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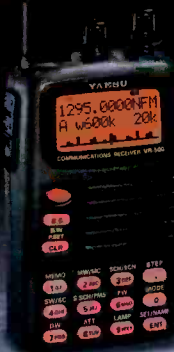
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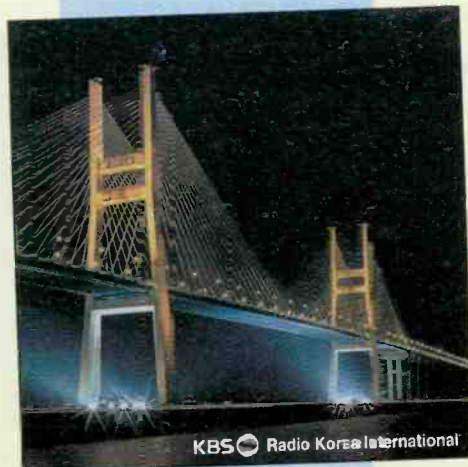
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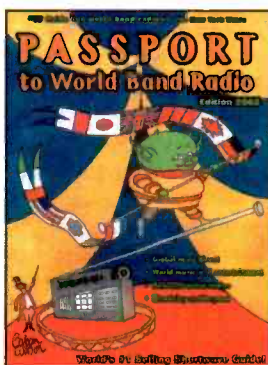
On The Cover

The war on terrorism continues around the clock—in Afghanistan and at home. This downed service member at Moody AFB, Georgia practices enemy evasion techniques while calling on the radio for help. Check out "Monitoring Operation Enduring Freedom" on page 12, and Utility Radio Review loggings beginning on page 64 for comms you can hear. (Photo by Larry Mulvehill)

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tuning in

by Harold Ort, N2RLL, SSB-596

an editorial

Survey Results: "I'm A Radio Operator, Not An E-mailer!"

It's been a while since we've reported the results of our Reader Surveys, so this month I'm taking the opportunity to report on four month's worth of results. Believe me, compiling the results and putting it into an easily understood (at least I hope so!) article takes considerable planning. Anyone can toss out the facts as you've been so kind to report each month, but I'd frankly rather weave it into an article that tells your story.

Typically we receive about 100 responses every month — and while that might seem low, that's been our experience over considerable time — and it's quite sufficient to paint a picture of our readership. Take for example our question about the types of equipment you own and regularly use, in addition to your radios. No doubt about it, you're certainly "wireless" — and not just when it comes to scanning and shortwave. Nearly 60 percent of you report having a cell phone. Slightly more of you have a cordless phone. Contrast that with the 5 percent of you who use a pager with E-mail and other wireless capability. Interestingly, about 5 percent of our readers say they have a satellite phone, and about four times that number use a GPS unit regularly.

Your Other Interests

When we asked the question about how many of you use a NOAA weather radio, we expected quite a few, but not necessarily 63 percent. From that May (yes, that long ago!) survey we learn that while you're certainly wild about radios, your other interests include photography and amateur astronomy; about 63 percent of you use a standard 35mm camera, and another 29 percent use a digital camera. About 20 percent of you own a telescope valued at \$300 or more, and another 15 percent come inside after looking at the stars and relax with a home TV satellite system. About the same number of our readers report having a surround-sound DVD system.

Hams: What Got You Interested In Getting That License

It's no secret — although talking to some hams once they get licensed, you'd never know it — that about 40 percent of you got interested in amateur radio as a result of your early years as a CBer. The exact same number of you report that a radio enthusiast got you interested in radio. Could it be that person also was a CBer that had just become a licensed ham? Perhaps, but in the same section about 35 percent of you said another ham was responsible for getting you licensed.

The same number of readers credited *Pop'Comm* and *QST* (17 percent each) for their amateur radio involvement. *CQ Amateur Radio* has been responsible for 10 percent. Wayne's 73 is responsible for about 4 percent, according to our survey results. (We didn't ask if any of you had been abducted by aliens or if hams were somehow responsible for global climactic changes). Putting it all together, though, a lot still must be said for CB as an entry into amateur radio — even today, I believe, to a certain extent.

In June we asked you to mark all items that applied to the following statement (a total of five possibilities): "I'm an active amateur operator or CBer and the following applies to me."

- I attend radio club meetings — 28%
- I have never attended a radio club meeting — 38%
- I'm not certain there is a local radio club — 18%
- I attended a couple of meetings and never went back — 8%
- There's no radio club in my area, but I'd go if there were one — 18%

It seems that we're talking about quite a potential number of club members to help out — only if we were reaching out

(Continued on page 76)

POPULAR COMMUNICATIONS

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-Tom O'Hara, W6CRG, of PC Electronics in Amateur Television Quarterly - Spring 2001

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Frequencies courtesy of Scanning USA, Feb. 2001 -Something new to monitor, by Tom Filecco



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The "Take Over" Isn't The Real Point

Dear Editor:

I cannot stop laughing after reading Mark Pearsal's call for a hostile take over of the ARRL by CB'ers. I cannot see how such a take over could ever happen. The resources needed to take over the ARRL are the same as those needed to create a separate CB organization. It is clear that CB'ers do not have the resources or the interest to take part in Mr. Pearsal's plan. Even if they were to succeed it would not help the cause of CB. You see the ARRL is nothing more than a group of people with a common goal to promote and protect amateur radio. It has no legal authority to make or change rules on its own. The FCC is still an independent federal organization. To prove my point the ARRL has been pushing for a number of years to have the FCC pre-empt covenants and restrictions that homeowner groups place on radio towers and antennas. Just recently the ARRL's latest request on the matter was turned down. This clearly shows that the ARRL does not make policy for the FCC. The real power is in the PEOPLE who make up the ARRL. A take over would not stop individual hams from doing what they have for years, writing and calling members of Congress and the Senate on matters that concern them. The ARRL has every right to comment on part 95. There have been several times when I could not use the HF radio in my car because of some trucker running a dirty amp. No matter where I tuned, 10 meters, 20 meters, 40 meters you name it there he was!

The ARRL is not alone in commenting on part 95 devices. Another organization I belong to, the AOPA (Aircraft Owners and Pilots Association), has also commented on different part 95 rules. The cellular industry has very deep pockets and poses a bigger threat to CB than the ARRL does. The bottom line for CB'ers is that the FCC will never change the power and distance limits on CB. If they did they would be in violation of rules set forth by the ITU regulating communications below 30 MHz. The ITU regulations are binding on the USA due to treaties we have signed in the past. If the limits were removed by the FCC then they would have to go back to issuing licenses that could be obtained only by passing a 5 wpm CW test. The fact of the matter is that CB is not meant to be used for DX communication; its purpose is to provide short-range personal communication. If you want to talk to people that are far away pick up the phone, get on the Internet, or get an amateur radio license

Philip D. Noah Jr.
N3WJL

Dear Philip:

It just seems to me that the ARRL has as much business being concerned about CB as the Cellular Telecommunications Industry Association has with the ARRL's business. Perhaps the League should have embraced CBers years ago, offering assistance to those who might have wanted to try ham radio. Notice I said, "try" ham radio. Ham radio isn't for everyone, and hams must not think of other services (FRS, GMRS, CB) as inferior to ham, or that "those folks should upgrade." And for the record, Dixon's petition sought to change the 155-mile communications limit on CB for emergency calls. After all, the CB rules went through countless changes during its natural evolution — this could have been one more positive change, but the bureaucracy thought different than Dixon, an educated — and yes, ham — did.

Based on recent events in the USA, I'd say the AOPA has its hands full just trying to effect rule changes in its own arena for the safety and well being of passengers and those on the ground. I'm sure they're doing a fine job, but like any other organization or individual, we can always do better. Who can say whether those lost couple of hours wrangling over Part 95 would have made a difference had they been spent differently? Strive for the higher bar in our own area of responsibility. What I've seen the past few years in government and private industry is a tendency toward looking outside our little world at other folks' houses, especially when our own house isn't in order.

And the real fact of the matter is that the FCC bungled back in 1958 by putting CB on 11 meters. Had you or I done such a dumb thing we be laughed at and would be banned for life from shopping at RadioShack!

Height of Hypocrisy?

Dear Editor:

As a radio amateur of 33 years standing and a broadcast engineer since 1971, I never cease to be amazed at the antics of the American Radio Relay League (ARRL). Recently, the ARRL filed comments opposing RM-9807, the petition to permit skip communications in the CB Radio Service. RM-9807 was dismissed by the FCC. It seems to me that the ARRL lacks standing in this matter. Eleven meters ceased to be an amateur band in 1958. Why should an amateur radio organization concern itself with another radio service, provided that the users of that service (CB) stay within their legally assigned 40 channels and do not interfere with amateur communications on 10 meters or other bands?

Meanwhile, the amateur radio service itself is seriously over regulated in this country. The United States is the only country in the world that still divides amateur bands into voice and CW segments by government fiat. This results in inefficient use of precious HF spectrum. Yet the ARRL, throughout its history, has supported emission subbands. Amateur radio operators in the rest of the world can set their own band plans for allocating frequencies for various emission modes. Are Americans somehow unable to do this?

The ARRL also sponsors "contests," such as the November ARRL Sweepstakes, which clutter the HF bands with two-second contacts and contest QRM, rendering these bands totally useless for any other type of communication. Heaven help us if an emergency should occur during a contest weekend! No provision is made to reserve portions of the voice or CW bands (depending upon whether the weekend is for the phone or CW contest) for non-contest activity. Yet the ARRL is worried about CB'ers working skip? The antics of some of our contesters make the worst of CB sound tame by comparison! Do I detect a bit of hypocrisy here?

Worse is the position of the National Association of Broadcasters (NAB) opposing RM-9807. What does "shooting skip" on 11 meters have to do with commercial broadcasting? Of course, this is the same NAB that lobbied for the deregulation, which enabled greedy conglomerates to take over most radio broadcasting in this country, depriving most communities of good, local radio service. This is the same NAB which fought to cripple LPFM, denying communities the local service and niche programming that is not provided by the corporate stations. And these corporate shells are worried about CB'ers working skip? If TVI is the concern, maybe the NAB should lobby the Consumer Electronics Association (CEA) to improve the design of TV sets to reject out-of-band transmissions.

If the FCC really wants to establish CB as a local, line-of-sight radio service, it should move it to a high VHF or UHF band where skip rarely occurs.

Sincerely,
Philip E. Galasso, K2PG
West Creek, NJ

A Science Lesson

Dear Editor:

I hereby agree that the 155-mile limitation on the 11 meters band is ridiculous because propagation does not work that way and who ever came up with that idea didn't know his science very well.

73's
Milan Lemmon, KE7MBL

Still Laughing!

Dear Editor:

I have subscribed to *Pop'Comm* since it began and to *CQ* for decades so I look

forward to receiving each one every month. Well, the article in April's issue on the New HASSEL stuff really blew me away. It started out sounding legit, but the more I read the funnier it got ending up with the Ionosphere on Mars. Can you even comprehend my thoughts when I got halfway through the letter "Bombs Away: Heissluft Strikes Again"???? I couldn't stop laughing after his reference to the HASSEL stations and what the FCC was going to do to freebanders. And when I did stop laughing I looked down to see

who it was from — NO!!! — not a Ph.D. Then I really couldn't stop laughing. Well, then I read your reply and I'm still giggling every time I think about it. I can't imagine any ham with any common sense taking this article as anything other than an April Fool's spoof. There are just too many tip offs.

This letter and the reply made my day. Thank you very much.

Denny Reeves, W4PRA Austin, TX

(Continued on page 74)

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Restoring Imported Mechanical Filters

Is Your Aging Receiver Suffering From A Common Malady?

by Peter J. Bertini, K1ZJH

No doubt about it, my JRC NRD-515 is a keeper! I've owned this classic receiver and the companion NSD-515 transmitter for over 20 years, and I don't plan to switch! Sure, there are newer receivers on the market sporting many more features, and even a select with better specs, but no one has offered companion receiver and transmitter packages since the JRC twins were taken off of the market!



Photo 1: My JRC twins, although vintage classics, still reliably provide the backbone for my HF ham and SWL needs.

After a long hiatus from ham and SWLing activities, I've recently had a renewed interest in pursuing my radio hobbies. But, after listening and operating for a few days, signals seemed to be a lot weaker than they used to be. Something wasn't right. I blamed it on poor propagation; until I made a startling discovery: Signals that were barely moving the S-meter using the 2.1 kHz and 600 Hz filter positions were S9 plus with either the 6-kHz AM ceramic filter or 300-Hz crystal filter selected. After some quick troubleshooting, my fears were confirmed: The two mechanical filters had become extremely lossy.

Nothing To Lose

Unfortunately, I couldn't find a source for replacement 600-ohm impedance filters the receiver was designed for; and as I will show, 20-year old *new-old-stock* filters from a dealer's back shelves may not be a bargain, even if they could be found. These were my alternatives: I could live with the degraded performance, or I could adapt the receiver to use more modern 2-kHz impedance Rockwell-Collins torsional-mode mechanical filters. Rob, from Sherwood Engineering, was willing to tackle

the upgrades; or I could do them myself and just buy the filters. Either way it would be costly, but I'd do it if I had to if it meant saving my '515!

Mechanical filters use transducers to convert electrical energy into mechanical energy, and this energy is coupled through precisely made metal disks that resonant at the passband frequency. The action is not unlike a tuning fork, which responds to a single frequency. At the other end of the filter, another transducer converts the mechanical vibrations back into an electrical signal.

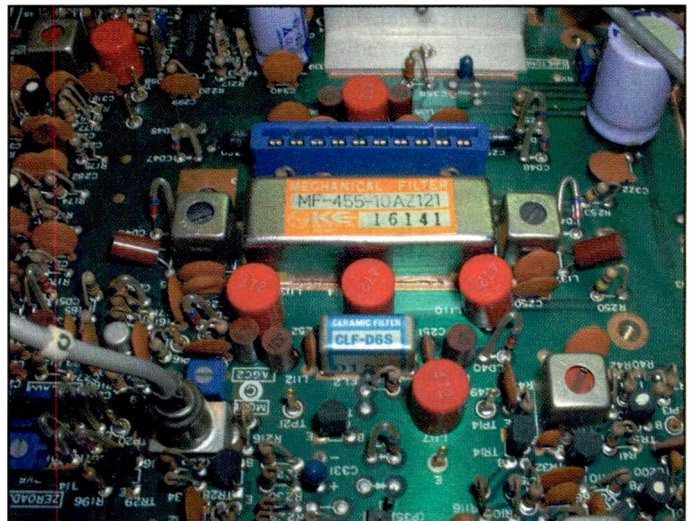


Photo 2: The JRC SSB filter (larger can) is seen in back of the smaller ceramic 6-kHz AM filter. The 600-Hz CW filter, with the companion 300-Hz CW crystal filter, is mounted on a plug-in "option board" — which was removed when the photo was taken.

Care Is Needed

The increased insertion loss for this style filter didn't make sense. Why? I decided to investigate to see if I could spot an obvious cause for the problem. Unless you have some experience removing components from circuit boards, and don't mind risking permanently damaging your mechanical filters, leave the repairs or upgrades to a professional! Unsoldering the filters is tricky! I was careful, yet I managed to pull the plated-through holes when removing the filters.

The filters can be opened for examination by lifting four metal tabs that hold the metal cover to the base assembly. **Use great care here!** The filter assembly is not fixed-mounted in the case — once the cover is removed, the filter component is free to

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Photo 3: Opening the SSB filter reveals a gooey mass of decaying yellow foam adhering to the mechanical filter's transducers and resonator disks. The weight of the filter had compressed the gooey foam into an almost "superglue"-like substance where the filter components rested on the Bakelite base, destroying the filter's performance.

flop about, and is very easily destroyed if stressed or dropped! It's only supported by thin wire leads connecting the filter to the base terminals.

Photo 3 shows what was found when opening the 8-pole mechanical SSB filter. The filter was originally cradled in a wrapping of soft yellow-colored foam rubber. Over time the foam had gradually decomposed until it became a sticky mass adhering to the resonator disks. Even the foam that still looked like foam was extremely sticky and gooey, and was easily rolled into a mass of chewing gum-like consistency. The filter was

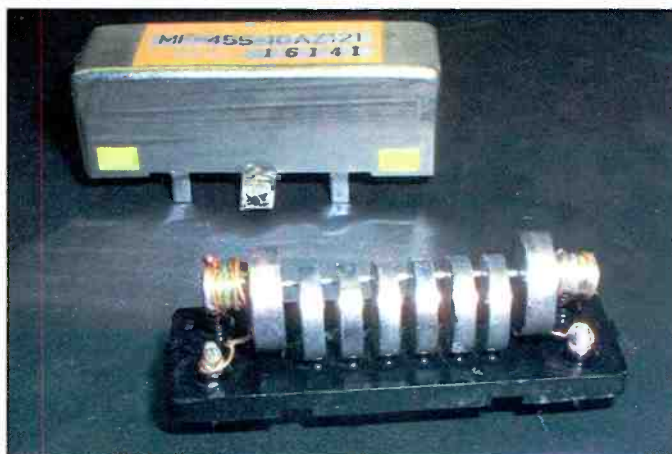


Photo 4: After using a solvent to melt away the old foam rubber, followed by several rinses in pure isopropyl alcohol, the old filter is free of contamination.

"glued" to the base. At first I thought this was done intentionally, but upon closer examination I found the "glue" was fully decomposed foam. This was the primary cause for the severe attenuation, just as our tuning fork example would be muted when inserted into a vat of molasses.

I carefully picked away what foam I could by hand, and then used flux remover (Tech Spray 1621-10S defluxer) to dissolve the remaining foam, and to flush it away from the filter components. Acetone may also work as a solvent here. Work in a well-ventilated area when using these chemicals. The cleaning was assisted by using a small artist's brush to gently wipe the filter as it was soaking. For the final cleaning, the filter was thoroughly rinsed in pure isopropyl alcohol (Tech Spray 1610-P cleaner/degreaser) and allowed to air-dry. **Photo 4** shows the SSB filter after cleaning. Similar steps were taken to restore the 600-Hz mechanical filter. **Photo 5** shows the 7-pole CW filter after cleaning.

Rebuilding The Filter

The foam must be replaced. All I had on hand was a thick block of rubber foam salvaged from a shipping box; from this I cut-to-fit some narrow replacement strips. Thin sheets of foam are sold for replacement air conditioner filters. This material — cut to size — might also serve as good replacement cushions for the filters. **Photo 6** shows how a layer of new foam is placed between the filter and the Bakelite base. A second layer of foam was formed inside of the cover to provide protection for the sides, ends, and top of the filter. Once the cover is replaced, the filter is again gently cradled in a loose blanket of soft rubber-foam material.

Now the mechanical filters can be reinstalled in the receiver, and proper operation verified. Note that the filter terminals have E, G, E, P markings (Earth, Grid, Plate) that should line up with the silk-screened legends on the PCB when the filter is properly orientated.

A Common Problem?

I've heard this problem is common to other vintage receivers using Japanese mechanical filters; it is not unique to the JRC NRD-515. Opening and working on these delicate filters requires some skill, and a smattering of luck, but when faced with the

Mobile DXer

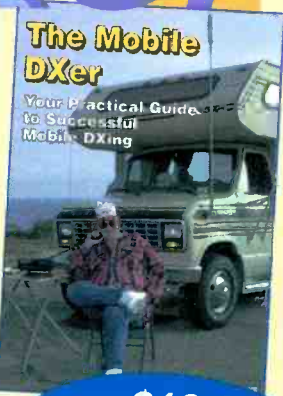
by Dave Mangels, AC6WO

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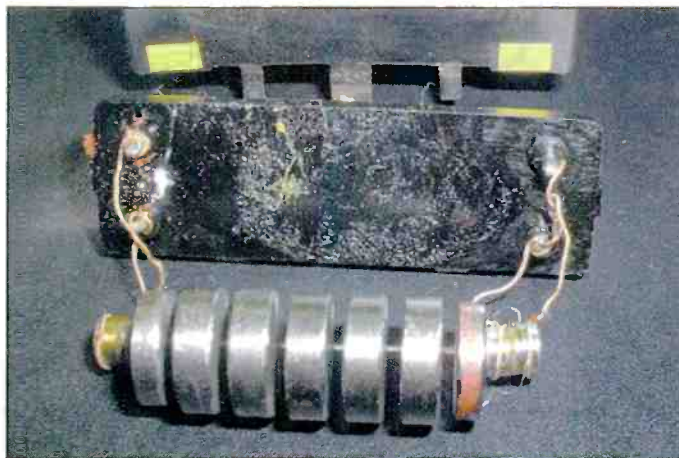


Photo 5: The 7-pole 800-Hz CW filter after cleaning.



Photo 6: Replacement foam is trimmed to fit and placed between the filter elements and the mounting base, and inside the cover. When assembled, the filter is again gently cradled in soft foam rubber.

chance of eking more life out an expensive component rather than trashing and replacing it, why not? Newer, torsional-mode 2k-ohm mechanical filters cost around \$125 each, and would require some added impedance matching networks to work with the '515. 2k-ohm crystal filters are also available and will do the job for a

similar cost. The '515 design inherently suffers from some IF signal *blow-by* issues caused by unwanted coupling between the SSB and AM filter inductors on the receiver board. Sherwood Engineering can correct these problems, if the set is sent to them for upgrades and modifications. There is quite a bit of work involved in these mods, and it isn't cheap.

How long will the new foam last? I don't know; but I suspect at least several years if not much longer. But for now my problems are solved, and I am again actively SWLing and chasing DX on the ham bands! 73! ■

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Monitoring Operation Enduring Freedom

The Afghan Air Story And Operating Frequencies

by Keith Stein

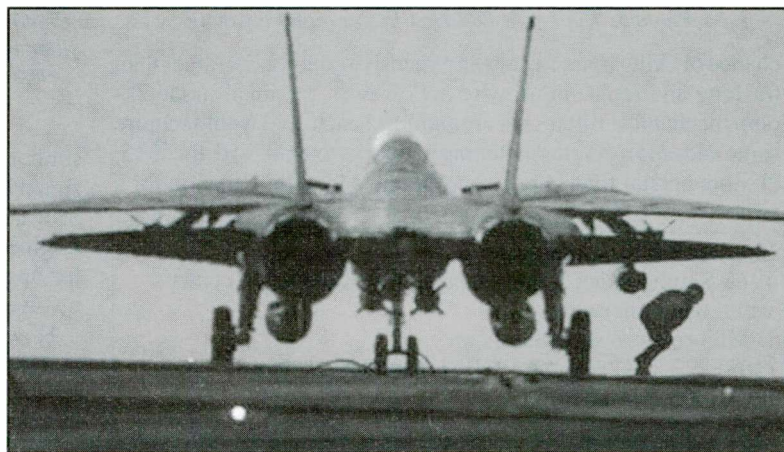
With the current war on terrorism in full force in Afghanistan, the Department of Defense (DoD) and Federal Aviation Administration (FAA) have issued special notices prohibiting flight operations within the territory and airspace of Afghanistan by all U.S. air carriers, and commercial operators, unless the pilot is a foreign national engaged in the operation of a U.S.-registered aircraft for a foreign carrier.

Pilots are following enhanced safety procedures for humanitarian aid (HA), and international organization/non-government organization (IO/NGO) flights in and out of country where intense military combat operations continue.

All civil aircraft have been instructed to monitor one or both international emergency frequencies while operating in the area (VHF 121.5 and / or UHF 243.0 MHz).

The Defense Department has recommended that HA and IO/NGO flights be conducted during daylight hours only. Pilots are required to submit a pre-flight notification to U.S. Central Command, or the Coalition Humanitarian Liaison Center in Pakistan or Uzbekistan at least 24-hours prior to each flight into Afghanistan.

Before entering Kabul airspace (the capital of Afghanistan), all HA and IO/NGOs should contact airborne early warning (AEW), call sign "BOSSMAN" or "SPARTAN" on 126.325 MHz (primary) or 360.7 MHz (secondary). AEW is not an air



F-14D Tomcat from the "Blacklions" of Fighter Squadron 213 (VF-213) on the USS Carl Vinson (CVN 70) supporting Operation Enduring Freedom (U.S. Navy photo).

traffic control (ATC) agency and cannot provide any air traffic services. They will only monitor, watch, and advise pilots of other aircraft in the area.

As of Dec. 19, the following airfields were being used for humanitarian aid/assistance: Bagram, Faisabad, and Mazar-E-Sharif.

Air Force tactical controllers are currently providing limited terminal control at Bagram coordinating landing and take-off clearances. Pilots are advised to contact Bagram tower on 118.5 MHz 10 minutes from landing or departing the airfield. Mazar-E-Sharif airfield has sustained considerable damage as a result of recent hostilities and has no terminal ATC. Faisabad airfield also has no terminal ATC. Pilots are advised to monitor BOSSMAN or SPARTAN channels when using these two airfields.

According to U.S. military notice to airmen (NOTAM) dated Feb. 8, 2001, Kabul International airport was equipped with an air-to-ground communications VSAT system using VHF 128.5 MHz. In addition, the airports control tower used 118.1, 121.9, and 125.0 MHz. NOTAMs dated Oct. 29,



U.S. Marines with the 26th Marine Expeditionary Unit deployed off USS Bataan's Amphibious Ready Group arrive ready at an undisclosed location to support Operation Enduring Freedom. (U.S. Navy photo).

1998, stated that Kabul International was also experiencing a shortage of aviation fuel.

Afghanistan On HF

The following HF frequencies were also listed in use at Kabul; 10018, 5658, 3467, 6547 kHz, followed by 4132, 2966, 6828.5, 7318 kHz being available, but not in use. It is unclear what frequencies, if any, are being used today since Afghanistan closed their airspace to all flights on Sept. 16 prior to U.S.-led attacks.

Other Afghan airports: Kandahar Airport Tower; 118.1, 128.5 MHz Herat Airport Tower; 118.1, 128.5, 121.9 MHz Mazar-E-Sharif Airport Tower; 118.1, 128.5, 121.9 MHz Jalalabad Airport Tower; 118.5 MHz

Sanctions And War Kill Afghan Airline

The climax to a six-year project to update Afghanistan's antiquated air traffic control system took place in January 2001 when new state-of-the-art equipment was unveiled. The hope was that the new system would draw more airlines taking direct routes between Asia and Europe through Afghan airspace. The country earns approximately \$400.00 for each aircraft passing through their airspace.

Air traffic controllers are some of the country's most highly skilled workers and earn substantial revenues for the state. However, they are on standard government salaries of about six to eight dollars a month. The country's aviation industry started dying about two or three years ago. After 20 or so years of brutal warfare and under United Nation (U.N.) sanctions, there was little for the air traffic controllers to do.

Ariana aircraft — Afghanistan's once proud state airline — stood idle on the tarmac. The Ariana fleet consisted of three Boeing 707's and five Russian-built Antonov AN-24 aircraft. Under U.N. Security Council Resolution 1267, imposed in November 1999, all Ariana international flights (except those classed as humanitarian or for the fulfillment of religious obligations) were suspended, company funds were blocked, and no spare parts, supplies, or training could be provided by foreign companies.

Aside from the odd anti-aircraft guns and the burned-out fuselage of a Russian MiG fighter in the distance, there is little of interest at Kabul International. U.N.

Security Council Resolution 1333, imposed on Jan. 19, 2001, banned all international flights to the country, closed all Ariana's offices outside Afghanistan and barred the Taliban government officials from flying out of the country.

Diego Garcia Operations

U.S. and allied military forces in the Indian Ocean are also working under increased security in the Diego Garcia area. Civilian aircraft are required to contact "REDCROWN" prior to reaching

300 nautical miles from Diego Garcia. REDCROWN is using HF 13254, VHF 126.2 MHz, UHF 386.6 (primary) or UHF 340.2 MHz (secondary). Diego Garcia tower also operates on the same frequencies.

Pilots are required to check-in with aircraft identification, flight number, route of flight, altitude, origin, and destination information. Any aircraft that comes within 200 nm of Diego Garcia may be subject to military intercept or use of forces, according to NOTAMs released by DoD. ■

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Maha's MH-C777 Plus Universal Charger and Analyzer

A fresh set of rechargeable batteries should run your portable electronics for at least three years. Battery chemistry in the common rechargeable nickel cadmium cells might last up to five years before they need to be disposed of properly. Newer chemistry, like nickel metal hydride, should give three years of service with proper cell maintenance, and relatively new chemistry called lithium ion may last from 1-1/2 to 2 years before the cells become unusable.

The best thing you can do with a rechargeable battery is to regularly exercise it down to a near-dead condition, and then recharge it back up so they are fresh for another exercise. The worst thing you can do to a set of rechargeable batteries is to constantly leave them plugged into a trickle-charge circuit, slowly baking out their internal chemistry and clogging their internal pores by not regularly pulling a charge out of them, and then recharging them.

If you have any portable electronics that are constantly on trickle charge, warm to the touch, and not "exercised" within the last year, chances of those batteries working for more than just a few minutes are very remote. If the little batteries are individual AA-type cells, chances are you'll see white fuzz coming out of the positive terminal, and this crystalline substance usually indicates a fried battery pack.

Recharging your set of rechargeable batteries requires some fancy circuitry, well beyond that little "wall wart" that may have been supplied with the equipment originally.

Since the chemistry between nickel cadmium, nickel metal hydride, and lithium ion is quite different in rechargeable batteries, so are the charger techniques. Overcharge a lithium ion cell, and it could explode. Undercharge a nickel cadmium cell, and it develops a "lazy" memory effect. Over- or undercharge nickel metal hydride, and the life of the battery is halved.

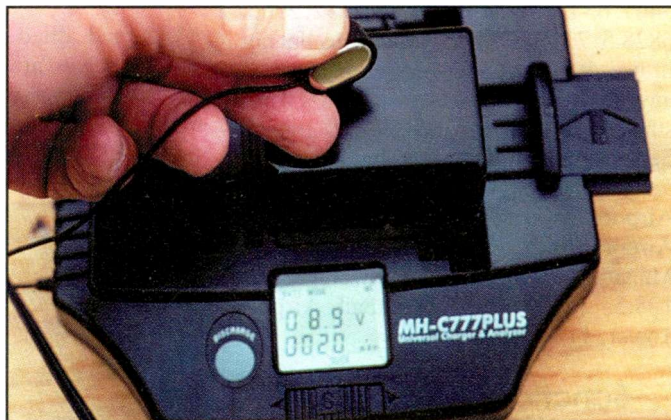
When a battery pack is recharged, both temperature and pressure begin to increase, and although a higher charging current can be achieved for an on-purpose overcharge, the cycle life of that battery pack gets sacrificed. Nickel metal hydride cells are much more sensitive to overcharging than the hardworking nickel cadmium cell. The smart battery charger may monitor temperature increase as well as voltage increase, and then decrease to terminate the charge cycle.

The smart battery charger will also have a time-out so as not to try to recharge a battery pack that may have one dead cell inside.

Some batteries will exhibit a slight drop in charge voltage when the cell becomes full — this would trigger the charger from fast charge over to slow charge. Some nickel metal hydride cells don't necessarily drop voltage, but rather exhibit a full stage at zero voltage increase, and this again would cause the smart charger to cycle over to a maintenance charge.

As you charge your batteries, chances are you have felt them getting warm. A temperature cutoff of 60 degrees C is recommended as a back-up for a fast-charge rate. The smart charger will also monitor the temperature change with time; and when the slope of temperature rise reaches a preset value, the fast charge is stopped.

Large-scale, integrated circuit chips may now handle all of



A look at the magnetic heat sensor on the MH-C777 Plus being placed on a battery before charging.

these monitoring functions. Thanks to this new all-on-one-chip technology, the price of "universal chargers" has dropped from several thousand dollars to well under \$100! As an example, the chip model MAX1666X from Maximum Integrated Products in a 20-pin QSOP package is available to charger manufacturers for less than \$3, and only a handful of additional low-cost components go on the inside of the charger to make it work with a variety of portable electronic battery chemistries.

I have recently run tests of multiple battery chemistries on the Maha MH-C777 Plus universal charger and analyzer, and concluded that this equipment does a nice job in supporting lithium ion, nickel metal hydride, and nickel cadmium battery chemistries from 1.2 volts to 14.4 volts. Its internal micro-processor senses negative delta voltage drop, zero delta voltage plateau, and a sensitive temperature sensor that insures the battery charging electronics shut down when a specific pack temperature is reached. On rapid charge, as much as 800 milliamps is provided, with 400 milliamps for lithium ion chemistry. And most amazing, the Maha charger recognizes the voltage of the battery pack during a three-minute analyzation cycle when you first make the red and black connections. You manually select between lithium ion chemistry or nickel metal hydride and nickel cadmium chemistry.

Working With The Maha Charger

The Maha Charger comes with both 110-volt AC power supply as well as a 12-volt DC power supply for mobile use. When you first plug in the AC supply, the LCD display quickly shows 20 volts potential with no battery pack in line. Next, maneuver your battery pack onto the charger, or use the supplied red and black alligator clips to connect positive and negative. If you should get the connection backwards, the charger will immediately beep at you, showing error. Reverse the connection.

Again, double check that you are on the right battery chemistry with the selector switch, and you will read that chemistry selected on the LCD readout.

Next, put the magnetic heat sensor on top of the battery pack, silver side down. It's magnetic, so it will stick instantly. Now watch the LCD readout showing the present pack voltage, and then three minutes of quick surface charging to identify the battery pack's voltage. Don't be surprised to see a 2- or 3-volt higher reading on the LCD readout during this fast-charge process — all part of the electronic learning maneuver.

At minute three, the charger now resets the charging capacity milliamp hour indicator, and goes through a fast charge process while keeping track of how many milliamps of charging current are going into your pack, and how much time has elapsed. Big numbers illustrate the battery peak voltage during charging.

The charger is microprocessor-driven and will automatically terminate rapid charging and enter a gentle, slow, trickle charging when the battery pack is detected full. The "full" indication is from sensitive voltage measurements on the chip, plus calculations of the temperature rise from the temperature pick-up. Once the battery is full, you can take it off the charger and begin using it in your radio.

If it's an older battery pack that you have resurrected from the dead, you may wish to run it through a conditioning cycle. To do this, sealed packs usually require using the red and black alligator clips on the part of the battery that contacts the equipment on the inside. Many times charging contacts exposed on the outside of the pack will not allow current to flow in the opposite direction.

During discharge, you will watch the energy calculated getting sucked out of your battery pack; and when the discharge process is completed with the pack at nearly zero, the charger will sound several long beeps, wait 15 minutes, and then automatically enter the recharge cycle. You should repeat this process several times if you are trying to resurrect an older battery pack that has been sitting around without a charge for a year or so. However, any battery pack that you have accidentally over-charged and is beginning to belch white crystals is terminally ill, and this charger won't be able to effectively resuscitate it.

This Charger Works With Singles, Multiples And Big Packs!

The Maha did well with charging single cells, multiple cells, and big battery packs from several different pieces of equipment I own. Just once did my Yaesu

FT-817, 9.8-volt, 1000 milliamp hour, nickel cadmium battery pack fool it — it figured it must have been a relatively depleted 12-volt pack, so started rapid charging it for a couple of minutes until it detected the temperature going up too fast, then reset itself, and then did a recharge at a lower voltage. On my little Yaesu lithium ion HT battery, I switched to the right chemistry, and the charger immediately knew what it was doing.

Seen selling for around \$90, the Maha Charger MH-C777 Plus with the LCD

conditioning readout is a good investment. The instruction manual has plenty of illustrations and is written in fairly good English, and Maha has a toll-free number where an expert can help you better understand any questions you may have about the charger.

Maha also manufactures a complete line of various chemistry rechargeable batteries, so check out their web page at <http://www.mahaenergy.com>. They have my vote for a relatively inexpensive battery-charging package. ■

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Getting Started With ACARS Using WACARS 0.7

Forget The Excuses - It's Easy To Do ACARS

by Greg Denson, AE4DC

WACARS 0.7 is a Microsoft Windows-based freeware-decoding program for ACARS, the Aircraft Addressing and Reporting System. It was natural for me to take an interest in ACARS since my hobbies include building and flying radio-controlled model airplanes, amateur radio, scanning, and computers. For the past few years, it seemed that every time I came across a magazine article or Internet page about ACARS, I would stop to read it, promising myself that I would soon give ACARS a try. Money was usually the obstacle to my keeping that promise. Trying to maintain an up-to-date ham shack, or buy an occasional new scanner or model airplane kit, would usually drain my hobby funds on a regular basis. There just never seemed to be the right time to spend a few hundred dollars on a dedicated receiver and decoder for ACARS.

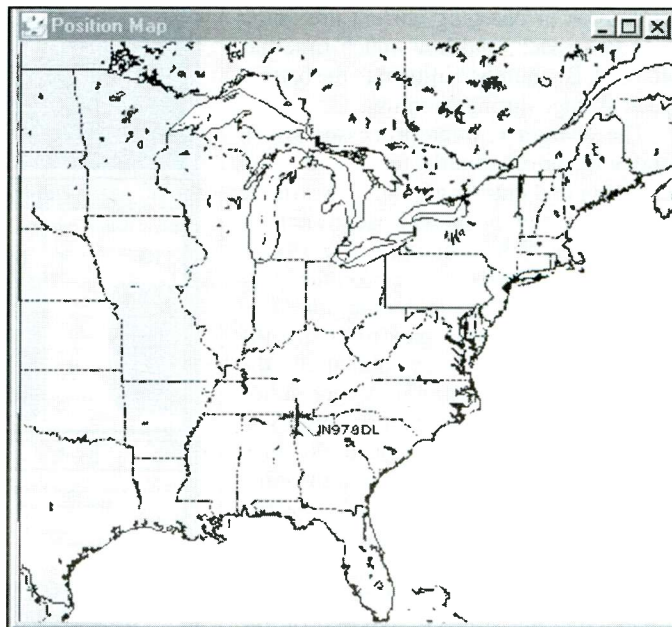
Then, while I was "surfing" the net recently, I discovered WACARS Version 0.7. As I said earlier, WACARS is a freeware program, and it uses my computer's sound card to decode the ACARS signals I receive with my scanner. In addition to decoding ACARS signals, the program has multiple logs for flights, aircraft, messages, etc. The distribution file that you download from the Internet also gives you other databases containing information on aircraft, airlines, ground facilities, etc. We'll talk more about those later. WACARS allows you to use maps to display the position of any aircraft that include position reports as part of their ACARS transmissions.

Having found WACARS on the Internet, I was suddenly out of excuses for not trying ACARS. I had a scanner capable of receiving the ACARS frequencies, a sound card in my PC, and now some free software. What more could I ask for? I immediately downloaded the software and got to work installing it. If you haven't already discovered WACARS, you'll probably want to give it a try, too.

Here's What You Need

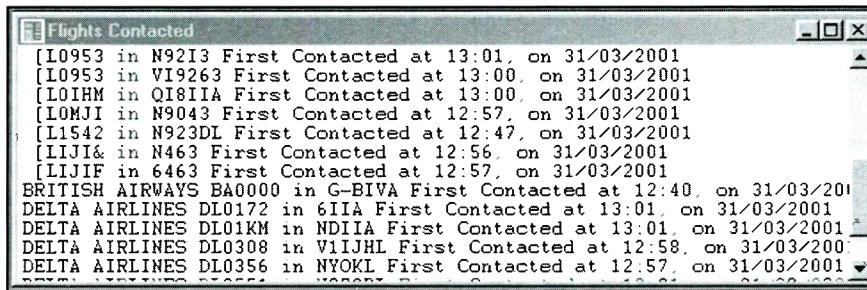
If you decide that WACARS 0.7 is for you, here's what you'll need in the way of hardware and software:

- A personal computer with a CPU that's 486 DX, 100 MHz, or better. The WACARS manual gives this CPU as an estimated minimum, but states that the exact requirements are unknown. Once the software is operational, there is a bar graph in the lower right corner of the screen that shows the load on your CPU. If it reaches 100% during decoding, your CPU is not able to keep up with decoding the signals, so you'll know that you need something faster. The Pentium clone in my desktop PC never even breaks a sweat with WACARS 0.7.



A map created right at the WACARS website.

- A windows compatible sound card. Most sound cards in modem PC's will do the job. If you'd rather use your DDE server, WACARS 0.7 also supports ACARS servers such as the Lowe Airmaster 2000 or Skyspy.
- At least one megabyte of free memory. Machines with 8 megabytes or more should be fine.
- Windows 3.1 or better. I'm using Windows 98 and it works great with WACARS.
- A scanner, or other receiver, that is capable of receiving the air band, 108-137 MHz. Most ACARS frequencies are between 129 and 137 megahertz.
- An audio cable to connect your receiver's audio output to your sound card's audio input. I connected my hand held scanner's ear-phone output jack to the sound card's microphone input jack. Be sure to check the documentation that came with your sound card or PC to ensure that you make the right connection for your equipment. I found the cable I needed at RadioShack.
- This last item is not really a requirement, but an outdoor antenna for your scanner is a big help if you're like me and live some distance from an airport. I live about 80 air miles from the Atlanta



Another part of the screen lists the flights that are contacted in the order they are received. If a flight is contacted multiple times, it will appear here for each contact.

airport and about 60 air miles from the Birmingham airport, so there are plenty of aircraft flying overhead. I've received and decoded their ACARS transmissions using the "rubber ducky" antenna on my hand held scanner. However, I've noticed a significant increase in the number of solid receptions and the signal quality when I attach an outdoor antenna. I normally use my 2-meter ham band vertical antenna that's mounted on my roof. It's not a perfect match, but it's close enough to improve my results.

So, where can you find the WACARS 0.7 software? Connect to the Internet and go to <http://www.fly.to/WACARS>. This shortcut will connect you to: <http://www.geocities.com/CapeCanaveral/Cockpit/9870/acars.html>.

This is the home page for WACARS 0.7. It's a long URL to type in each time you want to go there, so be sure to save it in your favorite places or use the shortcut, above. From there you can download WACARS, create some maps for tracking aircraft, check out a few other ACARS links, and read the frequently asked questions. If you aren't familiar with ACARS signals, you can even listen to a sound clip of an ACARS transmission so you'll know how to identify them with your scanner.

Before starting the download, I created a directory on my PC to hold all the WACARS files. You might want to consider doing the same. Then, when you're ready, follow the download instructions for your Internet browser and the instructions on the WACARS web pages to get the software downloaded to your PC. WACARS07.ZIP is a 359-KB zip file so if you don't have any software to unzip it, be sure to search for and download one of the shareware programs such as PKUNZIP or WINZIP so you can extract the individual files from WACARS07.ZIP. Always remember that if you test drive a piece of shareware software like WINZIP, find it useful, and continue to use it, you should register it and pay the author for his or her hard work. So, if you haven't already done so, go ahead and download the WACARS07.ZIP file now.

Before leaving the WACARS web site, click on a few of the links at the left side of the main page. Start with the FAQ link. It will take you to a page where you can find answers to a few of the questions others have had about WACARS. The answers to these questions may be very helpful to you in setting up and operating WACARS. While you're in the WACARS pages, especially if you're new to ACARS, be sure to click on the CLICK HERE link to hear a recording of a WACARS transmission. Then you'll know what you're chasing with your scanner.

The Frequencies

Check out the FREQUENCIES link, too. Unless you're already familiar with all the ACARS frequencies, you can gain some valu-

able information about frequencies for your location from this page. The main frequencies for the U.S. and Canada are:

129.125
130.025
130.450
131.125
131.550

The MAPS Link

Another link from the WACARS home page that you'll want to investigate is the MAPS link. It takes you to a web page where you can download some existing maps, which are mostly for Europe. Near the bottom of this page is another link that takes you to a page where you can create your own maps for use with WACARS. Go ahead and try making a map while you're there. This will give you a little practice, and you'll have a starter map for your first on-the-air WACARS session. If you're like me, after using WACARS for a few sessions, you'll probably want to make some modifications to the area your map covers, and you'll want to go back here to use this page again. So, it might be a good idea to bookmark this page for easy return if your browser allows you to save favorite web pages in this manner.

Check out the photo of one of the maps created using this web page. You can also create color maps if you wish. There are several options for showing cities, boundaries, rivers, etc. The first map I created had borders, scales, etc. I loaded it, scales and all, directly into WACARS. However, after using this image for a short while, I realized that I needed to get rid of the borders, scales, and titles. So, I used a Windows paint program to cut out just the map image, and then I saved that image as a separate bitmap file. You can use the WACARS Options menu to find the Map Options, which will let you select any bitmap (.BMP) file that you want to use for your WACARS, map display.

After creating your map, just be sure to record the East, West, North, and South coordinates you used to create your map so that you can tell WACARS what latitude and longitude are represented by your map. For example, my map of the Eastern U.S., (see photo) covers longitude -65 degrees to -100 degrees West, and latitude +25 degrees to +50 degrees North. WACARS will need those coordinates to accurately place aircraft on your map. Note that the map creation program requires that you enter West longitude as negative numbers to distinguish it from East longitude. If you need coordinates below the equator, remember that South latitude coordinates should also be entered as negative numbers. You can use an atlas that has the coordinates printed around the edges of the maps to select the coordinates that you need before going to the map creation page to create your personalized WACARS map.

Register Your WACARS Software

There is one more link to click on. Go to the registration link and register your software. Remember that the WACARS software is freeware, so there's no charge. Somewhere in the documentation I noticed that the programmers wouldn't turn down a contribution, if you were so inclined, but none is required. If you do register, they'll send you a registration number, and will have your name and e-mail address on file in case they want to contact you about upgrades, etc.

Installing The Software

Now that you've checked out the links on the WACARS page, created yourself a map, and downloaded the WACARS07 ZIP file, you're ready to begin installing the software. Use the PKUNZIP or WINZIP program to extract the files into your desired directory. After this process, you should have several files in your WACARS directory. The README file is an HTML (web-style) document containing an installation and user's guide for WACARS 0.7. I printed a copy of this file and have kept it close by my computer as a handy reference. In addition to telling you how to operate WACARS, it gives brief descriptions of all the program's features, menu options, databases, and log files.

The Test Drive

Now it's time to test-drive the software to see if everything is working properly. Locate and execute the WACARS .EXE file that was extracted from WACARS07.ZIP. I created a shortcut for WACARS .EXE and placed it on my Windows desktop to make it easy to find and run the program. The WACARS main screen should open in a few seconds. It will probably have several smaller windows for your map and various logs on the screen as well. Once you're comfortable with WACARS, you'll want to organize these windows to suit your needs. Here are a couple of my favorite WACARS windows to have on screen at all times. You can see that I've opened a window for the Message Log that displays all the text messages between the aircraft and the ground. I also like to view the list of Flights Contacted that displays each aircraft contacted as it occurs. In addition, I always keep the map window open. Refer to my sample map and notice the airplane symbol on the map near the Alabama, Georgia, and Tennessee borders.

Not all transmissions include position data, but when one does, WACARS will display an aircraft symbol on your map at the correct location, if the transmitted coordinates are within the geographic area covered by your map.

In the Aircraft Contacted window, some of the lines contain garbage characters. WACARS 0.7 has three options for error checking. 'Full Checking' will eliminate display of any messages

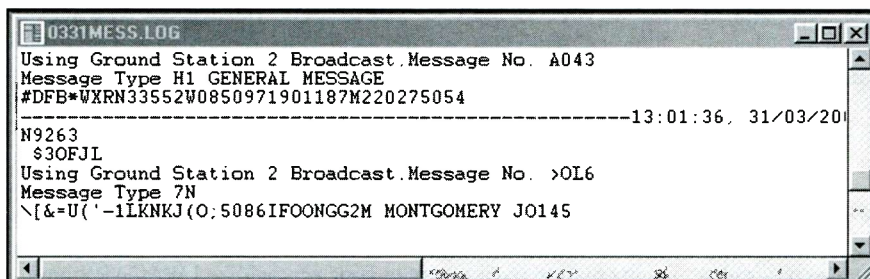
that are not complete. 'Only Header' will eliminate only those messages with errors in the heading. The other option is for 'No Checking'. Since I'm fairly new to ACARS and WACARS, I use this latter option most of the time. I want to see all sorts of messages, and get lots of practice in adjusting the volume on my scanner, trying out different antennas to see which one brings in the best signal, etc. After a while, I'm sure I'll tire of all the junk, but for now I enjoy watching all the messages scroll by. So, for starters, find the 'Options' menu and the 'Error Checking' option, and then set it to 'No Checking'.

In a few minutes, when we get around to connecting your scanner to the PC, you'll want to pay particular attention to two parts of this screen. One is the Signal Strength bar at the lower right of your screen, and the Raw Data Log. The Signal Strength bar will help you set the volume on your scanner correctly and the Raw Data Log will let you see if WACARS is able to receive raw data to decode.

Now, if everything appears to be working properly, go to the 'File' drop down menu at the upper left of the WACARS screen and be sure that the 38400 KB/sec Sound Driver has been selected. Or select DDE if you're using a DDE server instead of a sound card. According to the manual, the 38400 driver is the newer, and supposedly more efficient option for sound cards. Also, if you didn't do it earlier, go to the 'Options' menu and set the 'Error Checking' for 'No Checking'. Then, while in the 'Options' menu, be sure all the 'Expand' options are set to 'Expand'. This will show you more information about aircraft, flights, etc., in your log windows. Then, ensure that the 'Log Only Known Aircraft' option is NOT checked. For now, you'll want to see them all.

Next, go ahead and turn on your scanner and set it to one of the ACARS frequencies, and listen for a while to see if you are receiving signals on that frequency. If not, try another frequency until you find one that has some activity every few seconds. Once you've found a frequency that's receiving frequent transmissions, connect your scanner output to your sound card's input according to the directions with your sound card. Now watch the Signal Strength bar on the bottom of the WACARS screen as you turn on your scanner and increase the volume slowly. My copy of the WACARS manual said to turn the volume on your receiver up until the Signal Strength bar moves up about halfway when a signal is received, and is near zero when no signal is received. The documentation, however, did not mention that the Signal Strength bar would appear in three different colors at times. So, I had to experiment for a while to learn the best volume setting for my equipment.

Experimentation has shown me that I need to increase my volume control until the RED bar on the Signal Strength meter extends about 75-85% of the way across the Signal Strength meter when a strong signal is received. With one of my sound cards, I had to pull the audio cable part way out of the jack on my scanner so that I could hear the ACARS transmissions while the PC was still decoding the signal. I later tried the rig with another PC and dif-



While decoding ACARS here's a look at only part of my screen that displays any text messages that are included in the actual ACARS transmission.

ferent sound card, which would let me hear the ACARS signals over the PC's sound system. By using either of these methods, you can watch the signal strength bar while an ACARS signal is being received, and learn how to set the volume control correctly for your equipment. By the way, my desktop scanner requires different volume settings from my handheld scanner in order to work properly. So, be prepared to spend a little time determining what's the best setting for your rig.

The red signal bar will not extend across the meter all of the time, only when a strong signal is received. It may go to zero and not even be visible sometimes. At other times, it may only extend a short distance. So watch it for a minute or so and be sure that it's maximum extent is not taking it all the way across the Signal Strength bar. If the red bar does extend all the way across its window, reduce the volume a little and watch again. When you have the volume set correctly, you should also begin to see raw data appearing in the Raw Data Log window, another good indication that you're in the ballpark. You may have to do a little experimentation to get the fine-tuning down pat.

It's Functioning Properly!

Once you begin to get new raw data appearing frequently in the Raw Data Log window; you'll soon find aircraft, flights, and messages appearing in your other windows as well. This indicates that the WACARS decoder is functioning properly and decoding some of the raw data. Occasionally a message will contain a position report for an aircraft. If so, an airplane symbol and aircraft registration number for the plane will appear on your map.

As you get more adept at receiving and decoding signals, you'll want to check out more of the menu items for the WACARS window, especially the options and windows. You may want to select different options than those we're using as we learn how to operate WACARS. You may also want to change the windows that are displayed on the screen. This was one of the first modifications I made. I arranged the windows differently, and displayed as many of them as I could comfortably fit on the screen. I believe that as you are learning about WACARS, the more information you're able to see, the quicker you'll catch on to how the program works.

If you've managed to capture data on any aircraft, when you start to exit WACARS, you'll be asked if you want to save the var-

ious logs. If you answer YES each time, the logs will be saved in your WACARS directory as text files. I've found that I can get even more use out of these logs by cutting and pasting them into Excel spreadsheets where I can sort and manipulate them in various ways. For example, if I have the following line in my aircraft file: "N423UA Operating as UA1186 First Contacted at 10:59, on 16/04/2001",

I can use Excel formulas to extract the information into separate spreadsheet columns that I can sort:

| | |
|--------|----------------------------------|
| N423UA | The aircraft registration number |
| UA1186 | The flight number |

| | |
|------------|----------|
| 10:59 | The time |
| 16/04/2001 | The date |

Since the aircraft registration number is the first item to appear in the log line, the following spreadsheet formula extracts the registration number by copying all information up to the first space: `=MID(E2, 1, SEARCH(" ", E2, 1))` (This assumes the original data is in spreadsheet cell E2)

Again, please note that in all these formulas, I've assumed your original data you captured on WACARS is in spreadsheet cell E2 for these examples. If you have your data in another cell, please remember to modify the formula to point to your data cell. If you're familiar with spreadsheet

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software, and compare these formulas to the original data lines, such as the example shown again below, you can see how the formulas are seeking out the data to extract. Here's the data line again: N423UA Operating as UA1186 First Contacted at 10:59, on 16/04/2001

So, when the formula extracts everything up to the first space, you wind up with the aircraft registration number, "N423UA".

Of course you've heard the phrase, "Garbage in, garbage out". You'll have to expect that if you have lines of real garbage in your database, these formulas will extract garbage for some of the columns. However, it's a lot easier to clean up a few stray fields than it is to extract all this data by hand.

Finally, WACARS comes with a set of databases containing information on aircraft, airlines, ground facilities, etc. For example, the aircraft database matches aircraft registration with aircraft descriptions. As stated above, a typical line in this database might be: N423UA Operating as UA1186 First Contacted at 10:59, on 16/04/2001

Where:

10:59 The time I first decoded information from this aircraft
16/04/2001 The date I decoded the information from this flight (in European date format).

I normally keep the original message, above, in a separate column of my spreadsheet, as well.

Below, I've given you some of the additional Excel formulas that I use in my spreadsheets to extract data. Not everyone will be into doing all this data manipulation, and there are some database programs on the market that simplify this for you. But if you're like me and run a low budget operation, you can use and modify these formulas to help manipulate your logging data into other formats. These formulas should be easy to convert to Lotus 1-2-3 format if you use Lotus for your spreadsheets.

The first formula, below, extracts time information by searching for a colon, backing up 2 spaces, and copying the next 5 characters. E2 is the reference to the spreadsheet cell where the original line of data resides. You'll want to enter this formula into another cell on the same row as the one containing the raw data. For example, if your original log line is in E2, you may want to enter this formula to extract the time in E3. Since you'll have multiple rows of original data, you can then copy and paste the formula for as many additional rows as you need. =MID(E2,SEARCH(":",E2,1)-2,5)

The next formula, below, extracts flight information by seeking the word "as", and copying the next six characters. Again, the E2 type numbers represent the cells where the original data resides: =MID(E2,SEARCH("as",E2,1)+3,6)

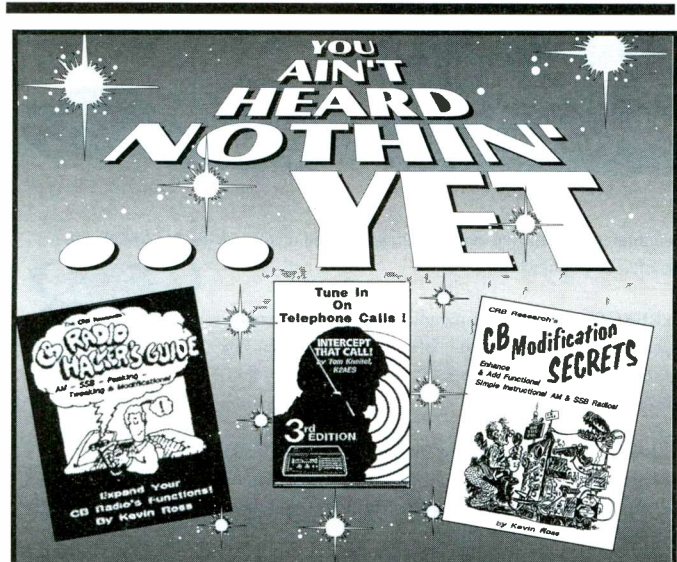
This tells us that aircraft N423UA is operating as United Airlines flight number UA1186.

You could also devise your own formulas to copy everything that follows "as" up until it hits the word "First", because sometimes you'll also capture the type of aircraft in the transmissions you copy. For example, you might learn that N121UA is a Boeing 747-422. This happens when your WACARS database contains the type of aircraft associated with the registration number. WACARS can use this information to display the aircraft type should it ever decode a transmission from N121UA. Here's an example of how the formula might look: MID(E2,SEARCH("as",E2,1)+3,(SEARCH("First",E2,1)-SEARCH("as",E2,1)-3))

You'll soon learn that the database that comes with your WACARS download is not all-inclusive, and that new aircraft are being purchased by airlines on a regular basis. You may wish to update your copy of the database with new data as you decode transmissions from new aircraft that are not currently in the database. A good source for this kind of information is the Landings web site. So, get back on the Internet and go to <http://www.landings.com/aviation.html>. There you'll find links that will take you to pages where you can enter the registration numbers you decoded with WACARS and search for more information on the aircraft. A typical search will give you a page of information on this aircraft including its type, its manufacturer, its registration date, its engine type, its owner, and more. 'Landings' is a good site for all types of aviation information.

For further information on ACARS, you may also want to look at <http://www.acarslink.com>. This is the ACARS-Link home page and provides you with access to other links, frequencies, related software, news, equipment, and sample files. As you'll see on their home page, they do not answer questions about WACARS, but it is a good site for general ACARS information.

Hopefully this article has given you enough information to help you get started decoding ACARS transmissions using WACARS 0.7. Maybe it has also planted a few seeds about manipulating the data you record in your WACARS sessions. Happy hunting! ■



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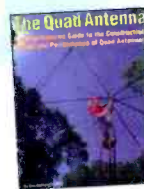
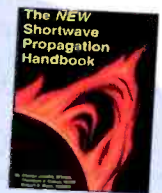


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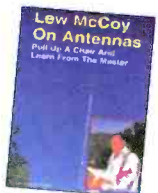


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The Inside Scoop On Rechargeable Batteries

You pull your handheld radio out of the charger, hang it on your belt, and 30 minutes later, the transmitter signals LOW BATTERY after just a few words on the air. Say thank you to the consumer electronics industry for better batteries. All those boom boxes down at the beach require high-current, long-life, big batteries that will keep the sounds pumping into the sunset. All those little personal stereos may require AA rechargeables that might not need high-current carrying capabilities, but DO need long life to feed those headphones sweet sounds for hours on end.

For sailors outfitting an emergency "bail out" life raft system with EPIRB, GPS, and a handheld inside, the very worst choice are the rechargeables that might power the boom box or personal stereo down at the beach. And for those new video scanners with TV receivers, fast-scan amateur TV, and slow-scan TV, the battery voltage from a set of rechargeable AA cells must not dip more than 10 percent from a fully charged state to half-charge, because of the fussy video circuitry in these diminutive portable video devices.

Which Battery Is Best?

There should be absolutely no answer to this question until we review how the electronic equipment operates. Each radio, or scanner, or portable TV, and GPS has its own battery requirements, even though the typical AA cells look exactly the same!

The consumer electronics industry and the manufacturers of personal radio and navigation devices have done everyone a major favor by basing their equipment on the common AA battery size. While there are big boom boxes that might require C cells or flashlight D cells, the AA cell is what we will find in most personal radio and NAV equipment, GPS equipment, small penlights, and even in those two-way radio and scanner radio "sealed" battery packs. That's right, break open the battery pack and guess what is on the inside — a series connection of AA cells.

The long-life alkaline battery, sized in AA and AAA cells comprising 80 percent of all batteries sold in the personal electronics marketplace, may offer close to 2,000 mAh capacity (a whopping 2 amps) with a balance of low internal resistance for momentary high-current drains, such as transmitting on a VHF at high power, yet chemistry to provide 50 percent longer playing time (usually associated with a higher internal resistance) to run low constant current receivers and navigation devices.

AA long-life, non-rechargeable batteries are part of the \$3 billion plus consumer electronics market, and the name of the game is to find a balance between staying power and momentary high-current peak demands.

The long-lasting alkaline batteries are preferred in emergency battery packs where they may be stored for up to five years without losing more than 10 percent of their initial capacity. For any piece of electronic equipment that may get stowed away for use "only in an emergency," the alkaline battery is a good choice.



New GPS equipment may soon switch to lithium ion battery systems.

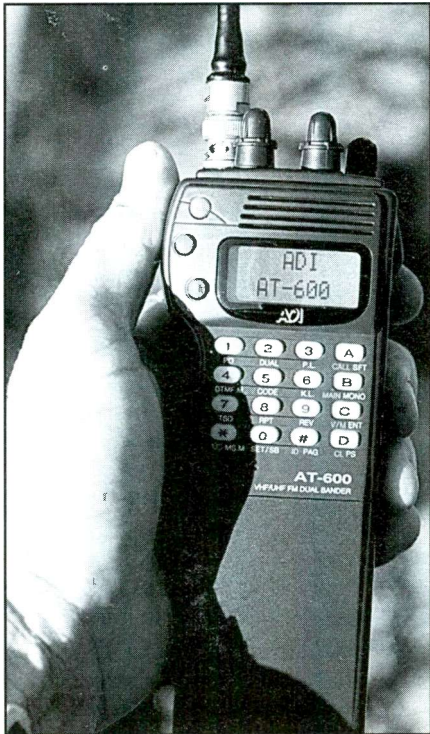
Alkaline batteries are also preferred for extremely cold and freezing environments. Ski patrols know the importance of keeping their two-way radio inside their jacket for warmth; a radio in freezing temperatures run by rechargeable batteries won't play long on transmit or receive. But with common alkaline cells, that same radio with icicles on it may work the longest.

As the consumer electronics market continues to introduce new products like personal digital stereo devices, tiny color LCD TV's, disk players, flash cameras, camcorders, and PDA's, the price of a quality alkaline throw-away cell is reasonable when balanced with its long life and dependability to play when the device has not been used for a couple of years. And in an emergency, AA cells are sold just about everywhere.

Renewal Rechargeable Alkaline™

A cross between long-life, non-rechargeable, alkaline cells and rechargeable cells are the batteries from Rayovac called Renewal Rechargeable Alkaline™. Not much is said about these little workhorse cells, but they indeed have their place in the portable electronics field if you keep track of exactly how many times you have given them a re-shot.

Like top-quality alkaline cells, the manufacturers (for some strange reason) don't stamp on the side of the battery exactly how many milliamp hours are on the inside. The reason they don't put this rating on the battery is because different consumer electronic devices have different current levels and may pull down the usable voltage faster than at other current levels. But let's assume a set of Rayovac renewal batteries along with their proprietary recharger come out of the plastic wrap at around



Powerful handhelds work well on most rechargeable battery systems.

1,900 mAh, just about the same as a high-quality AA non-rechargeable battery. Run the renewals for a day or so, and then put them back into the proprietary charger designed ONLY for those renewals. After about 10 cycles, you are now down to about half capacity, but with a terminal voltage almost the same as if they were brand new out of the box. After 50 times of renewing them, you are down to about half as much capacity, but that terminal voltage still remains almost like new — but just not as long.

If you're careful not to really pull your renewals down to their death, you can sometimes get 25 more cycles, but they only hold that nice, healthy, 1.22 volts per cell, for about one-third of the time as when they were brand new.

If you don't keep track of where you are on the renewal system, you might be planning on relying on a set of batteries all day, but they only go a couple of hours. But renewal batteries certainly do work, but just be sure to charge them with the charging circuit they packaged with the AA or AAA battery cells.

Real Rechargeables

The king of rechargeable batteries is a chemistry called nickel cadmium, abbreviated NiCd. We affectionately call them

Ni-Cads, and their energy density per cell may be as high as 4.0 Wh, with ratings of up to 1,200 mAh on their side. This is remarkable! I can remember the nickel cadmium battery at 500 mAh as a big deal, and just a few years later, we now have three times the capacity!

The Ni-Cad internal resistance is between 100 and 200 milli-ohms meaning that they are ideal for two-way radio products that need long life on receive, but capabilities of brief high-current flow on transmit. The Ni-Cad battery self-discharges at about 20 percent per month, and this means you have a dead battery pack about a half a year later without recharging. But boy oh boy, if you regularly cycle your Ni-Cad battery system, you can sometimes get between 1,500 to 2,000 recharges without significant loss of power density.

But this does not mean leave your handheld radio or scanner continuously in the battery charger, baking the cells. Constantly recharging a rechargeable nickel cadmium battery pack leads to crystalline formation, creating hard spots within the usual mushy energy chemistry, dramatically cutting down on how long the battery will last. Many times you can see the formation of this crystalline substance actually venting out from the positive terminal on the rechargeable AA Ni-Cad; and when you see this white stuff coming out of the top, this cell is toast. Not only must you dispose of it, but with cadmium, you must dispose of it properly.

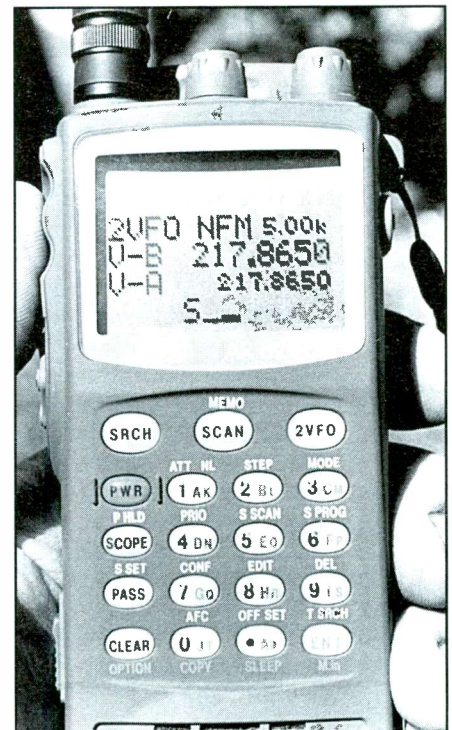
One of the best devices to obtain with your nickel metal hydride battery is a charging system that may cycle the battery through charge and discharge periods, exercising the battery, and keeping it from developing bad memory habits where the crystalline substance won't transform back into the gooey chemical. One of the leading manufacturers of "smart" battery chargers is a company called Maha Communications (<http://www.maha-comm.com>), 800-376-9992. While there are probably over 100 manufacturers of "smart chargers," these chargers are designed for a specific type of radio or battery pack, where Maha is concentrating on every battery pack by coming up with a universal charger that will take almost any type of battery chemistry and give that battery the exercise it needs to play long and hard, despite how badly the batteries may have been used in the past. But again, if you see that white stuff coming from the top of a battery pack, or if you have a nickel cadmium

battery that shows zero voltage on the terminals, NOTHING will bring it back!

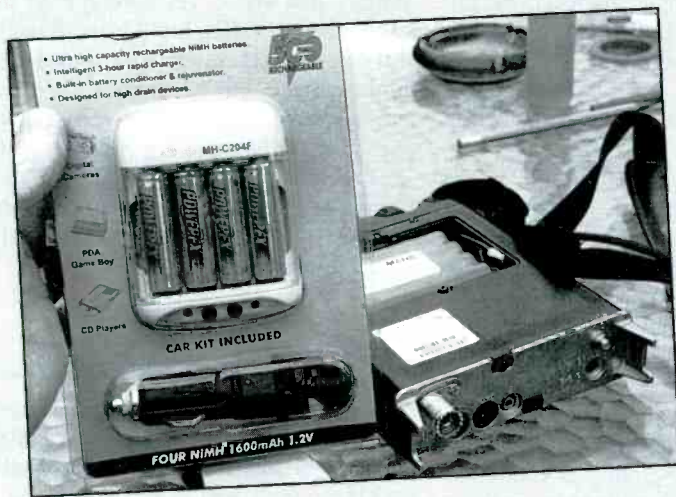
Battery experts say that the nickel cadmium battery will be around for many more years because it is not overly expensive to manufacture, dependable up to 1,500 recharges, tolerant of mild abuse, and the best value to offer customers purchasing a piece of equipment with "built-in rechargeable batteries."

Nickel Metal Hydride

For over seven years, a newer battery chemistry has gained popularity, called nickel metal hydride, abbreviated NiMH, packing over 1,800 mAh capacity at a slightly higher internal resistance than the Ni-Cad, but offering radio and navigation receiver users almost twice the playing time between recharges. The higher impedance of the nickel metal hydride battery makes it a real workhorse on portable electronics that won't necessarily need high demand current. A two-way radio, up to five watts, works nicely off of the nickel metal hydride cells. Power density is 5.3 Wh, with an internal resistance of around 700 milli-ohms. It self-discharges slightly faster than a Ni-Cad battery, which means after about four

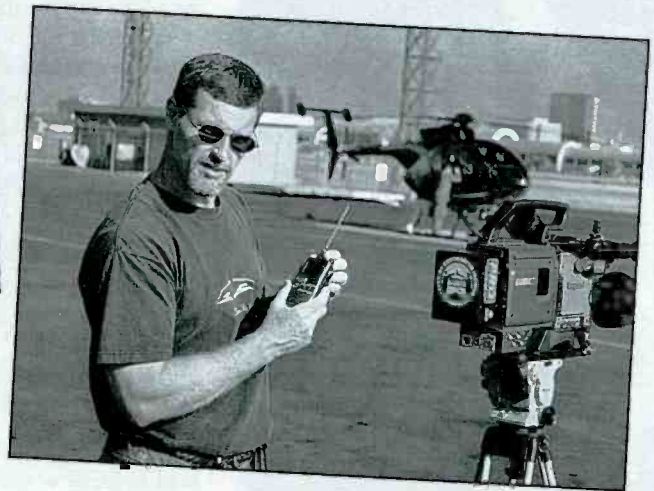


Portable scanners run days on NiMH batteries — much better than Ni-Cads.



The ICOM R3 may also take individual AA cells, but only the ICOM sealed battery pack charges inside the receiver.

The new Maha NiMH cells are now up to 1700 mAh!



months, a set of nickel metal hydride cells requires a recharge.

Engineers at Maha Communications, one of the largest providers of individual nickel metal hydride cells, claim that 700–800 recharges is typical, about half the recharges one would get out of a conventional Ni-Cad. However, Maha also

claims its cycling and conditioning nickel metal hydride battery chargers, combined with their line of nickel metal hydride batteries, will probably exceed 1,000 recharges.

The nickel metal hydride cells are very particular about how they are recharged. They require advanced charging techniques, accomplished with the extra smart battery charger that senses temperature, voltage, voltage peaks, current, and time measurements of voltage change. The Maha 777 universal charger takes care of all of these requirements. Most manufacturers offer battery trays that allow radio enthusiasts to drop in their own set of AA individual battery cells. The Maha charger conditioner can also charge up any style factory “sealed” battery packs.

Lithium-Ion

Battery manufacturers are now turning out a new rechargeable battery chemistry called lithium ion. Energizer, one of the leading battery manufacturers, has a \$90 million facility in Florida cranking out this new form of battery energy rated at 6.6 Wh, medium to high internal resistance, and capabilities of running portable electronics 1-1/2 times longer than nickel metal hydride, and better than twice as long when compared to nickel cadmium.

But lithium ion didn’t get started without some growing pains — sometimes going haywire with a cell phone or GPS that could cause the lithium battery to see

a short circuit could cause internal battery run-away. Cell temperature rockets to the temperature of lithium, and in rare cases, the early version of the lithium cell could actually go poof, permanently damaging the equipment and possibly spitting hot goo on someone operating the equipment.

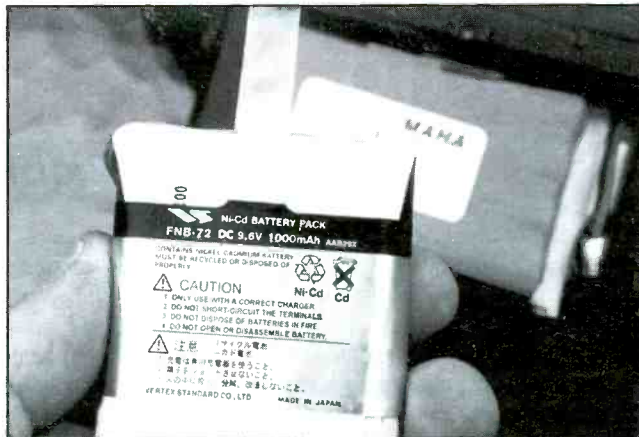
Newer style lithium batteries are now safe, using a non-metallic chemistry with slightly lower energy density, but far safer than earlier cells. Lithium individual cells are difficult to find in the traditional AA size — and good thing. Attempting to charge a lithium cell in a Ni-Cad or nickel metal hydride charger not designed for lithium ion could result in thermal run-away and battery destruction. The lithium cell is normally 3.6 volts, and most equipment sold with long-lasting lithium rechargeable batteries comes with a proprietary charging circuit with a specific type of plug that only fits that particular type of equipment.

Lithium ion batteries charge up quite quickly in about three hours, and an internal charging circuit triggers the charger off when voltage reaches a specific upper limit, while current drops back slightly. After the constant current charge, the smart lithium charger goes into a top-off charge, and then stops charging completely with no trickle charge thereafter.

The lithium cells will work fabulously well for the first year, but will probably poop out about month 15. Literature indicates they are rated for about 500 discharge/charge cycles. After about a year,



Do you regularly use up AA alkaline batteries and trash them? Think rechargeables!



This Maha pack is designed for the Yaesu FT-817 and rated at a whopping 1700 mAh, having almost twice the capacity as the Yaesu Ni-Cd pack for almost the same cost!

you will begin to notice that your equipment does not run quite as long. And there is also the problem with natural aging of lithium ion. After a year, even not using the battery, it will never hold a charge quite as long; and after a couple of years, even without much battery use, the cell is dead and non-revivable.

C777+ universal charger and analyzer with an LCD readout of what's going on inside the batteries being charged.

Why throw away hundreds of dollars a year in alkaline batteries when pieces of equipment you regularly use could run quite nicely on the same sized AA cells that are rechargeable! Even if your

equipment doesn't have built-in charging capabilities, almost every piece of portable electronics has capabilities to remove the AA style cells, and give them a separate recharge. Do it with a smart charger, and your batteries will keep your equipment running throughout the day with plenty of use.

So Which IS Best?

If your portable equipment comes with batteries, use that battery pack until it just won't take a charge or hold a charge. Then, consider a battery tray for your equipment that might take older nickel cadmium cells and drop in nickel metal hydride cells. Be sure you use the proper charger to charge nickel metal hydride cells in your equipment, or pull the cells out and charge them separately, such as with a Maha four-tray battery holder.

Keep your eye on lithium batteries, but don't expect you're going to see them in any high-power portable radio because of their high internal resistance and protection circuits to keep any high-load circuit from overheating the battery and creating thermal runaway.

Invest in something more than just the little "wall wart" that may come with your equipment in order to provide a trickle charge. These devices can actually cook your batteries if you don't take them off of charge after a day or so. You would do much better for your battery's health to invest in an after-market battery charger and conditioner unit, built to charge nickel cadmium, nickel metal hydride, and a few of the better chargers even rated to handle lithium ion, such as the Maha MH-



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Fixing CB Problems The Easy Way

No doubt about it, we live in what I call a “disposable” society. Just bought a new computer? What the heck, put the old one at the curb and, in most towns across America the sanitation engineers cart it away. I don’t know where they go—they just go away. I did hear something recently on TV about recycling the plastic and metal from the aging machines, and how not to clog our landfills with plastic and metal testaments to our lifestyles, but quickly changed the channel and watched a PBS special on dolphin communications—seems that in some respects they’re better communicators than humans—and without microphones or keyboards!

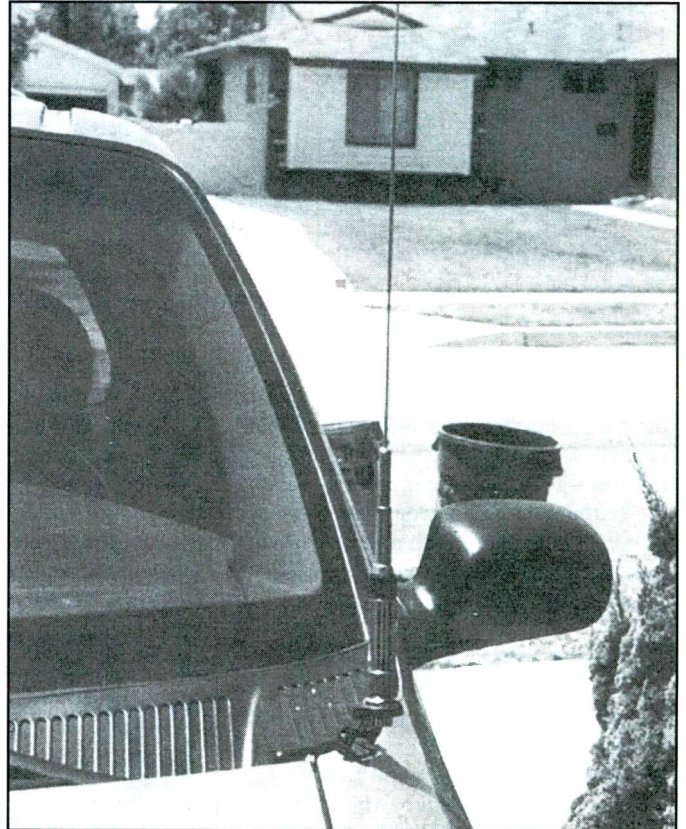
I don’t know about you, but I don’t like throwing things out. Sure, I’ve done my share of tossing in days gone by, but now, I think twice—well, most of the time. (I learned about canning things from my grandmother, Lula. Toasters, can openers, and all kinds of things that maybe just needed a little tweak here and there, wound up in the can, replaced by a new, improved model the next day.) I did the same thing with CB radios; play with one for a few months, read about a new rig, or get reports of scratchy audio, and I’d either can or sell the “old” one—each time losing bucks in the process. Manufacturers and dealers love folks who constantly buy the latest and greatest, but your wife or parents don’t share their sense of humor—and for good reason: Many times, your radio “problems” aren’t really “problems” at all—they’re just roadblocks designed to test your patience.

Some problems—many problems, actually—are our own fault. How many mobile antennas have you seen mounted near the front of the vehicle? One is too many. I saw one the other day on a new Ford pickup—a trunk mount antenna clamped to the upper driver’s side fender, right near the engine compartment! Talk about inviting engine noise into the radio! With today’s CB antennas—from glass-mount to heavy-duty mag mounts, there’s no excuse to mount antenna on the vehicle hood or fender.

Common Problems—Cured

Today, forget about repairing a CB; a new one costs less than a good dinner for two (less dessert and drinks). A little self-diagnosis usually cures most problems—and in short order you’re back on the air—and in many cases, sounding better than before!

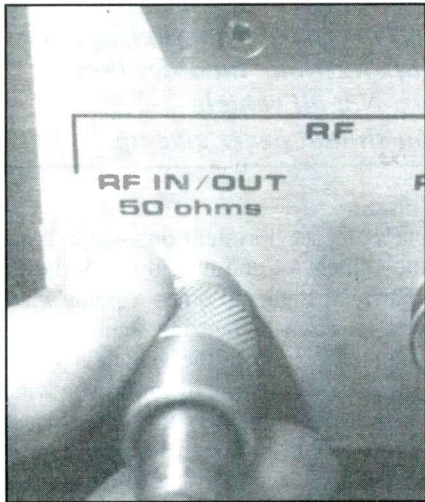
Now, many ham operators who swear they know the right way to do everything from shaving in the morning to putting their slippers on at night, will tell me I’ve spent too much time in RF fields for saying you *don’t always* have to hook your radio’s DC power cable to the battery. A legal CB draws very little current from your vehicle’s electrical system. That’s why mine is on a removable anti-theft plate mounting system and connects directly to the cigarette lighter socket. Hear that noise? It’s the sound of 500 hams fainting outside my door because they wire every rig to the vehicle battery. A higher powered amateur radio *should* be wired this way, but not your Cobra 148. Just going through a



This radio operator is begging for noise problems. Always install your mobile CB antenna as far away from the engine as possible.

firewall today is, in my opinion, quite an operation—and one I’m not willing to begin, unnecessarily. I get zero ignition noise or electrical noise by connecting to the 12 Vdc cigarette lighter receptacle (or sometimes to an unused fuse). Just make sure you use a good quality, relatively heavy-duty fused plug. If you’re experiencing intermittent radio operation, check to ensure you’ve cleaned out the receptacle. I use a can of air, followed by a long cotton swab-on-a-stick first lightly sprayed with electrical contact cleaner. From time to time wipe the metal contacts on the male cigarette plug with a clean cloth sprayed with the same cleaner. Of course when you first put the connector on your radio’s red/black power cord you soldered the connection, and properly taped the wires or used a short piece of heat-shrink tubing. No one in his or her right mind would use duck tape or simply twist the wires together and cap them!

Check the inline fuse, and the fuse in the plug for proper contact. Because of road vibrations, kids, pets, and Mother Nature, these contacts also need frequent checking. I’ve found it’s typically the simplest things that cause the biggest headaches. How about the antenna connection at the radio? Has it worked loose?



Got intermittent radio operation? Check the antenna connection, and finger-tighten the SO-239.

Resist the temptation to use pliers or your mother-in-law's false teeth to grip the SO-239; when it comes time to change radios or trade in the car, you'll regret the day you decided to over tighten that SO-239!

Check the rig's power cord where it plugs into the radio. Unless yours snaps into place, it can work loose. I once had an old 23-channel rig that had the strangest back-of-set power connection. Seems that although the design engineer went to school, he never actually used the radio because the plug wouldn't stay connected. I used a small dab of epoxy on one side of the connector to keep it snug.

Much of what we're talking about here applies to mobile operation; it's assumed that if you're using a CB base and a 12 Vdc power supply or a new base with built-in supply and using 120 Vac, you've checked your connections, including your wall socket and outside antenna connection. You've properly sealed the antenna connection from the elements, grounded the antenna support structure and regularly go outside and do a quick visual check on the antenna. For mobile operation, if your CB lights up properly, but the audio is intermittent, check your antenna cable. Is it damaged where it enters the vehicle? If you're using a tunable whip that's adjusted by small setscrews, are the screws tight? I use a simple trunk lip-mount and have routed the antenna coax through a hole behind the back seat, going up and over the rear side window near the car's roof, then come back down and under the dashboard area, carefully tucking the coax out of the way, finally connecting it at the radio. I

know many operators who bring the coax in the back and route it *under* the carpet or along the bottom edge of the floor — that's inviting trouble from passengers and packages that will eventually crunch the coax, either changing your SWR or completely ending your mobile radio adventure. Keep the coax up and away from the floor, and out of the way of the driver's feet and legs!

The Microphone Cord

Some radios won't operate until the microphone is connected. Frankly, as the mileage adds up, some radios operate erratically even *when* the microphone is connected! Check the mic connection. Turn up the volume and gently move the mic cable at the connector. After constant use the wires can break or insulation can work loose. It's a simple matter of repairing the connection or replacing the mic.

A microphone can also cause major headaches at the push-to-talk button. It's not uncommon for a mic to get stuck on transmit. Gently tap the other side of the microphone. Doing so may not cure the problem, but just might keep your entire radio out of the junkyard. Don't give the mic the ol' sledgehammer treatment! Slapping or pounding the microphone



It pays to periodically clean under the magnet of your mobile antenna. Moisture can insidiously creep under the magnet, resulting in higher SWR.

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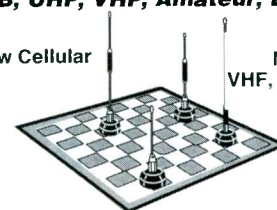
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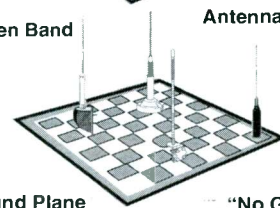
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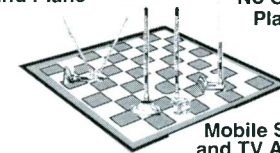
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itself on the dashboard fixes nothing, and you'll only scratch the dashboard.

Noise: You Can Find It — And Fix It!

Not all so-called engine noise problems come from the engine. And not all noise is cured by running the power cord directly to the battery. Many operators experience severe "engine" or spark-type noise that completely overrides incoming signals. The worst offender is from the vehicle's ignition system. Does the noise increase as the speed of the engine increases? Check the spark plugs and replace old ones. Consider replacing the older spark plug wires with newer resistor cables, and ensure they're tight.

Are you whistling? If other operators are telling you your transmitted signal has a slight musical-sounding tone or whistle, you've got alternator noise that's cured with a simple filter you can purchase at a marine or RV shop. Be careful here! You might also want to check with your vehicle manufacturer's service department, explaining the problem. They undoubtedly have a service bulletin describing the problem and cure. The last thing you want to do is mess up your car's alternator.

While vehicle manufacturers have made numerous safety and pollution improvements over the years, many of

"It's not uncommon to hear ignition-type noise from fuel injector systems, the alternator, and dozens of electronic modules that control a myriad of vehicle functions. Not all vehicle noise problems can be cured, but you should never give up."

today's vehicles are ignition noise nightmares. It's not uncommon to hear ignition-type noise from fuel injector systems, the alternator, and dozens of electronic modules that control a myriad of vehicle functions. Not all vehicle noise problems can be cured, but you should never give up. Good Internet sources of information include the American Radio Relay League (ARRL) at www.arrl.org/tis/, <http://www.arrl.org/tis/info/fuel.html>. There are many more Internet sources available, depending on the type of vehicle you have and noise problem you're experiencing. A quick search will yield a multitude of information too in-depth to present here.

There are also in-line series filters that connect directly to your CB. If these "fixes" don't work, you still notice alternator whine, and your battery just doesn't seem to have the power it once did, you're probably in the market for a new alternator.

One of the most annoying sources of noise comes from under the dashboard. Today's vehicles with an array of sensors and computer chips can wreak havoc on radio. Put on your old Colombo trench coat and start with the car keys. Turn the

car's electrical system on — don't start the vehicle — and tune through the CB channels. If there comes a point where you hear a raspy buzzing sound or other strange noise, turn the vehicle's system off. Repeated testing by turning on windshield wipers, heaters and other accessories should help you locate the problem. This is typically a difficult search, but narrowing the problem down before heading to the dealer will save you money in the long run. Again, describe the problem, what you've found, and ask them to look at service bulletins. Chances are you're not the first person to experience the problem, but chances are you'll have to prod the dealer a bit to get results. If you're met with a general complacent attitude, don't hesitate to contact the district manager's office for results.

We've All Done This

Have you checked the RF gain control? If the kids have fiddled with your radio (or you inadvertently turned the RF counterclockwise) your received signals will obviously suffer.

Does the radio have a PA switch? And you thought it was in the CB mode! How about the mic gain control? Many of today's radios require pencil-size fingertips — misadjusting a rotary control happens all the time!

If you're using a magnetic-mount antenna, regularly clean under the magnet with a soft, dry cloth. Too many otherwise good radio operators use a magnetic-mount antenna as a "permanent" mobile antenna without any thought about regular maintenance. Remember, magnetic mounts were originally designed to be a temporary antenna. Is your magnet in need of cleaning?

Maybe you don't need a new CB — at least this weekend! Take some time to keep yours in good shape, and perform regular maintenance on the radio and antenna system. It's usually the simple, frequently overlooked problems that can drive you crazy — problems you can fix in short order — and keep your radio out of the junkyard! ■

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Here's what's featured this year:

Collins 75S-3 Receiver, 1961; Lakeshore Bandhopper VFO, 1957; Gonset Commander II Mobile HF Transmitter, 1955; Gonset 913A 6 meter amplifier, 1964; Technical Materiel Corporation (TMC) GPR-92 Receiver, 1964; Hammarlund HQ-170 Receiver, 1958; McElroy Model 100 Straight Key, 1941; Sonar XE-10 Modulator, 1947; National NC-300 Receiver, 1955; Hallicrafters S-85 Receiver, 1954; Heathkit SB-500 VHF Transverter, 1969; Sideband Engineers SB-34 Transceiver, 1965; Swan 400 Transceiver, 1964; Drake TR-3 Transceiver, 1963; Utah UAT-1 Transmitter, 1937.

How many do you recognize? How many did you own? How many did you wish you owned?

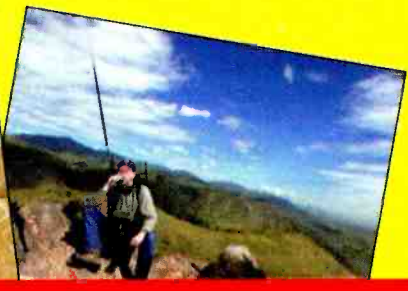
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Digital Radio Broadcasting Update

Digital radio is here! Overnight long-haul truckers are touting clear coast-to-coast reception of the Truckin' Bozo on XM satellite radio. The 2002 *World Radio TV Handbook* (WRTH) reviews two WorldSpace satellite receivers; the Hitachi KH-WS1 and Sanyo DSB-WS1000. Digital Audio Broadcasting (DAB) is rolling forward in Canada. WTOP is testing in-band on-channel (IBOC) digital broadcasting on 820 and 1500 kHz in Washington, DC. Welcome to a brave new radio world.

XM Satellite Radio

XM Satellite Radio (www.xmradio.com) is now on the air coast to coast via satellite and terrestrial booster transmitters. Truckers are often heard on the Truckin' Bozo with nothing but accolades about the clear signal versus trying to find a clear AM signal. The Truckin' Bozo is a country music and talk program serving overnight truckers, carried on select clear channel AM radio stations across the U.S. and XM channel 168 (www.thebozo.com). XM carries many of the national networks including Bloomberg, C-Net, ESPN Radio, Fox Sports, Sporting News Radio, Radio Disney, and the BBC World Service. XM features custom music channels as well, covering popular music from the '40s through the '90s and specific genres. Automotive satellite-ready receivers are available from any of the big-box home electronics retailers. A satellite-ready receiver provides the display options, controls, and hook-up required for a satellite receiver from XM or up-and-coming Sirius. Purchase of a satellite receiver and a subscription to one of the satellite services is required to complete the system.

WorldSpace Satellite Radio

WorldSpace satellite radio can be received in Africa, most of Asia, Western Europe, Central and South America. Unlike the subscription satellite radio services in the U.S., WorldSpace is free to anyone who can receive their signal, with the goal of providing access to quality programs for developing third world nations. WorldSpace carries national and international broadcasters including the BBC, and the World Radio Network (WRN), the same network that provides a variety of international broadcasts to the CBC overnight. Unfortunately the U.S. and Canada are beyond the WorldSpace coverage area.

Public Digital Radio Broadcasting

Canada seems to be taking the lead over the U.S. in the implementation of public (free) digital radio broadcasting. AM/FM/DAB receivers will be available soon in General Motors 2003 model year vehicles in Canada, and RadioShack of Canada plans to introduce a new line of DAB receivers this year. Canadian DAB services are based on the European Eureka-147 digital stan-

DAB RADIO STATIONS IN CANADA

MONTREAL, QUEBEC

| Analog Frequency | Callsign | Nickname/Format |
|------------------|----------|-------------------------|
| 730 | CKAC | Radiomedia |
| 800 | CJAD | News/Talk |
| 990 | CKGM | The Team (Sports) |
| 93.5 | CBM-FM | CBC Radio One (English) |
| 94.3 | CKMF | Radio Energie |
| 95.1 | CBF-FM | CBC Radio One (French) |
| 95.9 | CJFM | Mix 96 |
| 97.7 | CHOM | Chom |
| 105.7 | CFGL | Rythme |
| 107.3 | CITE | CitÉ Rock D'Étente |

TORONTO, ONTARIO

| Analog Frequency | Callsign | Nickname/Format |
|------------------|----------|-----------------------|
| 530 | CIAO | Ethnic |
| 590 | CJCL | The Fan (Sports) |
| 640 | CFYI | Mojo Radio (Talk) |
| 680 | CFTR | News |
| 740 | CHWO | Primetime (Nostalgia) |
| 1010 | CFRB | News |
| 1050 | CHUM | The Team (Sports) |
| 88.9 | CIRV | Radio International |
| 91.1 | CJRT | Classical/Jazz |
| 92.5 | CISS | Kiss 92 FM |
| 94.1 | CBL-FM | CBC Radio One |
| 96.3 | CFMX-1 | Classical |
| 97.3 | CJEZ | EZ Rock |
| 98.1 | CHFI | Rock |
| 99.9 | CKFM | Mix 99.9 |
| 101.3 | CHIN | Ethnic (1540 AM) |
| 102.1 | CFNY | The Edge (Rock) |
| 104.5 | CHUM-FM | Contemporary Hits |
| 107.1 | CILQ | Q-107 |

VANCOUVER, BRITISH COLUMBIA

| Analog Frequency | Callsign | Nickname/Format |
|------------------|----------|-------------------|
| 650 | CISL | Oldies |
| 690 | CBU | CBC Radio One |
| 980 | CKNW | News/Talk |
| 1130 | CKWX | News |
| 1410 | CFUN | The Team (Sports) |
| 95.3 | CKZZ | Z-95 |
| 96.9 | CKKS | 97 Kiss FM |
| 99.3 | CFOX | The Fox |
| 101.1 | CFMI | Rock 101 |
| 103.5 | CHQM | QM-FM |

WINDSOR, ONTARIO

| Analog Frequency | Callsign | Nickname/Format |
|------------------|----------|------------------------|
| 540 | CBEF | CBC Radio One (French) |
| 580 | CKWW | The Team (Sports) |
| 800 | CKLW | Talk |
| 88.7 | CIMX | 89-X |
| 93.9 | CIDR | Lite Rock 93.9 |

dard and are broadcast from terrestrial transmitter sites with several stations multiplexed to a signal. Right now, AM and FM stations in Montreal, Toronto, Vancouver, and Windsor are simulcasting via DAB. Ottawa is the next city scheduled to go digital with 17 stations. Visit www.digitalradio.ca where you can listen to DAB stations and read about the latest news and receivers.



CLASSIC COUNTRY BLUEGRASS NEWS & WEATHER

Meanwhile, the IBOC plan for digital radio broadcasting in the U.S. seems to be hopelessly stuck in the prototype stage with the latest round of testing in progress at WTOP radio.

My Analysis

What does all this mean for radio listeners and DXers? It may take another generation or two before AM and FM radio completely fades away, so that shouldn't be an immediate concern. Perhaps more disconcerting is the impending lack of compatibility between national digital broadcasting standards. With the U.S. going in the direction of IBOC and subscription satellite radio, and Canada dedicated to terrestrial DAB, will there come a time when you drive across the border only to find that your car radio has been rendered useless? Probably not. Once the battle for digital radio acceptance settles down, technology should compromise with the development of multi-format receivers. However, there's something to be said for old-fashioned AM and FM radio. No matter where you may travel around the world, the simplest portable AM/FM/SW receiver can pick up and demodulate a signal. Let's hope that the standards committees, government regulators, broadcast organizations, and manufacturers worldwide will ultimately seek to uphold the same expectation for digital radio as well. In the meantime, this might make for some good fodder in Bill Price's "Loose Connection!"

Norway Reprieve!

It appears that domestic broadcasting from the megawatt-powered 1314-kilohertz station in Kvitsoy, Norway, has been spared the axe that fell upon NRK international shortwave services from the same facilities. It was originally thought that all NRK operations in Kvitsoy would be terminated, but DXers are reporting continued reception of 1314-kilohertz broadcasts after shortwave transmissions were silenced. All Radio Norway International operations were shut down

in January due to extensive government budget cuts.

QSL Information

610 KOJM Havre, Montana, a nice letter and bumper sticker in 11 days, signed Lance Newman-PD. Address: P.O. Box 7000, Havre, MT 59501. (Martin, OR)

730 KBSU Boise, Idaho, full-data letter confirming 500 watt night power, a Boise State Radio info card, and Idaho's Jazz Station bumper sticker in 23 days, signed Steve Johnston, Dir of Eng and Ops. Address: 1910 University Dr., Boise, ID 83725. (Griffith, CO)

900 KTIS St. Paul, Minnesota, partial-data Northwestern College Network "Tune In For Life" card in 23 days, signed Jori Susanka. Address: 3003 Snelling Avenue North, St. Paul, MN 55113-1598. (Griffith, CO)

1280 KZNS Salt Lake City, Utah, QSL message on the back of a business card in 16 days, signed Kurt Thomas-Sales Manager. Address: 515 S 700 E, Salt Lake City, UT 84102. (Martin, OR)

1550 KSFT St. Joseph, Missouri, full-data letter in seven days for report and \$1 returned with a note saying, "We're just glad to hear from you," signed Bob Heater, Ops Mgr. (Griffith, CO) Address: P.O. Box 8550, St. Joseph, MO 64508.

1580 WLIJ Shelbyville, Tennessee, verification letter, "WLIJ 1580 AM Stereo" license plate, pencils, note pads, coverage map, and bumper sticker, plus a WZNG AM 1400 bumper sticker, in nine days for a report, stamp, and \$1 (returned), signed Rusty Reed, Manager. Address: Hopkins-Hall Broadcasting Inc, P.O. Box 7, 236 Woodland Drive, Shelbyville, TN 37160. (Conti, NH)

1650 KWHN Fort Smith, Arkansas, partial-data letter in 20 days, indicating parallel 1320 KYHN, signed Gary Elmore, Prog Dir. Address: 423 Garrison

Ave, Fort Smith, AR 72901. KWHN reception was mobile on I-25 north of Fort Collins, Colorado and just outside of the ground wave contour of KBJD. Expanded band QSL #33. (Griffith, CO)

Broadcast Loggings

It's interesting to learn what can be received outside of North America. **Ron Gitschier** checks in while serving in the U.S. Navy, at sea westerly of northwestern-most Peru in the Pacific, DXing with a barefoot RadioShack DX-398.

First, welcome to **Brian Smith, W9IND**, who writes, "I've read *Pop'Comm* for years, but never had much occasion to contribute anything until now. I thought you, and perhaps your readers, might enjoy hearing about the latest twist I've put on my hobby.

"Each weekday afternoon I make a half-hour trip from Indianapolis to my home in the south suburbs. Recently, instead of listening to FM music during the commute, I found something different. I discovered that the radio and antenna that came as standard equipment in my 2000 Toyota Avalon do an excellent job of receiving AM radio signals (no doubt aided by today's intriguing propagation).

"Anyway, here's the twist. Instead of tuning frequencies at random, I confine most of my DXing to just a few frequencies; lately, 540, 640, 1010 and 1080. I have my reasons for choosing them; 540 because it's the edge of the U.S. AM band, and because until recently I'd never heard an identifiable station there; 640 because I'm hoping to repeat my best-ever AM DX catch, KFI in Los Angeles; 1010 because it's the frequency of a nearby station that powers down at dusk; and 1080 because it operates in the shadow of the loudest local, WIBC on 1070.

"After only a couple of months, I've had fascinating results. Sometimes I hear three distinct stations on the same frequency; sometimes every station on the frequency is down in the muck, with an occasional one popping out briefly, and on rare occasions, a particular station suddenly booms in, as with my logging of CBK. And of course, sometimes unexpected propagation kicks in, as when a Tennessee station obliterated a station only 25 miles away even before the latter powered down.

"For anyone seeking something new in AM DXing, I recommend doing likewise, sampling the same few frequencies day after day, returning at various times

between dusk and dawn. After a while, you get to recognize the usual stations, which then makes it easier to spot a new one. And with the propagation we've had lately, the new ones keep jumping up like microwaved popcorn."

It looks like Brian is onto an awesome strategy. 640 kHz is a target frequency for many DXers chasing the elusive KFI Los Angeles. Now here are this month's selected logs, all times are UTC.

540 CBK Watrous, Saskatchewan, at 1150 excellent with CBC Radio One network rebroadcast of ABC Radio Australia, then local programming with Saskatchewan Weekend at 1200. In my 30-plus years of BCB DXing, this was the best signal I've ever heard on 540. (Smith, IN)

540 KWMT Fort Dodge, Iowa, at 1245 fair with country music, "The Saturday Morning Oldies Show." (Smith, IN)

540 WRRD Jackson, Wisconsin, at 0730 (and various other times throughout the night) fair with religious programming and syndicated shows such as Michael Medved and Dr. Laura. Periodic IDs as simply "The Word." (Smith, IN)

540 WDXN Clarksville, Tennessee, at 2300 fair, rising above the muck for a short ID. (Smith, IN)

550 KTRS St. Louis, Missouri, at 2308 fair, poking through with station ID, "The Big Five-Fifty, KTRS," on a frequency usually dominated by WKRC Cincinnati. (Smith, IN)

550 KTSA San Antonio, Texas, at 0720 "News every 30 minutes... your live local news station, 550 KTSA." (Gitschier, Peru)

640 WGST Atlanta, Georgia, at 2230 good with local sports talk. (Smith, IN)

640 WCRV Collierville, Tennessee, at 2330, good with news and religious programming, "The Bible Answer Man." (Smith, IN)

640 R. Progreso, Cuba, Spanish believed to be Cuban, generally predominant on the frequency most of the night with occasional deep fading. (Smith, IN)

660 HJJM Cali, Colombia, "Radio Autentica" mixing with "rrrrrrRadio Carrocel" HCLG2 Ecuador, Guayaquil. (Gitschier, Peru)

740 KRTH Houston, Texas, at 0515 "Newsradio 740 KRTH" and CBS Sports post game coverage of the Tampa Bay-Baltimore Ravens football game, then an old-time radio show. (Gitschier, Peru)

780 WTME Rumford, Maine, IDs as "1240 WCNM Lewistown, 1450 WKTQ South Paris, and 780 WTME Rumford," heard with a mix of religious, news, and talk programs, formerly at 790 kHz, and now with 10,000 watts daytime, Maine's most powerful AM station, a good DX target at sunrise and sunset. (Conti, NH)

820 WBAP Ft. Worth, Texas, with Neal Boortz show, sharing the frequency with another station in Spanish, many mentions of Colombia. (Gitschier, Peru)

Changes

| New Call | Location | Freq. | Old Call |
|----------|---------------------|-------|----------|
| KMBX | Soledad, CA | 700 | KSES |
| KYAA | Soquel, CA | 1200 | KSRK |
| KMJM | Cedar Rapids, IA | 1360 | KTOF |
| WTME | Rumford, ME | 780 | New* |
| KCCO | St. Louis Park, MN | 950 | KDOW |
| WFGI | Charleroi, PA | 940 | WPNT |
| WTUX | Madison, WI | 1550 | WHIT |
| KHOV-FM | Wickenburg, AZ | 105.3 | KSSL |
| KSEC | Bentonville, AR | 95.7 | New |
| KCVR-FM | Columbia, CA | 98.9 | KTDZ |
| KMYI | San Diego, CA | 94.1 | KMSX |
| KLIM-FM | Limon, CO | 93.7 | New |
| WQBT | Savannah, GA | 94.1 | WSCA |
| WINN | Columbus, IN | 104.9 | WWWY |
| WWWY | North Vernon, IN | 106.1 | WINN |
| WTSZ | Eminence, KY | 105.7 | WYKY |
| WPIQ | Manistique, MI | 99.9 | New |
| WYYL | Tunica, MS | 96.1 | WMPS |
| WVMJ | Conway, NH | 104.5 | WBNC-FM |
| KKRG | Albuquerque, NM | 101.3 | KCHQ |
| WBLJ-FM | Shamokin, PA | 95.3 | WISL-FM |
| WMPS | Germantown, TN | 107.5 | WYYL |
| WHBZ | Sheboygan Falls, WI | 106.5 | WWJR |

*WTME moved from 790 to 780 kHz, increased day power to 10 kW.

840 WHAS Louisville, Kentucky, at 0630 Coast-to-Coast AM with Barbara Simpson, local news, and "Live team coverage when you need to know, Newsradio 84 WHAS," a powerhouse with no interference! (Gitschier, Peru)

1010 WHIN Gallatin, Tennessee, at 2242 fair with country music, an auto dealership commercial, and discussion of local high school football. Heard briefly during unusual conditions: the complete disappearance of nearby WCSI Columbus, Indiana. (Smith, IN)

1010 WFGW Black Mountain, North Carolina, (a Billy Graham station) at 2252 fair with Christian music and format, weather and ID, "WFGW ten-ten." Heard briefly over nearby WCSI Columbus, Indiana. (Smith, IN)

1010 CFRB Toronto, Ontario, Canada, at 2130 good, typically the strongest station (with periodic fading) most of the night. (Smith, IN)

1030 HCRF2 Guayaquil, Ecuador, Spanish romantic music and a warm sultry female voicing the "Radio Punto" IDs, well done. I fell instantly in love. Been to sea too long, DXing under a brightly moonlit night with little to no breeze and comfy temps outside, calm seas. I was camping out on this frequency a short bit for my hometown WBZ Boston with no luck except the fortune of hearing the aforementioned ID. (Gitschier, Peru)

1080 WKGX Lenoir, North Carolina, at 2215 fair to good with bluegrass music. (Smith, IN)

1080 WTIC Hartford, Connecticut, at 0455 fair briefly before giving way to KRLD. (Smith, IN)

1080 KRLD Dallas, Texas, at 0500 fair (deep fades) with news and talk. (Smith, IN)

1130 KWKH Shreveport, Louisiana, "Fox Sports Radio 1130" and ads for a Ford dealership on 31 SW Boulevard, a good signal but Murphy was at the switch, most critical fade at the ID! (Gitschier, Peru)

1180 VOA Marathon, Florida, nasty jamming of VOA's Radio Marti noted. (Gitschier, Peru)

1290 OCX1Q Tumbes, Peru, with "Radio Adina" ID in jumble, I wanted to snag Radio Disney from Georgia or Virginia. (Gitschier, Peru)

1610 Caribbean Beacon, Anguilla, with Dr. Gene Scott religious ministry, very dominant on the frequency. (Gitschier, Peru)

1620 WTAW College Station, Texas, at 0700 "Dr Laura 3 to 5. . . WTAW College Station, Bryant," the strongest of all the x-banders. Hmmm 10kw power still on? (Gitschier, Peru) At 2200 good with news and syndicated talk show (Dr. Laura), frequent mentions of Brazos Valley. (Smith, IN)

1700 KQXX Brownsville, Texas, presumed with oldies, "Wild Thing" by the Trogs and "It's Magic" by Pilot, weak under and just over the noise threshold mixing with sports talk which I'll presume citing conditions (lots of Lone Star stations) as WTBK Sherman, Texas, and speckles of Spanish preaching presumed from WJCC Miami Springs, Florida. (Gitschier, Peru)

1710 Lubavitcher Radio, New York, New York, is being widely heard with Jewish religious lessons and Hebrew music, believed to originate from Lubavitcher headquarters in Brooklyn, New York. (Conti, NH)

Thanks to Patrick Griffith, Ron Gitschier, Patrick Martin, and Brian Smith. 73 and good DX! ■

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Pop'Comm Survey- April 2002

Circle Reader Service #

1. I own and regularly use the following types of scanners:

| | |
|-------------------------------------|---|
| One handheld scanner | 1 |
| Two handheld scanners | 2 |
| Three or more handheld scanners | 3 |
| One base scanner | 4 |
| Two base scanners | 5 |
| Three or more base scanners | 6 |
| One handheld and one base scanner | 7 |
| Two handhelds and two base scanners | 8 |
| Three or more of each scanner | 9 |

2. My scanner or scanners have the following number of channels:

| | |
|------------|----|
| 50 or less | 10 |
| 50-100 | 11 |
| 100-200 | 12 |
| 200-500 | 13 |
| 500 | 14 |
| 1000+ | 15 |

3. I have all channels and banks programmed with active frequencies.

| | |
|-----|----|
| Yes | 16 |
| No | 17 |

4. The price of a typical new scanner (handheld or base) is:

| | |
|-------------------|----|
| Too high | 18 |
| About right | 19 |
| Sometimes too low | 20 |
| No opinion | 21 |

5. The three most important considerations when buying a scanner are:

| | |
|--|----|
| Price | 22 |
| Number of channels | 23 |
| Type of battery | 24 |
| Size of radio | 25 |
| Number of features | 26 |
| Price of shipping | 27 |
| Frequency coverage | 28 |
| CTCSS | 29 |
| Performance features (attenuator, audio quality and specs) | 30 |
| Trunking | 31 |
| Computer programmable | 32 |
| Should be a ham handheld with extended receive | 33 |

Mom's Kitchen Radio

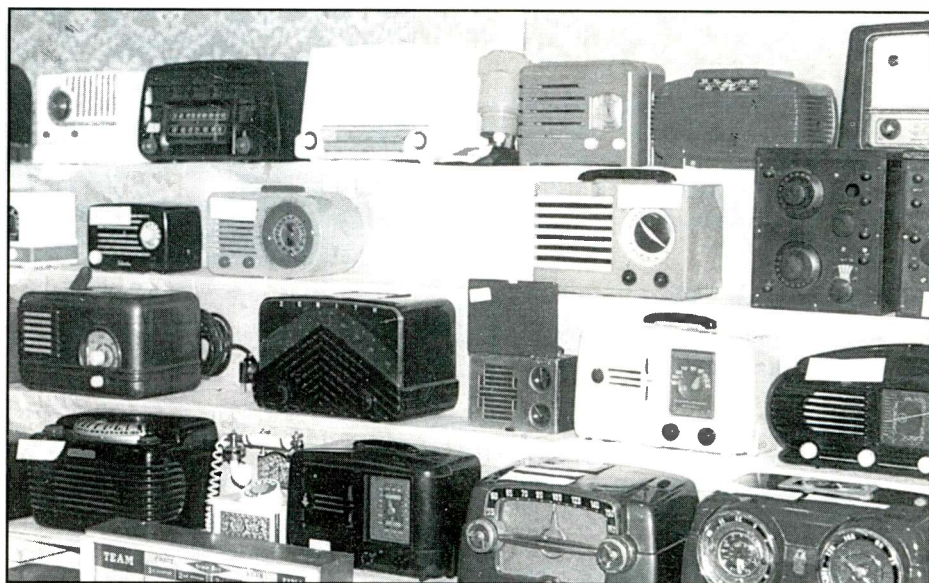
Mention vintage radio and most folks conjure up warm fuzzy images of families gathered around the parlor radio listening to Jack Benny, Amos and Andy, and other classic radio shows from a bygone era. Yet, the most used radio in a home was the kitchen radio, normally a housewife's companion for the better part of a day. Inexpensive Bakelite radios thrived in kitchens during the 1930s, '40s and '50s, and because of their great abundance they remain a staple at garage and tag sales.

I'm a member of the transitional generation — we had an early B&W set in the living room that was used for a few hours each evening, and mom had her little Bakelite Emerson playing away in the kitchen during the day. I remember the familiar voices and names of most of the shows, although I was still too young to grasp the story lines or program content; *The Secret Storm*, *The Arthur Godfrey Show*, and others, some of which continue on TV to this day. When I first started collecting radios I'd find a lot of Bakelite sets at tag sales, but they never interested me. Oddly enough, it was finding two forgotten sets stored away in my cellar workshop that caught my attention and kindled my interest. While both are common Emerson models, they're in great shape and add some contrast to the wood sets in my collection. They also kindle fond memories of mom in the kitchen listening to her radio, a plain-Jane brown Emerson Bakelite probably made in the late '40s or early '50s. That is one radio I intend to find one of these days. Alas, while the original was untimely decommissioned in my quest for electronic knowledge at a very young age, I'm hopeful that a least one of its cousins still survives.

While Bakelite and Catalin are both made from phenolic resins and are closely related, they represent the diametric extremes in radio collectables: the lowly and common brown Bakelite sets are at the low end of the spectrum, while the highly sought after and brightly-hued Catalins are commanding up to tens of thousands of dollars for the rarest models. One other tidbit: For some odd reason most antique dealers refer to various early Catalin collectibles (costume jewelry, utensils) erroneously as being Bakelite. If an antique dealer mentions he has a Bakelite radio for sale cheap it might be prudent to go check it out!

The History Of Bakelite

Leo Baekeland, a New York chemist, discovered Bakelite in 1907. Both Bakelite and Catalin are made from a phenol and

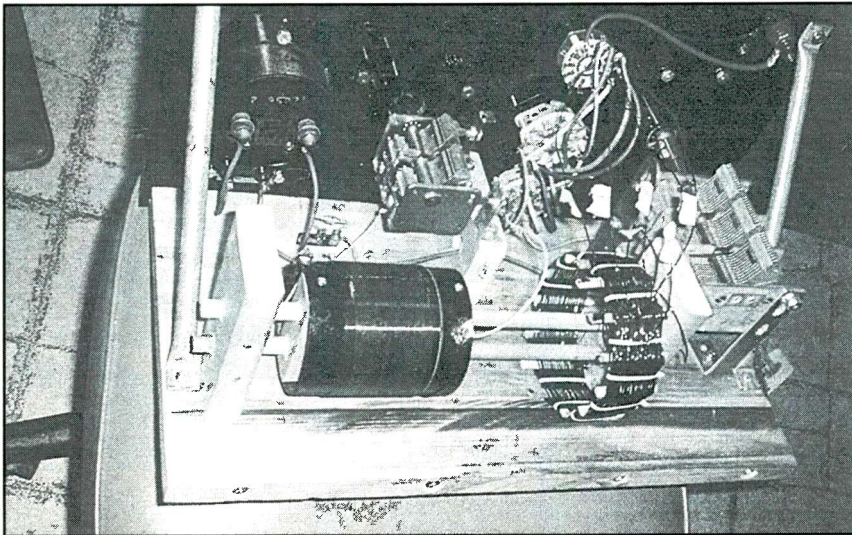


This colorful array of Catalins appeared at a local radio show several years ago.

formaldehyde base; and both products are registered trademarks. Manufacturing a Bakelite radio case involved several steps. First, the Bakelite resin is ground to a powder, and is then mixed with fillers (sawdust, talc, or asbestos) and molded under very high temperatures and pressure. If you've ever examined a broken Bakelite cabinet, the rough nature of the filler material is plainly visible. It is a thermosetting plastic — once the case is formed it is fairly impervious to melting, burning, and most chemicals. Once set, it's also a very stable product; and Bakelite remains one of the best available electrical insulators. That was kind of important, since most kitchen sets were *hot chassis* AC/DC designs, and the knobs and case served to isolate the user from the dangerous AC voltage on the *hot chassis*. Also, Bakelite cabinets were better suited to life in a kitchen



Despite the plain appearance, the almost factory-fresh gloss finish on this untouched Emerson is hard to resist!



Rear view of John and Aaron's homemade Lyonodyne crystal set project.

environment than one made of wood. While early wood sets would be destroyed after 30 or 40 years storage in a damp cellar or barn, a Bakelite cabinet would remain relatively unscathed after such callous treatment, so it's not surprising to find so many surviving examples.

Bakelite is always opaque. Unlike Catalin, you cannot pass light through it. It's almost always a dark brown or black color—never brightly colored unless it was painted afterwards. Some companies did paint the cabinets; you'll see quite a few cream-colored paint jobs out there. And, some Bakelite sets are highly collectable — Emerson's *Mae West* model comes to mind. This one is unique because of the two large cone-shaped dials — oh, never mind.

Colorful Catalins

Catalin was poured and let to set in molds. Unfortunately, as Catalin ages it often shrinks (due to out-gassing of volatile components). This leads to stress cracks and damage caused by overly tightened chassis mounting screws. Savvy Catalin collectors keep their chassis screws fairly loose. Bakelite is relatively free of volatile elements; they were purged due to the high heat and pressure used to cure the material. Catalins sold for more money, so sales lagged behind Bakelites, and because the cases often cracked, there are far fewer surviving Catalin sets compared to others. There are a few restorers who specialize in repairing cracked Catalin, but the process requires some skill

and knowledge and the cost is not cheap. I was surprised to learn that the apparent color of a Catalin cabinet will change over time, for example a butterscotch Catalin actually began life with an alabaster cabinet. A green Catalin was probably blue, and likewise a yellow case was probably lavender when first made. Catalin is easily buffed back to its original color since the surface oxidized layer is very thin, but will eventually return to their as-found colors. Catalins need to be kept out of direct sunlight. By the late 1950s newer plastics had replaced Bakelite; and radios began sporting cheesy looking cases. I suppose in 20 or 30 years someone will be seeking out chintzy plastic radios for nostalgia sake. I can't imagine it, just as mom would never understand why anyone would covet her old Emerson decades after it was abandoned and stored in the attic.

The high sheen on a Bakelite cabinet — like beauty — is only skin deep. Once the surface is worn away (crazed), or the cabinet broken, the very rough filler base is exposed.

Cleaning Your Cabinet

Years of kitchen grease and grime can be removed using *GoJo* (or similar) hand cleaner applied with paper towels, or by using paint thinner or lighter fluid. I've suggested using *GoJo* on filthy wood finishes to remove years of grime and wax build up in past columns. A good original finish should be protected with a good antique paste wax polished to a high shine. Remember, that gorgeous high-gloss finish results from the manufacturing process — it's very thin and easily damaged. Avoid cleaners containing alkalines or ammonia, and don't use alcohol! Years of polishing will also wear the finish, and once gone it can never be fully restored to the original factory gloss.

Subjecting Bakelite to direct sunlight over many years can craze and damage the finish. George Gonzalez, a collector featured in one of our early columns, offered some tips for repairing glazed Bakelite surfaces in an Internet post. George suggests using a "very light over-wipe with a cloth lightly dipped in dark tinted polyurethane, sufficient to put on the lightest of coats. The goal is to fill in the pores without noticeably adding any extra thickness. After the poly' dries, you should have a relatively glossy and even surface." George goes on to suggest using 000 steel wool to help even out any streaks. As a last step, apply a coat or three of good hard carnauba wax. George's final caution: "Remember, the goal is to just tint the rough spots and fill the pores,

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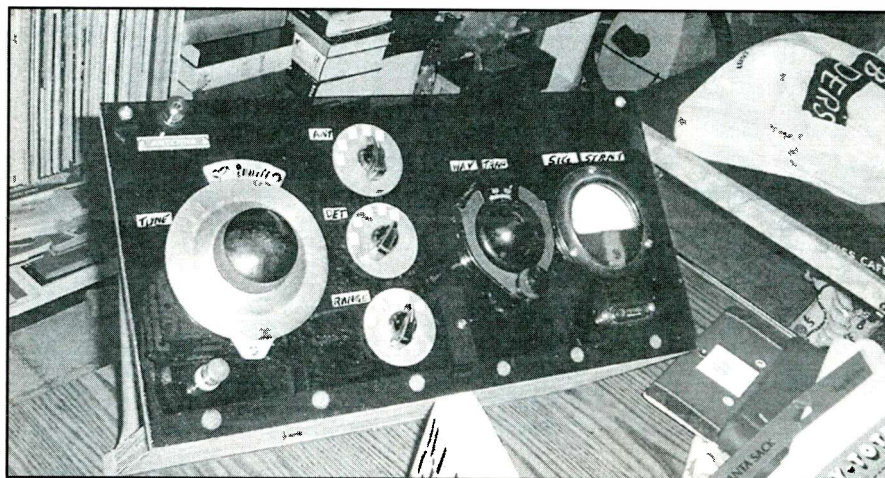
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The craftsmanship and time that went into building the set are also evident in this front panel view.

not cover the natural appearance of Bakelite — easy does it!”

Another good product is *Novus 2* plastic polish, which is ideal for buffing out small scratches in plastics. Some adventurous souls have advocated using buffing wheels (at about 1750 RPM) on Bakelite cabinets. Alas, the filler doesn't buff well, it's kinda like polishing concrete in my opinion, yet some still claim good results using a buffing wheel. I strongly suggest wearing safety goggles and a maintaining a strong grip if anyone is brave enough to try this method! One fellow suggested using *Old English* scratch cover to mask and dye a rough, porous damaged Bakelite surface. Unfortunately, *Old English* is volatile, and will dry out eventually leaving the original damaged and dull surface, requiring periodic reapplication.

Remember those heavy, clunky black Bakelite dial phones used by Ma Bell 50 years ago? Well, there's a restoration product made especially for the telecommunications industry called *Glaz-It* — it's the *cat's meow* for bringing back worn Bakelite finishes! The product is made by Arrow-Magnolia International, P.O. Box 59089 Dallas, Texas 75229. Unfortunately, it's only sold in expensive 24-can case lots. If anyone knows of a reseller, please let me know and I will pass the information in a future *Pop'Comm* column!

Readers' Mailbag: Another Lyonodyne!

John Caruso, W2JAC writes: “I read your April 2000 *Pop'Comm* article *Building A Selective Crystal Set* and was very intrigued with the idea of building a radio receiver that didn't require any form of external power. It also seemed

like a good way to influence my 14-year old grandson, Aaron, on merits of this endeavor. He couldn't believe any receiver could work without a source of power.

“I've accumulated a wealth of electronic parts during my career in radar design, so I started to gather together the parts needed for the receiver project. While searching through my parts I found two pair of high-impedance headphones — one set made by Baldwin Radio Co., Salt Lake City in Utah, and the other set made by William J. Murdock for the U.S. Army Signal Corps. Two headsets would allow Aaron and I to listen together.

“Building the 13-point winding jig for the basket-weave coil was exacting work — but the directions were very clear and detailed. Aaron wound the coil while I kept count of the turns and soldered each of the tap positions.

“A 16”x 9” plywood board serves as the set's base, and a piece of gray 3/16” Plexiglas for the front panel gives a professional look to the project. The three-gang tuning capacitor is used with a vintage 4” National Radio *Velvet Vernier* dial drive for very smooth operation. I

used ceramic switches, and the wavetrapp coil is wound on a 3” length of phenolic tubing. A vintage Bakelite vernier dial-drive is used with the wavetrapp tuning capacitor.

“For an antenna we ran a 100-foot long-wire from my ranch house chimney to a 40-foot maple tree. A connection to a water pipe served as the ground. When I hooked up the antenna and ground several stations pegged the tuning meter; I had to detune the set to prevent meter damage! My grandson was wide-eyed and very excited. We spent many days seeing what stations we could pick up.

“There is a side issue to all of this — he now wants to get an amateur radio license, and he is studying to take the test. I think he's gotten the bug, and I am grateful it has resulted from your project. Thanks, and let's see more interesting projects!”

Thank you, John! It is great to hear that the column is helping bring newcomers into our exciting hobby. On behalf of the *Pop'Comm* staff, we are pleased to award Aaron a one-year gift subscription to magazine. That's it for this edition. I'll see you again next month. ■

Resources

GoJo hand cleaner and *Old English Scratch Guard* should be available at local hardware stores, home centers or larger grocery stores.

Novus 2 is sold by Bob's Antique Radio and Electronics — contact Bob Piekarz, 111 East 29th St., LaGrange Park, IL 60526 (708-352-0648) or E-mail RadioBob1@aol.com. Ask Bob about his capacitors and other supplies when you contact him.

Tap into secret Shortwave Signals

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

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

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

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

Eavesdrop on the World

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

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

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

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

Super Active Antenna

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

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

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

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

Indoor Active Antenna

Rival outside long wires with this *tuned* indoor active antenna. MFJ-1020B \$79⁹⁵

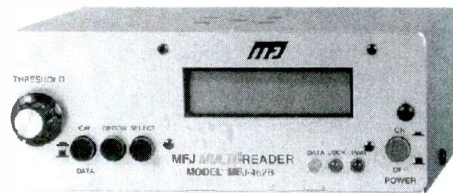
"World Radio TV Handbook" says MFJ-1020B is a "fine value... fair price... best offering to date... performs very well indeed."

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

Compact Active Antenna

Plug 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. MFJ-1022 \$49⁹⁵

Detachable 20 inch telescoping antenna. 9 volt battery or 110 VAC MFJ-1312B, \$14.95. 3 1/8x1 1/2x4 in.



MFJ-462B \$179⁹⁵

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

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 --

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 --

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Copies most standard shifts and speeds. Has MFJ AutoTrak™ Morse code speed tracking. Use 12 VDC or use 110 VAC with MFJ-1312B AC adapter, \$14.95. 5 1/2"Wx2 1/2"Hx5 1/4"D inches.

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

Eliminate power line noise!



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-1026 \$179⁹⁵

MFJ Antenna Matcher



Matches your antenna to your receiver so you get maximum signal and minimum loss. MFJ-959B \$99⁹⁵

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



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. MFJ-752C \$99⁹⁵

High-Gain Preselector MFJ-1045C \$99⁹⁵

High-gain, high-Q receiver preselector 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



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. MFJ-1214PC \$149⁹⁵

High-Q Passive Preselector



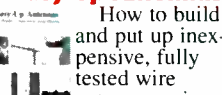
High-Q passive LC preselector boosts your favorite stations while rejecting images, intermod and phantom signals. 1.5-30 MHz. Preselector bypass and receiver grounded positions. Tiny 2x3x4 inches. MFJ-956 \$49⁹⁵

Super Passive Preselector



New! Improves any receiver! Suppresses strong out-of-band signals that cause intermod, blocking, cross modulation and phantom signals. Unique Hi-Q series tuned circuit adds super sharp front-end selectivity with excellent stopband attenuation and very low passband loss. Air variable capacitor with vernier. 1.6-33 MHz. MFJ-1046 \$99⁹⁵

Easy-Up Antennas



How to build and put up inexpensive, fully tested wire antennas using readily available parts that'll bring signals in like you've never heard before. Antennas from 100 KHz to 1000 MHz. MFJ-38 \$16⁹⁵

MFJ Antenna Switches



MFJ-1704 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. MFJ-1704 \$64⁹⁵ MFJ-1702C \$24⁹⁵

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21 Band World Receiver

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world band

tuning tips *your monthly international radio map*

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

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

| UTC | Freq. | Station/Country | Notes | UTC | Freq. | Station/Country | Notes |
|------|-------|--|---------|------|--------|--|-----------|
| 0000 | 7275 | RTT Tunisienne | AA | 0315 | 9760 | Voice of America relay, Philippines | |
| 0000 | 9460 | Voice of Turkey | TT | 0330 | 15365 | Radio Romania Int'l | |
| 0000 | 6900 | Turkish Meteorological Station | TT | 0330 | 4890 | National Broadcasting Corp., Papua New Guinea | |
| 0000 | 6175 | Voice of Vietnam, via Canada | | 0330 | 12025 | Voice of Russia | Hindi |
| 0000 | 9780 | Republic of Yemen Radio | AA | 0330 | 7335 | Voice of Russia | RR |
| 0000 | 4976 | Radio Uganda | | 0330 | 7400 | Radio Maryja, Poland, via Russia | Polish |
| 0030 | 13675 | UAE Radio | | 0330 | 9755 | RDP Int'l, Portugal | PP |
| 0030 | 5060 | Radio Tashkent, Uzbekistan | | 0330 | 15540 | RDP Int'l, Portugal | PP |
| 0030 | 11915 | Central Broadcasting System, Taiwan | CC | 0330 | 4992 | Radio Ancash, Peru | SS |
| 0030 | 9580 | BBC via Thailand | | 0330 | 15095 | Far East Broadcasting Corp., Philippines | various |
| 0030 | 9525 | Voice of Vietnam, via Canada | | 0330 | 6798 | Ondas del Rio Mayo, Peru | SS |
| 0030 | 12689 | Armed Forces Network, Florida | USB | 0330 | 3365 | Radio Milne Bay, Papua New Guinea | |
| 0030 | 11625 | Vatican Radio | | 0330 | 6296 | Radio Union, Peru | SS |
| 0100 | 15570 | Vatican Radio | | 0330 | 9965 | Voice of Hope, Palau | CC |
| 0100 | 7375 | Radio Ukraine Int'l | | 0330 | 9405 | Far East Broadcasting Corp., Philippines | CC |
| 0100 | 4980 | Ecos del Torbes, Venezuela | SS | 0330 | 15325 | Radio Taipei Int'l, Taiwan | CC |
| 0100 | 9335 | Voice of Korea, North Korea | | 0330 | 15215 | Channel Africa, South Africa | |
| 0100 | 11915 | Voice of America relay, Sao Tome | | 0345 | 9570 | Radio Korea Int'l, South Korea | |
| 0100 | 13610 | Radio Damascus, Syria | FF/EE | 0345 | 15205 | Deutsche Welle, Germany, Sri Lanka relay | GG |
| 0130 | 7140 | Voice of America relay, Thailand | | 0400 | 3320 | Radio Sonder Grense, South Africa | Afrikaans |
| 0130 | 5020 | Solomon Is. Broadcasting Corp. | | 0400 | 11730 | BBC relay, Seychelles Is. | |
| 0130 | 17870 | Channel Africa, South Africa | | 0400 | 15120 | Voice of Nigeria | various |
| 0130 | 6150 | Radio Singapore | | 0400 | 5770 | Radio Miskut, Nicaragua | SS |
| 0130 | 1130 | Radio Korea Int'l, South Korea, via Canada | | 0400 | 15340 | Radio New Zealand Int'l | |
| 0200 | 13695 | Radio Thailand | | 0400 | 9895 | Radio Netherlands | |
| 0200 | 6215 | Central Broadcasting System, Taiwan | CC | 0430 | 15430 | Radio Free Asia, Northern Marianas | unid |
| 0200 | 7145 | Radio Thailand | | 0430 | 17580 | Radio Netherlands | AA |
| 0200 | 6300 | WYFR, Florida, via Taiwan | CC | 0430 | 15595 | Radio Netherlands relay, Madagascar | |
| 0230 | 9885 | Swiss Radio Int'l, via French Guiana | GG | 0430 | 4725 | Radio Myanmar, Myanmar (Burma) | vern |
| 0230 | 18960 | Radio Sweden | | 0445 | 7255 | Voice of Nigeria | |
| 0230 | 9645 | Voice of America relay, Sri Lanka | | 0500 | 11985 | Radio Vlaanderen Int'l, Belgium, via Bonaire | |
| 0230 | 9870 | Deutsche Welle, Germany, via Rwanda relay | GG | 0500 | 7320 | Radio Rossii, Russia | RR |
| 0300 | 11734 | Radio Tanzania, Zanzibar | Swahili | 0500 | 7175 | Radio Tikhy Okean, Russia | RR |
| 0300 | 6055 | Radio Exterior de Espana, Spain | | 0500 | 15360 | BBC relay, Singapore | |
| 0300 | 15110 | Radio Exterior de Espana, Spain | SS | 0500 | 11795 | Radio Free Asia, Northern Marianas | CC |
| 0300 | 11605 | Radio Taipei Int'l | JJ | 0500 | 15140 | Radio Sultanate of Oman | AA |
| 0300 | 21725 | Channel Africa, South Africa | | 0500 | 151220 | Radio Pilipinas, Philippines | |
| 0300 | 5975 | Radio Korea Int'l | JJ | 0500 | 10400 | Voice of Korea, North Korea | RR |
| 0300 | 15230 | Broadcasting Service of the Kingdom of Saudi Arabia | AA | 0500 | 6398 | Pyongyang Broadcasting Station, N. Korea | KK |
| 0300 | 3240 | Trans World Radio, Swaziland | | 0530 | 15355 | Radio Sultanate of Oman | AA |
| 0300 | 7180 | Voice of Russia, via Moldova | | | | | |

| UTC | Freq. | Station/Country | Notes | UTC | Freq. | Station/Country | Notes |
|------|--------|---|---------|------|-------|--|-----------|
| 0600 | 15485 | Radio Free Asia, Northern Marianas | unid | 1400 | 5009 | Radio Cristal Int'l, Dominican Republic | SS |
| 0630 | 7185 | RTV Marocaine, Morocco | AA | 1430 | 4770 | Radio Centinela del Sur, Ecuador | SS |
| 0630 | 9575 | Radio Medi Un, Morocco | FF | 1430 | 4781 | Radio Oriental, Ecuador | SS |
| 0730 | 15345 | RTV Marocaine, Morocco | AA | 1430 | 3280 | La Voz del Napo, Ecuador, relay Radio Maria | SS |
| 0730 | 4895 | Radio Television Malaysia | | 1430 | 9640 | Deutsche Welle, Germany, via Portugal | |
| 0730 | 15495 | Radio Kuwait | AA | 1430 | 11615 | Radio Prague, Czech Republic | |
| 0800 | 11690 | Radio Jordan | | 1430 | 7380 | Idea Radio, Colombia | SS |
| 0800 | 5100 | Radio Liberia Int'l | | 1500 | 11980 | HCJB, Ecuador | |
| 0800 | 9870 | Trans World Radio, Monaco | | 1500 | 9820 | Radio Havana Cuba | |
| 0800 | 15435 | Radio Jamahiriyia, Libya | AA | 1500 | 15180 | BBC via Cyprus | |
| 0800 | 6010 | Radio Mil, Mexico | SS | 1530 | 15120 | Radio Havana Cuba | SS |
| 0800 | 11990 | Radio Kuwait | | 1530 | 6140 | Radio Rebelde, Cuba | SS |
| 0800 | 15400 | UAE Radio | | 1530 | 6115 | Voice of the Strait, China | CC |
| 0800 | 6130 | Lao National Radio, Laos | | 1600 | 5045 | Nie Menggu PBS, China | CC |
| 0815 | 15215 | Voice of America relay, Morocco | | 1630 | 6970 | China National Radio | CC |
| 0945 | 5960 | Radio Monte Carlo, Monaco, via Canada | AA | 1700 | 9515 | CBC Radio, Canada | |
| 1000 | 7245 | Radio Mauritanie, Mauritania | AA | 1700 | 6070 | CFRX, relay CFRB, Canada | |
| 1000 | 9840 | Voice of the Mediterranean, Malta, via Germany | | 1700 | 9790 | China Radio Int'l, via Canada | |
| 1000 | 17725 | Radio Jamahiriyia/Voice of Africa | AA | 1700 | 9730 | China Radio Int'l, via French Guiana | |
| 1015 | 6185 | Radio Educacion, Mexico | SS | 1700 | 21550 | Voz Cristiana, Chile | SS |
| 1100 | 11770 | Radio Mexico Int'l | SS | 1700 | 7400 | Radio Bulgaria | Bulg. |
| 1100 | 9530 | Radio Japan, via French Guiana | JJ | 1700 | 6035 | Voice of America relay, Botswana | |
| 1100 | 7270 | Radio Malaysia | | 1730 | 9645 | Radio Bandeirantes, Brazil | PP |
| 1100 | 11855 | Radio Japan via Ascension Is. | | 1730 | 2380 | Radio Educadora de Limeira, Brazil | PP |
| 1130 | 6055 | Radio Tampa, Japan | JJ | 1800 | 4820 | Radio Botswana | |
| 1130 | 21530 | RAI Int'l, Italy | II | 1800 | 3210 | Radio Mosoj Chaski, Bolivia | SS |
| 1130 | 9675 | RAI Int'l, Italy | II | 1800 | 4717 | Radio Yura, Bolivia | SS |
| 1130 | 15650 | Kol Israel | HH | 1830 | 7210 | Radio Minsk, Belarus | R |
| 1130 | 17545 | Kol Israel | | 1830 | 17510 | KWHR, Hawaii | |
| 1130 | 11605 | Kol Israel | | 1830 | 12130 | Trans World Radio, Guam | EE |
| 1130 | 11745 | Voice of Islamic Republic of Iran | Farsi | 1830 | 9400 | Radio Bulgaria | |
| 1130 | 11715 | All India Radio, Goa | | 1900 | 11775 | Adventist World Radio, Guam | |
| 1130 | 9525 | Voice of Indonesia | CC | 1900 | 9690 | Deutsche Welle, Germany, via Antigua | GG |
| 1145 | 13605 | All India Radio | | 1900 | 10320 | Armed Forces Network, Hawaii | USB |
| 1200 | 4753 | Radio Republik Indonesia, Makassar | II | 2000 | 4800 | Radio Buenas Nuevas, Guatemala | SS |
| 1200 | 10330 | All India Radio | | 2000 | 11930 | Radio Japan, via Gabon | AA |
| 1200 | 4819 | La Voz Evangelica, Honduras | SS | 2000 | 7125 | RTV Guinienne, Guinea | FF |
| 1200 | 9835 | Radio Budapest, Hungary | | 2000 | 17580 | Radio Australia | |
| 1200 | 5010 | Voz de Misiones, Honduras | SS/EE | 2030 | 4830 | Radio Litoral, Honduras | SS/EE |
| 1200 | 9605 | Voice of the Islamic Republic of Iran | | 2100 | 4700 | Radio Amistad, Guatemala | SS |
| 1200 | 4960 | Radio Federacion, Ecuador | SS | 2100 | 9745 | HCJB, Ecuador | |
| 1200 | 9510 | Radio Finland | Finnish | 2115 | 4905 | China National Radio, Tibet | CC |
| 1200 | 11865 | Voice of Greece | Greek | 2130 | 11660 | Radio Australia | |
| 1215 | 17880 | Adventist World Radio, Guam | CC | 2130 | 11600 | Radio Prague, Czech Republic | |
| 1230 | 11995 | Radio France Int'l | | 2200 | 9965 | Voice of Armenia | local |
| 1230 | 6940 | Radio Fana, Ethiopia | Amharic | 2200 | 9080 | Radio Rivadavia, Argentina | |
| 1230 | 15330 | Trans World Radio, Guam | | 2200 | 15345 | Radio Argentina al Exterior | SS |
| 1230 | 4845 | Radio K'ekchi, Guatemala | SS | 2230 | 11710 | Radio Argentina al Exterior | |
| 1300 | 4052.5 | Radio Verdad, Guatemala | SS | 2230 | 15476 | Radio Nacional Arcangel, Argentine Antarctica | SS |
| 1300 | 17705 | Voice of Greece, via Delano, CA | Greek | 2230 | 4950 | Radio Nacional, Argentina | PP |
| 1300 | 15300 | Radio France Int'l | AA | 2300 | 7270 | Radio Tirana, Albania | Albanian |
| 1300 | 6040 | Deutsche Welle, Germany, via Canada | | 2300 | 7160 | Radio Tirana, Albania | |
| 1300 | 15475 | Africa Number One, Gabon | FF | 2300 | 11765 | KNLS, Alaska | |
| 1300 | 9925 | Croatian Radio, via Germany | SS | 2300 | 15185 | Radio Africa, Equatorial Guinea | |
| 1330 | 9490 | Abkhaziaa Radio, via Georgia Rep. | RR | 2300 | 13860 | Rikisutvarpid, Iceland | Icelandic |
| 1330 | 5500 | Voice of the Tigray Revolution, Eritrea | local | 2330 | 3290 | Radio Huayacocotla, Mexico | SS |
| 1330 | 9990 | Radio Cairo, Egypt | | 2330 | 6325 | La Voz del Vecino, Peru | SS |
| 1330 | 12050 | Radio Cairo | AA | 2330 | 12172 | WWRB, Tennessee | |
| 1400 | 5003 | Radio Nacional Guinea, Equatorial Guinea | SS | 2330 | 11590 | China Huayi Broadcasting Corp., China | CC |
| 1400 | 5040 | La Voz del Upano, Ecuador | SS | | | | |

radios & high-tech gear

review of new, interesting and useful products

New QSL Card Styles From Artsci

By popular demand Artsci now has the detailed QSL card state format for more than California! They offer the special QSL card for the following states:

| | |
|---------------|--------------|
| Arizona | N. Carolina |
| California | N. Dakota |
| Connecticut | Nevada |
| Florida | Ohio |
| Hawaii (Oahu) | Oklahoma |
| Indiana | Pennsylvania |
| Massachusetts | Tennessee |
| Michigan | Texas |
| Nebraska | Virginia |
| New York | |

QSL cards are available in quantities of 100 cards per style. Each 100 cards are printed with black ink on five standard colors of card stock. This will give you 20 cards in each color. Business card size QSL cards are also available. These are great to hand out when you have a face-to-face contact. The popular name for these cards is "EYEBALL QSL CARDS." They are printed using the same artwork and paper card stock as the standard QSL Cards.

The first 100 cards are \$9.95. Each additional 100 cards (of the same style) are \$7.95. One hundred business card size cards are \$7.95. Delivery time is 3-4 weeks. The cards will be shipped via two-day priority U.S. mail (which takes approximately 4-5 days). The shipping charge is \$4. To order or to see samples please visit <http://www.artscipub.com/kamko.html>.

Lightning Bond — Helping The World Stick Together - One Drop At A Time!

The name says it all. This stuff adheres most anything to anything. I tried it with plastic radio knobs and a cracked old microphone housing. Let's just say, they're permanently repaired! Lightning bond isn't epoxy, but rather a high-tech super adhesive that sticks to wood, aluminum, steel, glass, rubber, hard PVC, porcelain, ABS, leather, china and more. They report



people using it to repair eyeglass frames, broken figurines, plates, vehicle upholstery, jewelry, tubes, and rafts.

Clean the surface and put just a bit of Lightning Bond on to one of the materials being bonded. Press 'em together and allow the item to set before using. Their spec sheet says, "Most materials will cure completely within eight hours at room temperature."

Their Lightning Fill is used in combination with Lightning Bond to fill in cracks, chips and missing material at joints, pipes and other surfaces. Later, in less than an hour, most surfaces can be machined! Finished surfaces can be sanded and painted, but will not accept stains. The hardened surface can be drilled and tapped.

For more information on Lightning Bond, call 570-421-8261, press "star" 1, or E-mail them at garr@epix.net. A 10-gram kit with glue and filler size bottle of this space-age bond costs \$15.

They offer two other kits — a 20-gram kit with the filler is \$20, and an industrial kit for \$50 which contains a dry epoxy which can repair anything that cannot be braized, soldered or welded. Included in the industrial kit is a underwater epoxy for underwater applications, and the 20 gram package, and a cleaner for cleaning surfaces prior to gluing, a primer used for polyethylene and polypropylene products, and an accelerator.

Be sure to tell the Lightning Bond folks you read about it in *Popular Communications*.

New Two-Way GMRS Radios From Kenwood Communications

Offering an alternative to airwaves crowded with two-way radio chatter, Kenwood Communications has introduced a compact two-way radio offering more than 1800 talk channels and a communicating range of four miles. The new FreeTalk XLS, a seven-ounce, one-watt GMRS (General Mobile Radio Service) radio, offers advanced features such as voice encryption, channel scanning, and automatic battery-saver functions, and popular features including vibration alert, an illuminated LCD display, rechargeable batteries with a 10-hour duty cycle, and the option to use store-bought AA alkaline batteries. The Kenwood FreeTalk XLS is also compatible with widely used FRS radios.

"The FreeTalk XLS is a great solution to the increasingly congested consumer airwaves," said Tom Wineland, president. "The availability of more channel combinations, extended range, new compact size and features, and increased functionality make this a superior product for small family businesses, outdoor enthusiasts and everywhere consumer two-way radios are needed."

The FreeTalk XLS comes equipped with 15 main channels, each with 38 analog talk groups and an additional 83 digital talk groups, for a total of 1815 selectable channels (15x38 plus 15x83). The digital talk groups provide more than 1200 channels of exceptionally clear communications. As with all GMRS radios, channels 1-7 are compatible with FRS radio channels

1-7, so users can easily communicate with FRS radio users. Channel 10 is preprogrammed to the frequency designated for travel aid and emergencies.

The FreeTalk XLS's new LCD display allows users to easily choose from a full selection of features. Channel scan ensures users can always find a clear channel to talk, and six call tones and a vibration alert means calls need never go undetected — even in noisy surroundings. Users can take advantage of a voice scrambler unique to XLS model radios to increase privacy between users. Built-in voice activation (VOX) circuitry, with three sensitivity levels, allows users to utilize



Kenwood's new FreeTalk XLS GMRS transceiver.

headsets to bypass the traditional push-to-talk (PPT) methods.

The XLS is small (about 4.5 inches tall) and lightweight (about 7 oz.) A tough polycarbonate case helps protect the unit from breakage, dents and scratches, and a top-mounted rotary volume control, similar to commercial-grade radios, makes for easy operation even when wearing gloves.

The FreeTalk XLS comes with a rechargeable NiMH battery that provides more than 10 hours of talk time based on a 90/5/5 (90% standby/5% talk/5% listen) duty cycle at 1-watt output. Users can select a lower power setting of 1/2-watt to further increase battery life and talk time. (This lower setting is identical in power and range to FRS radios.) The XLS also conserves battery power with a time-out timer that limits talk transmission time. An LCD battery meter shows battery power level, and an audible low battery alert signals when power is running low.

While standard equipment includes the NiMH batteries and a rapid charger, the XLS also accepts three conventional double-A alkaline or rechargeable batteries. The new Free Talk XLS radio has a suggested retail price of \$209.

Kenwood Communications is a leading manufacturer of two-way radios used in recreation, business, and government throughout the world. Further information can be obtained by contacting Kenwood Communications Corp., Technology Park at Johns Creek, 3975 Johns Creek Rd., Suwanee, GA 30024 (Toll free phone: 800-950-5005). The company's web site is www.kenwood.net.

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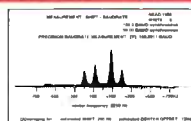
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Scanning For Trains and Boats

Many radio users within the spectrum have dedicated frequencies for their use. This is particularly apparent with the aviation band 108–137 MHz that is also in the AM mode, but there are some others. Over the past several years, many of the “hard and fast” frequency allocations have been blurred considerably in an effort to shift frequencies from services where they were not being well used, to services that were overcrowded in a particular area. This reallocation has been very geographical in nature and depends entirely on what services are in your area and what frequencies might be available. With some careful searching and research, frequency coordinators have been able to license many frequencies that are outside their “service” which blurs the lines for radio monitors trying to find those new frequencies.

One place where this has not happened, at least to any great extent are the railroad and marine services. These services have VHF frequencies allocated which have been in use for many, many years. There was a proposal to move the railroads to another band at one time, but it was dropped because of strenuous objections from the railroad industry itself. The cost of new equipment for different bands on a

nationwide basis is staggering. The aviation service is currently under siege as the entire air traffic control system is evaluated for upgrades, but I would expect it will be many years before any changes actually occur, if ever.

I have read in several places that there is another push to move the railroads to trunked radio. The problem is that the railroads have a lot of territory to cover. Putting up repeaters and trunking controllers along the thousands of miles of railroad track would be a tremendous undertaking. Perhaps some compromise solution such as satellite based radio, or the public cellular system which is much more likely to have continuous coverage than a private, built-from scratch-system, will eventually be used. But I wouldn't hold my breath, either.

Rail Comms Outside The Officialdom

There are, however, some railroad frequencies outside the official railroad band. These are used by railroad police, yard people, and others in instances where they do not have to communicate with the trains or other people running the “operations” side of things. Most of these “out of band” allocations are really nothing

more than business band licenses in another part of the spectrum. You can look for these channels in the UHF and other VHF portions of the spectrum, particularly in large metropolitan areas where there is likely to be a lot of auxiliary operations. Like all businesses, lots of communications is being done on cell phones too.

One easy thing to look for is the radio alarm detectors, or RAD's. These are automated systems that watch a train as it passes looking for problems, and then broadcast their findings on the radio. You'll sometimes hear a count of the axles, any defective wheel boxes or items hanging down from the train that shouldn't be there, and frequently the speed of the train in a mechanical voice, although not “robotic.” The train's crew will usually acknowledge these broadcasts as well.

If you're close enough to hear one of these detectors, it will tell you two things. One is that you're close enough to railroad operations to hear any traffic that might be passing by, and two, that there IS a train close by!

Just because you can't hear a RAD transmitter, don't despair. You may still hear plenty of activity from other railroad operations (such as a yard) close by, or just routine traffic on long haul tracks that pass within radio range of your location. They don't talk a whole lot on the open road, so you may have to listen for a while if you don't have a major operation nearby. You may decide that railroad monitoring isn't for you, if that's the case.

Another frequency to plug in to your scanner is 457.9375. This is a nationwide frequency used by most railroads for EOT (End of Train) telemetry modules. Since there are no cabooses on trains any longer, this device monitors the status of air pressure and other things at the far end of the train and transmits a signal approximately every 40–45 seconds even if the train is not moving. They only transmit data, so you won't want to actually listen to these things, but their presence does indicate a train close by. These operate at a power of about two watts, so you can hear them as far as four miles under ideal conditions. This dis-



Trains are almost everywhere, so it's quite likely that you'll be able to hear something on those frequencies. This engine is sitting in the National Museum of Transport in St. Louis.



Almost any radio will do for railroad and marine listening. Just make sure you have enough channels available!

tance can be severely limited by a number of factors, including buildings or trees between you and the railroad tracks.

One more set of nationwide frequencies for more data: **452.925/457.925** and **452.950/457.950** are used for locomotive speed control near some yard operations. Put them in your scanner and see what you come up with!

One final note about frequencies: The AAR channels in **Table 1** give both the channel designation and the frequency. Put the frequencies into your scanner, but be aware that the railroads will refer to the channels by number. Sometimes it's the number on the channels (most railroads are using synthesized radios these days, which can cover all of the channels in the band) or with older equipment, it could just be the channel number on that particular

radio. When using the synthesized radios, the channels are referred to in pairs. The first number is the transmit channel and the second is the receive channel.

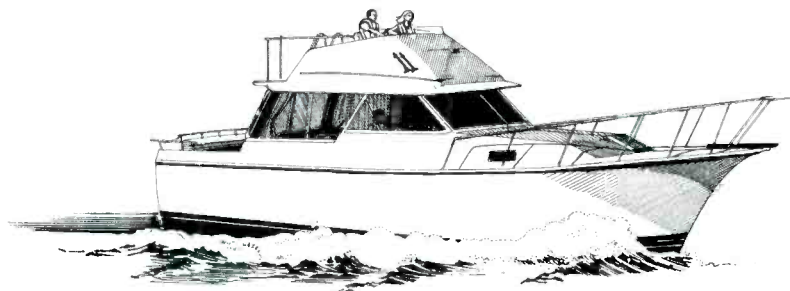
Often, these will be the same number, such as 3030, which means they are transmitting and receiving on channel 30. We'd call this "simplex" operation. This four-digit number is often referred to as the "window" number — the number that the radio operator sees in the window of his radio.

With 97 frequencies to monitor, you'll need at least a bank, and many railroad fans prefer a dedicated scanner. Put them in your radio and see what's there before you decide how serious you want to get about monitoring them. It can be fun, and it's certainly different from listening to another license plate check!

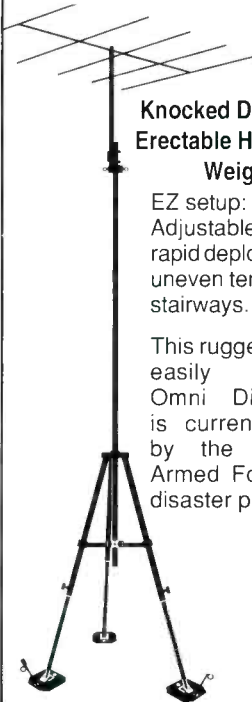
Maritime Monitoring

The maritime world also has a set of VHF allocations, which are very standard. Some of the frequencies, like channel 16 for instance, have even been standardized as to their use. Channel 16 is the calling channel. That frequency is used by boaters and ship operators alike. Local operators, the U.S. Coast Guard, and other maritime service users use other frequencies by either assignment or local agreement.

In larger ports, base operators are assigned a channel (or by agreement) and if you want or need the services of that port operator, you call on that channel, or call on 16 and someone will direct you to the correct channel. In smaller ports, it can become almost a free-for-all to find an open channel. In addition to the maritime operators, many "pirate" operations are using maritime frequencies for land-based operations because of the ease and widespread availability of the equipment. Most maritime supply stores, and many



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sporting goods stores and other outlets that sell even a few electronic products have marine band handheld radios available for a modest price.

On larger ships, handheld radios are often used on a quiet channel for person-to-person communications within the ship. Some of these operations are moving to FRS radios since they are so widely available and affordable, but if the crew has need for legitimate communications with other maritime users (such as talking to dock personnel during docking operations) they may well use one radio for everything. Even large handhelds don't generate much over 5 watts, so the range will be limited but you can hear some interesting conversations if you're close enough (or on the ship!).

Another great place to hear lots of radio traffic is at a lock facility on a river. Being in St. Louis right on the Mississippi, there are locks within range. Most of the traffic is routine operations, until something happens.

My advice for the marine band would be to put the whole mess into your scanner and then see what pops up as active. Some of it you'll find interesting, and some you will not. Once you decide what's worth listening to, you can take out the rest, or, leave them programmed in so you can check back a few times during the year. Maritime radio tends to be a very seasonal affair in many parts of the country, so what's dead today might very well be good entertainment tomorrow.

Don't think you won't hear anything until you try it. Even if there's no water within miles of you, there may still be some traffic to be heard. Illegal operations on the marine band were fairly common up until a few years ago when the GMRS and FRS radios became more widely available. Plug them in and see what you hear before you write off the whole band.

Frequency Of The Month

Let's pick a railroad frequency this month, since we're on the topic. **161.100**. Have a listen and send in what you hear. We'll enter your name (even if you don't hear anything) into the drawing for a free one-year subscription to your favorite radio magazine (as long as that's *Popular Communications*, of course). Send your loggings to armadillo1@aol.com, or via snail mail to: Ken Reiss, 9051 Watson Rd #309, St. Louis, MO 63126. Until next month, Good Listening! ■

Marine Frequencies

| | | |
|----|---------|------------------|
| 6 | 156.300 | Intership Safety |
| 7 | 156.350 | Commercial |
| 8 | 156.400 | Commercial |
| 9 | 156.450 | Commercial |
| 10 | 156.500 | Commercial |
| 11 | 156.550 | Commercial |
| 12 | 156.600 | Port Operations |
| 13 | 156.650 | Navigational |
| 14 | 156.700 | Port Operations |
| 15 | 156.750 | Environmental |
| 16 | 156.800 | Distress-Calling |
| 17 | 156.850 | State Control |
| 18 | 156.900 | Commercial |
| 19 | 156.950 | Commercial |
| 20 | 157.000 | Port Operations |
| 21 | 157.050 | Coast Guard |
| 22 | 157.100 | Coast Guard |
| 23 | 157.150 | Coast Guard |
| 24 | 157.200 | Marine Telephone |
| 25 | 157.250 | Marine Telephone |
| 26 | 157.300 | Marine Telephone |
| 27 | 157.350 | Marine Telephone |
| 28 | 157.400 | Marine Telephone |
| 65 | 156.275 | Port Operations |
| 66 | 156.325 | Port Operations |
| 67 | 156.375 | Commercial |
| 68 | 156.425 | Non-Commercial |
| 69 | 156.475 | Non-Commercial |
| 70 | 156.525 | Non-Commercial |
| 71 | 156.575 | Non-Commercial |
| 72 | 156.625 | Non-Commercial |
| 73 | 156.675 | Port Operations |
| 74 | 156.725 | Port Operations |
| 75 | 156.775 | |
| 76 | 156.825 | |
| 77 | 156.875 | Oil Tankers |
| 78 | 156.925 | Non-Commercial |
| 79 | 156.975 | Commercial |
| 80 | 157.025 | Commercial |
| 81 | 157.075 | Coast Guard |
| 82 | 157.125 | Coast Guard |
| 83 | 157.175 | Coast Guard |
| 84 | 157.225 | Marine Telephone |
| 85 | 157.275 | Marine Telephone |
| 86 | 157.325 | Marine Telephone |
| 87 | 157.375 | Marine Telephone |
| 88 | 157.425 | Commercial |

AAR Channels

| | | | |
|----|---------|----|---------|
| 7 | 160.215 | 54 | 160.920 |
| 8 | 160.230 | 55 | 160.935 |
| 9 | 160.245 | 56 | 160.950 |
| 10 | 160.260 | 57 | 160.965 |
| 11 | 160.275 | 58 | 160.980 |
| 12 | 160.290 | 59 | 160.995 |
| 13 | 160.305 | 60 | 161.010 |
| 14 | 160.320 | 61 | 161.025 |
| 15 | 160.335 | 62 | 161.040 |
| 16 | 160.350 | 63 | 161.055 |
| 17 | 160.365 | 64 | 161.070 |
| 18 | 160.380 | 65 | 161.085 |
| 19 | 160.395 | 66 | 161.100 |
| 20 | 160.410 | 67 | 161.115 |
| 21 | 160.425 | 68 | 161.130 |
| 22 | 160.440 | 69 | 161.145 |
| 23 | 160.455 | 70 | 161.160 |
| 24 | 160.470 | 71 | 161.175 |
| 25 | 160.485 | 72 | 161.190 |
| 26 | 160.500 | 73 | 161.205 |
| 27 | 160.515 | 74 | 161.220 |
| 28 | 160.530 | 75 | 161.235 |
| 29 | 160.545 | 76 | 161.250 |
| 30 | 160.560 | 77 | 161.265 |
| 31 | 160.575 | 78 | 161.280 |
| 32 | 160.590 | 79 | 161.295 |
| 33 | 160.605 | 80 | 161.310 |
| 34 | 160.620 | 81 | 161.325 |
| 35 | 160.635 | 82 | 161.340 |
| 36 | 160.650 | 83 | 161.355 |
| 37 | 160.665 | 84 | 161.370 |
| 38 | 160.680 | 85 | 161.385 |
| 39 | 160.695 | 86 | 161.400 |
| 40 | 160.710 | 87 | 161.415 |
| 41 | 160.725 | 88 | 161.430 |
| 42 | 160.740 | 89 | 161.445 |
| 43 | 160.755 | 90 | 161.460 |
| 44 | 160.770 | 91 | 161.475 |
| 45 | 160.785 | 92 | 161.490 |
| 46 | 160.800 | 93 | 161.505 |
| 47 | 160.815 | 94 | 161.520 |
| 48 | 160.830 | 95 | 161.535 |
| 49 | 160.845 | 96 | 161.550 |
| 50 | 160.860 | 97 | 161.565 |
| 51 | 160.875 | | |
| 52 | 160.890 | | |
| 53 | 160.905 | | |

Table 1

The Adventures of Scanner Dweeb
by M. A. Coletta

Since digital radios made the hobby of listening to police communications much more difficult, Scanner Dweeb decided to get a job where the radio action is...

Now he can hear digital communications, first hand....



Digital Donut Hole



www.ScannerDweeb.com

v.i.p.

spotlight

Congratulations To Scott Hernandez Of Louisiana!

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: "V.I.P. Spotlight," 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. Please print your return address on the envelope if using the postal mail system. Not doing so will delay your submission being processed. If you're E-mailing photos, please send them in a separate E-mail with your name in the "subject" line.

Our April Winner: Scott Hernandez

Our April VIP, Scott Hernandez, KD5PCK, says, "It all started in 1980 when I was five years old. Our family went on a road trip to Gatlinburg, Tennessee. My father had installed a CB rig in our van and I was fascinated by the voices coming over the radio's speaker.



A look at Scott's well equipped shack in Metairie, Louisiana.

Several years later, while in junior high school, that interest was again sparked when I dug out an old Lafayette SSB CB that belonged to my father and installed a ground plane antenna outside our home. This led to many late nights talking to a local crew that chatted on Ch. 1. While working at a Burger King during high school, I found a copy of Popular Communications that someone left on a table. After reading that first issue, I immediately become interested in scanning. Through the years of reading Pop'Comm, that interest has extended to SWL'ing, AM DX'ing, and ham radio. I just recently received my ham ticket in July and proudly have the callsign KD5PCK. My gear consists of the following: RadioShack DX-390 for SW work, RadioShack PRO-60, PRO-64, PRO-5052 TrunkTracker, several assorted mobile and base AM and SSB CB rigs, and an ICOM IC-T7H hand-talkie. More ham equipment is sure to follow." ■

If you enjoy radio communications you'll love....

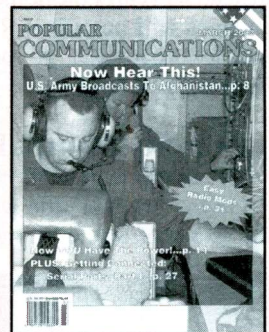
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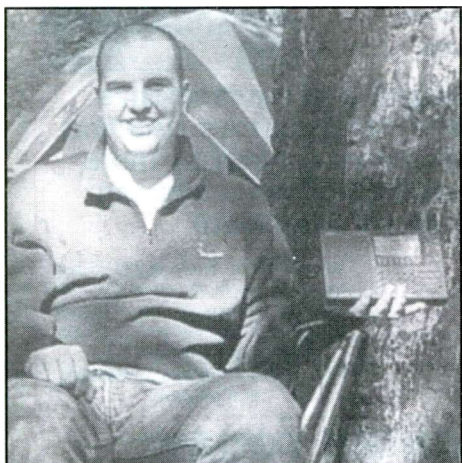
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Radio Norway International Axes Shortwave

Shortwave? Norway says “no way!” It’s a story we’ve heard before: Budgetary problems are plaguing that country and, consequently, their state broadcasting system, needs to adjust things downward to compensate for what amounts to a \$12-million shortfall. As usual, the axe man cast his eyes towards the shortwave operation first. In this case, though, it’s little easier to understand. Radio Norway International hadn’t bothered with English, or any other languages besides Norwegian in a number of years. This narrowed their potential listeners to Norwegian ex-patriots, Norwegian seamen, and citizens serving abroad. So it must have been hard to justify the \$5-million price tag for a foreign service, which couldn’t have had more than a few hundred or thousand listeners for any given broadcast. And so the last day of 2001 was also the last shortwave day for one of the elder statesmen of European shortwave broadcasters. RNI will disappear and instead will carry the home service. These changes will not affect Radio Denmark, whose broadcasts go out over Radio Norway transmitters.

Radio Bayrak Returns!

On the brighter side we can celebrate the return of Radio Bayrak, which oper-



Adam Smith (WA) is a happy fellow, listening outdoors on his Sony portable.



Rich D'Angelo got this card from Radio Litoral, Honduras, now a fairly regular reception on 4830 during the evenings.

ated for several years from the Turkish portion of Cyprus (Northern Cyprus). It had been off the air for a number of years but is now active again. Unfortunately, it’s proving to be a real bear to receive in the U.S on **6149 (nominal 6150)**. Some eastern listeners have been able to pin down all of about two minutes of reception time just before 2200 when China Radio International signs off and Bayrak leaves the air at 220 sign-off. They return again 0430 but reception at this hour is badly hampered by Deutsche Welle operating on 6145. Figure on a real fight if you decide to take this one on! The address is: P.O. Box 417, Lefkosa, T.R.N.C., via Mersin10, Turkey.

New Stations In Zimbabwe, And Chile, And Shortwave From Ecuador

Troubled Zimbabwe is the focus of yet another new station. SW Radio Africa will beam straight, unbiased news and information to Zimbabwe for three hours per day on **6145 kHz**. (No time schedule available yet.) The broadcaster is based in London.

There’s a new station on the air from Chile, too. It’s Radio Parinacota on **(6010)** where Radio Mil is sure to cause problems). This one runs 24 hours per day, relaying the local FM outlet on 94.5 and perhaps Radio Cooperativa as well. The

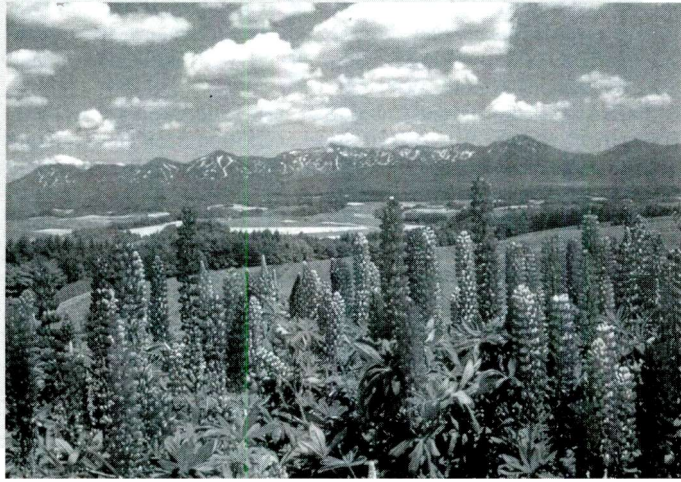
latter station was active on shortwave years and years ago. Address: Casilla 82, Arica, Chile.

Ecuador, too, has a new one. It’s Centro Radiofonico de Imbabura on **3380**. No schedule is known yet, but try them in the early evenings. Some confusion attends this one; it may be carrying broadcasts from other stations, such as Radio Maria. The fate of trusty ol’ La Voz del Napo, which has been on this spot for years, is a question mark.

AWR Forli, Italy Closes

Adventist World Radio’s small shortwave outlet at Forli, Italy, also closed down at the end of the year. Its coverage had already been duplicated by relays via Julich, Germany, and Austria’s site at Moosbrunn. So far as we know, AWR is proceeding with its plan to build a more powerful shortwave station elsewhere in Italy. Meantime, AWR’s station KSDA on Guam will put five 100 KW transmitters into use over the next couple of years, along with associated equipment and an automation system.

If it’s been a while since you’ve sent any logs in, you might just take the following as a hint: We’re saying “welcome back” to former reporter Howard Moser (IL) by awarding him our monthly book prize: a brand new copy of *Passport to World Band Radio*, courtesy of Universal Radio. It’s



A summer scene in Hokkaido, Japan, graces the front of this Radio Japan QSL. Wonder if you could string a wire along the tops of those tall flowers? (tnx: David Weronka, NC)

an inarguable fact that you do, indeed, need a copy of Universal's mammoth catalog containing everything a radio nut could want. Get a free copy by calling them at 614-866-4267, E-mailing them at dx@universal-radio.com or writing to: 6830 Americana Parkway, Reynoldsburg, OH 43068. It's almost as good as getting a QSL!

Remember, your reception logs are always wanted, too. We make every effort to use most, if not all, of the logs sent in, so don't be shy or feel yours aren't good enough. They are! Just be sure to list your logs by country and leave enough space between them one so we can navigate scissors easily. Logs are cut into strips and then sorted by country, so be sure to use only one side of the paper otherwise some of your logs won't survive. Also include your last name and state abbreviation after each logging. As always, thanks so much for your continued interest and participation.

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, **11765** at 1303 with ID and E-mail address; talk about what's available on their web site, back to "Post Card From America" program. (Montgomery, PA)

ALBANIA — Radio Tirana, **7160** at 0250 political parties and elections in Albania. (Moser, IL) **7270** at 0340 in Albanian with exotic music. (Linonis, PA)

ANGOLA — Radio Nacional, **4949.9** at 0500 with time pips, into news with a reverb on the live audio. (Strawman, IA)

ANTARCTICA — Radio Nacional Arcangel, **15475.5** heard at 2055 with brief SS talk, some music, close down announcements. (D'Angelo, PA)

ANTIGUA — Deutsche Welle relay, **9690** in GG to Australia at 0811. Also parallel via Germany on **9635**. (Becker, WA)

ARGENTINA — RAE, **11710** at 0214 with music, news, tangos. More news at 0230. Weather and ID at 0258 and sign-off. (Burrow, WA) Radio Nacional, **15345** with songs and anmts in SS at 2310. (Brossell, WI) 2317. (Jeffery, NY) Radio Rivadavia, **9080** at 1000 with U.S. pops and possible SS. Very poor reception and no ID so is tentative. (Montgomery, PA)

ARMENIA — Voice of Armenia, **4810** at 0334 with talk in local language, mid-East type music, choral music at 0400-0430, more talk.

Abbreviations Used In This Month's Column

| | | |
|---------|---|---|
| // | — | Parallel frequency |
| ABC | — | Australian Broadcasting Corporation |
| AFRTS | — | Armed Forces Radio Television Service |
| AFN | — | Armed Forces Network |
| AIR | — | All India Radio |
| anncr | — | announcer |
| anmt(s) | — | announcement(s) |
| BSKSA | — | Broadcasting Service of the Kingdom of Saudi Arabia |
| CNR | — | China National Radio |
| GOS | — | General Overseas Service |
| ID | — | identification |
| Int'l | — | international |
| IS | — | interval signal |
| Lang | — | language |
| LSB | — | lower sideband mode |
| NBC | — | National Broadcasting Corporation |
| OA | — | Peru, Peruvian |
| PBS | — | People's Broadcasting Station |
| Pgm | — | program |
| RRI | — | Radio Republik Indonesia |
| sked | — | schedule |
| SIBC | — | Solomon Islands Broadcasting Corporation |
| TOH | — | Top of the Hour |
| unid. | — | unidentified |
| USB | — | upper sideband mode |
| vern | — | vernacular (any local dialect or language) |
| VOA | — | Voice of America |
| VOIRI | — | Voice of the Islamic Republic of Iran |

//**9965** only at 0400-0430. (Alexander, PA) **9965** at 0300 in possible RR or Armenian with an animated woman anncr. (Linonis, PA)

ASCENSION ISLAND — BBC relay, **15190** at 1220. (Linonis, PA) **15400** at 2000. (Jeffery, NY) 2140. (Newbury, NE)

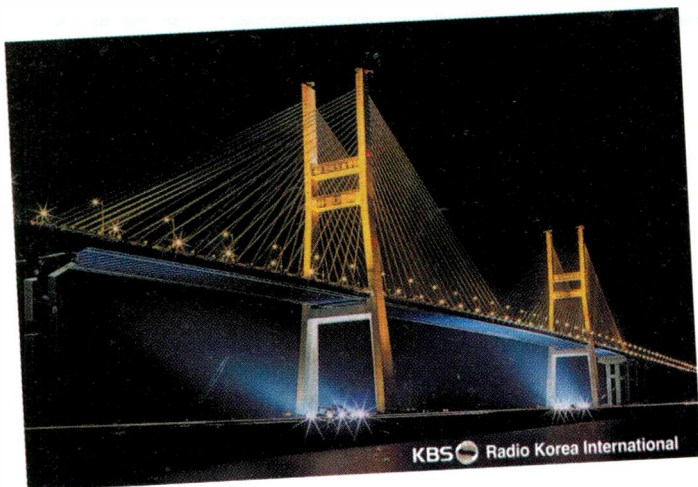
AUSTRALIA — Radio Australia, **9475** at 1700 with news, ID. (Burrow, WA) **9580** at 1320 and 1441, **15240** at 2319. (Newbury, NE) **11650/9580** at 1150. (Linonis, PA) **11660** at 1425. (Foss, Philippines) **15240** at 2311. (Jeffery, NY) **17580** at 0725. (Smith, WA) ABC Northern Territory Service, Alice Springs, **2310** at 1017. Extremely weak. **2325** at Tennant Creek had much stronger carrier but lower audio. Woman anncr with "ABC News," then faded down again. (Montgomery, PA)

BELARUS — Belarusian Radio, **7105** at 1517 with man in presumed Belarussian. (Foss, Philippines) Radio Minsk, **7210** at 0300 with EE news, comment, IDs. Schedule and address at 0329 close. (Alexander, PA) 0328 with ID, address, phone, web URL. Into unid. language at 0330. (Brossell, WI) 0330 with chimes IS, ID mentioning Minsk and into RR news. Not 100% sure this is Belarus. (Linonis, PA)

BELGIUM — Radio Vlaanderen Int'l, **11985** via Bonaire at 0404 with news, weather and "Belgium Today." (Brossell, WI) 0423 with modern Belgian music, ID, address, Internet address. (Newbury, NE)

BHUTAN — Bhutan Broadcasting Service, **5030** at 1019 with pop/rock tune, news in unid. language at 1030. (Foss, Philippines)

BOLIVIA — Radio Mosoj Chaski, **3310** at 2320 with instrumental music, man in Quechua with talks and numerous IDs, nice flute music. (D'Angelo, PA) Radio Movima, **4471.7** at 2312 with vocals, man with SS IDs, talks. (D'Angelo, PA) Radio Villamontes, **4600.4** at 2326 with mix of rustic vocals and SS talks. Beiges tune. Some drifting. (D'Angelo, PA) Radio Paititi, **4681.6** at 0010 with long, droning talk by man in SS, brief music segment, ID at 0018, more droning discussion. (D'Angelo, PA) Radio Yura, **4716.8** at 2328 with rustic group vocals, ID by man. (D'Angelo, PA) 0020 with bits of talk and music



Radio Korea International uses this full color QSL to show off Seoul's Seohae Grand Bridge, at 7310 meters, the ninth longest in the world. (Tnx: David Weronka)

at noise level, too weak for details. (Strawman, IA) Radio Malku, **4796.5** at 2352 with SS talk and rustic music. (D'Angelo, PA)

BOTSWANA — Radio Botswana, **4820** at 0356 with tribal vocals, woman with "This is Radio Botswana broadcasting from Gaborone. The time is now 6 o'clock" and into news at 0400. Also at 2315 with music program, ID and sign off at 2200. (D'Angelo, PA) VOA relay, **6035** at 0540 with news features. Also **9775** at 0407. (Newbury, NE) **11655** at 2200. Also **9885** at 0333. (Brossell, WI)

BRAZIL — Radio Cultura, tentative on **3365** at 0010. Extremely weak. Could only hear the music —the announcer was much weaker. (Montgomery, PA) Radio Educadora de Limeira, **2379.9** at 0045 with Brazilian pops, man in PP talk and ID. Poor to fair but better at 0200 re-tune. (D'Angelo, PA) Radio Bandeirantes, **9645** at 2251 with Brazilian music, man in PP. (Newbury, NE)

BULGARIA — Radio Bulgaria, **7400/9400** at 0002 with EE news, ID and into "Events and Developments" at 0010. (Burrow, WA) **7400** at 0345 in Bulgarian with jazz-type background music. (Linonis, PA)

CANADA — CFRX, **6070** at 1330 relaying "News Talk RadioCFRB-1010", (Lamb, NY) Radio Canada Int'l, **9590** with news at 2317 and **11990** with news at 0200. (Smith, WA) **11900** at 0230 with mailbag show. (Weronka, NC) CBC Radio, **9515** at 1415 with the "Morning Show." (Northrup, MO)

CHILE — Radio Minería, tentative on **5927.2** at 2258 with SS talks, various music styles. No ID noted. Poor, with deep fades. (D'Angelo, PA) Voz Cristiana, **21550** in SS at 1841 with music. (Newbury, NE)

CHINA — China Radio Int'l, **7405** at 1455 with promo for China Horizons, closing with E-mail and Web addresses. Also **9730** via Fr. Guiana at 0405 on **9790** via Canada at 0148. (Newbury, NE) **9440** at 1230 in unid. language. Also **15100** in unid. language at 0008. (Jeffery, NY) **9790** at 0150 with "Life in China." (Weronka, NC) 11945 at 1325, 11955 at 1325 and 11990 at 1320, all in CC. (Northrup, MO) China People's Broadcasting, **9675** in CC at 0738. (Becker, WA) China National Radio-1, **5030** in CC at 1217 and **5880** in CC at 1211. (Becker, WA) CNR-2, **4850** in CC at 1221. (Newbury, NE) **5010** at 2244 with CC/EE lessons, ID at 2250 with a "very happy good-bye to all." (Montgomery, PA) CNR-5, **6790** at 2132 in CC. Listed as Taiwan Service 2 with indigenous vocals and CC talks. (D'Angelo, PA) CNR — 6 **6790** at 2248 with Mandarin chatter, low audio. (Strawman, IA) Nei Menggu PBS, **5045** in CC at 1207. (Becker, WA) CNR — Lhasa, Tibet, **4905** at 1242 with orchestral music. Weaker on // **4920**. (Strawman, IA) Voice of the Strait, **6115** in CC at 1159. (Becker, A)

COLOMBIA — Idea Radio, **7380** with SS talk at 0740. Still going at 0820. (Becker, WA)

CROATIA — Croatian Radio, **9895** via Germany at 0006 with

unresolved issues, 0156 with times and frequencies, 0410 with U.S. policy towards Bosnia. (Newbury, NE) 0346 ending new, ID and into SS. (Burrow, WA) 0347 in SS. (Brossell, WI) 0401 with multi-lingual IDs, frequencies. (Smith, WA)

CUBA — Radio Havana Cuba, **9820** at 0154. (Newbury, NE) 0331, 0531, 0705. (Smith, WA) **15120** (new) at 2130 to 2258 close, mixing with co-channel Nigeria. // **11705 15230, 17750**. (Alexander, PA) Radio Rebelde, **6140** in SS at 1203. (Becker, WA)

CYPRUS — BBC relay, **15180** at 1733 with mid-Eastern music. (Jeffery, NY)

CZECH REPUBLIC — Radio Prague, **7345//11615** at 0020 in unid. language. IS. ID at 0027 and off. Also **17485** at 1657 with ID and complete sked. EE news at 1700. (Burrow, WA) **11600** at 0447 with Czech pops. (Brossell, WI) **21475** at 1650 with frequency anmts, news. (Linonis, PA)

DOMINICAN REPUBLIC — Radio Pueblo, **5009.8**, at 0045 with classical and religious music, phone talks, IDs. Off with national anthem. Strong but with slight distortion. Next night heard to 0247 close. (Alexander, PA) Radio Cristal, **5009.8** at 0200 with end of an oldies tune, man with ID and sign-off anmt, choral national anthem and off at 0204. (D'Angelo, PA) 1049 with long SS talks, mention of address at 1052, ID 1056 and 1059, address given at 1100. (Montgomery, PA)

ECUADOR — Radio Oriental, **4781.4** at 0956 with woman SS talk, vocals, canned ID and time check. (D'Angelo, PA) Radio El Buen Pastor, **4815** at 0957 with instrumental music, "Unchained Melody," anthem and opening ID, anmts with flute background. (D'Angelo, PA) Radio Centinela del Sur (presumed) **4770.1**, 1042 with long winded talk by man in SS, instrumental music at 1101. (D'Angelo, PA) La Voz del Upano, **5040.1** at 1045 with continuous lively Latin vocals and man anncr with ID at 1055 over more music. (D'Angelo, PA) Tentative at 0230 with SS anmts, commercials, jingles, sound effects. Wide variety of U.S. rock, SS pops, ballads. Off abruptly at 0312. (Alexander, PA) Presumed this at 0008 with Andes-style music and news headlines. (Strawman, IA) Radio Federacion, presumed, **4960** at 0055 with same type of programming heard from this station in the past. Religious program and recitations in unid. language, distinctive folk music. Off with a bouncy march tune. (Alexander, PA) La Voz del Napo, (tentative) **3279.6** at 0208 with music, man in SS. (Montgomery, PA) HCJB, **9745** at 0258. Also **11980** at 2337 in GG with hymn. (Newbury, NE) 1335. (Northrup, MO)

EGYPT — Radio Cairo, **9475** at 0300 with "Life in Egypt." (Burrow, WA) Man with ID at 0050. Also presumed on **9900** in AA at 0359. (Smith, WA) 2135 with news items. Also at 2235. (Brossell, WI) **12050** at 0646 in AA. (Newbury, NE)

ENGLAND — BBC, **5975** (Antigua) at 0406, **6135** (via Delano) at 0413 and **12095** at 1030. (Smith, WA) **9915** at 0111. **12095** at 0648.



Never at a loss for subjects, the date on this Radio Japan QSL missed July 4th by exactly a month. (Tnx: Adam Smith)

(Newbury, NE) **11680** at 2130 with "Calling the Falklands." Off at 2144. (Burrow, WA) **15555** via Cyprus in AA at 1320. (Brossell, WI)

EQUATORIAL GUINEA — Radio Nacional **5003** at 2151 in unid. language with music, man anncr. (Jeffery, NY) 2202 with march music, off at 2205. (Strawman, IA)

ERITREA — Voice of the Tigray Revolution, on **5500** heard at 0322 with Horn of Africa music program to ID and news at 0400. (D'Angelo, PA)

ETHIOPIA — Radio Ethiopia, **9704.2** at 0425 with music, tentative ID in Amharic. Two women talking at 0428 with short music interludes, sometimes that of children singing. (Montgomery, PA) Radio Fana, **6940** at 0340 with Horn of Africa music, Amharic talks. //**6210** was weak. This was non-existent earlier but suddenly faded up with dawn enhancement at the station. (D'Angelo, PA) 0404 with music with a slight techno slant. This was in Upper Sideband. On LSB there was a totally different music program and a guy trying to sing with the tunes. Also occasional conversation in SS. Not sure what this was. (Montgomery, PA) (*Very doubtful the SS was from Radio Fana — Ed*)

FINLAND — Radio Finland, on **9510** to Australia at 0808 in Finnish. (Becker, WA) (Linonis, PA) **6175** at 0659 with time pips, ID. (Smith, WA) **11615//11995//12015** (Gabon) and **17850** at 1627 in EE. (Burrow, WA)

FRENCH GUIANA — Radio France Int'l relay, **21645** in FF at 2119. (Smith, WA)

GABON — Africa Number One, **15475** at 1855 in FF to 1900 close. (Linonis, PA)

GEORGIA (rep.) — Radio Abkhazia, **9490** at 1447 in seeming RR with news or commentary. (Strawman, IA)

GERMANY — Deutsche Welle, **6040** (via Canada) at 0125. (Weronka, NC) **9640** via Portugal at 0138. (Newbury, NE) **21590** in GG at 2205. (Smith, WA)

GREECE — Voice of Greece, **7477** — slightly off nominal **7475** — at 0115 with Greek music and talk. //**5865** and **12110**. (Alexander, PA) **9420//15630//17705** (later via Greenville in Greek at 1625.)

(Burrow, WA) **11645** in Greek at 1957. Off suddenly at 1959. (MacKenzie, CA) **11865** — via Greenville? — at 0330 sign-on in Greek with IS, ID, news. (Linonis, PA) **15630** in Greek at 1730. (Moser, IL) 0702 with music, talks in Greek. (Newbury, NE) **17565** (Greenville) and //**17705** (Delano) at 2115 (Smith, WA)

GUATEMALA — Radio Amistad, **4698.8** from 1050 with open carrier, vocal at 1056 and man with opening ID, anmts. Long religious talk and to vocals program at 1128 and frequent IDs. (D'Angelo, PA) ID as Radio Truth at 0211. (Montgomery, PA) RadioVerdad, **4052.5** at 0300 with SS religious program, talk, marimbas, EE ID with address and request for reports at 0311 and 0404. Off with four minute long anthem. On later than normal with s/off at 0505. (Alexander, PA) 0024 with man with long talks in SS, talk of future programming. Address in EE at 0206. (Montgomery, PA) 0023 with frequent IDs. Muddy audio, ID and address at 0208. (Strawman, IA) Radio Buenos Nuevas, **4799.8** at 0008 with ID by man, American marching band music during long talks, "Radio Buenas" ID at 0013. (Montgomery, PA) Radio Maya, **3324.8** at 1120 with continuous vocals to 1200 ID by man. (D'Angelo, PA) Radio K'ekchi, **4855.9** at 1110 with religious vocals, ID by man at 1129, discussion. (D'Angelo, PA)

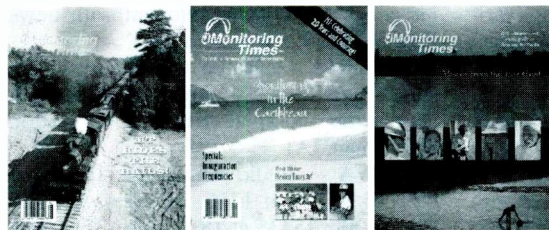
GUAM — Adventist World Radio/KSDA, **11775** at 2229 with "This is Adventist World Radio, the Voice of Hope from Agat, Guam on 11775 kilohertz." (Brossell, WI) **17835** in CC at 2235 and **17880** in CC at 2230 but not parallel. (MacKenzie, CA) Trans World Radio/KTWR, **12130** at 1325 with EE lessons for Chinese. (Brossell, WI) **15330** at 1453 with religious music. (Foss, Philippines)

GUINEA — Radiodiffusion duGuinea, **7125** at 2347 with hi-life and anmts in FF. (Brossell, WI)

HAWAII — KWHR on **17510** at 0124 with sermon. (Newbury, NE) AFRTS/AFN Pearl Harbor, **10320** USB at 0350 with sports program and USA Radio Network News. (Brossell, WI)

HONDURAS — La Voz Evangelica, tentative, **4819** with corridas music at 1015. (Barton, AZ) Radio Litoral, **4830** at 0355 with religious music, short EE religious messages, IDs, canned SS anmts

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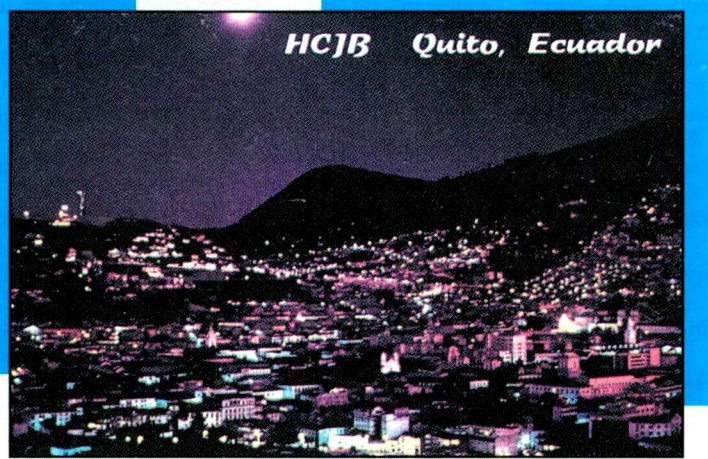
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This striking REE (Spain) QSL features white lettering on two shades of blue. (Tnx: Adam Smith)



HCJB highlights Quito at night on this QSL. (Tnx: Adam Smith)

"Searchlight" EE program. Off with EE anmts at 0456 with address and phone number. Listed for 0400 close. (Alexander, PA) Radio Misiones Int'l, **5010** at 2235 with lively Latin vocals, man anncr with IDs and time checks. (D'Angelo, PA) 0128 with man anncr yelling and using white noise. ID by man at 0202 then another screaming rant. At times I thought he'd almost collapsed during the broadcast. (Montgomery, PA)

HUNGARY — Radio Budapest, **9835** at 0058 with IS and news. (Smith, WA) 0335 with music, ID, regional economic news. (Burrow, WA) 0340 on National Bank of Hungary. (Brossell, WI)

INDIA — All India Radio, Port Blair (Andaman Is.) **4760** at 1150 with Hindi vocals and talk. Sudden fade out at 1221. (D'Angelo, PA) AIR — Chennai, **4790** at 0022 with Hindi vocals and flutes, some talk. ID and closedown anmts at 0044 prior to carrier being cut at 0045. **4920** at 1224 with Hindi vocals and drums to woman in possible Tamil and ID prior to apparent EE news at 1230. (D'Angelo, PA) 2359 with on with IS, and then off for about a minute, then back. (Montgomery, PA) AIR-Jaipur, **4810** with typical vocals at 1315. (Strawman, IA) AIR — Mumbai, **4840** at 0105 with Hindi vocals, talks by various male anncrs. Flute music at 0127 and woman with new sat 0130. (D'Angelo, PA) AIR — Delhi, **4860** at 1226 with talk by woman, ID, news in EE. Next day with program previews at 1226, 5 plus 1 time pips and EE news. **7150** at 2226 with end of Hindi music selection. ID and sign-off anmts. Beamed to Australia.

(D'Angelo, PA) AIR — Kuresong, **4895.1** at 1148 with Hindi vocals and woman anncr. (D'Angelo, PA) AIR — Itanger, **4990** at 1157 with Hindi music. Carrier cut for about five minutes at 1200 then back with more Hindi music and talks. (D'Angelo, PA) AIR (various) **10330** with sitars and vocal music at 1445. (Barton, AZ) AIR, **15585** with presumed sitar music at 1305. Also **11620** at 1800 with EE news. (Brossell, WI) **11620** (Bangalore) at 0300 in Hindi. (Linonis, PA) **13605** at 1900 in EE. //9950. (Newbury, NE) 1900 in EE. (Burrow, WA) **17800** at 1146 with high-pitched woman singing. (Foss, Philippines) AIR — Panaji (Goa) **11715** at 2219 with long EE talk, man with G.O.S. ID, sitar music, ID and frequency anmts at 2229. (D'Angelo, PA)

INDONESIA — Radio Republik Indonesia — Merauke, **3905** in II at 1236 with continuous woman vocals, quick ID and SCI at 1300 when possible news. (D'Angelo, PA) RRI — Makassar, **4753.3** at 2150 with talk by man and woman in II to SCI and Jakarta news. (D'Angelo, PA) Voice of Indonesia, **9525** at 1120 with easy folk music. **1129** in CC, 1130 man in another language. (Newbury, NE)

IRAN — VOIRI, **9605//11775** in EE at 1530. (Burrow, WA) 9835 presumed at 0034. (Smith, WA) **11720** at 0345 in presumed Farsi. also **9790** in AA at 0330. (Brossell, WI)

ISRAEL — Kol Israel, **11590** in HH with U.S. pops heard at 0445. (Brossell, WI) **11605** at 1712 in EE. **15650** in Yiddish at 1715 (Moser, IL). 1955 and off suddenly at 1956. (MacKenzie, CA) 0500 in EE with current

events discussion. (Linonis, PA) **17545** in HH at 1604. (Newbury, NE) 1705 in EE. (Burrow, WA)

ITALY — RAI Int'l, **9675** in II at 0143. (Newbury, NE) **9675//11800** at 0055 in EE with IS, ID, frequencies, news. (Burrow, WA) **21520** in II at 1230. (Linonis, PA)

JAPAN — Radio Tampa, **3925** in JJ at 1105. (Smith, WA) **6055** in JJ at 1205. (Becker, WA) **6115** at 0707. (Newbury, NE) Radio Japan/NHK — 6120 (via Canada — Ed) to North America at 1157. "Goodbye from Tokyo" and dead air. (Montgomery, PA) **6145** (via Canada) at 0001 and **9835** in EE at 0659. (Smith, WA) **9530** (French Guiana — Ed) in JJ at 0810. (Becker, WA) **11715** in JJ at 0707. (Newbury, NE) **11855** via Ascension with EE news at 2100. **11930** in AAA at 0402. (Brossell, WI) **17825** in JJ at 2237. (MacKenzie, CA) **17870** at 0617. (Barton, AZ)

JORDAN — Radio Jordan, **11690** at 1641 with "Interaction" EE call-in program, time pips, ID at news at 1700. (Burrow, WA) 1500–1701 with better than usual signals. Two minutes of EE news at 1500 and 1600. Announced EE broadcast starts at 1400. (Alexander, PA) 1705 with EE war news. Very strong. (Moser, IL) 1508 in EE and 0642 in AA. (Newbury, NE)

KUWAIT — Radio Kuwait, **11990** in EE at 1805 with "Burning the Kuwaiti Oil Fields" program. (Burrow, WA) **15110** at 1413 in AA with IDs at 1418 and 1448. Also //13620. (Lamb, NY) 0555. (Smith, WA) **15495** in AA at 2112. (Jeffery, NY) 1832 in AA. //15505 (Newbury, NE)

LAOS — Lao National Radio, **6130** at 1156 with nice instrumental music until familiar gongs at 1200 and woman with news. Faded at 1218. (D'Angelo, PA)

LIBERIA — Radio Liberia Int'l, presumed, on **5100** at 2244 with man/woman talk. Low audio and splatter from a ute station. (Strawman, IA)

LIBYA — Radio Jamahiriya, **15435** and //17725 in AA at 1716. EE News at 1725. (Moser, IL) **15435** at 1821 with "This is the Voice of Africa from the great Jamahiriya. Here are the news headlines in English." At 1822: "Thank you for listening and goodbye." (Brossell, WI)

MADAGASCAR — Radio Netherlands relay. **9860** in presumed Afrikaans at 0338. (Brossell, WI) **12080** at 1550. (Northrup, MO) **15595** at 1438. (Newbury, NE)

MALAYSIA — Radio Malaysia, tentative, **4845** at 1003 with woman and man in up tempo duet. (Foss, Philippines) **4895** at 1204 with EE vocals hosted by woman in EE. (D'Angelo, PA) **7270** at 1230 with children's choir and drum music. (Barton, AZ) **7295** at 1641 with "Midnight Madness" call-in music dedication program and "Radio 4" ID. (Burrow, WA)

MALI — Radio TV Malienne, **4835.3** at 2215 with FF anmts and vocals with plucked stringed instrument. //5995. (Strawman, IA)

MALTA — Voice of the Mediterranean, **9840** (via Albania, gld) at 1700 with pgm on

Maltese history, IDs as "VOM" and "Voice of the Mediterranean." (Burrow, WA)

MAURITANIA — Radio Mauritanie, **7245** at 0823 with prayers. Into presumed news in AA at 0830. (Becker, WA)

MEXICO — Radio Mexico Int'l, **11770** at 2335 in SS. (Brossell, WI) Radio Mil, **6010** at 0510 with SS pops; ID at 0513. (Strawman, IA) 0748 with Mexican pops. (Newbury, NE) 0931 with pops. (D'Angelo, PA) Radio Huayacocotla, **2390** at 0034 with ranchera music, man anncr and closedown anmts by woman in SS at 0059, children singing to 0101 and carrier cut about a minute later. (D'Angelo, PA) Radio Educacion, **6185** at 0445. Sounded like Marlene Dietrich singing in SS. (Newbury, NE)

MONACO — Trans World Radio, **9870** to Europe at 0815. (Becker, WA) Radio Monte Carlo, via Canada, **5960** at 0400 in AA. (Newbury, NE)

MOROCCO — VOA Relay, **15220** in FF at 2015. **15240** in EE at 2018. (MacKenzie, CA) 1751. (Jeffery, NY) **15410** with sports at 1630. (Barton, AZ) Radio Medi Un, **9575** at 0128 lively music, woman anncr in FF. (Newbury, NE) RTV Marocaine, **7185** at 0330 in AA. (Brossell, WI) **15345** in AA at 1829. (Newbury, NE) 2020. (MacKenzie, CA)

MYANMAR — Radio Myanmar, **4725** at 1147 with continuous indigenous vocals until short tuning signal, ID by woman and news. (D'Angelo, PA)

NETHERLANDS — Radio Netherlands, **9895** at 2328 with "On Target." (Smith, WA) 0634 in DD. (Newbury, NE) **11655** at 2000 with news, ID, more news. (MacKenzie, CA) **17580** (via Madagascar — Ed) in AA at 1230. (Linonis, PA)

NETHERLANDS ANTILLES — Radio Netherlands relay, **6165** with "Sincerely Yours" at 0430. (Smith, WA) 0438. (Newbury, NE)

NEW ZEALAND — Radio New Zealand Int'l, **15190** at 1810 with news, ID. (Burrow, WA) **15340** at 0400 with news, weather, local music. (Linonis, PA) 0419 and 0433. (Smith, WA) 0450. (Brossell, WI)

NICARAGUA — Radio Miskit, **5770** reduced carrier USB at 0105 with SS talk, SS ballads, ID, sign-off with national anthem. Irregular. (Alexander, PA)

NIGERIA — Voice of Nigeria, **7255** at 0516 with news items, ID and addresses. (Burrow, WA) 0531 with news. (Newbury, NE) **15120** at 2143 with ID. (Smith, WA) 0500 with IS, ID, EE news, discussion. (Linonis, PA) 0520 talk about foreign investment in telecommunications. Better than 7255. (Moser, IL)

NORTH KOREA — Pyongyang Broadcasting Station, **6398.5** at 1150 in KK to Central Asia. (Becker, A) Voice of Korea, **9325.1** at 1345 in Asian language. Muddy audio. **10400** at 1410 with choir music, anthem. (Barton, AZ) **9335** at 1501 with IS, sign-on, anthem. //11710. (Newbury, NE) **9975** in EE at 1633. (Burrow, WA)

NORTHERN MARIANAS — VOA relay, Tinian, **13615** at 0949 with business news. (Foss, Philippines)

OMAN — Radio Sultanate of Oman, presumed, **15140** at 1451 with Koran, man anncr difficult to copy due to HCJB co-channel QRM. HCJB off at 1500 and could hear a man in possible AA with what sounded like news. (Lamb, NY) **15355** at 0305 in EE with Koran verses in AA and EE commentary; pops to 0330 then news, schedule, address at 0340. (Burrow, WA)

PALAU — Voice of Hope, **9965** 1007 with gospel songs in CC. (Foss, Philippines) with hymn, man woman in CC and sign-on at 1328. (Newbury, NE)

PAKISTAN — Radio Pakistan, **15100** with man/woman talks in listed Urdu, Koran, possible news and ID. Also on listed //11570. (Lamb, NY)

PAPUA NEW GUINEA — NBC Port Moresby, **4890** at 1100 with pops, woman with news. (Barton, AZ) 1200 in EE and Tok Pisin with text of speech by the prime minister. (Linonis, PA) 1220 with music and anmts. (Becker, WA) Radio Milne Bay, **3365** at 1203 with news by man. //4890. Music at 1206. (D'Angelo, PA)

PERU — Radio Huanta 2000, **4746.7** in SS at 0936 with long talk, nice ID with flute music at 0943. (D'Angelo, PA) **4834.9** Radio Maranon, 1010 with ID and time checks, music. (D'Angelo, PA) **4855.7** Radio La Hora, 2346 with rap, SS talk, ID and listener phone call. (D'Angelo, PA) Radio Cultural Amauta, **4955** at 1030 with male vocals and woman anncr with ID, time checks, commls. (D'Angelo, PA) Radio Union, **6296** at 0810 with distorted, wobbly signal. SS talks, OA folk music. (Alexander, PA) Radio Ancash on **4991** at 1022 with excited anncr and local tunes. Tentative ID at 1031. (Montgomery, PA) Radio Sicuani, **4826.5** in SS with program info, OA music. Tentative ID at 0944 and more program info. (Montgomery, PA) Ondas del Rio Mayo, **6797.5** at 2354 with OA music, man anncr and SS ID. (Montgomery, PA)

PHILIPPINES — Radio Pilipinas, **15120** at 0322 with news, ID, address. (Burrow, WA) FEBC Int'l, **9405** in CC at 1002. (Foss, Philippines) **12065** with music, anmts, ID at 2327. (Brossell, WI) **15095** ending broadcast in listed Ash, sound of conch shell and into listed Karen at 1345. Listed Lisu at 1400. (Lamb, NY) VOA relay, **9760** at 1134 with news items. (Newbury, NE) **17820** at 2213. (Jeffery, NY) 2240 (MacKenzie, CA)

POLAND — Radio Mariya, tentative, **15455** at 0600. Possibly the rosary in Polish? (Linonis, PA) (This is via Samara, Russia — Ed) 2115 in Polish on **7400** with clear ID at 2130. (Brossell, WI)

PORTUGAL — RDP Int'l, PP to Europe on **9755** and **9815** at 0813. (Becker, WA) **15540** at 1827 in PP. (Brossell, WI)

ROMANIA — Radio Romania Int'l, **15365** at 1700 with IS, ID, talk. (Burrow, WA)

RUSSIA — Voice of Russia, **7180** via Moldova, with news at 0210. (Weronka, NC) 0450. (Newbury, NE) **12025** via Novosibirsk at 1359 with chimes, IS, E-mail address, into Urdu. (Strawman, IA) **13665** at 0421, **15595**

at 0450 and **17595** at 0156. (Smith, WA) **15595** at 0430. (Newbury, NE) Radio Rossii, **7320** in RR at 0740. (Becker, A) **7335** from St. Petersburg in RR at 0240. Just under CHU, with folk music, marches and RR ID. (Linonis, PA) Radio Tikhy Okean, **7175** at 0731 with in RR. Sounded like a music request/dedication program. (Becker, WA)

RWANDA — Deutsche Welle relay, **9870** in GG at 0337. (Brossell, WI) **15145** at 1503 with world and African news. (no name/state)

SAO TOME — VOA relay, **5970** at 0536. (Newbury, NE) 11915 in unid. African dialect, Congo and Zambia mentioned repeatedly. (Brossell, WIK)

SAUDI ARABIA — BSKSA, **15205** in with Holy Koran at 1745. Also 1951 with talk. (Jeffery, NY) 1820 in AA. Also **17560** in AA at 1607. (Newbury, NE) **15275** in AA with music, Koran prayer at 0550. (Linonis, PA)

SEYCHELLES — BBC relay, **11730** with sports roundup at 0320. (Brossell, WI)

SINGAPORE — Radio Singapore, **6150** at 1515 with pops. (Newbury, NE) BBC relay, **15360** at 0026 with news. Just audible in the static. (Jeffery, NY)

SOLOMON ISLANDS — SIBC, **5020v** at 1210 with news items. (Linonis, PA) 1221 with BBC Newshour program and BBC ID at 1230. (D'Angelo, PA)

SOUTH AFRICA — African Beacon, via Meyerton, **3230** at 2135 with religious talk in EE. Close down by man and off 2200. (D'Angelo, PA) Radio Sonder Grense, **3320** at 2234 in Afrikaans and pop tunes. (D'Angelo, PA) 0310 with classical music. (Strawman, IA) Channel Africa, **15215** with African news. (Moser, IL) **17870** with news, ID. (Burrow, WA) **21725** at 1316 with "Africa Changes" program. (Montgomery, PA)

SOUTH KOREA — Radio Korea Int'l, **5975** in JJ at 1209. (Becker, WA) **9570** at 0808 with ID. 9650 via Canada with soccer news at 1140. (Newbury, NE)

SPAIN — Radio Exterior de Espana, **6055** in EE at 0512. (Burrow, WA) **15110** in SS at 2141. (Smith, WA) **15585** at 1502 with news in SS. (Foss, Philippines)

SRI LANKA — Deutsche Welle relay, **15205** in GG at 0249. (Jeffery, NY) VOA relay, **9645** at 1538. (Newbury, NE)

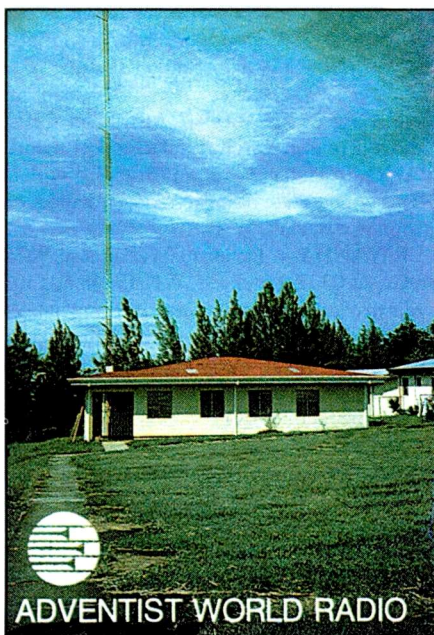
SWAZILAND — Trans World Radio, **3240** at 0315 with classical music. (Strawman, IA)

SWEDEN — Radio Sweden, **18960** at 1330 with "Sounds Nordic." (Weronka, NC) 1331 with domestic news. (Newbury, NE)

SWITZERLAND — Swiss Radio Int'l, **9885** in GG at 0114. (Newbury, NE)

SYRIA — Radio Damascus, **12085//13610** in FF at 2000. Into EE at 2008. (Burrow, WA)

TAIWAN — Radio Taipei Int'l, **9955** in CC at 1945. Jammed. (MacKenzie, CA) **11605** in JJ at 1130. (Barton, AZ) **15325** (listed 15320 — Ed) at 0346. (Smith, WA) WYFR, via Taiwan, **6300** with EE to CC Bible readings. (Becker, WA) Central Broadcasting System, **6215** in CC at 1155. (Becker, WA) **9640** in CC with continuous music. (Strawman, IA) **11915** in CC at 1320 with



Adventist World Radio's "Radio Lira" in Costa Rica now belongs to the University Network and carries Dr. Gene Scott's radio broadcasts.

woman DJ. (Northrup, MO) **15460** in CC at 2329. (Jeffery, NY)

THAILAND — Radio Thailand, **7145** at 1301 with gong IS and JJ anmt and into presumed news. (Strawman, IA) BBC relay, **9580** at 2204 with news in CC. (Strawman, IA) **13695** at 0030. (Burrow, WA) VOA relay, **7140** with news at 2300. (Brossell, WI)

TUNISIA — RTT Tunisienne, **7110** in AA at 0503 and **7275** in AA at 0544. (Newbury,

NE) **7275** in AA. Also obnoxious hams with racial slurs aimed at the programming and wondering where it was coming from. (Brossell, WI) (*Can't these guys with licenses ID a strong and regular occupant of this frequency?* — Ed) 12005 at 0320 with news items in AA. (Linonis, PA)

TURKEY — Turkish Meteorological Station, presumed, **6900** at 0515 with non-stop Turkish vocals. (D'Angelo, PA) Voice of Turkey, **9460** with man/woman anners at 0451. (Smith, WA)

UGANDA — Radio Uganda, **4975** at 0346 with talk about Uganda. At 0401 "It's one minute past 7 o'clock at Radio Uganda" (D'Angelo, PA) 0356 with reggae-style music and EE anmts before TOH. (Strawman, IA)

UNITED ARAB EMIRATES — UAE Radio, Dubai, **12005//13675** at 0330 with anthem, ID and news. (Burrow, WA) **13675** in AA at 1315. (Brossell, WI) **15395** with mid-East music at 1345. (Barton, AZ) **15400** at 0330 to 0349 close. (Barton, AZ)

UNITED STATES — AFN, Key West, **12689** at 1544. (Newbury, NE)

UKRAINE — Radio Ukraine Int'l, **7375** at 0101 with IS, sign-on, ID, woman with news. (Newbury, NE) 0404 with news. (Burrow, WA)

UZBEKISTAN — RadioTashkent, **5060** at 1215 with EE talk by man, woman. Also //5975 (poor) and **9715** under co-channel QRM. (D'Angelo, PA)

VATICAN — Vatican Radio, **11625** with EE news at 0637. (Newbury, NE) **15570** at 0510 with news in EE. (Moser, IL)

VIETNAM — Voice of Vietnam, **6175** (*via Canada* — Ed) at 0337 with domestic and

international news. (Burrow, WA) 0340 with EE talks. Into VV at 0400. (Linonis, PA) **9525** via Canada at 0118. (Newbury, NE)

VENEZUELA — Ecos del Torbes, **4980** in SS with ID, frequency and song at 0400. (Brossell, WI)

YEMEN — Republic of Yemen Radio, **9780** in AA at 0315 with Holy Koran. (Linonis, PA) 0345 with songs and talk in AA. (Brossell, WI)

ZANZIBAR — Radio Tanzania, **11734** at 1952 with children's choir, time pips at TOH but five seconds fast by my "atomic" clock. (Strawman, IA)

That does it! Let's give a rousing cheer to the following who were kind enough to share their listening results with us this time: Richard D'Angelo, Wyomissing, PA; Robert Montgomery, Levittown, PA (both on a DXpedition to French Creek State Park); Bruce R. Burrow, Snoqualmie, WA; Brian Alexander, Mechanicsburg, PA; Jerry Strawman, Des Moines, IA; Jack Linonis, Hermitage, PA; Robert Brossell, Pewaukee, WI; Stewart MacKenzie, Huntington Beach, CA; David Weronka, Benson, NC; Pete Becker, Clarkston, WA; Marie Lamb, Brewerton, NY; Ed Newbury, Kimball, NE; Dave Jeffery, Niagara Falls, NY; Rick Barton, Phoenix, AZ; Marty Foss, Guinayangan, Philippines; Howard Moser, Lincolnshire, IL; Adam Smith, Federal Way, WA and Mark Northrup, Gladstone, MO. Thanks to each one of you. Until next time, good listening! ■

Of Mental Lapses and Senior Moments

We encountered one or the other (maybe both) of these trip wires during the preparation of the Papua New Guinea article featured in the January issue. The first two stations on the list were wrong. Below is a corrected station list. We apologize for any inconvenience the incorrect info may have caused.

| Frequency | Station | Location | Radio Country |
|-----------|--------------------------|---------------------|-------------------|
| 2410 | Radio Enga | Wabag | New Guinea |
| 3205 | Radio Sanduan | Vanimo | New Guinea |
| 3220 | Radio Bougainville | Buka | North Solomons |
| 3235 | Radio Central | Port Moresby/Boroko | Papua |
| 3245 | Radio Eastern Highlands | Goroka | New Guinea |
| 3260 | Radio East New Britain | Rabaul | New Britain |
| 3275 | Radio East Sepik | Wewak | New Guinea |
| 3290 | Radio Enga | Wabag | New Guinea |
| 3305 | Radio Gulf | Kerema | New Guinea |
| 3315 | Radio Madang | Madang | New Guinea |
| 3325 | Radio Manus | Lorengau | Admiralty Islands |
| 3335 | Radio Milne Bay | Alotau | New Guinea |
| 3345 | Radio Morobe | Lae | Papua |
| 3355 | Radio New Ireland | Kavieng | New Ireland |
| 3365 | Radio Northern | Popondetta | New Guinea |
| 3375 | Radio Sanduan | Vanimo | New Guinea |
| 3385 | Radio Simbu | Kundiawa | New Guinea |
| 3395 | Radio Southern Highlands | Mendi | Papua |
| 3905 | Radio Western | Daru | New Guinea |
| 4890 | Radio Western Highlands | Mt. Hagen | New Guinea |
| 9675 | Radio West New Britain | Kimbe | New Britain |

Getting Back To Normal?

Just when you think the U.S. aviation system is getting back to some semblance of normalcy we have another attempted bombing of an international flight and a 15-year-old boy crashing the Cessna 172 he was flight training in into a bank high-rise in Tampa, Florida. If there's anything to say about flying, it's that aircraft monitoring is anything but uninteresting.

In addition just after last month's issue went to press the NOTAM concerning enhanced class B airspace (ECB airspace) was rescinded throughout the U.S. Basically the airspace throughout the U.S. has returned to normal except in the vicinity of Washington D.C. and near New York City. Only in recent weeks have pilots been allowed to fly with little restriction. One of the recurring questions I hear is, "Are the restrictions around power plants, dams, and sporting events still in effect?" The answer to this question is, "No. The NOTAM has been cancelled." However, AWACS aircraft from the U.S. Air Force and NATO are monitoring the airspace at all times. Thus, I tell pilots not to "fly suspiciously." In other words, though there are no NOTAM prohibiting pilots from flying next to nuclear power plants, it is wise for pilots not to fly next to them while maneuvering in such a manner as to call attention to themselves. The AWACS controllers know just where the aviation school practice areas are located. As a result, if an AWACS controller notices a pilot practicing loops, lazy-8s and stalls you can be assured the controller will certainly be calling up an Air Force or Navy fighter to investigate.

These controllers are also monitoring, with great enthusiasm I might add, the Air Defense Identification Zone or ADIZ. I have heard reports that should a pilot knowingly or unknowingly bust the ADIZ it is not uncommon for said pilot to receive a hefty bill from the DoD for "services rendered." Even recent NOTAMs have portrayed our fighter pilots as being "highly motivated." You can, of course, draw your own conclusions here.

I have also noticed an increase, as many of you have, in military banter, especially on UHF emergency — **243.0 MHz**. I highly recommend monitoring this, and other military frequencies, if you have a receiver capable of monitoring Military UHF freqs. E-mail me with what you have. You can write me at flacap388@hotmail.com or mr-atc@att.net.

A Trivia Question

Before I get into the new NOTAMs and frequency changes I have an aviation trivia question. (Be advised that though this is the April edition, it is *NOT* an April-fools joke.) What do the following military aircraft have in common? P-11, P-14, P18, P-19, P-27, P-28, P-32, P-33, P-34, P-44, P-48, P-52, P-53, P-57, P-65, P-68, P-69, P-71, F-103, and F-108. And what do these four have in common? P-73, P-74, F109, and F-13. Answer at the end of the column.

NEW/CHANGED/DELETED FREQUENCIES

NEW

FL

Fernandina Beach Municipal (55J)
 AWOS-3 118.075
 Fort Drum (QYT)
 PIE AFSS RCO 122.2
 Vero Beach (VRB)
 RCAG 389.9

IL

DeKalb — Taylor Municipal (DKB)
 CD 121.72

MI

Lansing — Capital City (LAN)
 GCO 121.75

MT

Bozeman — Gallatin Field (BZN)
 ATIS 135.425

MN

South St. Paul Municipal — Richard E. Fleming Field (SGS)
 CD 118.2

PA

Coatesville — Chester County (40N)
 CD 125.6
 Collegeville — Perkiomen Valley (N10)
 CD 118.55
 Doyles Town (DYL)
 CD 118.55
 Perkasio — Pennridge (N70)
 CD 118.55
 Philadelphia — Penn's Landing (P72)
 CD 118.85
 Quakertown (UKT)
 CD 118.55
 West Chester — Brandywine (N99)
 CD 125.6

TX

Fort Worth — Meacham International (FTW)
 SNK RCAG 132.6/257.2/269.05
 SNK RCO 122.45

WI

Green Bay — Austin Straubel International (GRB)
 83D RCO 122.35

CHANGED

AL

Birmingham International (BHM)
RCAG was 307.225, now 350.325

AZ

Show Low Municipal (SOW)
CTAF was 122.0, now 123.0

CA

Monterey International (MRY)
Apch was 302.0, now 251.15
was 309.2, now 288.25

GA

Atlanta — William B. Hartsfield International (ATL)
RTR was 254.25, now 268.7

HI

Honolulu International (HNL)
ATIS was 279.4, now 251.15
Apch was 265.0, now 239.05
LC was 267.9, now 233.7
Kahului (OGG)
Apch was 343.8, now 255.4

IA

Cedar Rapid — Eastern Iowa (CID)
RCAG was 247.2, now 266.8

KS

Wichita — Mid-Continent (ICT)
Apch was 281.5/290.3, now 269.1
Apch was 120.6/124.75, now 134.8

MN

Aitkin Municipal (AIT)
CTAF/UNICOM was 122.9, now 123.05
Redwood Falls Municipal (RWF)
RCAG was 269.025, now 263.05
Warrod International — Swede Carlson Field (RRT)
AWOS was 118.325, now 119.925

MO

Cassville Municipal (94K)
CTAF was 122.9, now 123.0
Farmington Regional (FAM)
RCAG was 128.4, now 127.475
St. Louis Lambert Field (STL)
Apch was 353.9, now 270.35
Apch was 388.0, now 353.9
Apch was 324.1, now 338.25
Apch was 272.75, now 371.875
Apch was 126.7, now 126.5

MI

Sault Ste. Marie Municipal (ANJ)
GCO was 121.725, now 133.075

NM

Los Lunas — Mid Valley Airpark (E98)
CTAF was 122.8, now 122.9

NY

East Hampton (HTO)
CD was 132.25, now 118.95
Apch was 118.95, now 132.25
Farmingdale — Republic (FRG)
RTR was 229.5, now 279.65
White Plains — Westchester County (HPN)
RTR was 381.2, now 284.65

TX

Lubbock International (LBB)
RCAG was 127.7, now 132.6
was 326.3, now 269.05

VA

Richmond International (RIC)
RTR was 319.8, now 282.375
Apch was 398.2, now 269.525
ATIS was 266.6, now 263.025

DELETED/DECOMMISSIONED

IL

Belleville — Scott AFB/Mid-America (BLV)
RTR 124.075/120.65/316.1/373.0/290.35

NOTAMS

A0099/01 — ZZZ U.S. NATIONAL AIRSPACE SYSTEM INTERCEPT PROCEDURES. UNTIL FURTHER NOTICE ALL AIRCRAFT OPERATING IN THE U.S. NATIONAL AIRSPACE, IF CAPABLE, WILL MAINTAIN A LISTENING WATCH ON VHF GUARD 121.5 OR UHF 243.0. IT IS INCUMBENT ON ALL AVIATORS TO KNOW AND UNDERSTAND THEIR RESPONSIBILITIES IF INTERCEPTED. REVIEW "AERONAUTICAL INFORMATION MANUAL" SECTION 6, 5-6-2 FOR INTERCEPT PROCEDURES.

A0119/01 — SPECIAL NOTICE RESTRICTED/PROHIBITED AREA ENFORCEMENT EFFECTIVE IMMEDIATELY, COMMERCIAL AND PRIVATE AIRCRAFT FLYING INSIDE, OR IN CLOSE PROXIMITY TO, NEWLY ESTABLISHED OR CURRENTLY EXISTING RESTRICTED OR PROHIBITED AREAS OF THE UNITED STATES WILL BE SUBJECT TO BEING FORCED DOWN BY ARMED MILITARY AIRCRAFT, IF NECESSARY. THE MILITARY HAS INDICATED THAT DEADLY FORCE WILL BE USED TO PROTECT THESE AREAS FROM UNAUTHORIZED INCURSIONS. THESE MEASURES ARE NECESSARY IN RESPONSE TO THE TERRORIST ATROCITIES OF SEPT. 11, 2001, WHICH CAUSED THOUSANDS OF INNOCENT CIVILIAN CASUALTIES. THE MILITARY WILL USE DEADLY FORCE ONLY AS A LAST RESORT, AFTER ALL OTHER MEANS ARE EXHAUSTED. THIS NEW POLICY IS IN EFFECT UNTIL FURTHER NOTICE. OFFICIAL CHARTS OUTLINING THE NEW RESTRICTED OR PROHIBITED AREAS WILL BE MADE AVAILABLE AS SOON AS POSSIBLE. THESE AREAS WILL BE PERIODICALLY REVISED AND WILL THEREFORE REQUIRE THAT EACH PILOT RECEIVE AN UP TO DATE

BRIEFING ON THE STATUS OF THESE AREAS PRIOR TO EVERY FLIGHT. IN ADDITION, ALL AIRCRAFT OPERATING IN THE U.S. NATIONAL AIRSPACE AND IN CLOSE PROXIMITY TO THE SUBJECT AREAS, IF CAPABLE, WILL MAINTAIN A LISTENING WATCH ON VHF GUARD 121.5 OR UHF 243.0. IT IS INCUMBENT ON ALL AVIATORS TO KNOW AND UNDERSTAND THEIR RESPONSIBILITIES IF INTERCEPTED. REVIEW AERONAUTICAL INFORMATION MANUAL SECTION 6, 5-6-2 FOR INTERCEPT PROCEDURES.

A0157/01 — SPECIAL NOTICE FLIGHT RESTRICTIONS EFFECTIVE IMMEDIATELY UNTIL FURTHER NOTICE, PURSUANT TO 14 CFR 99.7, SPECIAL SECURITY INSTRUCTIONS, OPERATIONS WITHIN THE TERRITORIAL AIRSPACE OF THE U.S. THIS IS A RESTATEMENT OF A PREVIOUS ADVISORY. PILOTS ARE ADVISED TO AVOID THE AIRSPACE ABOVE, OR IN PROXIMITY TO, SITES SUCH AS NUCLEAR POWER PLANTS, POWER PLANTS, DAMS, REFINERIES, INDUSTRIAL COMPLEXES, MILITARY FACILITIES AND OTHER SIMILAR FACILITIES. PILOT SHOULD NOT CIRCLE AS TO LOITER IN THE VICINITY OF SUCH FACILITIES.

A0158/01 — SPECIAL NOTICE FLIGHT RESTRICTIONS EFFECTIVE IMMEDIATELY UNTIL FURTHER NOTICE. PURSUANT TO 14 CFR SECTION 99.7, SPECIAL SECURITY INSTRUCTIONS. THIS IS A RESTATEMENT OF A PREVIOUS RESTRICTION. ALL AIRCRAFT OPERATIONS ARE PROHIBITED WITHIN A THREE NAUTICAL MILE RADIUS/ 3000 FEET AGL AND BELOW OVER ANY MAJOR PROFESSIONAL OR COLLEGIATE SPORTING EVENT OR ANY OTHER MAJOR OPEN AIR ASSEMBLY OF PEOPLE UNLESS AUTHORIZED BY ATC.

A0159/01 — SPECIAL NOTICE EFFECTIVE IMMEDIATELY UNTIL FURTHER NOTICE. 1. FLIGHT RESTRICTIONS WASHINGTON, DC. PURSUANT TO 14 CFR SECTION 99.7, SPECIAL SECURITY INSTRUCTIONS. UNLESS SPECIFICALLY AUTHORIZED BY THE UNITED STATES SECRET SERVICE, ALL 14 CFR PART 91 FLIGHT OPERATIONS ARE PROHIBITED WITHIN 15 STATUTE MILES OF THE WASHINGTON MONUMENT, EXCLUDING A 1 NAUTICAL MILE RADIUS OF FREEWAY AIRPORT (W00), MITCHELLVILLE, MD., FROM THE SURFACE UP TO BUT NOT INCLUDING FL180 OR, WITHIN AN AREA FROM THE SURFACE UP TO BUT NOT INCLUDING FL180, BOUNDED BY A LINE BEGINNING AT THE WASHINGTON (DCA) VOR/DME 300 DEGREE RADIAL AT 15 NM (385655N/0772008W) THENCE CLOCKWISE ALONG THE DCA 15 NM ARC TO THE DCA 022 DEGREE RADIAL AT 15 NM (390611N/0765751W) THENCE SOUTHEAST VIA A LINE DRAWN TO THE DCA 049 DEGREE RADIAL AT 14 NM (390218N/0765038W) THENCE SOUTH VIA A LINE DRAWN TO THE DCA 064 DEGREE RADIAL AT 13 NM (385901N/0764832W) THENCE CLOCKWISE ALONG THE DCA 13 NM ARC TO THE DCA 282 DEGREE RADIAL AT 13 NM (385214N/0771848W) THENCE NORTH VIA A LINE DRAWN TO THE POINT OF BEGINNING; EXCLUDING THE AIRSPACE WITHIN A 1 NM RADIUS OF FREEWAY AIRPORT (W00), MITCHELLVILLE, MD. ALTON SCOTT, 202-267-7682, IS THE FAA POINT OF CONTACT. 2. FLIGHT RESTRICTIONS BOSTON, MA. PURSUANT TO 14 CFR SECTION 91.137A(1) TEMPORARY FLIGHT RESTRICTIONS. AIRCRAFT OPERATIONS ARE NOT AUTHORIZED WITHIN A THREE NAUTICAL MILE RADIUS OF 422321N/0710357W AND THE BOSTON (BOS) VOR/DME 317 DEGREE RADIAL AT FOUR NAUTICAL MILES, AT AND

BELOW 3000 FEET MSL UNLESS AUTHORIZED BY ATC. BOSTON APPROACH CONTROL, 617-567-6675, IS THE FAA COORDINATION FACILITY. 3. FLIGHT RESTRICTIONS NEW YORK, NY. PURSUANT TO 14 CFR SECTION 91.137A(1) TEMPORARY FLIGHT RESTRICTIONS IN THE VICINITY OF DISASTER/HAZARD AREAS. AIRCRAFT FLIGHT OPERATIONS ARE PROHIBITED WITHIN A TWO NM RADIUS OF 404244.16N/740047.30W AND THE LAGUARDIA (LGA) VOR/DME 250 DEGREE RADIAL AT EIGHT NAUTICAL MILES AT AND BELOW 8000 FT AGL, UNLESS AUTHORIZED BY ATC. JOHN McCARTNEY, PHONE IS IN CHARGE OF THE OPERATION. NEW YORK AFSS /ISP/ PHONE 631-471-7395 IS THE FAA COORDINATION FACILITY. 4. THIS PART RESTATES PREVIOUS ADVISORY. COMMERCIAL AND PRIVATE AIRCRAFT FLYING IN PROXIMITY TO THESE NEWLY ESTABLISHED OR CURRENTLY EXISTING RESTRICTED OR PROHIBITED AREAS WILL BE SUBJECT TO BEING FORCED DOWN BY ARMED MILITARY AIRCRAFT. THE MILITARY HAS INDICATED THAT DEADLY FORCE WILL BE USED TO PROTECT THESE AREAS FROM UNAUTHORIZED INCURSIONS. HOWEVER, THE U.S. MILITARY WILL USE DEADLY FORCE ONLY AS A LAST RESORT, AFTER ALL OTHER MEANS ARE EXHAUSTED. PILOTS ARE REMINDED THAT IT IS THEIR REQUIREMENT TO RECEIVE AN UP TO DATE BRIEFING ON THE STATUS OF THESE AREAS PRIOR TO EVERY FLIGHT. IN ADDITION, ALL AIRCRAFT OPERATING IN THE U.S. NATIONAL AIRSPACE AND IN PROXIMITY TO THE SUBJECT AREAS, IF CAPABLE, SHOULD MAINTAIN A LISTENING WATCH ON VHF GUARD 121.5 OR UHF 243.0. IT IS INCUMBENT ON ALL AVIATORS TO KNOW AND UNDERSTAND THEIR RESPONSIBILITIES IF INTERCEPTED. ALL PILOTS SHOULD REVIEW AND FAMILIARIZE THEMSELVES WITH THE INTERCEPT PROCEDURES CONTAINED IN THE AERONAUTICAL INFORMATION MANUAL SECTION 6, 5-6-2.

1/3352 — SPECIAL NOTICE FLIGHT RESTRICTIONS EFFECTIVE IMMEDIATELY UNTIL FURTHER NOTICE, PURSUANT TO 14 CFR 99.7, SPECIAL SECURITY INSTRUCTIONS, OPERATIONS WITHIN THE TERRITORIAL AIRSPACE OF THE U.S. THIS IS A RESTATEMENT OF A PREVIOUS ADVISORY. PILOTS ARE ADVISED TO AVOID THE AIRSPACE ABOVE, OR IN PROXIMITY TO, SITES SUCH AS NUCLEAR POWER PLANTS, POWER PLANTS, DAMS, REFINERIES, INDUSTRIAL COMPLEXES, MILITARY FACILITIES AND OTHER SIMILAR FACILITIES. PILOT SHOULD NOT CIRCLE AS TO LOITER IN THE VICINITY OF SUCH FACILITIES.

To see updated NOTAMS set your web browser to: <https://www.notams.faa.gov/>.

Trivia Answer

Answer to this months aviation trivia questions. These 20 aircraft: P-11, P-14, P18, P-19, P-27, P-28, P-32, P-33, P-34, P-44, P-48, P-52, P-53, P-57, P-65, P-68, P-69, P-71, F-103, and F-108, were planned and even assigned these numbers by the USAF but never built. These four aircraft: P-73, P-74, F109, and F-13, were never assigned to any aircraft, planned or otherwise.

I know it's been a long seven months since the tragedy of 9-11, but please continue to pray and give blood. Those are my soap boxes. ■

Airborne Security Surveillance At The Cape

In the September 2001 issue of "Space Monitor" we looked into airborne weather surveillance operations that support all launches from Cape Canaveral Air Force Station, Fla. For this issue, we will look into airborne security surveillance.

Currently, airborne security around the Extended Restricted Area (ERA) at, and around, Cape Canaveral Spaceport, Fla., is performed by a twin engine Cessna 337 aircraft at a contract cost of \$487,100.00. The aircraft provides day, night, and adverse weather airborne security surveillance around designated launch sites, facilities, and surrounding areas along the Florida coast.

The aircraft is required to provide at least 18-hours of continuous surveillance coverage prior to, during and after launch operations. The sensor-equipped aircraft has the capability to detect and assess all intruders or threats in the area.



Here's a Cessna 337, the type of aircraft used for Cape Canaveral airborne security. (NASA Image)



A NASA B-52B take-off from Edwards Air Force Base, Calif. (NASA Image)

The crew consists of an operator(s), security force observer, and flight crew. Equipment consists of a stabilized infrared and color TV camera with magnification capabilities. The system has the ability to distinguish between a human being and an animal at a minimum slant range of 5,000 feet. Surveillance video is downlinked in real-time to the Range Operations Control Center.

According to documents obtained from the 45th Space Wing, radio equipment on board the aircraft covers the 125 to 164 MHz range and provides up to five FM frequencies in the range of 30 to 40 MHz. These radios provide communications between the aircraft, Range Operations Control Center, Security Forces Launch Operations Console, and ground security forces.

The sensor equipment on board the aircraft provides GPS coordinates, date, time, and aircraft heading information in addition to real-time video images.

NASA's New B-52 Receives Overhaul

NASA's new B-52 aircraft made a pit stop at Tinker Air Force Base, Okla., in December to undergo maintenance. The aircraft is on loan to NASA to be used for space research. The new B-52H will replace NASA's current B-52B aircraft. Maintenance crews started to de-militarize the aircraft by pulling off a lot of classified boxes and other stuff that NASA doesn't necessarily need.

NASA officials at Edwards Air Force Base, California, have been seeking a replacement for their B-52B for some time and say the B-52H should provide an excellent launch platform in the future.

Most air and space vehicles cannot reach space independently and need a little "lift" to help them reach altitude. The vehicles



A NASA B-52B carries NASA X-38 experimental test vehicle to drop altitude. (NASA Image)

we're talking about are experimental vehicles primarily. These don't have a power source of their own, so they will use the B-52H to carry them to launch altitude.

The Office of the Secretary of Defense, NASA, and the Air Force are partially funding a flight research instrumentation package to be installed on the aircraft, as well as other modifications. The aircraft will be delivered to NASA following maintenance, new pylon construction, flight research instrumentation installation, and aircraft envelope clearance flights.

Right now, the B-52B is capable of carrying a heavier payload under the wing, so modifications will be needed to bring the H model up to that standard.

NOAA Satellite Updates

The following has been monitored recently by Lawrence Harris in Southampton, U.K.:

NOAA-12, normal apt on **137.50 MHz**; continuous transmissions including usual channel change during 'night.'

NOAA-14 apt on **137.62 MHz** but scanner in fault state so no meaningful images.

NOAA-15 normal apt on **137.50 MHz**; continuous transmissions.

NOAA-16 no apt, but normal hrpt. No Meteor wxsats heard. Expect Meteor 3-5 to be re-activated soon due to improved illumination of its solar panels.

What would you like "Space Monitor" to do for you? What articles and information would be of particular interest to you? Let us know. We look forward to hearing from you.

Monitoring Reports

All times in UTC. All voice transmissions in English unless otherwise noted.

10780: Cape Radio, 1517, USB mode, working RAZOR 05 (JSTARS E-8C, Robins 93ACW) phone patch to RAYMOND 19 (Al Stern — Satellite Beach, Fla.)

11217: "Trackstar" and "Cape Radio" heard. Switched to 10780 and the 5711, USB mode (Gary Russell — East Central Illinois).

119.550: NASA 917 (T-38N based at Ellington Field, Tex.) cleared to land at Moffett Federal Field, Calif., AM mode, 2044 (Dave — Los Angeles, Calif.).

120.700: NASA 7 (King Air based at Edwards Air Force Base, Calif.) heard, AM mode, 2123 (Dave — Calif.)

121.600: NASA 908 (T-38N, based at Ellington Field, TX), cleared to Cheyenne, WY, AM mode (Sandy — Denver, Colo.).

124.100: NASA 962 (T-38N, #70-1556, Ellington) heard landing at Shuttle Landing Facility at 1705, AM mode. Also heard on 133.800, and 128.550 (Stern — Fla.)

128.550: NASA 924 (T-38N, #67-14825, Ellington) heard departing Shuttle Landing Facility at 1612. Also heard on 132.650, AM mode (Stern — Fla.).

133.500: NASA 7 (King Air, based at Moffett Federal Field, Calif.) heard making approach to March Field, AM mode (D. Stijovich — March Field, Calif.).

133.750: NASA 913 (T-38N #65-10355, Ellington) heard departing Patrick Air Force Base, Fla., at 1455. Also heard on 132.650, 124.800, 134.000, and 126.350, AM mode SEARCH 3 (UH-1 based at NASA Shuttle Landing Facility, Fla.) heard performing touch-n-goes at 1530 (Stern — Fla.).

134.00: NASA 903 (T-38N, Ellington) heard departing March Field (Stijovich — Calif.).

262.275: Very heavy secure traffic on FLTSATCOM, FM mode (Russell — IL).

263.000: NASA 843 (F/A-18 based at Edwards Air Force Base, Calif.) heard flying to Bakersfield High — level at 390, 2158, AM mode (Dave — Calif.)

269.650: Heard Spanish and possibly Italian language transmissions with burst of secure traffic from FLTSATCOM Delta satellite at 105 degrees West longitude, FM mode (Russell — IL).

284.700: NASA 850 (F-18 based at Edwards Air Base, Calif.) heard, AM mode (Stijovich — Calif.).

291.675: NASA 908 (T-38N, Ellington) landed at Buckley, Colo., AM mode (Sandy — Colo.)

304.000: NASA 851 (F/A-18 based at Edwards Air Force Base, Calif.) heard, AM mode, 2114 (Dave — Calif.)

318.100: NASA 806 (ER-2 based at Edwards Air Force Base, Calif.) heard leaving Edwards, AM mode, 2058 (Dave — Calif.)

327.050: NASA 959 (T-38N, Ellington) heard descending to 11,000 feet, AM mode. Also heard on 322.400, and 288.150 (Dave — Lake Logan Martin, Ala.).

343.700: NASA 819 (T-34C based at Edwards Air Force Base, Calif.) heard leaving Edwards, 1910 (Dave — Calif.)

372.200: SPACE 1 (C-21A, based at Peterson Air Force Base, Colo.) takeoff from Colorado Springs airport, AM mode (Sandy — Colo.)

Keith Stein is the editor of *Space & Missile Defense Report* (<http://www.kingpublishing.com>). You can contact him via E-mail at kstein@erols.com. ■

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Answers To Your Letters —And Jupiter Calling!

This month's column is going to be short. I'm in the middle of researching a number of topics for the upcoming months, and rather than giving you a "weak" column, I'd frankly rather give you logs and letters rather than compromising on the quality of the article section. So, it's directly on to the letters, then off to the logs!

Readers Letters

I received a number of E-mails and letters about my column on ethical monitoring during the current war on terrorism. Due to the intensely felt events of September 11th, people spoke from the heart.

With the exception of a very small number of dissenters, the people who wrote in expressed their support and understanding for my policy. I felt that due to the personal nature of the messages, where they talked about fears and concerns for loved ones on duty and for the security and safety of their homes and family, that it would not be appropriate to publish them.

We have all been through a lot during the fall of 2001, and now is the time to complete the healing and move forward. Things will, over time, return to normal. However, I will let one reader have the last word on the topic, and that is;

Mr. Cooper,

National security is the responsibility of all Americans. Monitoring does not break national security, talking does. Knowing what is going on in the world could give you the edge to survive.

William Hansen, W8YQJ
Rockford MI

Well said, Mr. Hansen and thank you for sharing that with us. Definitely words to remember and practice.

The February column on the history of radio monitoring laws and regulations was well received, as the following letter from Brooks indicates.

Dear Joe,

Enjoyed your piece in *Pop'Comm* on Telefunken, etc. I am interested in HF utility monitoring; mainly CW. I downloaded a list of utilities in the past but unfortunately deleted that and have been unable to find it again. If you know the URL of such a list, I would appreciate the information. I am interested primarily in shore stations worldwide.

Sincerely,
Brooks Klostermyer, KE4UMW
Asheboro, NC

However, it seems that I needed to do some double-checking on some of my facts before the column went to press.

Joe,

There appears to be an error in your comments about the sinking of the *Lusitania* at the end of your January *Pop'Comm* col-

umn. The German submarine was the U-20, not the U-39. Also a minor point: the time it took for the ship to sink was 18 minutes, not 15. The reference to "an armature radio monitoring station" intercepting German messages is somewhat curious for the use of the word "armature" when "amateur" was apparently intended. I wonder if some uninformed person supplied you with the article, and that you may not have edited it as critically as you might have. Before the ship's sailing the German embassy published a warning in U.S. newspapers that travelers sailing in the war zone on British ships do so at their own risk.

An excellent reference is *The Lusitania*, a book by Colin Simpson published by Little, Brown, and Company in 1972. Among other things it alleges that the ship was carrying munitions and military personnel and was armed, despite official statements to the contrary. In addition, Winston Churchill had issued orders that British merchant vessels sighting submarines should attempt to sink them by ramming. According to the Cruiser Rules understood by belligerents at the time, this policy justified sinking the *Lusitania* without warning.

Perry Crabill, W3HQX

Well Perry, I thought that I had caught "armature" before I had sent it off to the press. Let's just say that it's the readers of this column who keep me honest. However, I do hone that the main point of the writing, that our radio monitoring practice has had a major impact upon historic events, did come through in the writing of the column. That's why I refer to my writing as a practice, because even after doing it for years I'm still trying to get it right. Still, I take your point and I will try harder to be more careful in the future.

On the other hand, I'm glad to have given the Friends of Long Island Wireless History (FoLIWH) further exposure through my writing. In this next letter, the president of the group gives an update on their very worthwhile activities.

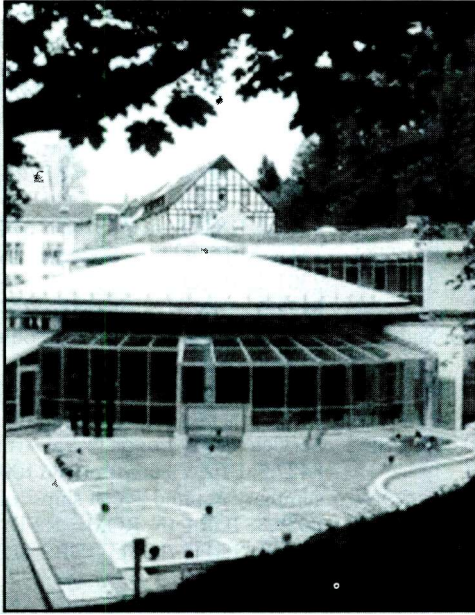
Hi Joe,

Many thanks for the credits in your February article. We are continually coming up with additional information on the L.I. sites. I was amazed at how many government stations, such as Fire Island and even the small station in West Sayville at Section V, the U.S. Navy Base were to keep silence and listen in to what was being sent out of the Telefunken Station in the evenings.

We have just completed spending a \$1000.00 grant given to us by Suffolk County and we have enlarged our traveling exhibits which will be at the Emma S. Clark (Setauket) library all of this month. We are also scheduled to be in the Bayport/Bluepoint Library and Bellport Library in subsequent months. Again many thanks, we can use all the help we can get.

Connie Currie,
President, Friends of Long Island Wireless History

Thank you, Connie for those kind words. Don't forget that you can view their very informative website at: <http://www.geocities.com/g3zfj>.



This is a picture of one of the hot spring spas in the German town of Thermalbad Wiesenbad, where the DXpedition is to be held. The area is located in the mountains near the Czech border. What a delightful way to monitor Ute stations.

Mr. André Muller sent the following E-mail to me from Germany. It describes a rather interesting "DXpedition" that is being held in the eastern part of the country near the border of former Czechoslovakia. Unfortunately by the time you read it the event will be over (it was held at the end of February 2002). However, it's interesting to imagine the fun that the participants had when you read the itinerary. "Bad" in the name of the town where this event was held means "Bath" in German. Thermalbad means "hotsprings," and the area is a big health resort and spa. Mr. Muller writes:

The DXpedition is to be held in the small town Thermalbad Wiesenbad. It is located 40 miles from Dresden-Klotzsche Airport (direct connections from Frankfurt). The town is the location of a famous thermal spa. While many of the "the older generation" go to the town for the health spa, there are lots of things for the younger crowd to do as well. The main attraction is the great outdoor-pool with a lots of smaller pools connected directly to the hot bubbling water of the spring.

Four miles before the large town of Annaberg-Buchholz you will find the town of Thermalbad Wiesenbad. The event will take place in "the heart" of Wiesenbad at the "Hotel Wettin."

In Thermalbad Wiesenbad and the towns around you could find a lot of good bed-and-breakfast homes, boarding houses and hotels. You could experience a lot of great things here in the surrounding area called Erzgebirge (or ore-bearing mountains in German). There are many things to see, such as old silver mines, the wonderful landscape with small villages, dark and green forests, mountains and deep valleys. If people want to we can rent a small van for local sight seeing tours. Some of the sites that we could visit are a new herbal farm, a very old liqueur distillery, one or two great breweries, and Mt. Fichtelberg (1214m.).

If there is enough interest, we can arrange a visit to the studios and transmitter of Radio Praha (Prague) International as a side trip.

For the actual DXing we will rent a room at a Beer-Garden called "Sonneneck" or "the Sunny Corner." It has good food and is open around the clock. From the beer-garden you have a wonderful view to the next mountain-ridge and Hohenwendel Castle (it is for sale by the way). While there will be lots of good beer, we cannot guarantee good weather, so you may have to content yourself with listening to the radios.

Participants who want to eat something fancier can get their lunch and supper in the hotels "Wettin" and "Rosenaue." One mile from the "Sonneneck" is also a small trailer park for participants with mobile homes. It is called "Himmelmühle" (in English: "Heavens Mill") and it is located beside the idyllic Zschopau river in a deep valley. And after listening to the radios there is always the thermal spa, which is open daily from 2 p.m. to 10 p.m..

The cost of this event is U.S. \$30, not including your own accommodation and food (you take care of that yourself). We will provide all the short wave receivers and HAM transceivers for the participants. We will also provide a welcome snack for everybody and reserve some tables for a group lunch at the "Suncorner."

We invite drop-in visitors from Germany, the near Czech Republic, Slovakia, Hungary, Polonia and maybe Slovenia, Romania, Bulgaria and the Baltic states. Use of the radios by drop-in visitors is not guaranteed, but you are welcome to listen and have a beer with us."

Thank you, André for sharing that with us. One of the reasons that I wanted you to read that was to inspire some of you out there to put together your own DXpeditions in order to share your monitoring interests with some friends, and maybe some new radio enthusiasts. If you put one together, send me notice of it at least three months ahead of time. I'll be glad to let people know, and publish pictures and reports when you are done.

Speaking of Europe, here is an E-mail (with some questions) from Russia! *Pop'Comm* is read internationally! It is a small world after all.

Dear Joe,

I look forward to participating in your column. *Popular Communications* was always interesting for me to read when I had chance to get a hold of a copy. I'm not always able to monitor due to my job having a lot of traveling, but when I do I listen to Russian military.

One thing that I am interested in are CIS MIL nets making radio check in AM and USB modes. They are hard to be identified. Some of them relay broadcasting stns (Belorussian and Ukrainian nets). One of them is listed below. If you know anyone collecting this particular info, I would be of great interest.

5040: Myster 45-Myster 48, CIS MIL, r/check in RR, stand by freq. for this net. (Myster c/s). (SK) or (SMK)

4750: 1328-1330 UNID CIS MIL stn tuning with counting from 1 to 0 in Russian (SMK)

5040: 0037-0038 Myster 45-Myster 48, CIS MIL, r/check in RR, stand by freq. fr this net (c/s Myster) (SMK)

73! Sergey

Can anyone help Sergey? Please send along an answer so I can forward it to him.

Reader's Logs

The logs continue to come in thanks to the readers of this column. Lots of good military and commercial logs this month,

plus a special log that is "out of this world." Can you find it?

Note: All frequencies are in Kilohertz.

0000: STATION, Anytown, USA, summary of traffic heard in MODE at 0000 Z, personal comments here (JC)

194: TUK, NANTUCKET, BOSTON. (LH)

248: UL, MONTREAL, CANADA. (LH)

257: YXR, EARLTON, CANADA. (LH)

264: YGK, KINGSTON AIRPORT, CANADA. (LH)

335: YLD, CHAPLEAU, ONTARIO, CANADA. (LH)

335: YQA, MUSKOKA, CANADA. (LH)

335: SW, NEWBURG, NEW YORK, NEELY NDB. (LH)

340: YY, MONT-JOLI, CANADA (LH)

351: YKQ, QUEBEC, CANADA (LH)

356: PB, RUBIN NDB, WEST PALM BEACH FLORIDA. (LH)

392: ML, CHARLE VOIX, CANADA. (LH)

394: YB, NORTH BAY, CANADA. (LH)

405: YSD, UNID, CANADA. (LH)

414: BC, BAIE-COMEAU, CANADA. (LH)

516: YWA, PETAWAWA, CANADA. (LH)

2463: IDR IN ROME RTTY//75/N/850 CARB "IGJ41 /IGJ42 /IGJ43 /IDR2 /IDR3 /IDR8." Two passes then off air. (DW)

3401.7: RITA49 UNID AX25 Supervisory pkts to RITA51 (DW)

3401.7: RITA51 UNID AX25// "RITA30 de RITA51 QSL ZBKL AR." (DW)

3401.7: RITA74 UNID AX25 Supervisory pkts to RITA51. (DW)

3401.7: RITA30 UNID AX25 [Rita51] de RITA30 ARARAR." (DW)

4003: Caroline (Brit YL) in Caribbean WKG Marine Net. 1210z USB. Boat counts in harbors, WX conditions in Hopetown Abacos, Royal Island, etc. (ALS)

4003: AFR4GX, N Alabama WKG AAT4GQ. 1212z USB. AAR4CZ also in Net. (ALS)

4214: IDR2 IN ROME RTTY//75/N/850 CARB "IGJ41 /IGJ42 /IGJ43 /IDR2 /IDR3 /IDR8". Two passes then off air for short period

4218.5: LZW VARNA RADIO SITOR/B//100/E/170 WX fcst. Freq replaces 4212.5. (DW)

4426: USGS SAN FRANCISCO, 0435Z, USB, AUTOMATED WESTCOAST OFFSHORE WEATHER. (TH)

4452: V5G MFA BUCHAREST FEC/ROU//164.5/R/400 End of transmission. B/inv=24. s/off in C'W. (DW)

4990.2: RFFTA: Paris, France 20.00 ARQ-M2 200/400 Ch. A: Some op chat, "comment me receivéz vous? and start of msg with cct ID "AFD." Ch. B: RFFTA with TFC in FF to BURINFABERO SARAJEVO also flight info to RFFSBIA. Sarajevo on FDXB cct (PT)

5097: CFH: Halifax, Canada 20.15 ITA2 75/850 Naval Radio Station Newport Corners with "NAWS DE CFH." (PT)

5687: DHM-91 (GAF Hqs, Transport Cmd, Muenster): 0437 USB w/GAF 2121 in position report. (RP)

5777.5: KYAASF US ARMY/NG? MIL. STD 188-141A ALE on USB. Soundings. Also at 0442 0513 0643 0713 0714. (DW)

5857.5: LL2 SEOUL MET FAX//120/576/N/800 "NO DATA HLL" advisory. Rptd 2050. 2100 blurred fcst in Korean script. (DW)

5930: FIGW NODE RO GALAND CW Chan free marker (Globe) "LFL." (DW)

6320: UFZ Vladivostok rdo 1150 ARQ TFC to UFNB BMRT Mys Babushkini, QSX as 6269. (ML)

6330.5: OSY: Belgium 07.30 Pactor Sailmail station working FW7840. (PT)

6529: VI: 2359z USB; "Cuban Babbler"; poss Cuban air Def sta. (ALS)

6577: UNID, New York Cnetre, 04:00, USB, Air Traffic. (BH)

6586: NEW YORK RADIO, 0543, CONTACT WITH IBERIA FLIGHT 6622, USB. (TH)

6604: NEW YORK RADIO, 0530Z, AVIATION WEATHER USB. (TH and BH)

6637: BISCAYNE 413: 0243 USB WKG Miami LDOC; departed San Juan 0205z, ETA Orlando-Sanford A/p 0456z w 156SOB. (ALS)

6846.2: UNID FF UNID? ARQ/E3//192/E/170 4rc. Poor signal, little/no sync. (DW)

6849.3: V5G MFA BUCHAREST CW "QRU QRX TMW." (DW)

6875.5: RMP CISN KALININGRAD CW "RMC99 RMK32 de RMP QSU 1 QSX 4823 AAA5 AR." (DW)

6911.5: I18 U.S. ARMY/NG? MIL. STD 188-141A ALE on USB. Sounding. (DW)

6911.5: KYAASF U.S. ARMY/NG? MIL. STD 188-141A ALE on USB. Sounding. Also at 0716 0746. (DW)

6911.5: P18 U.S. ARMY/NG? MIL. STD 188-141A ALE on USB. Sounding also 0718 0749. (DW)

6911.5: I18 U.S. ARMY/NG? MIL. STD 188-141A ALE on USB. ALE on USB. Sounding. Also at 0634 0705 0735. (DW)

6912: SYN2: 2349 USB; Numbers station. (ALS)

6947: STI TUNISIAN MOI/MIL? MIL. STD 188-141A ALE on USB. Cng itself ST1. (DW)

6966.2: UNID FF UNID? ARQ/E3//192/E/170 4rc. Poor signal, little/no sync. (DW)

6967: MKL, RAF Pietreavie Castle. "...MKL out..." YL/EE 2200 USB (LA)

7361.5: p18 U.S. ARMY/NG? MIL. STD 188-141A ALE on USB. Sounding. Also 2305. (DW)

7685.5: No-Call: Un-ID USCG shore station 21.00 Pactor No TFC but many connects attempted to e.g. NNNONZK — USCGC *Dauntless*, NNN0NXZ — USCGC *Confidence*, NNN0CNY — USCGC *Campbell* etc. (PT)

7909.7: No-Call: Libya? 21.12 ARQ Poor rx but TFC in EE with lots of oilfield words. Klingenfuss reports this freq as LASMO's operation in Libya. (PT)

8028: V5G MFA BUCHAREST ROU/FEC//164.5/R/400 Diplo broadcast. Bit

Inv=24. On line encrypt. (DW)

8097: V02A, Atencion Numbers Station 0603 AM YL/SS w/54803 56251 86863 repeated then into 5FGs. (1/Dec/01). (MADX)

8122: Canberra Control: 1053 USB w/UNIDentified Australian Navy vessel in msg service. Switch to 6 MHz freq (6510). (RP)

8171.5: I18 U.S. ARMY/NG? MIL. STD 188-141A ALE on USB. Sounding. Also at 2231 2301 2331. (DW)

8171.5: P18 U.S. ARMY/NG? MIL. STD 188-141A ALE on USB. Sounding. Also 2254. (DW)

8303.2: LOR: AN Puerto Belgrano 0625 RTTY 75/170 WX forecasts fm Radiovisos Servicio de Hydrogria Naval Armada. (RH2)

8427.5: UFZ Vladivostok rdo 1000 FEC TFC summary & blind TX of ships' msgs. (ML)

8429.5: IDR4 IN ROME RTTY//75/N/850 CARB "IGJ41 /IGJ43 /IDR2 /IDR3 /IDR8." (DW)

8560: LARAND, Colombian Army Larandia 2249 MIL-STD 188-141A/USB CLG SANTANA: Colombian Army Santana. At 2321Z, TRESESQINT: Colombian Army Tres Equinas Radar Site CLG FLORENCIA: Colombian Army Florencia. (MADX)

8560: 2222, Moroccan Oil 2355 MIL-STD 188-141A/USB w/sounding call. (MADX)

8560: FLORENCIA, Colombian Army Florencia 0026 MIL-STD 188-141A/USB CLG FACATATIVA: Colombian Army Facatativa. Again at 0034. (MADX)

8560: 5555, Moroccan Oil 0241 MIL-STD 188-141A/USB w/sounding call. (MADX)

8560: 2222, Moroccan Oil 0542 MIL-STD 188-141A/USB w/sounding call. (MADX)

8560: SANTANA: Colombian Army Santana 1031 MIL-STD 188-141A/USB CLG SIGNET: UNID Colombian Army. At 1047, SANTANA: CLG TRESESQINT, Colombian Army Radar Site Tres Equinas at 1058, SANTANA CLG LARANDIA, Colombian Army Larandia. (MADX)

8560: 2221 N/AFRICAN OIL COMP NET? MIL. STD 188-141A ALE on USB. Sounding. Also at 2113z. (DW)

8560: 2222 N/AFRICAN OIL COMP NET? MIL. STD 188-141A ALE on USB. Sounding. (DW)

8560: 2223 N/AFRICAN OIL COMP NET? MIL. STD 188-141A ALE on USB. Sounding. (DW)

8560: 5555 N/AFRICAN OIL COMP NET? MIL. STD 188-141A ALE on USB. Sounding. (DW)

8700: Relay of "Comand Solo", UNID location prob in south Asia, USA information service in Afghan language, 1704 USB. (LA)

8700: UNID, dictation telegram in FF with spelling and "stop" at the end of every phrase, prob location north Africa, 2050 USB. (LA)

8705.5: LFI GW NODE RO GALAND CW Chan free marker (Globe) "LFL." (DW)

8906: AIR FRANCE 3554, over Atlantic. 2231z USB. WKG NY Rdo; position report; EJAM Selcal check on 11309. (ALS)

8962: O/M (JJ): 0432 USB w/O/M (JJ). (RP)

8983: CAMSLANT, Chesapeake VA. 1534z USB. WKG CG 24C (CG 6024, HH-60J Helo, CGAS-Clearwater FL) on anti-drug mission. Is told Shark 19 can be reached on Uniform or Victor frequency of the day. (ALS)

8983: CAMSLANT, Chesapeake VA. 1543z USB. WKG CG RESCUE 2163, airborne from CGAS-Corpus Christi; CAMSLANT assumes guard. I have no listing for CG 2163; may have been mis-ID of CG 2136, an HU-25 from CGAS-Corpus Christi. (ALS)

8983: CAMSLANT, Chesapeake VA. 1557z USB. WKG CG 1720 (HC-130H, CGAS-Clearwater FL) with Ops Normal msge. (ALS)

8983: CAMSLANT, Chesapeake VA. 1558z USB. WKG CG 1719 (HC-130H, CGAS-Elizabeth City NJ) with Ops Normal msge. (ALS)

8983: CAMSLANT, Chesapeake VA. 1619z USB. WKG CG 1720 (HC-130H, CGAS-Clearwater FL), approaching homeplate Clearwater; guard secured. (ALS)

8983: Camslant Chesapeake: 2132 USB w/CG 34C asking if boat was still on a trailer at Ft. Montague (sounded like). Camslant then told 34C that Panther was releasing him to RTB. (RP)

9025: Hawk 83: 0240 USB calling Hawk 84 w/no response. (RP)

9111: UNID, same as 9079 KHz, 2220 USB. (LA)

9148: O/M (SS): 0256 USB w/O/M (SS). (RP)

9156: 8PD UNID MIL STD 188-141A ALE on USB. CLNG 4WV. (DW)

9295: P18 U.S. ARMY/NG? MIL.STD 188-141A ALE on USB. Also at 2154. (DW)

9295: 118 U.S. ARMY/NG? MIL.STD 188-141A ALE on USB. Also at 2322. (DW)

9295: P8 U.S. ARMY/NG? MIL.STD 188-141A ALE on USB. Sounding. Also at 2255 2325. (DW)

10000: LAB, UNID 0354 MIL-STD 188-141A/USB CLG PR2: UNID. At 0358. LAB CLG PGR: UNID. (2/Dec/01) (MADX)

10033: Panther 202: 2231 USB WKG Miami LDOC re arr at Santo Domingo; Selcal check. (ALS)

10033: Panther 901: 2233 and 2309 USB WKG Miami LDOC; en route Havana Cuba. (ALS)

10033: Planet 961: 2254 USB WKG Miami LDOC; HLCG Selcal check. (ALS)

10051: Gander Rdo: 2226 USB WX BCST for Calgary, Churchill, Winnipeg, etc. (ALS)

10780: KING 22 (USAF C-130): 1550 USB WKG Cape Radio pp w Keesler AFB Metro re WX at Gulfport for 1922 ETA. (ALS)

10805.3: Un-ID: French Mil 13.48 ARQ-E3 192/400 Idles for a while then shifts to 10807.9, then 10809.6 then shuts down. (PT)

10917.7: RFTJ: FN Dakar 0553 ARQ-E3 48/400 CdeV to itself on TJJ cid. (RH2)

10975: O/M (CC): 0159 USB w/O/M (CC). (RP3)

11050.2: D2Z: Budapest, Hungary 14.00 FEC-A 192/400 French emb with svc TFC to Paris — "P6Z de D2Z zui vx compure de ton emeteur." (PT)

11064: CXS (Mars station): 2332 USB w/TWT (Mars station) w/morALE pps. (RP)

11150: O/M (IT): 2248 USB w/Y/L (IT). Telephone dialing noted. Possible radiotelephone link. (RP)

11175: YD 215 (P-3C Kaneohe MCAS VP-4 Sqdn): 0010z USB WKG Andrews GHFS w pp to Duty Ofc; msg: "Feet dry." (ALS)

11175: N8G: 0028 USB WKG Andrews GHFS. (ALS)

11175: REACH G3: 0058 USB WKG Andrews GHFS. (ALS)

11175: REACH 320Y (C-141B #60175, McChord 62AW): 0140 USB WKG Andrews GHFS pp to Hilda East & Hilda Metro re ETA 0345 at Pope AFB; Maint status Alpha 2 for air refueling receptacle. (ALS)

11175: Three different coded messages from Andrews AFB. Each were 28 characters. Messages were repeated later by a weaker station. USB between 0004 and 0029. (CG)

11175: REACH 459 with p/p via Hickam AFB to Travis AFB Command Post. REACH 459 reported ETA of 0200, had nine crew and 13 passengers. USB from 0017-0019. (CG)

11175: REACH 8223 with p/p via Ascension to Travis AFB Command Post. Had two questions, including his flight time from Travis to his next destination. USB from 0032-0039.. (CG)

11175: REACH 171 requesting radio check, answered by REACH 8223 in USB at 0037 (CG)

11175: ADOBE 85 with p/p via Ascension to a Command Post. Reported ETA at Fairchild AFB Also asked about avail of civilian taxicabs. P/P terminated before completion due to poor copy by Command Post. USB from 0042-0047. (CG)

11175: ADOBE 85 with p/p via Ascension to Fairchild Metro. Requested WX report for Fairchild AFB. USB from 0048-0050. (CG)

11175: Croughton: 2146 USB calling Cyprus Flight Watch w/no response. Also Lajes Command Post calling Global. Answered by Offutt. (RP)

11193: O/M (SS): 2317 USB w/Y/L (SS). (RP)

11220: Andrews: 0133 USB w/SPAR 06 in radio checks. (RP)

11225: O/M (African language): 2319 LSB w/O/M (African language). (RP)

11253: RAF WX: 2221 USB WX BCST for var locations. (ALS)

11282: San Francisco (MWARA CP): 0343 USB w/various aircraft in position reports. (RP)

11282: San Francisco (MWARA CP): 0152 USB w/Oskay 67 (sounds like) and Air Canada 3021 w/position reports. (RP)

11291: Dakar (MWARA SAT-2): 0158 USB w/various aircraft. (RP)

11291: Dakar (MWARA SAM-1/AFI-1): 0337 USB w/Lufthansa 526 in position report & selcal check. (RP)

11300: Tripoli (MWARA AFI-3): 0155 USB w/various aircraft. (RP)

11303: O/M (CC): 0512 USB w/unheard station. (RP)

11306: Lima Flight Support: 0115 USB w/AA 956 w/departure message & position report.. (RP)

11309: EFF 005, over Atlantic. 2234 USB. WKG NY Rdo; position report. (ALS)

11309: MARTINAIR 064, over Atlantic. 2235 USB. WKG NY Rdo; BQEG Selcal check. (ALS)

11315: O/M (JJ): 2320 USB w/O/M (JJ). (RP)

11386: O/M (JA): 0053 USB w/O/M (JA). (RP)

11431: Y/L (SS): 0133 USB w/O/M (SS) in personal conversation. (RP)

11566: Y/L (SS): 0345 USB w/numbers. (RP)

12127.5: No-Call: Un-id USCG shore station 10.10 Pactor Working NNN0CMV, USCG Tampa, with "PSP DATE = NOV99 QRU." (PT)

12133.8: No-Call: Prob. Sofia, Bulgaria 16.45 ASCII 75/500 Bulgarian MFA working GUB, Damascus embassy with "GUB ZAN PSE ZAL 16007." (PT)

12178: DRAX, FGS Gorch Fock A-60 1855 USB +3-ch VFT WKG DHJ59: German Navy Wilhelmshaven. Again at 1915 CLG DHJ59. (MADX)

12333: Un-ID: location un-ID 19.55 ITA2 75/950 Sends RYs and LBPX repeated, then into encryption. (PT)

12489: P3DH7 TK Ventspils 0959 ARQ svc msg to Vladivostok. (ML)

12491: UHKD TH Isidor Barazhov 1020 ARQ TFC to Kholmok. (ML)

12510: UESN TH Pasifik Star 0942 ARQ 54945 UESN log on & TFC to Vladivostok. (ML)

12612.5: UFZ Vladivostok rdo 1000 FEC TFC summary & blind TX of ships' msg. (ML)

12710.8: PWZ33: BN Rio 0605 RTTY 75/850 Coastal WXPP. (RH2)

12728.2: NMC, PT. REYES, and CALIF. 2113, FAVORATE GOES WEATHER SATELLITE PHOTO OF THE WESTERN U.S. AND PACIFIC, USB, 120/576. (TH)

12743.8: JJC, TOKYO RADIO, 0440Z, TNX SCHEDULE AND CHARTS, USB, 120/576. (TH)

12748.2: NMF, BOSTON, MASS., 2151, FAVORITE GOES WEATHER SATELLITE PHOTO OF THE U.S. & ATLANTIC, USB, 120/576. (TH)

12788.1: NMG, NEW ORLEANS, LOUISIANA, and 0155Z, FAVORATE GOES WEATHER SATELLITE PHOTO OF THE GULF & SOUTH AMERICA, USB, 120/576. (TH)

12788.1: NMN, CHESAPEAKE, VA. 0500, EAST COAST MARINE WEATHER REPORT. (TH)

12903: RBSL: Mumbai, India 19.25 ITA2 50/850 "RY RY VTH 1/5/7 RBSL BNR BNR SG...SG." (PT)

13152: WLO: 2212 USB WX BCST, msg for vessels. (ALS)

13200: O/M (SS): 1938 USB w/unheard station confirming receipt of several 5-figure groups. (RP)

13213: O/M (JA): 0047 USB w/O/M (JA). (RP)

13257: Trenton Military: 2047 USB w/Canforce 3131 in radio checks. (RP)

13270: New York Rdo: 2208 USB Av WX for Norfolk, Charlotte, Bangor. (ALS)

13282: Tokyo (Y/L EE): 2343 USB w/volmet for Manchuria & Mongolia. (RP)

13285: Beijing: 0049 USB w/automated voice volmet. (RP)

13306: New York: 1530 USB w/F-GVDP (UNID) in position report. (RP)

13339: Aero Mexico Ops (O/M SS): 0125 USB w/Aero Mexico 413 who reports departure from Miami and ETA Mexico City. (RP)

13339: Aero Mexico Dispatch (O/M-SS): 1320 w/unheard aircraft. Also Air Transat 443 (O/M FF) w/Air Transat Dispatch (O/M FF) w/current WX for Quebec. Also Cubana 481 (O/M SS) calling Boyeros, Havana w/Cubana Aero Dispatch (O/M SS) w/departure report from Las Palmas. (RP)

13339: Aero Mexico Ops (SS): 1500 USB w/Aero Mexico aircraft (SS) passing WX forecasts for Tijuana, Mexicali and Cancun. (RP)

13350: O/M (Tagalog): 0051 USB w/O/M (Tagalog). (RP)

13354: Air Jamaica 010: 1541 USB w/Air Jamaica Ops in position report and arrival information. (RP)

13354: San Francisco (MWARA/CEP-1): 0304 USB w/N129QS w/flight clearance and UA 966 in selcal check (FP-AS). (RP)

13366: O/M (CC): 0310 USB w/O/M (CC). (RP)

13380: O/M (IT): 2032 USB w/Y/L (IT) in radiotelephone conversation. Possible maritime link. (RP)

13886.7: RFFXOC: Paris, France 19.40 ARQ-E3 192/400 5-lg TFC to RFTJD, Libreville, on IAH cct. (PT)

13927: REACH 62P1 (C-130 #01272), 200mi off coast of Florida. 1835 USB. WKG AFAINA MARS station; pp to Hilda West (Scott AFB). Departed Norfolk 1623z; ETA San Juan 2230. Will depart San Juan tomorrow for Roosevelt Roads NAS, Puerto Rico. (ALS)

13927: VADER 06 (C-130), over Alabama. 1858 USB. WKG AFA2SA MARS Sta, Orlando FL; pp to homebase re disposition of Vader 04; is informed 04 is about to take off. (ALS)

13927: REACH 62P1 (C-130 #01272). 1921 USB. WKG AFAIEN MARS Sta, Orlando FL; pp 888-791-5003 Borinquen Air, San Juan; reports inbound in 2.5 hrs; will park at India Ramp; rqsts hotel reserv for eight ("cheaper than our \$190/night support rate"). (ALS)

13927: VADER 06 (C-130), over Montgomery AL. 1925 USB. WKG AFA2SA MARS Sta, Orlando FL; pp to DSN 854-7247 Patrick AFB Transportation; ETA 15 past hour; VADER 04 to follow in two hrs. I watched VADER 04 land at Patrick at 2205z. (ALS)

13927: SWEET 83 (C-130H, AFRC Milwaukee 440AW/95AS "Flying Badgers" Sqdn) over TN. 1937z USB. WKG AFAIEN MARS Sta, Indiana; M&W pp. (ALS)

13927: TAZZ 83 (KC-135R, Rickenbacker ANGB OH-ANG 145ARS) over SC. 2035 USB. WKG AFAIEN MARS Sta, Indiana; M&W pp. (ALS)

13927: LC 002 (P-3C, Brunswick VP-8 "Tigers" Sqdn) over Bahamas. 2048 USB. WKG AFA2SJ MARS Sta; pp DSN 831-4536 Roosevelt Roads NAS Duty Ofc; one hour out.. (ALS)

13927: REACH 81Y, over Atlantic. 2054 USB. WKG AFAIEN MARS Sta, Indiana; M&W pp. (ALS)

13927: AFA2SJ (MARS station): 1744 USB w/Reach 294Y w/morALE pp. (RP)

14230: HAM SLOW SCAN TV FREQ., FUN IMAGES ANYTIME, USB. (TH)

14367: BAF Beijing Met 1145 FAX 120/576 sked amendments. (ML)

14411: UNID: CIS Navy 1805 36-50 50/240. (RH2)

14731.7: RFFHCC: Comleget Aubagne 1713 ARQ-E3 192/400 Msg\FF to RFVITT/ Detlegetinf Mayott. (RH2)

14731.7: RFFHCX: FF Marseille 1723 ARQ-E3 192/400 Msg\FF to Gendmobile Mayotte cc Groupgend/Papeete. (RH2)

15867: Service Center (U.S. Customs AICC): 0015 USB & ALE w/aircraft 25 in radio checks. (RP)

15973: SNN: Warsaw, Poland 13.46 POL-ARQ 100/240 PAP press reports in Polish. (PT)

15973: UNID: Polemb Baghdad 1525 Pol-ARQ 100/340 Msg\Pol to MFA Warsaw. (RH2)

16013.7: RFFVIC: Le Port, Reunion 16.40 ARQ-E3 100/400 COMAR LA REUNION with TFC in FF to RFQPM - OC/AIG 1946, copied to RFQPT - CELMER EMIA DJIBOUTI, on RUN cct. (PT)

16014: RFQP: FN Jibouti 0620 ARQ-E3 100/400 CdeV on RUN cid. (RH2)

16133.3: KVM70, HONOLULU METRO, and 1815Z, WEFAX OCEAN CHARTS & GOES SATELLITE PHOTOS, USB, 120/57.6 (TH)

16135: KVM70: Honolulu Meteo 0714 120/576 120/576 Nice chart. (RH2)

16207: Stockholm Radio (Y/L EE): 1551 USB w/unheard aircraft in pp. (RP)

16713: UFBH TH Bereg Nadezhdy 0709 ARQ TFC to Vladivostok. (ML)

16801.5: P3LL7 RTMS Kapitan G Koval' 0916 RTTY 50/170 TFC to Kaliningrad. (ML)

16803: UNID: PNA Resend 0940 FEC N\LEE & Tagalog. (RH2)

16985.7: CTP: NATO Lisbon 1808 RTTY 75/850 NAWS de CTP etc. (RH2)

17069.5: JJC Kyodo Tokyo 1100 FAX 60/576 NAV wngs in JJ. (ML)

17149.4: NMC, PT. REYES, and CALIF. 2113Z, FAVORATE GOES WEATHER SATELLITE PHOTO OF THE WESTHER U.S. & PACIFIC, USB, 120/576. (TH)

17994: Trenton Military: 1538 USB w/unheard Canforce aircraft w/WX for Prestwick & RAF Lyneham. (RP)

18218.3: JMH5, TOKYO METRO, and 2130Z, WEFAX OCEAN CHARTS, USB, 120/576. (TH)

18334.7: UNID: MFA Cairo 1533 ARQ Selcall KKVA (Lagos Emb). (RH2)

18560: BMF Taipei Met 0925 FAX 120/576 fishery WX in CC. (ML)

18931.5: LAB: UNID 1317 MIL-STD 188-141A/USB CLG PR2: UNID. (MADX)

18940: BDF Shanghai Met 0815 FAX 120/576 Yellow & East China Seas surface anal chart, poor quality. (ML)

18986.7: RFHI: Noumea 15.46 ARQ-E3 100/400 CdeV to self being relayed on HJI, Papeete - Noumea, circuit. (PT)

19031.7: UNID: Paki Diplo 1542 Twinplex 100/170 Selcall KMEU (Islamabad). (RH2)

19036.4: HAR: Harare, Zimbabwe 15.26 Coquelet 8 13.33baud Algerian embassy with TFC in FF to MFA Algiers (PT)

19101.7: RFLI: Fort de France, Martinique 11.30 ARQ-E3 192/400 CdeV to self on BFL cct to Paris (28Dec01). (PT)

19131: 24C, USCG HH-60J #6024 (CGAS Clearwater) 1849 USB WKG ALTAS, DEA-contracted Comms Center Cedar Rapids. (MADX)

19131: Atlas (DEA contract Facility): 1953 USB w/Flint 453 (DEA pilot) in radio checks.. (RP)

19131: Atlas (DEA contract facility): 1746 USB w/CG 24C (H-60 # 6024, CGAS Clearwater) who provides arrival information for destination. (RP)

19131: Atlas: 2130 USB w/Flint 913 checking in w/"ops normal" report.. (RP)

19131: Atlas: 2039 USB w/Flint 932 reporting departure w/Flint 934 and 1 pax from Sundance 775 enroute to Sundance 710. Flight time 1 hour. (RP)

19204.7: RFLI: Fort de France, Martinique 10.10 ARQ-E3 192/400 CdeV to self on LIJ cct to Dakar. Also relaying RFTJ's CdeV (28Dec01). (PT)

19204.7: RFVI: Le Port, Reunion 16.20 ARQ-E3 100/400 CdeV to self on VII, Le Port - Noumea, cct. (PT)

19241.9: Un-ID: Germany??? 15.04 Pactor Mailbox with TFC in EE, FF, GG. Mentioned is MAS (MITARBEITERSCHULE), which seems to be a missionary/teaching organisation. Messages come from Cameroun and Central African Republic. (PT)

19242: dej02: "Sofia Beirut"? 1546 Pactor 200/200 E-mail Msgs/Pol to various addresses in Poland Very strong sigs! Not sure of origin! (RH2)

19862: MGJ: RN Faslane 0614 RTTY 75/340 CARBS. (RH2)
20126.7: No-Call: Cairo, Egypt 11.30 ARQ MFA calling N'djameina embassy (KKVO) then receiving TFC. (PT)
21013: PLANET JUPITER.0852Z. DECA-METRIC EMISSIONS (SOUNDS LIKE OCEAN WAVES), AM. (TH)
22541.4: JJC. TOKYO RADIO, JAPANESE NEWSPAPER CPY, and USB, 120/576. (TH)
23190: RFGW: MFA Paris 1505 FEC-a 192/400 621 mixed length groups; is this the new mode decoded only by the Hoka 30 folk? Some letter sub stuff seen! (RH2)
23265.5: HGX?: Hungarian Diplo 1215 Dup-ARQ 125/170 Good synch but data scrambled! Heard again at 0725z next day — again scrambled — didn't look online crypto! (RH2)
23265.5: HGX21: MFA Budapest 0625 Dup-ARQ 125/170 NXHNG to HGX44/Baghdad. (RH2)
23522.9: JMH Tokyo Met 0103 FAX 120/576 test chart w/pix of Crown Princess Masako. (ML)
23523: JMH6: Tokyo Meteo 0710 fax 120/576 Nice clean chart! (RH2) 24370: P6Z: MFA Paris 0944 FEC-a 192/400 CLG N2G (Sana Emb).(RH2)
24370: P6Z: Centrexbag 0948 FEC-a 192/400 Central Post Office? To all Milfrance Callsigns re postal security procedures for Middle East countries. (RH2)
24370: P6Z: MFA Paris 0915 FEC-a 192/400 Clg N2G (San'a). (RH2)
24370: P6Z: MFA Paris 1755 FEC-a 192/400 Call strings for S5F/Brasilia. (RH2)
24537: UNID: II Consulate Lagos (Vislago) 1510 Rs-ARQ 228/170 TFCII to MFA Rome (Maevista) followed by more TFC to Maevista from Lagos Emb (Amblago). (RH2)
26241.7: RFVI: FN Le Port 1341 ARQ-E3 100/400 CdeV on REI cid. (RH2)
26241.7: RFVI: FF Le Port 0808 ARQ-E3 100/400 CdeV on REI cid. (RH2)
26241.7: RFFKU: CEMPP ATLANT (Brest) 0814 ARQ-E3 100/400 Admin Msg\FF to Frigate Albatross REI cid. (RH2)
26241.7: RFVITTB: FN Le Port 0820 ARQ-E3 100/400 5LG to RFFIM (FN Paris) & RFFUHF (FAF Paris?) On REI cid. (RH2)
26241.7: RFVINVS: Frigate Nivoise 0831 ARQ-E3 100/400 5LG to 28 callsigns!!! REI. (RH2)
26241.7: RFVIT: Comsup St Denis 0838 ARQ-E3 100/400 Msg\FF to REGSPAHS VALENCE REI cid. (RH2)
26241.7: RFVINS: Frigate Nivoise 0842 ARQ-E3 100/400 Personnel Msg\FF to CENIF Paris (?) REI cid. (RH2)
26241.7: RFFKC: Marine Sirpa Brest 0910 ARQ-E3 100/400 Nx\Presse to All Stations! REI cid. (RH2)
26441.5: RHRMDAF 5970 1515 ARQ-E3 100/400 Pages of 5LG to RRFVINVS/Frigate Nivoise & RFFMOS (?) - on IRE cid. Later at 1524z complete list of US Warship.s (RH2)
26241.7: Unid: Maeroma 1220 Rs-ARQ 228/170 Vislago/Consular TFCII. Good to

see this mode back again! (RH2)
26241.7: RFVI: FN Le Port 0630 ARQ-E3 100/400 Msg\FF fm RFVIC/Comar La Reunion to RFVIFLR/Floreal info Zen/Cosru Port des GALEts & RFFINDI/Alindien with Meteofrance Metoc Data for Reunion, Amsterdam, Crozet & Kerguelen — AVIS DE TEMPETE!!!! Force 9 vitesse de Beaufort!!!! Wow — watch it chaps! Batten down les hatches matelots! REI. (RH2)
26241.7: RFVI: FN Le Port 0635 ARQ-E3 100/400 CdeV on REI cid. (RH2)
26241.7: RFVI: FN Le Port 0700 ARQ-E3 100/400 Msg\FF fm RFVIC pp RFFINDI/Alindien to RFVIFLR/Floreal with Metoc Storm warnings repeat REI. (RH2)
26241.7: RFVI: FN Le Port 0710 ARQ-E3 100/400 Msg\FF fm RFFLH/Comflottiaero trente six to RFVIFLR/Floreal; RFNJPRL/Prairial RFLINVS/Ventose; RFHIVDR/Vendemiaire; RFVINS/Nivoise; - MCA Notex - object/rfvz questionnaire aero. (RH2)
26441.7: RFFA: MOD Paris 1000 ARQ-E3 100/400 All 0947 Msg on 26241.7 above repeated back on IRE cid. (RH2)
26441.7: RFFA: MOD Paris 1350 ARQ-E3 100/400 Msg\FF fm Celenv Toulouse Msg\FF to AIG2131 info COSRU Port des GALEts; RFVIT/Comsup St. Denis; RFVIC/Comar La Reunion; RFFKC/Cometoc, with Metoc Wx Data for Zone Reunion. on IRE cid. (RH2)
26441.7: RFFA: MOD Paris 1410 ARQ-E3 100/400 Paris CdeV to itself on IRE cid (RH2)
26441.7: RFFA: MOD Paris 1416 ARQ-E3 100/400 5LG Fm RFFLAAO (loc?) to RFVINVS (Nivoise) on IRE cid. (RH2)
26441.7: RFFA: MOD Paris 1430 ARQ-E3 100/400 5LG fm RFVIFE (?) to RFVILL (?) & RFVINE (?) on IRE cid. (RH2)
26441.7: RFFA: MOD Paris 1436 ARQ-E3 100/400 Msg\FF fm Marine Dircomis Paris to RFVICS & RFVIFLR (Floreal) On IRE cid. (RH2)
26441.7: RFFA: MOD Paris 1440 ARQ-E3 100/400 5LG fm RFFINDI (FN HQ) to RFVINVS (Nivoise) on IRE. (RH2)
26441.7: RFFA: MOD Paris 1444 ARQ-E3 100/400 5LG fm RFFIVAR (Paris?) to RFVIC, RFVINVS & RFVIT On IRE cid. (RH2)
26441.7: RFFA: MOD Paris 1520 ARQ-E3 100/400 5LG fm RFFLH (FN loc?) to RFVIFLR (Floreal) + RFFHIJPR (Prairial) + RFHIVDR (Vendemiaire) + RFVINVS (Nivoise) These four ships are rated "Frigates de Surveillance" of the Floreal Class. (RH2)
27065: Relay of proofs of song with choir from UK or Ireland church, Religious ceremonies from these countries are frequently heard on CB band, 1115 FM. (LA)
27870: GUA: USAF Guam 1217 ALE/USB SND Many repeats! (RH2)
27870: HAW: USAF Ascension 1218 ALE/USB SND. (RH2)
27870: OFF: Offutt AFB 1256 ALE/USB SND. (RH2)
27870: ADW: Andrews AFB 1307 ALE/USB SND. (RH2)

27870: HAW: Ascension 1521 ALE/USB SND. (RH2)
29850: Argentine net of sailors w/ chat and info on meeting location/date, SS 1130 USB. (LA)

The "out of this world" log was — the planet Jupiter! Heard on **21013 kHz**, the signal is really very clear and distinct. I'm working with Thomas Henchy to write an article on how to build a simple but effective antenna that you can use to listen to this natural radio source. Maybe not a true utility station, but it's still part of the non-broadcast signals that you can hear on the HF band of your radio.

This month's contributors are:

Al Stern (ALS)
Chris Gay (CG)
DD (LA)
Lenroy Hogan (LH)
MidAtlantic DXer (MADX)
Murray Lehman (ML)
Peter Thompson (PT)
Ron (RP)
Robert Hall (RH2)
William B. Hansen (BH)
Thomas Henchy (TH)
Day Watson (DW)

Thank you all for your fine work. As always it is very appreciated.

Next Month: Globe Wireless' Operations

After having focused so much on the past during recent columns I decided it was time to look at the future. Next month I will be profiling the operations of Globe Wireless. This company provides the world naval shipping industry with reliable radio communications. Through their services, ship board personnel can send E-mail to their family from around the world. The company also provides a number of other services using radio that are interesting to know about.

I will also be looking at the work career of one of the staff of Globe Wireless who spent many years as a U.S. Merchant Marine radio operator. Wait until you see the radio rig that he got to operate! All of that, plus letters and logs, will be coming your way next month.

Until next month, may all your utility radio monitoring sessions be productive and enjoyable!

And don't forget our fighting forces overseas and at home, as well as the security people who keep us safe — be they police, firefighters, or ambulance attendants. Thanks to them all, and a sincere wish that 2002 will be a year of peace. ■

discoveries connecting as a radio amateur

PSK31: Easiest RTTY Ever is Now Even Easier!

Most hams and SWLs have at least toyed with the idea of listening in on (or participating in) the various short-wave digital modes that allow keyboard-to-keyboard communication. And just in case you blinked, the digital modes are easier and better than ever before thanks to new software and the power of the home PC.

Not all that long ago we might have started monitoring short-wave RTTY and fax stations with a variety of equipment ranging from cheap two-diode PC serial interfaces to expensive HAL or Universal terminal units.

In the late '80s, multimode terminal units from Kantronics and AEA were the rage, pushing aside the more venerable RTTY-only gear made by TONO and HAL. During this time, RTTY itself saw competition from the various error-correcting "handshaking" modes AMTOR, packet, PACTOR, G-TOR, CLOVER, and so on and I couldn't help but feel that an era was coming to an end. RTTY was still around, but it wasn't exactly the "in" thing unless you were a ham radio digital-mode contester.

The error-correcting modes were fun for a while, but I found that working other stations via AMTOR — which keeps chirping away until all data is correctly transmitted and acknowledged — was too much like using the Internet. It didn't feel like radio where our ability to copy ebbs and flows according to the whims of propagation.

What we needed was a new digital mode that might incorporate some means of error correction without requiring back-and-forth chirp-chirping to ensure copy. Well, friends, that mode is here, and it's called PSK31 and you probably have everything you need to operate this exciting new mode right in your shack!

Introduced in the late 1990s, PSK31 is already well out of its toddler stage and has become a major player on the world stage. It's the digital mode of choice for an ever-increasing number of hams who've never worked the keyboard modes before. If you've always wanted to get started in RTTY but lacked the hardware or the fortitude to mess with it all, PSK31 is for you!

PSK31

Some guys have all the luck — and all the smarts! **Peter Martinez, G3PLX**, the guy who came up with AMTOR, developed PSK31, the mode that's well on its way to making conventional RTTY a thing of the past.

PSK31 uses the DSP brains of your IBM-compatible computer's sound card (16-bit) and free (open source, like Linux) software that runs in Windows 95/98/NT/2000/XP. If your present sound card is an old 8-bit model, a new 16-bit card can cost as little as \$9 at a computer parts store or flea market. The hardware required to connect your PC's sound card to your radio, and to make an optional PTT connection between your PC and your rig, can be built from junk-box remnants or purchased from any RadioShack store for less than \$10. That's as close to free as you can get nowadays! And if you want an affordable ready-made interface, check out the **Rigblaster at West Mountain**



With its line of Rigblaster sound card interfaces, West Mountain Radio makes it easy to set up a first-class PSK31 station on a budget. Check out the entire line at www.westmountainradio.com. The site also hosts a bunch of downloadable ham radio software that works with your PC's sound card.

Radio (www.westmountainradio.com). It's the Cadillac of PC sound card interfaces and a real pleasure to use. It's also relatively easy on the pocketbook.

The "PSK" in PSK31 stands for **Phase Shift Keying**, the space-age modulation technique used to transmit an entirely new digital code. The "31" refers to the data rate, or baud rate, of the transmitted signal. It also represents the bandwidth occupied by a PSK31 signal—a paltry 31 Hz!

The digital code itself is called Varicode, a term coined by G3PLX because each character is made up of a varying number of data bits just like Morse code! Just like Morse code, commonly used letters have fewer bits, while rarely used characters have a whole bunch.

So what does this mean in practical terms? PSK31 takes up almost no precious bandwidth, its weak-signal performance is comparable to that of Morse code (a definite improvement over RTTY), and it will likely cost you less than a night at the bowling lanes to get started. And QRP ops take notice: PSK31 is so efficient that it works famously while running low power. Neat! (Actually, there are other nifty PSK31 features, but I don't have the space to explore them here!)

PSK31 in Your Shack

The best introductory article on PSK31 is still Steve Ford's excellent piece in the May 1999 issue of *QST* ("PSK31 Has RTTY's Replacement Arrived?" on page 41). If you don't have

access to a copy, point your web browser to <www.qsl.net/wm2u/psk31.html>. You'll find free-to-download PSK31 software, detailed info about PSK31, build-them-yourself hardware interface schematics and excellent links to related sites.

Assuming you have a 486-or-better PC running Windows 95, 98, NT, 2000 or XP, you'll need a 16-bit sound card, the downloadable software, a fairly stable HF SSB rig (USB is the ad hoc standard for PSK31) and a set of cables to interconnect the components. Like I said, you probably have all this stuff in your shack.

Hot Spots

Once you have your software and hardware up and running, tune around the digital subbands (especially on 20 meters) and look for PSK31 signals. They're distinctive, so you won't have much trouble finding them. PSK31 signals don't deedeedle like RTTY, and they don't chirp like AMTOR, they warble like a science fiction mind-control machine, or like a synthesizer played underwater. Once you've heard a PSK31 signal, you won't mistake it in the future.

Because the signals are so narrow, you'll have to tune slowly. At the lower left-hand corner of the PSK31 terminal program sits the waterfall, a digital tuning indicator. Filled with random red "spikes" when the signal is "unlocked," the display shows a vertical line when the signal is tuned properly. From then on you can simply use the software's "automatic frequency control" to track your QSO partner if he/she drifts up and down in frequency. Once the desired signal is locked and you're seeing text flow across your screen, PSK31 QSOs proceed pretty much like regular RTTY.

People who have been using PSK31 for a while are singing its praises. They're also mentioning that the mode can be a bit eerie at times. For example, thanks to PSK31's extreme sensitivity and exceptionally narrow bandwidth, signals that fade to the point of being inaudible often produce perfect copy!

Move over RTTY?

Will PSK31 replace RTTY over time? It just might happen. It's already happening! PSK31 offers all the benefits of Baudot RTTY and adds the weak-signal performance of CW. The gear is inexpensive, widely available and works bet-

The Band Plan

Although the following band plan has been endorsed by European PSK31 enthusiasts, the distinctive droning signals can be found in most parts of the digital subbands, especially near 14,070 kHz. Remember, with such a narrow signal bandwidth, a lot of PSK31 transmissions can share a crowded band. Some ops report that 100-Hz channel separation is sufficient for interference-free copy! Look for PSK31 signals here (in MHz).

| | | | |
|-----------|------------|------------|---------|
| 1.838.150 | 10.130 | 21.080.150 | 51.120 |
| 3.580.150 | 14.070.150 | 24.920.150 | 145.550 |
| 7.035.150 | 18.100.150 | 28.120.150 | |

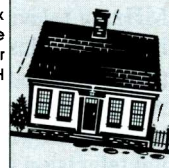
ter than the most expensive dedicated RTTY terminals made only a few short years ago. The first PSK31 contest took place in April of 1999, and the new mode is now showing up in DXpeditions, Field Day and Special Events. Check it out!

As usual, send your QSL cards, questions and letters to "Ham Discoveries," *Popular Communications*, 25 Newbridge Rd, Hicksville, NY 11801. See you on the green keys (old-time RTTY ops will know what I mean). ■

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FCC Reallocates Lower 700 MHz Band

The Federal Communication Commission has adopted allocation and service rules for 48 megahertz (MHz) of spectrum in the **698–746-MHz** band (known as the lower 700 MHz band) currently occupied by television channels 52–59 in many areas. This spectrum is being reclaimed for new commercial services as part of the transition of television broadcasting from analog to digital transmission systems. The Commission's new flexible allocation for this band will allow service providers to select the technology they wish to use to provide new services that the market may demand. The reclamation of the 700-MHz band is occurring as a result of the planned migration of broadcasters into the "core" broadcast spectrum (currently Channels 2–51) that will occur when they convert from analog to digital operations. The FCC previously reallocated the upper portion of the 700-MHz band (747–806 MHz, or television Channels 60–69), and adopted service and licensing rules for that spectrum. As part of the conversion process, Congress has provided for a transition period during which broadcasters may continue to operate their existing analog systems while using a second channel to transmit their digital television (DTV) signals. While Congress enacted a statutory requirement to auction this spectrum by September 30, 2002, the transition period is targeted to end in 2006, the Commission is statutorily required to extend that date on a market-by-market basis if one or more of the four largest network stations or affiliates are not broadcasting in digital, digital-to-analog converter technology is not generally available, or 15% or more television households in the market are not receiving a digital signal. At the end of this transition, analog service will cease, and the remaining broadcast operations above Channel 51 will be relocated into the core broadcast spectrum.

More Reallocations

The FCC has reallocated 27 megahertz of spectrum from the **216–220 MHz, 1390–1395 MHz, 1427–1429 MHz, 1429–1432 MHz, 1432–1435 MHz, 1670–1675 MHz, and 2385–2390 MHz** bands for non-government use. The reallocation of these seven frequency bands is pursuant to the provisions of the Omnibus Budget Reconciliation Act of 1993 (OBRA-93) and the Balanced Budget Act of 1997 (BBA-97) and continues the implementation of the Commission's November 1999 Spectrum Policy Statement. The Commission said that "we believe that the actions taken, coupled with a companion Notice of Proposed Rule Making seeking comment on appropriate service rules for the reallocated frequency bands, will lead to the development of new technologies and services and provide spectrum alternatives for users currently operating on heavily encumbered spectrum where operations are constrained due to congestion." The allocations break down in the following way:

216–220 MHz band — Allocated to the fixed and mobile (except aeronautical mobile) services on a co-primary basis;

elevates the Low Power Radio Service (LPRS) from secondary to primary status in the 216–217 MHz band and provides existing licensees in the Automated Maritime Telecommunication System (AMTS) with additional flexibility, but does not alter the status of the 218–219 Service, which already operates on a primary basis in this spectrum.

1390–1392 MHz band — Allocated to the fixed-satellite service (Earth-to-space) and the 1430–1432-MHz band to the fixed-satellite service (space-to-Earth) on a primary basis. Use limited to feeder links for NVNG MSS systems (Little LEOs) and is contingent on the adoption of international allocation.

Wireless Medical Telemetry Service (WMTS) — Allocation has been shifted from 1429–1432 MHz to 1427–1429.5 MHz and maintains the secondary status of non-medical telemetry systems in this band. Telemetry has been elevated to primary status in the 1429.5–1432-MHz band.

1392–1395 MHz band and the 1432–1435 MHz-band — Allocated to the fixed and mobile (except aeronautical mobile) services on a co-primary basis. These bands will be available on a paired basis.

1670–1675 MHz band — Allocated to the fixed and mobile (except aeronautical mobile) services on a co-primary basis and the 2385–2390-MHz band to the fixed and mobile services on a co-primary basis. These bands will be available on an unpaired basis.

1390–1395 MHz, 1427–1429 MHz, and 2385–2390 MHz bands — Allocated for exclusive non-federal government use.

216–220 MHz, 1432–1435 MHz, and 1670–1675 MHz bands — Allocated for mixed use.

Verizon Offers Cellular Caller Location Service

Verizon Wireless has announced that it is offering Samsung phones that provide police and fire/rescue personnel with the caller's location and phone number. Though the service is currently in limited use, it should be available to about 65 percent of Verizon Wireless subscribers by April of 2002.

3G Goes Live!

San Diego-based Qualcomm has announced that all 29 CDMA carriers in North America using their proprietary standard have begun receiving shipments of 3G next generation high-speed phones. Vendors include Kyocera, LG Electronics, and Sierra Wireless. One of the first 3G-capable products on the market is AirPrime's Digital Link, an expansion module that turns PDAs made by Handspring into cell phones. Sprint and

Verizon Wireless have both said they will launch their 3G network upgrades during 2002. What's the advantage of 3G? According to manufacturers, 3G phones will offer features like the Global Positioning System, wireless connections to computers and handheld devices through the Bluetooth standard, and streaming audio and video clips.

Guardian "Manoverboard" Personal EPIRB Seeks Certification

McMurdo Limited has filed a request for waiver of Section 80.1055 of the FCC Rules to permit the type certification for its new 121.5 MHz Guardian Manoverboard (MOB) Personal EPIRB (Emergency Position Indicating Radio Beacon). EPIRBs are battery-operated transmitters used to send distress signals from ships in trouble. Because safety of life is involved and ships travel worldwide, the Commission's Rules specify minimum operational performance standards. McMurdo's 121.5 MOB Personal EPIRB is a small, lightweight unit designed to be worn on the wrist. It is water activated, and signals a receiver installed on the vessel's bridge to allow local search and rescue to be initiated after the wearer falls overboard. McMurdo is seeking waiver of the FCC rules relating to frequency and power standards and battery requirements, without which its unit cannot be certified.

New Mobile Cell Phone Laws

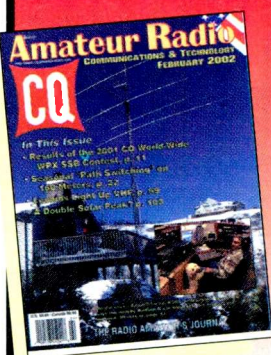
The city of Santa Fe, New Mexico, has enacted an ordinance that adds talking on hand-held cell phones to a list of other outlawed driving activities like shaving and applying makeup. Meanwhile, in California, cell phones and driving will be the subject of a new study. In Oregon, things are going in just the opposite direction: they've made it illegal for local governments to regulate cell phones and driving. And in North Bend, Washington, inattentive drivers — those fiddling with the radio, talking on a cell phone, or eating — can be fined an extra \$300 if they get a ticket.

FM Station Operator Convicted

It really doesn't pay to operate an unlicensed station these days. Just ask **Khalid Kubweza**, who though he could get away with broadcasting FM station 91.7 MHz from his home. Think again. Kubweza, of Richmond, Virginia, was convicted on four criminal counts. The United States District Court, Eastern District of Virginia, found that Kubweza "did willfully and knowingly use and operate an apparatus for the transmission of energy and communications and signals by radio from a place in Virginia to another place in Virginia without a license." Prior to taking him to court, the FCC tried through Commission and court actions to deter Kubweza from operating his unauthorized FM radio station, but finally had to serve a search warrant and seize his equipment. The operation of an unlicensed broadcast station is a violation of section 301 of the Communications Act of 1934, as amended. Operators of illegal, unlicensed broadcast stations may be subject to civil penalties of up to \$11,000 per violation, seizure by court order of all radio equipment involved in the operation, and or a court order enjoining the operator from operating an illegal station. In addition, unlicensed operators could be subject to criminal fines of up to \$100,000 or imprisonment of up to one year, or both. Ouch.

Hacker Ham

Should a convicted computer hacker be allowed to renew his amateur radio license? That's the question that will be put before an FCC Administrative Law Judge in the matter of **Kevin David Mitnick, N6NHG**. You remember Mitnick, the guy who some consider the greatest computer hacker ever. Well, now he's applied for renewal of his ham license, but the FCC is just a little leery. "Mitnick is a convicted felon whose illegal activities have included the interception of electronic communications, computer fraud, wire fraud, and causing damage to computers. Based on the information before us, we believe that Mr. Mitnick's criminal behavior raises a substantial and material question of fact as to whether he possesses the requisite character qualifications to be and remain a Commission licensee. Because we are unable to make a determination that grant of Mr. Mitnick's application would serve the public interest, convenience, and necessity, we hereby designate the application for hearing . . ." Mitnick was sentenced to 46 months in federal prison as a result of an August 9, 1999 conviction. He had previously been sentenced to 22 months in prison for possessing cloned cellular phones after his arrest in North Carolina in 1995 and for violating terms of his supervised release imposed after his conviction for unrelated computer fraud in 1989. Further, Mitnick admitted to violating the terms of supervised release by hacking into PacBell voicemail and other systems and by associating with known computer hackers. Mitnick is currently on probation following his release from federal prison in January 2001. Is there any question that this guy really can't be trusted with technology? ■



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computer assisted radio monitoring

by Joe Cooper

The Computer/Radio Interface – Part II

Last month I began the first part of this exploration of the personal computer's "Serial Port". If you intend to control a compatible monitoring radio with your computer you will most likely do so through a serial cable and connection between the two devices. More times than naught, if there is a problem in a computer assisted monitoring station, it can be traced back to the serial port.

As a quick review, the serial port on a computer is one of the many devices called a "peripheral port". It is called this because it allows devices outside of the computer (like a printer, a modem or your monitoring radio) to communicate with the software you are using. You can easily identify a serial port at the back of the computer, as it is a plug comprising either 9 or 25 pins.

Last month I outline the basics of what a serial port is and how it works. This month I'm going to look at the proper set up, operation and basic troubleshooting of that device.

The most important thing that you must do when experiencing serial port problems is to be systematic while looking for and fixing the problem. If you start off with out a plan and checklist you are never going to find the cause of your serial port difficulties. Serial port problems will not be solved by wiggling cables or turning equipment on and off. You might get lucky once, but not often.

- Is the serial adapter card properly installed in the PC? (Either in the card slot or directly in the computer's mother board)
- Are the correct serial adapter card drivers properly installed in the computer?
- Are the correct COM port(s) selected in System Setup window in your Windows Operating system?
- Is the serial port properly configured through the COM port set up?
- Are there any hardware (IRQ) conflicts?

If you completely answer each of these questions in the order that they are shown here, you will have properly examined all of the possible causes for your problem. If you jump over or ignore, or get out of order any of the steps, then you will have significantly reduced your chances of finding the cause as well.

The vast majority of serial port problems that occur are due to two devices (say a modem and the monitoring radio) trying to use the same COM port (e.g. both have been told that they are COM 1 or COM 2). When that happens both devices are "fighting" with one another to take control of that port. As a result the computer software that is used to control the device can't find it.

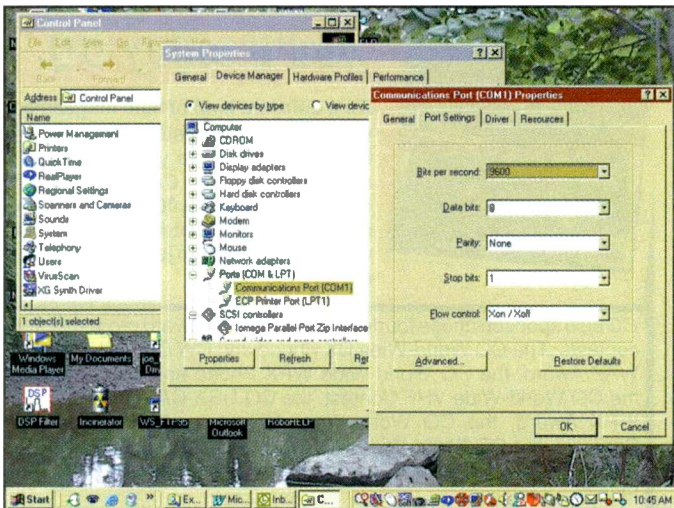
The next most common problem is hardware interrupt (IRQ) conflicts for the serial port itself. This prevents the computer (CPU) from knowing that the serial port is attached to the computer. As a result the computer cannot control the flow of information in and out of the serial port.

Configuring Your COM Ports

Windows 95 and 98 includes a set of "Basic Configurations" for communications (COM) ports. These configuration options make it easier for you to avoid hardware conflicts by letting you easily change the settings a COM port uses.

These Basic Configurations provide the following:

- A default configuration for each COM port. You cannot change this default setting.
- Additional configurations for each port that lets you edit the IRQ setting. These configurations do not let you change I/O addresses.
- Additional configurations for each port that lets you edit both the IRQ and the I/O range.



The following screenshot shows you the sequence of windows that you will open to properly configure a COM port, as will be explained in this column.

The basic questions that you are going to be asking in order to diagnose a serial port problem are asked in the following order:

- Are all the required cables properly connected to each device, such as the computer and the monitoring radio?

Basic configurations are determined by the following table:

| Configuration | IRQ Setting | Editable? | I/O Setting | Editable? |
|---------------|-------------|-----------|-------------|-----------|
| 0 | 4 | No | 03F8-03FF | No |
| 1 | 4 | Yes | 03F8-03FF | No |
| 2 | 3 | No | 02F8-02FF | No |
| 3 | 3 | Yes | 02F8-02FF | No |
| 4 | 4 | No | 03E8-03EF | No |
| 5 | 4 | Yes | 03E8-03EF | No |
| 6 | 3 | No | 02E8-02EF | No |
| 7 | 3 | Yes | 02E8-02EF | No |
| 8 | Variable | Yes | Variable | Yes |

COM 1 defaults to Basic Configuration 0. The IRQ can be changed by selecting Basic Configuration 1.

COM 2 defaults to Basic Configuration 2. The IRQ can be changed by selecting Basic Configuration 3.

COM 3 defaults to Basic Configuration 4. The IRQ can be changed by selecting Basic Configuration 5.

COM 4 defaults to Basic Configuration 6. The IRQ can be changed by selecting Basic Configuration 7.

Basic Configuration 8 can be used to configure additional COM ports because it lets you change the IRQ and the I/O address. Example

Changing The IRQ

The following is a sample procedure for changing the IRQ for COM 1:

1. Click the Start button on the taskbar.
2. On the Settings menu, click Control Panel, then double-click the System icon.

NOTE: You can skip steps 1 and 2 if you use the right (secondary) mouse button to click the Computer icon and then click Properties.

3. Click the Device Manager tab, double-click Ports (COM & LPT), then double-click Communications Port (COM1).

4. Click the Resources tab.

NOTE: COM 1 defaults to Basic Configuration 0, and the settings are according to the table above.

5. Click the arrow next to the Setting Based On box, and click Basic Configuration 1.

6. Under Resource Settings, double-click Interrupt Request (or IRQ), then click the up or down arrow to change the Value field setting.

7. Click OK and restart Windows when you are prompted.

In Windows NT or 2000 open the Administrative Tools/Windows NT Diagnostics. Find out if there are conflicting devices. Try to change the card to another PCI/PC Card (PCMCIA) slot if necessary.

If you are using regular COM port for

communication and you have a modem installed, check that you don't have it installed into same COM port (IRQ or I/O conflict).

Next Month

Next month I will be looking at the first batch of letter that have arrived for the column. You're starting to ask a lot of interesting questions that will help to guide the direction I'm going to be going over the next few months. One of the big questions that is being asked a lot is how do you set up the files that contain the frequencies used by radio control programs. It appears to be one of the primary reasons why people get frustrated with their software.

So after finishing off the trouble shooting of serial cables next month, I will be looking at the set up and use of frequency and log databases.

In the meantime, If you have any questions, comments or suggestions about this, and other columns, please email me at ur-review@provcomm.net or send regular mail to: Computer Assisted c/o Joe Cooper, PMB 121 1623 Military Rd. Niagara Falls, New York 14304-1745.

Again, please note that I can only answer questions about topics covered in the column. I cannot answer general questions about using computers, computer peripherals or computer compatible radios. See you next month!

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Repeater Radio

Note: This letter is from June 2001, well before the 9/11 tragedies.

Dear Editor:

As most of your readers know, most municipal emergency agencies operate using a repeater style radio system. When information like names of injured members of the service go over the air, the field unit can, and does, request the repeater, known in my agency as "the mixer," be momentarily disabled. However, due to a bad policy, some sections of New York City leave "the mixer" off all the time.

What follows is a letter from the President of the Uniformed EMS Officers Union of the Fire Department New York, to the Commissioner of the FDNY, that was faxed to all stations of the EMS Command of the FDNY, and sent to you with the permission of the president.

Richard C. Berger
NY State Emergency Medical Technician,
Registered Monitor/SWL Station KNY2SC
Belle Harbor, NY
(PS: Footnotes are mine. RCB.)

May 22, 2001
Thomas VonEssen, Commissioner,
Fire Department City of New York,
9 Metro Tech Center, 8th Floor,
Brooklyn, NY 11201

Dear Commissioner VonEssen:

On May 21, 2001, at approximately 1430 hours (1) an FDNY/EMS ambulance crew and an EMS Lieutenant (2) responded to an EMS assignment for a "Drug"(3). Upon the arrival of the ambulance crew, they encountered a male patient who became uncooperative, and requested the response of the patrol Lieutenant. Once Lieutenant Escalera convinced the patient to sit in the carry chair and allow the crew to remove him to the hospital the patient was removed to the ambulance.

Once inside the ambulance, the patient freed himself from the ambulance cot straps and began to severely assault one of the EMTs. Lieutenant Escalera and the second EMT attempted to rescue the assaulted member, but were themselves attacked by an unknown number of bystanders. One of the EMTs attempted to radio for assistance, but due to the foolhardy decision to have the mixer in the off position on the Brooklyn North (4) radio frequency, their calls for assistance were not heard by EMS units on the same frequency nor the dispatcher.

Several attempts were made to call for assistance, and after an unknown period of time the dispatcher finally heard the calls and sent for police response, which I understand took a total of 18 minutes.

This is totally unacceptable. This foolhardy mixer off situation is placing both my members, and those of the Uniformed EMTs and Paramedics Union, in harm's way. There is no excuse for the department's blatant disregard for the safety of its members. We have attempted to convince the department that this

policy is wrong and dangerous. But all we have received is a deaf ear to our complaints. The department was warned numerous times that someone is going to get seriously hurt, by it's total lack of understanding of field EMS work and the inherent dangers that all field personnel face. Now, through the department's own fault, three members of the EMS Command suffered physical and emotional injuries.

The injuries to the EMS personnel could have been minimized if assistance could have responded faster. Instead, EMS personnel suffered back, knee, and facial injuries. The department, and you as the commissioner, are totally responsible for the severity of these injuries.

It is time for the department to take responsibility for the safety and well being of all its employees. I demand that you remedy this situation immediately so that there can be no repetition of this incident again.

Sincerely,
Donald J. Rothschild, Jr., President,
Uniformed EMS Officers Union of Fire Department NY

(Footnotes: 1 — Local time, 2 — We have removed the Lieutenant's name to protect his privacy, 3 — There are over 50 "call types" with assigned priorities as used by our Computer Assisted Dispatch system, 4 — Due to the size of our area of coverage, each of the five counties of New York City are further broken up into North/South, or East/West radio frequency areas.)

Seeing The Light

Note: Our sincere thanks to the many readers who responded to Mr. Cohen's letter in July. The following from Eric Friedebach says it all.

Dear Editor:

In the July 2001 issue, reader Harry Cohen inquired about a device to change a traffic light from red to green. What he needs is an Opticom® transmitter from 3M. To quote the 3M website: "The Opticom system gives an authorized vehicle advantage over other traffic, intersection by intersection, as needed. As the vehicle approaches, it saturates the intersection with an encoded, infrared signal that is received, decoded, and validated to give the requesting vehicle the safest possible driving condition — a green light."

I've been thinking about building an infrared transmitter, but right now most of my free time is being spent on an EMP generator that is small enough to fit in the back of my Corvette.

Best regards,
Eric Friedebach

Liked Cobra Feature

Dear Editor:

The article "Inside Cobra Electronics Corporation" was appreciated. I look forward to more "factory tours."

Regards,
Ron Lindow

pirate & alternative radio

free radio broadcasting

From Songs By Betty Boop To Hendrix, It's All Here!

Pirate activity seems to have picked up lately! Some interesting things have shown up in ye olde mailbox.

WHYP, 6295 at 0425 with punk rock, IDs, "Girlfriend," more punk rock and more IDs "WHYP, WHYP" sounding like someone had covered their mouth while speaking. They went off at 0432. (Sean Ingram, VA)

KIPM has been all over the place. **6900** at 0317 and 0500, the latter with a program called "He Who Evolved." Also **6925** at 0112 with program "Pirate Jesus" and at 0900 with "He Who Evolved." All USB. (William T. Hassig, IL)

WHACK Radio, 6925 USB at 0220 with "Bad Moon rising," phone number: 1-888-959-8177. I called, they called me back and we talked on the air for several minutes. (Hassig, IL) **6925** at 0321. Another time at 0408. (Lee Silvi, OH)

Voice of Oz, 6924.4 at 0208 with the song "Time Has Come Today." (Hassig, IL)

Captain Ron Shortwave, 6920.1 at 2305 with rock. (Hassig, IL)

Betty Boop Radio, 6925.08 with Bach's Toccata and Fugue in F Minor, a song by Betty Boop then swing and big-band music from the '20s and '30s. (Hassig, IL)

Radio USA, 6954.8 at 2235 with news of the weird, funny commercials. Hosts were R.F. Watts and Joe King. (Hassig, IL)

WAIR, (All Indie Radio) 6925 USB at 0216 with independent music groups. Hosts were Robert J and Ravi Yardbrown. (Hassig, IL)

Radio Azteca, 6950 at 0002 to 0033. (Jerry Coatsworth, ON) **6925** at 0200 with program #39. Also 1329 to 1350 sign-off. I think this was also program 39. Also 0200-0220 close. Very good entertainment for us DXers. I can hardly wait for program 40. (Lee Silvi, OH)

Crunch Radio, 6955 USB at 0314 with "Clemintine" by Bobby Darin. (Coatsworth, ON)

Radio Three, 6950.3 at 0105 to 0137 sign-off. The "usual stuff." (Coatsworth, ON) Radio Three/Three Rock Radio, **6950** at 0110-0130. (Silvi, OH)

Freedom 40, 6925 USB at 0125 with a program from 1994. (Coatsworth, ON)

Psycho Radio (tentative) 6950 USB at 0255 with an old time radio show about a monkey's brain. (Coatsworth, ON) **6925 USB** at 0130 to 0113 close, a rebroadcast of a 1994 program, giving Wellsville drop and requesting three 29-cent stamps. Also **6955** at 0217 to 0222 close and then from 0226 to 0244 close. Again from 0251 to 0254 and 0257 with IDs. And maybe them on **6955** at 1323 to 1420. (Silvi, OH)

MIDI Radio, 6955 USB at 0251-0318. Also at 0248 to 0318 sign-off. (Silvi, OH)

Paragon Radio, 6955 USB at 0409 testing with Hendrix music. Plus 0408 to 0426 with Hendrix music and test announcements. (Silvi, OH)



Here's another of those big, colorful, imaginative, not to mention far out QSLs from KIPM.

Radio Doomsday, 6955 at 0005 with "Radio Doomsday Science Fiction Theater." (Silvi, OH)

Patriot Militia Bingo Radio (tentative) 6925 at 0243-0320. Also at 0229 to past 0305. It was either this or Psycho Radio or both. IDs of Patriot Militia bingo by a woman, clips of United Patriot Radio's Steve Anderson, jazzy music and Jamaican-style music. Listener appreciation show #8 for Lee Reynolds at 0308. (Silvi)

Z100, 6955 USB from 0102 to 0259.

Hmm, there was less in the mailbox than I thought! **6925** seems to be the new hot spot, now rivaling 6955 in activity. I wonder who decides these things? Anyway, thanks for your reports and I look forward to getting more of them. I am well aware of the old line about "beggars can't be choosers" but even so, it wouldn't hurt to include a little more program information so people can get an idea of what a particular station is into when it does go on. Thanks. I'll catch you again next month! ■

Tuning In (from page 4)

to them. Clearly folks would take part in local activities — and probably more so now after the events of last fall. A few months prior to the event, 6 percent of you said your getting licensed was the result of first-hand experience with hams during a disaster. That's first-hand experience, not seeing radio operators on TV or in the newspaper holding a microphone or working on a keyboard! If you don't think that 6 percent is a lot, suppose you take that figure and even cut it in half; imagine getting 3 percent of the USA involved in radio and perhaps amateur radio? At the same time, why did the 8 percent of respondents attend a couple of meetings and not return? Just food for thought.

Internet Or Radio?

One of our readers named Terry, from Evansville, Indiana, wrote the title for this month's Tuning In: "I am a radio operator, not an E-mailer." He wrote that remark on the bottom of our survey response card in the "E-mail" block. I thought it was quite a statement — whether or not it accurately reflects others' attitudes about E-mail, radios, computers or not, it still makes me think. So, let's look at that month's survey results, particularly the question about the famous Internet. We asked how much time, during a typical week, you spend on the Internet. Look out, Terry, a whopping 22 percent of readers spent more than 10 hours at the computer. That's in combination with other survey questions in following months where we asked how much time you spend listening to international shortwave news and commentary. Eleven percent of you said you spend more than eight hours. Interestingly, most readers — the same percentage of you who spend more than 10 hours at the computer — spend "a few minutes — less than an hour listening to SW." Of course that doesn't take into account scanning, hamming, FRS, or other radio activity, but this is one reason we've continued to merge computers and radios in *Pop'Comm*; Joe Cooper's "Computer Assisted Radio Monitoring" and Ken's "Overheard" column are examples of where the hobby is headed, like it or not. We're embracing the technology and the outstanding things you can do with both. We hope you'll tell your friends — especially those who aren't yet radio hobbyists, but use the Internet on a daily basis — what a kick both mediums offer!

Trunking And More

If you think trunktracking is too complicated to master, it's not — thanks to writers like Ken Reiss and others who are constantly showing us the ropes of this and other high-tech communications systems. We're sometimes asked why we don't have tons and tons of frequencies each month. The answer is that in many respects we do — but you have to find them in your area. Anyone can put together lists (the Internet is great for lists, but be careful about the accuracy of "lists"), so we stay focused on telling you *how* to find the frequencies. Sure, it's exciting to plug in a frequency and let the radio listen as you sit there spellbound, but isn't it much more of a challenge to work with the radio using material our writers present each month than to be spoon-fed lists? I thought so. Forgive me, I digress — 65 percent of you said that trunking is NOT too complicated to figure out or too much bother. While about 14 percent of

you are uncertain about purchasing a new trunktracker scanner in the next few months, many of you said you were indeed planning on taking the plunge, however a near equal amount said you weren't. Stay tuned — we're continuing with trunking coverage in the coming months!

I'll admit, I was more than surprised by your answer to the question, "During the course of a year, I attend the following number of auto racing events AND bring my scanner to hear the action." Fully 74 percent of you said "never." There could be many reasons for this, because, frankly I expected *Pop'Comm* readers would attend at least one racing event. Very few of you apparently do, as only 5 percent of you said you attend either one racing event, or two to four events. Obviously the "four or more" response got even less — about 3 percent I'd be interested in your thoughts on this subject, because from NASCAR to CART there are thousands upon thousands of folks that are missing out on lots of great radio action — and we can help!

A few of you noted on your cards, "my neighbors don't know" or similar words. Interesting, because at least 53 percent of you said they know you're a radio hobbyist because they see your antennas. About the same number of you report talking with them about the hobby, and only about 10 percent of you say they've actually listened to your radios. When you do talk to non-shortwave radio enthusiasts about international radio, most are intrigued by news and commentary and utility radio. Most are somewhat interested or very interested (20 percent). They're very polite listening to your excitement or they really *are* interested in radio — I think they're actually interested, based on my own experience where they either buy a CB or portable shortwave or even a basic scanner after hearing my excitement. Non-hobbyists are least interested in sports on shortwave and dramas or plays. Let's face it, if they want sports, they can easily watch it on TV — not so with international news and commentary — at least with the tremendous variety offered by radio.

Free Pop'Comm Subscriptions — Or One-Year Extensions!

The following readers will be receiving a free one-year subscription or sub extension. They were randomly selected from four month's worth of survey cards — except Terry McCrarey, Indiana, whom I selected because he's not "an E-mailer."

Congratulations also to Jerry V. DiTrollo of Philadelphia, Pennsylvania; Bobby Tanner of Monroe Twp., New Jersey; and Brad Zimmerman of Airway Heights, Washington. Thanks again to everyone for responding to our monthly surveys — remember to send in yours and be entered in our free subscription drawings! ■

Editor's Note: An article in our February issue contains a substantial portion of text which was not credited to its original author, Ray Jacob, KB2ZPE. Hank Brandli's article "Weather Satellite Imagery At Your Fingertips" contains a large section relating to HF wefax which was written by Ray a little over a year ago for his own webpage at www.qsl.net/kb2zpe. Nonetheless, Ray says, "I hope your readers found it helpful." Ray, I'm sure they did — and you have our sincere apologies for the error. Readers are encouraged to visit Ray's excellent website for tons of additional HF information.

clandestine communiqué

by Gerry L. Dexter

tuning in to anti-government radio

Radio From Afghanistan: Is It Real, Or The U.S. Military?

Afghanistan continues to be the front and center in the news, both in the regular media and for us who follow the secret and not-so-secret world of clandestine broadcasting. Soon after much of the Northern part of the country had been liberated there were reports in the news that Radio Afghanistan had returned to the air. Almost simultaneously a "Radio Afghanistan" appeared on 9950 shortwave and many (based on some media reports) at first thought the government radio had miraculously become hearable on shortwave again, even though the Taliban's Voice of Shairah was virtually impossible to hear even before it was bombed off the air. The government's Radio Afghanistan is back on the air but with local coverage only (TV is also back on the air.).

The 9950 signal was widely reported throughout North America, broadcasting from 1330 (some reports said as early as 1130) to 1430 in the local Pashto and Dari languages and using the name "Radio Voice of Afghanistan." Getting quality copy on shortwave signals direct from Afghanistan was too good to be real, of course. At this writing evidence is growing that, rather than coming from Afghanistan, the broadcasts are emanating from a site in Russia or one of the former Soviet republics — most likely Uzbekistan or Tajikistan which are cooperating in the war against the Taliban and al Qaida.

The operators of this new clandestine have, so far, declined to identify themselves or their organization and nobody seems

to have any kind of handle on who might be providing the broadcasts, though it might be a U.S. military operation. The station hasn't provided any address information so far.

Commando Solo Continues

Meantime, the "Command Solo" broadcasts continue on 8700, but we question how much longer there'll be a need for these. The station may be off the air by the time you read this. The location of the 8700 transmitter remains an unanswered question. North American DX'ers have managed to get some copy on this upper sideband signal from its 0030 sign-on, but the best we've been able to do with the mess on that frequency is a very weak signal which now and again manages to get a few words out midst the din.

Robert Montgomery (PA) has had this one from 0057 tune, in what he thinks sounded like Pashto, with talks by a man announcer and Afghani-style music. Bob notes the QRM is pretty bad. Stewart MacKenzie (CA) also found them at 0132.

And, by now the U.S. government should have Radio Free Afghanistan on the air. RFA operated during the Soviet-Afghan war and was dumped after the Soviet defeat. The broadcasts will be a part of the government's Radio Free Europe/Radio Liberty. No times or frequencies have been announced, so far.

The Bad Boys Of Iran

Iran is beginning to be seen more as a country that wants to be rid of its errant ways, but the powers there are still into a lot of mischief. A recent addition to their long list of unfortunate choices is an addition to the fires fueling the Palestinian-Israeli problem, namely a station calling itself the Voice of Al-Aqsa Intifadah from Tehran. It's operating on 7105 and 7175 at the useless time of 1900-1930.

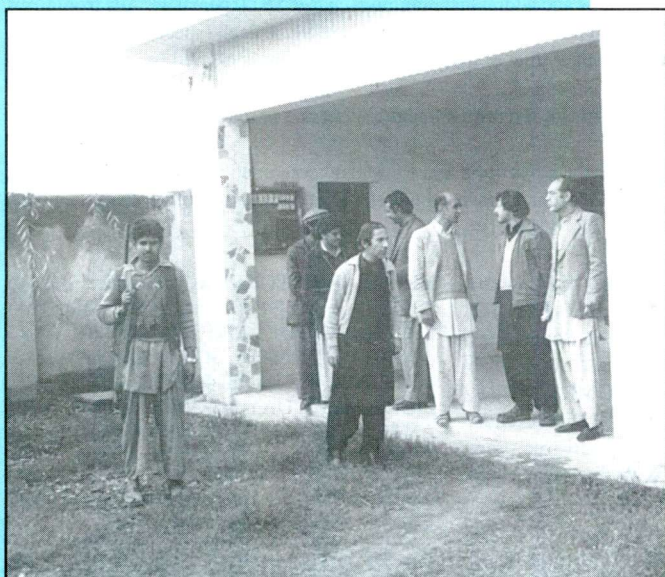
Eritrean Clandestine

The **Voice of Freedom** is an Eritrean clandestine being heard these days on 6965 at around 0330.

Radio National de la RASD, the station, which seeks independence for the Western Sahara area now part of Morocco is being heard, again on 7460 from fade in during the late afternoons and again from around 0700, with all Arabic language broadcasts. For many months reception of this station was impossible due to WWCR's occupancy of the frequency. They moved off recently, clearing the way for this interesting (and now well heard) station.

New Star Broadcasting Station

Taiwan or Mainland China, depending on which theory you buy, continues to be targeted by the mysterious New Star



The courtyard of Radio Free Kabul, a network of low-power broadcasters that was active during the Soviet occupation of Afghanistan in the 1980s.



Afghanistan's capital city, Kabul, during better days.

Broadcasting Station. It continues to broadcast Chinese language numbers (read by a woman) in transmissions lasting 15 or 20 minutes on an off and from

around 1100. Frequencies are **8300, 9725, 13750 and 15385** — an odd mix of out of band and regular broadcast channels. Not all of them are necessarily used

at the same time. We've recently had reception of the 13-MHz broadcasts a couple of times around 1300, though the signals were weak.

Brian Alexander (PA) logged what's believed to be **The Voice of Iraqi Kurdistan** on **7090** at 0308 with Koran recitations running to past 0325.

Montgomery heard the **Voice of the People of Kurdistan**, based in Iraq, at 0352 on **6995** while they were having problems with their tape player (slowing down and speeding up)

Richard D'Angelo (PA) had the Ethiopian clandestine **Radio Rainbow** on **11840** from 1858 sign-on to 1959 sign-off. They opened with a brief music segment and then going into a political talk in Amharic.

Montgomery heard the **Voice of Freedom, 6965**, aimed at Eritrea, from 0330 with Arabic-style music and man announcer. Bob notes this is a tentative log and the signal is extremely weak.

Remember, we're always grateful for your clandestine station logs, along with any related information you come across, such as station info, transmitter locations, addresses, QSLs, and so on. Thanks so much for your continued support. Until next month, good hunting! ■

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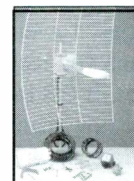


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“It’s a Wonderful Life”

Ha. For April Fools’ Day, I should write a serious column! I don’t think I’ve ever written a serious column in my life. Anyway, you could say that this one starts out about your AGE! Not that you’re old — or young — it’s just that whatever your age is, there are things that have always “been around” during your lifetime. The first time I gave this any thought was when I found a dictionary from before the Civil War. I found myself looking up “airplane,” and “gasoline,” and I was fascinated to find those words did not exist!

I remember life before cell phones. I remember life before copy machines. Unleaded gas. I even remember life before cheap electronics! It was when you had to buy military surplus to get a bargain in electronics. If CB radios had been available for \$30 in 1965, just imagine how many would have sold!

So, what if there were no transistors? Let’s just skip over that one invention for a while. No Shockley, no Bell Labs. Remember Univac? If you don’t, it was a huge computer — several rooms full of tubes and relays, hand-wired, and roughly equivalent to a really wimpy four-function calculator. One that required several people and several kilowatts to operate it. Oh, yes — and air-conditioning. Lots of air conditioning.

So, let’s take a trip through your life — home, work, recreation — and remove transistors wherever they are found. We’ll start with this column. Wouldn’t get written. I feel like Jimmy Stewart after Clarence the Angel fixed it so he had never been born. I know it wouldn’t have been written, because when I had my first desire to write, I was using a Teletype machine as a word-processor. Paper tape for storage, mechanical 100 wpm printer. Big, massive, required frequent visits by skilled technicians. Made a lot of noise. It was no IBM Selectric with automatic correction. I was too lazy to write on a typewriter, and re-write, edit, re-write. I knew that someday, a method of editing similar to what I’d used on a Teletype machine would be invented, and I swore to myself when one was available — I would become a writer.

I waited from 1965 until 1990 until a word processor had been invented, and until I could afford one — before I began to write in earnest. Without the transistor, I doubt I ever could have afforded a Univac (and it would have been the size of Cleveland!) to function as a word processor. No one would use a “computer” for anything but mathematical calculations, because the cost of vacuum-tube computers would be so astronomically prohibitive. Poof! There goes the space program. All those unemployed NASA guys would have never had jobs in the first place. No rocket could carry (and power enough of a computer to operate a coffee maker, let alone a navigation system).

Remote-controlled televisions would still use sonic transmitters to mechanical dial-turners. There is something to be said

for the nice smell of dust roasting atop a string of vacuum tubes, though. Guitar players, forced to use tube amplifiers, would long for something to replace the hot, unreliable vacuum tubes, instead of coveting the old “vintage” models as they do today.

If any common carrier could begin to afford a vacuum-tube switching network to operate a cellular telephone site (or reliable 900 MHz transmitters) — who would they have for customers? The super-rich, with dynamotors in the trunks of their cars, powering 900 MHz mobile telephones? The term “trunking” would refer to the way installers mounted telephones in cars— they’d fill a whole trunk!

Could you get through a day without: A copy machine? A computer? A cell phone? Your faithful Palm Pilot? The “brain” in your car that controls engine operation to give you clean emissions? It’s almost unthinkable to imagine our planet without Shockley’s invention—That little bit of silicon which “semi-conducted.” Once it was understood, it was immediately reduced in size until an “integrated circuit” was born. I remember my first IC in a small audio amplifier from HeathKit — it looked like an octopus—round body with eight gold-plated legs. It contained the equivalent of “several components!” very revolutionary.

By the late ’70s, we saw LSI (large scale integration), then VLSI, ELSI and such massive integration that it boggles the mind. We now look at gadgets of the ’60s (my VW Fastback with transistorized electronic fuel injection had 114 discrete transistors, and was mounted inside a box the size of a cake pan) and think that they were comical. Imagine if we had a vacuum tube operated fuel-injection controller. On a bumpy road, or in the desert?

In this room alone (my “office/library/workshop/dung heap”) there are countless gadgets which would not exist if it weren’t for the ingenious minds of those white-coated electronic engineers who wore jackets and ties in the lab. If I began to pick things off my shelves which wouldn’t exist if there were no transistors — including those things whose design, manufacture and distribution required transistors, I doubt I’d have anything here except the few things which were made before 1948 (such as me and my desk)!

The invention of the transistor is as important to the entire world’s society as was the wheel — perhaps even more so, though it’s difficult to hang a value on either. I wonder if the Shockley heirs receive any remuneration for having an ancestor who changed the world more, perhaps than any other scientist? I don’t even think that Frank Capra could conceive of a version of *It’s a Wonderful Life* if it were a story of what the world would be like if Shockley had never been born.

If you run into someone by that name — buy them lunch — and tell them thanks! ■

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