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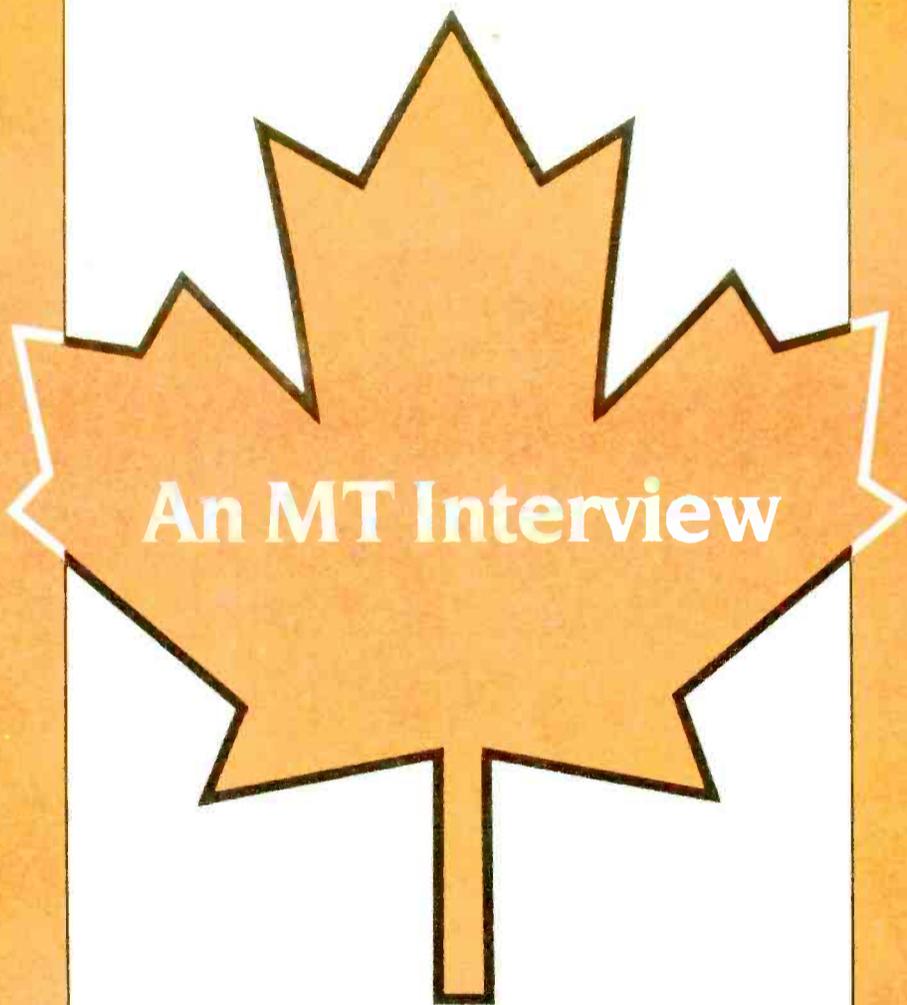
MONITORING TIMES

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Also Inside This Issue:

- **DXing Venezuela**
- **"Gettin' Down"**
Getting Acquainted With the Low Frequencies
- **A Sporting Chance**
Balancing the Odds In The SW Frequency Hunt
- **Magne Tests a New Set from Japan**
A Look at the Marc II

Radio
Canada's
Hot New
'North
Country'
Host



Wojtek
Gwiazda



An MT Interview

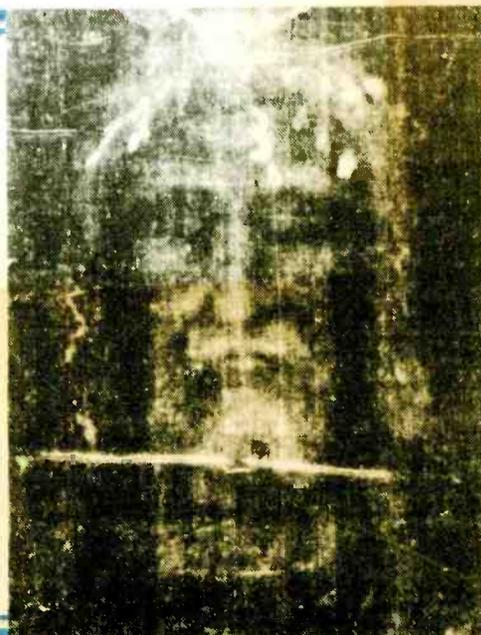
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Dating The Shroud of Turin

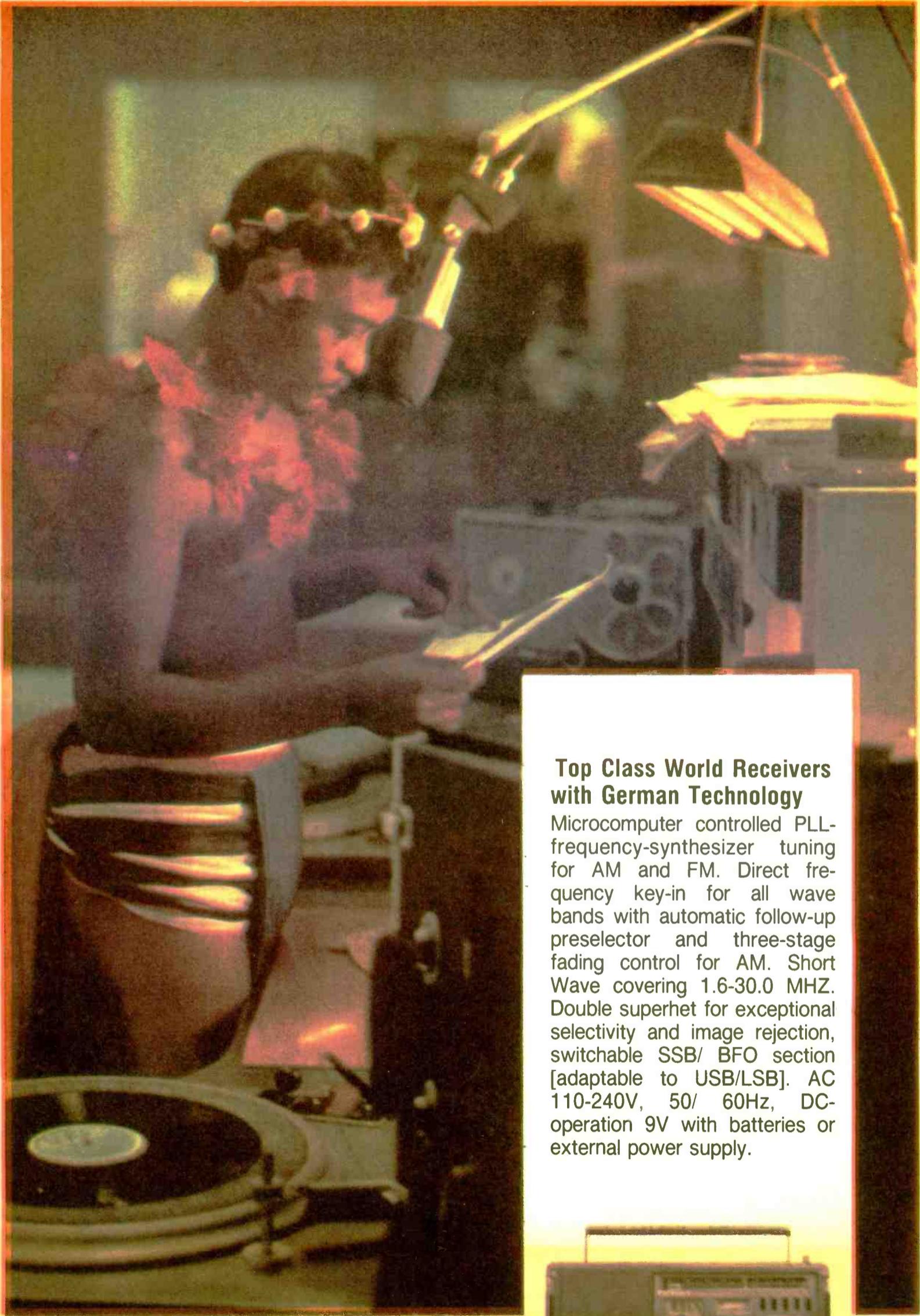
Special High-Tech Christmas Feature

by W. Edmund Hood

[Face section of Shroud of Turin, shown in positive (left) and negative versions]



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From the Publisher: Cellular Censorship: The Rumor is True

A year ago Tandy decided to delete cellular frequencies from their wide range PRO2004 scanner in order to avoid conflict of interest with their cellular telephone marketing program. The exclusion is user-defeatable as first disclosed to the public in the March, 1987, issue of Monitoring Times.

Rumors persisted that other scanner manufacturers might follow Tandy's direction, deleting cellular reception from their scanners to avoid conflict with the provisions of the Electronic Communications Privacy Act (ECPA) of 1986.

As you may recall, this new law forbids anyone from listening in on mobile telephone calls and several other services as well. Its perpetrators, the cellular telephone conglomerate, set out to convince legislators that cellular telephones are inherently private--which they are not.

The ruse worked; in spite of expert testimony to the contrary, Congress was duped into believing the ploy and the bill became law, enabling the cellular marketeers to hawk their wares under the illusion of privacy.

Regency Electronics now includes in all of their 800 MHz scanners a simple "strap" capability--the addition of a wire or diode which will disable cellular coverage if it should appear prudent for the company. A user modification should easily restore Regency cellular coverage; not so with Uniden.

We have just learned that while the Bearcat BC800XLT will continue to receive cellular communications, all future products--including the delayed BC200XLT and future BC950XLT-- will not receive cellular. Their microprocessors will be factory programmed with this disability and cannot be restored as an aftermarket modification.

The trend is disturbing. In 1982 President Reagan issued a proclamation which classified the Government Master File of radio frequencies "Confidential," removing from public access information which had been previously available for decades, an executive action which is unlawful under the Freedom of Information Act.

In 1986 American radio hobbyists learned of the impending ECPA, but were helpless to object in the face of cellular lobby PAC money which purchased Congressional representatives to champion the bill which attempted to legislate that cellular telephones are inherently private--which they are not.

In 1987 the traditional American right to listen to everything being transmitted on the airwaves and penetrating their property, homes and bodies was taken away by the implementation of the ECPA.

Now, in the closing days of 1987, we see manufacturers--one by one--deleting certain frequency ranges from radio receivers in spite of earlier reassurances that this would never happen. It is as though some veiled conspiracy is leveling its sights on the hobby radio listener.

As the ECPA was being railroaded into law by special interests, American radio listeners protested that it is not incumbent upon them to avoid overhearing specific transmissions; inexpensive voice scramblers abound which protect user privacy. Still, the onus of accidentally overhearing some proscribed transmission now sits squarely on the shoulders of the innocent hobbyist.

Are you incensed that your "unalienable rights" are being taken away, auctioned off to manipulative interests--the highest bidders? You should be. And yet there's more.

Still tasting the sweet nectar of success with the ECPA, the Cellular Telephone Industry Association (CTIA) is now pressuring the FCC's Office of Science and Technology to deny certification of any scanner which includes cellular coverage. They assert that since cellular frequencies are exclusive, a receiver which has cellular coverage is primarily designed to hear that service, and thus illegal to manufacture or own.

Would a concerted effort to halt the rising tide of restrictions prove futile? Only if the hobby listening community remains passive, waiting for "someone else" (Who might that be?) to do the job.

Recent efforts--and victories--by TVRO (satellite TV) owners to access the airwaves should be an incentive to radio hobbyists; perhaps their persuasive depositions to Congress could be extended to recreational listening as well.

Remember last year when our editorials urged you to write to your Congressman, protesting the self-serving interests which threatened to impose the ECPA? Did you write? Apparently not; we now have the ECPA. Next year will you have your radio? This could well be your last chance.

Bob Grove
Publisher

Inside

Dating the Shroud of Turin
High technology may answer surrounding one of Christianity's most relics - by author W. Edmund Hood.

Venezuela on Shortwave 6
Once a significant presence on the tropical shortwave bands, Venezuela's stations seem to be steadily decreasing. Charles Sorrell provides an update on where to catch those that remain.

Interview:
Vojtek Gwiazda 8
Radio Canada's lively "North Country" host talks about his singular and successful morning show.

Gettin' Down 10
Your monitoring mission: to explore strange new worlds. To boldly go where few men have gone before -- the low frequencies. Ken Cornell is your capable navigator.

A Sporting Chance 12
DXing the MUF (Most Used Frequencies) way; unbeknownst to you, your own loggings can predict station frequency locations even without your Monitoring Times at hand!

The Swiss Army 42
Because of its unique defense system, preparing for a national disaster in Switzerland is like no other military exercise you've seen. Ugo Lazzarini covers last year's "war games."

DEPARTMENTS

Radio Roundup: Broadcasting	14
Radio Roundup: Communications	18
Plane Talk - Jean Baker	22
Scanning - Bob Kay	24
Special Scanner Review - TS-2 TurboScan	25
Utility Intrigue - Don Schimmel	26
Signals From Space - L. Van Horn	28
FAX Facts - Gregory Mengell	29
On the Ham Bands - Ike Kerschner	30
Domestic Broadcasting - Paul Swearingen	32
Outer Limits - John Santosuosso	34
Havana Moon	
Frequency Section	35
"Ask Bob" - Bob Grove	58
Mailbag	60
Stock Exchange	62

TOOLS FOR LISTENING

Magne Tests... - Larry Magne	45
The Marc II	
Behind the Dials	46
Heath Frequency Counter	
ERD-1 Active Antenna	
EEB Shortwave Converter	
What's New?	50
Getting Started - K. Vito Zichi	52
Helpful Hints	53
Antenna Topics - Clem Small	54
Technical Topics - Terry Staudt	55
Experimenters Workshop	56
Fine-Tuning the Kenwood R-2000	

On the Cover: Preparing the next edition of Radio Canada's "North Country" are (left to right) Slawka Maksymkiw, production assistant, Wojtek Gwiazda, announcer-producer, and Craig MacLaine, journalist; Positive and negative images of the head and face from the Shroud (Photo courtesy Dr. Vernon Miller, copyrighted by Shroud of Turin Project). Cover by Owassa Graphics, Murphy, NC.

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Dating The Shroud of Turin

The Mystery of the Shroud

It is an ancient piece of linen, almost five yards long. There, in the center, is a haunting, life-size image, front and back, of an unclothed man. The man, wearing a beard and long hair, has been brutally beaten, his body covered with dozens of cuts and contusions. Nail marks pierce his wrists and feet. Blood trickles from wounds on the head and arms; splotches on the side. Clearly, the figure on the cloth must have suffered a savage and humiliating death.

It is, in itself, a remarkable piece of art. The body, anatomically correct, appears to be a portrait, uncannily accurate, of the man described in the Gospel as Jesus of Nazareth. Indeed, many believe that this ivory colored piece of linen is the very cloth that Joseph of Arimathea placed under and over the body of Christ in a tomb near Golgotha nearly 2,000 years ago.

The Shroud's appearance is itself something of a mystery, first emerging onto the stage of history during the mid-14th century as the property of a knight named Geoffrey de Charny. Although there is no indication of how de Charny came to possess the relic, there are accounts of a Constantinople shroud bearing "the figure of our Lord" dating as far back as 1203. The following year, it was said, the linen disappeared when crusaders looted the Byzantine capital.

Since the time of its first public exhibition in Lirey, France, in 1389, the Shroud has been surrounded by controversy -- the 14th century, especially, being notorious for relic forgeries. So it is not surprising that the local bishop of Troyes quickly denounced it as a fake, citing a previous investigation which labeled it "cunningly painted." Avignon Pope Clement VII, too, although allowing that the shroud or *sydoine* could be an object of devotion, cautioned the faithful that it was nothing more than a "representation" of the true shroud.

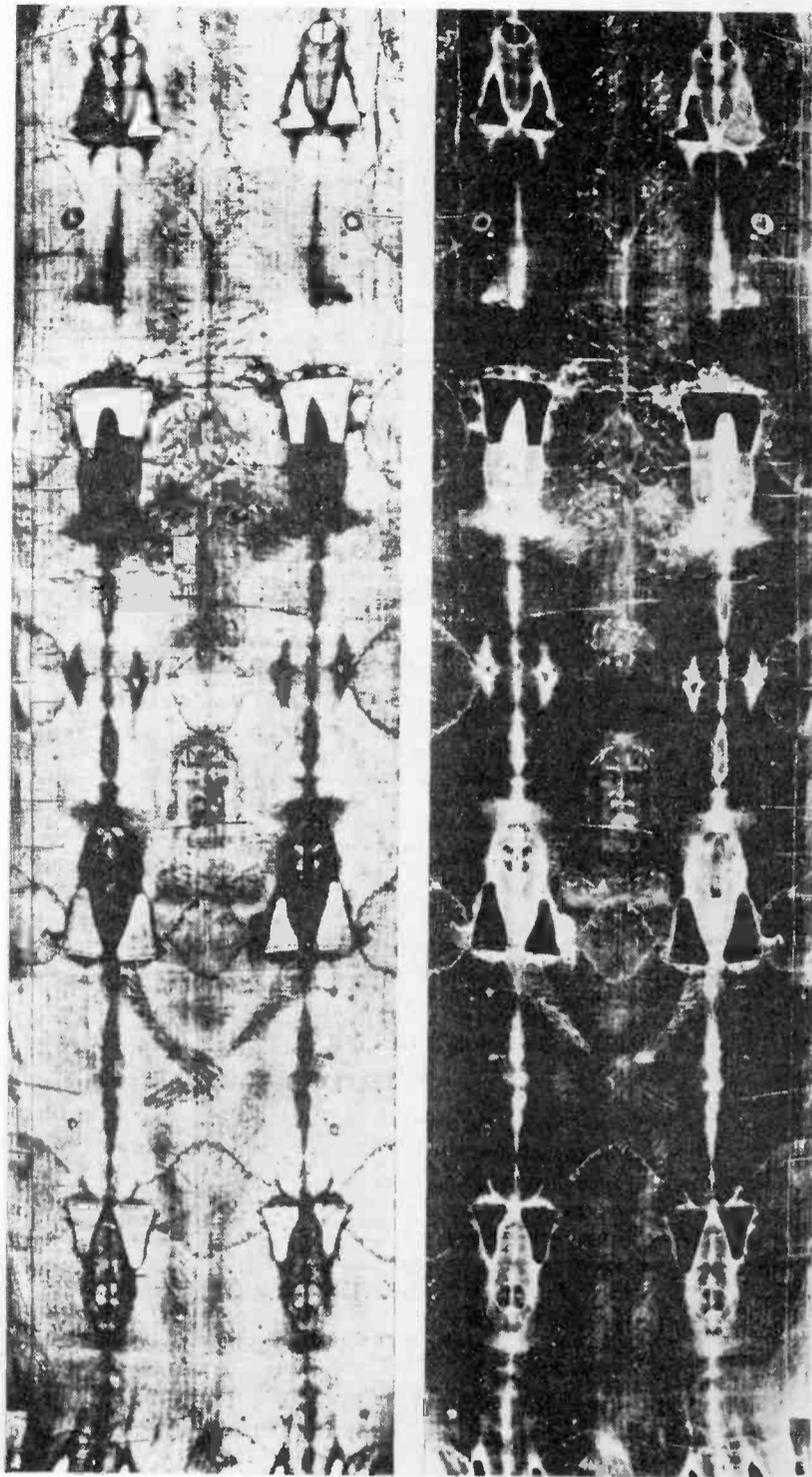
More modern interest in the Shroud began in 1898, coincidental with the

first photos of the relic, taken by Italian Secondo Pia. Pia, when developing his glass-plate negatives of the Shroud, was shocked to see, not the usual unrealistic negative image of his other photos, but a clear, *positive* image of a man! And so it was discovered that the image on the cloth was a true *negative* image. But how could that be? Suddenly, the idea of a hoax, perpetrated by a medieval artist, seemed impossible. Others tried to duplicate the image in a variety of media. And although none succeeded, the controversy became more intense.

Some thirty years later, noted French surgeon, Dr. Pierre Barbet, verified the anatomical accuracy of the marks on the shroud by experimenting with cadavers. He quickly learned that nails in the palms do not support the weight of a man's body. However, a man crucified through the wrists -- as was the man on the Shroud -- will not tear out. A medieval hoaxer, reasoned Barbet, would have based his image on what he had seen in traditional paintings of the crucifixion.

Until very recently, examinations of the Shroud had been restricted to photographs. In 1969 and again in 1973, however, experts were for the first time allowed to examine the Shroud itself. Although the 1969 inspection was only cursory, the 1973 group made several discoveries. Most noteworthy was that the image is completely superficial. There is no penetration into the fibrils of the threads at all. Another discovery, by Swiss criminologist Max Frei, showed that pollen taken from the cloth could be placed in saline areas such as the Dead Sea, Palestine and Anatolia. Still, one thing was missing. Acceptable technology with which to date the Shroud.

The problem was that using currently available technology, a sizable piece of the *sydoine* would have had to be destroyed in order to carry out the test. And it is understandable that the Shroud's owners were unwilling to allow that to happen. All that changed, however, when Dr. Harry Gove stepped onto the scene...



The Shroud of Turin

In these photographically-enhanced views, the image is plainly visible. It is negative in nature, so the negative picture of the shroud shows a positive image. It appears as if the man was laid on one end of the shroud, and then the remainder folded over him; thus you see both a front and back image, aligned head to head (Photo courtesy Dr. Vernon Miller, Brooks Institute of Photography. Copyrighted by Shroud of Turin Research Project)

The Challenge

Not too long ago, a group at the University of Rochester, headed by Dr. Harry Gove, developed a method of carbon dating using a nuclear accelerator. While conventional methods of carbon dating require substantial amounts of material to be destroyed, Gove's method needs less than a square centimeter (about the same size as the tip of your finger).

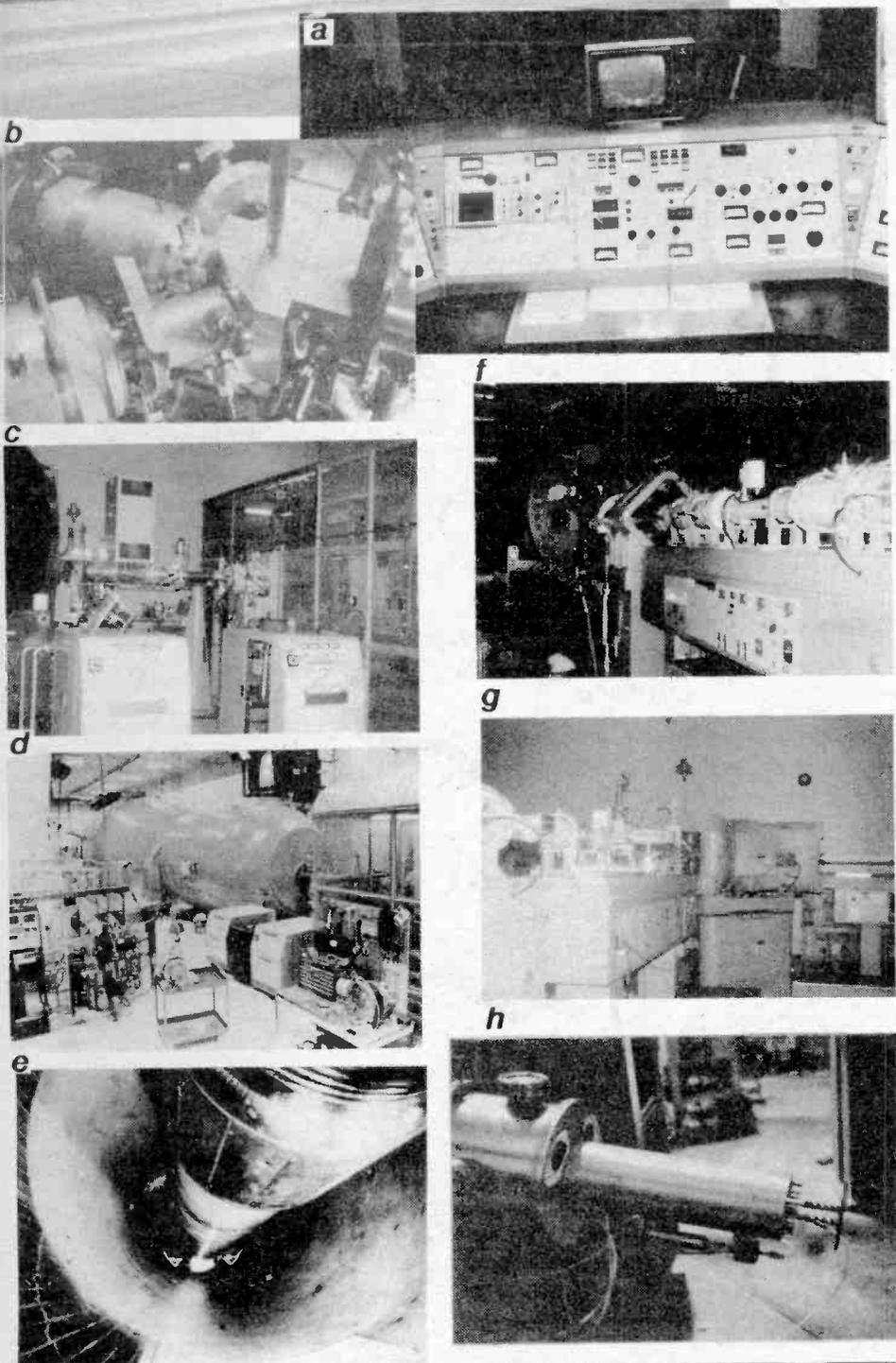
All carbon dating is based on the fact that living matter contains carbon. The testing is based on two types of carbon:

everyday carbon, which is called carbon-12 and a radioisotope known as carbon-14.

Living things constantly take in carbon-14 and pass it out again. The ratio of carbon-12 to carbon-14 is constant and very precise. The carbon-12 is stable, and is part of the remains forever. However, the carbon-14 slowly deteriorates over time. After a few thousand years, there is only half as much as there was when the organism was alive. And the rate of decay is

A High-Tech Christmas Story

by W. Edmund Hood, W2FEZ



Versus the Ultimate Machine

Top; Home of the Accelerator: The accelerator is sheltered under the mound to the right of the offices. Thick concrete walls and earth embankments provide shielding so effective that you could lean on the fence all day while the accelerator is running full power with its most dangerous beam, and you would experience no more than the normal background radiation that is always present everywhere.

(a) Operation of the accelerator is controlled from this console -- separated from it by several thick concrete walls.

(b) The Injector: The carbon atoms from the shroud would begin their journey in this metal chamber. The cesium gun enters from the lower left; the beam of atoms leaves toward the upper left.

(c) The injector and its supportive equipment is housed inside this steel cage. Equipment is monitored from the control console by closed-circuit television.

(d) The Accelerator: The beam is accelerated by a terminal inside a massive tank about the size of a railroad car where a Van DeGraff generator charges the terminal to a positive potential of millions of volts.

(e) Inside the tank: The terminal, at the top right, is about the size of a small car. A column containing the beam tube and pelletron chains enters the terminal from both ends. Normally the voltage would jump the gap from the terminal to the tank wall, but the tank is kept filled with a dense, insulating gas--the only substance that can hold off the voltage.

(f) The high-energy end of the tank: Here the beam tube is surrounded by a set of steering magnets similar to the yoke of a TV picture tube.

(g) The 90-Degree Analyzer: This magnet, using hundreds of amperes current, turns the beam 90 degrees to isolate the desired particles.

(h) Journey's End: Leaving a vacuum higher than that found in outer space, the particles pass into this cylinder, here ornamented with eyes by some humorous technician. Inside, the high-energy atoms ionize a gas, producing electrical impulses sensitive enough to detect individual atoms.

constant. Therefore, if one can measure the ratio of the two isotopes, one can determine how long ago the organism died. Since the linen from the Shroud is made of a plant called flax, Dr. Gove could tell when the plant was cut and dyed -- a good measure of the age of the cloth.

To test this minute amount of material using Dr. Gove's method requires an array of equipment that could more than fill a football field. Beginning in a steel cage containing a platform, crowded with equipment, the shroud material would move at about a quarter the speed of light through a massive tank as big as a railroad car. Inside the tank, an electrode as big as a small automobile, charged to several million volts, gives the material the needed energy for testing. Then it continues on through a long tube past an electromagnet whose current is measured in the hundreds of amperes to a small, gas-filled chamber.

The machine just described is the University of Rochester's tandem Van DeGraff electrostatic accelerator. Its massive size is testimony to the amount of energy that must be imparted to the atomic particles in order for accurate measurement to be made of such minute quantities as the amount of carbon-14 in the tiny scrap of shroud material.

The scrap of the shroud must first be carbonized in an inert atmosphere, and the carbon deposited onto a sample holder which is then placed in the injector. There, in a small chamber mounted on a platform charged to a negative 150,000 volts, the particles will begin their journey. A beam of cesium atoms knocks carbon atoms loose from the sample. The carbon atoms have either positive, negative or neutral charge. The negatively charged atoms become the beam for the accelerator.

Inside the accelerator tank, a highly sophisticated version of a Van DeGraff generator charges the terminal to about six million volts. (The machine goes as high as 18 million volts, but six is all that's needed for this job.) The negatively-charged carbon particles are attracted toward the positively-charged terminal. As they reach the vicinity of the terminal, they are moving so fast that inertia carries them on past. At that point, the particles pass through a "stripper" foil, which strips the electrons off the carbon atoms. The carbon atoms are now positively charged and are repelled away from the positive terminal.

About fifty feet after leaving the accelerator tank, the beam is turned 90 degrees by a massive electromagnet.

This is very important. At any given energy level, it takes slightly different amounts of magnetic flux to turn different atoms exactly 90 degrees; consequently, only the carbon 12 atoms make the turn exactly and continue on down the beam line.

After passing the 90-degree magnet, the beam is intercepted by a Faraday cup and the current is measured. The intensity of carbon-12 in the beam is now known. The Faraday cup is then removed and the 90-degree magnet current adjusted to isolate the carbon-14 portion of the beam. This amount is so minute that it cannot be measured with a Faraday cup. Instead, it passes through a gas-filled chamber where the passage of the atoms ionizes the gas producing measurable electrical impulses. This detector is so sensitive that, at the energy level of the beam, it can detect individual atoms.

The measurements of the carbon-12 and carbon-14 are now compared, and the ratio of the two isotopes used to calculate the age of the material. This process will take place in seven different labs, each testing two control samples of known age, and one actual sample of shroud material. The labs will not know which is which. The British museum, which is overseeing the project, will then examine the data from the labs and announce the result.

Now, you may ask, "What will all this prove?" If the age of the material is just a few hundred years, it will prove that the shroud is either a fraud or an icon -- a piece of ancient religious art. If the age is correct, it will not prove the shroud to be Christ's -- only that it could be. While some may feel that negative results could shatter the faith of many Roman Catholics, in reality it shouldn't. Neither Catholics nor any other Christian denomination bases their faith on any relic. Religion goes deeper than that.

If it were proven not to be genuine, the shroud is still an object of great mystery. Nobody has yet determined how the image got there, or where, if it is man-made, its maker acquired such medical knowledge as is exhibited on the work six centuries ahead of his time. The shroud, whether it is Christ's burial *sydoine* or not, is a highly accurate, haunting reminder of one of the principal focal points of Christianity. ■

The author has been a ham since 1951, living in upstate New York for the past 19 years. He holds a bachelor degree in electronic technology and manages the electronic shop at the University of Rochester's Nuclear Structure Research Laboratory.

Venezuela on Shortwave

A Study in Changing Times

Do you remember Escuelas Radiofonicas? Or Radio Vision or Ondas Panamericanas? How about Radio Libertador, Radio Puerto Cabello, Radio Trijillo? Do Radio Maracay, Radio Monagas or Radio Impacto ring a bell? Would the mention of names such as Radio Barcelona, Radio Frontera, Radio Bolivar or Radio Lara jiggle any memory cells? If not, what about La Voz de Apure, Radio Maracaibo, Radio Tropical, Radio Juventud, Radio Caracas, Radio Coro or Radio Sucre? Perhaps Radio Bocono or Radio Reloj Continente?

All of these stations - and any number of others - have been on shortwave from Venezuela and, as recently as a decade ago, were still listed in the standard reference books of the industry. One well known DX'er has logged 56 Venezuelan shortwave broadcasters over his not inconsiderable listening career. And yet right now, most lists contain the names of only about 20 stations. And a half dozen of those are inactive.

What's going on here? We seem to be seeing a slow yet near inevitable attrition taking place in Venezuelan shortwave broadcasting, right before our very ears. No one has expounded any theories as to why this situation has developed nor does this author have any ideas to offer aside from the usual semi-educated guesses (the economy, disinterest in shortwave broadcasting and such). Perhaps the slide has now reached bottom, perhaps the pattern is unstoppable, perhaps, like other countries, the plunge will reverse itself sometime in the future, who knows?

Get'em while you can!

We can't tell just how rock solid the foundations are of those Venezuelans currently on shortwave. Will

Venezuela seems to be disappearing from the airwaves as her number of active shortwave stations continues its steady decline. Where will it end?

one or more of them be gone tomorrow? Next week? Should they not be grabbed off and recorded for history in our logs "ASAP"? The question reflects the view taken by the hardcore DX'er looking for one more catch. The listener interested more in program content - in the case of Venezuela, Latin music - may simply want to pay some attention to these stations while it still possible. Many of them play some absolutely superb Latin American music, ranging from the more traditional tropical sounds of the coast to jazz and African-influenced tunes to the Latin rock beats of the big cities.

So, whether you want to tune in the "YVs" to get them while you can or just want to discover them for their great music, here's a look at who is where.

Where to look ...

But first: Rather than repeat sign on and off times over and over throughout the listings, let us save both space and effort and say that, in general, Venezuelans sign on at 1000 UTC and sign off at 0400. Your best bets for evening reception are on 60 meters, lesser so 90 meters. It is smarter to check for sign-ons for those stations on 49 meters, thus

escaping a lot of evening interference from the powerhouse international broadcasters. The one or two Venezuelan stations which use 31 and 25 can normally be heard during the daytime hours.

With a little bit of effort, and less, really, than most other countries of Latin America, it's possible to hear all the stations active from Venezuela. Once you have accomplished that, it's simply a matter of watching for new stations to come on the air, or older ones to be reactivated -- and then catching them as they show. It's a tough job but somebody's got to do it. Why not you? ■



by Charles Sorrell

ACTIVE VENEZUELAN SHORTWAVE BROADCASTERS

- 3225 - is home to a longtime Venezuelan broadcaster, Radio Occidente in Tovar, which has a lengthy history of coming on and going off the air for extended periods. YVTC uses 1 kW and may or may not be there when you try for it tonight, depending in almost equal parts on the propagation conditions on 90 meters and whether shortwave is "in" or not at the station this month.
- 3255 - La Voz del El Tigre in the town of El Tigre is another voice which may or may not be in an "on" phase when you try for it. In any event, it may turn up just a shade under the listed frequency if it shows at all. It's listed for 24 hour operation, though, and also may use the ID "Radio Novecientos Ochenta" (Radio 960) reflecting the medium wave channel which it uses and whose programming is relayed on shortwave.
- 3275 - Radio Mara in Maracaibo was being heard by DXers this past fall, after an apparent period of inactivity. YVMC, like most of the Venezuelans, uses only 1 kW on shortwave. It, too, is an old time shortwave station which comes and goes perhaps as a result of a tired transmitter? Anyway, it seems to be active again.
- 4780 - La Voz de Carabobo in Valencia takes its name from the Carabobo indians in that area. It can almost always be found on this frequency in both evenings and early mornings though it often suffers interference from nearby stations as well as utility station.
- 4830 - Radio Tachira in San Cristobal returned to the air a couple of years ago, after a long absence from shortwave. It is a pretty steady performer now, although it does suffer interference from Radio Reloj in Costa Rica on 4832. If you can notch out Reloj, you can usually hear this very well. There's lots of excellent Latin music on the air all evening.
- 4840 - Radio Valera in Valera has also come and gone a few times during its shortwave life. Currently, it is with us. Trouble is, there's interference some nights from co-channel Peruvian, Radio Andahuaylas and from the occasionally active Radio Interoceania, Ecuador, both of which use 4840.
- 4850 - Radio Capital in Caracas (maybe that's why they named it "capital") is available most nights with its 1 kilowatt signal. It is listed to run 'round the clock on weekends and normally provides a fairly good signal.
- 4970 and 9660 - Radio Rumbos in Caracas is an old standby from Venezuela. Always there and almost always with a top notch signal -- which isn't surprising since it runs a healthy 10 kW into both frequencies. 9660 provides good reception during the day and 4970 in the evening. As a result, Rumbos can be enjoyed most of your waking day.
- 4980 - Ecos del Torbes in San Cristobal is another 10 kW power pack, although there are some occasions when this one goes off the air without explanation. The station gained some notoriety a few years back when Radio Earth announced tried to buy airtime there. Ecos del torbes is also famous for having aired anti-Cuban programs from La Voz del CID. On occasion, you may hear the station operating 24 hours a day, although regular sign off is at 0400 UTC.
- 5020v - 9540 inactive, 11695 inactive, 11816 -- Radio Nacional de Venezuela, the government-owned outlet from Caracas is still developing its multi-lingual international service using high power transmitters on the international bands. But so far, the programming remains almost entirely in Spanish. 5020, which varies to 5022 kHz, is usually active in the evening. 11816 is audible during the day. For the most part, the station features cultural programs and excellent programs of classical music, a la Radio Nacional de Colombia.
- 6010 - Radio Los Andes in Merida also IDs as Radio Mil Cuarenta. Here's one that you probably won't catch in the evenings due to heavy QRM from the big guns who have more important missions than this poor little Venezuelan. In any event, it is possible to hear -- sometimes -- in the mornings -- but seldom at very good readability or for a very long period.
- 6130 - Radio Valles del Tuy in Ocumare del Tuy is in an uncertain status. It's hard to tell if it's active or not since it is heard so infrequently. It's another which is best sought a sign-on time, about 0900 UTC.
- 6180 - Radio Turismo, another station from Valera, is also a question mark insofar as current activity is concerned. Check for it at 0900 UTC.

Wojtek Gwiazda

Radio Canada's Hot New



Shortwave radio is like a time machine. Spin the dial and you'll hear programs virtually unchanged since the days of World War II. Unfortunately, this involuntary trip down shortwave's memory lane isn't necessarily a look at shortwave's "Golden Age." Instead, it's a look at a medium with an identity crisis; one that never grew up.

The problem is that shortwave didn't really begin as a broadcasting medium. Originally conceived as a method of communication between and among ships at sea, its international potential was first noticed and then immediately grabbed by the governments of the world. That government stranglehold on the HF

broadcast bands has remained virtually unbroken for half a dozen or so decades. The result is that today the medium is enveloped in an atmosphere of pure bureaucracy, one that seems to quickly choke even the most professional and highly motivated broadcasters.

That's why, nine times out of ten, when you turn on your shortwave radio, you're going to hear some of the driest, most arid and esoteric programs ever to drift through the ether. Because of this it is not at all unusual, unfortunately, to hear such gems as "Copper Wire Production in Bulgaria, Pt. 37," "A Day in a Moscow Boot Factory," or "Quill Pens of The American Constitution."

There have been and continue to be exceptions to this dusty diet. Even back before World War II, people like Radio Nederland's Eddie Startz were leading one-man crusades to show that the medium could be entertaining and informative as well as "politically ideological."¹ As time went on, other names continued to champion that concept: Tom Meyer, Willis Conover, Jeff White, and Rudy Espinal, among them.

Fortunately, there seem to be others who share that dream -- to make shortwave broadcasting something beyond a private government-to-government party line. Something of interest to people who don't own soldering guns and who don't care about tuning in low powered stations in languages they don't understand. New commercial stations in the United States have, in recent years, attempted to stretch the sorry programming traditions of the medium.

Ironically, one of the hottest and most masterful names in international broadcasting happens to work at a government station: Radio Canada International. His name is Wojtek Gwiazda (pronounced Voytek G'VEE as duh).

The Man

Host of the station's fast-growing morning show, North Country, Gwiazda was born in Manchester, England, of Polish immigrant parents. He first got interested in broadcasting by accident, when, as an aspiring writer and student broadcaster, he walked into the Canadian Broadcasting Corporation (CBC) out of curiosity and was offered a job.

"I started free-lancing for the CBC while I was still at University," says Wojtek, "and when I graduated, kept on free-lancing -- for the domestic service, local programs, the network and even Radio Canada International."

But international shortwave broadcasting was hardly Gwiazda's original focus. "That was not my main market. But I did it for years and years, along with work for newspapers and magazines, on all kinds of topics -- anything you would do as a free-lancer."

Despite some success as a free-lancer, Gwiazda decided to take a break and return to school for his Masters degree in history. And while he did get the coursework done, he never did receive his degree. Instead, he was hired by Radio Canada International.

"I started with RCI as a production assistant and was really lucky. We have a very wide jurisdiction in terms of the unions we belong to. I could do anything I wanted, except touch the machinery in the studio. So that meant that I got to do all kinds of things, from news and current affairs to music programs.

"A shortwave listener, and not a hobbyist," Gwiazda relies on his radio to keep an ear on the competition and to see how other stations are presenting their programs. "When I listen to the other stations and consider the resources that we have at Radio Canada International, I think we're doing a fairly good job."

The Program

Gwiazda is far too modest. Instead, his North Country program is a perfect example of what *can* be done despite limited resources and budget cutbacks.

"When I heard about the program -- even before I started doing it -- I thought that it was a great idea," says Gwiazda. "This is a program that is typically Canadian, something that you might hear on the domestic service on any station in the country. Yet we tailor it with information so that it appeals to an international audience."

North Country is, in essence, a Canadian version of the [U.S. National Public Radio's] highly acclaimed Morning Edition, complete with international news, music and sports, a financial report, features, and even weather. It is a relatively new addition to Radio Canada's line-up. Begun in the fall of 1985 and originally hosted by Judith Ritter, it is peppy, occasionally humorous, and oriented to news and information; tight and fast-paced.

And opening at 1300 UTC (8:00 a.m. EST), it is one of the few programs -- perhaps the only one -- specifically tailored to the North American morning audience.

'North Country' Host



Gwiazda himself gets underway at 5:30. Within a half hour, he's hard at work, packing a brown bag lunch in the kitchen of his Montreal home, and scanning local radio stations for things he can use in his show. He's out of the house by 6:20 and at work soon thereafter -- The studio is only ten minutes away.

Once at work, the first job on the agenda is a review of internal CBC audio feeds from all over Canada. Then there's a meeting with other journalists, most recently, Craig MacLaine, who joins him later on the air for a look at Canadian newspaper headlines.

"Once we get through all of that -- looking at what's in the newscasts, the newspapers, and the features -- we try to examine the program for 'holes' to make sure we've covered everything. At about 7:15 or 7:30, we're taping interviews (although some are done live) and by 7:55, we're in studio and ready to go on the air."

Actually, all of North Country is done live, right down to the 12-1/2 minute newscast from the CBC that starts the program.

"I think that the fact we are live is one of the reasons why North Country sounds as good as it does," says Gwiazda. "Sometimes we do make mistakes on the air as a result -- maybe cue up the wrong report or the wrong record. But for the listener, that's proof that we are really doing the show at the same time that they are hearing it."

"We even have a window -- we are one of the rare studios in CBC that has one -- and can see what's going on outside. During the course of an

hour, I can actually say whether it's getting darker, clearer, or whatever. A lot of Radio Canada's programs are done live [for their initial airing], but we have the window!"

The Philosophy

That window is important to Gwiazda's philosophy of North Country. "I emphasize the weather in Montreal because I want the listener to get a feeling of this country as a real place."

Gwiazda's vision for North Country is expressed in a joke he tells the staff: that he would like to include live traffic reports for major North American cities on the program. When asked if such a thing might be possible, Wojtek laughs and says, "No," but then quickly parries: "People have said that North Country sounds like private radio, and there's an element of truth there. I'm trying to give people an idea of what Canadian radio sounds like."



"North Country," continues the young broadcaster earnestly, "isn't a question of educating the listener or giving them propaganda. It's a question of giving them a chance to understand, for instance, Canada's position on free trade and to understand why some people are in favor of free trade and others strongly opposed to it. If I can get [an audio tape of] a good debate from the House of Commons, I'll sometimes go for the debate rather than analysis by an expert."

"What I think we have is an informal style that's very open. I try to talk with the listener and not to whoever is in the studio."

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On the Air

Four people are in the studio whenever North Country is on the air. Included in the team is a technician, journalist MacLaine, and assistant Slawka Maksymkiw. "All of us," says Gwiazda, "are hoping that we can come up with the best possible product, and that's the beauty of it. Even though we might all be running frantically around the studio, there is a goal, a responsibility, to provide as much of the best information as we can for the listener, and that's a real high."

Gwiazda and company should be high on North Country. In just a short time the program has become one of the most popular, fastest-growing programs on shortwave -- itself a tribute to high technology.

For if it wasn't for those little, high-tech shortwave radios now available, North Country's popularity might not be. After all, who would want to

drag one of the big old tube radios into the bathroom so they could listen to Canada while they shave? It is, in all, part of the changing times that world band radio is experiencing and North Country is a model for the future.



1. Donald Browne. *International Radio Broadcasting: Limits of the Limitless Media.*

North Country can be heard from 1200-1300 UTC on 9625 11855 and 17820 kHz.

Gettin' Down

Getting Acquainted

by Ken Cornell, A.R.S., W2IMB

Anyone who has fooled around with a radio receiver has probably noticed that there is a frequency range that extends below the normal AM broadcast band. In fact, many of the newer receivers have a tuning range down to 150 kHz. Yet how many owners have seriously studied this LF spectrum?

There are thousands of operational stations on the air with most of your airport and navigational beacons being located at the higher frequency end of the LF spectrum. European and other foreign AM Broadcast stations can be found at mid-range and the Omega navigational system is at the lower end. Searching for stations in this LF range is not for the timid or easily frustrated. We are dealing with extremely weak signal detection.

For many radio hobbyists, however, the most interesting frequency range is the 160 to 190 kHz band known as the *LOWFER* band, ("LOWFER" is short for Low Frequency Experimental Radio Station). In Section 15 of the FCC rules, they permit the use of a transmitter without a license. Any transmitting mode may be used except damped waves for communications or other experimental endeavors. Transmitter power is limited to one watt input to a final amplifier, antenna length to 15 meters including transmission line and below 160 kHz or above 190 kHz be suppressed 20 dB below the unmodulated carrier (Section 15:112).

One watt of input power is discouraging enough. But to use an antenna only slightly less than 50 feet long on a frequency that has a wavelength of over a mile long seems like a real "forget it!" as far as any useful communications is concerned. LOWFERS, however, have proved that contacts in 200 to 300 mile range are not uncommon.

Once you get below 10 kHz, however, all FCC rules concerning transmitter licenses stops. There are no power or antenna limitations as long as any harmonics or spurious signals do not fall above 10 kHz. The range, from 10 to 500 kHz, is only a frequency spread of 490 kHz -- smaller than the 3.5 to 4

MHz amateur radio band. Yet it is amazing how many signals can be crammed into this space.

It's very hard for many radio buffs to rationalize the compression of frequencies as we go lower in wavelength. For example, a 365 pf variable capacitor will tune the entire AM broadcast band, yet as you approach 10 kHz, it will tune a tuned L/C circuit only a few kHz. LOWFERS don't specify their operating frequencies down to 1 kHz. They use decimal points like 187.65 kHz.

Most LOWFERS run beacons with their signs (any call sign can be used except ones issued to another station by the FCC) and the search for these beacons can be quite a challenge. The reward is some very unique QSL cards and confirmed reception reports of over 1000 miles.

Let's Get Started

The low frequency DX season is now under way. It runs from late fall, through the winter, and into early spring. During the off-season, however, listening in the early morning hours from just before sunrise to about 10 AM can produce some surprises. Sunset is also worth a listen though the noise level is usually high at this hour.

Noise is the LOWFER's biggest problem. Most of it is man-made and easily picked up by the receiving antenna. Even your own home can be an offender -- light dimmers, fluorescent lights, TV sets, appliances, bug blasters. Noise that comes in on the power mains can be reduced with filters and good grounding and many solid state receivers can be battery operated.

Long wire antennas can be very effective noise collectors and the type of noise received is so bad that using average receiving techniques will hardly even cut the brush.

As a result, considerable attention must be given to the receiving antenna. I happen to live in a high noise level area and after much experimentation have settled on active antennas. These are broad-



Popular among VLF listeners are commercial or military surplus frequency selective voltmeters like the Rycom R2174 and noise measuring test sets like the Ailtech NM17/27A and Singer NM25T shown here.

band devices with a 30" whip mounted on a weathertight enclosure containing a preamplifier. It uses coax cable feed with a receiver coupler/power isolator located in the shack.

I use three of them, one mounted in front of the house, one in the rear and the third at the side, each mounted on the eaves of my house. A switch allows selection of the one that gives me the best signal to noise ratio (S/N/R). The difference in performance can be, at times, remarkable.

Loop antennas with a preamplifier are also quite popular since the loop has the classic figure "8" pattern. Signal strength can be intensified off the front and rear lobes and the sharp nulls off the sides can be used to attenuate a noise source or interfering signal. Keep in mind, though, that if your home has metal siding or stucco on wire mesh (my case), the loop may be ineffective for all practical purposes. Some operators get around the problem by using a large diameter shielded loop (6 to 8 feet in diameter) with a broadband preamplifier mounted outside on a TV rotator.

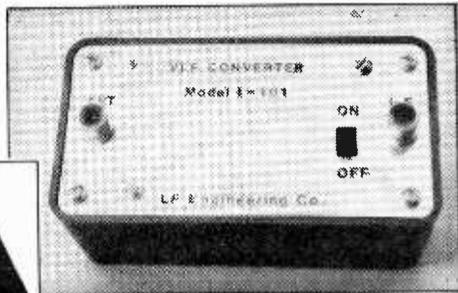
Considering the wavelengths involved, we are basically dealing with extremely short antennas with

a minimal capture area. Therefore a preamplifier between the antenna and the receiver is highly recommended. I have yet to hear a receiver whose sensitivity could not be improved with a preamplifier. My favorite is the regenerative type.

It is amazing how a regenerative RF preamplifier, properly tuned and at the threshold of oscillation, will pull an almost unreadable signal up out of the noise level. I describe a regenerative amplifier in my scrapbook and have received letters stating that the users are now copying LOWFERS signals comfortably whereas before they could not even detect the signals!

Unfortunately for the average shortwave enthusiast that likes to hear voices and music, the vast majority of the activity involves CW (code). While there are some airport and navigational stations using voice for weather reports and a few RTTY stations, most of your beacons, including LOWFERS, use CW. The good news is that they transmit their code at very slow speeds -- speeds so slow that copy is not that difficult. A tape recorder can make the job even easier. There are, however, some LOWFERS, particularly on the West Coast, that use AM and SSB.

with Low Frequencies



You don't need to go out and buy a new receiver to bring in the LOWFERS -- On the market are several excellent converters to use with your existing receiver, such as these by Palomar Engineers and LF Engineering.

There's no use in trying to deceive aspiring LOWFERS about the possible results on these frequencies. Several LOWFERS have experimented with powers as high as 2 kW or more and fairly sizeable antennas and have still been unable to get out more than a mile or two. It might also be wise to point out that even at low power, shock can be painful. At higher power, they can be lethal. All exposed feedline and antenna wires must be well protected from accidental contact with the body.

Using What's on Hand

Equipment can be quite simple and an audio amplifier with a proper frequency control will do just fine. Due to the bandwidth required, though, voice communications can not be used in the ELF spectrum -- an area used by Uncle Sam to communicate with submerged submarines.

If you have a respectable receiver to start with -- regardless of its frequency range -- the simplest approach for tuning the LF to ELF range is the use of a converter. You can use any 500 kHz tuning range on your receiver and you will probably find that the 3 to 4 MHz range is best. It is usually in the receiver's most sensitive range.

A simple converter consists of nothing more than a mixer stage

and a local oscillator that is crystal controlled. Some designs use a broadband RF stage ahead of the mixer. If we consider the received signal frequency as f_1 and the local oscillator frequency as f_2 , then when the local oscillator signal is fed into the mixer with the incoming signal, the two frequencies beat against each other producing another frequency signal, f_3 , that is f_1 plus or minus f_2 . For example, if we use a 3000 kHz crystal the receiver will tune in 10 kHz @ 3010 kHz, the LOWFERS band would tune 3160 to 3190 kHz and 3500 would be 500 kHz.

You may also find many types of older tube type LF to ELF receivers in surplus outlets and various radio flea markets.

Those interested in obtaining more detailed information on activities and technical data may find the following of interest.

The Low and Medium Frequency Radio Scrapbook (5th edition)
Ken Cornell
225 Baltimore Avenue
Point Pleasant Beach, NJ 08742

Receivers and reception aides, transmitters, antennas, coil winding, Solar Flare Detection and the FCC Rules and Regulations, Section 15. \$15 per copy post-paid book rate US. Foreign, allow 1 lb. US Funds.

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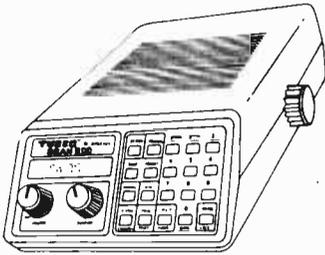
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- TS-2 75ch, 29-54, 118-174, 406-512, 806-956, AC/DC.....338.00
- TS-1 35ch, 29-54, 118-174, 406-512, AC/DC.....249.00
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Shortwave Directory
Bob Grove
Grove Enterprises
P.O. Box 98
Brasstown, NC 28902

For the first time, this edition of Grove's SW Directory has a VLF section which concentrates on beacons and military

stations which can be heard below 500 kHz. \$12.95 + \$1.95 shipping.

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\$10 per copy postpaid 1st class mail US. Foreign \$15 airmail US Funds payable to Ken Stryker. Up to date listing of over 6100 beacons from the Western Hemisphere, Pacific and Asia with frequencies, locations, power, etc. with cross references.

The World Below 500 kHz
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MONITORING TIMES

December 1987

11

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A Sporting Chance

Shortwave Listening the MCUF Way

To the average person looking through the over 1100 shortwave channels, the search for a specific station can be very frustrating. After all, international broadcasters change frequencies four, six, even eight and ten times a year. Add to that the changes in broadcast schedules brought on by daylight saving time (both in Europe and North America!) and it becomes almost impossible to follow. The truth is, you can't tell the players without a program.

To continue with sports as the basis of this analogy, you might even say that shortwave broadcast frequencies are like managers for the New York Yankees: they both change a lot. The analogy, however unusual, is more than superficial.

If you look at a list of the names of people who have held the skipper's job with that baseball club, you'll undoubtedly notice that one name keeps popping up over and over again: Billy Martin. Yankee's owner George Steinbrenner keeps falling back on an old reliable.

What most people don't realize is that shortwave broadcasters do the same thing. If you look at a list of shortwave frequencies that a specific station uses over the years, you'll notice that they, too, have their "old reliables" -- frequencies that are used over and over again. The trick is to find them.

There is such a trick and its name is "MCUF" (pronounced "EM cuff") or Most Commonly Used Frequencies. By examining spectrum occupancy data from the past five years, we can pinpoint where a station will probably be found. In essence, this is a list of the Billy Martins of shortwave broadcast frequencies.

How to Design an MCUF List

If you have kept reasonably good logs over a period of a few years, making an MCUF list for your location will be a piece of pie.

Pick a station. For our example, we'll use Radio Polonia. Leaf through your logbook and make a list of all of the frequencies on which you've heard Radio Polonia. In one column, list all of the ones used in 1987; in the next 1986; in the next, 1985; and in the last one, 1984.

In its simplest version, all you need do is compare those five years of Radio Polonia frequencies and look for frequencies that keep reappearing. Often, you'll be surprised to see just how stable a station's frequency usage is!

For those with an eye towards detail and perfection (and who have a computer on which to work), "weights" should be assigned to each frequency. For example, frequencies used in 1987 should get a 5, frequencies used in '86 a 4, and so on.

Then look for all of the times a frequency appears over the years, add up its "weights," and drop all frequencies under, say, 12. You'll have a good, working and surprisingly accurate list of regularly heard frequencies for the station.

You can, of course, "self tune" your MCUF list by experimenting with cut off "weights," tailoring them to what has been heard at your location.

When using your MCUF list, keep in mind that in an effort to avoid losing listeners a station will often, when forced to change frequencies, stay as close as possible to an MCUF frequency. For example, if the BBC, which uses 6175 kHz, had to move because, say, Radio Moscow decided to occupy the same frequency, chances are they're going to stay as close to 6175 as possible. Look for them above and below 6175, maybe 5, 10, or even 20 kHz away.

There are, of course, some stations with no reliable pattern of repeated frequency usage. Those stations, it seems, choose their spots on the dial with the aid of a roulette wheel. In the accompanying list, taken from the soon-to-be-published *Shortwave Directory* by Bob Grove, we've based



**You can't tell the players without a program, and goodness knows the SWLer needs one!
A little advance scouting will help you improve your batting average.**

our information on worldwide frequency information for all languages. And we've added some currently used frequencies. The *Shortwave Directory* will be available in January for \$12.95 plus \$1.50 shipping from Grove Enterprises, Box 98, Brasstown, North Carolina, 28902.

Remember that what you have is a list of most commonly used frequencies -- not all are on the air at any given time. Some may be off the air for months. But what you do have is a list, based on historical fact, that greatly increases your odds of hearing a particular station. ■

Most Commonly Used Frequencies

A Partial Listing from the 1988 Shortwave Directory

Albania: Radio Tirana 1	9835 11910 12000 15160 15220 17710 21525
5985 6135 6170 6185- 6200 7030 7065 7075 7080 7090 7120 7145 7235 7275 7280 7290 7300 7310 9375 9430 9480 9500 9515 9520 9715 9750 9765 9790 10510 11835 11845 11905 11915 11935 11965 11985 15435 16230	
Albania: Radio Gjirokastra 1,2	Iraq: Radio Baghdad 4
5020 ^a 5057	6100 6195 9875 11705 11790
Australia: Radio Australia	Italy: RAI (Radiotelevisione Italiana)
5995 6035 6060 6080 7135 7205 7215 9505 9580 9620 9710 9760 9770 11720 11730 11800 11855 11910 15140 15160 15240 15320 15365 17715 17795	5990 6050 6165 7235 7275 7290 9575 9585 9710 11800 11810 11905 15245 15330 15385 17715 17780 21610
Belgium: Belgische Radio en Televisie (BRT)	Korea (South): Radio Korea
5895 5910 6010 9880 11695 11965 15515 15590 17595 21810	5975 6060 6135 6480 7275 7550 9570 9640 9750 9870 11725 15395 15575
Botswana: Radio Botswana	Kuwait: Radio Kuwait
3356 4820 5995 7255	6055 7120 9750 9840 9880 11675 11990 15345 15495 15505 17850 17885 17895
Canada: Radio Canada International	Libya: Radio Jamahiriya 4,9
5960 5965 5995 6015 6055 6065 6140 6195 7155 7230 7235 7285 9535 9555 9590 9595 9615 9625 9650 9755 9760 11710 11720 11775 11840 11845 11850 11915 11935 11940 11945 11955 11960 15140 15150 15235 15260 15315 15325 17820 17875	6155 6185 7245 9600 9890 15235 15415 15450 17895
Czechoslovakia: Radio Prague	Luxembourg: Radio Luxembourg
5930 6055 7345 9505 9600 9605 9630 9740 11855 11990 15110 17705 17840 21505 21705	6090 15350
Denmark: Danmarks Radio 2,4	New Zealand: Radio New Zealand International 4
6140 9740 9765 11910 15165 17770 25850	11780 11960 15150 17705
Egypt: Radio Cairo 9	Norway: Radio Norway International
9475 9495 9620 9655 9675 9740 9755 9770 9805 9850 11665 11715 11785 12050 15155 15175 15210 15255 15335 15375 15420 17670 17675 17690 17745 17785 17800 21465	6015 6030 7210 7235 9525 9590 9675 11850 11860 11870 15165 15180 17840 21700 21725 21730
Finland: Radio Finland	Poland: Radio Polonia
6120 11755 15265 15400 21475	5995 6095 6135 7125 7145 7270 7285 9525 9540 9675 11815 11840 15120 17865
Gabon: Afrique Numero Un	Portugal: Radio Portugal 4
4830 7200 11940 15200 15475 17870	6095 9600 9740 11800 11840 15250 15285 21700
Germany (Federal Republic): Radio in the American Sector (RIAS) 2,5	Qatar: Qatar Broadcasting Service
6005	9905 11820 17830 17910
Greece	Romania: Radio Bucharest
9420 9865 11645 15630 17565	5990 6155 6190 7175 7195 7225 9510 9590 9625 9685 9690 11775 11790 11810 11830 11840 11885 11940 15250 15335 15365 15380 17720 17745 17790 17850 21665
Hungary	Saudi Arabia: Broadcasting Service of the Kingdom of Saudi Arabia 9
6025 6110 7155 7165 7225 9585	5875 7145 7195 7210 7225 9705 9720 9885 11730 11910 15060 15140 15245 15345 15435 17740 21495

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This unique manual covers the complete shortwave range from 3 to 30 MHz, plus the adjacent frequency bands from 0 to 150 kHz and from 1.6 to 3 MHz. Contrary to imitative publications it is built on real-time monitoring throughout the year around the clock. It includes details on all types of utility stations including facsimile, morse, phone and teleprinter stations, the latter covering the entire spectrum from standard RTTY over SITOR to all those fascinating new ARQ, FDM, FEC, TDM and VFT systems.

The numerical frequency list covers 15802 frequencies of stations which have been monitored during 1987, thereof 33 % RTTY and 3 % FAX. Frequency, call sign, name of the station, ITU country symbol, types of modulation and corresponding return frequency, or times of reception and details, are listed. The alphabetical call sign list covers 3123 call signs, with name of the station, ITU country symbol, and corresponding frequencies.

77 RTTY press services are listed on 502 frequencies not only in the numerical frequency list, but also chronologically for easy access around the clock, and alphabetically in country order.

Additional alphabetical indices cover

- Schedules of 72 meteorological FAX stations on 287 frequencies.
- 81 meteo RTTY stations on 243 frequencies. 518 kHz NAVTEX schedule.
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- All Q-code and Z-code groups for civil and military use.
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Further publications available are Guide to Facsimile Stations, Radioteletype Code Manual, Air and Meteo Code Manual, etc. For further information ask for our catalogue of publications on commercial telecommunication on shortwave, including recommendations from all over the world. All manuals are published in the handy 17 x 24 cm format, and of course written in English.

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6065 9605 9615 9630 9695 9730 11705 11845 11955 15390 15435 17790 21555 21610	4853 6135 9780
Syria: Radio Damascus 7	Yemen, People's Democratic Republic: Democratic Yemen Broadcasting Service
9905 12085 15020	5970 6005 7190 11770 11950
Turkey: Voice of Turkey 4	Yugoslavia: Radio Yugoslavia
7135 7215 7225 9505 9560 9660 9670 11955 15220 17760	6100 7200 7240 9505 9620 11735 15240
United Arab Emirates: UAE Radio-Dubai	
9550 9595 11730 11940 11955 15300 15435 17775 17830 21605 21700	
United States: Armed Forces Radio Television (AFRTS)	
6030 6125 9700 15265 15330 15430	
United States: KVOH 7	
6005 9525.5 11930 17775	
United States: WHRI 7	
5995 6000 6010 6100 6155 7355 7400 9580 9770 11770 11980 15105	

Legend

- 1 Some frequencies vary up to 10 kHz.
- 2 No English language broadcasts.
- 3 Transmission are in SSB.
- 4 No or little reliable pattern of frequency usage. List may include current frequency usage.
- 5 Stable, single frequency station(s).
- 6 Pirate or quasi-legal station.
- 7 Station less than five years old. Unable to establish pattern of regular frequency use. Listing may include current frequencies.
- 8 Station not on air at press time. Proposed frequency usage.
- 9 Includes other external and/or domestic service programs.
- ^a alternate frequency

RADIO ROUNDUP: Broadcasting

There's quite a bit to say and not enough space to say it in, so let's get right down to business, remembering that, unless otherwise mentioned, all times are in UTC and all frequencies are in kilohertz. Onward...

Alaska

KNLS has revised their schedule again. English is now at 0800-1100 UTC on 6150 kHz (*Ed LaCrosse, RCI SWLD*)

Angola

Radio Nacional broadcasts in English at 1600 UTC on weekdays and 1700 UTC on weekends, and in French at 1700 UTC on weekdays and 1730 on weekends. The frequencies for these broadcasts are 3375, 7245, and 9335 kHz. (*RNMN*)

Australia

Big news comes this month from the land down under. Radio Australia is, on the request of the British government, relaying broadcasts of the BBC at 2200-0030 UTC on 15110 kHz. This is targeted to the people of Fiji, the island nation wracked by recent political turmoil. This frequency suffers from interference from All India Radio at 0000 0115 UTC. (*RCI SWLD*)

Canada

Radio Canada International's relay via Japan to South and Southeast Asia and the Pacific is now scheduled to start in April. (*RCI SWLD*)

Radio Beijing is now being relayed via Swiss facilities. Check 3984 kHz and 6165 kHz at 2100-2300 UTC. This should vastly improve reception in Europe. (See "Switzerland" for more information on this transmitter swap.) (*RCI SWLD*)

Costa Rica

Radio for Peace is broadcasting occasionally around 0200 UTC. The new frequency is in the 41 meter band at 7375 kHz. (*RCI SWLD*)

Egypt

Nile Valley Radio is indeed a station on the air from Cairo, and does broadcast Arabic on shortwave as follows: 0500-0600 UTC on 9770, 11880, and 11905 kHz; 1500-1800 UTC on 15285 kHz; and 1700-1800 UTC on 11785 kHz. A long shot, but still possible in North America! (*RCI SWLD*)

France

Radio France International has a new English broadcast to North America at 1305-1315 UTC on 15365, 17720 and 21645 kHz. (*RCI SWLD*)

Gabon

Africa Number One is now trying out some English programs produced in London. There are two 25-minute programs each week composed of soul, reggae and Africa music. (*RNMN*)

Guam

KTWR Guam has English on 9785 kHz at 1430-1600 UTC. (*Ed LaCrosse, RCI SWLD*)

KTWR is broadcasting their DX program, "Pacific DX Magazine," as follows: Fridays at 0945 UTC on 11805 kHz to Australia; Saturdays at 1445 UTC on 9780 kHz to India; Sundays at 0845 UTC on 11805 kHz to Japan. (*ASWLC*)

Guatemala

A new Protestant station has taken the air in Guatemala. Radio Buenas Nuevas, San Sebastian, broadcasts at 1130-1230 UTC and 0030-0130 UTC on 4800 kHz. (*RNMN*)

Italy

Adventist World Radio is planning a shortwave broadcast using their ten kilowatt transmitter, pending an Italian government decision. The frequency has not yet been announced, but they will broadcast English at 1930-2000 UTC and German at 2000-2100 UTC. (*RNMN*)

Japan

Radio Japan's Oceania Service is now at 0900-1000 UTC on 15235 kHz. The general service to the area is also at 0900 UTC, on 11840 and 17810 kHz. (*ASWLC*)

Lesotho

The BBC continues to test its two 100 kilowatt transmitters on 6190 kHz and 3340 kHz, both well heard. The latter interferes with Mozambique on 3338 kHz. (*RNMN*)

Mauritius

For a decent DX catch, try the Mauritius Broadcasting Corporation, still active on 4855 kHz. Programs are English and French through about 1900 UTC. (*SWB Sweden, RCI SWLD*)

Mexico

LaHora Exacta is once again active on the shortwave bands, on the frequency of 9555 kHz. Check for them on weekends around 1730 UTC or so. (*RCI SWLD*)

Mozambique

Baira can be heard with 100 kilowatts of power at 0255-0500 UTC and 1500-2000 UTC on 3280 kHz. The 31 meter band frequency is more stable, on 9640 kHz at 0500-1500 UTC. (*RNMN*)

Netherlands Antilles

Here's the schedule for Trans World Radio's outlet on the island of Bonaire. This is nominally good through 6 March, but these frequencies should work through about 4 September or thereabouts.

0300-0430 (Tu-Sa)	9535 (North America)
0300-0530 (Su-Mo)	9535 (North America)
0710-0857 (Mo-Fr)	11815 (North America)
0710-0932 (Sun)	11815 (North America)
0710-1005 (Sat)	11815 (North America)

These broadcasts will be on Christmas Day (25 December) only:

1257-1400 (25 Dec)	11815 (North America)
1400-17-- (25 Dec)	15185 or 15180 (North America)

The Netherlands

On Radio Netherlands' excellent DX program, "Media Network", this month:

6th: "Medium Wave Special" - commercial MW loop antennas, Australia goes all night on MW, and an MW stereo conference.

13th: "The Chinese Question" - European markets in China, and Richard Ginbey with African radio news.

20th: "News Update: - German direct broadcast satellite, and KUSW, the new SW station in Salt Lake City, Utah USA.

27th and December 4th: "The Long Path through Asia" - DXing from the point of view in Bangkok (27th) and Jakarta (4th). On the 27th learn of exotic Thai local stations, DX news from the Pacific, and local shortwave stations: a dying breed in Indonesia?

Hear the program as follows: UTC Fridays (local Thursday evenings) at 0250 UTC on 6020, 9590, and 9895 kHz (for Eastern North America) and on 6165 kHz (Central North America). Also, at 0550 UTC on 6165 and 9715 kHz (Western North America). Note the change in their schedule: for the 0230 UTC broadcast, 9895 kHz replaces the old 11730 kHz for the winter.

As if that's not enough, there have been numerous reports of apparent feeders originating from Radio Netherlands. Bob Padula in Australia notes one on 9860 kHz at 2200 UTC, past 2230 UTC. At other times, check 13700 kHz. These were perhaps the SSB feeders for the Madagascar relay site, whose satellite link to Hilversum had recently undergone some repairs. These feeders should now be off the air.

South Africa

Southern Sound, the Transkei station, has closed down for financial reasons. (RNMN)

Capital Radio broadcasts on 3927.8 kHz at 0200-0500 UTC and 1700-2200 UTC, and on 7149 at 0500-1700 UTC. (RNMN)

Spain

Spanish Foreign Radio is now broadcasting in English on 6125 kHz at 0455-0555 UTC. This is well-heard in North America. (RCI SWLD)

Sweden

Radio Sweden International broadcasts English programs as follows through 26 March 1988.

0230-0300	9695 (North America)
0330-0400	11705 (Middle East)
0930-1000	9630 15390 (Australia, New Zealand, Europe, Africa)
1100-1130	6065* 9630 21690 (Middle East, Europe, Africa)
1230-1300	9565 15430 (East Asia, South Asia)
1400-1430	9695 15345 (North America)
1600-1630	6065 11940 (South Asia, Europe Africa)
1830-1900	11845 (Africa)
2100-2130	6065 9700 (Europe, Africa)
2300-2330	6065 9695 (North America)

* Mon-Fri.

Their DX program, "Sweden Calling DXers," can be heard on Tuesday broadcasts (the Wednesday broadcast for the 0230 UTC transmission).

Switzerland

Swiss Radio International is using two transmitters in China for their programs. They broadcast daily at 1315-1500 UTC (English is at 1330-1400 UTC) on 11695 kHz (from Beijing) and 15135 kHz (from Kunming). Listen for the Red Cross Broadcasting Service broadcast at 1310-1327 UTC, next on 7 January 1988. (RNMN)

U.S.S.R.

Radio Tallinn in Estonia is back on shortwave after a sixteen year absence. They have a five-minute Esperanto broadcast at 0925 UTC on two Sundays of the month, and at 2225 UTC on two Thursdays of the month - a whole twenty minutes of shortwave per month. How economical! (RNMN)

United States

The Voice of America's Pashto service is trying a program linking American country music and traditional Afghan poetry. What will they think of next? Beethoven's relation to punk rockers? (RNMN)

The VOA has installed a new 500 kilowatt transmitter for broadcasts to the Soviet Union at Munich, West Germany. This replaces an old transmitter which was captured from the Nazi in World War II! Listen for test broadcasts in English at 0500-0530 UTC on 6060 kHz, and at 0630-0700 UTC on 6025 kHz. (RNMN)

KYOI, owned by the Christian Science Monitor people, broadcasts American "Top 40 hits as follows:

0000-0200	15405
0200-0800	17780
0800-1700	11900
1900-2200	9670
2200-0000	15405

All broadcasts are beamed to Japan and Korea.

WRNO has been on and off the air lately. The most reliable times to listen are at 2300 UTC or so on 9495 kHz, and then at 0300 UTC on 6165 kHz.

Vatican City

Here's the cryptic English schedule for Vatican Radio, good through at least 31 December, probably until March. These broadcasts do not include music or Mass, and last about ten to twenty minutes each.

0050 UTC	6150	9605	11780
	(North America)		
0310 UTC	6150	(North America)	
0600 UTC	6185	9645	(Europe)
1200 UTC*	15190	17865	(the Pacific)
1445 UTC	6248	7250	9645 11740
	(Europe)		
2050 UTC	6190	7250	9645
	(Europe)		
2205 UTC	6015	9615	11830
	(Australia and New Zealand)		

* = Mo-Fr.

Good luck!

Clandestine

Radio Caroline is once again testing on shortwave, on 6220 kHz, using 200 watts of power. They are planning to beam religious programs into Eastern Europe. They will have 3.5 kilowatts of power when a new transmitter is installed, and will use 6210 kHz and 9940 kHz. (RCI SWLD)

The anti-Sandinista Radio Liberacion has been noted on 5930 kHz instead of the old 5890 kHz. The broadcast can be heard for one hour at 1200 UTC. The frequency is the same as an old one used by CIA-funded clandestine Radio Quince de Septiembre. (RCI SWLD)

Bernhard Gruendl notes an interesting clandestine, Voice of the Communist Party of Iran, at 1825 UTC to signoff at 1915 UTC on 4510 kHz, Mondays only. A toughie for listeners in the Western Hemisphere! (RCI SWLD)

Well that will do it for this column - see you here next month. Happy Holidays for one and all - may you get receivers under the tree this year!

Broadcast Loggings: RADIO ROUNDUP

- 0005 UTC on 7430**
Greece: V.O. Greece. Greek folk music and news from 0130-0140. ID's included in Greek and a record that kept skipping. (Peter Farris- Albany, N.Y.) - thanks for the logs this month, Peter! - ed.
- 0006 UTC 9440**
Clandestine: V.O. Democratic Kampuchea. Cambodian. Cambodian vocals with male announcer at 0020 and 0026 sign-off. (Bruce Mac Gibbons - Gresham, OR) Thanks for all your tremendous help this month!
- 0020 UTC on 4980**
Venezuela: Ecos del Torbes. Spanish. News at 0030 followed by the old song "Dr. Robert" by the Beatles. Weak signal tonight. (Peter Farris, Albany NY)
- 0100 UTC on 9575**
Italy: RTV Italiana. News read by lady including bits on relations between Vatican and worldwide Jews. (Robert Fraser - Cohasset, MA) Thanks for your logs this month, Bob. - ed.
- 0110 UTC on 4795**
Ecuador: LV de los Caras, Spanish. News covered by male and female announcer. ID with KHz and promo. Brassy Latin tunes.
- 0140 UTC on 4890**
Ecuador: R. Centinela del Sur. Spanish. Lengthy reading of text into romantic ballads. Station ID at 0145.
- 0158 UTC on 6010**
South Africa: R. RSA. Ending newscast and program on the African bushmen and a DX show. (Tom Roach - San Jose, CA) Thanks for all your help this month, Tom - ed
- 0205 UTC on 11745**
Brazil: Radio Nacional. Features covering the industrial recession and Brazil's European tourist. (Al Rayment - Nelson, BC, Canada) First time contributor. Welcome, Al! - ed
- 0240 UTC on 7065**
Albania: R. Tirana. News bits on a 'Romeo and Juliet' production in the capital. Israeli colony at Gaza and North Sea pollution. (Al Rayment - Nelson, BC, Canada)
- 0305 UTC on 7115**
Bulgaria: R. Sofia. Newscast on Bulgaria and the Persian Gulf with comments from the German Prime Minister. (Al Rayment - Nelson, BC, Canada)
- 0306 UTC on 9475**
Egypt: R. Cairo. Program of Arab music by lady announcer. Parallel heard on 9675. First time for Cairo! (Tom Roach - San Jose, CA)
- 0332 UTC on 9640**
Swaziland: TWR. Somalia. Station interval signal at 0332 and ID. 9640 is a new frequency and runs to 0350. (Bruce Mac Gibbons - Gresham, OR)
- 0350 UTC on 6725**
Peru: R. Satellite. (Tentative) Spanish. Latin vocals and heard announcer mention "Cajamarca". Peruvian national anthem and sign-off at 0405. (Bruce Mac Gibbons - Gresham, OR)
- 0404 UTC on 6070**
Canada: CFRX. Relay of CFRB Toronto. Nob Hill Farms ad and lady with weather and sports report at 0405. (Bruce Mac Gibbons - Gresham, OR.)
- 0415 UTC on 9800**
France: R. France Int'l. Station ID's and international newscast. (Tom Roach - San Jose CA)
- 0430 UTC on 4300**
Lesotho: R. Lesotho. Lesotho. Religious format including gospel music and sermon. (Tom Roach - San Jose, CA)
- 0531 UTC on 9720**
Angola: Nacional de Angola. Portuguese. African music and station ID Signal QRM'd by R. Netherlands at 0550. (Bruce Mac Gibbons - Gresham, OR)
- 0533 UTC on 5020**
Niger: LV Du Sahel. French. Qu'ran recitations followed by announcer and children singing African native music. (Tom Roach - San Jose, CA)
- 0535 UTC on 11825**
Tahiti: R. Tahiti. French/Tahitian. Phone-in show from listeners. (Tom Roach - San Jose, CA.)
- 0604 UTC on 4815**
Burkina Fasa: RTV Burkina. French. Native African music on drums with announcer talk and announcements. (Tom Roach - San Jose, CA.)
- 0636 UTC on 9505**
Cuba: R. Havana Cuba. Report on peace demonstrator Brian Wilson's train accident. 9505 is a new frequency. (Bruce Mac Gibbons - Gresham, OR)
- 0645 UTC on 6015**
Cote D' Ivoire: RTV Ivoirienne. French. Local merchant ads, interview on higher education in the Cote D' Ivoire, Senegal Ambassador visit and soccer scores. (Garie Halstead - St. Albans, WV.) excellent details Garie and welcome to MT! - ed
- 0835 UTC on 4940**
Marshall Islands: WSOZ. Religious music from chorus. Brief comments then into more religious service.
- 0840 UTC on 7170**
New Calendonía: RFO French U.S. rock music and DJ with titles. More 'oldies' from Chuck Berry.
- 0900 UTC on 4800**
Peru: Onda Azul. Spanish. Sign-off shortly after 0900 with Peruvian national anthem (about 0904) and into Aymara. Fades quick in Wisconsin. ID noted as, "Radio Onda Azul, La Emisora Catolica". (John Tuchscherer Neenah, Wis.) - you always hear the 'good stuff', John! - ed
- 0925 UTC on 4755**
Brazil: R. Educ. Campo Grande. Portuguese. Mornings show announcements and music ballads. (Rod Pearson - St. Augustine, FL.)
- 0930 UTC on 3958**
Falkland Islands: F.I.B.C. DJ format with mention of "Port Stanley". U.S. rock tunes by Huey Lewis. Local time check and more music. Only brief ARO interference this time!
- 0935 UTC on 4955**
Brazil: R. Cultura Campos. Portuguese. Male and female with newscast and talk about Campos into Brazilian ballads.
- 0945 UTC on 4845**
Brazil: R. Nacional-Manaus. Brazilian pops nad Nac'l ID, station promos. Signal mixing with Latin station. (Rod Pearson - St. Augustine FL.)
- 1000 UTC on 4840**
Peru: R. Andahuaylas. Spanish. Clear ID with 'echo' effect. Station call letters and city given also with station promotional. Brassy Spanish vocals followed.
- 1015 UTC on 4880**
Brazil: R. Dif. Acreana. Portuguese. Sunday morning religious music with sermon and organ music. (Rod Pearson - St. Augustine, FL)
- 1019 UTC on 6165**
Mexico: LV de la America. Spanish. Latina vocals and announcer with chat about Mexico. ID caught at 112. (Bruce Mac Gibbons - Gresham, OR)
- 1020 UTC on 5035**
Bolivia: La Cruz del Sur. Spanish. Distorted audio from lady announcer with religious piano music and vocals.
- 1035 UTC on 5050**
Ecuador: R. Jesus Gran Poder. Spanish. Morning 'Rosary' religious service. Break for ID at 1045. (Rod Pearson - St. Augustine, FL)
- 1045 UTC on 3340**
Peru: R. Altura. Spanish. Peruvian vocals and instrumentals with one "Radio Altura" ID
- 1049 UTC on 5995**
Australia: R. Australia. Pidgin. U.S. rock music with titles. Aussie theme music into English news at 1100. (Rod Pearson - St. Augustine, FL)
- 1058 UTC on 9695**
Brazil: R. Rio Mar. Portuguese. Canned ID and two announcers trade news topics on Brazil. Singing ads and promos.
- 1125 UTC on 3385**
Papua New Guinea: R. East New Britain. Pidgin. U.S. and country and western music. Talk and titles. Quite weak and audible only in USB.
- 1127 UTC on 3335**
Papua New Guinea: R. East New Sepik. Pidgin. Lady announcer with ID at 1130 into presumed newscast. Male announcer talks about PNG and local news. (ed. log)
- 1130 UTC on 3345**
Papua New Guinea: R. Northern Pidgin. Friendly male and female DJs full of laughter. Lots of country and western music. Signal faded out by 1150. Heard several mornings at same time.
- 1132 UTC on 6791**
Peru: R. Sensacion. (Tentative) Spanish. Lively Spanish vocals with male announcer. Never heard an ID and signal poor. (Bruce Mac Gibbons - Gresham, OR) I'd bet it probably was Sensacion, Bruce - ed.
- 1135 UTC on 3306**
Indonesia-Timore: RRI Dili. Indonesian. Very weak but audible Asian and "island" sounding music. Male announcer with talk. Frequency is approximate.
- 1140 UTC on 4753**
Indonesia - Celebes: RRI Ujung Pandang. Indonesian. Lady announcer with talk and introduction of piano music. Presumed interview as signal began to fade.
- 1150 UTC on 3315**
Papua New Guinea - Admiralty Islands: R. Manus. Pidgin. "Island" music with singers. Breaks by male at 1200 with ID and talk about Manus and city Lorengau. Deep fades on signal.
- 1201 UTC on 6570**
Burma: Burmese Army Station. Burmese. Two selections of Asian/oriental music. Male announcer with talk. Fade out at 1207. Heard same time for three mornings with same format. Signal should improve in a few weeks.
- 1205 UTC on 6106**
Bolivia: R. Panamericana. Spanish. Easy-listening instrumentals into station promo and local ads. (Rod Pearson - St. Augustine, FL.)

Send your loggings to Gayle Van Horn, 160 Lester Drive, Orange Park, Florida 32073 USA. All loggings are of English broadcasts unless otherwise noted. Logs without contributor name are the editor's loggings.

- 1205 UTC on 4890**
Papua New Guinea: N.B.C. International news covered by male announcer. Several bits on the USA. National items of PNG also covered. ARO interference began at 1210.
- 1215 UTC on 15320**
Austria: R. Austria Int'l. "Coffeetable" program of Anton Brucker's religious music. (Robert Fraser - Cohasset, MA)
- 1305 UTC on 9655**
Saudi Arabia: B.S.K.S.A. Arabic. Middle Eastern music and occasional announcement breaks from DJ. Presumed news at 1330.
- 1314 UTC on 9715**
Australia: R. Australia. Japanese. Voice oriented program two female announcers with discussion. ID's included at sign-off in English at 1329. (John Healy - Syracuse, N.Y.) Thanks John! - ed
- 1324 UTC on 4725**
Burma: Burmese Minority SVC. Lang unknown. Burmese? Male and female announcers with chat and music. (Bruce Mac Gibbons - Gresham, OR)
- 1337 UTC on 6130**
Laos: Radio National Laos. Lao. Lady talking about tobacco farming, how to and when. Lao song at 1341. This is a rough translation via interpreter. (Bruce Mac Gibbons - Gresham, OR) - great log, Bruce! - ed.
- 1400 UTC on 11900**
Saipan: KYOI. Rock music program including "la Bamba", ID as "Choy, KYOI, Saipan". Poor signal with fading. (Robert Fraser - Cohasset, MA)
- 1401 UTC on 9535**
ALaska KNLS. Japanese. Lady with 'oldies' like "Surf City" and "Little GTO". 9535 is a new frequency from ex 9750. (Bruce Mac Gibbons - Gresham, OR)
- 1413 UTC on 9615**
India: A.I.R. (tentative) Indian dialect. Indian music from a male announcer. QRM from VOA on 9620 and Perth 9610. Sign-off at 1445 but never heard the ID. Must try again. (Bruce Mac Gibbons - Gresham, OR)
- 1415 UTC on 5005**
Nepal: R. Nepal. (Tentative) Nepalese? Male announcer with ID type announcement followed by Asian sounding "chats". No ID heard so a big question on this one! (Tom Roach - San Jose, CA.)
- 1438 UTC on 9670**
Philippines: FEBC. Newscast until 1440 and sports roundup. Station ID and meter band schedule. (Bruce Mac Gibbons - Gresham, OR.)
- 1446 UTC on 9655**
Thailand: R. Thailand. Asian vocals to ID as "you are listening to Radio Thailand" and 1450 sign-off. (Bruce Mac Gibbons - Gresham, OR)
- 1527 UTC on 15135**
UAE: Abu Dhabi. Arabic. Announcers with Middle Eastern music and ID at 1530 into newscast until 1554. (Bruce Mac Gibbons - Gresham, OR)
- 1530 UTC on 7412**
India: A.I.R. - Delhi. Male announcer with, "this is A.I.R., the news has been read by" "Poor signal, Parallel 10330 is a new frequency (from ex 10335) (Bruce Mac Gibbons - Gresham, OR)
- 1654 UTC on 11570**
Pakistan: R. Pakistan. Urdu. Pakistani music and female announcers. ID at 1703 as "Radio Pakistani" and sign-off at 1900 with national anthem. (Bruce Mac Gibbons - Gresham, OR)
- 2015 UTC on 9575**
Spanish Morocco: R. Medi Un. Arabic. Rock music and 'talk-show' format. IDs and Arabic vocals after 2030.
- 2137 UTC on 15120**
Nigeria: V.O. Nigeria. News to 2138 and main headlines. Usual poor modulation and QRM from REE 15125. (Bruce Mac Gibbons - Gresham, OR)
- 2145 UTC on 9875**
Iraq: R. Baghdad. Explanation on the Iran/Iraq war and why it continues (Robert Fraser - Cohasset, MA.)
- 2240 UTC on 4850**
Cameroon: R. Cameroon. French. Lots of 'Blues' music with talk between selections. ID at 2300. (Rod Pearson - St. Augustine, FL)
- 2240 UTC on 15575**
Korea, Republic: R. Korea. Lady announcer with talk on her favorite seasons of the year. (Tom Roach - San Jose, CA)
- 2300 UTC on 4000**
Cameroon: R. Bafoussam. French. National news of Africa. RTTY interference. Station still on past usual 2300 sign-off.)
- 2325 UTC on 7260**
USSR: R. Rodina. Russian. Program of two stand-up comedians before a live audience. (Robert Fraser - Cohasset, MA)
- 2325 UTC on 15355**
Bonaire: TWR. German. Bible commentary and religious hymns. (Peter Farris - Albany, N.Y.)

HUGE

70 PAGE

SHORTWAVE CATALOG

SEE WHAT'S NEW IN ...

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- 2330 UTC on 9465**
USA: WCSM. ID's and features until sign-off at 2355. (El Charlton - Baton Rouge, LA) another first time contributor! welcome El! - ed.
- 2330 UTC on 4976**
Colombia: Ondas Ortegua. Spanish. Spanish pops into local time check and canned promo for Todelar network.
- 2330 UTC on 6055**
Czechoslovakia: R. Prague. Czech. Program of classical music, Mahler I believe. (Robert Fraser - Cohasset, MA)
- 2340 UTC on 9560**
Turkey: V.O. Turkey. Turkish. Program of classical Turkish music. (Robt. Fraser - Cohasset, MA)
- 2345 UTC on 4783**
Mali: RTV Mali. French. CW interference amid U.S. rock music and 60's pop from the Beatles. Closing ID with city and national anthem. Station sign-off at 0000.
- 2345 UTC on 7260**
USSR: R. Kiev. Report on the International Day of Peace. (Robert Fraser Cohasset, MA.)
- 2355 UTC on 4825**
Guatemala: R. Mam. Spanish. Local programming with marimba music. Flute signal into canned ID with 'Inca' style music.

"I was impressed. Of the three controllers present, two had just started handling traffic about a week ago. Already, they were plotting both air and ground traffic." -- See "Scanning," on page 24.

The long-awaited Bearcat BC200XLT has been postponed until at least March of next year. A spokesman for Uniden said that unexpected problems with acceptable 800 MHz reception has resulted in the setback.

In the meantime, **Regency's New Turboscan TS-2 has finally been released.** It, too, had been delayed because of problems in acquiring a key component for the scanner, being manufactured in Regency's Satellite Beach, Florida, facility. *[See MT's press-time scoops on both items, this issue!]*

Despite our article in the June issue indicating that the net had been busted, **the California pirate network is back on the air, flaunting the FCC.** Monitoring of the network frequencies would seem to indicate that about four nuclear members of the Los Angeles area net, all licensed hams, renewed their illegal activities during September.

"Pirate Zero", Lazlo Hirsch (WA6SWG) of Lomita, California, was reported by area newspapers as having been fined \$1300 by the Commission, but has apparently reopened the radio network which uses crossband transmitters and repeaters in the CB band (FM mode) and 49 MHz cordless telephone band.

It looks as though 1988 may be the year of super receivers. The *MT* information network reveals three exciting products emerging from manufacturers' laboratories. We are told that one product is now being test marketed in Europe.

The Sony CRF350 is a wide-frequency-coverage multimode receiver with a large LCD which is used for spectrum display (signals above and below the selected frequency appear as "pips" or "spikes" on a baseline across the screen) as well as facsimile pictures.

ICOM is expected to announce a follow-up to their popular R7000 general coverage VHF/UHF receiver which will include a panoramic display like the Sony, but probably a CRT rather than LCD.

Unfortunately, as the value of the dollar continues to fall on the foreign market, the Sony and ICOM products will be high-tag items selling in the \$2000-\$4000 range!

More affordable will be another wide-frequency-coverage receiver with a spectrum display to be announced by an American firm. Designed for the surveillance market, the targeted \$1000 price tag for the precision AM/FM/SSB panoramic receiver will make it irresistible to hobby monitors as well.

It may be hard for SWLs to believe, but **the voice of America's German relay utilized the same transmitters used by Hitler** to espouse Nazi propaganda in Berlin since 1939; however, if VOA is on schedule, by the time you read this the antiquated system will have been replaced by a new 500 kW transmitter in Bavaria for broadcasting to Russia.

Three additional high power transmitters are expected to be operational by spring, 1989. The upgrade is part of VOA's \$1 billion-plus modernization authorization from Congress and stands in stark contrast to the dismal audio quality heard routinely over Radio Havana.

The Cuban transmitters were manufactured in Communist China in the 1958-59 time frame and installed by CIA technicians when Castro first came to power. Neither the RF stages nor AF stages are impedance-matched, thus accounting for the degraded performance. *(Contributed by Lauren Colby, Frederick, MD)*

Amazing things cross our desk--few top this one: **Dial A Nazi!** The phone phreak publication, 2600, often runs lists of unusual telephone numbers. The latest issue contains several Nazi BBS numbers (214-263-3103, 304-927-1773, 312-253-9789, 619-723-8996, 713-941-7619), three Nazi newlines (415-626-4458, 714-887-5552, 818-988-7956) and an Aryan Nations Hotline (916-334-5916). You may wish to report these to the FBI (412-527-8291) or CIA (806-353-9901).

The California outlet for the Australian firm **Dick Smith Electronics has been sold.** The new owner is American Electronics, PO Box 468, Greenwood, IN 46142 (Ph. 317-888-7265). The firm formerly made kits for receivers and transmitters, including shortwave converters for tuneable VHF/UHF receivers.

A ham radio feat has proven that packet radio can interface with large capacity data storage. **A compact disc ROM with a capacity of 550 megabytes of data** was accessed by two-meter packet operators on 145.01 MHz as part of a BBS experiment involving the 472,000- amateur database maintained by Jack Speer, N1BIC, of Mineral, Virginia, proprietor of Buckmaster Publishing. A similar HF experiment is being planned.

Jim DeArras, WA4ONG, provided the multiuser PBBS and interface software while Speer supplied the Hitachi 1502S CD-ROM player and the CD-ROM database consisting of over 142 megabytes.

Comments and suggestions are welcome; Speer can be reached at 703-894-5777 or through WA4ONG-10, Richmond, VA. At the PBBS prompt, type: OS QTH N1BIC (return).

In the ever-present crunch for finding more land mobile frequencies, the **FCC is considering assigning TV Spectrum to two-way users.** Needless to say, the broadcasters are up in arms at the proposal, complaining that even if there are unused swaths of spectrum now, they would be needed for future high-definition television techniques planned for the future.

The FCC has agreed to hold off while a special committee investigates the matter further. A report is due in mid-1988. The FCC has decided not to act on applications for new TV stations in 30 American cities awaiting the outcome of the study which will shed light on the feasibility of HDTV in the present spectrum bandplan. *(Clipping from Robert Eisner, Germantown, MD)*

We were pleased to see an announcement recently that *MT's* own **Gregory Mengell is taking over a satellite journal.** The *Journal of the Environmental Satellite Amateur Users' Group* was formerly published by its founder, Raul J. Alvares (WD4MRJ) of Tampa, Florida. The group shares technical information related to space communications, meteorology and electronics.

We wish to acknowledge the substantial contribution Raul has made to the science of monitoring and congratulate Greg on his appointment to continue the journal. For subscription information, write Greg Mengell at 2685 Ellenbrook Drive, Rancho Cordova, CA 95670.

Computer control of receivers seems to be popular nowadays judging from the number of new interfaces and software support springing up on the marketplace. Universal Shortwave Radio (1280 Aida Dr., Reynoldsburg, OH 43068) offers an RS232C computer control package for the Kenwood R5000 receiver.

Utilizing Kenwood's own IF232C (\$79.95) and IC-10 (\$26.95) options, Universal's "SWL PC to Kenwood R5000 program sells for \$49.95 and shows memory channel information such as name of station, mode, function, date, SINPO, and comments; it also provides computerized logging of stations and backup memory to disk.

Electronic Equipment Bank's (EEB, 516 Mill St. SE, Vienna, VA 22180) Computer/Radio Interface System (C.R.I.S.) is designed to work with receivers and transceivers like the ICOM R71A, R7000, 271, 275, 375, 471, 475, 575, 735, 751, 761, and 1271; Kenwood R5000, TS440S, TS940S, 711, and 811; Yaesu FT757GX, 757GX-II, FRG8800, FRG9600, FT980, 767, and 727; the JRC NRD525; and the A.O.R. AR2002 scanner.

Requiring an IBM PC/XT or compatible with MS-DOS 2.11 or later, serial port, DSDD floppy drive, and 256K of user memory, EEB's package maintains a logbook, scans up to 800 memorized channels, searches between set limits, autotracks dual VFOs for split frequency operation, and allows editing.

An optional EED-SDA is available for data acquisition and display, DBS for shortwave broadcast database, a DBU for utilities database, and an RCM for modem-operated remote control.

Two Gulfport, Mississippi, thieves learned the hard way that **if you're going to steal a police radio, don't talk on it!** An eighteen-year-old and his juvenile accomplice broke into a campus security office and stole three walkie-talkies. Their big mistake was to use the system as a private telephone.

It was a simple matter for the law enforcement officers to monitor their idle chatter--which included their locations--as they walked about the streets. The police matched the conversations with an individual talking into a radio and arrested him. The burglar eagerly volunteered the location of the other perpetrator. Case closed. *(Clipping sent in by Bill Hodge, Ocean Springs, MS).*

A recent New York Times article described how American technology is providing **new satellites which penetrate clouds and discriminate real targets from decoys.** Imaging techniques using frequencies outside those of visible light are not stopped by clouds and will allow probing beams to penetrate camouflage and tell plastic from steel.

Spy satellites presently maneuver in repetitive orbits, allowing the foe to schedule his activities when the birds are out of range. New stealth satellites will be harder to track; other satellites like the KH-11 launched in late October may vary their orbital parameters to elude predictability.

Even more maneuverable will be the next generation KH-12 spy satellites which can be refueled from space by a shuttle craft or space station. Lightweight, radio-wave-absorbant materials will make such orbiters invisible to ground radar tracking installations. *(Contributed by Ruth Hesch, White Plains, NY).*

In spite of the prohibitions against eavesdropping stipulated by the Electronic Communications Privacy ACT (ECPA) of 1986, a **landmark decision recently upheld the conviction of a murderer based upon an intercepted cellular telephone call.**

Judge Ronald Himel of Cook County (Illinois) asserted that when Earl Wilson used his (Radio Shack cellular telephone) to describe his plans to kill drug kingpin Willie "Flukey" Stokes and then made

a second call to say that Flukey was dead, there was "no reasonable expectation of privacy" as there would be on an ordinary telephone.

Defense attorney Robert Edwards objected to the admittance of eavesdropping evidence because of the ECPA, saying that it might have been the result of an unauthorized surveillance by a law enforcement officer rather than a casual intercept by a scanner hobbyist. Edwards questioned, "What citizen carries around sophisticated listening equipment?"

Judge Himel ruled that the information may have been illegal if it came from a police officer's surreptitious eavesdropping, but that it was legal because a citizen "inadvertently" overheard the conversations. *(Item from Michael Yanul, Chicago, IL)*

More Motorola Manuals: Some months ago, Curtis Harbin of Johnson city, Tennessee, mailed us a package of Motorola equipment manuals for fellow *MT* readers who needed them. We just got a fresh batch, bigger than before! For \$2 each including postage, the following sets are available--first come, first serve.

- MOTRAC 136-174 MHz two-way radio
- MICOR 150.8-174 MHz alignment/schematics
- N1254A VHF power amplifier
- PAGECOM 148-174 MHz pager
- PAGECOM 132-174 MHz pager
- PAGECOM 406-512 MHz pager
- PAGECOM 450-470 MHz pager
- PAGECOM 450-512 MHz pager
- PAGEBOY II 148-174 MHz pager
- PAGEBOY II 450-512 MHz pager
- MINITOR 138-174 MHz pager
- MINITOR 132-174 MHz alert monitor
- MINITOR low, high, UHF alert monitor
- SPIRIT 132-174 MHz pager
- DIRECTOR 406-512 MHz pager
- DIRECTOR 132-174 MHz pager
- DIRECTOR II 132-174 MHz pager
- DIMENSION IV 148-174 MHz pager
- DIMENSION IV 132-174 MHz pager
- HT90 136-174 MHz handie talkie
- PULSAR II control head
- MICOR 132-174 MHz full maintenance manual (\$5)

Whether you are a ham or an SWL, **you can get a colorful certificate for working or hearing hams in all 50 states** before December 31st. We apologize for not letting you know sooner, but the information didn't arrive until November 16th.

The American Radio Relay League (ARRL) has apparently been conducting a Constitutional Bicentennial celebration since September by offering both a "Worked All States" and "Heard All States" endorsement; a beautiful red, white and blue certificate is available to those who qualify.

Log amateur radio operators (one per state, any modes and any bands) worked or heard up until December 31, 1987; be sure to include state, call sign, date, and band. A sample logging would be: North Carolina, WA4PYQ, 12/25/87, 20 meters.

Here are a few tips: Try weekends and nets (networks) on 75/80 and 20 meters, especially the County Hunters Net (3866 kHz LSB, 14066 kHz CW, 14336 kHz USB) and the Maritime Mobile Net (14313 kHz USB).

Start logging now and write for an entry form from: "We the People" WAS Award, ARRL HQ, 225 Main St., Newington, CT 06111, USA. ■

Something for Everyone

MONITORING IN NEW ENGLAND

Connecticut Scanning

contributed by
Wayne Schulz
East Hampton, CT

State Police

- 42.04 F-1 Troops H,G,W,E
- 42.36 F-2 Troops K,D,C
- 42.48 F-3 Troops F,I
- 42.52 F-4 Troops A,B,L
- 42.18 F-5 Radar car-to-car
- 42.30 F-6 Radar car-to-car
- 42.20 F-7 Radar air-to-ground
- 42.24 F-8 Radar air-to-ground
- 42.58 Radar
- 42.64 Radar
- 42.32 Radar
- 154.83 Vehicle repeaters
- 155.475 SWAT tactical channel

CT State Police Codes

- MVA: Summons
AMV: Abandoned motor vehicle
EM: Trooper and tracking dog
14-219: Speeding (radar)
14-218: Driving unreasonably fast
Code A: Emergency
Code B: Sensitive information
- 1 Dept mobilization
 - 2 Emergency operations plan
 - 3 State Capitol
 - 4 Governor's residence
 - 5 Priority use of radio
 - 6 Priority use of Chan 1
 - 10 Accident
 - 11 Fatality
 - 12 Motor vehicle violation
 - 13 Drunk driver
 - 14 Disabled motorist
 - 15 Need motor vehicle data on...
 - 16 Stolen motor vehicle check
 - 20 Wanted persons check
 - 21 Sex offense
 - 22 Stolen motor vehicle
 - 23 Alarm
 - 23A Active alarm

- 23C False alarm
- 24 Bomb threat
- 25 Escape
- 26 Hostage
- 31 Out of service
- 32 In service
- 33 Call troop by phone
- 34 What is your location
- 35 Return to troop
- 36 Transport passenger
- 37 Transport prisoner
- 38 Transport package
- 39 Radio test
- 40 Repeat message
- 41 Check radio tower
- 42 Radioactive material
- 43 Intoxicated person
- 44 Untimely death
- 45 Missing person
- 46 Fire
- 47 Bank check
- 48 Transport blood
- 49 Shift check
- 50 Voluntary response

Miscellaneous Frequencies

- 46.02 Glastonbury Police F-1
- 45.82 " F-2 (10-91)
- 46.20 Glastonbury Fire
- 155.385 Lifestar Medical Helicopter
- 154.785 East Hampton PD
- 46.18 E. Hampton Fire/Amb
- 46.22 "
- 460.25 East Hartford PD
- 460.35 Wethersfield PD
- 460.05 Hartford PD F-1 North
- 460.20 " F-2 South
- 460.375 " F-3 Info on license/reg
- 460.40 " F-4 car-to-car/detectives
- 161.64 WTNH TV-8
- 450.05 WFSB Channel 3
- 453.00 Hartford Courant [?...ed]
- 119.6 Brainard Hartford tower
- 120.30 Bradley Windsor Locks tower

New Hampshire Utility Loggings

Anonymous contributor
All loggings USB, spring 1987

- 5700 Andrews in coms w/SAM 500 & 501
- 8984 COMSTA Miami in coms w/RAM 25
- 4428.7 USS Austin & CGC Cherokee on SAR of dstrss vsl
- 6683 Andrews PH Ptch w/SAM 30500 & other unit re: 2 Helos mssng in Honduras w/Amer Med Pers on Bd.
- 5696 USCG Helos 1 fr. NY & 3 FR. Cape Code MA re: Russian vsl sinking. All crew evacuated safely by USCG (all day rescue mission)
- 5696 SAR re: Man ovbd USN Air Sta Scituate MA. CG Helo 1489 from Cape Cod on air search
- 3253 GRP Portland ME in coms w/CGC Sanibel re: SAR for UNS crewman ovbd near Portsmouth NH
- 6212 CGC Baron in PH Ptch w/COMSTA Portsmouth/VA
- 11176 MAC 38078 in coms w/Ascension AFB
- 6693 Canadian Military 2439 in Ph Ptch w/XYL thru Halifax
- 6773 Unknown Sta using callsign Pantera Halifax
- 5696 CG 1503 on final apprch to Gander Nfld

AERONAUTICAL FREQUENCIES

contributed by
Bernie Wimmers, Jr. (VA)

Washington DC ARTCC

High Alt	Low Alt
120.350	118.750
125.450	123.850
127.750	123.900
128.150	124.050
132.025	124.250
132.225	125.850
132.275	128.600
132.950	132.550
133.025	133.650
133.275	133.900
133.725	134.150
134.225	134.300
134.625	135.000
135.200	
135.400	
135.500	
135.525	

Washington Dulles

120.100	Tower
120.450	App/Dep
123.000	UNICOM
124.650	APP
125.050	App/Dep
126.100	App/Dep
125.800	App
134.850	ATIS

Washington National

118.100	Dep
118.300	App
119.100	Tower
119.850	App
124.200	App
124.700	App
126.550	Dep
132.650	ATIS

- 8989 MELBA 81 in Ph Ptch w/Loring Metro (ME) Radio quit part-way thru patch
- 5696 CG Helo 1489 enrte Provincetown MA for Medevac
- 5696 CG 1438 and 2119 enrte Medevac from Otic AFB Cape Code
- 5696 CG Helo 1495 calling MAYDAY re: #1 engine out. Emgcy landing was made safely at Hyannis MA airport
- 5696 COMSTA Boston adv. CG 1495 that they are released from VP Patrol for day (Vice Pres?)
- 8989 Loring AFB (ME) calling HeadBand
- 4428.7 COMSTA Boston in coms w/NOAA vsl Albatross IV
- 6693 Halifax Military & Bearcat 02 w/Ph Patch to SVTP testing radio speech encryption equipment
- 8989 Navy Lima Charlie 85 in coms w/Loring AFB, ME
- 6735 Many units using tactical callsigns on "Alligator-Playground"
- 6509.5 NOAA vsl Delaware II (WNBD) in coms w/Woods Hole MA
- 6693 UT 68 req. Ph Patch thru St. John's Military

July New Hampshire loggings
from W.J. Battles, NH

- 7234 Smithsonian Institution NN3SI calling CQ/July 4 Celebration
- 4125 Univ of Delaware standing by on freq
- 5696 COMLAT Area & CGC Cherokee in Ph Patch Re: SARSAT EPIRB hit on 121.5. Cherokee diverted to SAR area
- 5710 Lajes AFB & Tutonic in coms. Started on 6738 then went to 11271
- 4449 Distilled Water, Tender, Air Dry, End Man/ unid net
- 8950 Fishing vsls in coms (outbanders?)
- 8993 Albrook AFB in coms w/Johnathan. Freq switch to 11126, then to 13201 finally sent data
- 3353 New England Regional Emerg & Defense Readiness Net
- 6761 SAC aircraft declaring in-flight emerg w/unid base
- 2670 CGC Sanibel in coms w/Group Boston & Group Wood's Hole MA
- 14216 WA6TWF at Anaheim, CA, bicycle mobile!
- 11214 Dagnet Victor, Bandsaw India, Bandsaw Golf, Bigfoot in coms
- 2670 CG group Wood's Hole MA working FV Provider ref. Medevac by Helo
- 6761 Taybee 38 with relay for Crystal Palace (SAC tfc)
- 4464.5 CAP Net Maine & NH units Pinetree & Profile hrd
- 7535 Roosevelt & Norfolk doing Radio Chks. USB, LSB, FSK, CW, ISB, Double Count & AM modes
- 7525 Unid net heard in coms (MARS type but w/looser format)
- 6200 CGC Eagle requesting wx for New England coast frm/Grp Boston
- 5750 Unid Callsign Two & Zero QSO about a canoe party & setting up a dipole. Will call later on VHF.
- 8984 CG COMMSAT Kodiak AK in coms w/Avionics
- 5691 German Air Force wkg aircraft

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MOBILE TELEPHONE FREQUENCIES

As a result of the Electronics Communications Privacy Act of 1986, several frequency ranges within the normal tuning ranges of scanners have become taboo. With the exception of cordless telephones (Group II below), all mobile/portable telephone intercommunications are against the law to monitor.

I. VHF LOW BAND LAND MOBILE TELEPHONE (WIREFINE)

Channel	Base	Mobile
20	35.260	43.260
2F	35.300	43.300
2H	35.340	43.340
2M	35.380	43.380
2A	35.420	43.420
2Y	35.460	43.460
2R	35.500	43.500
2B	35.540	43.540
2W	35.620	43.620
2L	35.660	43.660

II. WIRELESS (CORDLESS) TELEPHONES

Channel	Base	Mobile (handset)
1	49.670	46.610
2	49.845	46.630
3	49.860	46.670
4	49.770	46.710
5	49.875	46.730
6	49.830	46.770
7	49.890	46.830
8	49.930	46.870
9	49.990	46.930
10	49.970	46.970

III. VHF HIGH BAND MOBILE TELEPHONE (NON-WIREFINE) (* = being discontinued)

Channel	Base	Mobile
1	152.030	158.490
*2	152.045	158.505
3	152.060	158.520
*4	152.075	158.535
5	152.090	158.550
*6	152.105	158.565
7	152.120	158.580
*8	152.135	158.595

So that there is no confusion as to the protected frequency ranges, we include below a list of frequencies (in MHz) allocated to mobile telephones; monitoring of these channels is now unlawful.

9	152.150	158.610
*10	152.165	158.625
11	152.180	158.640
*12	152.195	158.655
13	152.210	158.670
*14	152.225	158.685

IV. VHF HIGH BAND LAND MOBILE TELEPHONE (WIREFINE)

Channel	Base	Mobile
JL	152.510	157.770
YL	152.540	157.800
JP	152.570	157.830
YP	152.600	157.860
YJ	152.630	157.890
YK	152.660	157.920
JS	152.690	157.950
YS	152.720	157.980
YR	152.750	158.010
JK	152.780	158.040
JR	152.810	158.070

V. VHF HIGH BAND MARITIME MOBILE TELEPHONE

Channel	Coastal Base	Ship Mobile
24	161.800	157.200
84	161.825	157.225
25	161.850	157.250
85	161.875	157.275
26	161.900	157.300
86	161.925	157.325
27	161.950	157.350
87	161.975	157.375
28	162.000	157.400
88	162.025	157.425

VI. UHF LAND MOBILE TELEPHONE (NON-WIREFINE)

Channel	Base	Mobile
21	454.025	459.025
22	454.050	459.050

23	454.075	459.075
24	454.100	459.100
25	454.125	459.125
26	454.150	459.150
27	454.175	459.175
28	454.200	459.200
29	454.225	459.225
30	454.250	459.250
31	454.275	459.275
32	454.300	459.300
33	454.325	459.325
34	454.350	459.350

VII. UHF LAND MOBILE TELEPHONE (WIREFINE)

Channel	Base	Mobile
QC	454.375	459.375
QJ	454.400	459.400
QD	454.425	459.425
QA	454.450	459.450
QE	454.475	459.475
QP	454.500	459.500
QK	454.525	459.525
QB	454.550	459.550
QO	454.575	459.575
QR	454.600	459.600
QY	454.625	459.625
QF	454.650	459.650

VIII. UHF AERONAUTICAL MOBILE TELEPHONE

Channel	Ground Base	Aircraft Mobile
"Calling"	454.675	459.675
6	454.700	459.700
7	454.725	459.725
5	454.750	459.750
8	454.775	459.775
4	454.800	459.800
9	454.825	459.825
3	454.850	459.850
10	454.875	459.875
2	454.900	459.900
11	454.925	459.925
1	454.950	459.950
12	454.975	459.975

Cellular	Base	Mobile
	869-894	824-849

Looking Forward to Summer

It is winter. Depending on where you live, you might well be getting a little snow. A little sleet. It sure is cold outside. So let's take a trip to an air show.

Picture yourself at a small, rural air field. It's summertime and a warm breeze ripples the tall grass nearby. Hundreds of people are milling about; the sound of distant planes caress the sky overhead.

Part of the fun of attending an airshow is being able to monitor the action. Even if you don't have a hand-held scanner, you can still catch all of the action by using a small, portable, tunable receiver. I found that my little AM/VHF pocket "Jetstream Mini" from Radio Shack (\$19.95) was a perfect unit to take along. They're about the size of a pack of extra-long cigarettes and they fit perfectly into a shirt pocket or handbag.

Frequencies utilized at air shows are usually found in the 123.1 - 123.425 range. These frequencies in the VHF band, which are utilized for events of a temporary or seasonal nature, are referred to as "MULTICOM." Other uses include aerial search and rescue, fire-fighting operations coordinated from the air, and balloon races.

UHF is for the Military

UHF frequencies are utilized when military performers, such as the Navy's Blue Angels or Canada's Snowbirds are appearing. When a large airport is used as the site for an airshow, regular tower/ approach/ departure frequencies in the VHF air band will also be utilized. When limited, regular air traffic operations take place, show action is temporarily suspended.

Jim Nelson of Colorado reports that at the Greater Denver Air Show, 251.6 and 275.35 were used by the

Blue Angels; Air Boss (Command Control) utilized 123.95 for coordination, 118.6 was used for routine Tower traffic, and 388.0 for other Military aircraft. In Indianapolis, 123.400 was Rebel Control's (Confederate Air Force Command Control) frequency at the small, satellite airport where the show was held.

Aircraft on the Ground

Another real treat at air shows is the exhibition of aircraft on the ground (see photos). The "War Birds" are really something to see, and many an old World War II pilot can be seen pausing in front of the giant planes, a reminiscent gleam in their eyes.

Bert Huneault of Ontario, Canada is real dyed-in-the-wool air show fan. He says that the greatest air show of them all is the one held in Harlingen, Texas, every October. "The World War II segment put on by the Confederate Air Force," says Bert, "is so realistic that you can almost believe you're back at Pearl Harbor in 1941 when it was attacked by Japan!" The Confederate Air Force maintains their headquarters and a very interesting museum there.

Canadien Pacific Merger

Bert also has sent in a clipping that announces the merger of Canadien Pacific Airlines with two other airlines. It is now called "Canadien Airlines International." I mention this because I was wondering if they are going to keep their longstanding callsign, "Empress." According to Bert, the answer is no. The new callsign is simply, "Canadien" and the flight number when they announced their presence to ATC, ARINC, etc.

That's too bad in a way, because the name "Empress" stood out from the crowd of common names, just like Pan American World Airways' "Clipper" and British Airways' "Speedbird." The new airline will, however, use their old two-letter designation of CP for flight plan filing and to appear on ATC's radar screens.

Crowded Airways

These frequencies lead into another contribution from *Monitoring Times* scanner columnist, Bob Kay. He passes along a story from the *Philadelphia Enquirer* about the crowded airways over the Atlantic and Pacific.

The person who wrote the story mentioned that there were five routes crossing the Atlantic, each separated by 60 miles. Planes which are following the same route must stay apart by approximately 75 miles.

Planes are assigned altitude (depending on whether they are going east or west) of 33.0 (the .0 after a figure means 'thousands' - consequently, a plane flying at 33.0 would mean it is at thirty-three thousand feet), 35.0, 37.0, or 39.0. Five routes also connect Alaska to Tokyo, with numerous other oceanic routes from cities on the West Coast joining up with these five aforementioned routes. In addition, there is a very complex system of more routes, which connect the West Coast to Hawaii and other Pacific (North and South) destinations.

The reporter goes on to say that while enroute over oceanic areas, pilots have no way of receiving communications - either direct or relayed from an ATC facility -- unless it is through another aircraft or company! Obviously, whoever wrote the reporter who wrote the story didn't know anything about aeronautical enroute ground stations.

These ground stations relay instructions from ATC facilities to aircraft who are out of radar contact as well as requests from aircraft for higher or lower altitudes to other ATC facilities -- in addition to providing phone patches between flights, ATC facilities, and company stations.

Frightening Misinformation

It does make you wish that reporters who write features such as the above would check out all pertinent facts regarding a subject before putting their fingers to a keyboard.

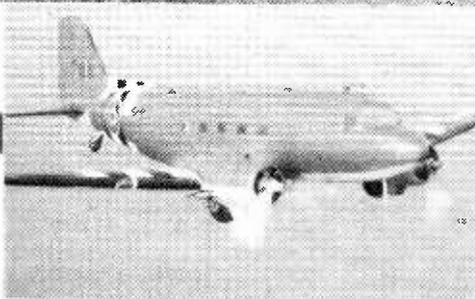
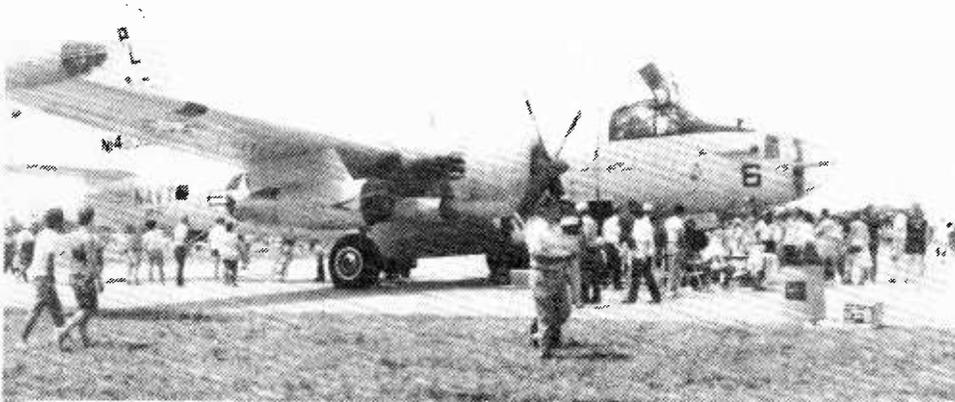
These stories frighten the public. And frankly, if I were under the impression that I was sitting in a metal tube, 35.0 feet above the earth with other air traffic whizzing by -- and my pilot had no radio contact with the ground -- it would scare the heck out of me too!

Review:

World Wide Air Traffic Control

World Wide Air Traffic Control is a nifty volume containing HF (shortwave) aero band frequencies in use throughout the world. The cost is quite nominal -- \$6.00 -- which includes postage and handling in North America. Elsewhere, airmail cost is \$7.00. It is published by Cambridge Airradio Services (Box 3154, Silver Spring, MD 20901).

As an auxiliary tool to have when monitoring the HF aero bands, it can't be beat. Covering the aero bands in the 2-22 MHz range, this book is arranged so that it can be utilized by both the newcomer to monitoring, and by the experienced listener. For example, in one of the



During the summer months, air shows can be found in almost every state. In the top two photos, an A-2 and a B-17 are on exhibit at the Indianapolis Air Show (photos by Dale Spurgeon). Above, a Douglas C-47 Dakota at the Hamilton, Ontario, Airshow (contributed by Bert Huneault). Left, *MT's* Rachel Baughn enjoys exhibits at a Blue Angels' air show at the Naval Air Base in Marietta, GA (photo by Harry Baughn).

More Aero Frequencies

For residents of Dayton, Ohio, and surrounding areas, here is a list of UHF/VHF frequencies in use at Wright Patterson Air Force Base contributed by Joe Hayes of Wheaton, Maryland:

126.9/289.6	Tower
121.8/335.8	Ground Control
115.2/269.9	ATIS (Automatic Terminal Information Service)
118.85/327.1	Approach
122.85	Base Ops

In addition, Dayton International Airport uses the following frequencies:

Approach/Departure - 118.85, 134.45

Bob Kay, "Scanning" columnist, sent the following HF aero band frequencies in which are in use between New York, Gander, San Juan, and Santa Maria*.

2899	2962	3016	5598
5616	5649	8825	8864
8879	13291	13306	17946

*Also Canarias and Lisbon, in some cases.

tables, frequencies are listed by city, country, and type of usage. In another, the frequencies are in order, starting with the low end and working toward the highest, with the ground stations who use each frequency for air/ground transmissions. There is also a complete listing of VOLMET stations, as well as designations for Major World Air Route Areas (MWARA) and Regional and Domestic Air Route Areas (RDARA). (More about how these work and their purposes in a future column)

Bear in mind, however, that although the words "Air Traffic Control" are utilized in the title and throughout the book, it does not concern Air Traffic Control as we know it from listening to the VHF aero band. Instead, it pertains to aero enroute air/ground transmissions between aircraft and operators of ground stations. These do not control air traffic themselves but rather act as the middlemen between aircraft and Air Traffic Control facilities when the aircraft are out of ATC radar range. They also relay messages between pilots of aircraft and their companies, set up phone patches for them, and perform a host of other important functions.

The publisher also stocks air route charts for both Atlantic and Pacific oceanic air space. These are available for \$5.00 (Atlantic) and \$10.00 (Northern Pacific), including postage and handling. Prices are slightly higher outside of North America. The charts are informative, useful, and very easy to understand. With them, you can follow a flight whose transmissions you are monitoring almost all the way from point of departure to destination.

Worldwide Air Traffic Control is highly recommended for all monitors of the HF Aero Band!

Clearance Delivery

Several readers have written into ask just what it is that a Controller who works the position known as "Clearance Delivery" does. First of all, this controller would work at an Air Traffic Control Tower facility, and in reality, does not actually 'control'

aircraft when reading clearances. He or she 'clears' a flight from its departure point to its destination, as filed in its flight plan, before its immediate departure.

Since controllers in every ATC facility rotate positions on a regular basis, everyone gets a turn working CD, as it is called, even though it is not known as a Controller's favorite position! Also, this is one of the first jobs that a "Development," as Controllers-in-training are called, learns to perform in an ATC Tower facility. Note in the accompanying photo of a Controller working CD, the 'flight strips' which he has on the board in front of him. These strips are used in all of the ATC facilities across the country.

When I visited the ATC Tower here in Indianapolis, I was able to watch the CD Controller work with these flight strips. The one which you see here as an example is a copy of that which the Developmental Controllers were using in the classroom which I was also able to visit and observe. This is the 'strip' of a hypothetical flight whose eventual destination is Dayton, Ohio.

Looking at the strip from left to right, in the far left hand corner, the letters "TW28" mean that it stands for TWA, flight 28. Then, moving to the right on the strip, observe that it (the flight) is to cross the ABB navaid (VOR), SHB (Shelbyville, Indiana) VOR, and using V12 ('Victor' Airway 12, which is a low-altitude airway) proceed by way of the RID VOR (RID is Richmond, Indiana) to Dayton.

That's all for this month. Upcoming features in "Plane Talk" include an interview with Richard Covell, the Air/Ground Operations Manager of ARINC at their Corporate Headquarters in Annapolis, Maryland, the VHF aero communications band (108.000 - 135.975 MHz) plan arrangement and utilization of frequencies; and other interesting subjects, not forgetting more ARTCC Sector Charts as previously promised, of course!

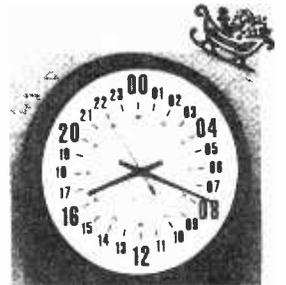
Until next time, 73 and out. ■

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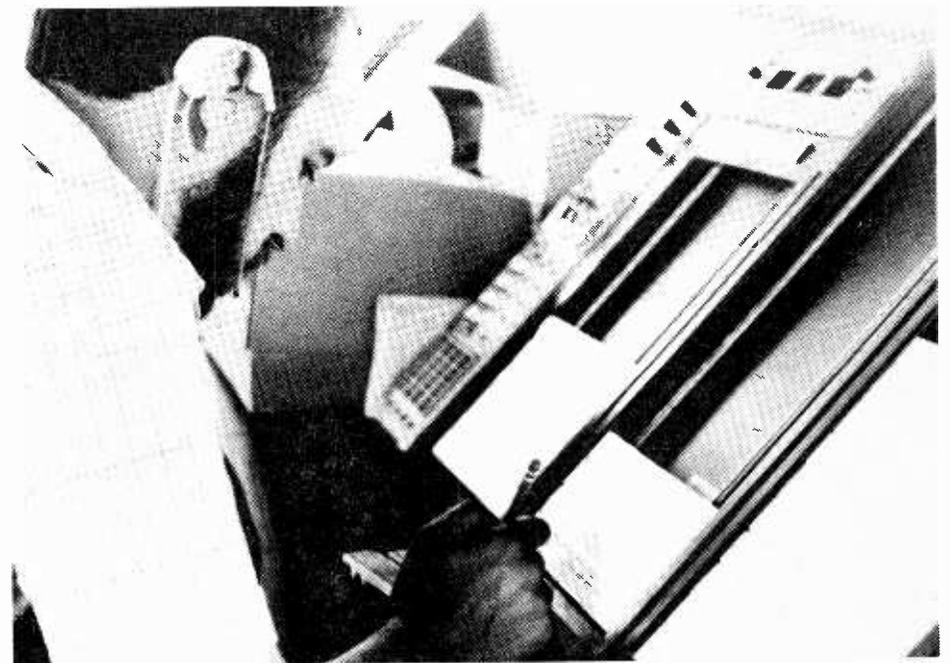
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Newark ATC controller (tower) working clearance delivery position; on the board are flight strips representing flights awaiting the sequence for departure (Photo courtesy Bill Wolf) Below is a closeup of a flight strip (smaller than actual size)

XXXTW28 2	20 58	210	SBY./ABB360015 SHB	4510
8707/A			V12 RID DAY	
T440				
143 18 03		ABB 360/015		

Scanner Games

As I walked into the room, one of the "air traffic controllers" acknowledged my presence by placing a finger to her lips. I immediately understood the gesture as a warning to be quiet.

Moving very softly, I positioned myself behind the nearest controller. Her "scope" showed "United 240" on the ramp, awaiting permission to taxi. "Eastern 110" was cleared for takeoff and "Delta 331 Heavy" was on the ILS, cleared for landing.

I was impressed. Of the three controllers present, two had just started handling traffic about a week ago. Already, they were plotting both air and ground traffic.

The Tension Rises

The third controller was an invited guest and I could see by her puzzled look that she was in trouble. As I took a seat next to her, the radio squawked, "Delta 890 heavy, cleared to land."

I didn't see Delta 890 on her scope! "You have a fully loaded plane on the ILS and it's not even here," I whispered.

"I can't keep track of all of them," she replied.

"Look," I began, "I'll handle the approach traffic, you concentrate on the ground traffic."

"OK," she replied.

The radio came alive again, "Delta 890, taxi to ramp and follow the shuttle."

I watched her as she maneuvered Delta 890 safely down to the exit ramp.

"That's not fair, Dad!" my oldest daughter shouted. "She has to do it on her own."

"Can't you give her a break?" I pleaded. "She just started playing."

My youngest daughter was the next one to make her feelings known. "Dad, you just made a mess of the whole game. Now we have to start over."

Let the Games Begin

The game "Airport" is played by one or more players with a scanner and a realistic, but fake computer screen. The game cannot be found in stores. It is my own invention. The idea came to me when I was trying to discover how to get my two daughters, ages 11 and 13, interested in scanning. Since they played computer games for hours on our Commodore 64, I decided to build a scanner-controlled board game which resembled a computer screen.

Initially, construction of the game was kept simple. After obtaining a map of Philadelphia International, the runway configuration was copied onto an 8 x 12 inch thick piece of plexiglass. Compass points were added and care was taken to correctly align the landing field in the proper direction.

A scanner was programmed to the ground frequency and a tape recorder was directly connected to the scanner record jack.

Traffic was then represented by strips of paper on the plexiglass "scope." When the controller directed "Delta 890" to the ramp, a strip of paper was designated as "Delta 890" and placed on the ramp. Other traffic was represented in the same manner. Within five minutes the board, or "scope" as I like to call it, projected an up-to-the-minute preview of all ground traffic.



Compass headings and wind direction will indicate runway usage; runway "27" actually stands for a heading of 27 degrees.

Departures were held in a specific group for later verification. For example: In the left hand corner of the scope, an area was designated for New York bound traffic. Planes bound for points south were held at an opposite corner. Still another area was designated for arrivals.

After ten minutes of play, the game was stopped. Total board status was then verified. Starting with one hundred points, five points were deducted for each plane that was improperly logged. Further points were subtracted for incorrect departure, arrival and ground traffic positions. Disputes were settled by playing back the tape.

For the beginner, the game can be simplified by pre-recording the air controllers' instructions. After pre-viewing the tape and taking notes, the game will be much easier to play. Presenting small trophies to players with high scores helps to build and maintain the players interest. Saving the "live" action for more experienced players also adds to the excitement.

Variations / Enhancements

Monitoring and controlling both ground and air traffic is challenging. In order to accurately plot the movement of planes, two scanners will be needed. Two channels on one scanner will only step on one another, making accurate traffic handling impossible. Listening to both channels simultaneously may be confusing at first, but your ear will quickly grow accustomed to this practice. Separate tape recorders will be needed for each scanner. Mike hook-ups must be direct, plug to plug.

Enhancement of the game is limited only by your imagination. A small box can be built with a plexiglass top that is illuminated by an interior light. Magnetic strips along the runways allow for miniature metal planes to be used. Check your local hobby shop for small airplanes and other interesting items that would make the game more interesting.

Another plexiglass board may be mounted vertically along the back of the

main board. This vertical board will provide "air space" for traffic that is inbound or in a hold pattern.

To mark on plexiglass, I used a non-permanent marker that my local artist shop recommended. Made in Germany, "Lumocolor" markers have a very fine tip, come in various colors and mark very well. They will not stain the plexiglass and are water soluble.

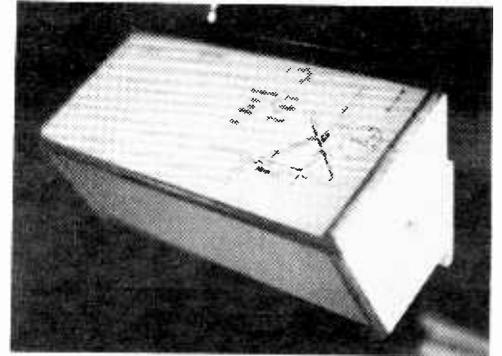
A more permanent method of marking the runway boundaries and other fixed objects can be accomplished by using a glass stain. Many of the available stains are transparent and will give a professional looking touch to a lighted project.

For some "hands on" flying experience, consider taking the Air Safety Foundation's, "Pinch Hitter Course." The course is designed to teach a passenger how to land a light plane, should the pilot become incapable of doing so. It is a rather unique way to learn the business of flying without having to participate in a more expensive and lengthy pilot training course. For more information write: APOA Air Safety Foundation, Air Rights Building, 7315 Wisconsin Avenue, Washington, DC 20014.

Computer programmers should be able to "hack" out a program so that "Airport" could be played with an actual computer. (If anyone develops such a program, please let me know.)

River traffic can also be plotted in the same manner as air traffic. Instead of runways, draw the outline of your local river as it passes through your area. Maneuvering tugs, barges and cargo ships through busy shipping channels will be just as interesting as handling air traffic. To determine river markers, draw-bridge frequencies and other related data, stop by your local Coast Guard Station or obtain a copy of *River Pilot*. This handy reference is published by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

Complete with charts, graphs and frequency lists, *River Pilot* is over two hundred pages. Printed according to



The author built a small box with internal lighting as a permanent fixture in his shack. The glass "eye" is a photo-electric relay to light the unit automatically at dusk!

specific regions, a local copy is available for your area. Further information can be obtained by writing to Director, Charting and Geodetic Services, National Ocean Service, NOAA, Rockville, MD 20852-3806.

Police and Fire Departments can also be added to the list of scanner games. Simply have a map of your town or other area of interest, enlarged by a coping center. Program the appropriate frequencies and begin plotting the action.

One of my favorites is to cover a map of my town with a thin clear plastic overlay. Using a grease pencil, each police call is designated as a blue dot. Fire calls receive a red dot. Use a new overlay each day, but save the one before it. At the end of a week, place all the sheets over the map. An interesting picture of emergency calls and the number of calls will be at your finger tips.

In the winter make a "scope" of your main and secondary roads. As snow plows and traffic reporters are monitored, close off the roads that are impassable and indicate areas of slow traffic. A very realistic "birds eye view" of the highway situation can be obtained in this manner.

If you're scheduled to work during one of those snowy mornings, this game could turn into serious business as you look for alternate routes to your destination.

A friend who is a model railroad enthusiast suggested using a train set with a scanner. By making a scale model of your local rail yard, trains could be moved according to the yard master's instructions. Point to point traffic could also be handled by making a working model of railways between two cities.

Train scales start at "O" gauge, followed by "HO" and "N" scale. The smallest scale is "Z" -- about the size of a pencil eraser. A working "Z" scale layout of a small city and its rail traffic would fit into a briefcase!

In the living room the kids were playing "Airport" again. I didn't mind that they were hogging all three of the games that I had made; I was building my own game in the basement. Completely portable, it was lighted, contained a built in scanner, extension speaker and amplifier. A forty inch whip pulled up from the top of the case and the "scope" was interchangeable. I planned to finish the project in time for Christmas. If they asked to play with it, I already knew what my answer would be--

"Bah, Humbug!"

Regency TS-2 Turboscan

Many months ago Regency Electronics announced the imminent release of a new technology, the Turboscan, a scanner which hurled through its memories at an unprecedented 50 channels per second--at least three times faster than anything else on the market.

Was the wait worth it?

APPEARANCES

Removing the VHF/UHF scanning receiver from its styrofoam packing we discovered a familiar look: The cabinet is virtually identical to the M-100/400 and MX3000 scanners. The soft rubber keypad, however, is a distinct improvement.

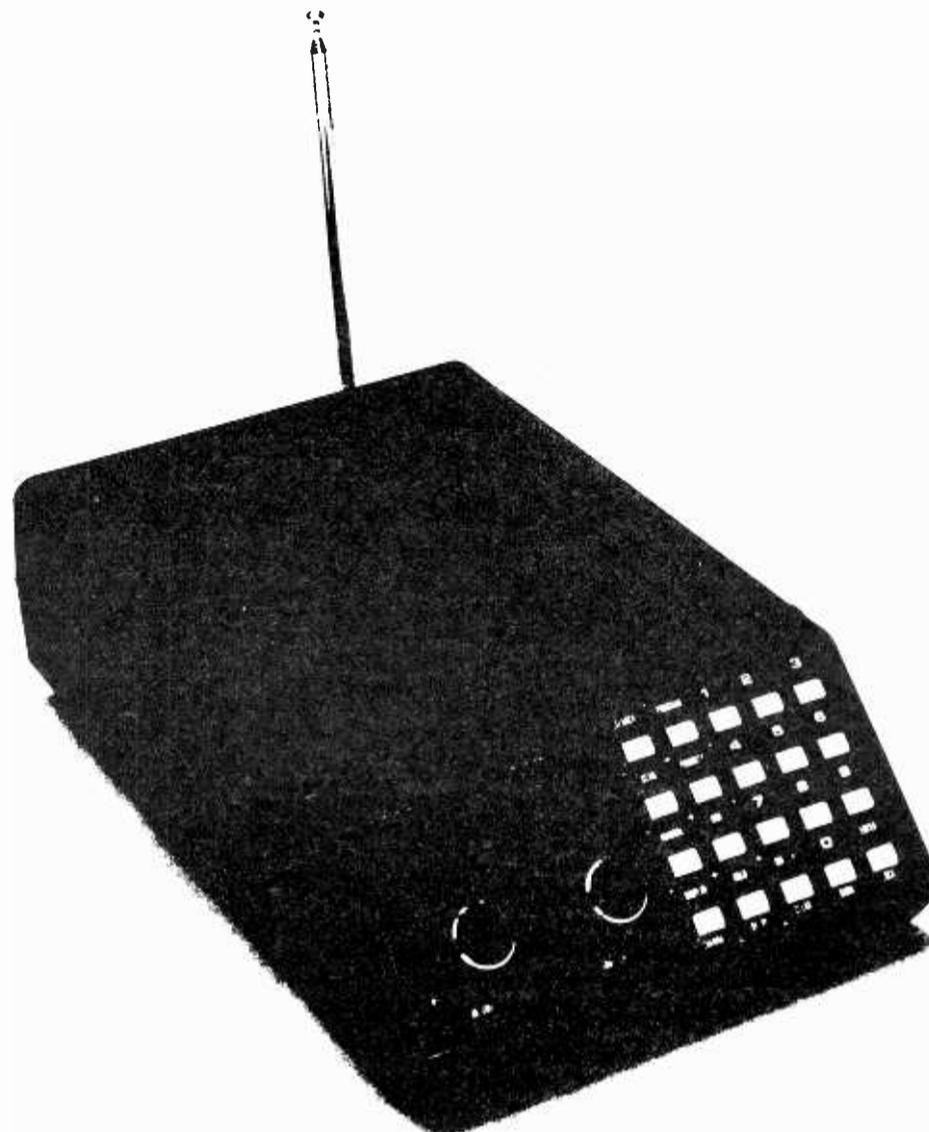
Boasting an impressive frequency range (29.94-54 MHz FM, 118-136 MHz AM, 136-174 MHz FM, 406-512 MHz FM, and 806-950 MHz FM including cellular telephone), the TS-2 flashes its frequency, channel number and status symbols from a brilliant (and dimmable for night viewing) fluorescent display.

FEATURES

Search increments are 5 kHz for low band and aircraft, and 12.5 kHz for UHF. The 800 MHz spectrum is, however, incrementally mixed to be compatible with various allocations: 10 kHz for 825.030-844.980 and 870.030-889.980 MHz; 12.5 kHz for 890-950 MHz; and 25 kHz for 806-825.025 and 845-870.025 MHz.

A 75 channel memory may be loaded in any combination of 6 banks which may be scanned selectively or sequentially; this feature allows small and large frequency lists to be sorted by agency or purpose and loaded to suit the user.

The memory comprises two non-volatile EAROMs which never need



batteries and can hold their program for ten years. Programming is easier than found on previous Regency scanners; preliminary pressing of a "program" key for frequency or channel entry is not required.

Scan speed is truly impressive. The user may elect to display either the frequency or the channel number and when it is executing its scan sequence, the display is a blur! It was refreshing to hear a transmission from the beginning rather than dropping in on it mid-sentence.

A programmable search function allows up and down directions as selected by the user. After the search limits are programmed they may be reviewed by pressing the "program" key (twice, although not stated in the manual: once for the lower limit and again for the upper limit).

The many features of a top-end scanner are included: individual channel lockout; channel one priority; individual channel scan delay; automatic decimal (except low band) and trailing zero entry during frequency programming; and pre-programmed weather channel search.

A rear-apron memory lockout switch may be enabled to prevent accidental erasure of frequency entries. Other rear apron jacks include external antennas (two separate Motorola jacks: one for low, high, UHF; the other for 800 MHz); external 8-ohm speaker; and 13.8 VDC power.

SOME OBSERVATIONS

After a keyboard function is entered, the display will blink unaccountably once or twice about six seconds later; we assume this is normal since it

10155 and 10176, Dave also logged YL/SS and YL/GG broadcasts. He also picked up a Russian single letter beacon (SLB) using "IM" (Morse equivalent for the cyrillic character) with the letter repeated 44 times per minute.

occurred predictably and in no way disabled the radio.

While the notorious key-press confirmation "beep" is present on the TS-2, its level is low enough as to be non-distracting. During the search function, when the "search" key is pressed after the sequence stops on a signal, the function resumes on the last displayed frequency -- an improvement over predecessors which reverted back to the low limit frequency.

Since the circuit is a conventional down-conversion scheme with a 10.7 MHz intermediate frequency, images are present 21.4 MHz away from (usually above) the signal frequency and may be prominent in strong signal areas. They are no worse, however, than on any other competitive scanner utilizing down conversion.

Birdies (weak signals generated by the radio itself) are few and far between--except on the aircraft band where they appeared to be particularly noticeable; but once again, no more than on the competition.

Sensitivity is excellent. The specifications showed typical sensitivities in the 0.5-0.9 microvolt range, better than claimed by most other scanners, and on-air monitoring verified excellent weak-signal reception.

Accessories provided with the TS-2 include an AC wall adaptor, DC mobile power cable, mobile mounting kit, plug-in whip antennas, and instruction manual.

Was it worth the wait?
You bet!

(Regency TS-2 Turboscan, \$499 retail; \$319.95 plus \$5 shipping from Grove Enterprises. Also available from other MT advertisers -- call for availability as this scanner is still in limited supply) ■

516 Kingsley Road SW
Vienna, VA 22180

Due to the volume of mail I have been receiving it is necessary to remind readers that if a personal reply is desired, a self-addressed, stamped envelope *must* be included with your letter. Additionally, if I request reimbursement for actual expenses for postage or reproduction costs of for copying services, these will be expected.

I would like to thank those of you who have always cooperated with such reimbursements, realizing that my time for these efforts is donated and expenses are very real.

**Ground Wave
Emergency Network**

A recent *Washington Post* article indicated that the U.S. Air Force has had to delay construction of several of the GWEN towers in New England due to a suit filed by a Boston-based Conservation Foundation and the Rhode Island attorney general's office. Apparently the Air Force did not conduct individual environmental impact studies for each tower site -- the basis for the suit.

Mail Bag

Using an NRD-525 receiver and a dipole antenna, Robert Swan of Maryland logged some beacons and requested identification data for them. Since these may be of interest to other readers, here is the list.

- 209 SYS Somerset (Stoystown Co.), PA
- 227 GDX Upperville (Goodwin Lake), VA
- 242 INP Indiana (Stewart Field Co), PA
- 317 CBE Cumberland (Municipal), MD
- 339 RYP Cumberland (Municipal-Cresap), MD
- 404 YSL St.Leonard,NB, Canada
- 414 BC Baie Comeau, Quebec, Canada
- 432 IZN Lincolnton, NC

Two letters were received from Dave White of Maine outlining comments about some Russian transmissions he had logged. He speculated that activity on 10115, 10118 and 14508 kHz appeared to be someone imitating Russian communications, perhaps a NATO or U.S. military exercise. During a five-day period between the hours of 1730-2100Z on

Chuck Oliver of Texas asks about the identification of some U.S. vessels noted in the callup of "Coral Bay this is Coral Star, whiskey sierra echo 6460." I do not have these stations listed in my references. Perhaps someone else can supply the breakout for these calls.

Monitoring Times subscriber Roman Robakiewicz of Connecticut writes, "I never gave shortwave radio much thought. I was an ET in the Coast Guard so, naturally, I knew that anyone who pounded keys was weird. Monitoring magazines perked up my interest so that when I found a quarter on the side of the road one day, I spent it on an IC-R71 and an Info-Tech M6000. I had some wire hanging around, so I strung it out to an oak tree."

Roman described a CW station he had picked up sending very brief transmissions of cut numbers at 7 wpm on 5196.1 kHz. The cut number system in use is believed to be this one:

1 2 3 4 5 6 7 8 9 0
A U V 4 E 6 B D N T

A set of these cut number characters would be sent and then repeated a number of times, followed by a different set. This procedure would continue for most of an hour and then the station would go off the air. Sometimes during the course of the sequences, tone bursts would be heard and on one occasion there were 60 tone beeps, one per second in the manner of a timing sequence.

"Utility Intrigue" has monitored transmissions on 6944.1 (2018Z), 9389 (1734-1741Z), and 18736.5 kHz (1320Z) that, while not identical, were quite similar to those heard by Roman.

Here is a sample of the transmissions. These were monitored during the period of 2236-2252 UTC on 1 September 1987: 6N EE4VTV (rptd 14 times), BT 6TNENA (rptd 7 times), TU UBATDT (rptd 14 times) and off the air. Similar transmissions were also heard from 1910-2000 UTC on 2 September and from 2211-2250 UTC on 3 September. Roman reports he has not heard the activity after 3 September.

**SPECIAL INTEREST ITEMS -
Sep**

4203 kHz--010761Z--CW

An unidentified station sending cipher traffic. The signal was very weak and the text was full of special Morse characters. Two of these were AY and KY and they were heard frequently. I can't recall

ever hearing transmissions with these particular special characters.

6840--050016Z--MCW

Cut number traffic, auto sent, very, very slow. The cut number system was AUV4E6BDNT = 1-0. Sent in groups of 5-characters

13414.9--051316Z--CW

Another cut number activity. Some numbers sent full, others cut. The break-out is AU34567DNT = 1-0. The station actually sent the number 7 as "AS" and this initially caused some confusion as I was copying the message.

14910.1--141430Z--RTTY 75-425

This frequency appeared to be a Yugoslavian diplomatic link which carried encrypted traffic as well as Serbo-Croatian PT traffic. The transmission led off with DFZG DFZGDFZGQTC RY's. After several minutes of this the message

heading was transmitted and addresses were all designated by trinomes such as 452, 480, 410, 482, etc. Following the message number a series of XY's were sent and into encrypted traffic which printed out as garbage. Three encrypted messages were sent followed by the plaintext message.

14910.1--101448Z--RTTY 75-425

This may have been the same activity as the 14910.1 kHz station. The message heading was the same type but the separator between the heading and message text consisted of repeated ZP's.

18736.7--151738Z--MCW

Automatic, very slowly sent, cut number transmission of just three groups of 5-characters each. The cut number system is believed to be AUV4E6BDNT - 1-0. The station went down at 1739Z. ■

W.J. Battles, New Hampshire, made up this PFC and with its return he also received a colored slide of a CG helo and a nice letter from the aircraft commander of the flight he had monitored.

COAST GUARD



Confirming your reception of: RESCUE 1493

DATE 8-17-87 TIME (ZULU) 1503 MODE USB

FREQ: 5696 KHZ ANTENNA _____

POWER _____ TRANSMITTER AN/ARC 94

REMARKS: POSITION - 41-26.3N
71-13.0W

M. J. Williams LCDR USCG
Signature ACFT CHDR
1493

CAPE
COD
AIR

SEPTEMBER 1987 LOGGINGS		
KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
3352	250246	CW/555 555 TTT (rptd over & over
3445	020233	AM/Atencion 628 180/bvrs bcst upcoming
3479.1	280101	CW/FNE DE MOA, PFO DE MOA (all unid)
3529	240607	CW/5F grps, speed key sent
4409	240548	CW/RKJ DE SYF, RKJ DE YVE (all unid)
6243.6	021947	CW/5 charac grps, ltrs A-Z, Spanish enyeh (MW) & figs 2,3,8
6428	281237	CW/DE VIX (Master Station Canberra, Australia)
6785	010816	AM/YL-SS with 5F grps
7587.6	280109	USB/YL-EE with 3-2F grps/weak & QRM
9222.1	080005	RTTY 50-170/DE TJK (ASECNA, Douala, Cameroons) with RY's
13399.2	281219	RTTY 50-425/Cuban Minrex msg to various Cuban embassies
13569.4	051502	CW/SNN213 DE SPP313 (Polish alloc)
13827.9	051244	CW/5L grps with cyrillic characs AA IM OE OT
13958.3	081619	RTTY 50-425/Cuban Minrex Pt Spanish tfc for various Cuban embassies
14445.6	031228	CW/5L grps with Cyrillic characs
14540	051450	AM/YL-SS with 5F grps
14585.5	281350	CW/5F grps, auto sent, cuts zero as T, went down with TTT TTT
14617	281348	RTTY 50-425/5L grps then into RY's DE Y7A53-55-74-77 (East German Diplomatic)
14763.6	041719	CW/5L grps, auto sent
14899.5	041723	RTTY 50-170/DE CLN451-530, Cuban relay of TASS (Soviet Press Agency items)
14948	281342	RTTY 50-170/5F grps, Cuban Minrex tfc to various Cuban Embassies in Africa

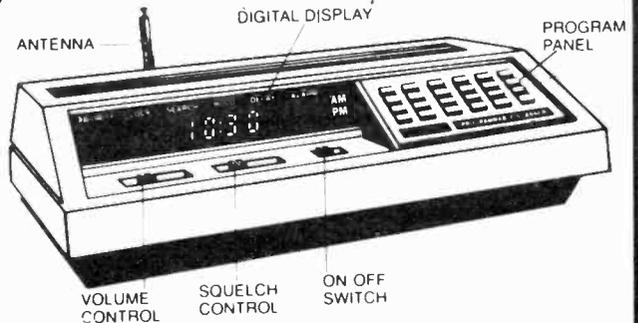
"The Largest Dealer of Scanners in the World"



SCANNER WORLD, USA®

10 New Scotland Ave., Albany, NY 12208 518/436-9606

Regency® Z30 30 Channel Automatic Programmable Scanner



Scanner World Special

\$129.99

(plus \$5.50 shipping each)

Optional Accessories:

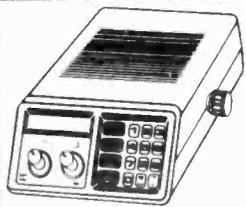
Cigarette Lighter Plug RGMPC . . . \$4.95
Z Mobile Bracket — **Special** . . . \$5.99

The Regency Z30 is a compact, programmable 30 channel, multi band, FM monitor receiver for use at home or on the road. It is double conversion, super heterodyne used to receive the narrow band FM communications in the amateur, public safety and business bands: 30-50, 144-174, and 440-512 MHz. Size 10 3/4" W x 2 7/8" H x 8-3/8" D.

Sophisticated microprocess-controlled circuitry eliminates the need for crystals, instead, the frequency for each channel is programmed through the numbered keyboard similar to the one used on a telephone. A "beep" acknowledges contact each time a key is touched. The Z30 scans approximately 15 channels per second.

Any combination of two to thirty channels can be scanned automatically, or the unit can be set on manual for continuous monitoring of any one channel. In addition, the search function locates unknown frequencies within a band.

Other features include scan delay, priority and a bright/dim switch to control the brightness of the 9-digit Vacuum-Fluorescent display. The Z30 can be operated on either 120 VAC or 12 VDC. Includes one year warranty from Regency Electronics (optional 3 yr extended warranty only \$39.99, gives you a total of 4 yrs complete warranty or 2 yr extended warranty only \$29.99, gives you a total of 3 yrs complete warranty.) Z-30 Service Manual \$5.00.



**Regency®
MX-3000**

Special \$169.99
(\$7.00 shipping)

30 CHANNELS—MOBILE/BASE —SCANNER WORLD EXCLUSIVE—

Features include simple programming of the following frequency ranges: 30-50 MHz, 144-174 MHz, 440-512 MHz. Digital display, priority, search, lockout, delay, dim control, top mounted speaker, one year factory warranty. Includes AC & DC cords, mobile mounting bracket, telescopic antenna. All for only **\$169.99** plus \$7.00 shipping (optional extended warranty: 3 years \$39.99; 2 years \$29.99.) MX3000 Service Manual \$5.00.

Cobra® SR-15

\$219.99 (\$7.00 shipping)



100 channel pocket sized hand-held scanner (6" H x 2 3/4" W), no crystal, portable scanner, 29-54 MHz, 118-174 MHz, 406-512 MHz. bank scanning, backlit LCD display, automatic search, lockout, scan delay, priority, key lock, plus much more. Includes rubber antenna, rechargeable Ni-Cad battery pack, AC adapter charger, earphone, and carry case. optional cigarette lighter adapter #15MPC \$12.99.

Regency® HX2200

\$172.99

(Plus \$7.00 shipping each)

Digital Programmable 20 Channel Hand-Held Scanner with raised button keyboard for easy programming of the following frequency ranges: 118-136 MHz, 138-174 MHz, 406-512 MHz, 800-950 MHz (NOTE: This is the only hand-held portable scanner which will receive the 800-950 MHz range plus high band, air, and UHF). Features include priority, scan delay, memory backup, dual scan speed, channel lockout, jacks for external antenna and earphone, 90 day factory warranty, keyboard lockswitch, sidelit liquid crystal display for night use, program AM or FM mode, search or scan, size is 3" x 7" x 1 1/2". Complete HX2200 package includes Ni-Cad rechargeable batteries, wall charger adapter, protective carry case, and rubber antenna. All for the low price of only **\$172.99** plus \$7.00 shipping each. (Optional extended warranty: 3 years \$39.99, or 2 years \$29.99)



REGENCY HX1500

Digital programmable 55 channel hand-held scanner. Frequency coverage 29-54 MHz, 118-174 MHz, 406-420 MHz, 440-512 MHz. Covers Public Service bands plus aircraft, trains, marine, plus many others. Has priority, search, lockout, scan, banks, sealed rubber keyboard. 90 day factory warranty. Includes flexible rubber antenna, belt clip and earphone.

\$224.99 (Plus \$7.00 Shipping each)

Optional Accessories Available for HX-1500: Call For Price.

REGENCY RH-256 B PROGRAMMABLE TRANSCEIVER

RH-256B Transceiver, 16 channel 12 VDC 2-way Radio fully programmable in transmit and receive mode. includes built-in CTCSS tones for encode/decode, time-out timer, scan delay, 25 watts transmit power, priority, plus more. Frequency spread as shipped 152-158 MHz. Package includes mobile mike, bracket, mobile antenna, and all cables and instructions for installation. **Special package deal only: \$359.99** (7.75 shipping) (2 year extended warranty \$49.99 - 3 year \$69.99)

ORDERING INFORMATION

Call (518) 436-9606 to place orders by phone or mail orders to **Scanner World**, 10 New Scotland Av., Albany, NY 12208. Orders will be shipped same day received by United Parcel Service. **Scanner World** accepts VISA, MasterCard (COD shipments by United Parcel will be for cash or certified checks only). Mail orders with personal or business checks will be held 4 weeks for bank clearance. Orders with cashiers checks or money orders shipped same day received. Prices, specifications and terms subject to change without prior notice. If items are out of stock we will backorder and notify you of delivery date. All shipments are F.O.B. **Scanner World** warehouse in Albany, NY. We are not responsible for typographical errors. All merchandise carries full manufacturers warranty. Bid Proposals and Purchase orders accepted from Government agencies. Free full line catalogue available upon request. No minimum order. New York State Residents add 7% sales tax.

SHIPPING CHARGES

(* Add (\$) per scanner, and **\$3.00*** for all accessories ordered at same time. C.O.D. shipments will be charged an additional \$3.00 per package. Full insurance is included in shipping charges. All orders are shipped by United Parcel Service. Shipping charges are for continental USA only. Outside of continental USA, ask for shipping charge per scanner.

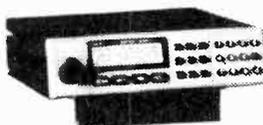
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**Bearcat
BC-600 XLT**

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Digital Programmable 100 Channel Scanner

BC-600 XLT covers the following frequencies 29-54 MHz, 118-174 MHz, 406-512 MHz. Features compact size of 6-5 1/8" W x 1-5 8" H x 7-3 8" D. scan delay, priority, memory backup, channel lockout, bank scanning, key lock, AC/DC power cords, telescopic antenna, mounting bracket supplied, one year factory warranty, search direct channel access, track tuning, service search including pre-programmed frequencies by pushing a single button for police fire/emergency, aircraft, weather, and marine services. Plus exclusive optional features never available on any scanner before. First is an RF receive amplifier for boosting weak signals for only \$24.99 plus a CTCSS tone board is available for only \$59.99 to make this the number one scanner available in the USA. Optional cigarette lighter plug #600MPC \$4.99

BEARCAT 100XL Hand-Held Programmable	194.99	(7.00)
REGENCY INF-1 Informant Scanner	\$249.99	(7.00)
BEARCAT 70XLT Programmable Hand-Held	169.99	(6.00)
BEARCAT 50XL Programmable Hand-Held	119.99	(5.00)
AD100U AC Adapter/Charger for 50 XL	12.95	(*)
BP55 Ni-Cad Battery Pack for 50XL	13.99	(*)
CASO Carry Case for 50XL	11.99	(*)
PS001 Cigarette Lighter Adapter for 50XL/100XL	12.95	(*)
BEARCAT 140 AC Programmable Scanner	94.99	(5.00)
BEARCAT 145XL AC Programmable Scanner	99.99	(5.00)
BEARCAT 175XL AC Digital Scanner	159.99	(5.00)
BEARCAT 100XL Digital Hand-held	194.99	(7.00)
BEARCAT Weather Alert	39.99	(4.00)
BEARCAT 210XLT AC/DC Digital Scanner	199.99	(7.00)
BEARCAT 800 XLT AC/DC Digital Scanner	299.99	(7.00)
REGENCY R1075 AC Digital Scanner	94.99	(6.00)
REGENCY MA-257 Cigarette cord for HX1000/1200	16.99	(*)
REGENCY MA-917 Ni-cad Battery for HX1000/1200	24.99	(*)
REGENCY HX-CASE Hvy Leath. case for HX1000/1200	19.99	(*)
REGENCY MA-549 Drop in charger for HX1000/1200	89.99	(5.00)
REGENCY MX-3000 AC/DC Digital Scanner	169.99	(7.00)
REGENCY HX-2200 Digital Hand-Held Scanner	172.99	(7.00)
REGENCY Z-30 AC/DC Digital Scanner	129.99	(5.50)
REGENCY Z-60 AC/DC Digital Scanner	149.99	(7.00)
Mobile Mounting Bracket for Z Scanners	5.99	(*)
REGENCY ACT-R-1 AC/DC Crys. Single Channel	75.99	(4.00)
REGENCY RH-256B High Band Transceiver	359.99	(7.75)
REGENCY UC 102 Hi-VHF Hand Transceiver	119.99	(5.50)
REGENCY RH-600B High Band Transceiver	429.99	(7.75)
REGENCY R806 AC/DC Crystal Scanner	79.99	(5.00)
COBRA SR12 Digital Hand-Held Scanner	199.99	(6.00)
COBRA SR10 Digital Hand-Held Scanner	129.99	(6.00)
COBRA SR900 AC/DC Digital Scanner	109.99	(5.00)
COBRA SR925 AC/DC Digital Scanner	164.99	(6.00)
Book "Top Secret Registry of Gov't Frequency"	12.95	(3.00)
Book "Covert Intelligence, Electronic Eavesdropping"	8.95	(*)
Book "Betty Bearcat Frequency Directory"	14.95	(*)
Book "Rail Scan Directory"	7.95	(*)
Book "Air Scan Directory"	12.95	(*)
RCD MRP-1 Single Channel Hand-Held	38.99	(3.00)
FANON M8HLU DC Crystal Scanner	89.99	(5.00)
FANON PSK-1 AC Adapted for M8HLU	12.99	(*)
FOX BMP-1060 AC/DC Digital Scanner	129.99	(5.50)
FOX Mounting Bracket for BMP-1060	9.99	(*)
ANT-1 Magnet Mount Mobile Scanner Antenna	29.99	(3.00)
ANT-6 Base Scanner Antenna w/50' cable	29.99	(3.00)

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NASA Announces STS-27 Crew

NASA has announced the five crew members for space shuttle mission STS-27, slated for launch in the early fall of next year. On board will be Robert L. Gibson (CDR,USN), commander; Guy S. Gardner (LT.COL, USAF) pilot; mission specialist Richard M. Mullane (Col, USAF); Jerry L. Ross (Lt. Col, USAF) and William M. Shepherd (CDR,USN).

The 41 year old Gibson was the pilot on STS-41B in February, 1984, and commander of STS-61C in January, 1986. Born in Cooperstown, New York, he makes his home in Lakewood, California.

STS-27 will be the first space flight for astronauts Gardner and Shepherd. Gardner, born January 6, 1948 was born in Virginia and Shepherd, 37, in Tennessee. Mullane flew as a mission specialist in August, 1984, as did Ross, in November of '85.

Funding for Space Station

The National Aeronautics and Space Administration is expected to win its battle to fund the space station despite the efforts of Senator William Proxmire (D-Wis). Proxmire has opposed the space station, shuttle and other high-profile space programs saying that the \$767 million earmarked for the space station in the 1988 budget would go a long way toward cutting the federal deficit. He calls the space station "ill conceived" and says it "has no mission." NASA calls the space station "essential."

Instead, Proxmire is pushing for a privately funded alternative to the space station composed of Boeing, Lockheed, Westinghouse, and Houston's space industries. According to NASA, however, comparing the two efforts "is like comparing a rowboat to the Queen Mary." (Information courtesy of *AMSAT News Service*)

Launch Success Boosts 3c Launch Campaign

With the successful launch of the Ariane V-19 mission on September 16, AMSAT's phase 3c satellite launch campaign is under way. If all goes according to plan, AMSAT's newest, biggest and most powerful satellite ever will be lofted into a Molniya elliptical orbit within 3 months.

Phase 3c contains four separate transponders including two modes never before used; mode S with 70 cm uplink and 13 cm downlink and Rudak, the packet radio experiment developed by the Munich contingent of AMSAT DL. In addition, the new mode JL will be aboard phase 3c. Mode JL combines 2 meter and

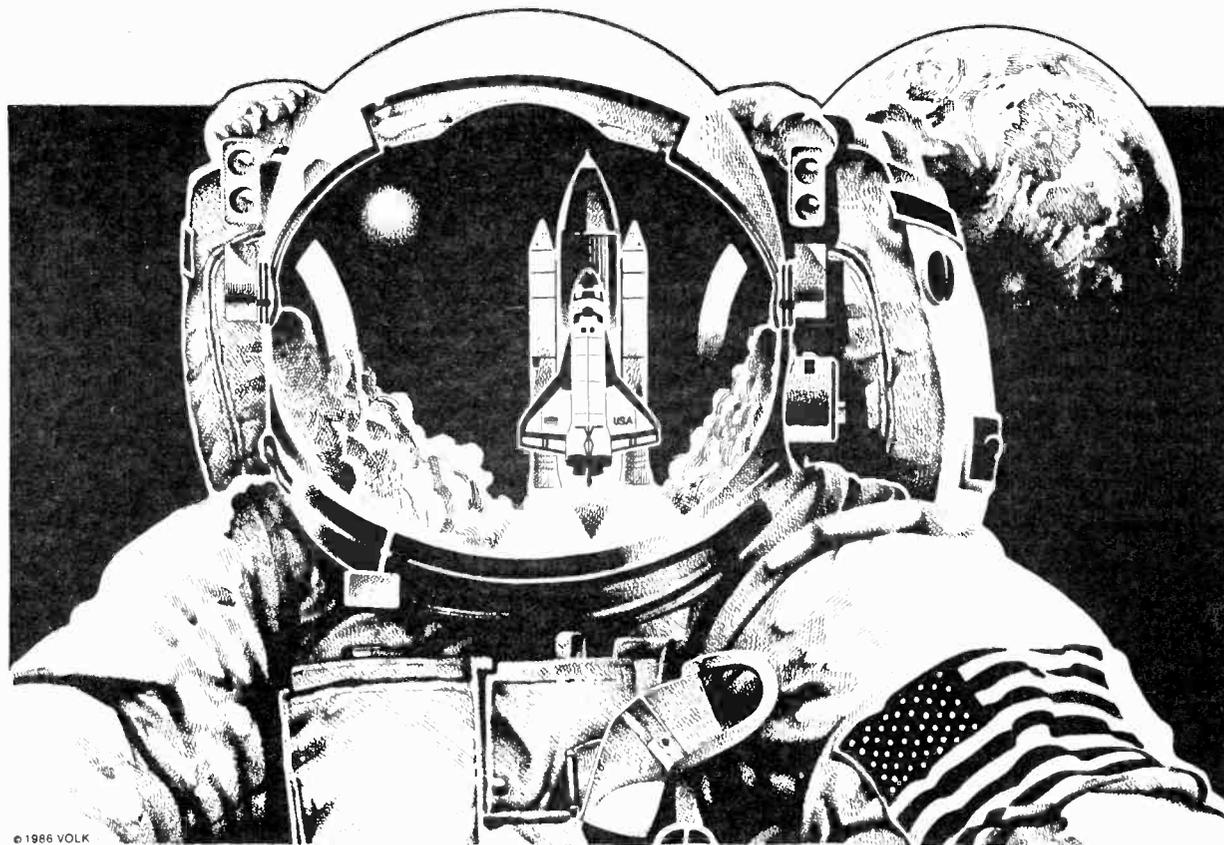
24 cm uplinks to generate a 70 cm downlink. The fourth phase 3c transponder is a mode B device very similar to AO-10's mode B.

AMSAT NA will join its phase 3c collaborator, AMSAT DL, to purchase launch insurance for phase 3c. The insurance would cover the loss of the spacecraft if the worst should happen. AMSAT NA has set \$10,000 as its launch insurance fund goal and is inviting donations to the program.

Every donation of \$10 or more to the P3c insurance fund will be acknowledged with a special phase 3c QSL card and by having the donor's name and callsign printed in an amateur satellite report. Donors of \$30 or more will receive a handsome AMSAT certificate suitable for framing and have their name and callsign in *ASR*. The certificate will feature a special "Ghosted" image of phase 3c overprinted with the donor's name and callsign.

Donors of \$100 or more will receive the certificate, the QSL card, and, if they wish, their photograph in *ASR*. Donors of \$1000 or more will get their choice of a complete, leather-bound set of seven years of *ASR* or a special recognition plaque from AMSAT and in addition, will have their photograph prominently featured in *ASR* if they desire.

Mail your donations to: Phase 3c Insurance Fund, AMSAT, P.O. Box 27, Washington, D.C. 20044, or call, 301-589-6062. Donations may be put on your major credit card. AMSAT is a non-profit scientific, educational corporation and is



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treated as a charitable organization for tax purposes. Your donation may be tax-deductible. (Information courtesy of the *AMSAT News Service*)

Soviet Weather Sats

The following frequency list is the latest summary of Soviet weather satellite activity courtesy of the Data-link RBBS author Grant Zehr.

137.300 MHz

No APT transmissions have been heard on this channel recently.

137.400 MHz

Meteor 2-type signals were heard on this channel on 18 August 1987 by *Monitoring Times* columnist Greg Mengell. Activity was confirmed here when signals were heard from this location on 23 August 1987 between 2145 and 2200 UTC and again between 2321 and 2329 UTC. It was again heard on 20 and 30 August 1987 during afternoon passes.

The new spacecraft transmits imagery in the typical Meteor 2 APT format with fourteen white synchronizing pulses in the calibration segment of the image. The usual 6 bit Binary Bar Code and eight steep gray scale were also present. Unfortunately, the poor land-water contrast characteristics of earlier Meteor 2 series is again evident.

This spacecraft is almost certainly the new Meteor 2 launch mentioned in *Aviation Week* magazine for August 24, 1987 (p. 32). The published apogee and perigee for Meteor 2-16 are 974 x 954 km. This corresponds well to the observed

orbital period of 110 minutes. Imagery received here also confirms the published inclination (82.5 degrees).

It is unclear why the higher orbit was selected for this spacecraft. The last Meteor spacecraft launched into this orbit was referred to as the first Meteor 3 series (Meteor 3-1, object. 16191).

137.850 MHz

Meteor 2-15 continues to transmit on this channel on a daily basis. It was heard here on 23 August 1987 with typical imagery during orbit number 3187 after a northbound equator crossing on 273 degrees west at 17:42 GMT. This produces a midday, North to South pass over north America.

Meteor 2-14 also remains on this channel. Early morning and late afternoon passes are both available at this time. The spacecraft was heard during an afternoon pass on orbit number 6272 after an equator crossing at 245 degrees west at 21:37 UTC on 23 August 1987. The 120 line APT imagery on that date showed numerous small changes in image brightness resulting in a stripe or "corduroy" pattern. The late afternoon pass did result in some dramatic cloud shadow patterns and interesting sun-glint off the western Great Lakes.

In summary: Both Meteor 2-14 and Meteor 2-15 continue to transmit APT imagery on 137.850 MHz. Meteor 2-16 has been heard on 137.400 MHz with afternoon passes from North to South over North America. ■

Back to Earth...

And all at sea

Well, I've been taken to task by a few readers for being too esoteric with all of this weather (WX) satellite material. My personal opinion is that such things are vital to users of fax gear. It is where all non-hard-wired fax will be someday with the possible exception of Marine Fax.

Broadcast under WMO Treaty Auspices, Marine Fax gives vital WX information to ships at sea as well as ground meteorological stations in remote areas of the world. This life-saving service should extend a repeated thanks to the many vendors who have worked so hard to maintain it. Such names as Alden, Muirhead, Hellfax, Furuno and JRC have dominated the field for the past 40 years.

Staying Power

One result of this longevity of manufacture is the availability of equipment from years past, at very attractive rates. I would urge anyone who is technically inclined and wanting to receive facsimile reception of WX charts to consider trying to obtain a used recorder in working order.

For example, this writer picked up a Japan Radio Corporation, solid-state weather fax recorder with a built-in receiver for under \$500 -- It sold for over \$2000 in 1980. It was purchased surplus, the only fault being an antenna connector that had fallen off. This unit has speeds of 60-90-120, with tuning indicators, video image reversal (positive and negative). The in-board receiver is crystal controlled (JRC NRD-515 Quality) and has provision for use of an external H.F. receiver.

In the United States, Alden Electronics has manufactured a complete line of very fine chart recorders for marine fax for years. The standing (if somewhat exaggerated) adage is that they are designed so well they even work upside down under water (but please don't try!) Among the more notable models of recent vintage is the 9271. It is a large, heavy duty unit which is also available in an 11 inch model under different nomenclature. Most of these units are terrestrial linked to marine fax under map mode and give stunning WX satellite photos as well.

These Alden marine fax machines (when used properly) render excellent hard-copy resolution. Anyone who states differently simply has not had ample exposure to the line of equipment. In recent years, they have also made a line of compact (text-book size) fax recorders with built-in receivers. The assembled marine fax series deserves investigation. Some, such as the marine IV series, have solid state H.F. receivers with tuning - Red L.E.D. or now L.C.D. displays can be obtained for maritime or mobile use.

FAX TRANSMITTER SITES AND FREQUENCIES



NORTH ATLANTIC

Frobisher, Canada
Area: Hudson Strait, Hudson Bay, East Coast Baffin Is., Foxe Basin, Lancaster Sound, Queen Elizabeth Is.
Freq: 3253, 7710, 15644

Halifax, N.S., Canada
Area: W. North Atlantic
Freq: 4271, 6330, 9890, 13510, 122.5

Boston, MA
(U.S. Coast Guard Ice Broadcast - Seasonal)
Area: W. North Atlantic
Freq: 8502, 12750

Boston, MA
Area: North of 35°N latitude, west of 60°W longitude
Freq: 3389, 7530

Brentwood, NY
Area: W. North Atlantic (transmissions beamed toward Caribbean, Central and South America)
Freq: 9290, 9389.5, 11035, 17436.5

Norfolk, VA
(U.S. Navy Fleet Broadcast)
Area: N. Atlantic Ocean
Freq: 4975, 8080, 10865, 16410, 20015

Mobile, AL (NWS)
Area: Gulf of Mexico
Freq: 6852, 9157.5, 11145

Bracknell, England
Area: E. North Atlantic
Freq: 3289.5, 4610, 8040, 11086.5, 14582

Bracknell, England
Area: E. North Atlantic
Freq: 4782, 9203, 14436, 21618.5

Northwood, England
Area: NE Atlantic
Freq: 2813.85, 3436.85, 4247.85, 6436.35, 8494.85, 12741.85, 16938.85

Norrkping, Sweden
Area: NE Atlantic and Baltic Sea
Freq: 119.85, 4037.5, 6901, 8077.5

Helsinki, Finland
Area: Baltic Sea
Freq: 83.1, 8018

Copenhagen, Denmark
Area: North Sea, North Atlantic, Greenland
Freq: 5850, 9360, 13855, 17510

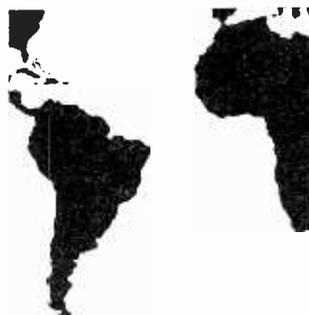
Moscow, U.S.S.R.
Area: E. North Atlantic
Freq: 2815, 5355, 7750, 10980, 15950

Offenbach, Germany
Area: N.E. North Atlantic, Mediterranean Sea
Freq: 134.2

Hamburg, Germany
Area: N.E. North Atlantic
Freq: 3855, 7880, 13657

Paris, France
Area: North Atlantic, Mediterranean Sea
Freq: 131.8, 4047.5, 8185, 12305

Dakar, Senegal
Area: E. Atlantic, Equator
Freq: 7587.5, 13667.5, 19750



SOUTH ATLANTIC

Rio de Janeiro, Brazil
Area: S. Atlantic
Freq: 12025, 8291.1

Brasilia, Brazil
Area: 15°N, 85°W; 15°N, 10°W, 35°S, 10°W; 35°S, 85°W
Freq: 10225, 18080

Buenos Aires, Argentina
Area: 48°S, 12°E; 48°S, 132°W; 04°N, 30°W; 04°N, 90°W
Freq: 5185, 10720, 18093

Pretoria, South Africa
Area: S. Atlantic E. of 40°W, Indian Ocean W. of 80°E
Freq: 4014, 7508, 13773, 18238



NORTH PACIFIC OCEAN

Esquimalt, BC, Canada
Area: N. Pacific, N. Polar Region
Freq: 4268, 6968, 12125

San Francisco, CA
Area: E. North Pacific, South Pacific
Freq: 4346, 8682, 12730, 17151

La Jolla, CA
Area: 05°S, 30°N, E of 140°W
Freq: 8646, 17410.5

Honolulu, Hawaii
(U.S. Navy Fleet Broadcast)
Area: N. Pacific Ocean
Freq: 2122, 4802.5, 9440, 13862.5, 16398, 21785

Honolulu, Hawaii (KVM 70)
Area: 25°S-40°N, 160°E-110°W
(Broadcast is broadly beamed west)
Freq: 9982.5, 11090, 13627.5, 16135, 23331.5

Kodiak, Alaska
Area: Gulf of Alaska, Bering Sea
Freq: 4296, 8457

Guam, Marianas Islands
(U.S. Navy Fleet Broadcast)
Area: W. North Pacific and E. Indian Oceans
Freq: 3377.5, 4975, 7645, 10255, 10966, 13807.5, 18620, 22865, 23880

Khabarovsk, U.S.S.R.
Area: U.S.S.R. and neighboring Pacific
Freq: 4516.7, 7475, 9230, 14737, 19275

Tokyo, Japan
Area: W. North Pacific
Freq: 3622.5, 7305, 9970, 13597, 18220, 22770

Peking, Peoples Republic of China
Area: W. Pacific, E. China Sea
Freq: 5525, 8120, 10115, 12110, 14365, 18235

Bangkok, Thailand
Area: 30°S, 50°N; 45°E, 160°E
Freq: 6765, 7395, 17520



MEDITERRANEAN

Rota, Spain
(U.S. Navy KFAX Broadcast)
Area: E. North Atlantic, Mediterranean Sea
Freq: 7417, 9875

Madrid, Spain
Area: E. North Atlantic, Mediterranean Sea
Freq: 3650, 6918.5, 10250

Athens, Greece
(U.S. Navy KFAX Broadcast)
Area: E. North Atlantic, Mediterranean Sea
Freq: 5206, 8100, 12903

Monsanto, Portugal
Area: North Atlantic, W. Mediterranean Sea
Freq: 4235, 8526, 13002

Rome, Italy
Area: North Atlantic, Mediterranean, Black and Caspian Seas
Freq: 4777.5, 8146.6, 13600

Beograd, Yugoslavia
Area: Mediterranean Sea
Freq: 3520, 5800

Sofia, Bulgaria
Area: 30°N, 20°W, 28°N, 34°E, 64°N, 45°W, 60°N, 63°E
Freq: 5093

Ankara, Turkey
Area: Mediterranean Sea
Freq: 3377, 6790

Cairo, Egypt
Area: Mediterranean and Red Seas, Africa
Freq: 4526, 10123



SOUTH PACIFIC, INDIAN OCEAN AND PERSIAN GULF

Darwin, Australia
Area: 25°N to 25°S, 75°E to 180°E
Freq: 5755, 7535, 10555, 15615, 18060

Canberra, Australia
Area: S. of 10°N, 70°E, 150°W
Freq: 5100, 11030, 13920, 19690

Wellington, NZ (Auckland)
Area: 30°N-60°S, 140°E-120°W
Freq: 5805, 9410, 13550, 16220

Nairobi, Kenya
Area: Indian Ocean
Freq: 10115, 22867

Tehran, Iran
Area: 50°N, 20°E; 28°N, 85°E; 23°N, 20°E; 08°N, 65°E
Freq: 8715

New Delhi, India
Area: 45°N, 25°S, 30°E, 125°W
Freq: 7405, 14842, 18227

ANTARCTIC

Reunion-Saint Denis
Freq: 8176, 16335

Orcades
Area: 50°S-Pole, 20°W, 90°W
Freq: Summer: 2422.5, 8818, 8195, 11147
Winter: 2422.5, 4250, 6454, 9984

(Courtesy of Alden Electronics)

For some time now, Litton-Amecon has had available the DL-19WE unit which can be adapted to marine fax as well as APT. It is offered factory reconditioned for approximately \$850. Be sure to be specific on your requirements. These are updated versions of the older DL-19 units, popular among WX satellite enthusiasts (there I go again).

Until recently, Muirhead LTD was a very big name in the weather fax field, selling their excellent D649 and K649 18 inch chart recorders. I once purchased two D649's from a fellow for under \$400. Video detail on press is exceptional as well as on wx photos sent on H.F. The machines are really hard to beat, but alas, in the U.S. are as rare as hen's teeth.

There has been some talk in recent months of the discontinuation of some H.F. press fax by Rueters in favor of renting transponder space via an Intelsatellite bird. While there is a trend to go this route, it will probably be some time before this becomes a reality. Industry rumors do abound about greater resolution being accomplished at speeds around 475-950 revs a minute and higher. I don't think that this is an imminent threat; most customers or vendors are not eager to spend thousands of dollars to upgrade without good reason. In short, this is not a big problem for the near future.

A final note should be given to a turnkey system that comes up occasionally. It is large by today's standards but for wx charts broadcast by the

Navy out of NPM in the Pacific or NAM in the Atlantic, it does well. The Litton UHX-2B carbon transfer recorder with the FRR-59A receiver feeding a CV1066 converter is an excellent system if your needs are primarily for charts. It is also very good for heating a garage or outdoor shop (put on an earthquake fault it will probably safeguard your home from damage!), with 84 tubes in the receiver (built by National Radio in the early 1970's), 30 in the fax and converter and weighing in (all combined) at about 500 pounds once you install it. It certainly will not go anywhere. What it does, it does extremely well, day in, day out, 24 hours a day, producing volumes of wx charts.

Please feel free to call me anytime at (916) 364-1572. ■

Setting Up an HF Novice Station

Last month we discussed the various high frequency bands the Novice class licensee is allowed to operate on. Now we will take a look at equipment required to transmit and receive signals on those bands.

Most of the HF gear available today will cover the 80, 40, 15, and 10 meter bands without any difficulty. There are some single band transceivers on the market designed for low power mobile operation that may be of special interest to the Novice operator.

Newcomers hesitate to spend money (\$450.00 up) for a new rig; this is understandable given the present state of the economy. It is possible to purchase a truly outstanding piece of pre-owned gear at a bargain price; however you can be ripped off in a grand manner too! Follow a few guidelines and you can cut the odds on a rip-off considerably.

Buying New

New rigs vary from plain Jane basic to super deluxe glitter boxes. Which to choose will be governed by the amount you want to spend and your future goals in amateur radio.

For a rig that will cover all the amateur bands, operate SSB, CW,

RTTY and SSTV, you must be prepared to pay in the neighborhood of \$750.00 for a basic setup. And that figure can go well over \$2000.00 if you add bells and whistles. On the other hand, a rig that covers only CW on the 80 through 10 meter bands can be obtained for about \$450.00 complete.

A microphone, key or keyer, antenna and antenna tuner to round out the basic station will add at least another \$150.00 to your total cost.

Names from your shortwave listening days such as Ten-Tec, Kenwood, Icom, and Yaesu will keep popping up in your search. The ham rigs are quite similar in construction to their SWL cousins and all will do a fine job.

Most hams hold strong opinions about specific brands of gear and are pleased to tell you why brand X is better than brand Y. But what it all boils down to is; choose something you can afford and learn to use it properly!

If a problem crops up with a new rig, the dealer or manufacturer is usually quite prompt in correcting the trouble. Word gets around fast in the radio hobby and no one wants a bad reputation.

Buying Used

If prices on new rigs leave you numb, perhaps you should check out used gear. A set averaging five to ten years old should sell for 35 to 50% of its new price if it is in good working order. Some hams expect to sell a used rig for just a few dollars less than they paid for it new. Forget this guy and deal with someone more realistic.

Purchasing used gear from a dealer is the surest way to avoid picking a lemon. Most dealers will repair problems with used gear if it is brought to their attention within thirty days. Expect to pay about 25% more for used gear with a warranty.

Shopping the Hamfests

Local hamfests are where you can pick up real bargains on second hand gear. Take someone along to advise you (look for someone who has been a ham at least five years). When you find something you like ask for the best price.

Often the seller will reply, "Make me an offer." At this point offer 25 to 50% of his asking price. If he says OK, look at the rig with real care and

ask to try it if possible. Chances are good a rig like this will require some work.

On the other hand, if the seller says no to a low offer and insists the rig is in good order and he can't take any less; it probably is. Chances are that it's worth close to the asking price.

If you purchase a piece advertised in good condition at a hamfest, always be sure to obtain the name, call sign and address of the seller. Try to get him to commit to a refund or lower price should there be a problem (most honest hams will do so). On the other hand, "as is" gear is your problem. Ask the advice of an experienced amateur.

A five to ten year old HF rig in good working condition that will cover all the Novice HF bands and is capable of operation on CW, SSB, RTTY and SSTV should not cost more than \$350.00 -- depending on age and condition. Understand that I am talking about a basic rig that will serve the average Novice well. If you are shooting for a high end rig, the cost can go several hundred dollars more. I see perfectly good rigs at hamfests going for \$150 to \$200.00--for example, the Heath HW-101.

When deciding what to buy remember that a power of 100 watts is plenty. Doubling output will not improve your signal enough to be worthwhile. In fact, to make a worthwhile signal improvement over 100 watts requires at least 400 watts. 100 is quite satisfactory even for chasing rare DX.

We have been talking about transceivers up to this point (a transmitter and receiver in one unit). Now let's consider individual units; that is, a separate receiver and transmitter.

Individual Units

The major disadvantage to this kind of setup is room. It will take at least twice the space of the transceiver.

The plus side of going this route is cost! I have purchased complete rigs for under \$100.00 that will cover all the HF ham bands on CW and SSB and provide at least 75 watts of power. If your interest is strictly Morse operation, you can obtain a complete station for \$60.00 or less that will do an excellent job. Again it is wise to take someone along who

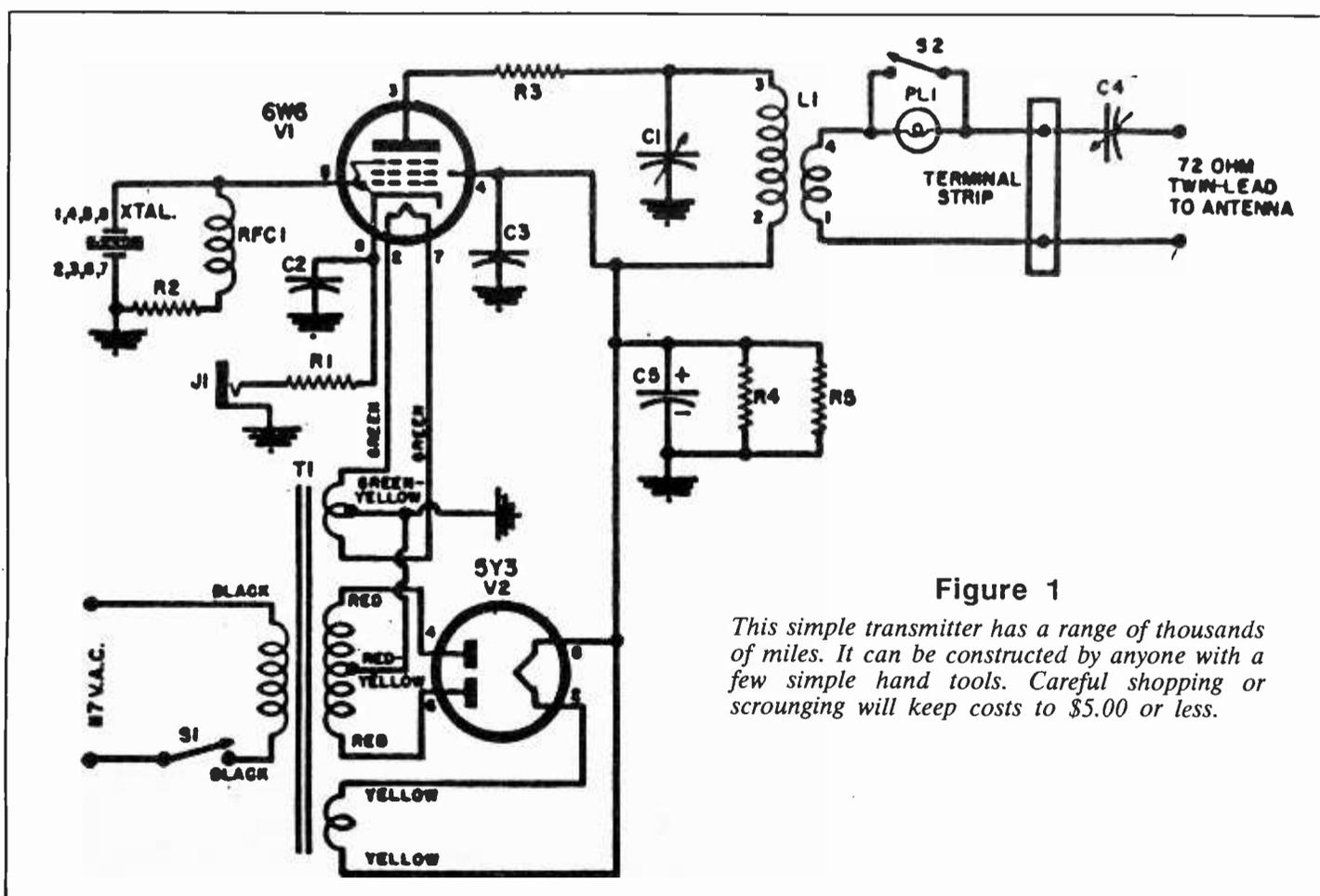


Figure 1

This simple transmitter has a range of thousands of miles. It can be constructed by anyone with a few simple hand tools. Careful shopping or scrounging will keep costs to \$5.00 or less.

knows this older equipment to advise you.

Generally, individual units will use tubes instead of transistors. This has some advantages in that tubes are very rugged and will take any beating a new ham may give them. In addition tube rigs are easy to repair and modify.

I have prepared a list of many of the older tube type units suitable for Novice operation. The list encompasses both individual units and transceivers, both SSB/CW and CW only units. It is far too long to include in this article but it is available for an SASE.

The Third Option

Build your own rig! This is not as far-fetched as it may seem to the newcomer. Thousands of amateurs have built their own rigs and proudly contact stations all over the globe with them.

If this is of interest to you I suggest you contact your local ham dealer and ask to take a look at the many books that describe easy to build equipment.

Cost of building your own rig varies depending on complexity and your access to a junk box (old parts).

It is fairly easy to build a simple transmitter; but a receiver requires more components and is more difficult to get operating. A lot of hams

purchase a receiver and build a transmitter.

I have plan sets for easy-to-build inexpensive transmitters (see Figure 1). They are complete with all instructions, pictorial and schematic diagrams. If you would like a set, please send me an self addressed, stamped envelope and \$1.00 to cover copy costs.

The Antenna

Your antenna doesn't need to be anything fancy. Simple wire antennas are quite satisfactory for normal operation. For the 80 and 40 meter bands dipoles are super and difficult to beat. If space is a problem you'll want to investigate one of the many multiband antennas on the market. An end fed long wire antenna works well on all bands if it is used with an antenna tuner.

The ham interested in DX on 10 and 15 meters will want either a good directional antenna or a quality vertical antenna mounted high and in the clear.

The best advice I can offer you concerning antennas is to purchase the *ARRL Antenna Handbook*. This manual will provide all the information needed to make an intelligent choice for your first sky wire.

That's all for this month, gang. Happy holidays to one and all - see you in 1988.

CONVENTION CALENDAR

Date	Location	Club/Contact Person
Dec 4-6	Apache Jct, AZ	Superstition ARC/ Billy Glaze 7809 E. Javalina, Mesa, AZ 85208
Dec 5	Okeechobee, FL	Okeechobee ARC/ Tim Taylor N4AOJ 401 SW Park St., Okeechobee, FL 33474
Dec 5	Banning, CA	Banning Police Dept/ Dennis Paul Decker (714) 849-6966
Jan 23	Ft. Myers, FL	Ft. Myers ARC/ Harry Arnold K9ALX 5414 Brand Circle SW, Ft Myers, FL 33919
Jan 17	Richmond, VA	Richmond Frostfest/ Mike Henley 2201 Mendota Dr, Richmond, VA 23229
Jan 30	Inverness, FL	Sky High ARC/ Richard Barrett N2EVY Homosassa, FL 32646
Jan 30	San Antonio, TX	San Antonio ARC/ Melvin Anderson WB5NOL 8932 Saddle Trail, San Antonio, TX 78255

MONITORING TIMES IS HAPPY TO RUN ANNOUNCEMENTS OF RADIO EVENTS OPEN TO OUR READERS. Send your announcement at least 60 days before the event to: *Monitoring Times Convention Calendar*, P.O. Box 98, Brasstown, NC 28902.

Happy Holidays and the best in radio listening for 1988

Judy Angie
Due Jan Bob Nada
Mitsi Rachel

from the gang at
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MONITOR



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736RMT

73: Amateur Radio's Technical Journal, PO Box 931, Farmingdale NY 11737

Choosing Your Target

Getting frustrated in your DXing? I'm beginning to realize that narrowing down your field of interest may have more to do with successful DXing than purchasing expensive equipment and listening for stations at random. And joining a regional DX club may be one of the best ways to begin.

John Rieger's DX Midamerica, based in Wisconsin (801 Sherman Ave. - South Milwaukee, WI 53172), is aimed at BCB'ers in the upper midwest. "Hot Tips and Targets!" the club's bulletin, has target DX down to a science.

Targeting your DX can be done in several ways ... by state, by frequency, by time of day, or in combinations. "HT&T" targets potential DX by sunrise/sunset times. As the terminator sweeps across the country, many stations will change patterns and decrease or increase their powers, changing the DX status of a channel abruptly, and enabling the DX'er to identify a station which may dominate the frequency for only a few minutes until the sun rises and the usual short-range conditions prevail ... or it sets, and an eastern dominant takes over the channel.

For example, a sunrise/sunset map for December will reveal that at 5 pm CST, in a band stretching from New Orleans to western North Dakota, stations mandated to change power or pattern will then do so (or they may instead do so at the exact moment of sunset). Fifteen minutes later, in a parallel area from east Texas to east Montana, stations in this area will follow suit. On a frequency such as 1550 kHz I can hear stations west of me come and go until at least 6 pm.

The map shown is for October, and John has kindly included target stations within each time zone. The DX'er will note the ones which he hasn't heard and then listen for them in sequence as the terminator sweeps across the U.S. from east to west.

The parallel areas for sunrise times slant from southwest to northeast. For example, Milwaukee stations will be required to change pattern/power at 7:15 am, as will Kansas City and Corpus Cristi, TX stations. The DX'er may hear some stations operating at low pre-sunrise authority (PSA) powers, and then as they raise power suddenly dominate the channel for a few minutes until they are solidly in daylight.

Listening for the Impossible

One thing about moving to the geographical center (almost!) of the U.S. - it's a wee bit more difficult for me to hear TP (trans-Pacific) DX than when I lived twelve miles from the ocean. But Gene Martin has been listening to Japanese, Australian, and New Zealand stations at his Denver

listening post for years, and he recently has prodded a few of us slackers into arising a bit earlier in the morning to listen for this elusive DX.

Now, I have to put this quest into perspective. No one, but *no one*, has claimed in recent years to have heard Australians from New England. But Gene says, if you could hear 'em in the '30's (when they were widely reported), you should be able to hear 'em now, unless they're covered up by locals. Then why has no one reported them? Because, he says, we've all been conditioned to think that it's impossible. And we don't listen for the impossible. That's a waste of time, right?

Sorry, chum. Tom Farmerie, Ray Moore, and Bill Bailey, all common-sense New England pragmatists (Tom lives in Grafton, MA), have heard the Australian "for the sight-impaired" stations on 1620 and 1629 kHz. In DX News, Tom says, "Ray is using an indoor ferrite loop; I am using two loops and a phased longwires setup of no great lengths, so it doesn't take a monster beverage antenna, guys." Or gals. What it takes is target DX'ing. Tom knows that his best chance for hearing TP's is just at dawn, perhaps as the sun starts to rise, and he is aware that there's almost no interference on those above-band frequencies. And so ... after a few weeks of target listening, he hears them.

Here's another tip. If you're in New England and decide to point your directional loop antenna towards Japan, knowing that Tokyo is a little south of Boston, which direction do you choose? If you said due northwest, you're right. If you don't believe me, take a globe and a piece of string. Stretch the string along the shortest distance between your location and your target station; this path is called the "Great Circle" path, and that's the bearing AM radio waves choose to travel.

Japanese radio waves will travel across the U.S.S.R., Alaska, and Hudson Bay on their way to Boston, and depending upon auroral conditions, local interference, thunderstorms, and how you feel about hauling it out of bed an hour or so before sunrise, you should be able to hear a TP signal sooner or later.

If your receiver has a BFO or USB/SSB setting, turn it on and tune across the dial between 530 and 1610. Note that you hear a squeal (and perhaps some voice on locals) as you tune across each station. In the U.S., 10-kHz spacing is used, but in most of the rest of the world, a 9 kHz spacing is standard. Any squeal you hear in between the 10 kHz stations is almost certainly a foreign station ... and some common TP frequencies to check out are 747, 756, 774, 819, 828, and 837; 1035, 1044, and 1205; 1475 and 1566, plus 1620 and 1629. A bit rarer DX are some stations below 700 kHz.



Naturally, strong locals or regionals will block out some of these frequencies, but if you turn on the BFO or USB and tune up the band, you may hear a whistle jump out at you. Beware of audio whistles from strong locals, however; although they do sound different and change with the music, they can fool you until your ear is trained to ignore them.

Unfortunately, I have to leave my house for work around 7 am, so I miss about the last half-hour before sunrise. However, I definitely heard a signal on 756 kHz around November 1, probably the station in Tahiti, common on the west coast. And while traveling a week earlier in New Mexico, I heard a mess of hets (heterodynes, or tones caused by signals beating against each other on different frequencies) from 600-900 kHz on my car radio. So significant foreign DX is possible from the heartland, too!

From the Letterbag

Now a few letters to the editor. Pete Wahlquist, of Reseda, CA, appreciated my advice in the July column, as he reports a rare lightning strike which blew out the top of a palm tree 100 feet from his longwire antenna. Luckily, he had disconnected his antenna from his R2000 and suffered no damage. Lightning strikes in the winter may be rare, too, but they do occur. Check your connections before you go to bed tonight, and disconnect your longwire. No, grounding your receiver is not enough.

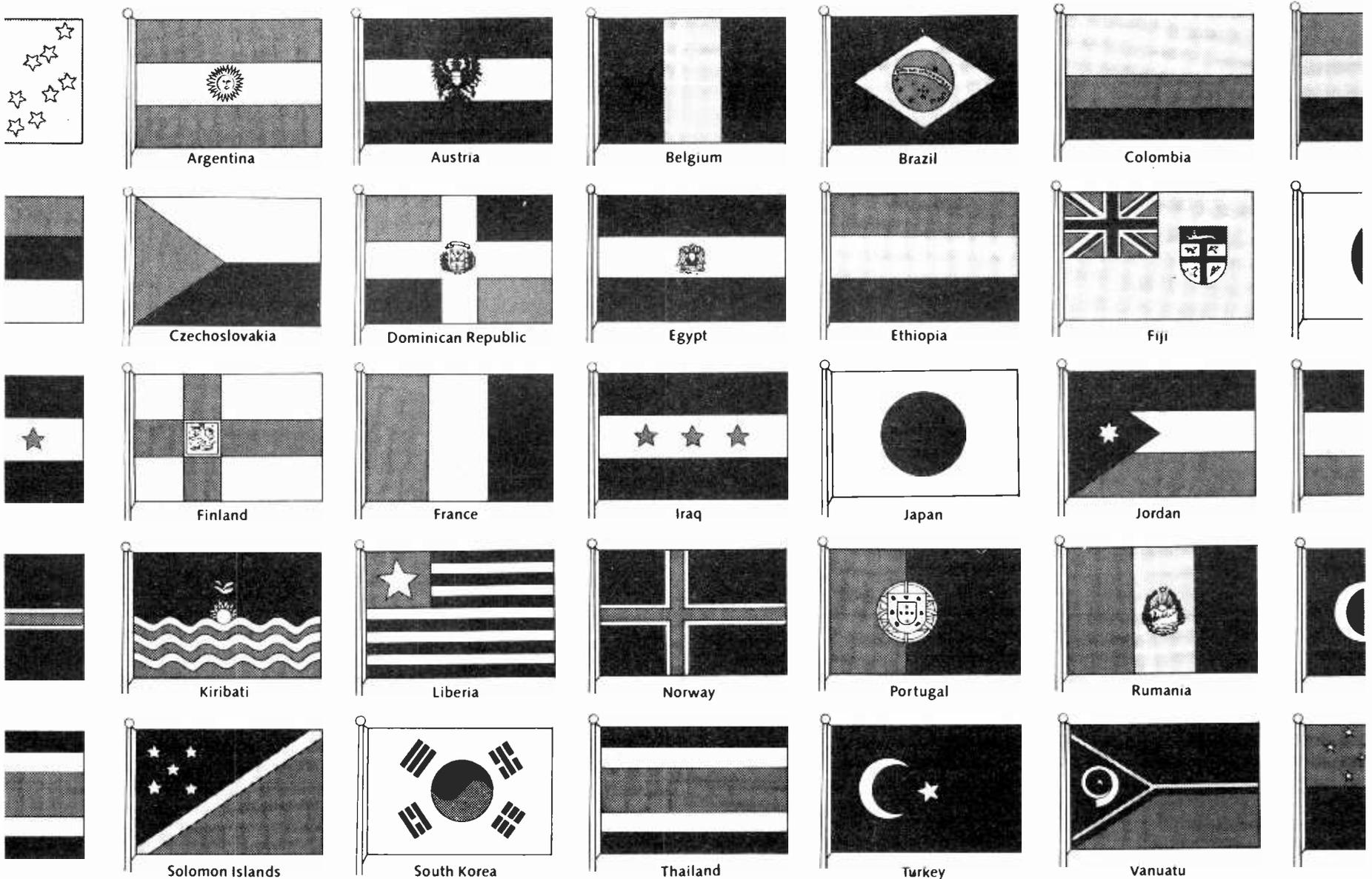
Emil Rodriguez, 19, is a DX'er who lives in Belize and who would be interested in receiving a recycled frequency list. I don't have any to send him now, but I'd be happy to serve as a clearing house. When you order your 1988 editions, remember that some third-world DX'ers would love to have your old copies.

Janet Perry, of Fredericksburg, VA, says that she, too, was able to acquire a pair of radios, for \$3 and \$10, at an auction. Janet also asks about writing stations for QSL's and whether or not she should use the same techniques as for querying shortwave stations.

Unfortunately, Janet, most shortwave stations have a designated person to read requests and crank out QSL's. In domestic stations, this task most often falls to the engineer, who may also be a contract engineer for several other stations -- now that first-class radiotelephone license requirements have been relaxed. All too often the verie requests pile up or just get pitched because of lack of time. Also, apparently one pushy DX'er who demanded a verie apparently turned off one Chicago engineer who now refuses to send out any at all.

In general, if you can include accurate information (of course), but also make your letter more friendly and personal, you stand a better chance of getting a reply. If you really need the verie, send a tape of the station. Praise is helpful. Even try perfumed stationery that he *can't* ignore! And follow up several times, using different methods, but stay polite in your requests. Remember, the engineer probably doesn't get paid extra for answering your letters - he most likely is doing you a personal favor by replying, especially if he works at a small station which is barely making it.

Speaking of individuals, WREN-1250, one of Kansas' oldest stations, went off the air in early September, leaving 15-year DJ "Louie-Louie" Constantino without an air gig. Now local fans are waging a campaign through petitions and a full-page ad in the Topeka *Capital-Journal* to get him back on the air locally. Perhaps that shows that you don't have to be nasty and controversial to get fans - and friends. I hope the campaign works. Until next time, 73. ■



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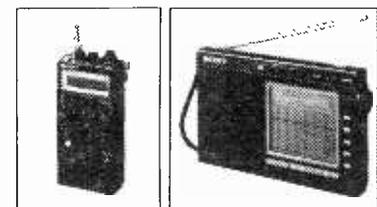
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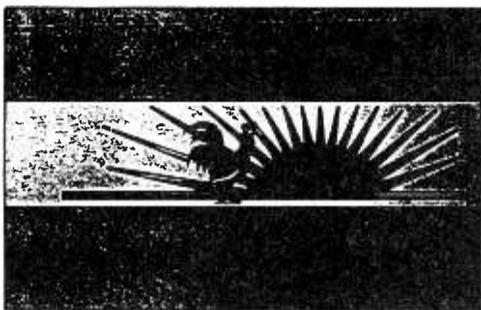
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Dr. John Santosuosso

P.O. Box 1116
Highland City, FL 33846

National Union for the Total
Independence of Angola

UNITA



Angola

An African clandestine that has been around for some time now is A Voz de Resistencia do Galo Negro (Voice of the Resistance of the Black Cockerel). It is the station of UNITA (National Union for the Total Independence of Angola), which under the leadership of Jonas Savimbi has fought the Marxist government of Angola ever since the country gained independence from Portugal in 1975. The black cockerel or rooster is displayed prominently on UNITA's flag and symbolizes the party's motto, "Wake up!"

Although it has long been believed that the station transmits from South African government facilities, it is quite possible that the actual site is at Jamba, UNITA's capital in Southeast Angola. That area has been firmly under UNITA's control for many years.

This clandestine is not easy to hear, but it is not impossible either. The best opportunity is probably sign on at 0330 UTC on 4973 kiloHertz. The distinctive interval signal is the sound of a cock crowing. Programs are in Portuguese and local languages and may continue up to 0530.

A few verifications have been issued. An English report is satisfactory, but a tape recording of what you heard and a prepared verification card have been necessary in most cases. The address is Free Angola Information Service, P.O. Box 65463, Washington, DC 20035-5463. This office also publishes a newsletter entitled, *Kwacha News*.

Radio NewYork International

At least two publications, and probably many more, have published the FCC's denial that it destroyed equipment in its seizure of the "Sarah" and the closing of RNI. The FCC claims it simply "dismantled and disassembled" the equipment. Upon contacting a very reliable source close to the operators of RNI I was told, "equipment was destroyed, and cables were cut. The FCC knew there was a legal question, so they tried to make sure the station couldn't return to the air."

The source also confirmed that the FCC did definitely seize mail sent to RNI, although it is not clear how this was obtained. The photograph on page 19 of the August 11 issue of the *Village Voice* shows what is either destroyed equipment or that which has fallen victim to some pretty enthusiastic "dismantling and disassembling."

New Pirate

Florida's David Crawford has heard a pirate testing in AM and USB around 2345 and 1742 kHz. There has been no identification, just an announcement for an equipment test followed by Kenny Rogers music.

Iran

Of the many anti-Khomeini clandestines the easiest to hear remains Voice of the Crusader (Mujahed). While the nominal frequency is 4450, it was recently heard here on 4460 at its 0300 sign on. The bubble jammer is annoying but no serious problem. The station is allegedly run by the Iranian Socialist party. Few if any verifications exist, but if you care to, try send your report to Voice of the Mujahed, P.K., Karakoy, Istanbul, Turkey.

Book Reviews

Despite the awful blue paper (which hurts clarity) and use of the rather yuppy sounding "world band" for the perfectly good term "shortwave," Radio Database International's 1988 *Passport to World Band Radio* is about as useful a book as you will find. Its receiver reviews are honest, and its graphic layout of stations by frequency is a pleasure to use. Thoughtfully the editors include clandestine and some Europirates. I increasingly find this annual publication indispensable. Order from Imprime or other *Monitoring Times* advertisers.

Guatemala

A strange numbers station in USB has been heard here at 0100 on 9966 kHz. Five-digit Spanish numbers predominate, but you may hear various phrases and even brief political commentary. In *DX South Florida* Terry Krueger reports numerous mentions of Unidad Revolucionaria Nacional Guatemalteca and even one "La Voz de la URNG," although this may be a slogan rather than an ID. The transmissions are live and normally last 20 to 30 minutes. This one is worth some of your time!

And now An Outer Limits Special 'Numbers' Report by Havana Moon

New Zealand Intelligence

Numbers transmissions are meteorological information. This amazing bit of information was relayed to this column by aerogramme just a few days ago by PLB of Wellington, New Zealand.

In that aerogramme, PLB reports that at 0530 hours UTC on 1 August he was tuned to 9465 kHz when he heard a female voice with definite North American accent reading numbers in groups of four. PLB says that this YL's voice was right in the "background" of the Christian Science Monitor station but was very audible despite QRM.

This New Zealand monitor also tells me that at 1930 hours UTC on 1 August 9465 kHz also produced a YL with 4-digit traffic. QRM was from Radio Pakistan at the time of this intercept.

PLB reported both transmissions were reported to New Zealand's Defense Signals Intelligence Group and Ministry of Defense. Said agencies--according to PLB--expressed little interest and stated that what was heard was nothing more than a transmission of meteorological information!

Now--not for a second--does PLB put any faith in this official (?) statement! Says PLB, I was being "fobbed" off with a story!"

Right you are, PLB! Thanks for the very interesting bit of disinformation from the "down under" intelligence agencies!

"Achtung!"

German numbers revelations: As stated last issue, SJM of Humberside, England, was kind enough to provide some revealing German "numbers" information. It's possible that much of the information has never before been made public in a United States short-wave listening publication.

The information this month concerns the "two letter phonetic" sign on stations (see page 18 of *Uno, Dos, Cuatro*).

SJM says that "Papa November" is the most important (emphasis mine--HM) of the "phonetic sign on" stations! "PN" has--according to SJM--a unique way of sending its traffic. From day to day, "new" traffic appears at the start of each transmission day, while "old" traffic is moved to the end of each transmission day before it disappears. Important traffic disappears off the bottom after a few days!

This would appear to be the identical format that some 5-digit Spanish stations follow, SJM!

I hope I have your explanation right, SJM. If not please advise. Also, I would like more information if possible.

SJM also says that "Kilo Whiskey" was monitored on 5285 kHz at 2130 UTC with abrupt stop at 2133 hours. Much shuffling of feet heard along with tape machine switching. All this followed by tape machine being turned on and YL with "Sierra tango" instead of "Kilo Whiskey"! At 2135 kHz a German "numbers" transmission began.

Well, SJM, it certainly seems that most "numbers" stations operators are technical misfits of the highest order!

SJM says that the "musical scale" stations use the SAME YLs as the "two letter" stations. In fact, says SJM, these transmissions come from the same site, as "Papa November" has been heard in the background with its callsign!

Thanks for the very interesting information, SJM. There will be an updated list of German "numbers" frequencies and times as well as other information in the next issue of *MT*.

The Mailbag

J. Glenn of Pennsylvania checks in with his "numbers" intercepts.

April ?, 1987, 2300 UTC on 15,450, YL with French numbers transmission.

April 26, 1987, 2115 UTC on 9844, YL with numbers in English.

English numbers also on 7000 kHz at 0100; 7000 kHz at 0307; 9845 kHz at 2205; 17,915 kHz at 2115.

J. Di Leo of Louisiana says that on a recent trip to France he was able to intercept two different "numbers" stations between 2000 and 2030 UTC. Transmissions were on 3815 and 3615 kHz and in German. Another German transmission was noted on 4015 kHz at 2018 UTC. The 2018 UTC transmission format was: Three digits, then "UBER" followed by 1 through 0 and finally three digits preceding two digits were noted. (Most probably the identifier(?) and group count--HM). At 2020 UTC there was a celeste(?) tone for 15 seconds and then dead air!

Thanks to Detective Lieutenant John Fuard, Diane H., and Eric Conners for their assistance in the preparation of this column, and a big thanks to those who sent in reports. How about the rest of you? All it takes is a few minutes of your time and a postage stamp! ■

frequency SECTION

The MT Monitoring Team

Joe Hanlon, PA

Rich Foerster, NE

Greg Jordan, NC

LEGEND:

- * The first four digits of an entry are the broadcast start time in UTC.
- * The second four digits represent the end time.
- * In the space between the end time and the station name is the broadcast schedule.

S=Sunday M=Monday T=Tuesday W=Wednesday
H=Thursday F=Friday A=Saturday

If there is no entry, the broadcasts are heard daily. If, for example, there is an entry of "M," the broadcast would be heard only on Mondays. An entry of "M,W,F" would mean Mondays, Wednesdays and Fridays only. "M-F" would mean Mondays through Fridays. "TEN" indicates a tentative schedule and "TES" a test transmission.

- * The last entry on a line is the frequency. Codes here include "SSB" which indicates a Single Sideband transmission, and "v" for a frequency that varies.

We suggest that you begin with the lower frequencies that a station is broadcasting on and work your way up the dial. Remember that there is no guarantee that a station will be audible on any given day. Reception conditions can change rapidly, though, and if it is not audible one night, it may well be on another.

The MT frequency section is divided into two parts. All regularly audible English broadcasts are listed in this section. The information is obtained exclusively through monitoring and all listed frequencies have been heard by one or more members of the MT Monitoring Team. Broadcasts in English and other languages, which are less often heard, can be found in the loggings column on pages 16 and 17. Your comments on the frequency section are always appreciated. Address them to "Frequency Manager," c/o Monitoring Times, Box 98, Brasstown, NC 28902

0000 UTC [7:00 PM EST/4:00 PM PST]

0000-0025	Kol Israel.....	7465, 9435
		9855
0000-0030	BBC, England.....	5975, 6005
		6120, 6175
		7325, 9515
		9590, 9915
		11820, 11955
		15360, 15435
0000-0030	Radio Canada International..	5960, 9755
0000-0030	M Radio Norway International....	9580, 9605
0000-0045	Radio Berlin International..	6080, 9730
0000-0045	WYFR, Florida.....	9660, 9680
		15440
0000-0100	Armed Forces Radio and TV..	6030, 15345
0000-0100	CBC Northern Quebec Svce....	6195, 9625
0000-0100	CFCX, Montreal, Canada.....	6005
0000-0100	CFRX, Toronto, Canada.....	6070
0000-0100	CFVP, Calgary, Canada.....	6030
0000-0100	CHNX, Halifax, Canada.....	6130
0000-0100	CKFX, Vancouver, Canada....	6080
0000-0100	KVOH, California.....	9495
0000-0100	Radio Australia.....	15320, 15240
0000-0100	Radio Beijing, China.....	9665, 9770
		11715
0000-0100	Radio Havana Cuba.....	6090, 9770
0000-0100	Radio Moscow.....	5915, 5940
		6000, 6045
		7115, 7150
		7215, 7310
		12050, 13605
		15425
0000-0100	Radio Sofia Bulgaria.....	6070, 13665
0000-0100	Spanish Foreign Radio, Spain	6125, 9630
0000-0100	Voice of America.....	5995,
		6130, 9455
		9650, 9775
		9815, 11580
		11695, 11740
		15205
0000-0100	WHRI, Indiana.....	11770
0000-0100	WRNO Worldwide.....	7355
0030-0055	BRT, Belgium.....	5910, 9925
0030-0100	BBC, England.....	5975, 6005
		6120, 6175
		7325, 9515
		9590, 9915
0030-0100	HCJB, Ecuador.....	9875, 11775
		11910, 15155
0030-0100	Radio Belize.....	3285
0030-0100	Radio Kiev, Ukrain SSR.....	6020, 6200
		7165, 11790
		13645
0030-0100	S,M Radio Canada International	5960, 9755
0045-0100	Radio Berlin International..	6080
0050-0100	Vatican Radio.....	6150, 9605
		11780

0100 UTC [8:00 PM EST/5:00 PM PST]

0100-0115	Vatican Radio.....	6150, 9605
		11780
0100-0120	RAI, Italy.....	5990, 9575
0100-0124	Kol Israel.....	7465, 9435
		9855
0100-0130	Radio Canada International	5960, 9535
		9755, 11845
		11940
0100-0150	Deutsche Welle, West Germany	6040, 6085
		6145, 9565
0100-0200	Armed Forces Radio and TV...	6030, 15345
0100-0200	BBC, England.....	5975, 6005
		6120, 6175
		7325, 9515
		9590
0100-0200	CBC Northern Quebec Svcs....	6195, 9625
0100-0200	CFCX, Montreal, Canada.....	6005
0100-0200	CFRX, Toronto, Canada.....	6070
0100-0200	CFVP, Calgary, Canada.....	6030
0100-0200	CHNX, Halifax, Canada.....	6130
0100-0200	CKFX, Vancouver, Canada....	6080
0100-0200	HCJB, Ecuador.....	9870, 11775
		11910, 15155
0100-0200	T-A KVOH, California.....	9495
0100-0200	Radio Australia.....	15320, 15395
0100-0200	Radio Havana Cuba.....	6090, 9770
0100-0200	Radio Moscow.....	5915, 5940
		6000, 6045
		7115, 7150
		7215, 7310
		7400, 12050
		13665
0100-0200	Radio Prague, Czechoslovakia	5930, 7345
0100-0200	Spanish Foreign Radio, Spain	6125, 9630
0100-0200	Voice of America.....	5995, 6125
		6130, 7205
		9455, 9650
		9740, 9775
		9815, 11740
0100-0200	WHRI, Indiana.....	9850
0100-0200	WRNO Worldwide.....	7355
0100-0200	WYFR, Florida.....	9680
0115-0200	Radio Berlin International..	6080
0130-0140	Voice of Greece.....	7430, 9395
		9420
0130-0200	Radio Austria International.	9550

0200 UTC [9:00 PM EST/6:00 PM PST]

0200-0210	Radio France Int'l.....	5950, 6055
		9790
0200-0215	S Radio Austria International.	9550
0200-0230	BBC, England.....	5975, 6005
		6120, 6175
		7325, 9515
		9590, 9915
0200-0230	Kol Israel.....	7465, 9435
		9855
0200-0230	Radio Budapest, Hungary....	6025
0200-0230	Swiss Radio International...	5965, 6135
		9725, 9885
		12035
0200-0250	Deutsche Welle, W. Germany..	7285

0200-0256	Radio RSA, South Africa.....	9580, 9615
0200-0300	Armed Forces Radio and TV...	6030
0200-0300	CBC Northern Quebec Service.	6195, 9625
0200-0300	HCJB, Ecuador.....	6230, 9875
		11775
0200-0300	Radio Australia.....	17795
0200-0300	Radio Bras, Brazil.....	11748
0200-0300	Radio Bucharest, Romania...	5990, 6155
		9570
0200-0300	Radio Cairo, Egypt.....	9475, 9675
0200-0300	M-F Radio Canada International..	5960, 9755
0200-0300	Radio Havana Cuba.....	6090, 9550
0200-0300	Radio Moscow, U.S.S.R.....	5915, 5940
		6000, 6045
		6070, 7115
		7150, 7215
		7310
0200-0300	RAE, Argentina.....	9690, 11710
0200-0300	Voice of America.....	5995, 6130
		7205, 9650
		9740, 9815
0200-0300	Voice of Free China, Taiwan.	5985
0200-0300	WHRI, Indiana.....	7400
0200-0300	WRNO Worldwide.....	7355
0215-0300	Radio Berlin International..	6080
0230-0300	T-A Radio Portugal.....	9680
0230-0300	Radio Netherlands.....	6020, 6165
		9590, 9895
0230-0300	Radio Sweden International..	9695

0300 UTC [10:00 PM EST/7:00 PM PST]

0300-0310	CBC Northern Quebec Service.	6195, 9625
0300-0325	Radio Netherland.....	6020, 6165
		9590, 9895
0300-0330	BBC, England.....	5975, 6005
		6120, 6155
		6175, 6195
		7185, 7325
		9515, 9600
		9915
0300-0330	Radio Cairo, Egypt.....	9475, 9675
0300-0330	Radio Kiev, Ukrain SSR.....	7165
0300-0350	Deutsche Welle, West Germany	6010, 6045
		9700
0300-0355	Radio Beijing, China.....	9770, 11715
0300-0400	Armed Forces Radio and TV...	6030
0300-0400	CFCX, Montreal, Canada.....	6005
0300-0400	CFRX, Toronto, Canada.....	6070
0300-0400	CFVP, Calgary, Canada.....	6030
0300-0400	CHNX, Halifax, Canada.....	6130
0300-0400	CKFX, Vancouver, Canada....	6080
0300-0400	HCJB, Ecuador.....	6230, 9870
		11775
0300-0400	T-A KVOH, California.....	9495
0300-0400	T Radio Earth (WHRI).....	7400
0300-0400	Radio Havana Cuba.....	6090, 9550
0300-0400	Radio Japan.....	5960
0300-0400	Radio Moscow.....	5915, 5940
		6000, 6045
		6070, 7115
		7150, 7310
0300-0400	Radio Prague, Czechoslovakia	5930, 7345
		9740
0300-0400	Radio RSA, South Africa.....	9580, 11900
0300-0400	Trans World Radio, Bonaire..	9535

frequency SECTION

0300-0400	Voice of America.....	6035, 7280 9575, 9740
0300-0400	Voice of Free China, Taiwan.	5985
0300-0400 W-M	WHRI, Indiana.....	7400
0300-0400	WRNO Worldwide.....	7355
0313-0400	Radio France International..	6055, 7135 7175, 9790 9800
0330-0400	BBC, England.....	5975, 6005 6155, 6175 9600, 9915
0340-0350	Voice of Greece.....	7430, 9395 9420
0352-0358	Radio Yerevan, Armenian SSR	11790, 13645 15180

0400 UTC [11:00 PM EST/8:00 PM PST]

0400-0425	Radio Netherlands.....	9850
0400-0430	BBC, London, England.....	3955, 5975 6005, 6120 6175, 6180 6195, 7105 7185, 7260 9410, 9600
0400-0430	Radio RSA, South Africa.....	9580, 11900
0400-0430	Swiss Radio International..	6135, 9725 9885, 12035
0400-0430	Trans World Radio, Bonaire..	9535
0400-0500	Armed Forces Radio and TV...	6030
0400-0500	CBC Northern Quebec Service.	6195
0400-0500	CFCX, Montreal, Canada.....	6005
0400-0500	CFRX, Toronto, Canada.....	6070
0400-0500	CFVP, Calgary, Canada.....	6030
0400-0500	CHNX, Halifax, Canada.....	6130
0400-0500	CKFX, Vancouver, Canada.....	6080
0400-0500	HCJB, Ecuador.....	6230, 9870 11775
0400-0500	Radio Havana Cuba.....	6035, 6090 9560
0400-0500	Radio Moscow World Service.	5940, 6000 7150, 7165 9490, 11780
0400-0500	Radio New Zealand.....	11780 15180
0400-0500	Radio Sofia Bulgaria.....	7115
0400-0500	RAE, Argentina.....	9690
0400-0500	Voice of America.....	5995, 6040 7280, 9550 9575
0400-0500	Voice of Turkey.....	9445
0400-0500	WHRI, Indiana.....	7400
0400-0500	WRNO Worldwide.....	6185
0425-0440	RAI, Italy.....	7275
0430-0500	BBC, London, England.....	3955, 5975 6005, 6180 6195, 7185 9510, 9600
0430-0500	Deutsche Welle, W. Germany..	7225, 9765
0430-0500	Radio Austria International.	6000
0440-0455	Radio France International..	6055, 6175 7135, 7175 9790, 9800

0500 UTC [12:00 PM EST/9:00 PM PST]

0500-0510	CBC Northern Quebec Service	6195
0500-0515	Deutsche Welle, W. Germany..	7225, 9565
0500-0530	BBC, London.....	5975, 9600
0500-0530 S,M	Trans World Radio, Bonaire..	9535
0500-0550	Deutsche Welle.....	5960, 6120 6130
0500-0600	Armed Forces Radio & TV....	6030
0500-0600	CFCX, Montreal, Canada.....	6005
0500-0600	CFRX, Toronto, Canada.....	6070
0500-0600	CFVP, Calgary, Canada.....	6030
0500-0600	CHNX, Halifax, Canada.....	6130
0500-0600	CKFX, Vancouver, Canada.....	6080
0500-0600	HCJB, Quito, Ecuador.....	6230, 9870 11775

0500-0600	Radio Havana Cuba.....	5965, 6035 6090
0500-0600	Radio Moscow.....	7150, 7310
0500-0600	Spanish Foreign Radio.....	6125
0500-0600	Voice of America.....	6035, 7280
0500-0600	WHRI, Indiana.....	7400
0500-0600 S	WRNO Worldwide.....	6185
0530-0600	Radio Netherlands.....	6165, 9715

0600 UTC [1:00 AM EST/10:00 PM PST]

0600-0630	Radio Netherlands.....	6165, 9715
0600-0645	WYFR, Florida.....	7355
0600-0700	Armed Forces Radio and TV...	6030
0600-0700	BBC, London.....	5975, 7105 7150, 9600 9640
0600-0700	CBC Northern Quebec Service.	6195
0600-0700	CFCX, Montreal, Canada.....	6005
0600-0700	CFRX, Toronto, Canada.....	6070
0600-0700	CFVP, Calgary, Canada.....	6030
0600-0700	CKFX, Vancouver, Canada.....	6080
0600-0700	CHNX, Halifax, Canada.....	6130
0600-0700	HCJB, Quito, Ecuador.....	6230, 9845 9870, 11775
0600-0700	Radio Havana Cuba.....	9525
0600-0700	Radio Moscow.....	5915, 7165 7310
0600-0700	Voice of America.....	5995, 6035 6125, 7280 9530, 9540 9550
0600-0700	Voice of Nicaragua.....	6100
0600-0700	WHRI, Indiana.....	6100, 7400
0615-0630	Radio Canada International..	6140

0700 UTC [2:00 AM EST/11:00 AM PST]

0700-0730	BBC, London.....	5975, 7150 9410, 9600 9640
0700-0730	Radio Australia.....	9655, 11720
0700-0800	HCJB.....	6130, 9745 9845, 11925 11835
0700-0800	Radio Havana Cuba.....	9525
0700-0800	Radio Moscow.....	5915
0700-0800	Radio New Zealand.....	11780
0700-0800	Trans World R. Monte Carlo	7105
0700-0800	WCSN, Boston, Mass.....	7365
0700-0800	WHRI, Indiana.....	6100, 7400
0700-0800	WYFR, Florida.....	6065
0730-0800	Radio Netherlands.....	9630, 9715
0730-0800	Swiss Radio International..	9535

0800 UTC [3:00 AM EST/12:00 PM PST]

0800-0825	Radio Netherlands.....	9630, 9715
0800-0830	HCJB, Quito, Ecuador.....	6130, 9845 11835, 11925
0800-0900	BBC, London.....	5975, 7150 9410, 9600 9640, 11860 15400
0800-0900	CFRX, Canada.....	6070
0800-0900	Radio Australia.....	9580, 9655 11720
0800-0900	Radio Moscow.....	7310
0800-0900	Radio New Zealand.....	11780
0800-0900	Radio Pyongyang, N.Korea...	15160, 15180
0830-0900	HCJB, Quito, Ecuador.....	6130, 11925
0800-0900	WCSN, Boston, MA.....	7365
0800-0900	WHRI, Indiana.....	7355

0900 UTC [4:00 AM EST/1:00 AM PST]

0900-0915	BBC, London.....	9410, 12095 15070, 17790
0900-0930	Radio Australia.....	9580, 9655 9710, 11720
0900-1000	ABC, Perth, Australia.....	9610
0900-1000	AFRTS.....	6030, 9530
0900-1000	CFRX, Canada.....	6070
0900-1000	Deutsche Welle.....	6120, 9720
0900-1000	HCJB, Quito, Ecuador.....	6130, 9745 11925
0900-1000	Radio Beijing, China.....	9700, 11755
0900-1000	WCSN, Boston, MA.....	7365
0900-1000	WHRI, Indiana.....	7355
0900-1000	WYFR, Florida.....	6175
0915-1000	BBC, London.....	11750
0930-1000	Radio Australia.....	9580, 9655 9710

1000 UTC [5:00 AM EST/2:00 AM PST]

1000-1025	Radio Beijing, China.....	9700, 11755
1000-1030	Radio Australia.....	9580, 9770
1000-1030 S	Radio Norway International..	9590, 15180 15230
1000-1030	Swiss Radio International..	17830
1000-1100	ABC, Perth, Australia.....	9610
1000-1100	AFRTS.....	6030, 6125 9530
1000-1100	BBC, London.....	9410, 12095 15070
1000-1100	CFRX, Toronto, Canada.....	6070
1000-1100	HCJB, Quito, Ecuador.....	6130, 9745 11925
1000-1100	Radio Moscow.....	6000, 13790 15405, 15225 15475, 15595
1000-1100	Voice of America.....	5975, 6160 9590
1000-1100	WHRI, Indiana.....	7355
1000-1100	WYFR, Florida.....	6175
1030-1100	Radio Australia.....	9580, 9770

1100 UTC [6:00 AM EST/3:00 AM PST]

1100-1125	Radio France Int'l, Paris..	11690, 11845
1100-1125	Radio Netherland.....	6020, 9650
1100-1130	HCJB, Ecuador.....	6130, 11925
1100-1130	Radio Australia.....	5995, 6080 7215, 9580
1100-1130	Voice of America.....	5975, 6160 9590, 9750
1100-1200	ABC, Perth, Australia.....	9610
1100-1200	AFRTS.....	6030, 6126 9700, 15430 11775, 15070
1100-1200	BBC, London.....	5965, 6195
1100-1200	CFCX, Montreal, Canada.....	6005
1100-1200	CFRX, Toronto, Canada.....	6070
1100-1200	CFVP, Calgary, Canada.....	6030
1100-1200	CHNX, Halifax, Canada.....	6130
1100-1200	CKFX, Vancouver, Canada....	6080
1100-1200	KYOI, Saipan.....	11900
1100-1200	Radio Japan General Service.	6120
1100-1200	Radio Moscow.....	6000, 13790 15225, 15405 15475, 15595
1100-1200	WYFR, Florida.....	5945
1115-1200	TWR, Bonaire.....	11815
1130-1200	HCJB, Quito, Ecuador.....	11740
1130-1200	Radio Australia.....	5995, 6060 6080, 7215 9580, 9710
1130-1200	Radio Netherlands.....	15560, 17605

frequency SECTION

1200 UTC [7:00 AM EST/4:00 AM PST]

1200-1225	Radio Netherland.....	15560, 17605
1200-1230	Radio Australia.....	5995, 6060 6080, 7205 7215, 9580 9710, 9770
1200-1242	Trans World Radio Bonaire..	11815
1200-1300	ABC, Wanneroo, Australia....	9610
1200-1300	AFRTS.....	6030, 6125
1200-1300	BBC, London.....	5965, 11775 12095, 15070 17705, 17790 21710, 21470
1200-1300	CFCX, Montreal, Canada.....	6005
1200-1300	CFRX, Toronto, Canada.....	6070
1200-1300	CFVP, Calgary, Canada.....	6030
1200-1300	CHNX, Halifax, Canada.....	6130
1200-1300	CKFX, Vancouver, Canada.....	6080
1200-1300	HCJB, Quito, Ecuador.....	11740, 15115 17890
1200-1300	KYOI, Saipan.....	11900
1200-1300	Radio Moscow.....	13790, 15140 15225, 15420 15460, 15475 15540, 15595 15585, 17655
1200-1300	Voice of America, Wash....	11715
1200-1300	WHRI, Indiana.....	5995, 11790
1200-1300	WYFR, USA.....	6185
1200-1256	Radio Beijing.....	9645, 9665
1230-1300	Radio Austria International	15320
1230-1300	Radio Bangladesh.....	15525, 17653
1245-1300	Radio Berlin Int, E.Germany	15240
1245-1255	Radio France International.	15155, 15365 17720, 21645

1300 UTC [8:00 AM EST/5:00 AM PST]

1300-1330	BBC, London.....	5965, 6195 9510, 11775 12095, 15070 15105, 17705 17790, 18080 21470, 21710
1300-1330	Radio Australia.....	5995, 6060 6080, 9580
1300-1330	Radio Berlin Int, E.Germany	15240
1300-1330	Radio Finland.....	15400, 11945
1300-1330	S Radio Norway International.	6040, 9590 15185, 15310 25730
1300-1330	Swiss Radio International..	12030
1300-1337	A-S TWR, Bonaire.....	11815
1330-1355	S Radio Finland.....	11945, 15400
1300-1400	ABC Wanneroo, Australia.....	9610
1300-1400	AFRTS.....	6125, 15330 15430
1300-1400	CFCX, Montreal, Canada.....	6005
1300-1400	CFRX, Toronto, Canada.....	6070
1300-1400	CFVP, Calgary, Canada.....	6030
1300-1400	CHNX, Halifax, Canada.....	6130
1300-1400	CKFX, Vancouver, Canada.....	6080
1300-1400	CKZU, Vancouver, Canada.....	6160
1300-1400	HCJB, Quito, Ecuador.....	11740, 15115 17890
1300-1400	Radio Canada Int'l.....	9625, 11855 15535, 17820
1300-1400	Radio Korea.....	9750
1300-1400	Radio Moscow.....	9820, 11745 13790, 15225 15475, 15490 15540, 15585 15590, 17655
1300-1400	Radio RSA, South Africa....	21590
1300-1400	WHRI, Indianapolis.....	9455, 11790
1300-1400	WYFR, USA.....	6175, 9675 13695, 15170 15535
1330-1400	BBC, London.....	12095, 15070 15105, 17705 17790, 21710

1330-1355	M-A BRT, Belgium.....	15590
1330-1400	Radio Australia.....	9580
1330-1400	Radio Berlin International.	17880
1330-1400	Swiss Radio International..	15570, 17830
1330-1400	U.A.E. Radio.....	15435, 17865 21605

1400 UTC [9:00 AM EST/6:00 AM PST]

1400-1415	Radio Berlin International	17880
1400-1430	Radio Australia.....	9580
1400-1430	Radio Finland.....	11945, 15400
1400-1430	S Radio Norway International.	15310, 15315
1400-1430	R.Stn Peace & Progress USSR	15470
1400-1430	Radio Sweden International.	15345
1400-1500	ABC Perth, Australia.....	9610
1400-1500	AFRTS.....	15330, 15430
1400-1500	BBC, London.....	12095, 15070 17790
1400-1500	CBC Northern Quebec Service.	9625, 11720
1400-1500	CFCX, Montreal, Canada.....	6005
1400-1500	CFRX, Toronto, Canada.....	6070
1400-1500	CFVP, Calgary, Canada.....	6030
1400-1500	CHNX, Halifax, Canada.....	6130
1400-1500	CKFX, Vancouver, Canada.....	6080
1400-1500	HCJB, Quito, Ecuador.....	11740, 15115 17890
1400-1500	KYOI, Saipan.....	11900
1400-1500	S Radio Canada International.	9625, 11720 11955, 15440 17820
1400-1500	Radio Moscow.....	11840, 13790 15225, 15475 15540, 15595 9455, 21590
1400-1500	Radio RSA, South Africa....	9455, 21590
1400-1500	Voice of America, Wash DC..	9760
1400-1500	WHRI, Indiana.....	11790
1400-1500	WYFR, USA.....	6175
1430-1500	S Radio Finland.....	11945, 15400
1430-1500	Radio Netherland.....	11735, 13770 15560

1500 UTC [10:00 AM EST/7:00 AM PST]

1500-1530	HCJB, Quito, Ecuador.....	11740, 15115 17890
1500-1530	Radio Netherland.....	11735, 13770 15560
1500-1556	Radio RSA, South Africa....	21590
1500-1600	AFRTS.....	9700, 15330 15430
1500-1600	BBC, London.....	12095, 15070 15400, 15420 9515, 15260
1500-1600	A,S BBC, London.....	9515, 15260
1500-1600	CBC Northern Quebec Service.	9625, 11720
1500-1600	CFCX, Montreal, Canada.....	6005
1500-1600	CFRX, Toronto, Canada.....	6070
1500-1600	CFVP, Calgary, Canada.....	6030
1500-1600	CKFX, Vancouver, Canada.....	6080
1500-1600	CHNX, Halifax, Canada.....	6130
1500-1600	KYOI, Saipan.....	11900
1500-1600	Radio Australia.....	9580
1500-1600	S Radio Canada International.	9625, 11720 11955, 15440 17820
1500-1600	Radio Japan General Service	21700
1500-1600	Radio Moscow.....	11840, 13790 15475, 15585
1500-1600	Voice of America.....	15205
1500-1600	WHRI, Indiana.....	15105
1500-1600	WYFR, Florida.....	6175, 13695 15170
1515-1600	Radio Berlin International	15240
1530-1600	Radio Yugoslavia.....	15240
1530-1600	Swiss Radio International..	15430, 17830
1540-1548	M-F Voice of Greece.....	15630
1545-1600	Radio Canada International.	15325

1600 UTC [11:00 PM EST/8:00 AM PST]

1600-1630	S Radio Norway International.	15310
1600-1700	AFRTS.....	15330, 15430
1600-1700	BBC, London.....	9515, 12095 15070, 15260 15400, 17705 17885
1600-1700	CBC Northern Quebec Svc....	9625, 11720
1600-1700	CFCX, Montreal, Canada.....	6005
1600-1700	CHNX, Halifax, Canada.....	6130
1600-1700	CFRX, Toronto, Canada.....	6070
1600-1700	CFVP, Calgary, Canada.....	6030
1600-1700	CKFX, Vancouver, Canada.....	6080
1600-1700	Radio Canada International.	9625, 11720 11955, 15440 17820
1600-1700	Radio France International.	11995, 15315
1600-1700	Radio Moscow.....	11840
1600-1700	Voice of America.....	15205, 15410 15445, 15580 15600, 17785 17800, 17870
1600-1700	WCSN, Boston, MA.....	15280
1600-1700	WHRI, Indiana.....	15105
1600-1700	WRNO Worldwide.....	15420
1600-1700	WYFR, Florida.....	11830, 13696 15170, 17750
1630-1700	Radio Netherland.....	15570

1700 UTC [12:00 PM EST/9:00 AM PST]

1700-1730	Radio Netherlands.....	15570
1700-1745	BBC, England.....	9410, 9515 12095, 15070 15260, 15400 17885
1700-1800	AFRTS.....	15330, 15430
1700-1800	CFCX, Montreal, Canada.....	6005
1700-1800	CFRX, Toronto, Canada.....	6070
1700-1800	CFVP, Calgary, Canada.....	6030
1700-1800	CHNX, Halifax, Canada.....	6130
1700-1800	CKFX, Vancouver, Canada.....	6080
1700-1800	CKZU, Vancouver, Canada.....	6160
1700-1800	KCBI, Texas.....	11735
1700-1800	Radio Moscow.....	9565, 11840
1700-1800	Voice of America.....	15410, 15445 15580, 15600 17785, 17800 17870
1700-1800	WCSN, Massachusetts.....	15280
1700-1800	WHRI, Indiana.....	15105
1700-1800	WMLK, Pennsylvania.....	9455
1700-1800	WRNO Worldwide.....	15420
1700-1800	WYFR, Florida.....	11580, 13695 9410, 12095 15070, 15400 17885
1745-1800	BBC, London.....	15070, 15400 17885

1800 UTC [1:00 PM EST/10:00 AM PST]

1800-1830	Radio Canada International	15260, 17820
1800-1830	Swiss Radio International..	9535
1800-1900	AFRTS.....	15330, 15430
1800-1900	BBC, London.....	9410, 12095 15070, 15400 9625, 11720
1800-1900	CBC, N. Quebec Service....	9625, 11720
1800-1900	CFCX, Montreal, Canada.....	6005
1800-1900	CFRX, Toronto, Canada.....	6070
1800-1900	CFVP, Calgary, Canada.....	6030
1800-1900	CKFX, Vancouver, Canada.....	6080
1800-1900	CKZU, Vancouver.....	6160
1800-1900	S KCBI, Texas.....	11735
1800-1900	Radio Moscow.....	9565, 11840
1800-1900	Radio Kuwait.....	11665
1800-1900	Voice of America.....	11760, 15410 15445, 15580 15600, 17785 17800, 17870

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SCN-11

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Wide frequency coverage: 29-54, 118-136 (AM), 136-174, 406-512, and 806-912 MHz FM with 40 channels of memory in two banks.

Rapid scan (15 channels per second), powerful 1.5 watt audio amplifier, two telescoping antennas (one for 800 MHz range), 0.7 microvolt average sensitivity, -55 dB selectivity @ ± 25 kHz, instant weather reception, brilliant fluorescent display, AC/DC operation, direct channel access, individual channel delay, priority channel one, fully synthesized keyboard entry.

Dimensions: 12½"W x 4½"H x 9¼"D; Weight: 7 lbs., 2 oz.



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frequency SECTION

1800-1900	WCSN, Boston, Mass.....	21515
1800-1900	WHRI, Indiana.....	15105
1800-1900 S-F	WMLK, Bethel, PA.....	9455
1800-1900	WRNO Worldwide.....	15420
1800-1900	WYFR.....	11580, 13695 15170
1830-1900	Swiss Radio International..	11955
1830-1900 A,S	Radio Canada International	15260, 17820
1830-1900	Radio Netherlands.....	15180, 17605 21685
1830-1900	Spanish Foreign Radio.....	15375
1830-1900	Radio Havana Cuba.....	11795

1900 UTC [2:00 PM EST/11:00 AM PST]

1900-1925	Radio Netherland.....	17605, 21685
1900-1930	Radio Norway International.	9590
1900-1930	Spanish Foreign Radio.....	15375
1900-2000	AFRTS.....	15330
1900-2000	BBC, London.....	9410
1900-2000	CBC Northern Quebec Serv....	9625, 11720
1900-2000	CFCX, Montreal, Canada.....	6005
1900-2000	CFRX, Toronto, Canada.....	6070
1900-2000	CFVP, Calgary, Canada.....	6030
1900-2000	CKFX, Vancouver, Canada.....	6080
1900-2000	CKZU, Vancouver, Canada.....	6160
1900-2000	HCJB, Ecuador.....	15270, 17790
1900-2000 S	KCBI, Texas.....	11735
1900-2000	Radio Havana Cuba.....	9670, 11795
1900-2000	Radio Kuwait.....	11665
1900-2000	Radio Moscow.....	9565, 11840
1900-2000	Voice of America.....	9700, 11760 15410, 15445 15580, 17785 17800, 17870
1900-2000	WCSN, Boston, Mass.....	21515
1900-2000	WHRI, Indiana.....	17830
1900-2000	WMLK, Bethel, PA.....	9455
1900-2000	WRNO Worldwide.....	15420
1900-2000	WYFR, Okeechobee, Florida..	11830, 13695 15170, 15566
1930-2000	Radio Bucharest, Romania....	9690, 11940
1930-2000 M-F	Radio Canada International.	11945, 15325 17875
1940-2000	Vatican Radio.....	9645
1945-2000	Radio Berlin International	15170

2000 UTC [3:00 PM EST/12:00 PM PST]

2000-2030	Kol Israel.....	9435, 11610
2000-2030	Radio Berlin International	15170
2000-2025	Radio Bucharest, Romania...	9690
2000-2030 S	Radio Norway International..	9655, 15225
2000-2100	AFRTS.....	15330, 15430
2000-2100	BBC, London.....	6175, 7325 9410, 11820 15070, 15260 15400
2000-2100	CBC Northern Quebec Svc....	9625, 11720
2000-2100	CFCX, Montreal, Canada.....	6005
2000-2100	CFRX, Toronto, Canada.....	6070
2000-2100	CFVP, Calgary, Canada.....	6030
2000-2100	CHNX, Halifax, Canada.....	6130
2000-2100	CKFX, Vancouver, Canada.....	6080
2000-2100	CKZV, Canada.....	6160
2000-2100 S	KCBI, Texas.....	11735
2000-2100	KVOH, California.....	17775
2000-2100	Radio Moscow.....	7115, 7150 9565, 11840
2000-2100	Voice of America.....	6045, 9700 11760, 15410 15445, 15580 17800, 17785 17870
2000-2199	WCSN, Boston, Mass.....	9495
2000-2100	WHRI, Indiana.....	11980, 17830
2000-2100	WRNO, Worldwide.....	15420
2000-2100	WYFR, Okeechobee, Florida..	9455, 13695 15170, 15566 17845

2005-2100	Radio Damascus Syria.....	11625, 12085
2015-2100	Radio Cairo, Egypt.....	9670
2030-2100	Radio Netherland.....	9540, 9715 9895, 11740

2100 UTC [4:00 PM EST/1:00 PM PST]

2100-2115	Radio Cairo, Egypt.....	9670
2100-2125 S-F	CBC Northern Quebec Service.	9625, 11720
2100-2125	Radio Netherland.....	9540, 9715 9895, 11740
2100-2130	Radio Bucharest, Romania....	9690
2100-2130	Radio Budapest, Hungary.....	9835
2100-2130 M-F	Radio Canada Int'l.....	11945, 15325
2100-2130	Swiss Radio Int'l.....	12035
2100-2140	Radio Havana Cuba.....	11705, 15230
2100-2150	Voice of Turkey.....	7215
2100-2156	Radio RSA.....	7295, 9580 11900
2100-2200	AFRTS.....	15330, 15345 15430
2100-2200	BBC, London.....	6005, 6175 7325, 9410 15260
2100-2200	CFCX, Montreal, Canada.....	6005
2100-2200	CFRX, Toronto, Canada.....	6070
2100-2200	CFVP, Calgary, Canada.....	6030
2100-2200	CHNX, Halifax, Canada.....	6130
2100-2200	CKFX, Vancouver, Canada.....	6080
2100-2200	KVOH, California.....	17775
2100-2200	Radio Baghdad, Iraq.....	7295
2100-2200	Radio Moscow.....	7150, 7195 7310, 11840 11760, 15220 15410, 15445 15580, 17785 17800, 17870 17880
2100-2200	Voice of America.....	6045, 9700 11760, 15220 15410, 15445 15580, 17785 17800, 17870
2100-2200	WCSN, Boston, Mass.....	9495
2100-2200	WHRI, Indiana.....	9770, 17830
2100-2200	WRNO, Louisiana.....	15420
2100-2200	WYFR, Okeechobee, Florida..	9852.5, 11830 11905, 13695 15170, 17845
2105-2200	Radio Damascus, Syria.....	11625
2130-2200 S-F	CBC Northern Quebec Service	9625, 11720
2130-2200	HCJB, Quito, Ecuador.....	15270, 17790
2130-2200	Radio Canada International.	11880, 15150 17820
2130-2200 A-S	Radio Canada International	11945, 15325
2130-2200	Radio Sofia, Bulgaria.....	7115, 9700
2145-2200	Radio Berlin International	6125

2200 UTC [5:00 PM EST/2:00 PM PST]

2200-2215 M-F	Voice of America.....	9640, 11740 15120
2200-2225	BRT, Belgium.....	5910
2200-2225	Radio Finland.....	6120
2205-2225	Vatican Radio.....	6015, 9615 11830
2200-2225	RAI, Italy.....	9710
2200-2230	All India Radio.....	11620
2200-2230	CBC Northern Quebec Service	9625, 11720
2200-2230	Radio Berlin Int'l.....	6125
2200-2230	Radio Norway Int'l.....	9525, 9605
2200-2230	WRNO Worldwide.....	9495
2200-2300	AFRTS.....	6030, 15345 15430
2200-2300	BBC, London.....	5975, 6005 6175, 6195 6180, 7325 9410, 9515 9590, 9915 15260
2200-2300	CFCX, Montreal, Canada.....	6005
2200-2300	CFRX, Toronto, Canada.....	6070
2200-2300	CFVP, Calgary, Canada.....	6030

2200-2300	CHNX, Halifax, Canada.....	6130
2200-2300	CKFX, Vancouver, Canada.....	6080
2200-2300	CKZU, Vancouver.....	6160
2200-2300	KVOH, California.....	17775
2200-2300	Radio Australia.....	15160, 15240 15320, 15395
2200-2300 M-F	Radio Canada International	9760, 11945
2200-2300	Radio Moscow.....	6045, 6170 7115, 7195 9490, 9710 9760, 11945
2200-2300	Voice of America.....	7355, 15220
2200-2300	Voice of Free China, Taiwan	7355, 9955 11805
2200-2300	WCSN, Boston, Mass.....	9850
2200-2300	WHRI, Indiana.....	9770, 17830
2200-2300	WYFR, Florida.....	13695, 15170 17845
2215-2230	Radio Yugoslavia.....	7240, 9620
2230-2300 A,S	CBC Northern Quebec Service.	9625, 11720
2230-2300	Kol Israel.....	7465, 9010 9435, 11610
2230-2300	Radio Beijing, China.....	3985
2230-2300	Radio Mediterranean, Malta..	6110
2230-2300	Radio Sofia.....	6070, 11720
2230-2300	Swiss Radio Int'l.....	6190
2230-2300	WRNO Worldwide.....	9495
2245-2300	GBC1 Ghana.....	4915

2300 UTC [6:00 PM EST/3:00 PM PST]

2300-2330	BBC, London.....	3955, 5975 6005, 6120 6175, 6180 6195, 7325 9410, 9590 9915, 9515 11955, 15435
2300-2330	Radio Canada International..	9755, 11730
2300-2330	Radio Korea, South.....	15575
2300-2330	Radio Sweden International..	6045, 9695
2300-2330	Radio Vilnius.....	7260, 7165 7185, 13645 11790
2300-2345	Radio Berlin International..	6165, 11750
2300-0000	AFRTS.....	6030, 15345
2300-0000 A,S	CBC Northern Quebec Service.	9625, 11720
2300-0000	CFCX, Montreal, Canada.....	6005
2300-0000	CFRX, Toronto, Canada.....	6070
2300-0000	CFVP, Calgary, Canada.....	6030
2300-0000	CHNX, Halifax, Canada.....	6130
2300-0000	CKFX, Vancouver, Canada.....	6080
2300-0000	CKZU, Vancouver.....	6160
2300-0000	KVOH, California.....	17775
2300-0000	KYOI, Saipan.....	15405
2300-0000	Radio Australia.....	17795
2300-0000	Radio Japan.....	11800
2300-0000	Radio Moscow, U.S.S.R.....	5915, 5940 5965, 6045 7115, 7150 7215, 7310 13665, 15425
2300-0000	Voice of Turkey.....	9445
2300-0000	WHRI, Indiana.....	9770, 11770
2300-0000	WRNO, Louisiana.....	9495
2300-0000	WYFR, Florida.....	9660, 9680 11580
2330-0000	BBC, London.....	5975, 6005 6120, 6175 7325, 9515 9590, 9915 11820, 11955 12095, 15435
2330-0000	Radio Korea (South).....	15575
2335-2345	Voice of Greece.....	9395, 11645



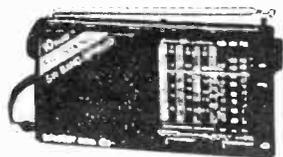
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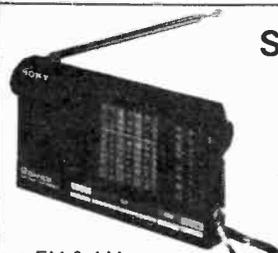
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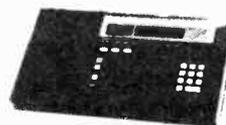
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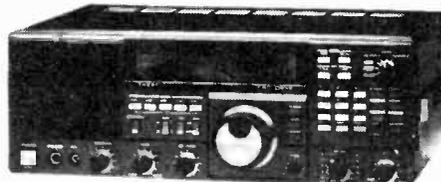
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- RD6: YAESU FRG8800
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- RD8: SWL ANTENNAS
- RD9: SONY ICF2010



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by Ugo Lazzarini

Monitoring military exercises is a common pastime in the U.S., but have you ever wondered about other countries? Here is a brief look into the somewhat unique situation encountered by the Swiss and their equally unique solution to emergency preparedness.



The Press and Radio Division of the Swiss Army

Unlike more militarily organized nations, the Swiss national defense is essentially entrusted to a people's militia. Military personnel on permanent service is very limited.

After the recruit training, soldiers are incorporated into units in which they attend 12 additional training courses of two or three weeks in the space of 30 years, considering, as much as possible, the professional experiences of the soldiers as civilians.

In case of a general mobilization, this would allow Switzerland to have a defense comprising nearly ten percent of its population.

Getting the Word Out

In time of peace, everyday radio, television and newspapers supply all sorts of information; in case of war, disasters or other critical situations, reports on national and international situations as well as dissemination of alarms or notices are of fundamental importance for the entire nation and sometimes a premise of survival.

The Federal Council (federal government) emphasizes the freedom of information and opinion, even in time of crisis or war, and does everything possible in order that the mass media are in a position to accomplish their information task without hindrance.

In war time, however, the means of disseminating information could be occupied or destroyed. In that case, the Federal Council would substitute a professional organization for information search and diffusion -- the "Press and Radio Division" (in Italian: *Divisione Stampa e Radio = DISTRA*).

DISTRA consists of professional journalists (about one third of its staff), editors, printers, engineers, cameramen, photographers, and employees of the Swiss Broadcasting Corporation (SSR) and the Post and Telecommunications Administration, for a total of nearly 2000 soldiers.

By means of such skilled personnel, DISTRA is able to gather informa-

tion (monitoring service) on behalf of the Federal Council as well as produce and broadcast radio and television programs, and print newspapers, bills and leaflets.

Because of its civilian task, DISTRA isn't under the direction of the Army Command, but of the Federal Department of Justice and Police.

DISTRA must prepare for possible emergencies as well as test cooperation with other concerned bodies. It undertakes frequent exercises to be better known and to engender the confidence of the population.

Preparing for the Worst

In November 1986, during the global drill "Infosuisse," the DISTRA operators conducted a mock emergency to test their ability to generate press releases and disseminate information for the mass media under difficult conditions.

For four days DISTRA personnel gathered news, broadcast by radio (and, for the first time, by television),

as well as distributed newspapers to the people. DISTRA television programs were broadcast over facilities of the conventional television network, fed by radio links and authorized by special decree of the Federal Council.

Programs consisted of news, studio interviews and short remote reports. They were prepared by simple technical means, often in improvised studios, to test their ability to operate in emergency situations. The audience recognized many familiar faces and voices from civilian radio and television.

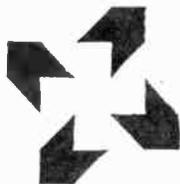
DISTRA also kept their audience informed about the development of the integrated defense drill "Dreizack" (= "Trident"), which was taking place simultaneously in East Switzerland, in which about 40,000 soldiers and civilians participated.

We wish to thank the Commander of the DISTRA, Col. Antonio Riva, for supplying the information and photos used in this article. ■

(Facing page) TV coverage (photo by Siegfried AG) provided on-the-spot information reported by well-known personalities; (this page) mobile transmitting and monitoring bases duplicated a mass communications black-out.



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INFOSUISSE

Exercice d'ensemble 86 de la Division Presse et Radio du 9 au 21-11-86

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The Marc II Shortwave Portable

Most new world band radios come from firms with familiar names, such as Sony and Kenwood. But every now and then a newcomer hits the scene unexpectedly, adding to the diversity not only of models, but also of manufacturers from which we can choose.

This month we've been going over a new model that's just beginning to hit the market from a distinctly unfamiliar firm, New Hope Industrial Co., Ltd., of Osaka, Japan. They've come out with a midsize portable, the MARC II, selling in the vicinity of \$400. That's the same as the excellent Sony ICF-2010, so it would appear that this set is aimed at a listening elite.

Quirks and Characteristics

The first thing that hits you when looking at this new model is that the radio, its box and instruction manual, contain no reference whatsoever to the manufacturer. Because there's no designation other than MARC II -- which seems more like a model designation than a brand name -- it would seem that this set is intended to be sold primarily under other firms' names. For example, the Jones Electronic Outlet would stick a "Jones" label on it, making it the "Jones MARC II."

The second unusual characteristic is that this set covers much more than the usual shortwave, longwave and mediumwave AM bands. In fact, it covers all the way from 150 kHz longwave to 520 MHz UHF, which is an awful lot of radio spectrum. As if this weren't enough, it also covers 850-910 MHz UHF. But in this range the frequency readout is 600 MHz low. So, for example, 850 MHz reads as 250 MHz -- a minor annoyance.

Otherwise, its features are typical for a modern radio. It has the usual tuning controls -- such as a knob, 20 memories for both frequency and mode, keypad and scanner -- along with a liquid-crystal digital display for the frequency readout, signal-strength indicator, 24-hour clock, battery check and so on. It has a nice switchable front-panel light, too, along with "sleep" and limited timer facilities.

Unfortunately, the MARC II isn't much of a performer. For starters, hissing and buzzing sounds generated by the radio's circuitry are highly objectionable. The set is also unusually prone to overload and generate spurious signals -- even when only its built-in whip antenna and outboard ac mains power supply

are used. When we tested the unit in Japan, where signal strengths are typically quite modest, we found overloading to be a consistent problem. In our tests in eastern North America it was even worse, and you can imagine what to expect in such high-signal places as Europe.

What this means is that you're likely to hear false radio signals piled in with the station you're trying to hear. When this happens, it sounds pretty awful.

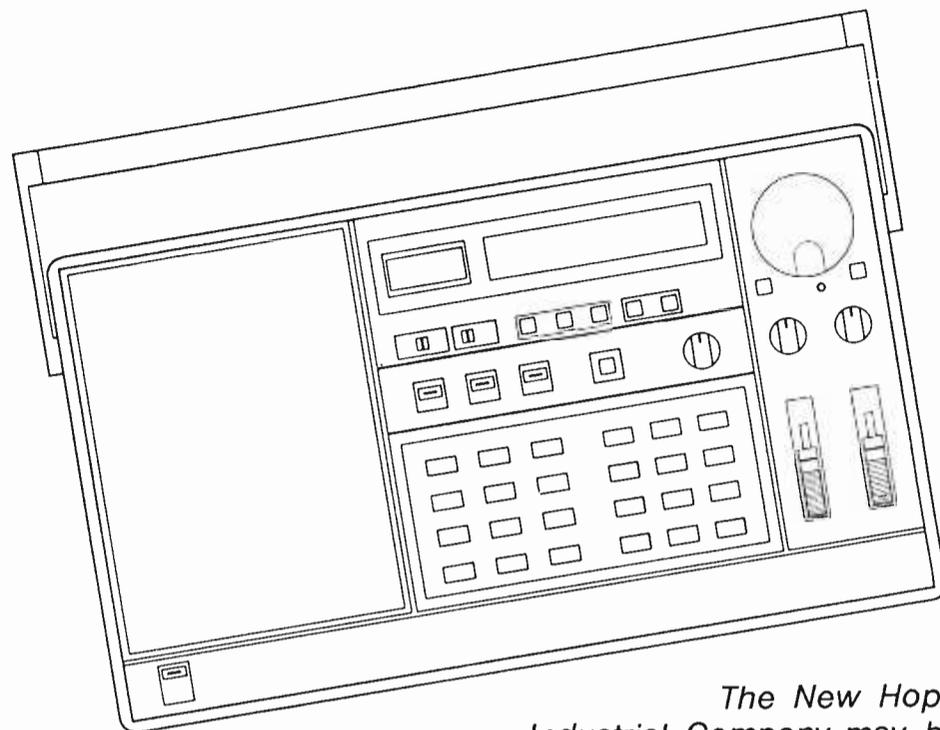
The best solution is to leave the set's attenuator on full time when you're tuning within the international bands. Of course, this reduces the set's sensitivity, but you can switch the attenuator off when you're listening within the tropical bands, where overloading is least common and signals are weakest.

Another way to cope with overloading on the MARC II is to regulate its antenna adjustment knob very carefully. This is tricky, because on some frequencies it peaks nicely with good results, whereas on others it doesn't really peak -- or the peak position allows it to overload.

The problem with this archaic preselector-type control is that it's not user-friendly. It also has to be repeaked at times when, during bandscanning, the radio clicks into a new frequency range and the set suddenly becomes insensitive until you repeak the antenna control. I've tested over 100 models of shortwave radios over the years, including a number with preselectors, and I still find the MARC II's antenna control tricky to use properly. Goodness only knows how the newcomer will make out.

The radio has two bandwidth filters -- wide and narrow. But the narrower one is for single-sideband only, so only the broader one can be used with conventional shortwave broadcasts. Unfortunately, it's so wide that you can sometimes hear stations one channel over better than you can hear the one you're tuned in to. It's a shame the manufacturer didn't allow the narrower filter to be selectable. Presumably they will do as Sangean did with its ATS-803 and remedy this shortcoming in future production.

Further to the subject of single sideband, the MARC II is only a fair performer. The bandwidth is a bit wide, the BFO not very stable, and there's no lower-sideband or upper-sideband controls. Instead, you have to fiddle back and forth between the tuning knob and a BFO



The New Hope Industrial Company may be new, and it may be long on hope.

But with the Marc II it's certainly short on performance.

potentiometer to achieve proper results. This is the technology of the 1950's, and it's a real pain as compared with more advanced switching and/or passband-tuning arrangements for sideband selection. Too, it negates the "mode" storage feature of the set's twenty programmable channel memories. You can set it for SSB, but not for the BFO's potentiometer adjustment.

On top of this, the set's construction is cheesy. It looks and feels like something you'd expect to find in some bargain basement. Its battery consumption is high, too, and our unit was so misaligned that frequencies read off by 2 kHz.

Audio quality is about average for a midsize portable. The set has a deceptively large speaker grill covering a much smaller speaker. Still, it sounds reasonable. And there's a single tone control to help in shaping the audio passband.

Nowhere to go but up

The New Hope Industrial Company may be new, and it may be long on hope. But with the MARC II it's certainly short on performance. Two years ago, this model would have qualified as a decent, but not terribly interesting, \$150 radio. Now, it's too little, too late, and for far too much money. The Sony ICF-2010 is in the same price range and runs circles around the MARC II. Even the Sangean ATS-803/EEB 2020, which costs half as much, performs noticeably better.

Perhaps the only bright spot is that the MARC II's manufacturer is anxious to improve the product. They've never made shortwave radios before, and they're trying to learn. Let's hope so.

As of now, the MARC II may be purchased only in Japan and Western Europe. So far, no dealer in North America has seen fit to handle it, although Electronic Equipment Bank is considering carrying it -- but only if the manufacturer does something about the performance and also drops the price. ■

You can hear Larry Magne's equipment reviews the first Saturday night each month over Radio Canada International's "SWL Digest" at 8:10 PM Eastern Time on 5960 and 9755 kHz. Larry's "What's New in Equipment" is also featured over "SWL Digest" various other Saturdays throughout the month. Additionally, Passport's Don Jensen and Tony Jones can be heard the third Saturday night each month.

In the US, RDI White Papers are carried by various dealers, including Electronic Equipment Bank, Imprime and Universal Shortwave. A free catalogue of the latest editions of all available RDI White Papers, which cover -- warts and all -- the most advanced communications receivers, portables and antennas, may be obtained by sending a self-addressed stamped envelope to Publications Information, Radio Database International, Box 300, Penn's Park PA 18943 USA.

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PC 22

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Heathkit IM-2420 Frequency Counter

In the past readers have inquired as to why we never review Heathkit products in the pages of *MT*. The answer is very simple: We have to build a kit. With our staff presently stretched to the limit with daily duties, there is no time left for such an assignment. Recently, however, we decided to make an exception.

Bill Grove, 16-year-old son of *MT* publisher Bob Grove, enjoys consumer electronics but is not a technical type; he is a typical trendy teen who loves computer games. If Bill could put a sophisticated kit together like the IM-2420 frequency counter, that would be a minor miracle!

Let the game begin

Slowly and carefully the bags and boxes of parts were removed from the carton and separated into groups for assembly as the instructions suggested. Only one minor component was missing and it was easily replaced.

In true Heathkit tradition, the assembly manual is complete, lavishly illustrated and professionally printed. The language is easy to understand. Technical terminology and descriptions are confined to specific theory sections; after all, this is an ASSEMBLY manual!

Simple tools are required: pliers--screwdriver, soldering iron, wire cutters--but solder, solder wick and special aids are provided. Wire, cable, ribbon, connectors, circuit components, and hardware are all of the highest quality.

Approximately 15 hours later, the assembly was complete. Triumphant, the plug was inserted into the wall receptacle and--nothing! Clearly, it was time for scrutiny. Sure enough, a few solder bridges and cold solder joints were discovered, and the display finally lit up.

Sadly, the display exhibited incomplete segments and the unit was shipped to Heathkit's warranty repair service. A couple of weeks

later it was back and working perfectly. Apparently we hadn't found every cold solder joint!

Reliable accuracy--the real test

Now, with a working unit in front of us, it was time to test everything around the shack that radiated a signal. A one-watt walkie-talkie was the first guinea pig to undergo the watchful eye of the IM-2420. Only an 18" whip (provided) was connected to the counter's input.

The digits flickered briefly then locked accurately onto the frequency output of the transmitter. But how sensitive was the counter? Walking across the room, then pressing the button, the IM-2420's display stayed steadfast, calling out the frequency. Even at a distance of twenty feet the random display quickly locked in when the button was pushed.

The challenge was too great to resist. Walking to the edge of the property well over 250 feet distant, the button was pushed again--and again the display locked immediately on frequency! Now THAT'S sensitivity!

Many frequency counters (including the one we have now retired after discovering the Heathkit IM-2420) have the irritating property of being level-sensitive; that is, only when a narrow range of signal voltage--not too high, not too low--is sensed by the counter will it read accurately.

The Heathkit is extremely forgiving of level, accurately reading its input over a wide range of signal voltages; in fact, internal limiters on both input circuits assure stable counting over a 60 dB range of level change.

A high-stability crystal in a proportionally-controlled oven holds the 10 MHz time base to one part per million per year, setable to 0.2 PPM and holding that stability from 0 to 40 degrees C. The oscillator circuitry is accessed by a rear apron jack which permits the internal time base to be sampled for external use, or for a precision time base to be injected into the counter as a high-accuracy standard.

What else does it do?

The Heathkit IM-2420 frequency counter is a laboratory-quality instrument designed to make its frequency measurement over a range of 5 Hz-512 MHz (we had ours to 570MHz); it is also useful for making other determinations as well, including period and frequency ratio between two inputs.

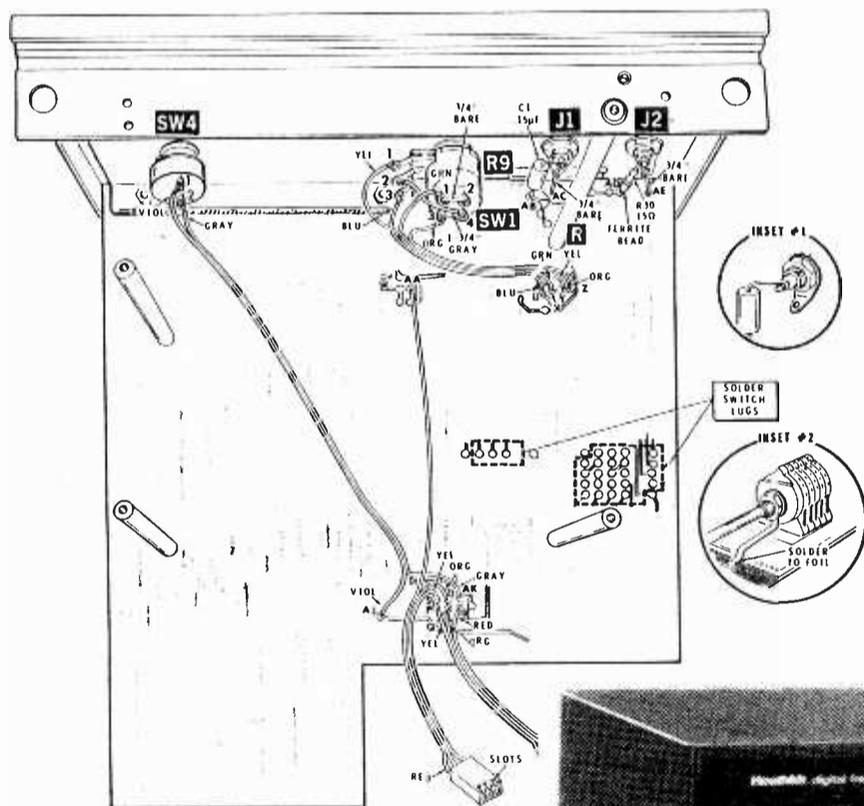
A trigger level control may be set for stable counting when signal noise is in the environment, or it may be left in a preset position. Direct connection to a transmitter is not recommended, although the unit can withstand up to 250 volts at 100 kHz, derated to 25 volts above 2 MHz (input A) and 5 volts above 40 Mhz (input B).

Ultimate resolution of the eight-digit display is 0.1 Hz; sampling times are from 0.1 to 10 seconds. A 10 minute warmup period provides 1 PPM accuracy, while 20 minutes gives 0.1 PPM.

The instrument is packaged in a metal cabinet for maximum shielding, rejecting stray radiation which can lead to inaccuracies. Standard BNC connectors are used for inputs A and B. Power required is 120/240 VAC, 50/60 Hz at 40 watts.

The IM-2420 measures 10"W x 4-1/4"H x 12-1/4"D and weighs 6-1/2 lbs.

(IM-2420 512 MHz frequency counter kit, \$289.95 plus shipping from Heath Company, Benton Harbor, MI 49022).



PICTORIAL 4-4

In true Heathkit tradition, the assembly manual is complete, lavishly illustrated and professionally printed. Only simple tools are required to produce a frequency counter which boasts excellent sensitivity as well as accuracy.



Inline Components ERD-1 Active Antenna

Many apartment-dwelling SWLs face an eternal quest for the ideal compact, indoor antenna. Several active antennas presently on the market tempt the listener. While it is unlikely for an inexpensive indoor antenna to equal the performance of a larger outdoor antenna mounted high and in the clear, many indoor antennas provide very serviceable results.

Appearances

The Inline Components ERD-1 is low profile, consisting of a black plastic base which houses the preamplifier, battery and a telescoping whip antenna. An on/off switch is mounted on the side of the box as well as an external power jack and a signal output jack to run to the receiver. Since the ERD-1 is intended for broadband (150 kHz-30 MHz) applications, there is no frequency preselection; additionally lacking is a gain control.

The unit measures about 4" x 5-1/4" x 1-1/2" high and sprouts a 36" antenna when fully extended. The antenna may be swiveled in any direction. A nice assortment of accessories includes AC adaptor, nine-volt battery, six-foot interconnect cable (1/8" mini phone plugs), adaptor for screw terminals, and a magnetic field coupler for radios with built-in ferrite rod loop antennas.

Since the preamplifier circuit draws only 5 milliamperes of current, a nine-volt battery should last for 80-

190 hours, depending upon whether the battery is conventional zinc-carbon or alkaline and assuming that the user doesn't forget to turn off the ERD-1 when not in use (there is no LED to show on-status).

Our Test

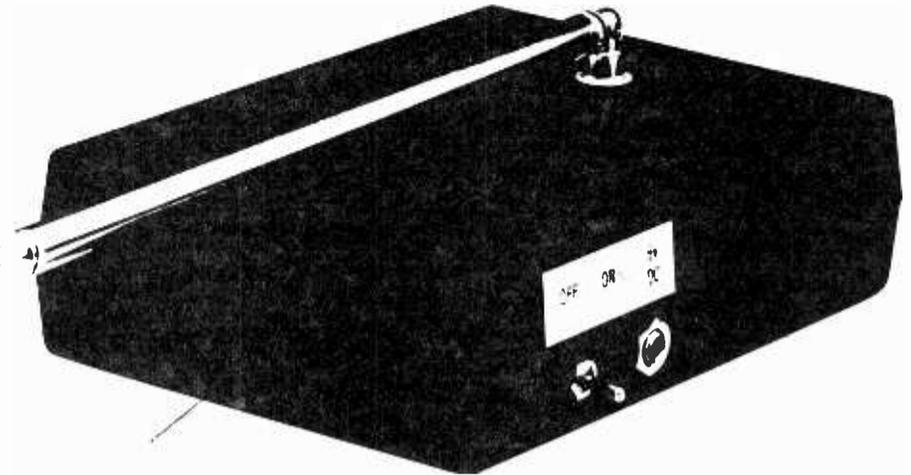
Since the Inline unit is designed for shortwave portables, we decided to try it with a Sony ICF-2010. The receiver's whip was fully extended and several trial stations were tuned in from 335 kHz through 27 MHz.

Results were Mixed

While the ERD-1 is a low noise active antenna and literature boasts of 10 dB gain, we could detect no difference in signal levels from the broadcast band through shortwave; there was a detectable improvement below 500 kHz, however, when using the active antenna compared with the Sony's whip.

This critique is not an indictment; using an optional coax cable the ERD-1 can be placed in a remote position where signals are better than at the desired receiver location. When used with receivers less sensitive than the CRF-2010, or with shorter whips, we suspect that the ERD-1 could offer a measurable signal improvement.

(ERD-1 active antenna, \$89.95 from Inline Components, 4521 Campus Drive #113, Irvine, CA 92715; ph. 714-720-8159)

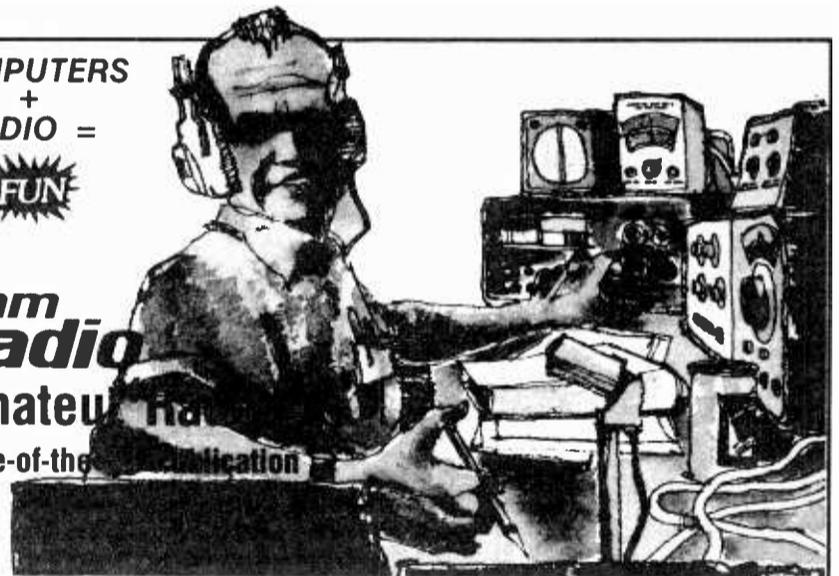


A mixed performance on our bench-test should not rule out the ERD-1; under certain conditions this active antenna should provide marked signal improvement.

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And there's more! Monthly columns by: Joe Carr, K4IPV on the ins and outs of repairing and troubleshooting your radio; Bill Orr, W6SAI on antennas and antenna technology plus a lot more; noted HF/VHF operator and DX'er Joe Reiser, W1JR's world of VHF and UHF technology; and noted government propagation expert Garth Stonehocker, KØRYW on propagation.

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EEB Shortwave Converter for the FRG9600 and R7000

Wouldn't it be nice if you could have continuous frequency coverage from the low kilohertz range all the way up to 1000 MHz or higher? You can, using a new converter made to work with the Yaesu FRG9600 or ICOM R7000.

Manufactured in the orient by Kuranishi Instruments and imported by Electronic Equipment Bank (1-800-368-3270), the FC965DX (Yaesu version) and FC7000DX (ICOM version) frequency converters permit coverage beginning at 20 kHz and extending up through the normal bottom range of the matching receiver.

The module is configured to interconnect with the CC965 switching unit which allows the convenience of selecting antennas, optional WA965 VHF/UHF preamplifier, or grounding the antenna input. Power for the subsystem is taken from a rear jack on the R7000.

Our test

Several components are available to expand the performance of the appropriate receiver; we decided to select those options intended for the ICOM R7000 since it is the leading VHF/UHF tunable receiver.

After attaching the WA965 wide-band preamplifier (\$109.95) and FC7000DX 20 kHz-30 MHz converter (\$159.95) to the CC965 control box (\$119.95), we attached our shortwave antenna and VHF/UHF antenna to the CC965 using appropriate UHF (PL-259) adaptors. We also had to supply the coax interconnect between the conversion subsystem and R7000.

An RCA phono plug on the end of a short red/black wire pair is inserted into the R7000's 10.7 MHz IF output jack on the rear apron of the receiver which has approximately 8 VDC present to run the conversion system. While this disabled our panadapter spectrum display unit, it is likely that the SDU function could be restored by using an RCA phono Y adaptor.

The preamp

The switches on the front of the CC965 control unit make it easy to do A/B tests on antennas as well as bypassing the WA965 preamp. It was

quite apparent from the outset that the WA965 provided good gain at low noise; quiet amplification was clearly present.

The specifications show maximum frequency response up to 1.5 GHz with typical gain 15-20 dB; current drain in use is 25 milliamperes. No noise figure or dynamic characteristics were provided. Low-loss N connectors are utilized to interface with the control unit.

The converter

The FC7000DX also utilizes N connectors for maximum signal transfer and converts the receiving range 60 megahertz below what is shown on the R7000 display. For example, to hear WWV on 15 MHz, you would need to enter 75 MHz on the R7000; 27 MHz CB would be tuned around 87 MHz on the R7000. It would have been preferable to use an offset of 100 MHz; this would allow direct frequency readout by simply ignoring the first digit: 115 MHz would be 15 MHz, 127 MHz would be 27 MHz, etc.

selected or disabled from the R7000 antenna connector.

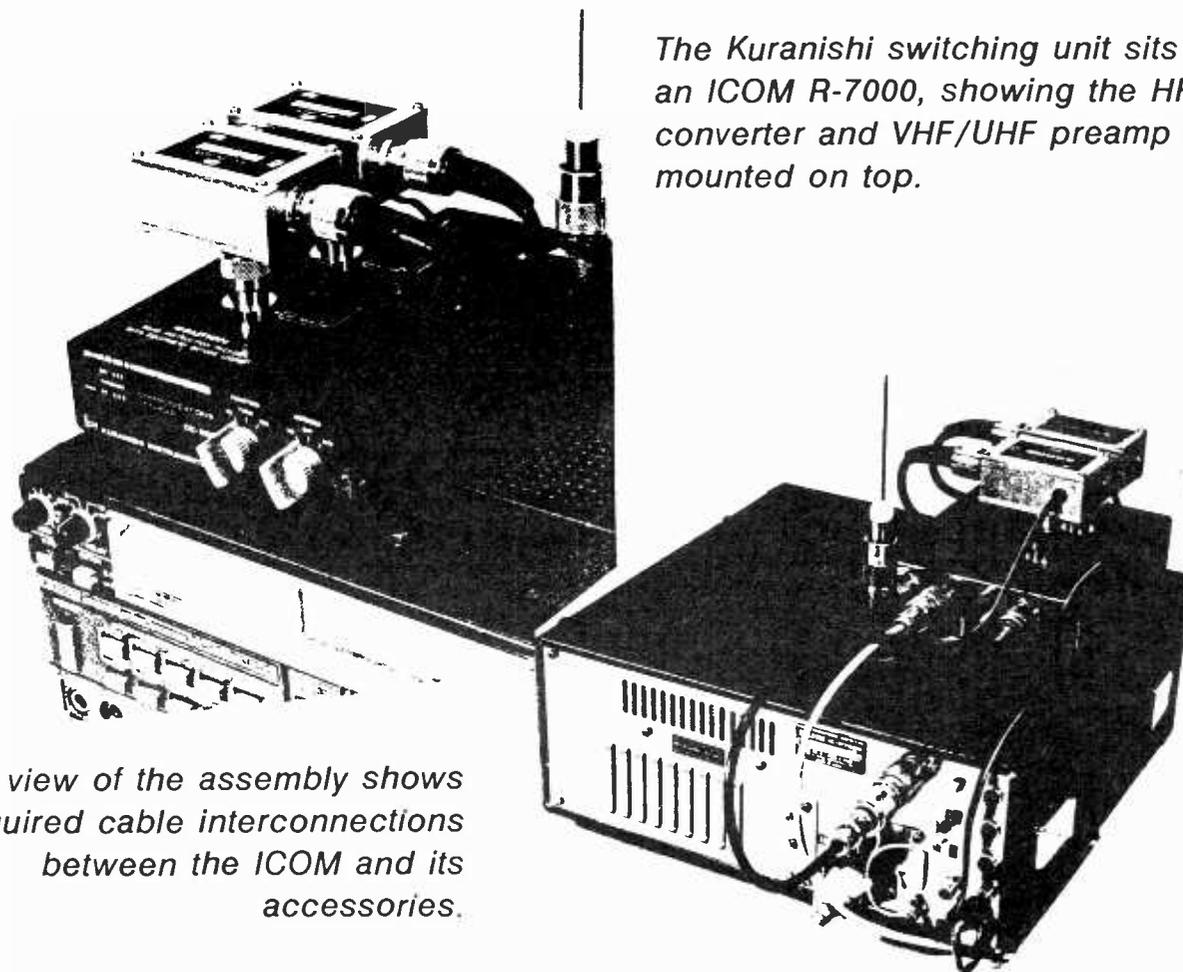
Reception was excellent when using a shortwave antenna; selectivity with such a scheme leaves something to be desired, however. The R7000 is designed for the wide channel spacing found at VHF/UHF ranges and crowded shortwave band conditions will cause considerable heterodynes (whistles) and "splatter" from adjacent stations.

Single-sideband reception was quite good in spite of the 100 Hz fine-tuning increments of the ICOM; adjacent-channel interference in this mode was also apparent due to the wide selectivity of the R7000, but audio was crisp and clean.

Other configurations

The preamp and converter modules may be used by themselves, even cascaded "piggyback", without the CC965 which provides switching convenience; without it the modules will have to be attached and disattached each time they are to be

The Kuranishi switching unit sits on an ICOM R-7000, showing the HF converter and VHF/UHF preamp mounted on top.



A rear view of the assembly shows required cable interconnections between the ICOM and its accessories.

Although the original instruction sheets are written in Japanese, adequate English translations are included for connecting up the units satisfactorily. Quality of construction is excellent and, while no circuit diagrams are provided, performance would indicate that engineering is also of high quality.

While the R7000/frequency conversion scheme allows considerable frequency agility in one radio, it should not be considered as a substitute for a decent shortwave receiver. Keeping in mind that the converter/control unit attachment with accessories represents an investment of some \$300, a separate shortwave receiver becomes an attractive alternative.

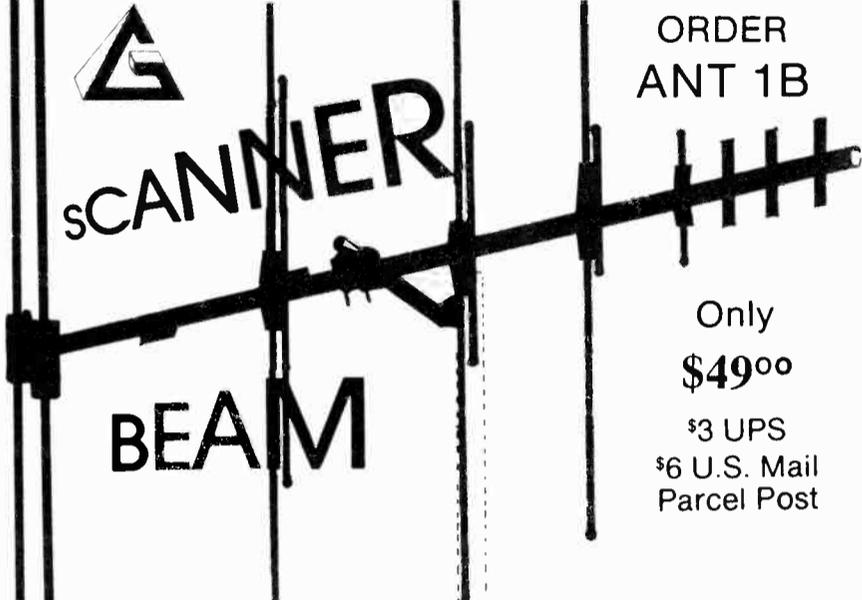
Rather, consider the conversion scheme a method of expanding the frequency coverage of the R7000 when a second receiver is undesirable, or when the expanded system is used as a backup to a good general coverage communications receiver. ■

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May be used with inexpensive TV antenna rotator for boresight accuracy, or fixed in one direction for those elusive, distant stations. Local signals still come in loud and clear from all directions.

Recommended for use with Grove low-loss cable and CK1 connector it. Balun transformer, offset pipe and all mounting hardware included (requires TV type F connector on your coax). Approximate size 6'H x 4'L.

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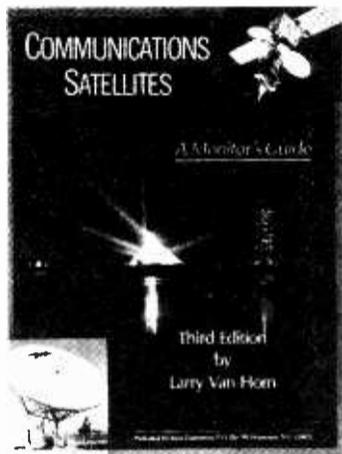
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Communications Satellites Third Edition

by Larry Van Horn (260 pages, 8-1/2" x 11", perfect bound; \$14.95 plus \$1.50 UPS shipping from the publisher, Grove Enterprises, PO Box 98, Brasstown, NC 28902; available also from other MT advertisers)

With a full color cover and laser typesetting, this brand new edition of Van Horn's classic treatise on monitoring the earth satellites is not only glamorous, but loaded with updated information as well.

Liberally illustrated and conveniently arranged in chapters by satellite classification, satellite topics include domestic, international, amateur, direct broadcast, weather, U.S. and Soviet military, and surveillance.

This edition contains for the first time a new chapter on tips and techniques designed to enable the ground listener to tune in more effectively on signals from space--frequency bands and users, receivers and antennas, foreign satellite schedules, and transponder subcarrier services.

Of exceptional value are the appendices in the back of the book: frequency lists of NASA ground tracking networks, exhaustive uplink/downlink frequency tables, an informative glossary of terms and abbreviations, an alphabetized list of satellites and their descriptions, a satellite location guide, even an up-to-date weather facsimile schedule for GOES satellite broadcasts.

Now in its third edition, *Communications Satellites* is clearly the

reference book for all phases of monitoring signals from space satellites.

Tornado-Wise

by Vince Luciani (43 pages, 8-1/2" x 11", paperback; \$2 including postage from Cologne Press, PO Box 682, Cologne, NJ 08213)

Originally published in 1980, this excellent manual is now being cleared at a giveaway price by the author. Nearly all areas of the country are threatened by severe storms and, during hurricane season, the information contained in this publication can prove extremely valuable.

Not only does it serve as a primer regarding tornadoes, their origins and characteristics, but several pages are devoted to the Weller method of using your TV set to signal the imminent arrival of a tornado.

Interesting reading, and the price is right!

Custom Scanner Frequency Lists

from Norm Schrein (Your county printout, \$3 plus a self-addressed, stamped envelope; from Mr. Scanner, PO Box 29-1918, Dept MT, Kettering, OH 45429)

Now that Fox Marketing no longer has its regional directories and Grove Enterprises has discontinued carrying microfiche, what is a listener to do? Well, if you would like a custom printout of the various services in your county (public safety, utility services, business, ham, GMRS, tow trucks, railroads, news media, and many more), Norm Schrein can provide it.

The list is sorted by frequency, call sign, licensee, and location and is extracted directly from FCC records.

Security Industry 1987/88

(1140 pages, 8-1/2" x 11", perfect bound; \$90 from Bell Atlantic, 4350 East-West Highway Dept MT, Second Floor, Bethesda, MD 20814)

Billed as "A comprehensive directory for the security professional", this premier edition lives up to its name. Representing a two-year cooperative effort between Bell Atlantic and the American Society for Industrial Security (ASIS), The directory places at the fingertips names, telephone numbers and addresses of security-related organizations and services around the country.

An alphabetized state sort lists companies which specialize in turnkey security installations; a products section lists manufacturers of equipment and accessories by category; consultants and engineering firms are listed separately, as are services.

Finally, a master list presents in alphabetized format all of the firms listed separately in the foregoing categories.

Over fifty firms are listed for eavesdropping countermeasures equipment alone, and hundreds of alarm companies are present. Identification systems, surveillance gear, countersurveillance equipment, computer security, voice privacy systems, couriers, executive protection and bodyguards, training institutions, and many other categorized and cross-referenced listings are provided.

If you have a need for security of any kind, its sources are in this exhaustive directory.

The Commodore Diagnostician

by Ian Perry (Laminated quick-lookup chart, 8-1/2" x 11"; \$6.95 plus \$1 shipping from KASARA Microsystems, 33 Murray Hill Dr., Spring Valley, NY 10977)

Developed last year in Australia, this quick-lookup chart is a real boon to technically-inclined computer owners. Now available for the C-64, an IBM edition is due soon. The author claims a 95% success rate using the chart which tells the most likely fix(es) for just about every conceivable complaint.

Does the display have a wavy screen after warmup? Check the external power supply and chip 6567. Is there a graphic display and blinking cursor at power-up? Better have a look at U14. The "FILE NOT FOUND" message is displayed? Try cleaning the drive head with alcohol; check the 0 stop adjustment and general alignment.

This cook-book approach to home computer repair can come in handy for those of us who don't have strong digital expertise but are willing to take a crack at repairing belligerent Commodores.

The ARRL Handbook, 1988 Edition

(1184 pages, 8-1/2" x 11", hardbound; \$21 from the American Radio Relay League, 225 Main St., Dept MT, Newington, CT 06111; also available from amateur radio dealers and many MT advertisers).

This perennial favorite has enjoyed for decades an international reputation as the singular reference on experimental radio communications design and techniques. The reputation is well deserved; the handbook never fails to provide copious information on virtually every facet of communications technology at every frequency range.

While each successive year's publication is largely a reprint of the former year, there is always something new, encouraging replacement every two or three years on anyone's bookshelf. This is the first year the handbook is available only in hard cover; no longer will it slump under its own weight on your bookshelf!

Probably no text in print is more lavishly illustrated, making the work particularly appealing to newcomers as well as veteran hams and experimenters. Targeted on amateur radio, the contents nonetheless are useful to all phases of radio and electronics, with designs originally published in the handbook frequently finding their way into commercial equipment around the world.

Digital and analog, audio and video, RF, antennas and tuning systems, receivers and transmitters, test equipment and techniques, facsimile and radioteletype, power supplies and accessories--an incredible array of topics, expertly written.

Aeronautical Utility Guide

by Robert E. Evans (146 pages, 8-1/2" x 11", looseleaf drilled, unbound; \$15 from the Ontario DX Association, Dept MT, PO Box 161, Station A, Willowdale, Ont., Canada, M2N 5S8)

Whether your aircraft monitoring interests lie in domestic VHF or international HF, this interesting collection of materials should provide some insight into aeronautical communications.

Comprised largely of newsletter reprints, private correspondence and custom made charts and forms, Evans's collection touches on VOLMET, LDOC, point-to-point RTTY, military, and civilian flights.

A section on interpreting aeronautical circuit RTTY is most helpful, showing the reader how to read the encoded lines of data. Many actual off-the-air quotes are given with interpretations of the flight crew's vernacular.

The publication concentrates on communications actually monitored in the Ontario area and frequencies and listings reflect this regional interest. ■

Understanding "Radioese"

Like all professions and special interest groups, radio hobbyists have their own "jargon". Like legal or medical language, "Radioese" is a set of words and phrases that have special meanings, used to simplify communications among those in the fraternity.

Unfortunately, that means anyone who has not been involved in the radio hobby who picks up a radio publication for the first time is assaulted with words, abbreviations, and what boil down to simple inside jokes. Without some sort of "Rosetta stone" they are indecipherable.

"Ham" Abbreviations

There is no good place to begin this exercise, but explaining the term "DX" is perhaps the best since it is so commonly used. Originally used to mean "distance," in more modern usage, it indicates a station that is a long distance away, and usually a low powered one that is not beamed toward your location. Similarly, a "DXer" is a person who seeks to hear such stations, regardless of whether he is looking to hear a rare Latin American station on SW, or a 100 watt station from the next state on the AM band.

Two ham terms that bear closer examination are QRM and QRN. Both refer to interference, and beginners and experienced listeners alike often confuse them. QRN is natural interference - most commonly, static from "nearby" lightning strikes. QRM is man-made interference (yes, there is a handy mnemonic there!) such as jamming or splatter from an adjacent channel.

Keeping Track of Time

For listeners concerned with worldwide communication, time becomes a bit of problem. A glance at the globe will confirm that when it is noon where you are, it is not noon half-way 'round the world!

SWLs have responded to this fact of nature by adopting an arbitrary standard to ensure that when a station says it will begin broadcasting at noon, everyone knows what time that is. That arbitrary standard is the time at the Prime Meridian, which passes through Greenwich, England. This time is called Greenwich Mean Time (GMT) or more recently, Coordinated Universal Time (UTC). UTC and GMT do differ by a couple of hundredths of a second per year, but for practical purposes, they are identical. In recent time, you'll find that UTC is more commonly used.

Hardware

Other terms used by DXers are less easily explained to the uninitiated, including, sometimes, the names

various pieces of equipment are called. Receiver and antenna are easy enough since both retain their common definitions but what is a "dipole," or a "panadaptor"?

For most people, an antenna is an antenna, and the idea that there are different types (other than CB versus TV...) is a novel idea. For radio enthusiasts, however, the plethora of antenna design names are terms that trip lightly on the tongue. Each type is distinguished by its shape and the position of its "feedline" - the part of the antenna that connects to your receiver terminals - and each does its job of sniffing out signals slightly differently.

The most common design used by SWLs is the "random-wire", which is simply a random length of wire with the feedline connected to one end of the antenna. More adventurous DXers may use a "dipole," which is two lengths of wire laid end to end and cut to specific lengths, depending on the frequency you wish to best receive. This is then connected to the receiver by one wire soldered to each "leg" of the antenna at the point where those two wires are closest together. (A cable containing two wires is the most common way to do this.)

The basic dipole design can be modified slightly by lowering the ends of the antenna relative to the centre feed-point, so that the whole contraption looks rather like an upside-down letter "V". Not surprisingly, this design is called an "inverted V" dipole.

Scanner users will be most familiar with "telescopic whip" antennae, (like those found on most portable radios and TVs) and "Yagi" antennae. This design is commonly used for TV antennae, and consists of one element that is essentially a resonant dipole, with other elements in front and behind it that act as directors and reflectors to augment the signal. As a result, this design is highly unidirectional.

Suffice it to say there are a plethora of antenna types, and to go through all of them would take the rest of the magazine, let alone this column. "Getting Started" columns will look into the various antenna designs, and what each type does that sets it apart from the others. For more detailed technical approach to antenna design and construction, check out Clem Small's regular column in *Monitoring Times* called "Antenna Topics."

Names of equipment other than antennae also fall into the "jargon" category, and are equally confusing for newcomers. A "lightning arrester" is not something to incarcerate lightning bolts, but rather is a device attached to your antenna feed-

line to help dissipate harmful electric charges that build up in the antenna as a result of static in the atmosphere. Without such a device, your receiver could be damaged given the wrong set of circumstances.

A "Q-Multiplier" is a device that in effect adds another amplifying stage to your radio, and also allows you to control the amount of the radio spectrum you are listening to. Many radios are not sensitive or selective enough to ferret out one signal and amplify it enough to be easily heard. A Q-Multiplier may be attached to such a radio to improve its reception by both increasing signal strength and also allowing you to narrow the slice of the radio spectrum your radio is amplifying and cut out unwanted signals near the signal you are trying to receive. "Q", by the way, is the electronics abbreviation for "selectivity".

An "antenna tuner" or "antenna matcher" is a device used to make an antenna resonant at a frequency on which it is not naturally resonant. Without getting into details, this is a device that will electrically lengthen or shorten an antenna to improve the signal strength.

A "panadaptor" is actually a brand name for something generically called a graphic frequency spectrum analyzer (you see why the brand name is used commonly!) that allows you to "see" a portion of the radio spectrum near the signal you are tuned on a small TV screen. It displays little "humps" to indicate the relative strength and position of stations, and you can also use it to judge modulation quality and other signal characteristics once you become familiar with how to use the device.

That is it for this month's overview of some of the jargon used in radio listening hobbies, and we have only scratched the surface! If you have a question about this month's column, or any "getting started" topic, feel free to drop me a line, with a self addressed stamped envelope, to the address at the top of the page, and I will do my best to answer. I cannot answer letters without your return postage - sorry!

We are happy to welcome Kenneth Vito Zichi to pages of Monitoring Times. Zichi has been a radio hobbyist since 1972, and he has written for one radio publication or another for over ten years. His primary interests are SW and AM broadcast listening and DXing, but he also dabbles in antenna and electronic equipment design/construction projects.

When he is not listening to the radio, he is a General Practice attorney, and is married (to a very understanding woman) with one daughter. He describes himself as

"CRACKING THE CODE"

A list of some of the more common abbreviations used by radio enthusiasts. Most of these originally were developed by amateurs to speed Morse Code transmissions.

BCB	Broadcast Band (any of the bands used by broadcast stations, eg. MW BCB (535-1600 kHz), FM BCB (88-108 MHz), or SW BCB (any one of many, like the 31 meter band, etc.))
CW	Continuous wave unmodulated transmission. Eg. Amateur Morse Code transmission.
DSB	Double sideband transmission, eg. standard AM.
GMT	Greenwich Mean Time [The time on the prime meridian, which runs through the Royal Observatory in Greenwich, England. See also UTC]
hi	Laughter, as in 'don't take the preceding too seriously' [From the Morse code convention of sending "....." when indicating laughter. When heard, "hi" in Morse sounds like a little man going "hehehehe hehe" - if your imagination is good. Who says radio hobbyists have no sense of humour!hi.]
ISB	Independent side band transmission.
kHz	Kilohertz [1000 cycles per second] see MHz.
LSB	Lower side band.
LW	Long Wave [below 540 kHz]
MHz	Megahertz [1,000,000 cycles]
MW	Medium Wave [also called BCB]
mx	Music
OM	Male (Old Man - all men, regardless of age, are old!)
QRM	Interference (Man-made "noise")
QRN	Static (Natural "noise")
QSB	Fading
QSL	Verification (card)
QTH	Location or address
RST)	
SIO)	
SINPO)	reception reporting codes
SINPFEMO)	
s/on (s/off)	- sign on (or off)
SSB	Single side band
SW	Short Wave (3-30 MHz)
SWL	Short Wave Listener
tc	Time check (announcement of time)
tfc	Traffic
tx	Talk or transmitter
USB	upper side band
UTC	Coordinated Universal Time (A standard used by DXers and SWLs to avoid time conversion confusion, based on internationally coordinated atomic clocks.) Practically, this is the same as GMT.
ute	Utility station
VHF	Very high frequency (above 30 MHz)
wx	Weather (report)
xmtr	Transmitter
xmsn	Transmission
XYL	Wife (Young Lady - yes, I know it is sexist!)
YL	Female (Young Lady - all women, regardless of age are "young")
73	Best regards (this is already plural. "73s" is redundant although commonly misused)
88	Love and kisses

"slightly crazy", and when pressed, defends himself by saying, "Everyone involved in radio as a hobby is a little crazy - you ever been in a room full of DXers?"

SWL Time Shifting

or How to Take Control of Your Radio Listening

by Bob LaPree

Time shifting. It's the rage for millions of VCR owners who can't watch a TV show when it's broadcast. Instead, the program is recorded and watched at another time.

One of the nicest things about today's VCR is that it's possible to program the machine to record several shows on different days, channels and times. Then, when Saturday night rolls around, you can watch all the shows you missed or couldn't watch this week before. The TV networks don't much like it, but it's wonderful for the busy viewer. This convenience is available to radio listeners for very little investment. Best of all, it's simple to set up.

Why Bother?

So why bother to time shift at all? So you can take charge of your listening! Work and family demands make it difficult for many of us to spend more than a few minutes a day at our radios. Many shows are on at inconvenient times.

Me, I'm a news junkie. I need to know what's going on in the world. For that, I want to hear Radio France International's *Paris Calling Africa* program at 1600 UTC; the BBC has good coverage of African, Asian and Pacific affairs; V.O.A. tells me what the U.S. government is telling the world; Radio Australia has excellent Pacific Rim news. And I hate to miss even one installment of Allistaire Cook's *Letter from America*.

By recording these and other public affairs programs it's possible to get a much wider view of world events than is usually provided by the American news media. In addition, the BBC often has ongoing serials such as the Titanic dramatization of *A Night To Remember* this past summer. With time shifting I'm able to hear these shows when I have the time and am often able to record them when reception conditions are best. Think of it--record the early morning world news and listen to it in the car on the way to work!

How to do it

For the most sophisticated SWL time shifting all you need is a receiver with multiple programmable frequency and on-off time capabilities. One such rig is the Sony ICF-2010. It allows the user

to program up to four different frequencies into its memory -- frequencies which will then come on up to four different times during the day for periods of up to one hour each.

Unfortunately, the timer on the '2010 does have its limitations and the most annoying is that it only runs for a 24 hour cycle. That's fine if you want to record a program this afternoon at 1600 UTC. But if you want to record a program today at 1600, another tomorrow at 0200 and a third on Friday at 0900 UTC, you're simply out of luck -- unless you want to keep resetting the radio and recorder each of those days.

There is, fortunately, an easy and inexpensive way around the problem. And all you need to do to remedy it is to run down to your local Radio Shack store and pick up a digital multi-event timer (Seven Day Digital Program Timer: #63-889). The cost: a mere \$29.95

This mighty little device is essentially the same as the program timer of the VCR without the channel selection capability. The timer allows you to set the on-off times for seven events over the span of a week. All you have to do is program the radio, program the timer, plug the recorder into the timer and push the record button. When show time arrives the radio turns on, the timer turns on the recorder, the program is taped and everything turns off at the prescribed time -- ready for the next show.

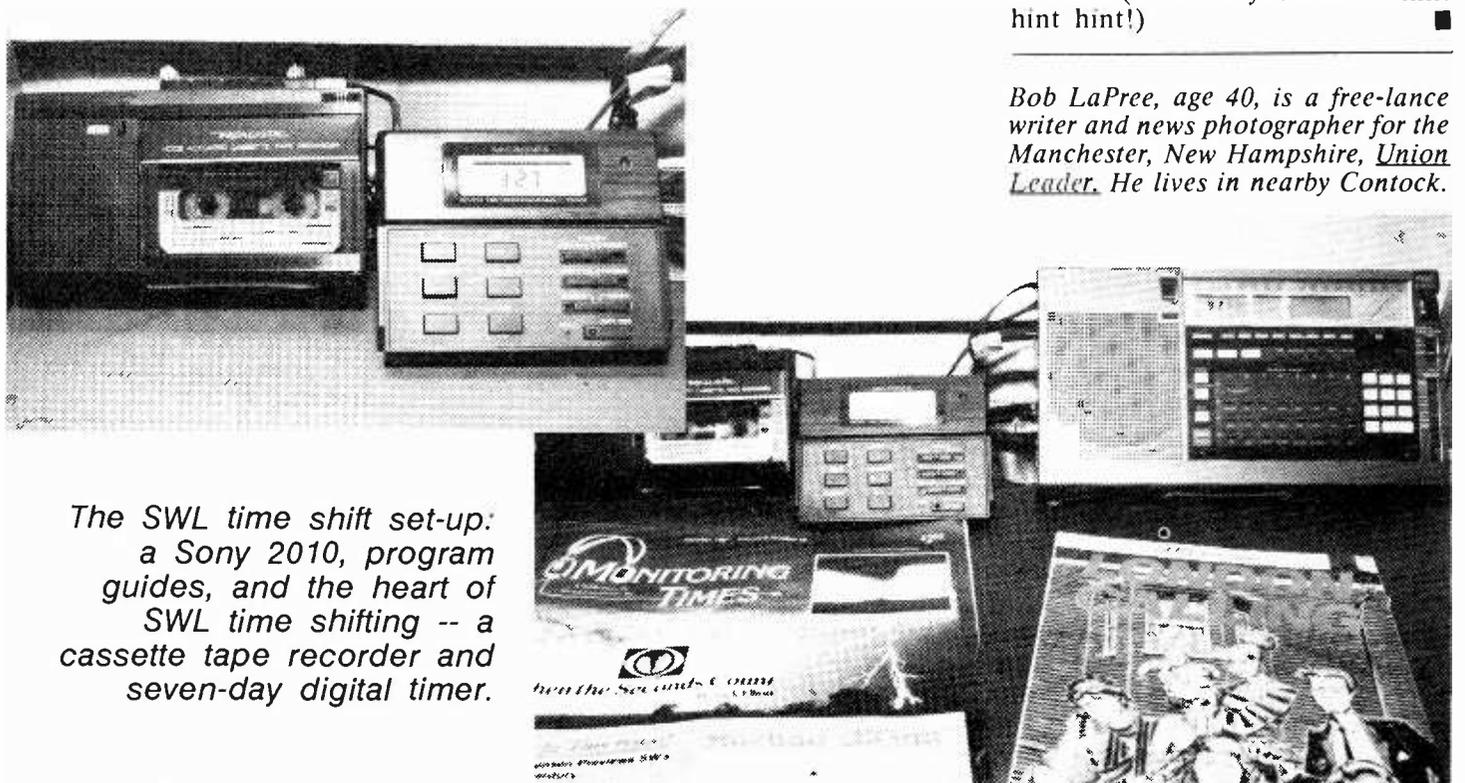
When you use an XR-120 tape, an hour's worth of recording can be made before the tape needs turning over. For those of you who need even more unattended recording capability, slow speed recorders are available which permit 10 hours on one side.

You can hook the tape recorder to the '2010 through the radio's "recorder out" jack, which can be used to feed the audio into a recorder through the microphone jack. Turn down the volume on both units and no one will be disturbed by the radio playing at odd hours of the day and night.

Another way to do this is to use the radio's earphone jack. It will cut off the speaker when in use. When using the earphone jack, you will have to experiment with the volume level so the microphone is not overloaded.

I do sometimes have a problem converting the UTC time of a show into local time. The simplest solution is to have the timer set at UTC. Though the unit is capable of 12 hour time only, it's easier to make the single conversion to 24 hour time. There are other timers available to time shift with, such as the multiple on-off timers used to turn lights on and off that give your house a "lived in" look when you're away. (These will do job but it is difficult to get them precisely on time- so the extra \$10-\$15 is well spent to get the digital unit.)

If your radio is capable of multiple on-off and station selection, the



The SWL time shift set-up: a Sony 2010, program guides, and the heart of SWL time shifting -- a cassette tape recorder and seven-day digital timer.



Wideband Preamp 10-1000 Mhz

Dual GasFet low noise preamplifier for HF, UHF or VHF systems. Just perfect for the R-7000. Excellent for Spec Analyzers, Scanners, etc. Gain 20 Db +/- 1 DB, -3 Db at 2 & 1100 Mhz. 1 Db compression of >10 Dbm. Intercept points >45 Dbm. New shipped price of only \$124.95. Pa. residents please add 6% state tax.



R-7000 Widespan Panadaptor

Panadaptor especially designed for the R-7000 receiver. For use with a standard scope. Variable span width from 1 to 10 Mhz. Uncover unknown elusive signals. Complete with all cables, & 90 day warranty. \$349.95 Shipped. Pa. res. add 6%.

GTI Electronics

RD 1 BOX 272
Leighton, Pa. 18235
717-386-4032

timer can be dispensed with by the use of a voice activated tape recorder (Radio Shack, Realistic CTR-85, #14-1056, \$49.95)- when the radio comes on the tape will roll.

The digital timer makes all this quite easy. And who knows, it might even make a nice Christmas present for your favorite shortwave listener (or even yourself -- hint hint hint!)

Bob LaPree, age 40, is a free-lance writer and news photographer for the Manchester, New Hampshire, *Union Leader*. He lives in nearby Contock.

Great Circles, Gray Lines, and Grabbing Those Elusive Signals

A World-Class Optical Illusion!

We'll start this month's column by describing a phenomenon which leaves many of us feeling, when it comes to deciding which direction to point our beam antenna, confused.

To illustrate, just imagine for a moment that you are at a monitoring post somewhere in the state of Washington. Toward what direction should you orient your directional antenna to tune in on the current shortwave radio action in the Persian Gulf?

Some of us would say that "east" would be the best answer to that question. But others would claim that "west" was correct. Surprisingly enough, both answers are wrong! In Washington, the direction from which to expect radio waves to arrive from the Persian Gulf is north: they travel over the North Pole! (see fig. 1)

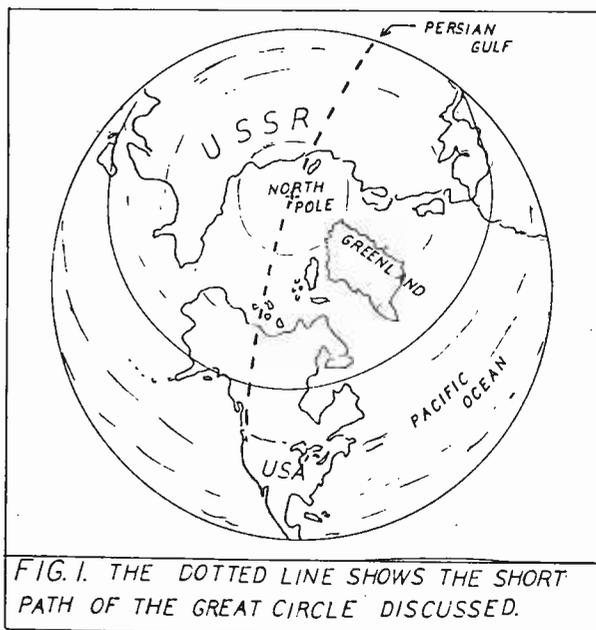


FIG. 1. THE DOTTED LINE SHOWS THE SHORT PATH OF THE GREAT CIRCLE DISCUSSED.

from directions other than the two great circle paths, but most generally they do not.

It's Great to Use a Great Circle:

The great circle is of interest to shortwave DXers with either directional or nondirectional antennas. If you have a directional antenna, great circle bearings tell you how to orient your antenna to the short path.

If you have a nondirectional antenna, great circle bearings help you pick a proper site for reception from specific directions. For instance, even with a nondirectional antenna, you should avoid a site where reception from a desired direction is cut off by nearby buildings or hills.

The "Graytest" Circle of Them All:

Slowly, as each long day fades to night, a very special great circle follows its never-ceasing circuit around this earth of ours. This particular great circle is the "twilight zone," or "terminator" -- the band encircling the earth where sunrise and sunset meet. In common radio terminology, it is called the "gray line." At sunrise in the state of Washington, the great circle indicated in figure one is a gray line, with daytime to the right of the gray line, and night time to the left.

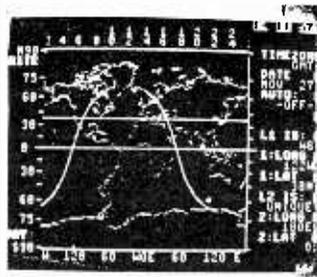


FIG. 2. SUPER DX EDGE

Now the interesting thing for us about the gray line is that, as Jacobs and Cohen point out in their well-known *Shortwave Propagation Handbook*: "Propagation along the gray line is extremely efficient ... Because the gray line is so efficient, it often can be one of the best modes to use for long distance communication in the h.f. bands."

Using the Gray Line

To make use of the special properties of the gray line for shortwave reception, you need some means of predicting the compass direction or bearing on which the gray line lies. When the gray line occurs at your location, you'll also want some indication of what points on the globe it connects you with.

Jacobs and Cohen tell how to use a globe and a home-made cardboard template for these purposes. There are also two commercial products which help you use the gray line: a slide rule known as "DX Edge," and a computer program called "Super DX Edge," (see fig. 2)

The slide rule version of DX Edge has several templates which are used to determine not only the path of the gray line, but also to see what areas of the globe are in darkness or light at any given time of day, sunrise and sunset times throughout the year, and other great circle bearings from your home location.

The Super DX Edge program is available for the Commodore 64 and the 128 (in 64 mode) computers. This program provides an impressive graphic display of a map of the world, with the gray line clearly indicated. As with the slide rule version, the Super DX edge gives daylight and darkness propagation paths, sunrise and sunset times for any location, and great circle beam-headings to any location on earth.

In addition, the computer version will give propagation predictions for maximum useable frequency (MUF) between any two locations on earth. For determining an MUF, the user must supply the current date, and a current index of solar activity.

All in all, either of these products are very useful for the shortwave radio operator or monitoring buff.

The slide rule version of the DX Edge is available from Imprime, Box 241, Radnor Station, Radnor, PA 19087, for \$19.95 plus \$1.95 UPS.

RADIO RIDDLES

Last Month's Radio Riddle: Last month's riddle mentioned transmission lines, halyard lines, Lecher lines, load lines, and gray lines. The riddle then asked: "Which of these lines is a phenomenon associated with radio wave propagation, and how does a knowledge of it help us improve our HF communications?" Obviously, this month's column gives the answer.

This Month's Radio Riddle: Why is the gray line such an efficient path for shortwave propagation?

We'll have the answer to that one next month. Til then, Happy Holidays, Peace, DX, and 73. ■

For more on gray line and great circle DXing, see Domestic Broadcasting on page 32

716 N. Roosevelt
Loveland, CO 80537

If I Just Had The Power

I've received several inquiries regarding power supplies in general and in particular, how to make one for 5 - 60 volts. The problem is that no one manufactures anything fitting the above description. The reason is that there's really very little call for a power supply over 40 volts.

The fact is that the 5 - 60 volt unit can be made for either low (400 ma.) current, or high, 2 amps. And all you need to make the change is different transformers. Radio Shack parts are used throughout.

Each request about this power supply also came with the caution, "It has to be *cheap and simple*." No problem. Here's the thing though. To keep it "cheap and simple," it's load dependent. What this means is, after you set it under no load conditions on a volt meter, applying load *will* cause the voltage to *drop* and it will need to be readjusted.

The second request granted is for a good regulated 12 - 14 volt supply. Radio Shack used to sell the stripped down little sucker with the rubber floor mats for about \$13.00 and the regulated unit for a few bucks more. Now they're about \$27 and \$40 respectively. (The parts still list out about the same as before).

Both devices offered here have "short circuit" protection. In one unit, the power pass transistor needs to be mounted to the case with a mica insulator and thermal compound. Also, a nylon screw or a teflon bushing needs to be used to keep the collector from ground. Such mounting kits are available at RS (#276-1373). The collector is grounded on the 5 - 60 V supply.

Let me throw in a word about thermal compound, or silicone grease (RS #276-1372). The "white stuff" with zinc oxide added is the best, as supplied by RS, but with either type, after using it, DO NOT RUB YOUR EYES!!!! Wash your hands immediately! I had a good friend in the Navy who on a hot, sweaty day didn't heed this advice and now he wears glasses that look like the bottom of a Coke bottle. That stuff is essentially ground glass! Forewarned is forearmed....

Good cases are available at Radio Shack. The #270-252 is excellent for the regulated bench supply and the 270-253, with careful parts placement will do for the variable unit.

One more word, the variable supply will *cream* a 12 volt device if you're

not very careful, so if you don't need it - don't build it!

Regulated power supply

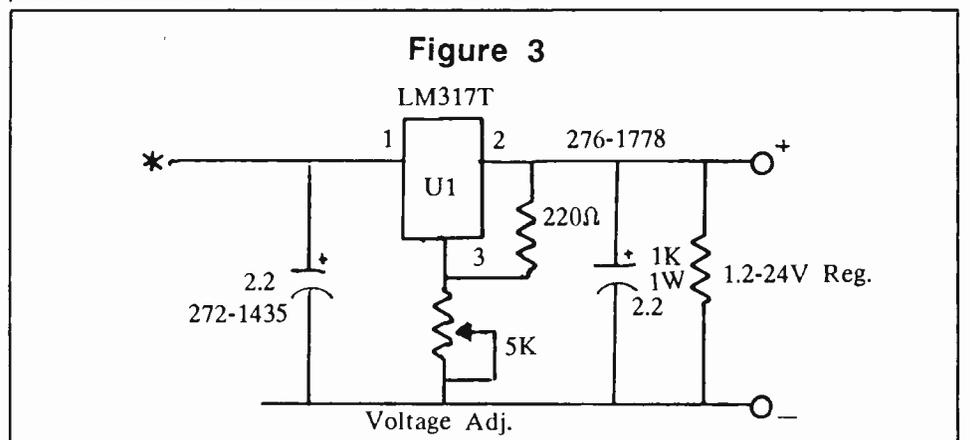
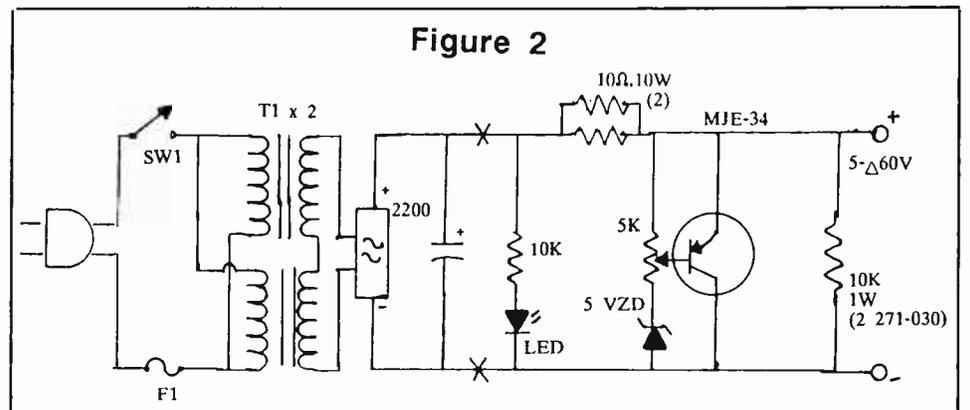
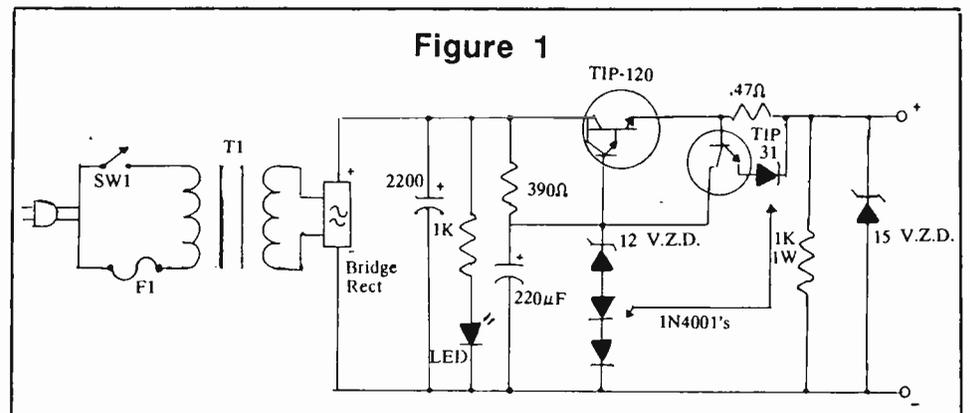
The regulated bench supply uses a high power Darlington transistor for excellent voltage regulation and plenty of reserve for nearly infinite life expectancy. The voltage can be adjusted from 11.5 to 13.8 with the #276-1101 diodes in series with the 12 volt Zener. As shown, it's 12.6 volts. Each diode adds .6 volts to the supply output.

The Darlington has a 1.2 volt drop, so, if you want a 13.8 volt supply (optimum), skip the #276-563 12 volt Zener and one package of #276-1101 diodes and just use the other #276-564 15 volt Zener as $15 - 1.2 = 13.8$. The first 15 volt Zener is a Kamakaze that will short out if the power pass transistor fails, thus saving your equipment.

Transistor #276-2017 together with resistor #271-130 and one of the #276-1101 diodes constitute a current limiting circuit. When the output current nears 2 amps, the transistor conducts, feeding the output voltage information to the base of the power transistor. To put it simply, if the leads are shorted, the voltage feed-back will be close to zero; *however*, 2 amps will *continue* to flow until the situation is corrected. *But*, this is within the limits of the power supply components and no damage will result. A .33 ohm unit will pass 2 amps.

Parts list for 12 - 14 volt regulated bench supply as shown in Figure 1:

Switch #275-1565
Transformer #273-1512
Pilot LED # 276-068
Transistor #276-2068
Zener diode #276-563
Diode (both) #276-1101 x 2
Bridge rect #276-1171
Capacitor #272-1020
Capacitor #272-1018
Resistor #271-018 (use 1)
Resistor #271-153
Fuse holder #270-739
Fuse #270-1282
Safety components
Zener diode #276-564
Transistor #276-2017
Diode #276-1101 (use 1, see text for other)
Resistor #271-130
Misc: Case, line (AC) cord and plug. Wires and alligator clips.



Parts list for 5 - 60 volt load dependent power supply:

Transformers 2 #273-1366 (1/2 amp.) or 2 #273-1512 (2 amps.)
Switch #275-1565
Pilot LED #276-068
Transistor #276-2027
Zener diode #276-565
Fuse holder #270-739
Fuse #270-1273
Bridge rect #276-1173
Capacitor #272-1048
Resistors #271-132
Resistors #271-028
Resistor #271-1714
Capacitor #272-1044
Misc: Case, AC cord & plug, wires and safety clips.

OK - This is strictly an experimenter's power supply and as such is somewhat inefficient at lower voltages plus it will run quite warm at same. The circuit is a modified "shunt" regulator and is bit out-

dated, but it does work and doesn't cost \$80.00. In fact, around \$20.00.

It's inherently current limiting, BUT you can *really flame out an expensive piece of equipment with it!* Always set the voltage *before* connecting the device to be used, then re-adjust! Be advised, this can cause a very unpleasant shock at full output! If you *want* a 5 volt supply, just use the regulated power supply circuit as shown, substituting a #273-1511 transformer and a #276-565 Zener diode, minus ONE #276-1101 diode.

IF you can live with 1-1/2 amps at a *very steady* 1.2 - 2.4 volts, simply substitute the circuit shown in Figure 3 for the regulator portion of Figure 2 (at the right of the two Xs).

Well, this shoots my space full of stuff from wall to wall, so enjoy and we'll see what cooks next month. Any question will receive a reply when accompanied with an S.A.S.E. ■

Fine-Tuning the Kenwood R-2000 Communications Receiver

by Wayne Mishler, KG5BI

Soon after buying my new Kenwood R-2000 receiver, I decided to take it out for a spin. Just as with a new car, I decided to break it in gently, tuning-in WWV in single-sideband mode and adjusted the tuning dial for zero beat. The display read 200 Hertz high.

Sure, the problem was no catastrophe. But it was certainly an annoyance. So, I telephoned the retailer who sold me the radio. He did not share my concern, but said his technician would check the receiver's alignment for a fee. There was, however, a three-week backlog. I might get the receiver back in a month.

That was out of the question. So was the alternative of sending the receiver back to Kenwood for alignment.

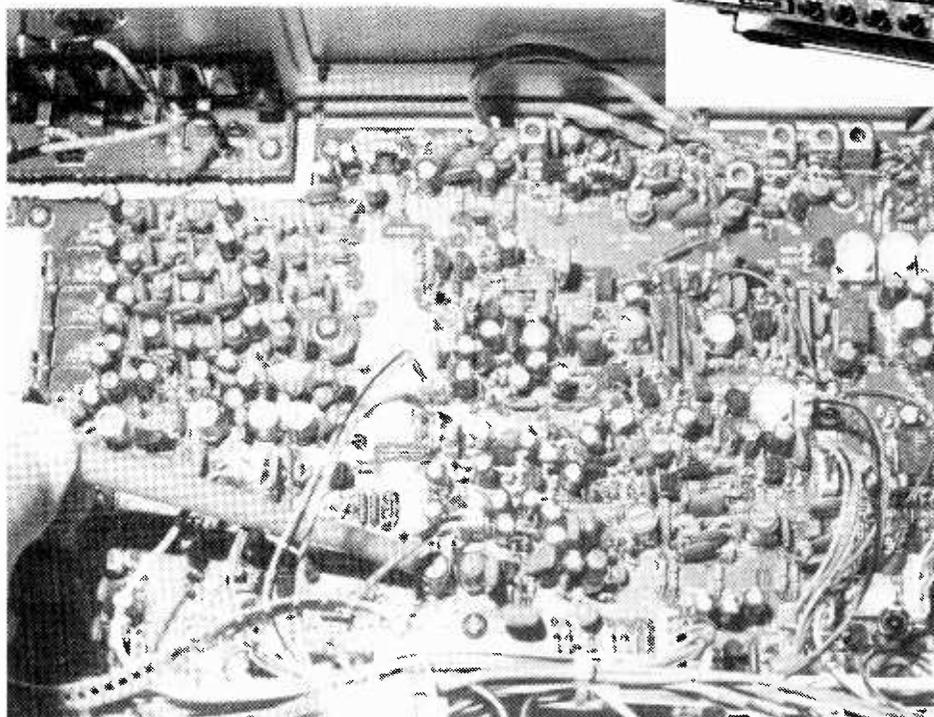
Taking courage in both hands...

Being a ham operator and somewhat familiar with receiver theory and electronic troubleshooting, I picked up the operator's manual and turned to the schematic diagrams. According to the block diagram, the Beat Frequency Oscillator (BFO) immediately precedes transistor Q21. A few minutes of circuit tracing led me to the RX unit (X55-1340-00) on page 77 of the manual.

The R-2000's mode circuitry enters this unit at connectors 42. The lower side-band signal goes directly from this connector to the base of Q20.

Closer scrutiny of Q20 revealed that the collector of this transistor drives a tank circuit consisting of T19 and C165. T19 is adjustable.

I disconnected everything from the receiver and began to carefully remove the covers. Once I got the bottom cover off, I found the RX unit (X55-1340-00) -- a large circuit board -- in plain view. Fortunately, Kenwood labels its components, and I soon found T19, which has a screwdriver slot in its top. Theoretically, turning this adjustment would adjust the receive frequency of the radio.



This is a photograph of the underside of the R-2000, with bottom cover removed. The antenna connector is located at the upper left corner of the photo. T19 is located at the lower center portion of the photo. It is the cylindrical component with the screwdriver slot in its top, at the tip of the alignment tool.

After much thought, I decided to proceed -- with caution.

Tuning 'er up

With the receiver laying upside down on a folded towel to avoid marring the finish, I double-checked my previous findings. Making sure that there was nothing that could fall into the open chassis, including rings and wrist watch, I connected the radio to power and antenna, and pressed the power switch.

In lower-sideband mode (because I knew that LSB went directly to the base of Q20), I once again tuned-in WWV and set the digital display precisely at 10 megahertz. A low beat note came from the speaker. I inserted a plastic alignment tool (with metal screwdriver blade) into the slot of T19 and slowly turned the lug. The beat note raised in pitch. Wrong direction!

I turned the lug in the opposite direction and the note lowered in

frequency, disappeared at zero beat, and began rising in pitch as I passed through zero beat. I reversed direction again and centered the lug at zero beat. This adjustment was very critical, and required several tries before I managed to find exact center.

I switched to upper-sideband mode and heard a slight beat note. I repeated the adjustment in USB, then switched to LSB. No beat note! Finally, I put the R-2000 on slow tuning speed and checked my work by finding zero beat with the tuning dial on both USB and LSB on the other WWV frequencies. Zero beat occurred precisely at 15, 10, and 5 megahertz.

I replaced the chassis cover and dialed up an English-speaking utility station. The operator's voice sounded normal at 8.241.5 megahertz. After several minutes, the operator gave his calling frequency and it matched my frequency display exactly.

End of Story.

Granted, not all utility transmitters are going to be exact in frequency, and therefore are not reliable reference points. However, I find that most are extremely close to the readout on my fine-tuned R-2000.

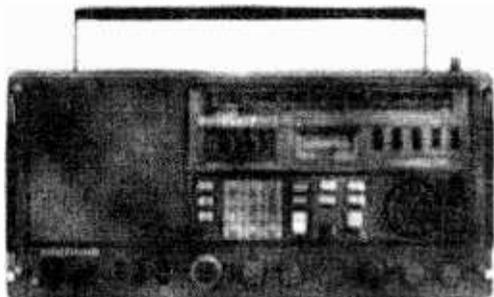
I can easily find the center frequency of AM broadcast stations by zero-beating them in SSB mode. I sometimes switch from AM to one of the side-bands to avoid interference -- without having to readjust the tuning dial.

This is not to suggest that all R-2000's are likely to be out of adjustment when they come from the factory. Yours probably will not be. However if you do experience the type of problem that I encountered with the R-2000, you might want to consider trying this simple adjustment. In my case, the procedure worked, and I am pleased with the results.

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As if those features weren't enough, Grundig has added a few more! Extendable whip antenna, internal ferrite loop antenna, external antenna connectors, external speaker connectors, headphone jack, battery charge indicator, and recorder input/output jacks. All in a 20"W x 9-1/2"H x 8"D cabinet weighing 19 pounds.

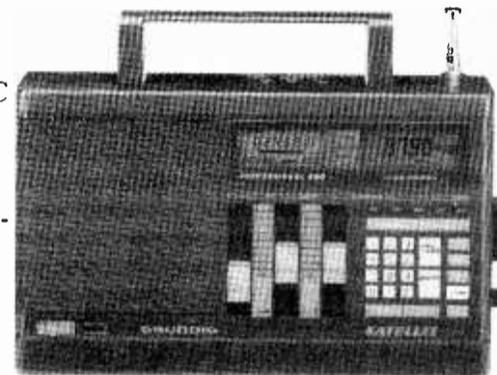
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For your accessories, consider the headphone jack, recorder input/output socket and external antenna connector. The dual 120/240 VAC 50/60 Hz AC power supply supports indoor operation while a 12 VDC connection allows mobile convenience as well. Naturally, the Satellit 400 will run off inexpensive internal batteries (6 C and 3 AA) as well.

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Figure 1

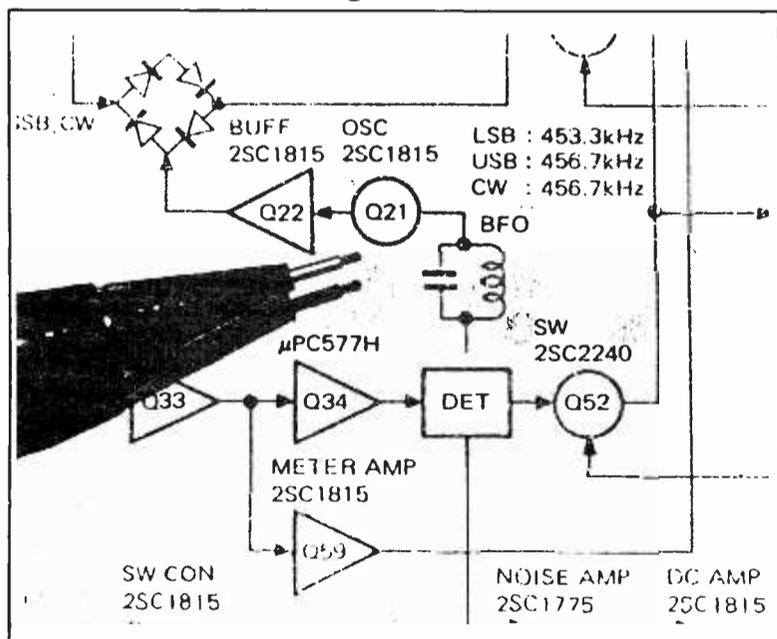
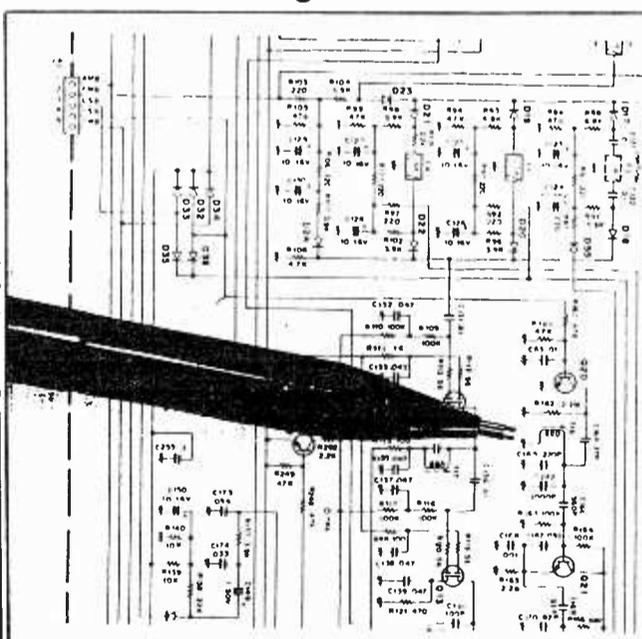


Fig. 1: The block diagram in the back of the R-2000 operator's manual shows that the Beat Frequency Oscillator immediately precedes transistor stage Q21. Fig.2: In this schematic diagram, we see that the lower side-band signal goes directly to the base of transistor Q20, which immediately precedes Q21,

Figure 2



and drives a tank circuit in the base of Q21. T19 adjusts the resonant frequency of this tank circuit as well as the receive frequency of the R-2000. Therefore, T19 enables us to zero-beat the receiver to a known signal source, such as an on-the-air WWV transmission.

BC600 Accessory Fix

When customers complained of erratic displays on their brand new BC600XLTs, we at Grove Enterprises were understandably concerned. The problem involved only those scanners in which the switch assembly had been installed.

Apparently, when the switch assembly is installed, it is possible for the board to press against a ribbon connector below it, possibly penetrating the thin insulation.

The fix is simple: press a length of plastic electrical tape across the bottom of the switch board to insulate it from the ribbon below it. Additionally, push the ribbon down gently toward the main circuit board to keep it from bumping the switch assembly.

Q. My VCR interferes with my scanner--a buzzing sound--when I'm monitoring the 40 MHz band. Is there a cure? (Edward King, Fair Lawn, NJ)

A. I have the same problem. It is because the VCR is actually a piece of radio equipment which emits oscillator and mixer products which may be heard by nearby radios. The buzzing sound is the video IF of the channel the VCR is "watching", commonly in the 42 MHz range.

If the shielding of the VCR is inadequate and if grounding it doesn't help, nor does using shielded coax for its leads, about all you can do is locate your scanner antenna as distant as possible or turn off the VCR (which is what I do!).

Q. At least two companies (Pocket Quote and QuoTrek) manufacture handheld stock market quote monitors. Can conventional equipment monitor the service? (John Clemens, Malibu, CA)

A. Not legally, or so the Electronic Communications Privacy Act of 1986 (ECPA) would seem to indicate. The signals are sent over local FM broadcast stations as subsidiary carrier authorization (SCA) information. Special FM receivers with SCA adaptors extract the subcarrier (usually 67 kHz above the center of the FM carrier) and digital circuitry extracts the data for display.

Q. How much does the metal of a mobile home detract from indoor reception? Will an outside antenna overload a sensitive receiver? (Greg Brown, Carbondale, IL)

A. Enclosing any antenna in metal will severely reduce received signal strengths. Locating an indoor antenna near or in a window will help. A large outdoor antenna without a preselector like the Grove TUN-3 MiniTuner will cause overload from strong signals on low and medium cost receivers (generally under \$500), but not on prime receivers like the R5000, R71A or NR525.

For some straightforward information on antennas and receivers, send a self-addressed, stamped envelope to Grove Enterprises, PO box 98, Brasstown, NC 28902 and request "How to Choose a Receiver" or "How to Choose an Antenna." [Now included in the preface to the Grove catalog...ed]

Q. I heard a Navy ship on 14477 kHz talking to shore. Can you help me identify this? (Barry Rader, Fostoria, OH)

A. Most Naval ship-to-shore traffic in that part of the spectrum belongs to the Military Affiliate Radio system (MARS), a dedicated cadre of licensed radio amateurs who donate their time, equipment and talents to handling morale traffic to and from enlisted personnel and their families back home.

While all US Navy/Marine Corps specialty ships afloat are allocated the prefix NNN0, callsigns are typically abbreviated; for example, the USS Missouri will identify as "Charlie Kilo Kilo", the last three letters of their authorized callsign, NNN0CKK.

A comprehensive list of MARS callsigns and frequencies is in the new fourth edition of Bob Grove's *Shortwave Frequency Directory*, available January 1st from Grove Enterprises and other shortwave dealers.

Q. I am thinking of buying a surplus R-484/APR-14 radar receiver which has a 3" CRT display. When I tune through a broadcast TV frequency, will I see a picture or merely a waveform? (John Johnson, Barboursville, WV)

A. Your proposed receiver has a panoramic display; a strong signal will produce a "pip" or "spike"--a rise in the baseline which sweeps across the face of the tube. Sorry, no picture!

Q. Where can I find out more about ham radio antennas such as beams, towers and rotators? (J. Perkins, County Durham, Eng.)

A. In the UK, I would suggest you get a copy of *Practical Wireless* from your newsstand; it is an excellent monthly magazine dealing with all aspects of radio. Advertisers abound in the publication and are a good source of additional information.

Q. Is there any way to monitor the police mobile data terminals I hear on my scanner? (Bobby Rose, Towlett, TX)

A. We have posed this question to our readers over the years and so far no one has reported success. Apparently the protocol is similar to packet, but incompatible with standard hobby demodulators on the market. Anyone out there had any success?

Q. What is "ECSS" tuning? (Mike Westphal, Akron, NY)

A. Exalted carrier single sideband is a method of tuning in a full-carrier AM broadcast station with the SSB function switched on. The dial is simply fine tuned until the voice or music sounds natural.

There are two advantages to ECSS tuning which chooses just one of the two sidebands of a signal: you eliminate adjacent-channel interference from the other side; and you reduce phase distortion on the arriving signal produced by unequal propagation of the upper and lower sideband frequencies.

Q. I already have an outdoor antenna for my Sony ICF2010 receiver; can I improve reception with the Grove TUN-3 MiniTuner and PRE-3 preamplifier? (John Holterman, Laurel, MD)

A. Yes and no. Yes, the TUN-3 MiniTuner, a frequency-selective passband filter, will pass the signals you want to hear and suppress the off-frequency signals which overload receivers like yours; no, using a preamplifier with an outdoor shortwave antenna is an invitation to overload problems like intermodulation and image interference.

Q. Where is London VOLMET located? (Robert Covington, Baltimore, MD)

A. VOLMET stations broadcast wide area aviation weather from major airports worldwide. In the United States, Shannon (Ireland) Aeradio may be heard broadcasting London-Heathrow VOLMET reports on 8957 and 13264 kHz USB on the hour and at 25, 30 and 55 minutes after the hour.

Q. Can you suggest several alternative antennas to use aboard my sailing sloop to hear shortwave signals 1000 miles off-shore? (Phillip Tanner, Lincoln City, OR)

A. Any antenna designed for HF two-way marine radio communications should work well for this application, even a full length (102 inch) CB whip will provide good reception on the higher frequencies (above 10 MHz or so). Amateur mobile whips are also available, cut to frequencies around the ham bands.

These short antennas need to work against a good ground, however; metal screening, foil or plate is often placed under the hull to contact saltwater for this purpose. In lieu of a ground to the seawater environment, a counterpoise can be used consisting of a wire or group of wires above the waterline and of the same length as the antenna. These are connected to the shield of the coax cable.

If you are using a fiberglass mast, you may wish to run a wire antenna up the mast; even a long wire connected to the rigging should work satisfactorily provided it is at least 25 feet in length. For receive-only purposes, a ground will not be necessary once an antenna of reasonable length is available.

Questions sent to MT are answered in this column as space permits. If you prefer an answer by return mail, you must include a self-addressed, stamped envelope.

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GRE 800 MHz Converter - A Rebuttal

In response to the letter to *MT Mailbag* from Bob Horvitz (Nov 87), concerning my article on the GRE 800 MHz converter, there are a few things that need yet to be said about this matter.

Yes, everything Mr. Horvitz stated was confirmed in a letter I received from Spencer Tall, Marketing Manager of GRE America, after the article had been written. However, I did receive my prior information over the phone from the GRE company, either from somebody who, perhaps, did not totally understand what happened or who was possibly misinformed. I naturally took it as factual and relayed it as such in my article.

The letter I received from Mr. Horvitz suggested that the article had overtones of "fabrication"; had Mr. Horvitz contacted me prior to his own research, he would have found differently. I most certainly do not object to "setting the record straight," but the way it has been done seems to have been a bit backwards.

Larry Wiland
Youngstown, OH

Yes to Guide & more Freqs

Kudos. *Monitoring Times* just keeps getting better and better. Been with you since your merger with the old *Shortwave Guide/International Radio* days.

After reading the Mailbag in the November issue, I have to agree with Ed Janowski; I miss the program guide that used to be a regular feature in the old *SW Guide*. I live in a rural area with no access to cable TV, and a satellite receiving system is cost prohibitive. I rely on shortwave radio for a lot of news and entertainment. Sure would be nice to have advance program details included on a regular basis in *Monitoring Times*.

Gary Fiedler
Mott, ND

I don't like the new format for the Frequency Section. The old one was great. I logged a lot of the listed frequencies that were listed as not being heard. This is one of my prime sources of frequency information and you cut out more than half of the scheduled frequencies. I hope you receive enough mail on this to go back to the old and better format.

Bob Zirkelbach
Pleasant Hill, CA

Airborne Scanners

(Regarding "So you want to listen to a scanner on board an aircraft, Oct 1987, P.19)

[Referring to] the Federal Aviation Regulation (FAR) 91.19, an advisory panel is studying possible changes for the use of lap-top computers, but ... nothing is close.

1. There is a blanket authorization for the use of tape recorders, hearing aids, pacemakers, and electric shavers;

2. FAR 91.19(b)(5) allows the use of any other portable electronic device the operator of the aircraft has determined will not cause interference (to aircraft systems);

3. However, the text of FAR 91.19(c) indicates that the determination of interference for a commercial flight (air carrier) is not up to the pilot-in-command. This determination is to be made by the air carrier or commercial operator (charter certificate holder, not the pilot in command, unless the pilot-in-command is also the certificate holder). In the final sentence of FAR 91.19(c), there is a specific reference for other aircraft (other than air carrier and charter), in which this authority is given to the pilot-in-command (generally "private" flying).

I've also been told that this determination (for a commercial flight) is made for a particular airframe (serial or tail number) and if the airframe is substituted, that determination is no longer valid, even if the substitution is the same type aircraft with the same equipment (91.19[b][5] uses the term "the aircraft").

I hope this will clear up some of the confusion on the use of radio equipment aboard an aircraft.

Sheldon Daitch WA4MZZ
Certificated Flight Instructor
Commercial-Airplane, Single &
MultiEngine-Instrument
Greenville, NC

Let's Hear it for RTTY

Praise Allah! Looks as if someone is finally coming out with a RTTY column so that newcomers like myself (and surely I am not alone) can get some useful and layman-level information. If future columns live up to the promises made in his first column, Mr. Albert and *MT* have a winner.

Hugh M. Hawkins
San Antonio, TX

PRO-2004 Channel Mod - Wow!

WOW! on *MT's* scoop of the extra 100-channels available in the Realistic PRO-2004 scanner! What a deal, especially since I had long since exhausted the stock 300-channels in my rig. So immediately upon reading that article, I performed the mod to mine, with excellent results.

Since then, I have performed this mod to several other units, and I have not yet encountered the same side effects as the reporting author did, regarding the loss of memory and the floating "lock out." I think if the installer is careful and doesn't mess around with any of the I/O connectors to the CPU, that existing memory will not normally be lost when adding "D-510." Now, if one later disconnects D-510, memory might be lost.

Perhaps the author, in working out the 100-ch add mod, experimented in other critical areas which caused memory to be lost. This will happen if certain of the CPU pins are accidentally shorted out, or if one or more of the I/O connectors are tampered with.

I don't have anything to say regarding the "floating lock out," as this has not happened to me. Great Scoop, Bob!

On a related note, what are the chances of YOU coercing one or more of your "digital logic" experts to do a technical rundown of the PRO-2004 logic section for *MT*? I think there may be a lot more latent capability in this rig than we have discovered thus far. For example, one wonders what would happen if D-511 and D-514 were installed, or if D-515 were disconnected (We already know that adding D-512 disables 30-54 MHz).

I can't understand how either 300 or 400 channels are the limit for this rig, since binary or octal counting methods would suggest either a 255 or 511 channel limit! Might there be some way to liberate another 111 programmable channels? Or, perhaps the UHF-TV band, 520-760 MHz? Speaking for myself, and possibly many others, one wonders what the limits of the PRO-2004 really are?

I am highly pleased with most operational characteristics of the PRO-2004, especially its ability to reject image frequencies and cross-mod or intermod. My unit is relatively interference-free, and completely so, compared to an older PRO-2002 that I use. In the \$400 class, this baby has

got to be the greatest scanner since the first programmable TENELEC came out around 13-15 years ago!

Bill Cheek
Commtronics Engineering
Lemon Grove, CA

The Defacto (well almost) Info on Configuration Diodes of the Realistic PRO2004

The section on adding 100 memory channels to the PRO2004 (*Helpful Hints*, October 87 *Monitoring Times*) left me with the impression that you only have partial information on the configuration diodes of the 2004. Therefore, I thought you might be interested in my findings, which I present in numbered form below (1 - 4).

1. D510 and D513 you already know about

2. D512 - at least on my unit, adding D512 does not disable 30-54 MHz or 66-88 MHz or any other range. What it does is disable the 30 KHz default search step for the cellular ranges (825-844.995 MHz and 870-889.995 MHz), changing it to the standard 12.5 KHz step.

3. D514 and D515 - these determine the scan/search speed:

D515	14	CH./Sec.	
0	0	12.5	
0	1	14.3	
*	1	0	16.7
1	1	20	

* Factory setting

Notes: 1.0 = out, 1 = in
2. Indicated channels/second are for my unit
3. Search speed changes proportionally
4. Speed key always cuts speed in half

Therefore, by adding D514, 300 channels can be scanned in 15 seconds rather than 18, and all 400 channels can be covered in 20 seconds rather than 24, a decrease of 4 seconds!

4. D511 - ? if it does do something, it must be transparent to the user, since it appears to have no external function (thus the "well almost" part of this letter's heading).

Bill Evans
W. Lafayette, IN

[How about it, experimenters? Anyone else have interesting observations about improving the PRO-2004?...-Bob]

Monitoring McDonald's

This letter is in reference to your article "QSLing Those Really Difficult Stations" (Oct 1987). One of the QSL letters was for a McDonald's drive-thru. Well, it should be noted that the true nationwide frequencies for McDonalds are 35.02 and 154.6 MHz.

Now, are you ready for this? Each McDonalds has its own repeater! (RXing on 154.6/TXing on 35.02). I won't go into detail about specifics, because it's more fun to find out for yourself, but I will say: (1) I suspect employees have a choice of transmitting on 154.6 plus an inaudible subcarrier or without, thus letting them carry on private conversations without activating the outside speaker; (2) 35.02 MHz is on 24 hrs a day, 7 days a week, closed or open. (By the way, this frequency lets you hear both customer and employee!)

Remember, this is only a 2 watt frequency. You practically have to be in the parking lot to receive it.

*Dave Lukitsh
Miami, FL*

Technical Support

Just a short note of thanks for the help you provided to me a short time back. I was having a problem with

What does the Shroud of Turin have to do with monitoring?

Absolutely nothing. Does it need to? This is a fundamental question which every publisher faces. Should every article in Monitoring Times follow the theme of the publication? After all, the subscriber has paid good money to subscribe to a magazine which enjoys a reputation for providing the most timely and accurate information on monitoring available.

In the past, divergent themes have drawn little response from our readers. Even when we run articles on CB or ham radio we hear from the monitoring-only mainstream reminding us to stay on the straight and narrow.

Editor Larry Miller even suggested (with tongue in cheek--I think) that we title the article, "DXing the Shroud of Turin"! Perhaps this thin disguise would deflect volleys from the purists.

What do you think? Should MT occasionally include articles of unusual interest even if they are not strictly on listening? Or should we reserve its hallowed pages for our primary purpose: to present information on monitoring signals throughout the radio spectrum? We'd like to know your thoughts.

one of my radios, and as usual you knew how to handle it.

Again, *thanks a million* for the help. Without you and your staff a lot of us radio buffs would be just hanging in the wind--along with our unused antennas!

*Dan McLaughlin
Hyde Park, NY*

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INDEX OF ADVERTISERS

AF Systems	43
Communications Electronics	45
EEB	41,59
Full Disclosure	21
Galaxy	11
Grove	9,23,39,49,57
Grundig	2,63
GTI Electronics	53
Ham Radio	47
Icom	64
Imprime	37,51
Klingenfuss Publications	13
Scanner World	27
Sony	33
73 magazine	31
Universal	17

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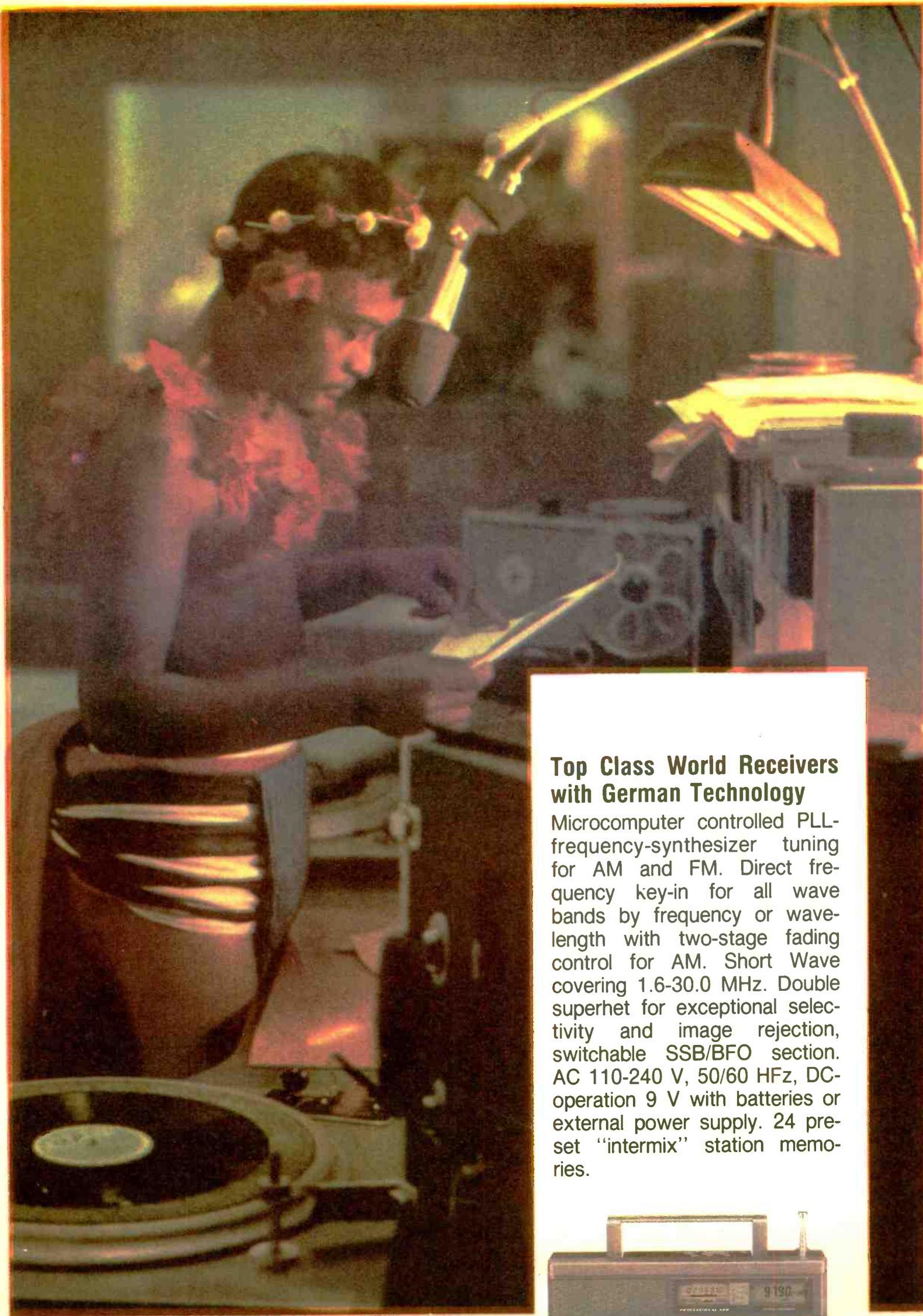
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