15565** in DD via Bonaire at 0403. (Miller, WA)

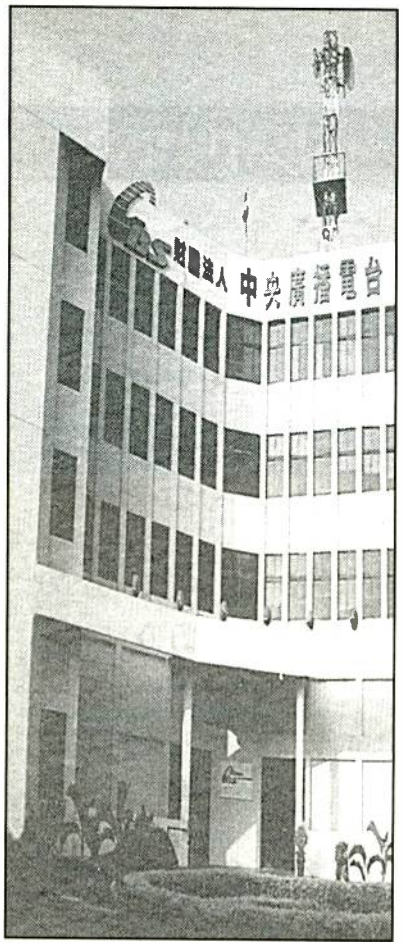
BENIN — ORTB, **7210** with man in FF and ID at 0629. Then more talk, some of it in EE. Muffled audio so it was hard to pick out words but music was nice and clear. Still there, but weaker at 0700. (Montgomery, PA)

BRAZIL — Radio Brazil Central, **4985** at 0056 with soccer match in PP. (D'Angelo, PA) Radio Clube do Para, Belem, **4885** with PP DJ at 0906. (Miller, WA) Radiodifusora, Londrina, **4815** in PP at 1329. (Miller, WA)

CANADA — CKZN, **6160** with CBC overnight at 0725. IDs at 0725 and 0728, complete with E-mail address. Switched to Radio Austria at 0730. Listed at 300 watts. (Montgomery, PA) CHU time station, **3330** at 0630. (Becker, WA) **14670** with time checks at 1749. (Weronka, NC) Radio Canada Int'l. **9640** at 1149 and **17695** at 2200. (Newbury, NE) With domestic CBC relay on **13650** at 1210. (Northrup, MO)

CHILE — Voz Cristiana, **6070** at 1034 with SS canned ID. CFRX not heard. **21500//21550** which provides a better signal. Some bleed from BSKSA on 21505. ID on the hour and one time pip heard. BSKSA had signed off prior to the ID. (Montgomery, PA)

CHINA — Central Peoples Broadcasting Station, Beijing, **9380** in CC at 1520. (MacKenzie, CA) **17580** *(Lingshi listed — Ed)* in CC from 0150–0250. (Silvi, OH) Guanxi PBS, **5010** in CC at 1306. (Becker, WA) China National Radio -1, **5030** in CC at 1310. **5880** at 1320. (Becker, WA) Voice of Jinling, **5860** at 1315 in CC to Central Asia.



Headquarters of Taiwan's Central Broadcasting System in Taipei.

// to CNR1-5850. (Becker, WA) China Radio Int'l., **5850** in CC to Northern Asia at 1315. (Becker, WA) **9615** in CC at 1510, **9730** via French Guiana at 0405 and **13685** via French Guiana at 0228 in SS. (MacKenzie, CA) **9690** via Spain at 0321. (Newbury, NE)

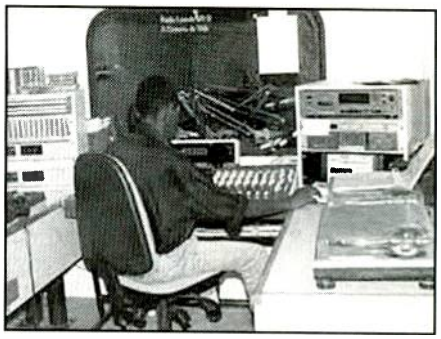
COLOMBIA — Ecos del Atrato, (presumed) **5019.66** from 0140 in SS with news. Many breaks for commercials, jingles, Caracol network promos, mentions of Colombia. Into LA music at 0210. Irregular. No ID heard. (Alexander, PA) Radio Nacional de Colombia, **9635** at 0215 in SS with local folk music, ID, talk. Fair but co-channel QRM from VOA. Colombia was slightly stronger. (Alexander, PA) 0221 in SS. (Miller, WA)

CONGO — Radio Congo, Brazzaville, **5985** at 2217 with mix of hi-life, FF talks and jazz with IDs and news at 2230 and close at 2302 without anthem. Fair, but some problems from VOA/UK and WYFR. (D'Angelo, PA)

COSTA RICA — Faro del Caribe, **5055** at 0944 in SS with music. (Miller, WA) RFPI, **15049** in GG, with schedule at 1556. (Barton, AZ) **21815** USB at 2130. (MacKenzie, CA)

CROATIA — Croatian Radio via Julich, Germany, **9925** at 0305 with talk on tourists to Croatia. (MacKenzie, CA)

CUBA — Radio Havana Cuba, **6000** in SS at 1140. (Northrup, MO) **9820** at 0135.



The control room at Radio Nacional de Angola in Luanda, sometimes audible around 0500 on 4955v and/or 11955.

(MacKenzie, CA) **13660 USB** at 2100. (MacKenzie, CA)

CYPRUS — BBC relay, **21470** at 1646. (Jeffery, NY)

CZECH REPUBLIC — **7345** at 0103 reading "Doors of Life." (Newbury, NE) **11615** at 2332 in Czech. (Miller, WA) 0115. (Brossell, WI) **17485** in SS at 2310. (MacKenzie, CA)

DENMARK — Radio Denmark, via Norway, **13800** at 0002 in DD with mostly news and talk. (Wilden, IN) **15735** in DD via Norway at 2259. (Miller, WA) *(Unless there has been a recent change we're not aware of, Radio Norway's programming starts on the hour, Radio Denmark on the half-hour. Same frequencies. Same transmitters — Ed)*

DOMINICAN REPUBLIC — Radio Barahona, **4911.1** in SS at 2340 with live Red Sox-Yankees baseball game. Very poor audio. ID as "Radio Barahona Internacional" (Montgomery, PA)

ECUADOR —Radio Quito, **4919** in SS at 0937. (Miller, WA) **4920** in SS at 0608. (Becker, WA) La Voz de Upano, **5040.07**, 1027 sign-on with national anthem, opening SS announcements, SS religious program. (Alexander, PA) HCJB, **9745//15115** at 0400 with news, mailbag. (Evans, NC) 0035 with "Saludos Amigos" program. (Wilden, IN) 0400. Also **15115** at 0050. (MacKenzie, CA) **15165** at 0301. (Jeffery, NY) HD2IOA time station, **3810** at 1004. (Becker, WA)

EGYPT — Radio Cairo, **9900** at 0022 with music request program. (Weronka, NC) **12050** in AA at 0243. (MacKenzie, CA) 2131 in AA. (MacKenzie, CA) **15210** in AA at 2015. (Brossell, WI)

ENGLAND — UN Radio, **15265** via Merlin Communications (Wooferton) at 1730 sign-on. "Welcome to the UN Today . . . 15 minute program." Mentioned the broadcast was to Africa on shortwave. News and short features in EE. This frequency was fair and //**17710** (Ascension) not as good. (D'Angelo, PA) World Beacon via Merlin, **15558** at 1759 with service to Africa. Announcing **3230** and **9675**, which was weak at 2000. (Watts, KY) BBC, **6195** at 1005 with news and **9740** at 1337 with discussion. (Miller, WA) *(The latter frequency is listed as via Singapore — Ed)* **7105** in FF to Africa at 0620. (Barton, AZ) **9590** *(via Delano — Ed)* with strange, music in the "Art in Action" program. **9915** at 0023 with sports and news. (Wilden, IN) **13660** in unid. Language. (Northrup, MO)

EQUATORIAL GUINEA — Radio Nacional, Malabo, **6249.35** at 2220 in SS and vernacular with ID, local folk music, off with national anthem at 2302. This is an hour later than their scheduled sign-off. (Alexander, PA)

ERITREA — Voice of Eritrea, **5500** heard at 0324 with Horn of Africa music and talks, ID around 0330, carrier cut in mid-sentence at 0348. Good until it disappeared. (D'Angelo, PA)

FINLAND — YLE Radio Finland, **11985** at 0100. (Newbury, NE) **15400** at 1430 in Finnish. (Miller, WA)

FRANCE — Radio France Int'l., **12015** (via Gabon) at 1611 with news in EE. (Miller, WA) **13640** (French Guiana) in FF at 1155. (Northrup, MO) **17605** in FF at 1530. (Brossell, WI) **17850** at 1625. (Weronka, NC)

GABON — Africa Number One, **9580** in FF at 0015 with African and Western pops. Several IDs and possible weather report. (Linonis, PA) **15475** at 1805 in FF with transmitter off and on eight different times. Off at 1832 recheck. (Montgomery, PA) 1850 in FF. (Miller, WA)

GERMANY — Deutsche Welle, **12015** via Armavir, Russia, in AA at 1444. **15275** (via Rwanda) and **15410** at 2312 in GG. **17810** via Antigua in GG at 2141. (Miller, WA) Bayerischer Rundfunk, **6085** with news in GG at 0115. (Watts, KY)

GREECE — Voice of Greece, **15445** in Greek at 1525. **17565** in Greek at 2120 and **17705** (via Delano, CA) in Greek at 2133. (Miller, WA)

GUAM — (presumed) AFRTS (presumed) **13662 USB** at 0217 with continuous music. Barely audible. (Jeffery, NY)

GUATEMALA — Radio Kek'chi, San Cristobal, **4845** at 0140 in SS with Latin music, ID and more music. Off at 0200. (Linonis, PA) Radio Tezulutlan, Coban, **4835** in Quechua at 1152. (Miller, WA) Radio Buenos Nuevas, **4799.8** at 0225 with SS talks, local religious music, ID, closing Announcements and off at 0232. (Alexander, PA) Radio Cultural, Guatemala City, **3300** in SS at 0145. (Brossell, WI) 1141 in SS. (Miller, WA) Radio Verdad, **4052** with SS ID, music, and talk at 1107. (Becker, WA)

GUYANA — GBC, **3289.73** at 0230. Reactivated, with EE DJ, local and some U.S. pops. ID as Voice of Guyana and mentions of GBC Radio. Fair. Also heard at 0650. (Alexander, PA) Radio Guyana 2, **3290** with BBC news at 0730. Weak, but the best heard in some time. (Montgomery, PA)

GUINEA — Radio Conakry, **7210** at 0010 in FF and possible AA, with AA-type music. (Linonis, PA) 0645 with ID and station info by man. (Montgomery, PA)

HAWAII — KWHR, **17510** at 0215 with "Truth for the World" religious program. (Watts, KY) 2330 with Christian music. Into JJ at 0000. (Linonis, PA) WWVH time signals, **5000 and 10000** at 0632. (Becker, WA)

HUNGARY — Radio Budapest, **9835** at

0230 with news. (Weronka, NC)

ICELAND — AFRTS/AFN, **6350 USB**, 0753 with stock market report, game show at 0803. (Montgomery, PA) **10320 USB** at 0242 with oldies (Today's hit music, yesterday's favorites) AP news on the hour. (D'Angelo, PA) Rikisutvarpid (Voice of Iceland) **11401** with news in Icelandic at 2326, off at 2330. (Miller, WA)

INDIA — All India Radio, **11585** at 1348 in unid language. Also **11620** in EE at 1350. (Miller, WA) **11620** in Hindi with talks and music at 0120. (Brossell, WI) EE music program. Radioteletype station started wiping most of the broadcast out at 2153. (Montgomery, PA) **15075** at 1210. (Northrup, MO)

INDONESIA — Voice of Indonesia, **9525** at 1145 with Indonesian music and JJ talks. (Newbury, NE) **15149.8** at 2000 sign-on with IS, woman with opening ID and announcements, news and various features during this EE hour. Off at 2100. (D'Angelo, PA) Radio Republik Indonesia, Ujung Pandang, **4753** in II with pops at 1322. (Barton, AZ) 1300 with music, ID, IS. //**4925**-Jambi

IRAN — Voice of the Islamic Republic of Iran, **9835** at 0050 with EE ID, need for a spiritual awakening. (Newbury, NE) **11930** at 0503 in AA. (Foss, AK)

ISRAEL — Reshet Bet home service, **9345** at 2345 in HH with phone interview. (Linonis, PA) **15760** at 2315 in HH. (MacKenzie, CA) Kol Israel, **9345** at 2142. Talks in HH and U.S. oldies. (Montgomery, PA) **11585** at 0448 in HH and **15760** at 0448. (Miller, WA) **17535** at 1916 with news in EE. (Jeffery, NY)

ITALY — RAI Int'l., 0030 in II and rap in II. (Newbury, NE) 0100 with music and very choppy reception. (Miller, WA) 0128 with ID at "RAI" at 0200 and into II. (Brossell, WI)

JAPAN — Radio Tampa/NSB, **3925** (NSB1) in JJ at 1015, **3945** (NSB2) at 1015 in JJ. Not in parallel. **9595** at 0551 in JJ. (Becker, WA) **6115** in JJ at 0956 and fighting co-channel Radio Union, Peru until Tampa sign-off around 1000. (Miller, WA) JJY time station, **8000** at 1057. (Becker, WA) Radio Japan/NHK, **6145** via Canada at 0000. (Provencher, ME) **9505** at 1410. (Newbury, NE) **9505** in JJ at 1514. **17810** in Malay at 2240. **17825** in EE at 2150. **21670** in EE at 2143. (MacKenzie, CA) **11730** at 1510 with news. (Brossell, WI) **11730** at 1401 and **12000** in SS at 1820. (Miller, WA) **13630** at 0620. (Barton, AZ)

KUWAIT — Radio Kuwait, **11675** in AA at 2333 and **15495** in AA at 2310. (Miller, WA) **11990** in EE at 1955 with music program "Helter Skelter." (Brossell, WI) **15495** in AA from 2330 to 0000 off. (Paszkiewicz, WI) 2323 in AA. (MacKenzie, CA)

LIBYA — Radio Jamahiriya, **17725**, tentative ID due to overmodulation. Man in AA with music in background. Program change to lighter fare at 1420, back to AA music at 1430. (Montgomery, PA) Voice of Africa service, **17725** with EE at these new times: 2047–2057, 1751–1756. WYFR dominates this frequency from 2300–0145. (Alexander, PA)

LITHUANIA — Radio Vilnius, **9855** (via Germany) 0030 in EE. (Weronka, NC) 0030 with news of Baltic states. (Provencher, ME) 0044. (Newbury, NE)

MEXICO — Radio Huayacocotla, 2390, weak but audible; SS and Mexican music. Woman with talk at 0056 then to ooompah type music. ID by man at 0104, then to kids singing to 0107 close. (Montgomery, PA) Radio Educacion, **6185** at 0625 with piano, SS vocals. (Becker, WA) 1004 with music and SS talks. (Miller, PA) Radio Mexico Int'l., **9705** at 0405 with mailbag program in EE. (Weronka, NC)

MOROCCO — RTV Marocaine, **15335** at 1744 in AA with Mideast music, news. (Miller, WA) VOA relay, **7195** at 0540 with feature about leaders and political power in the Mideast. (Foss, AK)

MYANMAR (Burma) — Radio Myanmar, **47215** at 1308 with a drama in Burmese. (Miller, WA)

NEW ZEALAND — Radio New Zealand Int'l., **17675** heard at 0456 with music, Maori announcements; 2131 with '60s pops. (Miller, WA)

NICARAGUA — Radio Miskut, **5770** 2345 to 2356 close. SS talks, commercials, jingles. Off with national anthem. (Alexander, PA) 2355–0001 close. Talk until brief fanfare and ID and sign-off routine by man. Off with orchestral national anthem. (D'Angelo, PA)

NETHERLANDS — Radio Netherlands, **6160** *(6165? — Ed)* heard at 0837, but wiped out at 0857 by Deutsche Welle sign-on. (Barton, AZ)

NETHERLANDS ANTILLES — Radio Netherlands via Bonaire, **9845** at 0030. (Provencher, ME) **21590** at 2050 in DD. (MacKenzie, CA)

NIGERIA — Voice of Nigeria, **7255**, 0530 with talk about African culture. (Weronka, NC) 0530–0632. Back on traditional frequency with EE news, ID and music program, and another news program at 0630. (D'Angelo, PA) 0540 with news. (Newbury, NE) 2205. (Evans, NC)

NORTH KOREA — Radio Pyongyang, **9335** at 1525 with news. **13760** in SS at 0225. (MacKenzie, CA) **11710** at 1500 with news and talk on reunification. (Brossell, WI)

NORWAY — Radio Norway Int'l., **15735** in NN at 2317. (MacKenzie, CA)

PAPUA NEW GUINEA — **4890**, NBC at 0909 with news, 1315 with music. (Miller, WA) **9675** at 1000 with local news, some U.S. pops and possible public service announcements in Pidgin. (Linonis, PA) 1020, weak, with town meeting or prayer meeting. (Becker, WA) Radio Sanduan, Vanaimo, **3205** with music, EE at 1145. (Miller, WA)

PARAGUAY — Radio Nacional, **9735** with sports in SS at 0147. (Miller, WA)

PERU — La Voz del Campesinos, **6956.57v**, 0045–0248 close. Peruvian folk music, SS announcements, IDs, off with anthem. Irregular. (Alexander, PA) Radio Comas, **4880.85** (new frequency) 1010 with SS talks, commercials, promos, Peruvian folk music, ID. Only a weak het heard here in the evenings. (Alexander, PA) Radiofifusora Huancabamba, **6535.84** at 0145 with folk music, SS announcements, abrupt sign-off at 0156. (Alexander, PA) Radio Altura, **6479.69** at 0250 with Peruvian folks music, echo ID announcements, SS talk. Abrupt sign-off at 0305. (Alexander, PA) Radio Super Sensacion, 0250–0303 close, nice Peruvian vocals with long talk segments by man, including IDs and time checks. Off with orchestral national anthem. (D'Angelo, PA) ID at 0250 and back to local folk music. (Montgomery, PA) Radio Peru, **5637.2**, very weak at 0014, tentative ID. (D'Angelo, PA)

PHILIPPINES — Radio Pilipinas, **11720** at 1805 with talks about employment opportunities. (Miller, WA) **15190** at 1827 with instrumental music, man with sign-off ID announcements at 1928 and off 1930. Poor. (D'Angelo, PA) VOA Relay, **9890** at 1140 in Asian language. (Barton, AZ) **17740** at 2055. (MacKenzie, CA) Far East Broadcasting Co., **9405** in CC at 1517. (MacKenzie, CA)

PORTUGAL — RDP Int'l., **11655** at 2259 in PP. (Miller, WA) **21500** with ID in PP at 1505, then again at 1506 and 1508 and back to pops. (Montgomery, PA) **21800** in PP at 2136. (MacKenzie, CA)

PUERTO RICO — AFRTS/AFN, **6458.5 USB** with ball game, //**12689** — Key West. Not parallel to **10940.5**. Still there at 0830. (Montgomery, PA)

RUSSIA — RWM time signal station, **4996** at 2316 with time pips and various tones, a quiet period, Morse code ID. (D'Angelo, PA) Krasnoyarsk Radio, **5290** in RR at 1310, relaying Radio Rossi. (Becker, WA) Radio Rossi, via Samara, **7360** in RR at 1445. (Becker, WA) Voice of Russia, **9665** at 0323. Western press not giving them credit for economic reforms. (Newbury, NE) **11675** at 1903 with news, Joe Adamov with mailbag. (Ziegner, MA) **11825** with news, report on Crimea at 0130–0145. (Brossell, WI) **15455** in RR at 2330. (MacKenzie, CA)

ROMANIA — Radio Romania Int'l., **15380** in EE at 0200. (Watts, KY)

RWANDA — Deutsche Welle relay, **17860** in GG at 2215. (Mackenzie, CA)

SAO TOME — VOA relay, **11975** at 1950. (Brossell, WI)

SAUDI ARABIA — BSKSA, **11710** at 2328 in AA with music. (Miller, WA)

SICILY (Italy) — AFRTS/AFN, **10940.5** USB at 0236 with "Field and Stream" program, loads of IDs ("You are listening to the Armed Forces Network"), AP news at 0300, AFRTS news at 0309. (D'Angelo, PA) 2356 with Fox sports, ID, commentary, ID, complete with address. National Anthem at 2359, one time pip on the hour and into news. Still there at 0831. (Montgomery, PA)

SINGAPORE — BBC relay, **6195** at 1344. (Becker, WA) **7135** in Asian language at 1410. (Barton, AZ) **9740** at 1500. (MacKenzie, CA) Radio Singapore Int'l., **6150** at 1338 with program "The Right Stuff." **7170** at 1355 in presumed Tamil. **9590** at 1335 with Asian news, music. (Miller, WA)

SOLOMON ISLANDS — Solomon Islands Broadcasting Corp., **5020** at 0752 with country tune, gospel rock. (Foss, AK) **0939.** (Miller, WA) **1023.** (Becker, WA)

An engineer at Radio Pilipinas, Manila, which is often heard in North America. (Thanks to Marty Foss, AK, who visited the station)

SOUTH AFRICA — Channel Africa, **15545** at 1334, unid language. Very faint. (Miller, WA) **17870** at 1825 in EE, into FF at 1828. (Montgomery, PA) Radio Sonder Grense, **3320**, man in Afrikaans playing music, then female with talks and what sounded like news at 0130. (Montgomery, PA) Adventist World Radio, **6015** at 0315 with religious broadcast in EE. (Newbury, NE) World Beacon, **11640** with ID, Web address and P.O. Box number in South Africa at 2008. (Brossell, WI)

SOUTH KOREA — Radio Korea Int'l., **9570** at 1325 with "From Us to You." (Barton, AZ) **11715** at 1045 with music show, news at 1100. (Evans, NC)

SLOVAKIA — Radio Slovakia Int'l., **9440** heard at 0125 with talk about QSLs. (Weronka, NC)

SPAIN — Radio Exterior de Espana, **6055** in SS at 0000. (Provencher, ME) 0500. (Weronka, NC) **11815** via Costa Rica, in SS at 1655. (Miller, WA) **21540** in SS at 2205. (MacKenzie, CA)

SRI LANKA — Sri Lanka Broadcasting Corp., **11905** at 1411 in unid language. Religious broadcast. (Miller, WA) **15425** with pop music in EE at 0120. (Montgomery, PA) 0157 with music to time pips, ID and EE news, more music, time pips at quarter hour and another ID. (D'Angelo, PA) 0200–0215 with news, ID, music. (Alexander, PA) VOA relay, **15250** at 0208. (Jeffery, NY) Deutsche Welle relay, **15275** in GG at 2020. (Brossell, WI)

SWEDEN — Radio Sweden, 15245 with news in EE at 0311. (Miller, WA)

SWITZERLAND — Swiss Radio Int'l., 9575 ending GG and into FF at 1530. (Miller, WA) **9885** in II at 0225. **9905** via French Guiana at 0320 in II. (MacKenzie, CA) **9905** in GG at 0031. (Barton, AZ)

SYRIA — Radio Damascus, **12085** in AA to Middle East at 1750. (Becker, WA)

TAIWAN — Radio Taipei Int'l., **5950** via WYFR at 0200. (Provencher, ME) **9680** (WYFR) at 0412. **9690** (WYFR) at 1505

(MacKenzie, CA) **11550** (direct) at 1150. (Barton, AZ) **11745** in Korean at 1406. (Miller, WA) Presumed on **15345** in CC at 0215. (Jeffery, NY)

THAILAND — Radio Thailand, **15395** heard at 0050 in EE with sports, weather and ID. Into Thai at 0100. (Linonis, PA) News, weather forecast at 0058, IS at 0059, clock chime IS, singing — possibly national anthem and into non-EE. (Montgomery, PA) VOA relay, **15235** with "Interview" at 1515. (Brossell, WI)

TURKEY — Voice of Turkey, **9445** at 0150 with music and announcements in TT. (Brossell, WI) **2300** in TT, music of the Shashmaqam. (Ziegner, MA) **11885** in TT at 2344. (Miller, WA) **0345** in TT. (Newbury, NE) **13640** at 2248 with Turkish music. (Barton, AZ) 2350–0015 in TT with music and news at 0000. (Linonis, PA)

TUNISIA — RTV Tunisienne, **7110** with AA music. Signal dropping at 0650, talks, music, talks, music. Off at 0659. (Montgomery, PA) **12005** in AA at 1945. (Brossell, WI) 1955. (Ziegner, MA)

UKRAINE — Radio Ukraine Int'l., **5905**, ID monitored at 0032. Weak signal. (Montgomery, PA)

UNITED ARAB EMIRATES — UAE Radio, Dubai, **13675** in AA at 0335 with morality play in AA. (Newbury, NE) 1200 in AA. (Northrup, MO)

UNITED STATES — WRMI, **7385** at 0228 with address in SS, then Radio Prague relay. (Paszkiewicz, WI) WINB, **12160** at 0155 with religious programming. Terrible signal. "This is WINB, Red Lion, Pennsylvania. We are no ending our broadcast day on **12160** kilohertz." at sign-off. (D'Angelo, PA) WMLK, **9465** at 1640 with EE sermons about teaching of Yahweh, IDs. (Alexander, PA) WBCQ, **7415** with Yiddish songs and comedy sketches. (Provencher, ME)

UZBEKISTAN — Radio Tashkent, **17775** at 1300 in probable Urdu, into Uzbek at 1400. KVOH-17775 knocks Uzbekistan out at 1500. (Ziegner, MA)

VATICAN CITY — Vatican Radio, **6020** at 1310 with EE close. Under Radio Australia. (Miller, WA) **12055** to India and Southern Asia at 0150 with news of Catholic Church activities in those regions. (Provencher, ME) **13765** at 1230 with news. (Northrup, MO)

VENEZUELA — Ecos del Torbes, **4980** in SS at 0921. (Jeffery, NY) 0933. (Miller, WA) 1030. (Becker, WA)

VIETNAM — Voice of Vietnam, **9695** (via Canada) at 0101 with news and program about Mongolia. (Weronka, NC) **9795** via Canada at 0331. (Newbury, NE) 0350. (MacKenzie, CA) **12019.7** at 1000 with EE news, commentary, ID. (Alexander, PA) **12020** at 2320 in VV. Music bridge, IS, EE ID. (Paszkiewicz, WI) **13740** at 1710 with VV news. (Miller, WA)

ZANZIBAR (Tanzania) — Radio Tanzania-Zanzibar, **11734** at 2016. Long vocal segments, man with news at 2030, more long music segments. Man with sign-off announcements at 2056. Anthem was either lost in building noise or went off with out it. (D'Angelo, PA)

And that's it. Lots of good stuff this time. And for that, a big salute to the great folks who came through with the essential info: David Weronka, Benson, North Carolina; Bobby Evans, Fayetteville, North Carolina (welcome both of you!): Stewart MacKenzie, Huntington Beach, California; Rick Barton, Phoenix, Arizona; Jack Linonis, West Middlesex, Pennsylvania; Mark Northrup, Gladstone, Missouri; Michael Miller, Issaquah, Washington; Robert Brossell, Pewaukee, Wisconsin; Lee Silvi, Mentor, Ohio; Edouard S. Provencher, Biddeford, Maine; Dave Jeffery, Niagara Falls, New York; Ed Newbury, Kimball, Nebraska; Tricia Ziegner, Westford, Massachusetts; Richard D'Angelo, Wyomissing, Pennsylvania; Robert Montgomery, Levittown, Pennsylvania; Brian Alexander, Mechanicsburg, Pennsylvania; Sue Wilden, Nobelsville, Indiana; R.C. Watts, Louisville, Kentucky; Marty Foss, Talkeetna, Alaska; Pete Becker, Clarkson, Washington and Sheryl Paszkiewicz, Manitowoc, Wisconsin. Thanks to each one of you!

Until next month, good listening! ■

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THE PIRATE'S DEN

Focus On Free Radio Broadcasting

One Pirate Says: "Ain't Payin' No $5 For Gas!"

Let's see what you're hearing lately. And please remember that your pirate logs are vital to the success of your column!

KRMI, 6955 USB at 0233–0240 with an ID, song "50 Ways to Leave Your Lover," sketch about Pokemon items, ID, rock tune. (Tim Taylor, PA)

WTFF, 6955 USB at 0504–0540 with rock song, ID, rock song. ID as "Rewind Radio" but later mention the WTFF call and later gave it as "Relay Rewind Radio." Still later as "WTFF — Rewind Radio" and "Relay Rewind Radio." Also mentioned "Broadcasting to you live on shortwave." (Taylor, PA)

KIPM, tentative, **6951 USB** at 0603–0625. Story segment, Alan Maxwell says "I'm not crazy" (or maybe that was said by a character). Later some new age music. Mailing address mentioned as P.O. Box 24, Lulu, GA 30554. (Taylor, PA) Tentative at 0240 to past 0300. (Lee Silvi, OH)

Jimmy the Weasel, 6955 USB from 0304–0315 with mentions of "Have to put up with your stinkin' mama for the Millennium." And "Ain't payin' no $5 for gas." Also calling some pirate using 100 watts a "sorry pirate." (Taylor, PA)

Psycho radio, 6955 USB from 0358–0416 with some sort of skit at tune-in, music by REM, then song called "Gotta Devils Haircut" and "In My Mind" by Beck. 0415 with song "A Tisket a Tasket" and off at 0416. (Taylor, PA)

WHYP, 6955 at 2137 to past 2158. 6950 USB from 0701–0713 with song about JTA, mumbling and talk, "Chattanooga Shoeshine Boy." (Taylor, PA)

WLIS, 6955 at 2250 to 2311. (Silvi, OH) *(I could use some notes on the program content, Lee. Thanks! —Ed)* **6955.1 USB** at 2250 with various station interval signals. (William T. Hassig, IL)

KNAH — Voice of the Northwest Aryan Homeland, 6955 at 0030. The host called himself "The Chief." Records by several hate bands (Insane Clown Posse and Marilyn Manson, among others). And, from what Rich reports, the above was the milder stuff!

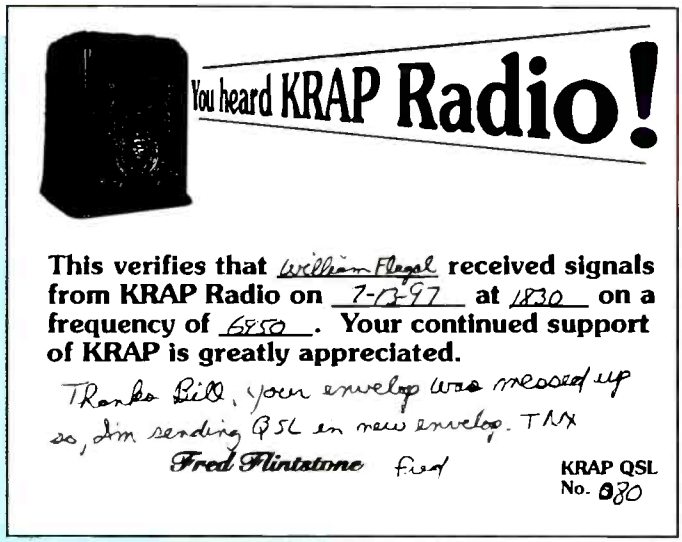
Radio Three, 6950.8 USB at 0122–0140 with a commercial for the ACE club, new wave, and heavy metal rock sounds. (Hassig, IL)

Voice of Prozac, 6955 USB at 0333 with ID and mention of an address in Pittsburgh. (Taylor, PA)

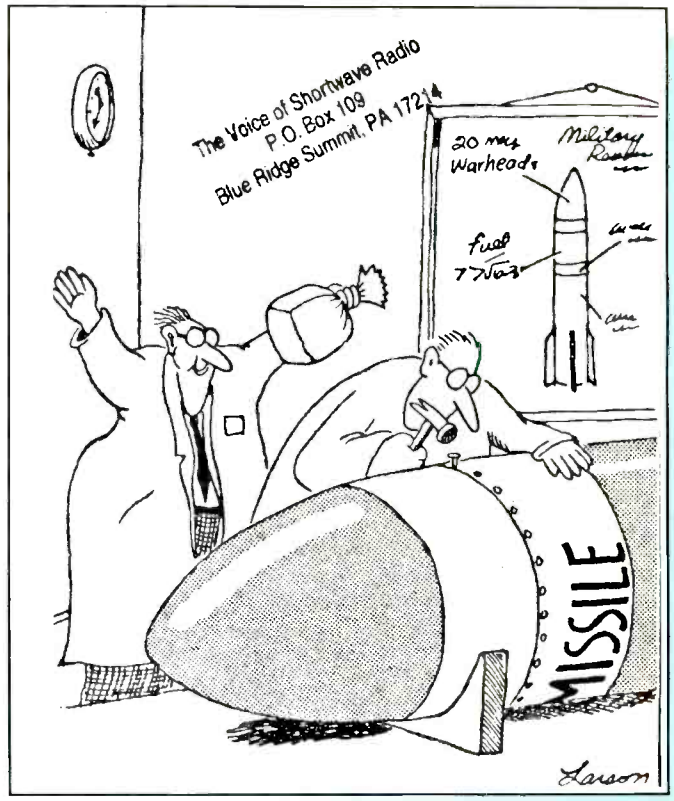
Radio Azteca, 6955 USB at 0311–0321 with special program number 3 with a "version" of "The Lord's Prayer," mention of "special program number" an old-fashioned tune followed by a slow song. (Taylor, PA)

Blind Faith Radio, 6955 USB from 2341–2353 with ID by "Stone Cold," and aired mostly songs unknown to me. (Taylor, PA)

Radio Xanax, 6955 USB from 0324–0328. Located in Detroit. ID, mention of "Who listens to pirate radio?"



From back in 1997 comes this QSL from KRAP Radio.



Another pirate oldie is the Voice of Shortwave Radio, which sent this cartoon with its QSL.

BY EDWARD TEACH

Aired a "Hooters Girls" segment and then the operator began arguing with another pirate operator. At 0336 Psycho Radio aired its "What's He Building in There?" skit. They mentioned an address in Pueblo, Colorado. Got 81009 zip code but the rest not copied. (Taylor, PA)

Radio Free Speech, 6955 from 1305 to 1328 with repeat of an earlier show including the Truckets Tabernacle of Norfolk, Virginia. Gave the old Wellsville drop address. (Silvi, OH)

Ground Wave Radio, 6955 USB at 0143–0217. The program included music from movie soundtracks, ID, talk on communism, talk of the public being aware of a certain kind of propaganda, "Miss Misery" by Nazareth, ID, talk about the top 10 adult videos and a jiffy lube skit, fake interview with a porn actor, fake commercials, e-mail address (not copied) some AC/DC recordings, mentioned that the broadcast was coming from a missile silo. Later the host gave his name as Dave Gunn and some Guns 'N Roses things. Off at 0217. (Taylor, PA)

WFB (William F. Burrows), 6955 USB from 0505 to 0519 with a comedy sketch, some sort of segment about old artifacts, talk about an arrowhead, comedy segment, what sounded like an old-style comedian, a skit about a man named Tim who was involved in some sort of shooting. Off at 0519. (Taylor, PA)

UNIDENTIFIEDS: (we have some room so here are a couple):

6950.45 in AM mode at 0210 with Beatles songs. (Hassig, IL)

6955 USB at 0217 with rock songs, sounded like a test. Interference from the Latin American station on 6956.5. (Hassig, IL)

6955 at 0100–0132 with oldies such as "Tossin' and Turnin'," "Denise," etc. Good signal but weak modulation and muffled audio. Sounded like a relay of an FM station on 92.5 or 102.5. Off suddenly at 0132. (Hassig, IL)

That cleans out the "in" basket for this time, except for a number of logs, which were just too old to include. It's best if you just send logs covering the past 30 days or so each time. In any event, keep those logs headed our way. And please have pity and also send some photo copies of your recent pirate QSLs. The files here are getting pretty thin! You station operators are invited to send sample QSLs for publication, as well as photos of your equipment and/or antennas. I appreciate whatever you can send in. Thanks!

See you next month! ■

ADVERTISERS' INDEX

THE LOOSE CONNECTION

Radio Communications Humor

Bill & Dave's Free (and worth every cent) Antenna Design Course

It's about time that my cohort, Dave Bradley, takes the blame - er - credit for some of the things that end up on this page. We were chatting over a game of Freecell about antennas, and it turns out that our childhood forays into electronics theory took many of the same paths, though in different states. His was confusion; mine was delirium.

Really, though, it turns out that many of our ideas regarding antenna design were so similar that if we'd have had any success, we'd be fighting patent infringement battles today instead of wallowing in wealth. Dave's first axiom was, "It has to look like an antenna." He goes on to explain, "A TV antenna in particular, has to live up to certain *visual* expectations. For VHF, it has to look like what we now understand to be a Yagi - a long piece in the middle, and a bunch of pieces across that. The lengths had to be different, and that difference had to be, well, tasteful. You couldn't just have random lengths. Of course, the simple taper was a great style - short elements at the front (he called them "rods") and long ones in the back. Another favorite of his was the "sine-wave" look (though he didn't know that term at the time). Dave's most attractive - and heaviest - TV antenna design used a steel handle from a pushbroom and (he says) "about a hundred straightened coathangers - short, longer, longer, longer, longer, shorter, shorter, shorter, shorter - then do it all over again - like shampoo - lather, rinse, repeat." The elements, he recalls, varied from about eight inches to about eighteen, and bore no relationship to any known formula for wavelength or frequency.

My first TV antenna took an entirely different approach, and probably would have worked pretty darn well if I could have only found a suitable solder for aluminum foil. It was obvious to any intuitive kid that if rabbit ears antennas worked 'OK,' then MORE would be BETTER! To that end, my first design was a filled-in version of the classic 'VEE.' I extended the two "ears" to the maximum (why would anyone ever use less than maximum?) and stretched aluminum foil (I believe it was "Kaiser Foil," quilted, for extra strength) between the ears, from tips to base. I can still remember my dad's smile. I thought he was so proud of me.

I remember too, the day I found his enormous electric soldering iron. Probably a few hundred watts, wooden handle, weighed a pound or so. I understood soldering to be welding, and never knew that you used solder - I figured you just hold the iron against the two pieces, and 'poof!' They become one.

There were quite a few 'poofs' that day. Hour after hour, I watched the aluminum foil change color, then vaporize (or at least 'cease to exist on this plane') as I held the iron in place, trying desperately to make a seam. I figured I didn't have enough heat, so I (Good Grief! DON'T try this one, kiddies) folded the foil into a neat seam and slid it delicately across a bright red burner on the stove. Do you know that aluminum foil will burn? Neither did I. Glad the stove was next to the sink.

Back up somewhere in the Hudson Valley, young Dave had completed his second design - the "Zigzag." This design, he remembers, made such perfect sense to him that he *had* to build it. The basic principle was that the TV signal would hit the flat side of each Zig and Zag, then travel with other pieces of signal that hit other Zigs and Zags, up the wire to the TV. The antenna was a wire design, which required quite a bit of real estate, but only in one direction. His yard and a neighbor's yard behind it were perfect, and they could share the antenna! Their folks would think they were geniuses! Dave unwound several thousand feet of enameled wire from a transformer - he remembers it was really fine wire - and he and his neighbor zigzagged it across both their yards, with a zig being only about three feet from a zag at the widest point, and the width of the thing conveniently equal to the width of their narrow small town lots.

Dave and his neighbor (who did not want even to be remembered in this article) figured that the great size of this antenna would make up for its lack of height. Since the guys were only about four feet tall when they built this little miracle, the antenna itself - made of almost invisible wire - only ever reached a maximum height of some five feet - at the ends. The middle of each section sagged considerably.

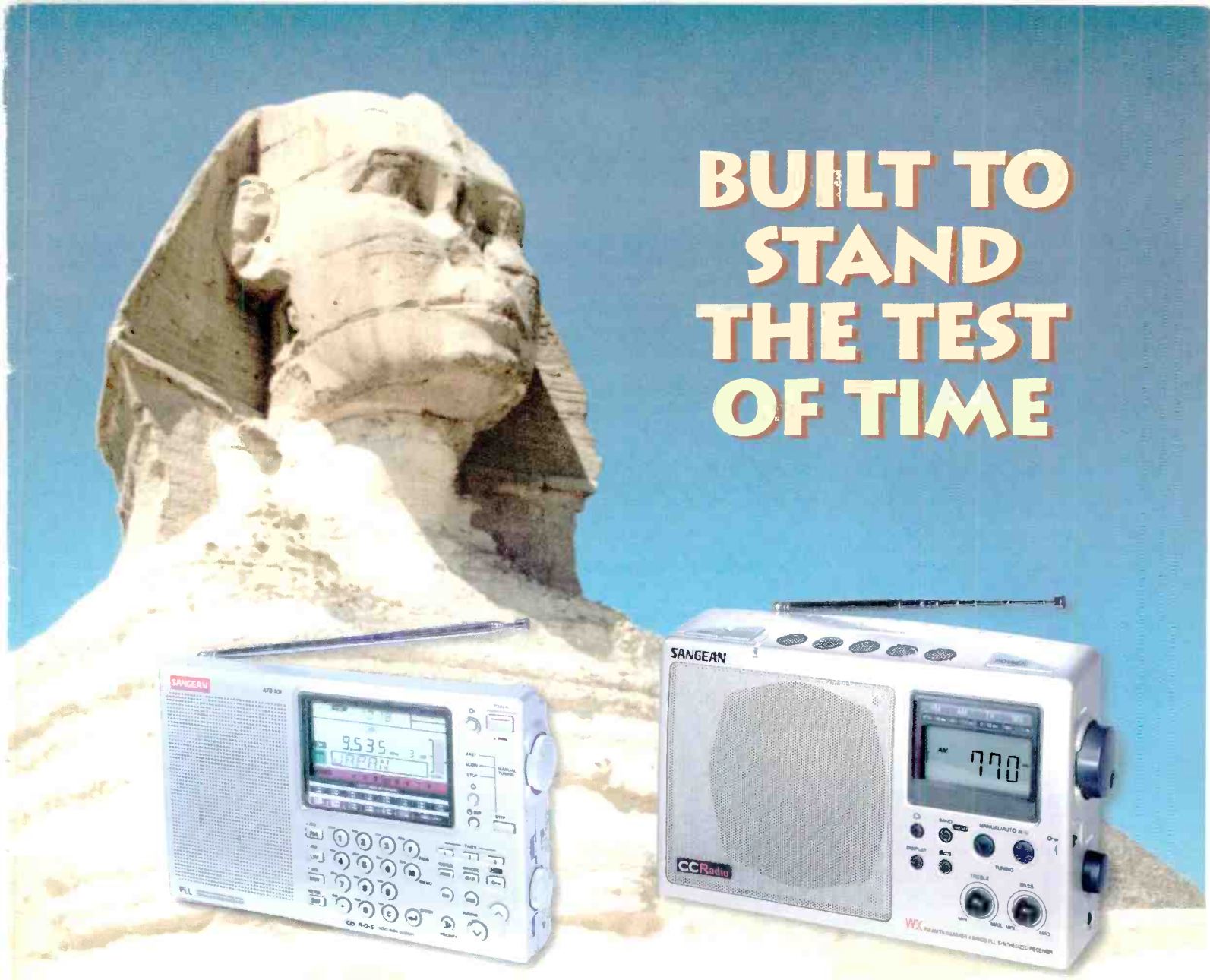
Because of the proximity of their houses, the kids' parents were close enough to borrow any of the staples needed to complete a meal, and did so by walking a familiar path from back door to back door. Dave remembers how lucky he felt that his friend's mother chose to be the borrower that night - just after dark. They never did get to prove their worth, and since that involved connecting each end of the wire to the antenna terminals on their respective TV sets, it's probably just as well. Who knows what difference in potential might have existed between the two sets? Dave says his friend laughed until his mother walloped him a good one, and still remember hearing how funny she looked tangled up in all that wire, waving her hands as if spiders had gotten her.

We also compared notes on shortwave radio antennas we designed. My best had been a piece of lead from a drafting pencil, inserted into the center of what I now recognize as an SO-239 UHF jack. A four-inch piece of lead got me a station in CHINESE! I couldn't even do the math to figure out how many miles of distance I got per inch of lead, but it was a big number!

Dave's best shortwave antenna was an antenna from a Buick - a three-section, chrome-plated telescoping car antenna, as he remember, which he mounted outside his attic window with thumbtacks and electrical tape. He now attributes the antenna's stellar performance to the extremely long "lead-in," a 100-foot piece of hookup wire which ran down to the eaves, around to the other end of the house, then down to his basement laboratory. Pure genius.

Dave and I are available for design consultation. We're not particularly expensive, but our per diem requirements can be overwhelming. Call for a quote.

BY BILL PRICE, N3AVY



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